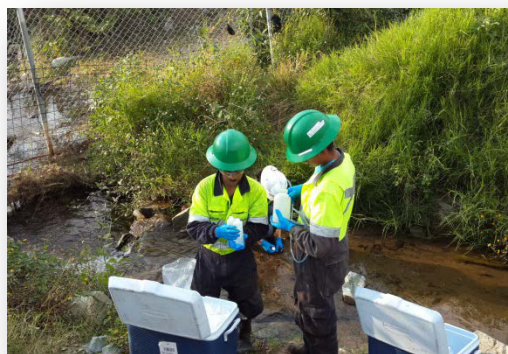


**Proyecto Minero Escobal
San Rafael Las Flores, Santa Rosa**

Informe de Monitoreo Ambiental



07 – 2014



Preparado para:



Ministerio de Ambiente y Recursos Naturales (MARN)

Informe Trimestral de Monitoreo Ambiental

Preparado por:



Departamento de Ambiente

San Rafael Las Flores, Santa Rosa, Guatemala

NOVIEMBRE 2013 – ENERO 2014

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1 Introducción

A continuación se presenta al Ministerio de Ambiente y Recursos Naturales (**MARN**), el informe trimestral de monitoreo ambiental del Proyecto Minero Escobal (**el Proyecto**) basado en lo siguiente:

- A.** Resultados obtenidos durante los monitoreos ambientales referente a la calidad del aire (material particulado, gases de combustión y niveles de presión sonora), calidad de agua, vibraciones, salud y seguridad ocupacional y geoquímica de roca llevados a cabo durante los meses de Noviembre 2013 a Enero 2014.

Esto como parte de los compromisos ambientales de Minera San Rafael, S.A. (**la empresa**) en base a la resolución 549-2012/DIGARN/ODGR/hapc, inciso B, el cual se lee: “La entidad MINERA SAN RAFAEL, SOCIEDAD ANÓNIMA, deberá continuar realizando los monitoreos en base a lo descrito en cada una de las resoluciones citadas en el primer considerando (4590-2008/ELER/CG), (262-2011/ECM/caml), (3061-2011/DIGARN/ECM/beor), llevando su respectivo registro y presentar los resultados de los monitoreos de cada uno de los proyectos de forma trimestral”.

- ❖ Proyecto de Exploración Minera Oasis ante el MARN con base en la resolución 4590-2008/ELER/CG, compromiso número VII; el cual se lee: “llevar un monitoreo mensual de la calidad de aire y niveles de ruido en el Área de Influencia Directa (**AID**) y presentar resultados mensualmente al MARN.”
- ❖ Proyecto de Túneles de Exploración Minera Oasis ante el MARN con base en la resolución 262-2011/ECM/caml, compromiso número XII; el cual se lee: “Continuar con el programa de monitoreo de la calidad del agua y aire, implementado desde 2008.”
- ❖ Proyecto Minero Escobal ante el MARN con base en la resolución 3061-2011/DIGARN/ECM/beor, compromisos número III y número VI; los cuales se leen: “La Empresa deberá de implementar el plan de monitoreo ambiental descrito en capítulo 13 y cumplirá con los límites establecidos por el MARN, además de lineamientos internacionales como Banco Mundial, Corporación Financiera internacional (CFI), Agencia de Protección Ambiental de los Estados Unidos (USEPA), Organización Mundial de la Salud (OMS) y Administración de la Salud y Seguridad Ocupacional (OSHA), según el componente que sea monitoreado...” y “Llevar un registro documentado del caudal bombeado de los pozos de abastecimiento y del agua bombeada desde los túneles hacia las piletas, así como de las descargas y los parámetros de descarga...”.

- B.** Resultados de calidad de agua y de calidad de aire, como parte de los compromisos ambientales de la empresa ante el MARN con base en la resolución 3061-2011/DIGARN/ECM/beor, compromisos número XXXI; el cual se lee: “Presentar los informes de monitoreo de la calidad del agua de los cuerpos naturales de agua potencialmente afectados por las actividades del proyecto y de la calidad del aire a este Ministerio en forma anual.”
- C.** Copia de registro documentado del Caudal bombeado desde los túneles hacia la planta de tratamiento y de su descarga hacia la Quebrada Escobal, como parte de los compromisos ambientales de la empresa ante el MARN con base en la resolución 3061-2011/DIGARN/ECM/beor, compromisos número VI; el cual se lee: “llevar un registro documentado del caudal bombeado de los pozos de abastecimiento y del agua bombeada desde los túneles hacia las piletas, así como de las descargas y los parámetros de descarga, remitiendo a este Ministerio una copia mensual de estos registros.”

El contenido del presente informe corresponde a la evaluación de los siguientes componentes ambientales:

- Calidad de Aire: Se monitorearon nueve estaciones ubicadas dentro del área de Influencia (**AI**) del proyecto para medir la concentración de material particulado igual o menor a 10 micrómetros (**PM₁₀**), en microgramos por metro cúbico (**µg/m³**). También se monitorearon siete estaciones para medir la concentración de metales en **PM₁₀**, sólidos sedimentables totales (**PST**), y gases de combustión: dióxido de azufre (**SO₂**) y óxidos nitrosos (**NO_x**).
- Calidad de Presión Sonora: Se monitorearon nueve estaciones ubicadas dentro del ID del proyecto, para determinar los niveles de presión sonora, en decibeles escala A (**dBa**) y respuesta lenta.
- Calidad de Agua: Se tomaron muestras en 11 estaciones de agua superficial, 5 estaciones de agua subterránea (manantiales), 1 estación de pozos de producción y 10 estaciones de agua en pozos de monitoreo ubicadas en el ID del proyecto.
- Sedimentos: Se tomaron muestras de sedimentos en las mismas estaciones de agua superficial ubicadas en el AI del proyecto.
- Calidad de Efluente: Se tomaron muestras mensuales en el efluente de la Planta de tratamiento de aguas proveniente de túneles y del agua contenida en la pileta de cumplimiento ambiental; además de mediciones diarias de datos *In Situ* y kit de cianuro de estos mismos puntos. En el anexo 11.2 se presenta una copia de los registros diarios.

- Vibraciones: Se instalaron tres medidores de vibraciones, los cuales registraron la velocidad de partícula durante cada una de las voladuras. En total se registraron 397 voladuras durante los meses de Noviembre 2013 a Enero 2014.
- Geoquímica de roca estéril: Se analizó el pH en pasta de 52 muestras de material extraído de los túneles.
- Mediciones de Seguridad y Salud Ocupacional: Se analizaron seis estaciones de monitoreo de presión sonora, tres estaciones de material particulado, y se presenta un extracto de las mediciones rutinarias de gases para determinar ácido sulfhídrico (H₂S)
- Copia de registro documentado del caudal bombeado de los pozos del agua bombeada desde los túneles hacia las piletas. En el anexo 11.1 se presenta copia de las lecturas diarias de flujómetros y los cálculos realizados para determinar los caudales bombeados del portal Este y el portal Oeste, durante los meses de Noviembre 2013 a Enero 2014.
- Copia de registro documentado del análisis In Situ y kit de Cianuro de efluentes. En el anexo 11.2 se presenta copia de las lecturas diarias de parámetros In Situ (pH, temperatura, Conductividad, Turbidez) así como los resultados obtenidos con el Kit de Cianuro (método colorimétrico) y resultados de muestras enviadas al laboratorio ACZ para la verificación del método colorimétrico; durante los meses de Noviembre 2013 a Enero 2014.

2 Condiciones Ambientales

En el Cuadro 2-1 se describen algunos parámetros meteorológicos en el área del Proyecto y de la Figura 2-1 a la Figura 2-3 se representa la dirección del viento durante Noviembre de 2013 a Enero de 2014.

Cuadro 2-1: Condiciones meteorológicas, Proyecto Minero Escobal

| Temperatura (°C) | | | Velocidad del viento (km/h) | | | Ráfagas (km/h) | Humedad relativa (%) | | | Evaporación (mm) | | | Precipitación (mm) |
|-----------------------|------|-------|-----------------------------|-----|-------|----------------|----------------------|------|-------|------------------|-------|-------|--------------------|
| Max | Min | Media | Max | Min | Media | Max | Max | Min | Media | Max | Min | Media | Total |
| Noviembre 2013 | | | | | | | | | | | | | |
| 27.4 | 12.9 | 19.8 | 120.3 | 0.3 | 21.1 | 146.3 | 99.9 | 44.5 | 76.8 | 298.1 | 186.4 | 261.5 | 27.58 |
| Diciembre 2013 | | | | | | | | | | | | | |
| 27.9 | 9.2 | 19.1 | 113.1 | 0.3 | 27.8 | >161.0 | 99.9 | 23.4 | 71.2 | 233.7 | 91.9 | 173.3 | 0 |
| Enero 2014 | | | | | | | | | | | | | |
| 29 | 9.5 | 18.5 | 133 | 0.2 | 35.6 | 155.1 | 97.3 | 19.1 | 64.6 | 220.8 | 18.9 | 138.5 | 0 |

°C = grados centígrados. Km/h = kilómetros por hora. % = porcentaje. mm = milímetros. Max = valor máximo. Min = valor mínimo. Fuente: MSR, 2014.

Durante el trimestre se registró una temperatura promedio de entre los 18.5° a los 19.8°C y solamente en el mes de Noviembre se registró precipitación (27.58mm). El mes que mayor humedad relativa presentó fue nuevamente Noviembre con 76.8% y el mes que en promedio presentó la mayor velocidad de vientos fue Enero con 35 km/h. En la Fotografía 2-1 se muestra la ubicación de la estación meteorológica, donde se registran las condiciones ambientales que se reportan.



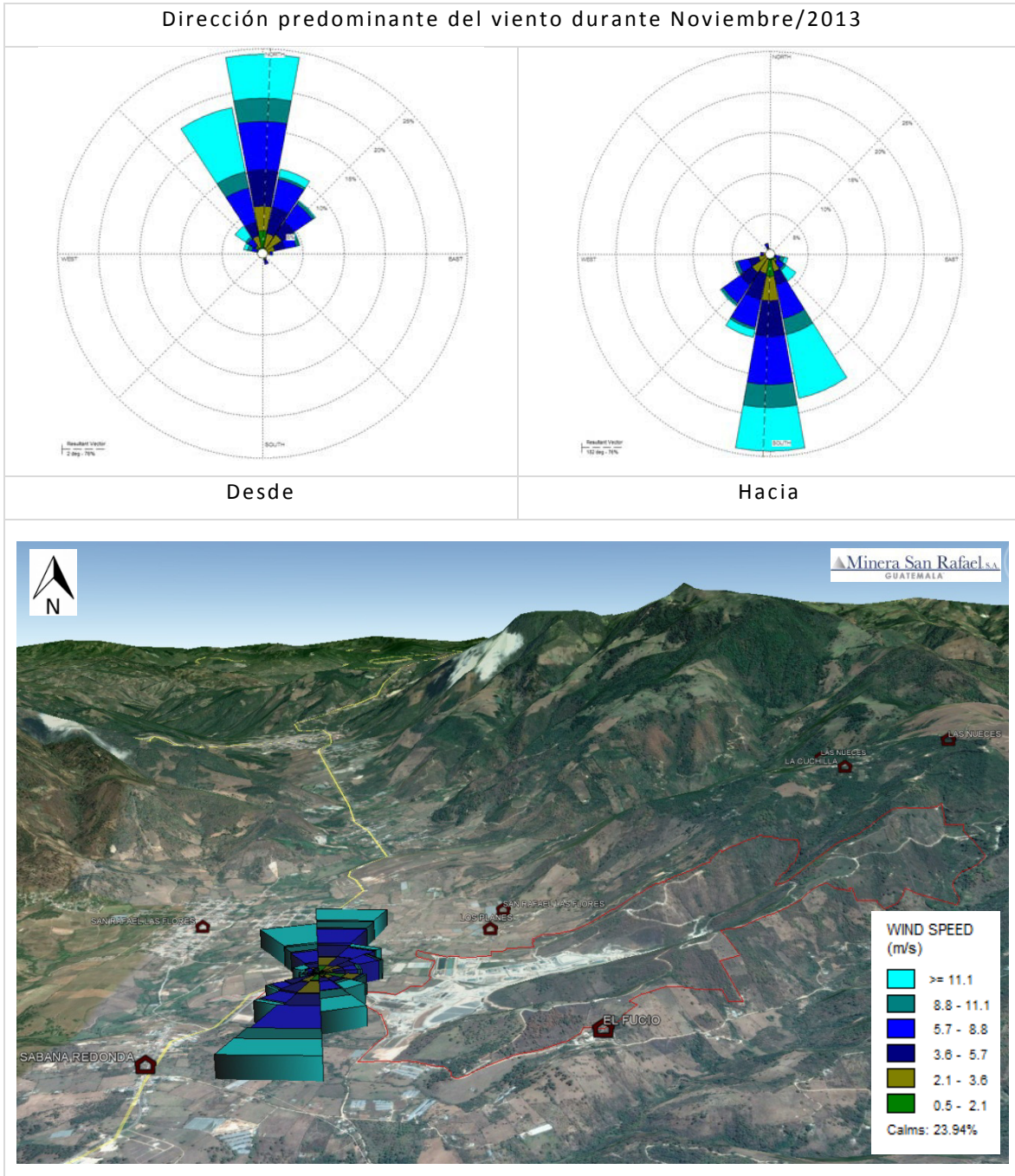
Fotografía 2-1: Estación meteorológica Escobal, San Rafael Las Flores, Santa Rosa.

Fuente: MSR, 2014.

Como se puede observar en la Figura 2-1, Figura 2-2 y Figura 2-3 la predominancia de los vientos durante el trimestre de Noviembre de 2013 a Enero de 2014 fue de noroeste a sureste.

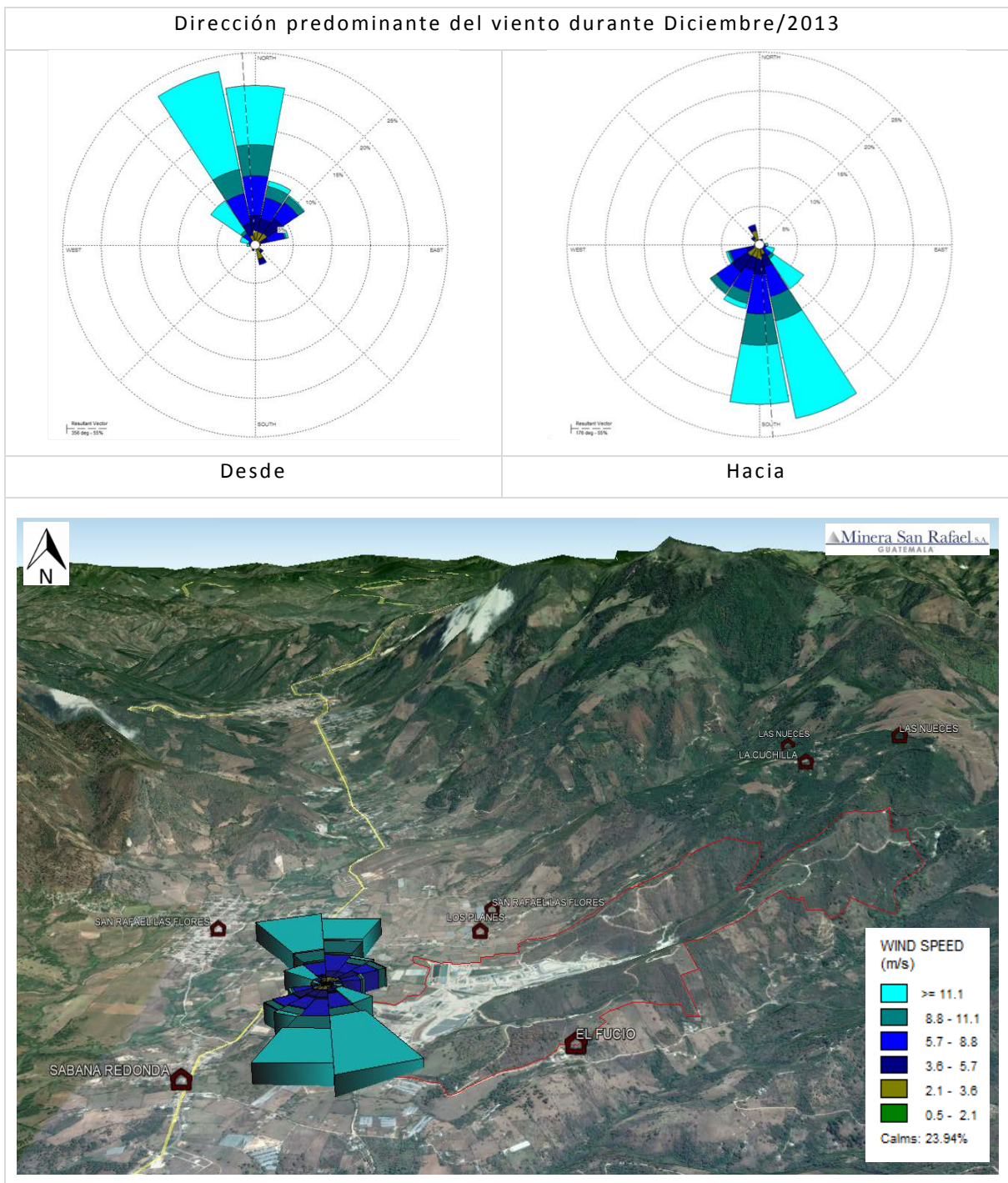
Figura 2-1: Dirección del viento Noviembre 2013, Proyecto Minero Escobal

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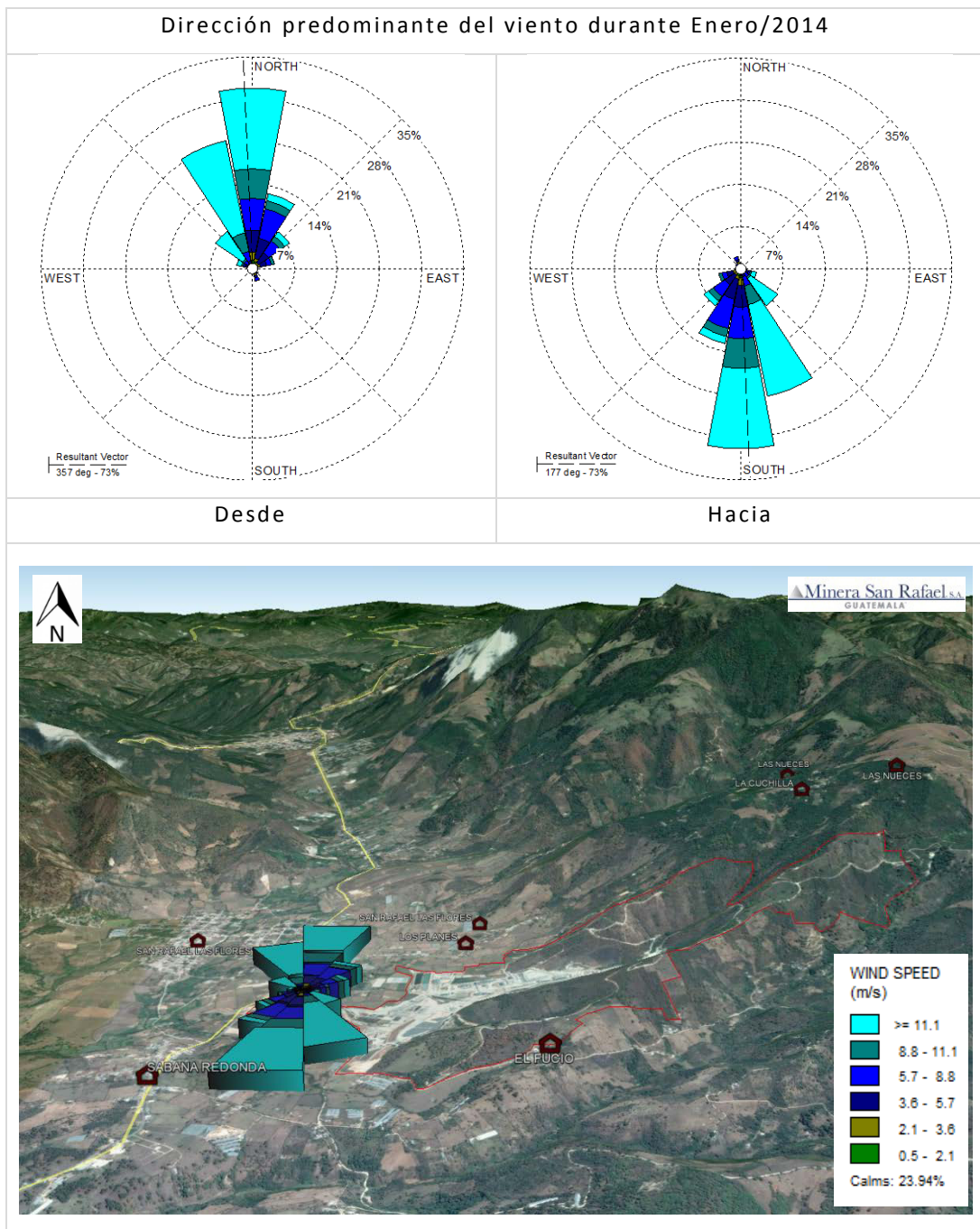
Fuente: MSR, 2014.

Figura 2-2: Dirección del viento Diciembre 2013, Proyecto Minero Escobal



Fuente: MSR, 2014.

Figura 2-3: Dirección del viento Enero 2014, Proyecto Minero Escobal



Fuente: MSR, 2014.

8

3 Calidad de Aire

3.1 Material Particulado

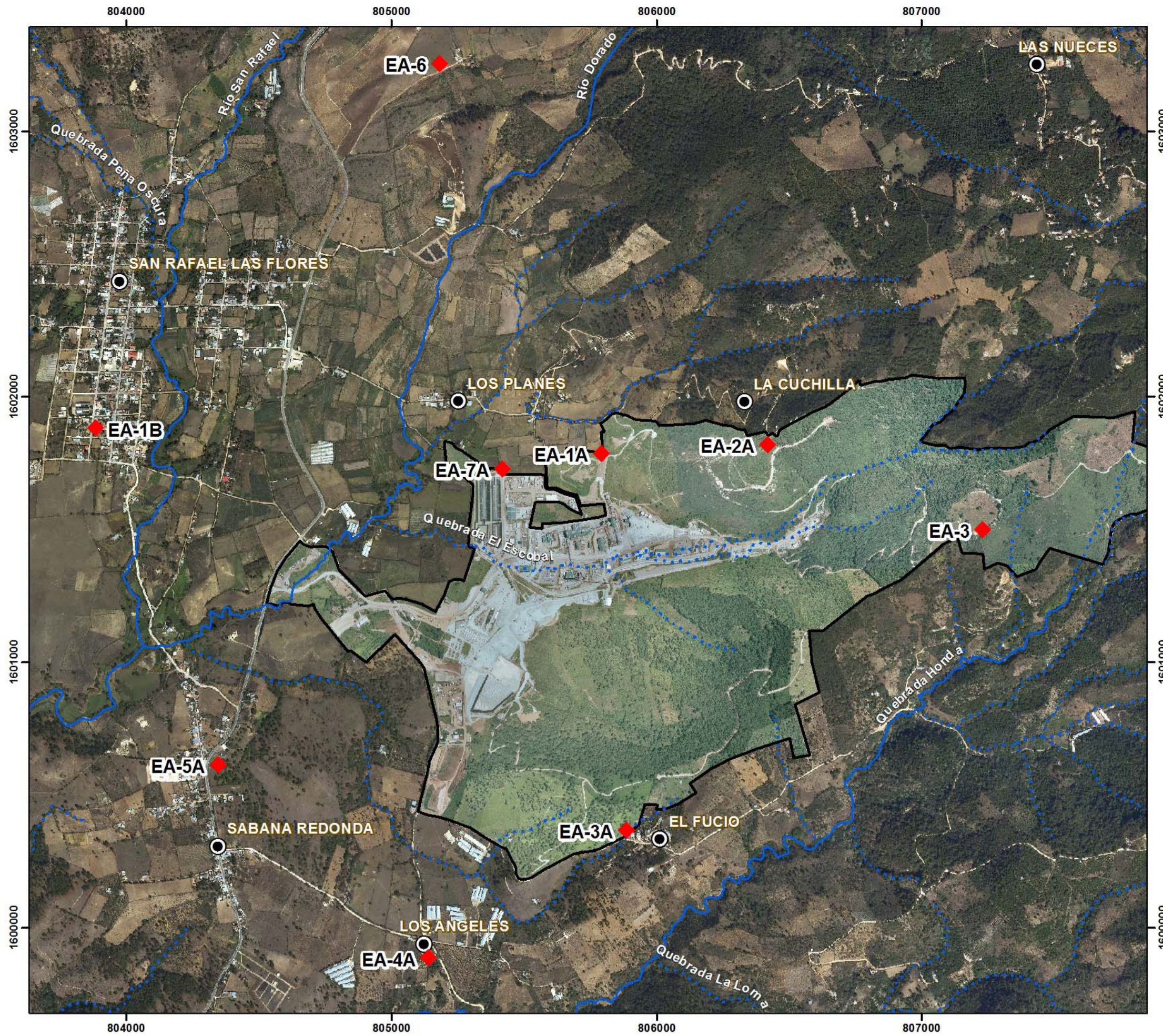
3.1.1 Sitios de Monitoreo

En el Cuadro 3-1 se enlistan las estaciones de monitoreo de material particulado (**PM₁₀**) menor o igual a 10 micrómetros, localizadas dentro de los terrenos de la mina y en la jurisdicción de los centros poblados ubicados en el área de influencia (**AI**) del Proyecto: Los Planes, La Cuchilla, El Fucío, Sabana Redonda, Portón de los Ángeles y San Rafael Las Flores. La ubicación de las estaciones de monitoreo de **PM₁₀** se presenta en la Figura 3-1.

Cuadro 3-1: Sitios de monitoreo de material particulado, Proyecto Minero Escobal

| Estación | Coordenadas | | Altitud (msnm) | Sitio | Período línea base |
|---|-------------|-----------|----------------|--|--------------------------|
| Periodicidad de monitoreo mensual | | | | | |
| EA-1A | 805,797 | 1,601,582 | 1,417 | Depósito de suelos, a inmediaciones de Aldea Los Planes | Febrero 2009 a Mayo 2011 |
| EA-2A | 806,427 | 1,601,605 | 1,564 | Aldea La Cuchilla | |
| EA-3 | 807,165 | 1,601,255 | 1,679 | Área Este del proyecto, a inmediaciones de Aldea El Fucío. | |
| EA-7A* | 805,425 | 1,601,523 | 1,320 | Al noreste de pileta de agua de proceso y pileta de cumplimiento ambiental, Jurisdicción de Aldea Los Planes | No cuenta con línea base |
| Periodicidad de monitoreo trimestral | | | | | |
| EA-1B | 803,894 | 1,601,727 | 1,328 | Poblado San Rafael Las Flores, cercano a Escuela | No cuenta con línea base |
| EA-3A | 806,000 | 1,600,108 | 1,416 | Aldea El Fucío | |
| EA-4A | 805,142 | 1,599,903 | 1,360 | Caserío El Portón de los Ángeles | Enero 2011 a Abril 2011 |
| EA-5A* | 804,352 | 1,600,408 | 1,339 | Aldea Sabana Redonda, al sur-oeste del proyecto | No cuenta con línea base |
| EA-6 | 805,168 | 1,603,247 | 1,434 | Al norte del Proyecto, ruta a Mataquescuintla | Julio 2010 a Abril 2011 |

*Se incluye como período de línea base de Julio 2010 a Abril 2011 la información registrada en las estaciones EA-5 y EA-7. Sistema de coordenadas proyectadas UTM, NAD27 ZONA 15. Msnm: metros sobre el nivel del mar. Fuente: MSR, 2014.



MAPA DE LOCALIZACIÓN ESTACIONES DE MONITOREO MATERIAL PARTICULADO (PM10)

PROYECTO MINERO ESCOBAL
SAN RAFAEL LAS FLORES, SANTAROSA



DEPARTAMENTO DE AMBIENTE
Sistema de coordenadas: WGS 1984 UTM Zone 15N
Proyección: Transverse Mercator
Dato: WGS 1984

LEYENDA

| Símbolo | Descripción |
|---------|-----------------------|
| | Polígono del Proyecto |
| | Centro Poblado |
| | Río Permanente |
| | Quebrada Intermitente |

ESTACIONES DE MONITOREO (PM10)

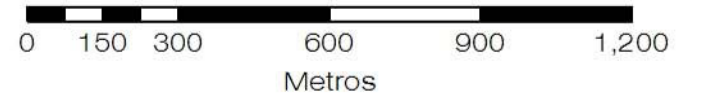
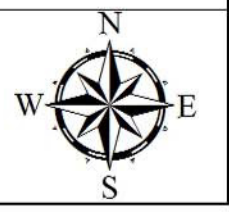
| Símbolo | Estación | X | Y |
|---------|----------|--------|---------|
| | EA-1A | 805791 | 1601785 |
| | EA-1B | 803885 | 1601881 |
| | EA-2A | 806419 | 1601819 |
| | EA-3 | 807232 | 1601498 |
| | EA-3A | 805886 | 1600364 |
| | EA-4A | 805140 | 1599883 |
| | EA-5A | 804346 | 1600611 |
| | EA-6 | 805181 | 1603257 |
| | EA-7A | 805419 | 1601726 |

FUENTE: Capas digitales del proyecto ESPREDE/MAGA/IGN del año 2000. Hojas catográficas año 2010 M ataquescuinta (2159-1) y Laguna de Ayarza (2159-II) del IGN, Ortofotos año 2006 del MAGA y Fotografía aérea del proyecto el Escobal año 2013, datos de campo del departamento de Ambiente.

Fecha de Elaboración: Enero de 2014

Distancia Horizontal y Vertical de Grilla: 1,000 metros

Escala 1:15,000



3.1.2 Metodología

En el Cuadro 3-2 se describe el procedimiento, parámetros y equipo utilizados en la medición de PM₁₀.

Cuadro 3-2: Procedimiento y equipo utilizado para medición de material particulado, Proyecto Minero Escobal

| Parámetros utilizados | |
|--|---|
| PM ₁₀ | Material particulado igual o menor a 10 micrómetros ($\leq 10 \mu\text{m}$). |
| Procedimiento | |
| La medición se realiza haciendo pasar un flujo continuo de aire durante 24 ± 1 horas por un filtro de fibra de vidrio que ha sido pesado inicialmente en un laboratorio equipado para realizar el análisis gravimétrico correspondiente; luego de la toma de muestra, el filtro es enviado de nuevo al mismo laboratorio para determinar su peso final. Con los datos obtenidos del muestreo y del análisis gravimétrico, se determina la concentración de PM ₁₀ . El equipo de medición utilizado cumple con las especificaciones de la Agencia de Protección Ambiental de los Estados Unidos (EPA). | |
| Equipo utilizado | |
| Nombre | PM ₁₀ Air Sampler |
| Modelo | PQ 200 |
| Fabricante | BGI INSTRUMENTS |
| Laboratorio contratado | |
| Nombre | Laboratorio Ambiental, S.A. Laboratorio respaldado por un Sistema de Calidad ISO 17025, otorgado por la Oficina Guatemalteca de Acreditación (OGA); y con ello los análisis acreditados (análisis gravimétrico de filtros) cuentan con validez internacional según OGA-LE 050-12. |

Fuente: MSR, 2014.

3.1.3 Resultados

En el Cuadro 3-3 se presentan los resultados de PM₁₀ durante los meses de Noviembre 2013 a Enero 2014 y los resultados de laboratorio del análisis gravimétrico de filtros y los cálculos realizados para determinar el PM₁₀ se presentan en el anexo 11.3.1

Los valores de PM₁₀ registrados durante el monitoreo realizado en todas las localidades, se encuentran dentro de los valores máximos permisibles, conforme a los valores establecidos por la EPA y el Banco Mundial ($150 \mu\text{g}/\text{m}^3$).

Cuadro 3-3: Resultados de PM₁₀, Proyecto Minero Escobal.

| Estación | Norma* | Guías* | | Línea Base | | | Resultados | | |
|----------|--------------------|----------------------------|------------------|----------------------|---------------------|--------------------|------------|--------|--------|
| | USEPA ¹ | Banco Mundial ² | OMS ³ | Promedio | Máximo | Mínimo | Nov-13 | Dic-13 | Ene-14 |
| | | | | (µg/m ³) | | | | | |
| EA-1A | 150 | 150** | 50 | 24.36 | 89.95 | 3.67 | 22.57 | 16.74 | 25.83 |
| EA-1B | | | | NR | NR | NR | 42.12 | NA | NA |
| EA-2A | | | | 21.40 | 76.20 | 2.74 | 28.48 | 12.68 | 19.17 |
| EA-3 | | | | 25.68 | 78.85 | 1.25 | 49.49 | 24.10 | 20.23 |
| EA-3A | | | | NR | NR | NR | 99.01 | NA | NA |
| EA-4A | | | | 103.55 | 120.40 | 86.70 | 71.18 | NA | NA |
| EA-5A | | | | 50.73 [¥] | 104.80 [¥] | 11.80 [¥] | 26.29 | NA | NA |
| EA-6 | | | | 23.05 | 57.90 | 1.70 | 14.54 | NA | NA |
| EA-7A | | | | 46.48 [¥] | 115.90 [¥] | 13.40 [¥] | 11.01 | 14.88 | 23.42 |

µg/m³ = microgramos por metro cúbico. NR = cálculo No Realizado por falta de datos de línea base. NA = No Analizado. ¹USEPA, 2006. Normas nacionales de calidad de aire ambiental (NAAQS), 40 CFR parte 50 (US). ²Guías Generales sobre Medio Ambiente, Salud y Seguridad, Corporación Financiera Internacional, Grupo del Banco Mundial 2007. ³Guía de Calidad del Aire, OMS 2005.* Las normas de calidad de aire ambiental son los niveles de calidad del aire fijados y publicados a partir de procesos legislativos nacionales y procesos regulatorios, mientras que las guías sobre calidad del aire ambiental hacen referencia a niveles de calidad del aire obtenidos principalmente a través de datos clínicos, toxicológicos y epidemiológicos. ** este valor corresponde al límite provisional 1 dado por esta guía. ¥: Corresponde a los valores de línea base de la estación EA-5 y de la estación EA-7 respectivamente. Fuente: MSR, 2014.

Los resultados obtenidos durante los meses de Noviembre 2013 a Enero 2014 se encontraron entre los 11.01 a 99.01 µg/m³. En Noviembre se registró el menor valor de PM₁₀ en la estación EA-7A (11.01 µg/m³), mientras que en Diciembre y Enero se registró en la estación EA-2A (12.68 y 19.17 µg/m³ respectivamente). Los valores más altos de PM₁₀ se registraron en la estaciones EA-3A durante Noviembre (99.01 µg/m³), mientras que los valores más altos en Diciembre y Enero se registraron en las estaciones EA-3 (24.1 µg/m³) y EA-1A (25.83 µg/m³) respectivamente.

Todos los valores de PM₁₀ registrados durante el monitoreo trimestral, se encuentran por debajo de los límites máximos establecidos durante el levantamiento de línea base. Todos los valores de PM₁₀ se encuentran por debajo de los valores establecidos por las guías de la OMS (50 µg/m³) a excepción de las estaciones EA-3A y EA-4A. Sin embargo son valores menores que los registrados durante el establecimiento de la línea base.

3.2 Metales en Material Particulado

3.2.1 Sitios de Monitoreo

En el Cuadro 3-4 se enlistan las estaciones de monitoreo de metales en material particulado menor o igual a 10 micrómetros (PM_{10}) localizadas dentro de los terrenos de la mina, y en la jurisdicción de los centros poblados ubicados en el área de influencia (AI) del Proyecto: Los Planes, La Cuchilla, El Fucío, Sabana Redonda, Portón de los Ángeles y San Rafael Las Flores. La ubicación de las estaciones de monitoreo de metales se presenta en la Figura 3-1.

Cuadro 3-4: Sitios de monitoreo de metales en PM_{10} , Proyecto Minero Escobal.

| Estación | Coordenadas | | Altitud (msnm) | Sitio | Período línea base |
|----------|-------------|-----------|----------------|--|------------------------------|
| EA-1B | 803,891 | 1,601,678 | 1,328 | Poblado San Rafael Las Flores, cercano a Escuela | No cuenta con línea base |
| EA-2A | 806,427 | 1,601,605 | 1,564 | aledaño a Aldea La Cuchilla | Julio 2010 a Abril 2011 |
| EA-3A | 805,892 | 1,600,161 | 1,416 | aledaño a Aldea El Fucío | No cuenta con línea base |
| EA-4A | 805,146 | 1,599,680 | 1,360 | Caserío El Portón de los Ángeles | Enero 2011 a Abril 2011 |
| EA-5A* | 804,352 | 1,600,408 | 1,339 | Aldea Sabana Redonda, al sur-oeste del proyecto | No se cuenta con línea base. |
| EA-6 | 805,187 | 1,603,054 | 1,434 | Al norte del Proyecto, ruta a Mataquescuintla | Julio 2010 a Abril 2011 |
| EA-7A* | 805,425 | 1,601,523 | 1,320 | al noreste de pileta de agua de proceso y pileta de cumplimiento ambiental, Jurisdicción de Aldea Los Planes | No se cuenta con línea base |

*Se incluye como período de línea base de Julio 2010 a Abril 2011 la información registrada en las estaciones EA-5 y EA-7. Sistema de coordenadas proyectadas UTM, NAD27 ZONA 15. Msnm: metros sobre el nivel del mar. Nota: 1er y 3er trimestre del año se analiza metales totales, 2do y 4to trimestre únicamente mercurio total. El análisis del laboratorio es destructivo, por tanto es imposible analizar metales y mercurio en un mismo filtro. Fuente: MSR, 2014.

3.2.2 Metodología

En el Cuadro 3-5 se describe el procedimiento, parámetros y laboratorio empleado para la determinación de metales en PM_{10} .

Cuadro 3-5: Procedimiento y laboratorio empleado para la determinación de metales en PM_{10} , Proyecto Minero Escobal

| Parámetros utilizados | |
|---|---|
| Metales en PM_{10} | Al, Sb, As, S, Ba, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Sn, Sr, P, Fe, Mg, Mn, Mo, Ni, Ag, Pb, K, Se, Si, Na, Tl, Ti, V, Zn, Zr |
| Procedimiento | |
| Los mismos filtros empleados para determinar el PM_{10} del muestreo trimestral, son enviados al laboratorio para determinar la cantidad de metales por el método analítico EPA 6010Bmod y EPA 6020mod, los resultados se dan en μg por filtro. Este peso se divide por el volumen de aire muestreado para obtener la concentración en $\mu\text{g}/\text{m}^3$. El | |

análisis de laboratorio es destructivo, lo que hace imposible analizar metales y mercurio en un mismo filtro. Por tanto en el 1er y 3er trimestre del año se analizan metales totales; y en el 2do y 4to trimestre únicamente mercurio total.

Laboratorio

| | |
|--------|--|
| Nombre | Laboratorio Ambiental S.A. (parte de CTA). Laboratorio respaldado por un Sistema de Calidad ISO 17025, otorgado por la Oficina Guatemalteca de Acreditación (OGA); y con ello los análisis acreditados (análisis gravimétrico de filtros) cuentan con validez internacional según OGA-LE 050-12. |
|--------|--|

Fuente: MSR, 2014.

3.2.3 Resultados

En el Cuadro 3-6 se presentan los resultados de concentración de mercurio en PM₁₀ durante el mes de noviembre 2013, los resultados de laboratorio del análisis de metales en filtros y los cálculos realizados para determinar el PM₁₀ se presentan en el anexo 11.3.2. La concentración de mercurio registradas durante Noviembre 2013 estuvieron por debajo de los valores registrados durante Noviembre 2012 en todas las estaciones de monitoreo.

Cuadro 3-6: Resultados de concentración de metales en PM₁₀, Proyecto Minero Escobal

| Parámetro | LD | EA-1B | EA-2A | EA-3A | EA-4A | EA-5A | EA-6 | EA-7A |
|--|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | 2233-1119 | 2271-0223 | 2273-0440 | 2230-0808 | 2229-0717 | 2234-1212 | 2272-0303 |
| Noviembre 2012 (µg/m³) | | | | | | | | |
| Mercurio | 0,0001 | 0,00062 | 0,00151 | 0,00052 | 0,00067 | 0,00091 | 0,00053 | 0,00053 |
| Noviembre 2013 (µg/m³) | | | | | | | | |
| Mercurio | 0,0001 | 0,0006 | <0.0001 | 0,0001 | 0,0007 | <0.0001 | <0.0001 | 0,0001 |

LD: límite de detección. µg/m³ = microgramos por metro cúbico. Fuente: MSR, 2014.

3.3 Partículas Sedimentables Totales (PST)

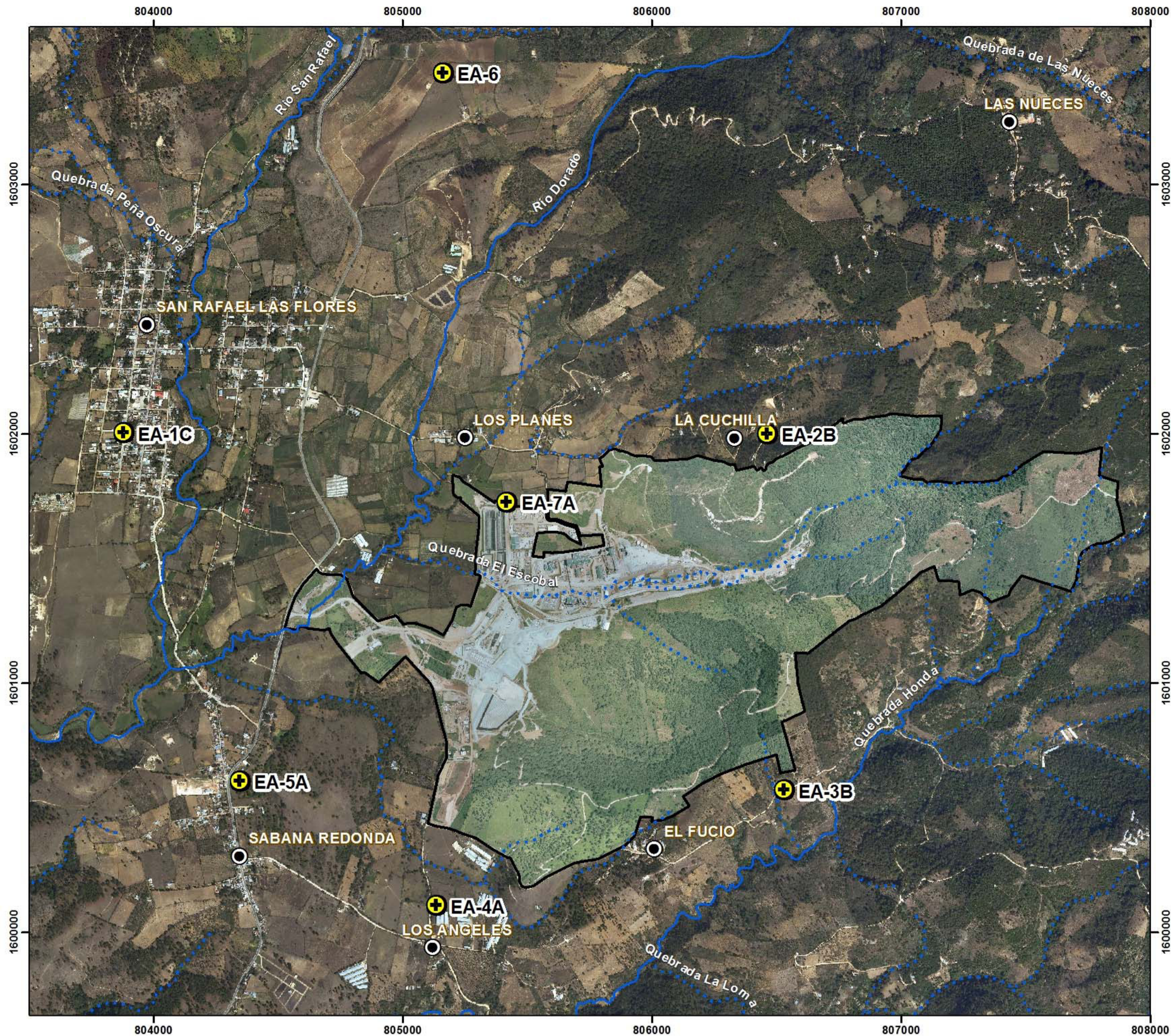
3.3.1 Sitios de Monitoreo

En el Cuadro 3-7 se enlistan las estaciones de monitoreo de PST ubicada en el área de influencia (AI) del Proyecto y su ubicación se presenta en la Figura 3-2.

Cuadro 3-7: Sitios de Monitoreo de PST, Proyecto Minero Escobal.

| Estación | Coordenadas | | Altitud (msnm) | Sitio | Período Línea Base |
|----------|-------------|-----------|----------------|--|-----------------------------|
| EA-1C | 803,887 | 1,601,801 | 1,337 | Poblado San Rafael Las Flores, cercano a Escuela | No se cuenta con línea base |
| EA-2B | 806,470 | 1,601,796 | 1,555 | Aldea La Cuchilla | |
| EA-3B | 806,538 | 1,600,367 | 1,427 | Aldea El Fucío | |
| EA-4A | 805,142 | 1,599,903 | 1,360 | Caserío El Portón de los Ángeles | Diciembre 2010 a Mayo 2011 |
| EA-5A* | 804,352 | 1,600,408 | 1,339 | Aldea Sabana Redonda, al sur-oeste del proyecto | No se cuenta con línea base |
| EA-6 | 805,168 | 1,603,247 | 1,434 | Al norte del Proyecto, ruta a Mataquescuintla | |
| EA-7A | 805,425 | 1,601,523 | 1,320 | Noreste de pileta de agua de proceso y pileta de cumplimiento ambiental, Jurisdicción Aldea Los Planes | |

*Se incluye como período de línea base de Agosto 2010 a Mayo 2011 la información registrada en la estación EA-5. Sistema de coordenadas proyectadas UTM, NAD27 ZONA 15. Msnm: metros sobre el nivel del mar. Fuente: MSR, 2014.



MAPA DE LOCALIZACIÓN
ESTACIONES DE MONITOREO
DE PARTICULAS SEDIMENTABLES
TOTALES

PROYECTO MINERO ESCOBAL
SAN RAFAEL LAS FLORES, SANTAROSA

Minera San Rafael, S.A.
GUATEMALA

DEPARTAMENTO DE AMBIENTE

Sistema de coordenadas: WGS 1984 UTM Zone 15N
Proyección: Transverse Mercator
Dato: WGS 1984

LEYENDA

| Símbolo | Descripción |
|---------|-----------------------|
| | Polígono del Proyecto |
| | Centro Poblado |
| | Río Permanente |
| | Quebrada Intermitente |

ESTACIONES DE MONITOREO

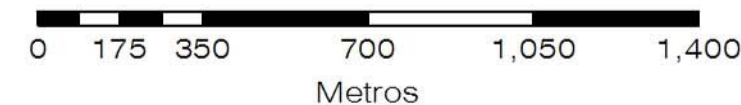
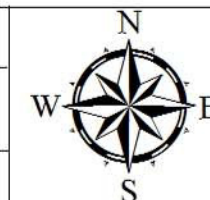
| Símbolo | Estación | X | Y |
|---------|----------|--------|---------|
| | EA-1C | 803881 | 1602004 |
| | EA-2B | 806464 | 1601999 |
| | EA-3B | 806532 | 1600570 |
| | EA-4A | 805136 | 1600106 |
| | EA-5A | 804346 | 1600607 |
| | EA-6 | 805162 | 1603450 |
| | EA-7A | 805419 | 1601726 |

FUENTE: Capas digitales del proyecto ESPREDE/MAGA/IGN del año 2000. Hojas cartográficas año 2010 Mataquesuintla (2159-1) y Laguna de Ayarza (2159-II) del IGN, Ortofotos año 2006 del MAGA y Fotografía aérea del proyecto el Escobal año 2013, datos de campo del departamento de Ambiente.

Fecha de Elaboración: Enero de 2014

Distancia Horizontal y Vertical
de Grilla: 1,000 metros

Escala 1:16,000



3.3.2 Metodología

En el Cuadro 3-8 se describe el procedimiento, parámetros y equipo utilizados en la medición de PST.

Cuadro 3-8: Procedimiento y equipo utilizado para medición de PST, Proyecto Minero Escobal

| Parámetros utilizados | |
|---|--|
| PST | Partículas Sedimentables Totales |
| Procedimiento | |
| Los muestreos fueron realizados por personal de la empresa Consultoría y Tecnología Ambiental (CTA), siguiendo la metodología ASTM D 1739-98 (re-aprobación 2004). La medición se realiza dejando reposar un recipiente limpio y de dimensiones conocidas en la estación de monitoreo durante un lapso de tiempo de 30 ± 2 días. El recipiente es enviado al laboratorio donde se determina los sólidos insolubles, sólidos solubles y sólidos totales que sedimentaron dentro de dicho recipiente. | |
| Equipo utilizado | |
| Nombre | High Altitude Ambient Particulate Sampler |
| Modelo | Diseño establecido en norma ASTM D 1739-98 |
| Fabricante | CTA |

Fuente: MSR, 2014.

3.3.3 Resultados

En el Cuadro 3-9 se presentan los resultados de Partículas Sedimentables Totales (PST) realizado durante Diciembre 2013. El resumen del informe de resultados presentado por el contratista se presenta en el anexo 11.3.3.

Cuadro 3-9: Resultados de partículas sedimentables totales, Proyecto Minero Escobal.

| Parámetro | Norma | Guías | EA-1C | EA-2B | EA-3B | EA-4A | | | EA-5A | | | | EA-6 | EA-7A | |
|--------------------|------------------------------------|--|--------|--------|--------|------------|--------|----------|------------|----------|--------|----------|--------|--------|--------|
| | USEPA ¹ | Banco Mundial ² OMS ³ | Dic-13 | Dic-13 | Dic-13 | Línea Base | | Muestreo | Línea Base | | | Muestreo | Dic-13 | Dic-13 | Dic-13 |
| | | | | | | Promedio | Mínimo | Máximo | Dic-13 | Promedio | Mínimo | Máximo | | | |
| | g/(m² x 30 días) | | | | | | | | | | | | | | |
| Sólidos Insolubles | ND | ND | 8.63 | 6.47 | 9.36 | 6.27 | 2.60 | 10.80 | 38.87 | 6.50 | 0.80 | 16.00 | 19.39 | 1.17 | 3.2 |
| Sólidos Solubles | | | 1.61 | 2.26 | 1.44 | 2.12 | 0.90 | 2.90 | 1.49 | 11.26 | 2.00 | 37.00 | 1.55 | 1.74 | 1.66 |
| Sólidos Totales | | | 10.24 | 8.74 | 10.80 | 8.37 | 4.60 | 13.00 | 40.36 | 17.58 | 3.20 | 50.00 | 20.94 | 2.91 | 4.86 |

¹USEPA, 2006. Normas nacionales de calidad de aire ambiental (NAAQS), 40 CFR parte 50 (US). ²Guías Generales sobre Medio Ambiente, Salud y Seguridad, Corporación Financiera Internacional, Grupo del Banco Mundial 2007. ³Guía de Calidad del Aire, OMS 2005. ND: estas normas y guías no establecen un límite para estos parámetros. g/(m² x 30 días)= gramos por metro cuadrado durante 30 días. ND: no determinado. Fuente: MSR, 2014.

Los valores de PST se encuentran entre 2.91 a 40.36 g/(m² x 30 días), los cuales corresponden a las estaciones EA-6 y EA-4A respectivamente. El valor para la estación EA-4A (40.36 g/(m² x 30 días)) se encuentra arriba de los valores máximos registrados durante el establecimiento de la línea base. Durante el mismo trimestre de 2012 se han registrado valores similares. Sin embargo, durante los demás trimestres de 2012 y 2013 los valores de PST en la misma estación registran datos dentro del rango establecido durante la línea base. Las estaciones EA-1C, EA-2B, EA-3B, EA-6 y EA-7A no cuentan con línea base.

3.4 Gases de Combustión (SO₂ y NO₂)

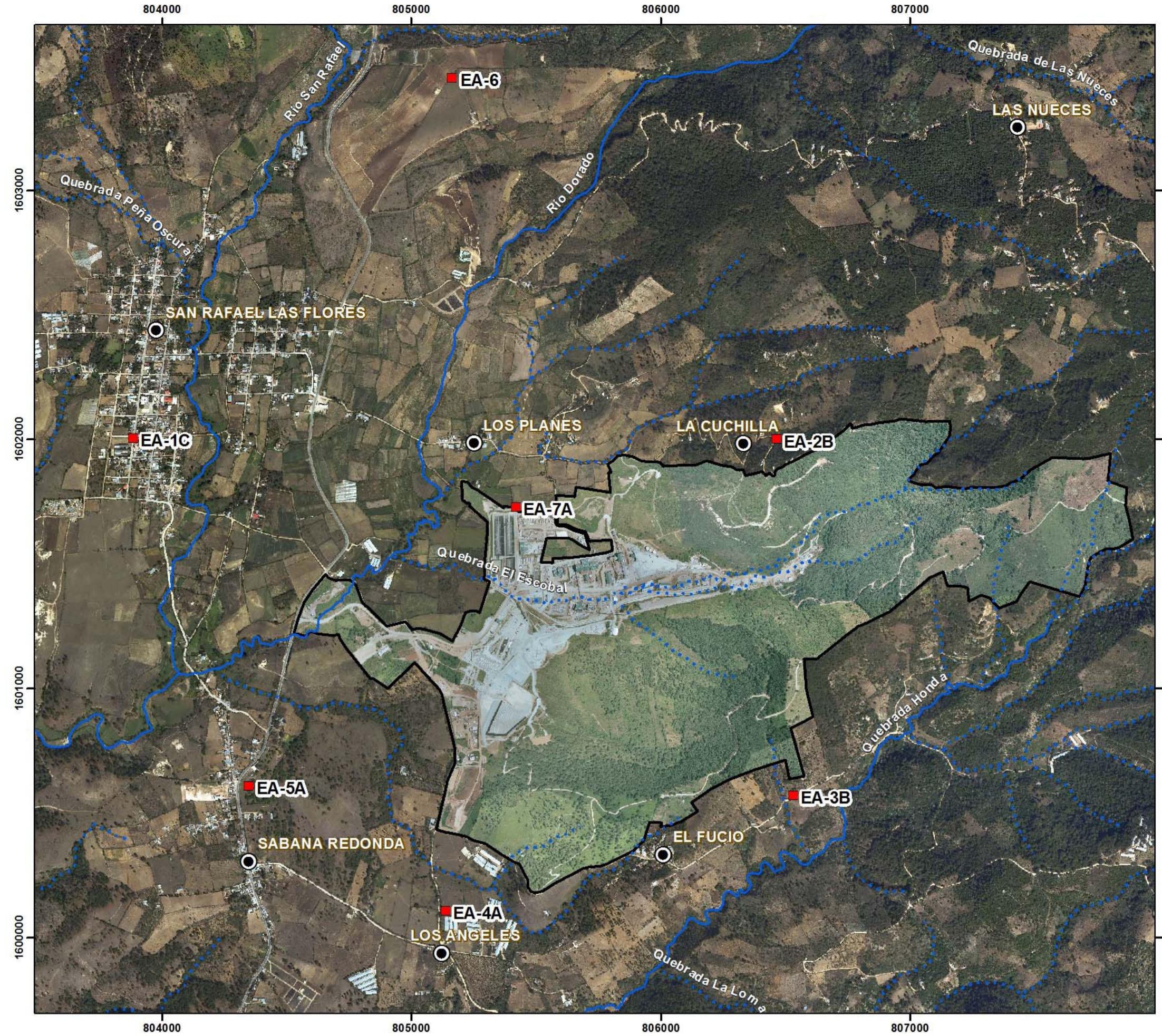
3.4.1 Sitios de Monitoreo

En el Cuadro 3-10 se enlistan las estaciones de monitoreo de dióxido de azufre (SO₂) y de dióxido de nitrógeno (NO₂) ubicada en el área de influencia (AI) del Proyecto. La ubicación de las estaciones de monitoreo de SO₂ y NO₂ se presenta en la Figura 3-3.

Cuadro 3-10: Sitios de Monitoreo de SO₂ y NO₂, Proyecto Minero Escobal

| Estación | Coordenadas | | Altitud (msnm) | Sitio | Período Línea Base |
|----------|-------------|-----------|----------------|--|-----------------------------|
| EA-1C | 803,887 | 1,601,801 | 1,337 | Poblado San Rafael Las Flores, cercano a Escuela | No se cuenta con línea base |
| EA-2B | 806,470 | 1,601,796 | 1,555 | Aldea La Cuchilla | |
| EA-3B | 803,887 | 1,601,801 | 1,427 | Aldea El Fucío | |
| EA-4A | 805,142 | 1,599,903 | 1,360 | Caserío El Portón de los Ángeles | |
| EA-5A | 804,352 | 1,600,408 | 1,339 | Aldea Sabana Redonda, al sur-oeste del proyecto | |
| EA-6 | 805,168 | 1,603,247 | 1,434 | Al norte del Proyecto, ruta a Mataquescuintla | |
| EA-7A | 805,425 | 1,601,523 | 1,320 | Noreste de pileta de agua de proceso y pileta de cumplimiento ambiental, Jurisdicción Aldea Los Planes | |

Sistema de coordenadas proyectadas UTM, NAD27 ZONA 15. Msnm: metros sobre el nivel del mar. Fuente: MSR, 2014.



MAPA DE LOCALIZACIÓN
ESTACIONES DE MONITOREO
DE GASES DE COMBUSTIÓN

PROYECTO MINERO ESCOBAL
SAN RAFAEL LAS FLORES, SANTAROSA



DEPARTAMENTO DE AMBIENTE

Sistema de coordenadas: WGS 1984 UTM Zone 15N
Proyección: Transverse Mercator
Dato: WGS 1984

LEYENDA

| Símbolo | Descripción |
|---------|-----------------------|
| | Polígono del Proyecto |
| | Centro Poblado |
| | Río Permanente |
| | Quebrada Intermitente |

ESTACIONES DE MONITOREO

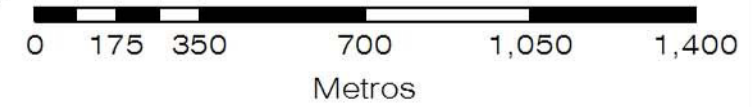
| Símbolo | Estación | X | Y |
|---------|----------|--------|---------|
| | EA-1C | 803881 | 1602004 |
| | EA-2B | 806464 | 1601999 |
| | EA-3B | 806532 | 1600570 |
| | EA-4A | 805136 | 1600106 |
| | EA-5A | 804346 | 1600607 |
| | EA-6 | 805162 | 1603450 |
| | EA-7A | 805419 | 1601726 |

FUENTE: Capas digitales del proyecto ESPREDE/MAGA/IGN del año 2000
Hojas catográficas año 2010 Mataquesuintla (2159-1) y Laguna de Ayarza (2159-II) del IGN,
Ortofotos año 2006 del MAGA y Fotografía aérea del proyecto el Escobal año 2013,
datos de campo del departamento de Ambiente.

Fecha de Elaboración: Enero de 2014

Distancia Horizontal y Vertical
de Grilla: 1,000 metros

Escala 1:16,000



3.4.2 Metodología

En el Cuadro 3-11 se describe el procedimiento, parámetros y equipo utilizados en la medición de gases de combustión.

Cuadro 3-11: Procedimiento y equipo utilizado para la medición de SO₂ y NO₂, Proyecto Minero Escobal

| Parámetros utilizados | |
|---|-----------------------|
| SO ₂ | Dióxido de azufre |
| NO ₂ | Dióxido de nitrógeno |
| Procedimiento | |
| Los muestreos fueron realizados por personal de la empresa Consultoría y Tecnología Ambiental siguiendo las metodologías: SO₂ : Metodología descrita en el CFR, del título 40, parte 50, apéndice A de la USEPA. NO₂ : Metodología descrita en el método de referencia designado por la USEPA No. EQN-1277-026. | |
| Equipo utilizado | |
| Nombre | RAC3 Gas Sampler |
| Modelo | 209063 |
| Fabricante | Andersen Instrument's |

Fuente: MSR, 2014.

3.4.3 Resultados

En el Cuadro 3-12 se presentan los resultados de las mediciones de SO₂ y NO₂ realizadas en siete estaciones de monitoreo de Calidad de Aire. El informe de resultados presentado por el contratista se presenta en el anexo 11.3.3.

En las mediciones efectuadas durante este trimestre se obtuvieron valores por debajo del límite de detección del método en todas las estaciones para SO₂ (<13µg/m³). Los valores de NO₂ se encontraron entre 14 µg/m³ (EA-1C y EA-7A) y 22 µg/m³ EA-4A. Todos los valores registrados de SO₂ y de NO₂ son menores a los valores guías establecidos por el Banco Mundial, la OMS, British Columbia y los valores norma establecidos por la USEPA. Lo que indica que las actividades realizadas durante el presente período, no han originado variaciones significativas en los parámetros reportados anteriormente.

Cuadro 3-12: Resultados de gases de combustión, Proyecto Minero Escobal.

| Parámetro | Norma* | Guías* | | | EA-1C | EA-2B | EA-3B | EA-4A | EA-5 ^a | | | EA-6 | EA-7A | | | | |
|-----------------|----------------------|----------------------------|------------------|-------------------------------|----------|--------|--------|----------|-------------------|--------|-----|--------|----------|--------------|-----|-----|--------|
| | USEPA ¹ | Banco Mundial ² | OMS ³ | British Columbia ⁴ | | | | | Línea base** | | | | Muestreo | Línea base** | | | |
| | | | | | Promedio | Mínimo | Máximo | Promedio | Mínimo | Máximo | | | | | | | |
| | | | | | Dic-13 | Dic-13 | Dic-13 | Dic-13 | | | | Dic-13 | Dic-13 | | | | Dic-13 |
| | (µg/m ³) | | | | | | | | | | | | | | | | |
| SO ₂ | 370 | 20 | 20 | 160 | <13 | <13 | <13 | <13 | <13 | <13 | <13 | <13 | <13 | <13 | <13 | <13 | <13 |
| NO ₂ | 100 [¥] | 40 [¥] | 40 [¥] | 200 | 14 | 17 | 10 | 22 | <9 | <9 | <9 | 16 | 13 | <9 | <9 | <9 | 14 |

Nota: µg/m³ = microgramos por metro cúbico; SO₂= dióxido de azufre, NO₂= dióxido de nitrógeno. ¹Guía USEPA, 2006. Normas nacionales de calidad de aire ambiental (NAAQS), 40 CFR parte 50 (US). ²Guías Generales sobre Medio Ambiente, Salud y Seguridad, Corporación Financiera Internacional, Grupo del Banco Mundial 2007. ³Guía de Calidad del Aire, OMS 2005. ⁴Guías para la calidad del aire ambiental. *Las normas de calidad de aire ambiental son los niveles de calidad del aire fijados y publicados a partir de procesos legislativos nacionales y procesos regulatorios, mientras que las guías sobre calidad del aire ambiental hacen referencia a niveles de calidad del aire obtenidos principalmente a través de datos clínicos, toxicológicos y epidemiológicos. **Corresponde a los valores de línea base de la estación EA-5 y de la estación EA-7 respectivamente. ¥ Este valor corresponde a la concentración promedio anual. Fuente: MSR, 2014.

3.5 Niveles de Presión Sonora

3.5.1 Sitios de Monitoreo

En el Cuadro 3-13 se enlistan las estaciones de monitoreo de presión sonora ubicados en el área de influencia (**AI**) del Proyecto, localizadas en la jurisdicción de los centros poblados: Los Planes, La Cuchilla, El Fucío, Sabana Redonda, Portón de los Ángeles y San Rafael Las Flores. La ubicación de las estaciones de monitoreo de presión sonora se presenta en la Figura 3-4.

Cuadro 3-13: Sitios de Monitoreo de Presión Sonora, Proyecto Minero Escobal

| Estación | Coordenadas | | Altitud (msnm) | Sitio |
|---|-------------|-----------|----------------|--|
| Periodicidad de monitoreo mensual | | | | |
| ER-1 | 805,797 | 1,601,582 | 1,417 | Depósito de suelos, a inmediaciones de Aldea Los Planes |
| ER-2 | 806,427 | 1,601,605 | 1,564 | Aldea La Cuchilla |
| ER-3 | 807,165 | 1,601,255 | 1,679 | Área este del proyecto, a inmediaciones de Aldea El Fucío |
| ER-7A | 805,425 | 1,601,523 | 1,320 | Al noreste de pileta de agua de proceso y pileta de cumplimiento ambiental, Jurisdicción de Aldea Los Planes |
| Periodicidad de monitoreo trimestral | | | | |
| ER-1A | 803,891 | 1,601,678 | 1,328 | Poblado San Rafael Las Flores, cercano a Escuela |
| ER-3A | 805,892 | 1,600,161 | 1,416 | Aldea El Fucío |
| ER-4A | 805,146 | 1,599,680 | 1,360 | Caserío El Portón de los Ángeles |
| ER-5A | 804,352 | 1,600,408 | 1,339 | Aldea Sabana Redonda, al sur-oeste del proyecto |
| ER-6 | 805,187 | 1,603,054 | 1,434 | Al norte del Proyecto, ruta a Mataquesuintla |

Sistema de coordenadas proyectadas UTM, NAD27 ZONA 15. Msnm: metros sobre el nivel del mar. Fuente: MSR, 2014.



MAPA DE LOCALIZACIÓN ESTACIONES DE MONITOREO NIVELES DE PRESIÓN SONORA
 PROYECTO MINERO ESCOBAL
 SAN RAFAEL LAS FLORES, SANTAROSA

Minera San Rafael S.A.
 GUATEMALA

DEPARTAMENTO DE AMBIENTE
 Sistema de coordenadas: WGS 1984 UTM Zone 15N
 Proyección: Transverse Mercator
 Dato: WGS 1984

LEYENDA

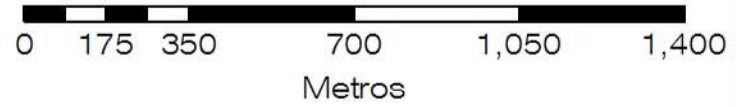
| Símbolo | Descripción |
|---------|------------------------|
| | Polígono del Proyecto |
| | Centro Poblado |
| | Río Permanente |
| | Quebrada Intermittente |

ESTACIONES DE MONITOREO

| Símbolo | Estación | X | Y |
|---------|----------|--------|---------|
| | ER-1 | 805791 | 1601785 |
| | ER-1A | 803885 | 1601881 |
| | ER-2 | 806419 | 1601819 |
| | ER-3 | 807232 | 1601498 |
| | ER-3A | 805886 | 1600364 |
| | ER-4A | 805140 | 1599883 |
| | ER-5A | 804346 | 1600611 |
| | ER-6 | 805181 | 1603257 |
| | ER-7A | 805419 | 1601726 |

FUENTE: Capas digitales del proyecto ESPREDE/MAGA/IGN del año 2000. Hojas catastrales año 2010 Mataquesuintla (2159-1) y Laguna de Ayarza (2159-II) del IGN, Ortofotos año 2006 del MAGA y Fotografía aérea del proyecto el Escobal año 2013, datos de campo del departamento de Ambiente.

Fecha de Elaboración: Enero de 2014
 Distancia Horizontal y Vertical de Grilla: 1,000 metros
Escala 1:16,000



3.5.2 Metodología

En el Cuadro 3-14 se describe el procedimiento, parámetros y equipo utilizado en la medición de los niveles de presión sonora ubicados dentro del AI del Proyecto.

Cuadro 3-14: Procedimiento y equipo utilizado para medición de presión sonora, Proyecto Minero Escobal

| Parámetros analizados | |
|---|--|
| L_{MAX} | Dato máximo durante 24 horas. |
| L_{MIN} | Dato mínimo durante 24 horas. |
| L_{EQ} | Promedio ponderado equivalente de datos. |
| Promedio Diurno | Promedio ponderado equivalente de datos de 07:00 am a 10:00 pm |
| Promedio Nocturno | Promedio ponderado equivalente de datos de 10:00 pm a 07:00 am |
| Procedimiento | |
| La medición del nivel de presión sonora se realiza durante 24 horas, efectuando lecturas de decibeles en escala “A” en respuesta lenta en intervalo de 10 minutos. Los datos obtenidos en las mediciones son crudos y automáticamente grabados en el equipo, los cuales se descargan a una computadora utilizando el programa Quest Professional II. Solamente el promedio diurno y nocturno son calculados por separado. | |
| Equipo utilizado | |
| Nombre | Sound Pro |
| Modelo | SE/DL |
| Fabricante | Quest Technologies, Inc. |

Fuente: MSR, 2014.

3.5.3 Resultados

En el Cuadro 3-15 y en el Cuadro 3-16 se presentan los valores registrados de los niveles de presión sonora (**NPS**) durante los meses de Noviembre 2013 a Enero 2014. Los informes generados por los equipos de medición se presentan en el anexo 11.3.4.

Los resultados obtenidos de NPS en las estaciones muestreadas respecto al parámetro L_{eq} , están dentro del rango de 45.7dBa y 52.7 dBa, los cuales corresponden a las estaciones ER-1, ER-5A y ER-3 respectivamente.

La estación ER-1 presentó el menor promedio diurno (45.3 dBa) y la estación ER-5A el menor promedio nocturno (44.3 dBa) de todas las mediciones efectuadas durante el monitoreo; mientras que la estación ER-3A presentó el mayor promedio

diurno (53.2 dBa) y el mayor promedio nocturno (52.8 dBa) se registró en la estación ER-3.

Las estaciones ER-1, ER-2, ER-3, ER-5A, y ER-7A presentaron valores de promedio diurno y nocturno dentro de los valores máximos registrados en el establecimiento de la línea base. Las estaciones ER-1A, ER-3A y ER-6 no cuentan con datos de línea base.

Los promedios diurnos registrados durante los meses de Noviembre 2013 a Enero 2014 estuvieron por debajo de la guía establecida por la OMS y Banco Mundial para zonas residenciales; asimismo por debajo de la norma establecida por la USEPA. A excepción de ER2 y ER3 en Diciembre 2013, los promedios nocturnos registrados estuvieron por debajo de la guía establecida por la OMS (50 dBa).

Ninguna de las estaciones monitoreadas presentó valores promedio (diurno y nocturno) superiores al valor de la guía para jornada diurna y nocturna del Banco Mundial para zonas industriales (70 dBa).

Cuadro 3-15: Resultados trimestrales de los niveles de presión sonora, Proyecto Minero Escobal.

| Parámetro | Norma* | | Guías* | | ER-1 | | | | | | ER-2 | | | | | |
|-----------|--------------------|------------------|----------------------------|------------|------------|--------|--------|--------|--------|--------|------------|--------|--------|--------|--------|--------|
| | USEPA ¹ | OMS ² | Banco Mundial ³ | | Línea Base | | | Nov-13 | Dic-13 | Ene-14 | Línea Base | | | Nov-13 | Dic-13 | Ene-14 |
| | | | Residencial | Industrial | Promedio | Máximo | Mínimo | | | | Promedio | Máximo | Mínimo | | | |
| | | | | | | | | | | | | | | | | |
| dBA | | | | | | | | | | | | | | | | |
| Lmax | | | | | 89.3 | 99.5 | 64.6 | 69,2 | 75,2 | 78,0 | 86.7 | 97.8 | 64.9 | 75,8 | 77,6 | 70,2 |
| Lmin | NL | NL | NL | NL | 32.5 | 37.7 | 27.0 | 36,3 | 35,5 | 33,1 | 35.2 | 42.8 | 26.5 | 39,3 | 43,6 | 44,2 |
| Leq | | | | | 49.9 | 57.1 | 41.2 | 45,7 | 46,1 | 47,6 | 49.4 | 58.7 | 39.7 | 46,8 | 49,4 | 48,6 |
| PD | 55 | 55 | 55 | 70 | 50.5 | 59.1 | 39.7 | 45,3 | 46,3 | 48,0 | 48.8 | 57.1 | 39.8 | 46,9 | 48,7 | 48,8 |
| PN | 55 | 50 | 45 | 70 | 47.6 | 55.7 | 39.3 | 46,5 | 46,0 | 47,0 | 46.6 | 54.5 | 37.9 | 46,6 | 50,5 | 48,5 |

| Parámetro | Norma* | | Guías* | | ER-3 | | | | | | ER-7A | | | | | |
|-----------|--------------------|------------------|---------------|------------|------------|--------|--------|--------|--------|--------|--------------|--------|--------|--------|--------|--------|
| | USEPA ¹ | OMS ² | Banco Mundial | | Línea Base | | | Nov-13 | Dic-13 | Ene-14 | Línea Base** | | | Nov-13 | Dic-13 | Ene-14 |
| | | | Residencial | Industrial | Promedio | Máximo | Mínimo | | | | Promedio | Máximo | Mínimo | | | |
| | | | | | | | | | | | | | | | | |
| dBA | | | | | | | | | | | | | | | | |
| Lmax | | | | | 87.4 | 100.7 | 67.2 | 76,1 | 80,2 | 72,4 | 87.5 | 89.0 | 82.1 | 71,6 | 72,2 | 68,4 |
| Lmin | NL | NL | NL | NL | 49.4 | 56.2 | 26.9 | 32,6 | 41,5 | 34,1 | NR | NR | NR | 37,7 | 39,4 | 38,9 |
| Leq | | | | | 56.8 | 63.2 | 39.7 | 47,5 | 52,7 | 50,0 | 52.8 | 54.5 | 50.9 | 46,2 | 48,7 | 50,4 |
| PD | 55 | 55 | 55 | 70 | 56.5 | 63.1 | 41.0 | 48,2 | 52,7 | 50,3 | 52.1 | 53.5 | 50.4 | 46,89 | 48,3 | 50,9 |
| PN | 55 | 50 | 45 | 70 | 57.2 | 64.0 | 34.1 | 46,1 | 52,8 | 49,6 | 49.7 | 50.9 | 48.8 | 44,92 | 49,4 | 49,7 |

*Las normas de calidad de aire ambiental son los niveles de calidad del aire fijados y publicados a partir de procesos legislativos nacionales y procesos regulatorios, mientras que las guías sobre calidad del aire ambiental hacen referencia a niveles de calidad del aire obtenidos principalmente a través de datos clínicos, toxicológicos y epidemiológicos. ¹Guía USEPA, 2006. Normas nacionales de niveles de presión sonora. ²Guías sobre ruido comunitario, OMS 1999. ³Guías Generales sobre Medio Ambiente, Salud y Seguridad, Corporación Financiera Internacional, Grupo del Banco Mundial 2007. dBA = decibeles en escala A. PD = promedio diurno (de 07:00 a 22:00)- PN = promedio nocturno (de 22:00 a 7:00). Lmax = lectura máxima registrada de dBA. Lmin= lectura mínima registrada de dBA. NL = no hay límite establecido para este parámetro. NR = cálculo No Realizado por falta de datos de línea base. NA = No Analizado. ** Los valores de línea base corresponden a la estación ER-7. Fuente: MSR, 2014.

Cuadro 3-16: Resultados mensuales de los niveles de presión sonora, Proyecto Minero Escobal.

| Parámetro | Norma* | | Guías* | | ER-1A | | | | ER-3A | | | | ER-4A | | | |
|-----------|--------------------|------------------|----------------------------|------------|------------|--------|--------|--------|------------|--------|--------|--------|------------|--------|--------|--------|
| | USEPA ¹ | OMS ² | Banco Mundial ³ | | Línea Base | | | Nov-13 | Línea Base | | | Nov-13 | Línea Base | | | Nov-13 |
| | | | Residencial | Industrial | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | |
| | | | dBA | | | | | | | | | | | | | |
| Lmax | NL | NL | NL | NL | NR | NR | NR | 88.5 | NR | NR | NR | 88.7 | 80.6 | 78.2 | 82.1 | 85.3 |
| Lmin | | | | | | | | 39.1 | | | | 42.4 | NR | NR | NR | 34.0 |
| Leq | | | | | | | | 50.7 | | | | 52.0 | 50.2 | 49.3 | 50.9 | 49.2 |
| PD | | | | | | | | 52.0 | | | | 53.2 | 49.5 | 48.4 | 50.4 | 49.8 |
| PN | | | | | | | | 47.2 | | | | 49.4 | 48.6 | 48.2 | 48.9 | 48.3 |

| Parámetro | Norma* | | Guías* | | ER-5A | | | | ER-6 | | | |
|-----------|--------------------|------------------|----------------------------|------------|------------|--------|--------|--------|------------|--------|--------|--------|
| | USEPA ¹ | OMS ² | Banco Mundial ³ | | Línea Base | | | Nov-13 | Línea Base | | | Nov-13 |
| | | | Residencial | Industrial | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | |
| | | | dBA | | | | | | | | | |
| Lmax | NL | NL | NL | NL | 91.6 | 85.1 | 92.2 | 74,8 | NR | NR | NR | 88,8 |
| Lmin | | | | | NR | NR | NR | 33,9 | | | | 35,1 |
| Leq | | | | | 65.8 | 51.6 | 67.6 | 45,7 | | | | 51,2 |
| PD | | | | | 61.2 | 50.2 | 63.8 | 46,4 | | | | 52,8 |
| PN | | | | | 62.8 | 45.9 | 65.0 | 44,3 | | | | 45,4 |

*Las normas de calidad de aire ambiental son los niveles de calidad del aire fijados y publicados a partir de procesos legislativos nacionales y procesos regulatorios, mientras que las guías sobre calidad del aire ambiental hacen referencia a niveles de calidad del aire obtenidos principalmente a través de datos clínicos, toxicológicos y epidemiológicos. ¹Guía USEPA, 2006. Normas nacionales de niveles de presión sonora. ²Guías sobre ruido comunitario, OMS 1999. ³Guías Generales sobre Medio Ambiente, Salud y Seguridad, Corporación Financiera Internacional, Grupo del Banco Mundial 2007. dBA = decibeles en escala A. PD = promedio diurno (de 07:00 a 22:00)- PN = promedio nocturno (de 22:00 a 7:00). Lmax = lectura máxima registrada de dBA. Lmin= lectura mínima registrada de dBA. NL = no hay límite establecido para este parámetro. NR = cálculo No Realizado por falta de datos de línea base. NA = No Analizado. ** Los valores de línea base corresponden a la estación ER-7. Fuente: MSR, 2014.

4 Calidad del Agua

4.1 Sitios de Monitoreo

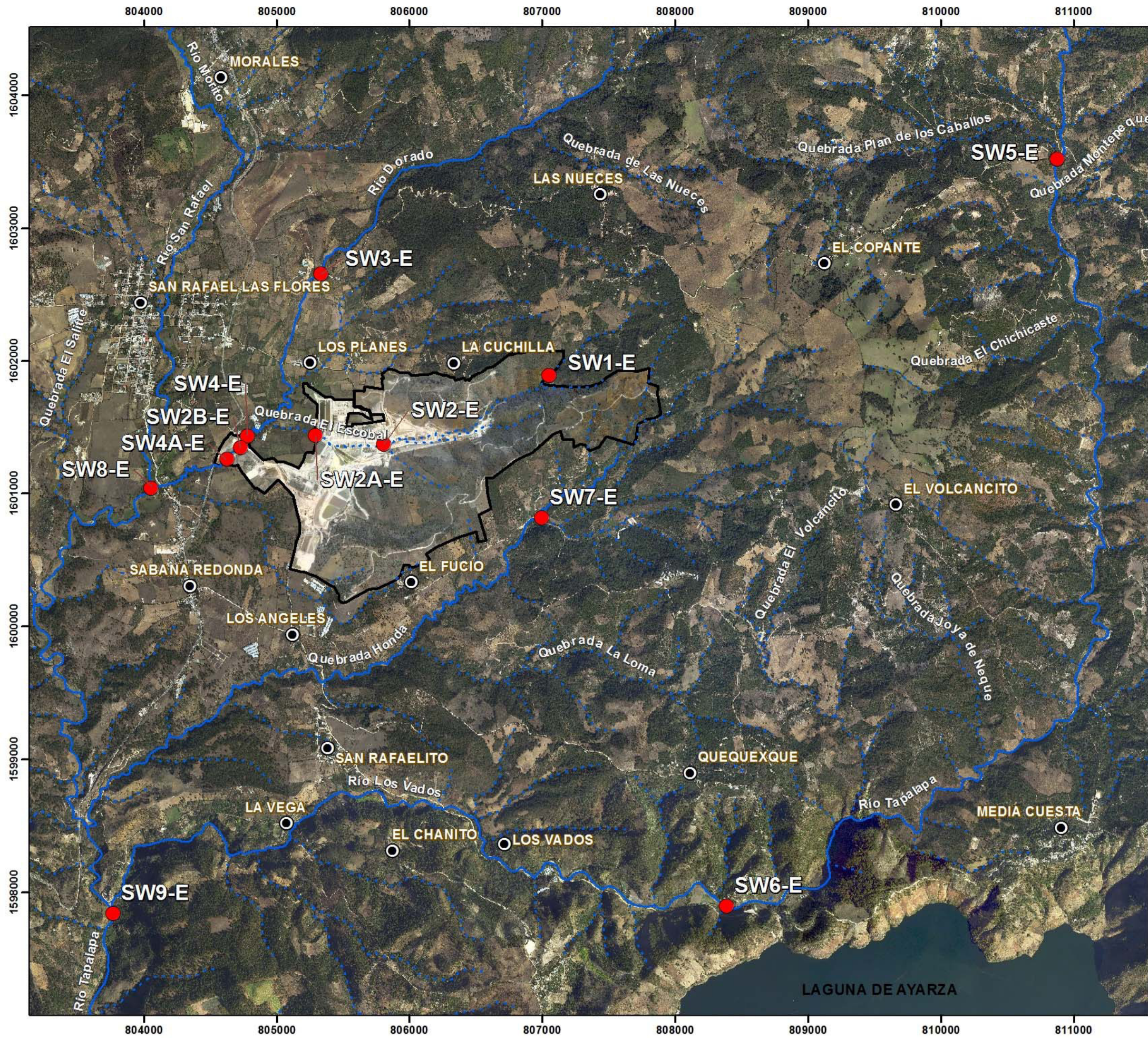
En el Cuadro 4-1 se enlistan las estaciones de monitoreo de calidad de agua superficial y subterránea localizadas en las quebradas, ríos, manantiales, pozos de monitoreo y pozos mecánicos ubicados en el área de influencia (AI) del Proyecto. La ubicación de las estaciones de monitoreo de calidad de agua superficial y subterránea se presentan en la Figura 4-1, Figura 4-2, Figura 4-3 y Figura 4-4.

Cuadro 4-1: Sitios de Monitoreo de Calidad de Agua, Proyecto Minero Escobal

| Estación | Coordenadas | | Sitio | Período Línea Base |
|---|-------------|-----------|---|---------------------------------|
| Agua Superficial | | | | |
| SW-1 | 807,053 | 1,601,682 | Quebrada El Escobal, aguas arriba. | Junio 2008 a marzo 2011 |
| SW-2 | 805,811 | 1,601,164 | Quebrada El Escobal, en medio de la propiedad | Junio 2008 a septiembre 2010 |
| SW-2A | 805,295 | 1,601,230 | Quebrada El Escobal, salida de la propiedad | No cuenta con línea base |
| SW-3 | 805,337 | 1,602,453 | Río El Dorado, aguas arriba | Septiembre 2008 a marzo 2011 |
| SW-4 | 804,781 | 1,601,228 | Río El Dorado, aguas abajo | |
| SW-4A | 804,629 | 1,601,052 | Río El Dorado, por puente de acceso al Proyecto, 30mts aguas abajo SW-4 | No cuenta con línea base |
| SW-5 | 810,882 | 1,603,313 | Río Tapalapa | Septiembre 2008 a marzo 2011 |
| SW-6 | 808,391 | 1,597,689 | Río Los Vados | |
| SW-7 | 806,989 | 1,600,618 | Quebrada La Honda. | |
| SW-8 | 804,054 | 1,600,834 | Unión Río San Rafael y El Dorado. | Noviembre 2011 a Diciembre 2012 |
| SW-9 | 803,772 | 1,597,635 | Río Tapalapa, aguas abajo (cercano a la Ceibita) | |
| Agua Subterránea, Nacimientos | | | | |
| GW-1A | 808,670 | 1,599,754 | Nacimiento de agua permanente, Aldea El Volcancito | Diciembre 2010 a marzo 2011 |
| GW-2 | 807,515 | 1,601,059 | Nacimiento de agua permanente, Aldea El Fucío | |
| GW-3 | 806,193 | 1,601,194 | El Mora, zona central del proyecto (frente a portal Oeste) | |
| GW-4 | 805,992 | 1,600,533 | Aguas arriba del depósito de colas y de GW5 | Diciembre 2010 |
| GW-5 | 805,962 | 1,600,525 | Aguas arriba del depósito de colas | No cuenta con línea base |
| Agua Subterránea, Pozos de monitoreo | | | | |
| MW-1 | 806,309 | 1,601,203 | Área de planta de pasta (Amate) | Diciembre 2010 a marzo 2011 |
| MW-2 | 805,206 | 1,600,565 | Sur-oeste del depósito de colas | |
| MW-3 | 805,153 | 1,600,790 | Al oeste del depósito de colas | |
| MW-4 | 805,186 | 1,601,009 | Al sur de montículos (acuífero somero) | |
| MW-5 | 805,304 | 1,601,277 | Al oeste de taller, en el límite de la propiedad de MSR | |

| Estación | Coordenadas | | Sitio | Período Línea Base |
|---|-------------|-----------|--|-----------------------------|
| MW-6 | 805,457 | 1,601,454 | Al norte de almacén general | Diciembre 2010 a marzo 2011 |
| MW-7 | 805,796 | 1,601,582 | Al oeste de depósito de suelos No. 1 | |
| MW-8 | 805,304 | 1,601,277 | Al oeste de taller, pozo de abastecimiento de oficinas temporales | Enero 2011 a marzo 2011 |
| MW-9 | 805,198 | 1,601,019 | Al sur de montículos (Acuífero profundo) | |
| MW-10 | 806,601 | 1,601,397 | Al norte del Portal Este | Febrero 2011 a mayo 2011 |
| MW-11 | 805,612 | 1,601,064 | Al norte de zona de infiltración quebrada Escobal | Marzo 2011 |
| RW-1 | 804,809 | 1,600,972 | Pozo artesanal ubicado en Finca Suandys | No cuenta con línea base |
| Agua Subterránea, pozo de producción | | | | |
| PSA-SR | 803678 | 1602044 | Pozo mecánico ubicado en las piscinas de San Rafael las Flores | Marzo 2011 |
| Agua de grifo | | | | |
| HW-1 | | | Agua de grifo, casa poblado San Rafael las Flores, cercano a Escuelita | No cuenta con línea base |

Sistema de coordenadas proyectadas UTM, NAD27 ZONA 15. Msnm: metros sobre el nivel del mar. Fuente: MSR, 2014.



MAPA DE LOCALIZACIÓN ESTACIONES DE MONITOREO AGUA SUPERFICIAL

PROYECTO MINERO ESCOBAL
SAN RAFAEL LAS FLORES, SANTAROSA



DEPARTAMENTO DE AMBIENTE

Sistema de coordenadas: WGS 1984 UTM Zone 15N
Proyección: Transverse Mercator
Dato: WGS 1984

LEYENDA

| Símbolo | Descripción |
|---------|-----------------------|
| | Polígono del Proyecto |
| | Centro Poblado |
| | Río Permanente |
| | Quebrada Intermitente |

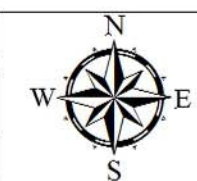
| Símbolo | Estación | X | Y |
|---------|----------|--------|---------|
| | SW1-E | 807047 | 1601885 |
| | SW2-E | 805805 | 1601367 |
| | SW2A-E | 805289 | 1601433 |
| | SW2B-E | 804728 | 1601341 |
| | SW3-E | 805331 | 1602656 |
| | SW4-E | 804775 | 1601431 |
| | SW4A-E | 804623 | 1601255 |
| | SW5-E | 810876 | 1603516 |
| | SW6-E | 808385 | 1597892 |
| | SW7-E | 806995 | 1600815 |
| | SW8-E | 804048 | 1601037 |
| | SW9-E | 803766 | 1597838 |

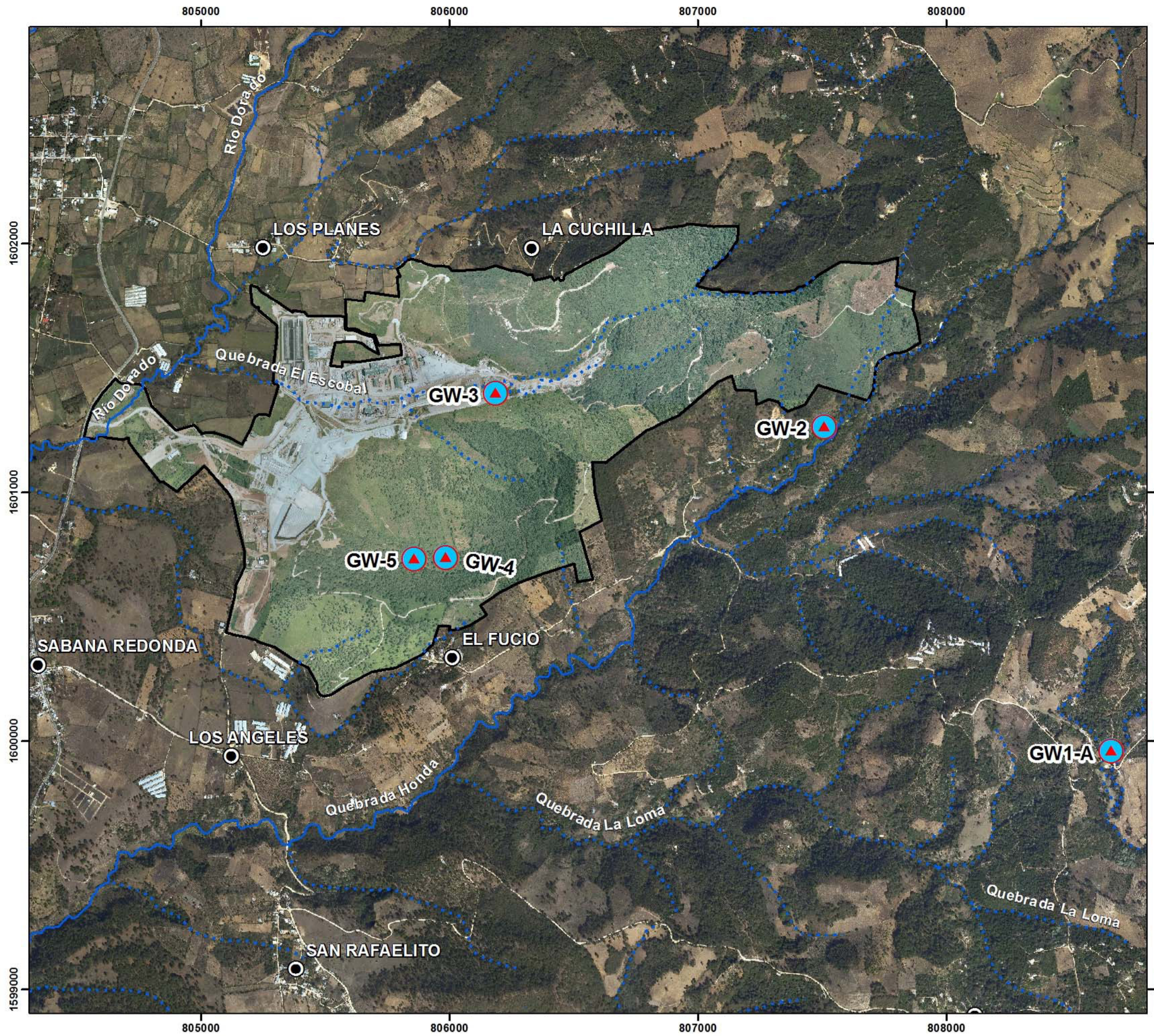
FUENTE: Capas digitales del proyecto ESPREDE/MAGA/IGN del año 2000. Hojas catográficas año 2010 Mataquesuinta (2159-1) y Laguna de Ayarza (2159-II) del IGN, Ortofotos año 2006 del MAGA y Fotografía aérea del proyecto el Escobal año 2013, datos de campo del departamento de Ambiente.

Fecha de Elaboración: Enero de 2014

Distancia Horizontal y Vertical de Grilla: 1,000 metros

Escala 1:30,000





**MAPA DE LOCALIZACIÓN
ESTACIONES DE MONITOREO
CALIDAD DE AGUA SUBTERRÁNEA**

PROYECTO MINERO ESCOBAL
SAN RAFAEL LAS FLORES, SANTAROSA

Minera San Rafael S.A.
GUATEMALA

DEPARTAMENTO DE AMBIENTE

Sistema de coordenadas: WGS 1984 UTM Zone 15N
Proyección: Transverse Mercator
Dato: WGS 1984

LEYENDA

| Símbolo | Descripción |
|---------|------------------------|
| | Polígono del Proyecto |
| | Centro Poblado |
| | Río Permanente |
| | Quebrada Intermittente |

ESTACIONES DE MONITOREO (POZOS)

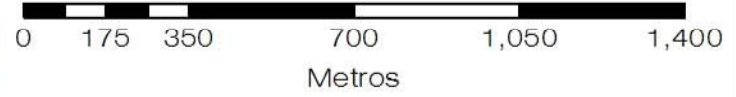
| Símbolo | Estación | X | Y |
|---------|----------|--------|---------|
| | GW-1A | 808664 | 1599957 |
| | GW-2 | 807509 | 1601262 |
| | GW-3 | 806187 | 1601397 |
| | GW-4 | 805986 | 1600736 |
| | GW-5 | 805858 | 1600731 |

FUENTE: Capas digitales del proyecto ESPREDEMAGA/IGN del año 2000
Hojas catográficas año 2010 Mataquesuinta (2159-1) y Laguna de Ayarza (2159-II) del IGN,
Ortofotos año 2006 del MAGA y Fotografía aérea del proyecto el Escobal año 2013,
datos de campo del departamento de Ambiente.

Fecha de Elaboración: Enero de 2014

Distancia Horizontal y Vertical
de Grilla: 1,000 metros

Escala 1:16,000





MAPA DE LOCALIZACIÓN ESTACIONES (POZOS) DE MONITOREO Y REFERENCIA

PROYECTO MINERO ESCOBAL
SAN RAFAEL LAS FLORES, SANTAROSA

Minera San Rafael S.A.
GUATEMALA

DEPARTAMENTO DE AMBIENTE

Sistema de coordenadas: WGS 1984 UTM Zone 15N
Proyección: Transverse Mercator
Dato: WGS 1984

LEYENDA

| Símbolo | Descripción |
|---------|-----------------------|
| | Polígono del Proyecto |
| | Centro Poblado |
| | Río Permanente |
| | Quebrada Intermitente |

ESTACIONES DE MONITOREO (POZOS)

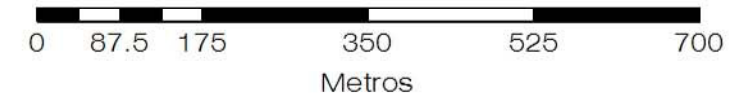
| Símbolo | Estación | X | Y |
|---------|----------|--------|---------|
| | MW-2 | 805201 | 1600768 |
| | MW-3 | 805148 | 1600993 |
| | MW-4 | 805181 | 1601212 |
| | MW-5 | 805299 | 1601463 |
| | MW-6 | 805452 | 1601657 |
| | MW-7 | 805791 | 1601785 |
| | MW-8 | 805298 | 1601480 |
| | MW-9 | 805192 | 1601222 |
| | MW-11 | 805607 | 1601267 |
| | | RW-1 | 804803 |

FUENTE: Capas digitales del proyecto ESPREDE/MAGA/IGN del año 2000. Hojas catográficas año 2010 Mataquesuintla (2159-I) y Laguna de Ajarza (2159-II) del IGN, Ortofotos año 2006 del MAGA y Fotografía aérea del proyecto el Escobal año 2013, datos de campo del departamento de Ambiente.

Fecha de Elaboración: Enero de 2014

Distancia Horizontal y Vertical de Grilla: 1,000 metros

Escala 1:8,000





MAPA DE LOCALIZACIÓN ESTACIONES DE MONITOREO POZOS DE SUMINISTRO

PROYECTO MINERO ESCOBAL
SAN RAFAEL LAS FLORES, SANTAROSA



DEPARTAMENTO DE AMBIENTE
Sistema de coordenadas: WGS 1984 UTM Zone 15N
Proyección: Transverse Mercator
Dato: WGS 1984

LEYENDA

| Símbolo | Descripción |
|---------|-----------------------|
| | Polígono del Proyecto |
| | Centro Poblado |
| | Río Permanente |
| | Quebrada Intermitente |

ESTACIONES DE MONITOREO

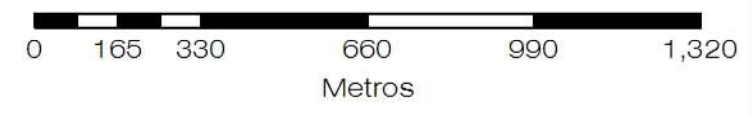
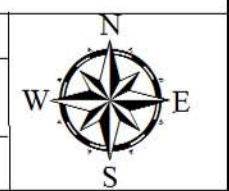
| Símbolo | Estación | X | Y |
|---------|----------|--------|---------|
| | PSA-1 | 805212 | 1601203 |
| | PSA-SR | 803672 | 1602247 |

FUENTE: Capas digitales del proyecto ESPREDE/MAGA/IGN del año 2000
Hojas catográficas año 2010 Mataquesuintla (2159-1) y Laguna de Ayarza (2159-II) del IGN,
Ortofotos año 2006 del MAGA y Fotografía aérea del proyecto el Escobal año 2013,
datos de campo del departamento de Ambiente.

Fecha de Elaboración: Enero de 2014

Distancia Horizontal y Vertical de Grilla: 1,000 metros

Escala 1:15,000



4.2 Metodología

En el Cuadro 4-2 se describe el procedimiento y equipo utilizado para la toma de muestras de agua.

Cuadro 4-2: Procedimiento y equipo utilizado para medir parámetros *in situ* de muestras de agua, Proyecto Minero Escobal.

| Parámetros analizados | |
|---|--|
| <i>In Situ</i> | pH, conductividad eléctrica, oxígeno disuelto, temperatura y sólidos disueltos totales. |
| Laboratorio | Laboratorio ACZ: Aceites y Grasas, Hidrocarburos Totales de Petróleo, Metales Totales (solo en agua superficial); Metales Disuelto, Cationes, Aniones y demás parámetros fisicoquímicos. Laboratorio Ecosistemas: DBO, coliformes totales, color, Cromo hexavalente. |
| Procedimiento | |
| Basado en el procedimiento de toma de muestra dado por Water Management Consultants y el laboratorio ACZ para las muestras del perfil de agua superficial (SW) y agua subterránea (GW). Y en el procedimiento dado por <i>Standard Methods for the Examination of Water and Wastewater, part 1060 B</i> para las muestras de agua residual. | |
| Equipo utilizado | |
| Nombre | Multiparámetros |
| Modelo | PCD650 |
| Fabricante | OAKTON |

Fuente: MSR, 2014.

Laboratorio empleado y valores de referencia: Las muestras fueron analizadas en el laboratorio ACZ, 2773 Downhill Drive Steamboat Springs, Colorado USA, el cual se encuentra acreditado y avalado por la USEPA. Los análisis de color, DBO, coliformes fecales y cromo hexavalente fueron analizados en el laboratorio Ecosistemas Proyectos Ambientales, S.A., laboratorio respaldado por un Sistema de Calidad ISO 17025, otorgado por la Oficina Guatemalteca de Acreditación (OGA); y con ello los análisis acreditados cuentan con validez internacional según OGA-LE 006-04.

4.3 Resultados

4.3.1 Control de Calidad

En el monitoreo correspondiente al mes de Diciembre 2013 se emplearon muestras control para determinar la confiabilidad de los parámetros analizados por el laboratorio encargado del análisis de muestras. En total se efectuaron 3 muestras blanco y tres muestras duplicado. Los resultados obtenidos se presentan en el Cuadro 4-3.

En las tres muestras del control de calidad de los blancos de campo, se detectaron concentraciones mínimas de vanadio disuelto (GW10), color aparente y real (WW20) y fosfatos, fósforo total y disuelto (SW10). Sin embargo las concentraciones detectadas están muy cerca a los límites de detección del método, por lo que se considera que no hay un aporte significativo de estos elementos en los resultados obtenidos. Todos los demás parámetros analizados por el laboratorio son confiables tanto en manipulación de las muestras como en precisión del análisis.

Cuadro 4-3: Resultados de control de calidad, blanco y duplicado, para análisis de agua superficial y subterránea

| Parámetros | Unidad | Blancos de campo | | | Muestras duplicado | | | | | |
|--------------------|-----------|--|---------|---------|---------------------|---------------------|-----------|----------|-----------|----------|
| | | Agua EMSURE (metales y agua desmineralizada (Fisicoquímicos) | | | Duplicado | Original | Duplicado | Original | Duplicado | Original |
| | | SW10 | GW10 | MW20 | SW11 | SW2A | GW11 | GW3 | MW21 | MW9 |
| Cr VI | mg/L | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| DBO | | <10 | N/A | N/A | <10 | <10 | N/A | N/A | N/A | N/A |
| Coliformes Fecales | NMP/100ml | <2 | <2 | <2 | 2.2x10 ³ | 1.6x10 ⁴ | <2 | <2 | 4.5 | <2 |
| Color Aparente | U Pt/Co | <1 | <1 | 325 | 5 | 5 | <1 | <1 | 246 | 325 |
| Color Real | U Pt/Co | <1 | <1 | 89 | <1 | <1 | <1 | <1 | 107 | 89 |
| Aluminio Disuelto | mg/L | <0.03 | <0.03 | <0.03 | 0,06 | 0,06 | <0.03 | <0.03 | 0.04 | <0.03 |
| Aluminio Total | | <0.03 | NA | NA | 0,08 | 0,08 | NA | NA | NA | NA |
| Antimonio Disuelto | | <0.0004 | <0.0004 | <0.0004 | 0,0049 | 0,005 | 0.0005 | 0.0005 | <0.0004 | <0.0004 |
| Antimonio Total | | <0.0004 | NA | | 0,005 | 0,0043 | NA | | | |
| Arsénico Disuelto | | <0.0002 | <0.0002 | <0.0002 | 0,0088 | 0,0087 | 0.0025 | 0.0025 | 0.0012 | 0.0011 |
| Arsénico Total | | <0.0002 | NA | | 0,0098 | 0,0084 | NA | | | |
| Bario Disuelto | | <0.003 | <0.003 | <0.003 | 0,046 | 0,046 | 0.122 | 0.118 | 0.049 | 0.048 |
| Bario Total | | <0.003 | NA | | 0,05 | 0,050 | NA | | | |
| Berilio Disuelto | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Berilio Total | | <0.01 | NA | | <0.01 | <0.01 | NA | | | |
| Bismuto Disuelto | | <0.04 | <0.04 | <0.04 | 0,04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 |
| Bismuto Total | | <0.04 | NA | | <0.04 | 0,04 | NA | | | |
| Boro Disuelto | | <0.01 | <0.01 | <0.01 | <0.01 | 0,16 | 0.01 | 0.01 | 0.05 | 0.05 |
| Boro Total | | <0.01 | NA | | 0,15 | 0,15 | NA | | | |
| Cadmio Disuelto | | <0.0001 | <0.0001 | <0.0001 | 0,0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Cadmio Total | | <0.0001 | NA | | 0,0001 | <0.0001 | NA | | | |
| Calcio Disuelto | | <0.2 | <0.2 | <0.2 | <0.2 | 328 | 59.3 | 58.2 | 82.8 | 84..6 |
| Calcio Total | | <0.2 | NA | | 345 | 347 | NA | | | |
| Cromo Disuelto | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Cromo Total | | <0.01 | NA | | <0.01 | <0.01 | NA | | | |
| Cobalto Disuelto | <0.01 | <0.01 | <0.01 | <0.01 | <0.1 | <0.01 | <0.01 | <0.01 | <0.01 | |
| Cobalto Total | <0.01 | NA | | <0.01 | <0.01 | NA | | | | |
| Cobre Disuelto | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | |
| Cobre Total | <0.01 | NA | | <0.01 | <0.01 | NA | | | | |
| Galio Disuelto | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | |
| Galio Total | <0.1 | NA | | <0.1 | <0.1 | NA | | | | |
| Hierro Disuelto | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 8.09 | 8.20 | |
| Hierro Total | <0.02 | NA | | <0.02 | 0,02 | NA | | | | |
| Plomo Disuelto | <0.0001 | <0.0001 | <0.0001 | 0,0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | |
| Plomo Total | <0.0001 | NA | | 0,0002 | 0,0001 | NA | | | | |

| Parámetros | Unidad | Blancos de campo | | | Muestras duplicado | | | | | |
|--------------------------|--------|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | | Agua EMSURE (metales) y agua desmineralizada (Fisicoquímicos) | | | Duplicado | Original | Duplicado | Original | Duplicado | Original |
| | | SW10 | GW10 | MW20 | SW11 | SW2A | GW11 | GW3 | MW21 | MW9 |
| Litio Disuelto | | <0.02 | <0.02 | <0.02 | 0,08 | 0,08 | <0.02 | <0.02 | 0.03 | 0.02 |
| Litio Total | | <0.02 | NA | | 0,09 | 0,09 | NA | | | |
| Magnesio Disuelto | | <0.2 | <0.2 | <0.2 | 19,6 | 19,5 | 9.6 | 9.5 | 14.7 | 15 |
| Magnesio Total | | <0.2 | NA | | 20,6 | 20,7 | NA | | | |
| Manganeso Disuelto | | <0.005 | <0.005 | <0.005 | 0,107 | 0,106 | 0.197 | 0.193 | 0.290 | 0.297 |
| Manganeso Total | | <0.005 | NA | | 0,115 | 0,116 | NA | | | |
| Mercurio Disuelto | | <0.0002 | <0.0002 | <0.0002 | 0,0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| Mercurio Total | | <0.0002 | NA | | 0,0002 | <0.0002 | NA | | | |
| Molibdeno Disuelto | | <0.02 | <0.02 | <0.02 | 0 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| Molibdeno Total | | <0.02 | NA | | <0.02 | 0,02 | NA | | | |
| Níquel Disuelto | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Níquel Total | | <0.01 | NA | | <0.01 | <0.01 | NA | | | |
| Potasio Disuelto | | <0.3 | <0.3 | <0.3 | 8,9 | 8,8 | 7.1 | 7 | 4.5 | 4.5 |
| Potasio Total | | <0.3 | NA | | 9,3 | 9,3 | NA | | | |
| Escandio Disuelto | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Escandio Total | | <0.1 | NA | | <0.1 | <0.1 | NA | | | |
| Selenio Disuelto | | <0.0001 | <0.0001 | <0.0001 | 0,0006 | 0,0007 | 0.0002 | 0.0002 | <0.0001 | 0.0002 |
| Selenio Total | | <0.0001 | NA | | 0,0005 | 0,0005 | NA | | | |
| Plata Disuelta | | <5x10 ⁻⁵ | <5x10 ⁻⁵ | <5x10 ⁻⁵ | <5x10 ⁻⁵ | <5x10 ⁻⁵ | <5x10 ⁻⁵ | <5x10 ⁻⁵ | <5x10 ⁻⁵ | <5x10 ⁻⁵ |
| Plata Total | | <5x10 ⁻⁵ | NA | | <5x10 ⁻⁵ | 0,00005 | NA | | | |
| Sodio Disuelto | | <0.3 | <0.3 | <0.3 | 74,4 | 73,8 | 19.3 | 19 | 31.4 | 31.8 |
| Sodio Total | | <0.3 | NA | | 77,4 | 77,3 | NA | | | |
| Estroncio Disuelto | | <0.01 | <0.01 | <0.01 | 3,55 | 3,53 | 0.33 | 0.33 | 0.71 | 0.71 |
| Estroncio Total | | <0.01 | NA | | 3,64 | 3,63 | NA | | | |
| Talio Disuelto | | <0.0001 | <0.0001 | <0.0001 | 0,0001 | 0,0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Talio Total | | <0.0001 | NA | | 0,0001 | <0.0001 | NA | | | |
| Estaño Disuelto | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Estaño Total | | <0.1 | NA | | <0.1 | <0.1 | NA | | | |
| Titanio Disuelto | | <0.005 | <0.005 | <0.002 | <0.005 | 0,005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Titanio Total | | <0.005 | NA | | 0,007 | 0,007 | NA | | | |
| Uranio Disuelto | | <0.0001 | <0.0001 | <0.0001 | 0,0002 | 0,0002 | <0.0001 | <0.0001 | 0.0001 | 0.0002 |
| Uranio Total | | <0.0001 | NA | | 0,0002 | 0,0001 | NA | | | |
| Vanadio Disuelto | | <0.005 | 0.005 | <0.005 | 0,011 | 0,011 | <0.005 | <0.005 | <0.005 | <0.005 |
| Vanadio Total | | <0.005 | NA | | 0,01 | 0,009 | NA | | | |
| Zinc Disuelto | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.01 | <0.01 | 0.01 | <0.01 |
| Zinc Total | | <0.01 | | | 0,01 | 0,01 | | | | |
| Grasas y Aceites | | <2 | NA | | <2 | <2 | NA | | | |
| DQO | | <10 | | | <10 | <10 | | | | |
| Cloruros | | <1 | <1 | <1 | 55 | 55 | 7 | 7 | 18 | 18 |
| Cianuro Total | | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 |
| Fluoruros | | <0.1 | <0.1 | <1 | 1.4 | 1.4 | 0.2 | 0.2 | 1 | 1 |
| Nitratos/Nitritos como N | | <0.02 | <0.02 | <0.02 | 2.32 | 2.63 | 2.53 | 2.55 | <0.02 | <0.02 |
| Amonio | | <0.05 | <0.05 | <0.05 | 0.68 | 0.73 | <0.05 | <0.05 | <0.05 | <0.05 |
| Nitrógeno Kjeldahl (TKN) | | <0.1 | <0.1 | <0.1 | 1.3 | 1.5 | <0.1 | 0.2 | <0.1 | <0.1 |
| Fosfatos | | 0,03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.06 | 0.06 | 0.09 | 0.12 |
| Fósforo Disuelto (Orto) | | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.03 | 0.03 | 0.03 | 0.01 |
| Fósforo Total | | 0.02 | <0.01 | <0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.04 | 0.04 |
| STD (TDS) | | <10 | <10 | <10 | 1530 | 1530 | 380 | 390 | 460 | 480 |

| Parámetros | Unidad | Blancos de campo | | | Muestras duplicado | | | | | |
|-----------------------------|--------|---|------|------|--------------------|----------|-----------|----------|-----------|----------|
| | | Agua EMSURE (metales) y agua desmineralizada (Fisicoquímicos) | | | Duplicado | Original | Duplicado | Original | Duplicado | Original |
| | | SW10 | GW10 | MW20 | SW11 | SW2A | GW11 | GW3 | MW21 | MW9 |
| SST (TSS) | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | 27 | 26 |
| ST (TS) | | <10 | <10 | <10 | 1560 | 1580 | 400 | 410 | 530 | 520 |
| Sulfatos | | <1 | <1 | <1 | 892 | 859 | 125 | 123 | 156 | 174 |
| Alcalinidad Total | mg/L | <2 | <2 | <1 | 67 | 79 | 90 | 92 | 143 | 146 |
| Hidrocarburos totales (TPH) | | <0.1 | NA | | <0.1 | <0.1 | NA | | | |

u.e.: unidades exponenciales. mg/L: miligramos por litro. NMP/100ml: número más probable en 100ml. u Pt/Co: unidades platino cobalto. Fuente: MSR, 2014.

4.3.2 Agua Superficial

En el Cuadro 4-4 se presentan los resultados de la calidad del agua superficial para el mes de Diciembre 2013 en las once estaciones de monitoreo y un resumen estadístico (promedio, valor máximo y valor mínimo) de la línea base establecida para cada estación. Los resultados del laboratorio se presentan en el anexo 11.5.1.

Según los parámetros fisicoquímicos analizados, todas las estaciones monitoreadas cumplen con los valores máximos permisibles dados por el Acuerdo Gubernativo 236-2006 para entes generadores nuevos.

Las estaciones muestreadas presentaron un pH levemente alcalino (7.04 a 8.25 u.e.). En ninguna de las estaciones se detectaron valores de grasas y aceites, cianuro total cumpliendo con las guías establecidas por la USEPA para la salud humana, el Banco Mundial y el Acuerdo Gubernativo 236-2006 (**Acuerdo**) para aguas residuales. La Demanda Química de Oxígeno (**DQO**) se detectó únicamente en las estaciones SW6 (10 mg/L) y SW7 (40 mg/L) en concentraciones entre 10-40 mg/L, y no sobrepasaron el límite máximo establecidos durante el levantamiento de línea base para cada estación, ni sobrepasa el valor guía establecido por el Banco Mundial (150 mg/L). En ninguna estación se detectó concentración alguna de Demanda Bioquímica de Oxígeno (**DBO**).

Las estaciones muestreadas presentaron concentraciones por debajo de la directriz de la USEPA para la salud humana de Cloruros (250 mg/L), Fluoruros (4 mg/L) y concentraciones muy por debajo de los valores establecidos por el Acuerdo para Fósforo total (10 mg/L) y el Banco Mundial (2 mg/L).

En tres de las once estaciones se detectó sólidos suspendidos totales en concentración entre 6 y 10 mg/L, encontrándose por debajo de los valores

establecidos por el Acuerdo (100 mg/L), por el Banco Mundial (50 mg/L) y dentro de los valores establecidos durante el levantamiento de línea base.

Los Sulfatos Totales y los Sólidos Disueltos Totales (**TDS**) fueron detectados en la mayoría de las estaciones en concentraciones por debajo de los valores máximos establecidos durante la línea base.

La estación SW2A no cuenta con línea base pero se utiliza los valores registrados en la línea base de la estación SW2 como referencia para analizar su comportamiento, ya que las dos estaciones están ubicadas en la quebrada El Escobal aguas abajo y están separadas a escasos 400mts aproximadamente.

A excepción de la estación SW2, el Aluminio fue detectado en todas las estaciones en concentraciones que van de 0.08 a 1.55 mg/L, la última concentración por arriba de la guía de la USEPA (0.2 mg/L). Sin embargo los datos se encuentran dentro de los límites establecidos durante el levantamiento de la línea base. El Antimonio fue detectado en todas las estaciones, excepto en SW5, SW6, SW3 y SW1 y se detectó en un rango de concentración de 0.0005 – 0.0043 mg/L, por debajo de los límites máximos establecidos durante la línea base.

Las concentraciones de Arsénico Total se encuentran por debajo de los límites establecidos por el Acuerdo (0.1 mg/L). Respecto de las directrices de la USEPA (0.01mg/L) todas las estaciones, a excepción de la estación SW2 donde se obtuvo una concentración de 0.0152 mg/L y SW3 con una concentración de 0.0119 mg/L, se encontraron ligeramente por encima del valor guía. Se dará seguimiento a la tendencia que tenga este parámetro en futuros muestreos para comprobar o descartar que dicho aumento se deba a las actividades realizadas dentro de la empresa. En ninguna estación de monitoreo de agua superficial fue detectado el Mercurio Total. Y en todas las estaciones fue detectado el Plomo Total, registrándose todas las concentraciones por debajo de los valores guía sugeridos por la USEPA (0.015 mg/L) y el Acuerdo (0.4 mg/L).

Cuadro 4-4: Resultados de la Calidad del Agua Superficial, Proyecto Minero Escobal (1/4)

| Parámetros | Unidades | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | SW1-E | | | | SW2-E | | | | SW2A-E | | | |
|--------------------------|-----------|--------------------|---------------------------|------------------|-------------------------------|---------|---------|---------------------|--|---------|---------|---------------------|---------------------------------------|--------|--------|---------------------|
| | | | | | Quebrada Escobal-aguas arriba | | | | Quebrada Escobal-en medio del Proyecto | | | | Quebrada Escobal- salida del Proyecto | | | |
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | |
| pH de campo | u.e. | 5.0-9.0 | 6.0-9.0 | 6.0-9.0 | 7,509 | 7,140 | 8,060 | 7,04 | 7,42 | 6,56 | 7,87 | 8,2 | | | | 8,25 |
| Temperatura (campo) | °C | | | | 17,4 | 13,0 | 19,8 | 16,1 | 22,4 | 20,3 | 25,6 | 27,4 | | | | 26,1 |
| Conductividad (campo) | µS/cm | | | | 277,9 | 66,3 | 566,6 | 184 | 807,3 | 177,3 | 1965,0 | 2206 | | | | 1748 |
| Oxígeno disuelto (campo) | | | | | 3,6 | 0,1 | 6,4 | 6,94 | 4,76 | 3,5 | 5,8 | 6,89 | | | | 6,89 |
| Cr VI | mg/L | | | | | | | <0.05 | | | | <0.05 | | | | <0.05 |
| DBO | | | | | | | | <10 | | | | <10 | | | | <10 |
| Coliformes Fecales | NMP/100ml | | | | | | | 4.3x10 ² | | | | 5.4x10 ³ | | | | 1.6x10 ⁴ |
| Color Aparente | U Pt/Co | | | | | | | 21 | | | | <1 | | | | 5 |
| Color Real | | | | | | | | <10 | | | | <1 | | | | <1 |
| Turbidez | NTU | | | | | | | 2,82 | | | | | | | | 0,83 |
| Aluminio Disuelto | | | | | 0,035 | <0.03 | 0,09 | <0.03 | 0,043 | <0.03 | 0,12 | <0.03 | | | | 0,06 |
| Aluminio Total | | 0.2 | | | 5,02 | <0.03 | 35,1 | 0,25 | 2,35 | 0,06 | 8,77 | <0.03 | | | | 0,08 |
| Antimonio Disuelto | | | | | <0.0004 | <0.0004 | 0,0006 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | 0,0004 | | | | 0,005 |
| Antimonio Total | | 0.006 | | | <0.0004 | <0.0004 | 0,0007 | <0.0004 | <0.0004 | <0.0004 | 0,0005 | 0,0005 | | | | 0,0043 |
| Arsénico Disuelto | | | | | 0,00216 | 0,0005 | 0,0034 | 0,0023 | 0,00184 | 0,0013 | 0,0024 | 0,0152 | | | | 0,0087 |
| Arsénico Total | | 0.01 | | 0.1 | 0,00339 | 0,0015 | 0,0094 | 0,0024 | 0,00266 | 0,0012 | 0,0054 | 0,0156 | | | | 0,0084 |
| Bario Disuelto | | | | | 0,1361 | 0,0860 | 0,2070 | 0,09 | 0,109 | 0,088 | 0,133 | 0,041 | | | | 0,046 |
| Bario Total | | 1 | | | 0,186 | 0,1000 | 0,4340 | 0,098 | 0,131 | 0,096 | 0,186 | 0,04 | | | | 0,050 |
| Berilio Disuelto | | | | | <0.002 | <0.002 | <0.01 | <0.01 | <0.002 | <0.002 | <0.002 | <0.01 | | | | <0.01 |
| Berilio Total | | 0.004 | | | <0.002 | <0.002 | <0.01 | <0.01 | <0.002 | <0.002 | <0.002 | <0.01 | | | | <0.01 |
| Bismuto Disuelto | | | | | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0,05 | <0.04 | | | | <0.04 |
| Bismuto Total | | | | | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | | | | 0,04 |
| Boro Disuelto | | | | | <0.01 | <0.01 | <0.01 | 0,01 | 0,114 | <0.01 | 0,29 | 0,26 | | | | 0,16 |
| Boro Total | | | | | <0.01 | <0.01 | 0,02 | <0.01 | 0,11 | <0.01 | 0,28 | 0,25 | | | | 0,15 |
| Cadmio Disuelto | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 |
| Cadmio Total | | 0.003 | | 0.1 | <0.0001 | <0.0001 | 0,0007 | <0.0001 | <0.0001 | <0.0001 | 0,0001 | <0.0001 | NR | NR | NR | <0.0001 |
| Calcio Disuelto | | | | | 45,2 | 18,900 | 74,500 | 24,3 | 144,9 | 20,7 | 333,0 | 430 | | | | 328 |
| Calcio Total | | | | | 45,5 | 20,900 | 70,500 | 25,4 | 144,6 | 20,5 | 331,0 | 437 | | | | 347 |
| Cromo Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | <0.01 |
| Cromo Total | | 0.1 | | 0.1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | <0.01 |
| Cobalto Disuelto | mg/L | | | | <0.01 | <0.01 | 0,01 | <0.01 | 0,01 | <0.01 | 0,01 | <0.01 | | | | <0.1 |
| Cobalto Total | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | <0.01 |
| Cobre Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | <0.01 |
| Cobre Total | | 1.3 | | 3 | <0.01 | <0.01 | 0,01 | <0.01 | <0.01 | <0.01 | 0,02 | <0.01 | | | | <0.01 |
| Galio Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 |
| Galio Total | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 |
| Hierro Disuelto | | | | | <0.02 | <0.02 | 0,04 | <0.02 | 0,04 | <0.02 | 0,12 | <0.02 | | | | <0.02 |
| Hierro Total | | 0.3 | | | 2,7 | <0.02 | 19,5 | 0,1 | 1,30 | 0,06 | 5,19 | 0,2 | | | | 0,02 |
| Plomo Disuelto | | | | | <0.0001 | <0.0001 | 0,0003 | <0.0001 | <0.0001 | <0.0001 | 0,0001 | <0.0001 | | | | <0.0001 |
| Plomo Total | | 0.015 | | 0.4 | 0,0025 | <0.0001 | 0,0191 | <0.0001 | 0,00088 | <0.0001 | 0,0038 | 0,0002 | | | | 0,0001 |
| Litio Disuelto | | | | | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0,13 | | | | 0,08 |
| Litio Total | | | | | <0.02 | <0.02 | <0.02 | <0.02 | 0,02 | <0.02 | 0,02 | 0,14 | | | | 0,09 |
| Magnesio Disuelto | | | | | 3,9 | 2,6 | 5,3 | 2,8 | 15,9 | 3,2 | 37,3 | 27,7 | | | | 19,5 |
| Magnesio Total | | | | | 4,2 | 2,8 | 5,2 | 2,9 | 15,1 | 3,6 | 32,2 | 28,6 | | | | 20,7 |
| Manganeso Disuelto | | | | | 0,0051 | <0.005 | 0,020 | <0.005 | 0,0195 | <0.005 | 0,070 | 0,501 | | | | 0,106 |
| Manganeso Total | | 0.4 | | | 0,1041 | <0.005 | 0,721 | 0,005 | 0,0602 | 0,0070 | 0,1740 | 0,529 | | | | 0,116 |
| Mercurio Disuelto | | | | | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | | | | <0.0002 |
| Mercurio Total | | 0.002 | | 0.01 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | | | | <0.0002 |
| Molibdeno Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 | | | | <0.02 |
| Molibdeno Total | | | | | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 | | | | 0,02 |
| Níquel Disuelto | | | | | <0.01 | <0.01 | 0,030 | <0.01 | 0,013 | <0.01 | 0,04 | <0.01 | | | | <0.02 |

| Parámetros | Unidades | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | SW1-E | | | | SW2-E | | | | SW2A-E | | | |
|-----------------------------|----------|--------------------|---------------------------|------------------|-------------------------------|----------|----------|----------|--|----------|----------|----------|---------------------------------------|--------|--------|----------|
| | | | | | Quebrada Escobal-aguas arriba | | | | Quebrada Escobal-en medio del Proyecto | | | | Quebrada Escobal- salida del Proyecto | | | |
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | |
| Níquel Total | | 0.61 | | 2 | <0.01 | <0.01 | 0,040 | <0.01 | 0,022 | <0.01 | 0,04 | <0.01 | | | | <0.01 |
| Potasio Disuelto | | | | | 4,4 | 3,5 | 5,1 | 3,8 | 6,1 | 4,9 | 7,6 | 4,7 | | | | 8,8 |
| Potasio Total | | | | | 5,3 | 3,5 | 13,0 | 4 | 6,3 | 5,2 | 7,4 | 4,8 | | | | 9,3 |
| Escandio Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 |
| Escandio Total | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 |
| Selenio Disuelto | | | | | <0.0001 | <0.0001 | 0,0001 | <0.0001 | 0,00045 | <0.0001 | 0,0002 | <0.0001 | | | | 0,0007 |
| Selenio Total | | 0.17 | | | 0,00010 | <0.0001 | 0,0003 | <0.0001 | 0,00011 | <0.0001 | 0,0002 | <0.0001 | | | | 0,0005 |
| Plata Disuelta | | | | | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | | | | <0.00005 |
| Plata Total | | | | | <0.00005 | <0.00005 | 0,00015 | <0.00005 | <0.00005 | <0.00005 | 0,00006 | <0.00005 | | | | 0,00005 |
| Sodio Disuelto | | | | | 9,81 | 8,300 | 11,600 | 8,2 | 40,1 | 9,4 | 87,8 | 90 | | | | 73,8 |
| Sodio Total | | | | | 9,46 | 7,800 | 11,800 | 8,4 | 39,8 | 9,4 | 85,2 | 92 | | | | 77,3 |
| Estroncio Disuelto | | | | | 0,17 | 0,09 | 0,2600 | 0,12 | 1,23 | 0,10 | 2,99 | 5,2 | | | | 3,53 |
| Estroncio Total | | | | | 0,18 | 0,10 | 0,2500 | 0,12 | 1,23 | 0,11 | 2,91 | 5,28 | | | | 3,63 |
| Talio Disuelto | | | | | <0.0001 | <0.0001 | 0,0002 | <0.0001 | 0,0001 | <0.0001 | 0,0001 | <0.0001 | | | | 0,0001 |
| Talio Total | | 0.002 | | | <0.0001 | <0.0001 | 0,0004 | <0.0001 | 0,0001 | <0.0001 | 0,0002 | <0.0001 | | | | <0.0001 |
| Estaño Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 |
| Estaño Total | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 |
| Titanio Disuelto | | | | | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | 0,0070 | 0,018 | | | | 0,005 |
| Titanio Total | | | | | 0,092 | <0.005 | 0,591 | 0,009 | 0,2715 | <0.005 | 0,171 | 0,015 | | | | 0,007 |
| Uranio Disuelto | | | | | 0,00013 | <0.0001 | 0,0003 | <0.0001 | 0,00028 | <0.0001 | 0,0006 | 0,0001 | | | | 0,0002 |
| Uranio Total | | | | | 0,00038 | <0.0001 | 0,0011 | <0.0001 | 0,00024 | <0.0001 | 0,0005 | 0,0001 | | | | 0,0001 |
| Vanadio Disuelto | mg/L | | | | <0.005 | <0.005 | 0,007 | <0.005 | 0,0065 | <0.005 | 0,015 | <0.005 | NR | NR | NR | 0,011 |
| Vanadio Total | | | | | 0,0059 | <0.005 | 0,024 | <0.005 | <0.005 | <0.005 | 0,006 | <0.005 | | | | 0,009 |
| Zinc Disuelto | | | | | 0,053 | <0.01 | 0,10 | <0.01 | 0,046 | <0.02 | 0,10 | 0,02 | | | | <0.01 |
| Zinc Total | | 7.4 | | 10 | 0,064 | <0.01 | 0,12 | <0.01 | 0,041 | <0.01 | 0,06 | 0,02 | | | | 0,01 |
| Grasas y Aceites | | | 10 | 10 | <2.062 | <2.062 | <2.248 | <2 | <2.04 | <2.04 | <2.04 | <2 | | | | <2 |
| DQO | | | 125 | | 15,7 | <10 | 40,0 | <10 | <2.04 | <2.04 | <2.04 | <2 | | | | <10 |
| Cloruros | | 250 | | | 5 | 4,0 | 7,0 | 6 | <2.04 | <2.04 | <2.04 | <2 | | | | 55 |
| Cianuro Total | | 0.14 | | 1 | 0,004 | <0.003 | 0,015 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | | | | <0.003 |
| Fluoruros | | 4 | | | 0,125 | <0.1 | 0,2 | 0,1 | 0,6 | 0,1 | 1,2 | 1,6 | | | | 1,4 |
| Nitratos/Nitritos como N | | | | | 1,61 | 0,08 | 4,87 | 0,86 | 2,46 | 0,03 | 4,90 | 0,02 | | | | 2,63 |
| Amonio | | | | | <0.005 | <0.005 | 0,070 | <0.05 | <0.05 | <0.05 | 0,07 | <0.05 | | | | 0,73 |
| Nitrógeno Kjeldahl (TKN) | | | | | 3,53 | <0.1 | 25,9 | 0,4 | 0,32 | <0.1 | 0,8 | 0,2 | | | | 1,5 |
| Fosfatos | | | | | 0,185 | 0,1 | 0,3 | 0,12 | 0,19 | 0,1 | 0,4 | 0,06 | | | | <0.03 |
| Fósforo Disuelto (Orto) | | | | | 0,06 | 0,03 | 0,10 | 0,04 | 0,06 | 0,02 | 0,13 | <0.01 | | | | <0.01 |
| Fósforo Total | | | 2 | 10 | 0,37 | 0,04 | 2,51 | 0,04 | 0,08 | 0,03 | 0,19 | 0,03 | | | | 0,01 |
| STD (TDS) | | 500 | | | 225 | 170,0 | 280,0 | 180 | 754 | 170,0 | 1620,0 | 1890 | | | | 1530 |
| SST (TSS) | | | 50 | 100 | 163,6 | <5 | 780,0 | <5 | 67 | <5 | 320,0 | <5 | | | | <5 |
| ST (TS) | | | | | 346,3 | 200,0 | 1080,0 | 190 | 850,0 | 230,0 | 1660,0 | 1960 | | | | 1580 |
| Sulfatos | | 250 | | | 26,3 | 10,0 | 42,0 | 18,6 | 472,6 | 14,0 | 1600,0 | 1060 | | | | 859 |
| Alcalinidad Total | | | | | 104 | 38,0 | 161,0 | 68 | 80 | 44,0 | 119,0 | 114 | | | | 79 |
| Hidrocarburos totales (TPH) | | | | | <0.1 | <0.09 | <0.1 | <0.1 | <0.1 | <0.09 | <0.1 | <0.1 | | | | <0.1 |

Dónde: u.e.: unidades exponenciales; mg/L: miligramos por litro; µS/cm: micro siemens por centímetro. °C: grados centígrados. NMP/100ml: número más probable en 100ml. u Pt/Co: unidades platino cobalto. NR = Cálculo No Realizado por falta de datos de línea base. Fuente: MSR, 2014.

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Cuadro 4-4: Resultados de la Calidad del Agua Superficial, Proyecto Minero Escobal (2/4).

| Parámetros | Unidades | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | SW3-E | | | | SW4-E | | | | SW4A-E | | | |
|--------------------------|-----------|--------------------|---------------------------|------------------|------------------------------|---------|---------|---------------------|--------------------------------------|---------|---------|---------------------|-----------------------------|--------|--------|--------|
| | | | | | Río El Dorado – Aguas arriba | | | | Río El Dorado – sobre camino vecinal | | | | Río El Dorado – Aguas abajo | | | |
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | |
| pH de campo | u.e. | 5.0-9.0 | 6.0-9.0 | 6.0-9.0 | 7,58 | 7,17 | 8,17 | 8,06 | 7,40 | 6,56 | 7,94 | 7,67 | 7,86 | | | |
| Temperatura (campo) | °C | | | | 19,8 | 17,0 | 24,0 | 18,6 | 21,0 | 17,2 | 24,0 | 23,7 | 24,9 | | | |
| Conductividad (campo) | μS/cm | | | | 219,7 | 80,0 | 374,5 | 219,8 | 308,9 | 120,0 | 612,0 | 1427 | 1205 | | | |
| Oxígeno disuelto (campo) | | | | | 3,8 | 0,1 | 6,8 | 7,91 | 4,2 | 0,1 | 7,5 | 7,09 | 6,61 | | | |
| Cr VI | mg/L | | | | | | | <0.05 | | | | <0.05 | <0.05 | | | |
| DBO | | | | | | | | <10 | | | | <10 | <10 | | | |
| Coliformes Fecales | NMP/100ml | | | | NR | NR | NR | 5.4x10 ³ | NR | NR | NR | 2.2x10 ⁴ | 1.6x10 ⁴ | | | |
| Color Aparente | U Pt/Co | | | | | | | 44 | | | | 29 | 12 | | | |
| Color Real | | | | | | | | 7 | | | | <1 | <1 | | | |
| Turbidez | NTU | | | | | | | 7,72 | | | | 6,67 | 591,10 | | | |
| Aluminio Disuelto | | | | | 0,061 | <0.03 | 0,15 | 0,03 | 0,030 | <0.03 | 0,10 | <0.03 | 0,04 | | | |
| Aluminio Total | | 0.2 | | | 3,25 | <0.03 | 17,4 | 0,55 | 5,72 | 0,1 | 36,0 | 0,66 | 0,14 | | | |
| Antimonio Disuelto | | | | | <0.0004 | <0.0004 | <0.0004 | <0.0004 | 0,0007 | 0,0 | 0,0011 | 0,002 | 0,0041 | | | |
| Antimonio Total | | 0.006 | | | <0.0004 | <0.0004 | <0.0004 | <0.0004 | 0,0012 | 0,0005 | 0,0037 | 0,002 | 0,0035 | | | |
| Arsénico Disuelto | | | | | 0,00797 | 0,0041 | 0,0139 | 0,0119 | 0,00541 | 0,0039 | 0,0072 | 0,0079 | 0,0073 | | | |
| Arsénico Total | | 0.01 | | 0.1 | 0,00888 | 0,0060 | 0,0137 | 0,0119 | 0,00873 | 0,0043 | 0,0326 | 0,0083 | 0,0065 | | | |
| Bario Disuelto | | | | | 0,0915 | 0,0510 | 0,1180 | 0,087 | 0,1645 | 0,0800 | 0,2340 | 0,114 | 0,1 | | | |
| Bario Total | | 1 | | | 0,12445455 | 0,0980 | 0,2530 | 0,092 | 0,2356 | 0,1440 | 0,5670 | 0,124 | 0,106 | | | |
| Berilio Disuelto | | | | | <0.002 | <0.0002 | <0.01 | <0.01 | <0.002 | <0.002 | <0.01 | <0.01 | <0.01 | | | |
| Berilio Total | | 0.004 | | | <0.002 | <0.0002 | <0.01 | <0.01 | 0,002 | <0.002 | 0,003 | <0.01 | <0.01 | | | |
| Bismuto Disuelto | | | | | <0.01 | <0.01 | <0.04 | <0.04 | 0,04 | <0.04 | 0,1 | <0.04 | <0.04 | | | |
| Bismuto Total | | | | | <0.01 | <0.01 | <0.04 | <0.04 | 0,04 | <0.04 | 0,040 | <0.04 | <0.04 | | | |
| Boro Disuelto | | | | | <0.01 | <0.01 | 0,02 | <0.01 | 0,008 | <0.01 | 0,02 | 0,12 | 0,09 | | | |
| Boro Total | | | | | <0.01 | <0.01 | 0,02 | <0.01 | 0,012 | <0.01 | 0,02 | 0,11 | 0,08 | | | |
| Cadmio Disuelto | | | | | <0.0001 | <0.0001 | 0,0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | |
| Cadmio Total | | 0.003 | | 0.1 | <0.0001 | <0.0001 | 0,0002 | <0.0001 | 0,00012 | <0.0001 | 0,0005 | <0.0001 | <0.0001 | | | |
| Calcio Disuelto | | | | | 27,8 | 11,700 | 39,900 | 27,9 | 37,4 | 18,500 | 61,700 | 248 | 220 | | | |
| Calcio Total | | | | | 27,9272727 | 12,300 | 38,700 | 29,1 | 38,3 | 17,200 | 58,900 | 257 | 230 | | | |
| Cromo Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | |
| Cromo Total | | 0.1 | | 0.1 | <0.01 | <0.01 | 0,020 | <0.01 | <0.01 | <0.01 | 0,020 | <0.01 | <0.01 | | | |
| Cobalto Disuelto | mg/L | | | | 0,01 | <0.01 | 0,01 | <0.01 | 0,01 | <0.01 | 0,01 | <0.01 | <0.01 | | | |
| Cobalto Total | | | | | 0,01 | <0.01 | 0,010 | <0.01 | 0,01 | <0.01 | 0,010 | <0.01 | <0.01 | | | |
| Cobre Disuelto | | | | | <0.01 | <0.01 | 0,010 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | |
| Cobre Total | | 1.3 | | 3 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0,01 | <0.01 | <0.01 | | | |
| Galio Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | |
| Galio Total | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | |
| Hierro Disuelto | | | | | 0,033 | <0.02 | 0,06 | 0,03 | 0,032 | <0.02 | 0,15 | <0.02 | <0.02 | | | |
| Hierro Total | | 0.3 | | | 1,9 | 0,060 | 10,2 | 0,29 | 3,8 | 0,090 | 26,5 | 0,49 | 0,11 | | | |
| Plomo Disuelto | | | | | <0.0001 | <0.0001 | 0,0004 | <0.0001 | <0.0001 | <0.0001 | 0,0002 | <0.0001 | <0.0001 | | | |
| Plomo Total | | 0.015 | | 0.4 | 0,0013 | <0.0001 | 0,0072 | 0,0002 | 0,0030 | <0.0001 | 0,0198 | 0,0012 | 0,0002 | | | |
| Litio Disuelto | | | | | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0,07 | 0,05 | | | |
| Litio Total | | | | | <0.02 | <0.02 | <0.02 | <0.02 | 0,02 | <0.02 | 0,020 | 0,07 | 0,05 | | | |
| Magnesio Disuelto | | | | | 2,6 | 1,3 | 3,5 | 2,2 | 4,2 | 2,4 | 7,3 | 16 | 13,8 | | | |
| Magnesio Total | | | | | 2,7 | 1,6 | 3,5 | 2,3 | 4,6 | 2,5 | 7,3 | 16,8 | 14,4 | | | |
| Manganeso Disuelto | | | | | 0,07418182 | 0,010 | 0,381 | 0,025 | 0,116 | 0,011 | 0,260 | 0,099 | 0,109 | | | |
| Manganeso Total | | 0.4 | | | 0,14745455 | 0,025 | 0,403 | 0,033 | 0,2844 | 0,101 | 1,230 | 0,152 | 0,123 | | | |
| Mercurio Disuelto | | | | | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | | | |
| Mercurio Total | | 0.002 | | 0.01 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | | | |
| Molibdeno Disuelto | | | | | 0,01 | <0.01 | 0,010 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 | <0.02 | | | |
| Molibdeno Total | | | | | 0,01 | <0.01 | 0,010 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 | <0.02 | | | |
| Níquel Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0,020 | <0.01 | <0.01 | | | |

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| Parámetros | Unidades | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | SW3-E | | | | SW4-E | | | | SW4A-E | | | |
|-----------------------------|----------|--------------------|---------------------------|------------------|------------------------------|----------|----------|----------|--------------------------------------|----------|----------|----------|-----------------------------|--------|--------|----------|
| | | | | | Río El Dorado – Aguas arriba | | | | Río El Dorado – sobre camino vecinal | | | | Río El Dorado – Aguas abajo | | | |
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | |
| Níquel Total | | 0.61 | | 2 | <0.01 | <0.01 | 0,050 | <0.01 | 0,010 | <0.01 | 0,060 | <0.01 | | | | <0.01 |
| Potasio Disuelto | | | | | 4,2 | 3,5 | 5,5 | 3,6 | 5,8 | 4,2 | 8,7 | 7,8 | | | | 9 |
| Potasio Total | | | | | 4,5 | 3,6 | 7,0 | 3,7 | 6,5 | 4,4 | 11,7 | 8,2 | | | | 9,3 |
| Escandio Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 |
| Escandio Total | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 |
| Selenio Disuelto | | | | | <0.0001 | <0.0001 | 0,0001 | <0.0001 | 0,00014 | <0.0001 | 0,0005 | 0,0003 | | | | 0,0005 |
| Selenio Total | | 0.17 | | | <0.0001 | <0.0001 | 0,0001 | <0.0001 | 0,00020 | <0.0001 | 0,0002 | 0,0003 | | | | 0,0004 |
| Plata Disuelta | | | | | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | | | | <0.00005 |
| Plata Total | | | | | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | 0,00011 | <0.00005 | | | | <0.00005 |
| Sodio Disuelto | | | | | 12,65 | 7,700 | 16,600 | 10,6 | 12,44 | 9,000 | 15,600 | 54,4 | | | | 51 |
| Sodio Total | | | | | 12,17 | 7,500 | 15,400 | 10,7 | 12,13 | 8,600 | 15,200 | 55,6 | | | | 52,6 |
| Estroncio Disuelto | | | | | 0,19 | 0,06 | 0,3000 | 0,19 | 0,22 | 0,09 | 0,3600 | 2,76 | | | | 2,23 |
| Estroncio Total | | | | | 0,18818182 | 0,08 | 0,3000 | 0,19 | 0,228 | 0,11 | 0,3300 | 2,81 | | | | 2,28 |
| Talio Disuelto | | | | | <0.0001 | <0.0001 | 0,0005 | <0.0001 | 0,00010 | <0.0001 | 0,0001 | <0.0001 | | | | <0.0001 |
| Talio Total | | 0.002 | | | <0.0001 | <0.0001 | 0,0002 | <0.0001 | 0,00017 | <0.0001 | 0,0007 | <0.0001 | | | | <0.0001 |
| Estaño Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 |
| Estaño Total | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 |
| Titanio Disuelto | | | | | <0.005 | <0.005 | <0.005 | 0,005 | <0.005 | <0.005 | <0.005 | 0,018 | | | | <0.005 |
| Titanio Total | | | | | 0,071 | <0.005 | 0,307 | 0,017 | 0,127 | 0,005 | 0,534 | 0,036 | | | | 0,01 |
| Uranio Disuelto | | | | | <0.0001 | <0.0001 | 0,0002 | 0,0001 | 0,00012 | <0.0001 | 0,0004 | 0,0002 | | | | 0,0002 |
| Uranio Total | | | | | 0,00019 | <0.0001 | 0,0005 | 0,0001 | 0,00027 | <0.0001 | 0,0009 | <0.0002 | | | | 0,0001 |
| Vanadio Disuelto | mg/L | | | | <0.005 | <0.005 | 0,008 | <0.005 | <0.005 | <0.005 | 0,011 | 0,005 | NR | NR | NR | 0,008 |
| Vanadio Total | | | | | 0,0051 | <0.005 | 0,019 | <0.005 | 0,0085 | <0.005 | 0,040 | <0.005 | | | | 0,007 |
| Zinc Disuelto | | | | | 0,068 | <0.01 | 0,14 | <0.01 | 0,061 | 0,050 | 0,14 | <0.01 | | | | <0.01 |
| Zinc Total | | 7.4 | | 10 | 0,174 | <0.01 | 1,01 | <0.01 | 0,065 | 0,010 | 0,17 | <0.01 | | | | <0.01 |
| Grasas y Aceites | | | 10 | 10 | <2.062 | <2.04 | <2.326 | <2.02 | <2.062 | <2.02 | <2.084 | <2 | | | | <2 |
| DQO | | | 125 | | 10,9 | <10 | 40,0 | <10 | 16,8 | <10 | 60,0 | <10 | | | | <10 |
| Cloruros | | 250 | | | 2,7 | 2,0 | 3,0 | 2 | 8,5 | 4,0 | 16,0 | 42 | | | | 37 |
| Cianuro Total | | 0.14 | | 1 | <0.003 | <0.003 | 0,015 | <0.003 | <0.003 | <0.003 | 0,014 | <0.003 | | | | <0.003 |
| Fluoruros | | 4 | | | <0.003 | <0.003 | 0,015 | <0.003 | 0,15 | 0,1 | 0,2 | 0,9 | | | | 0,9 |
| Nitratos/Nitritos como N | | | | | 0,59 | <0.02 | 1,51 | 0,26 | 4,49 | 1,96 | 10,10 | 2,76 | | | | 3,99 |
| Amonio | | | | | 0,050 | <0.05 | 0,210 | 0,05 | 0,059 | <0.05 | 0,150 | 0,08 | | | | 0,44 |
| Nitrógeno Kjeldahl (TKN) | | | | | 0,35 | <0.1 | 0,6 | 0,3 | 0,58 | 0,10 | 1,3 | 0,3 | | | | 1,2 |
| Fosfatos | | | | | 0,12 | 0,1 | 0,4 | 0,09 | 0,36 | 0,1 | 1,2 | 0,59 | | | | 0,5 |
| Fósforo Disuelto (Orto) | | | | | 0,04 | 0,02 | 0,12 | 0,03 | 0,12 | 0,03 | 0,39 | 0,18 | | | | 0,14 |
| Fósforo Total | | | 2 | 10 | 0,05 | 0,02 | 0,14 | 0,08 | 0,17 | 0,04 | 0,39 | <0.01 | | | | 0,17 |
| STD (TDS) | | 500 | | | 183,636364 | 140,0 | 220 | 180 | 233,6 | 150,0 | 350 | 1120 | | | | 1060 |
| SST (TSS) | | | 50 | 100 | 48 | 5,0 | 340 | <5 | 115 | <5 | 880 | 9 | | | | <5 |
| ST (TS) | | | | | 231,8 | 140,0 | 500 | 190 | 378,2 | 260,0 | 1180 | 1210 | | | | 1100 |
| Sulfatos | | 250 | | | 16,9 | 4,0 | 25,0 | 22,5 | 27,5 | 10,0 | 57,0 | 648 | | | | 545 |
| Alcalinidad Total | | | | | 83 | 38,0 | 118,0 | 86 | 80 | 45,0 | 102,0 | 91 | | | | 71 |
| Hidrocarburos totales (TPH) | | | | | <0.1 | <0.09 | <0.2 | <0.1 | <0.1 | <0.09 | <0.1 | <0.1 | | | | <0.1 |

Dónde: u.e.: unidades exponenciales; mg/L: miligramos por litro; µS/cm: micro siemens por centímetro. °C: grados centígrados. NMP/100ml: número más probable en 100ml. u Pt/Co: unidades platino cobalto. NA: no analizado. NR = Cálculo No Realizado por falta de datos de línea base. Fuente: MSR, 2014.

Cuadro 4-4: Resultados de la Calidad del Agua Superficial, Proyecto Minero Escobal (3/4)

| Parámetros | Unidades | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | SW5-E | | | | SW6-E | | | | SW7-E | | | |
|--------------------------|-----------|--------------------|---------------------------|------------------|-----------------------------|---------|---------|---------------------|---------------|---------|---------|---------------------|-------------------|---------|---------|---------------------|
| | | | | | Río Tapalapa – Aguas arriba | | | | Río Los Vados | | | | Quebrada La Honda | | | |
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | |
| pH de campo | u.e. | 5.0-9.0 | 6.0-9.0 | 6.0-9.0 | 7,5 | 7,1 | 8,0 | 8.09 | 7,4 | 7,1 | 7,8 | 7.43 | 7,5 | 6,9 | 8,0 | 7.08 |
| Temperatura (campo) | °C | | | | 17,4 | 14,5 | 21,5 | 15 | 19,4 | 12,2 | 27,3 | 16,4 | 18,7 | 15,0 | 21,3 | 17,9 |
| Conductividad (campo) | μS/cm | | | | 72,1 | 0,1 | 160,2 | 91,49 | 259,0 | 60,0 | 948,0 | 153,1 | 216,0 | 120,0 | 416,2 | 183,1 |
| Oxígeno disuelto (campo) | | | | | 4,0 | 0,0 | 8,0 | 7,94 | 4,0 | 0,0 | 8,3 | 8,2 | 3,9 | 0,1 | 7,5 | 7,23 |
| Cr VI | mg/L | | | | | | | <0.05 | | | | <0.05 | | | | <0.05 |
| DBO | | | | | | | | <10 | | | | <10 | | | | <10 |
| Coliformes Fecales | NMP/100ml | | | | NR | NR | NR | 3.1x10 ² | NR | NR | NR | 1.6x10 ⁴ | NR | NR | NR | 9.2x10 ³ |
| Color Aparente | U Pt/Co | | | | | | | 30 | | | | 46 | | | | 68 |
| Color Real | | | | | | | | 7 | | | | 10 | | | | 18 |
| Turbidez | NTU | | | | | | | 4.94 | | | | 8.01 | | | | 16.5 |
| Aluminio Disuelto | | | | | 0,055 | <0.03 | 0,14 | <0.03 | 0,031 | <0.03 | 0,08 | <0.03 | 0,033 | <0.03 | 0,13 | <0.03 |
| Aluminio Total | | 0.2 | | | 1,09 | <0.03 | 3,7 | 0,28 | 1,89 | <0.03 | 8,1 | 0,54 | 3,05 | 0,1 | 16,4 | 1,55 |
| Antimonio Disuelto | | | | | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | 0,0013 | <0.0004 | <0.0004 | <0.0004 | 0,0009 | 0,0006 |
| Antimonio Total | | 0.006 | | | <0.0004 | <0.0004 | <0.0004 | <0.0008 | <0.0004 | <0.0004 | <0.0004 | <0.0008 | 0,0005 | <0.0004 | 0,0007 | 0,0007 |
| Arsénico Disuelto | | | | | 0,00139 | 0,0005 | 0,0024 | 0,002 | 0,00320 | 0,0007 | 0,0076 | 0,0026 | 0,00382 | 0,0022 | 0,0054 | 0,0045 |
| Arsénico Total | | 0.01 | | 0.1 | 0,00177 | 0,0013 | 0,0028 | 0,0021 | 0,00387 | 0,0025 | 0,0074 | 0,0029 | 0,00446 | 0,0030 | 0,0061 | 0,0052 |
| Bario Disuelto | | | | | 0,0447 | 0,0230 | 0,0720 | 0,045 | 0,0618 | 0,0270 | 0,1360 | 0,049 | 0,0946 | 0,0520 | 0,1430 | 0,071 |
| Bario Total | | 1 | | | 0,0556 | 0,0390 | 0,0690 | 0,049 | 0,0806 | 0,0550 | 0,1360 | 0,053 | 0,2142 | 0,0880 | 0,9900 | 0,08 |
| Berilio Disuelto | | | | | <0.002 | <0.002 | <0.01 | <0.01 | <0.002 | <0.002 | <0.01 | <0.01 | <0.002 | <0.002 | <0.01 | <0.01 |
| Berilio Total | | 0.004 | | | 0,002 | <0.002 | <0.01 | <0.01 | <0.002 | <0.002 | 0,003 | <0.01 | <0.002 | <0.002 | 0,003 | <0.01 |
| Bismuto Disuelto | | | | | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0,1 | <0.04 | <0.04 | <0.04 | 0,040 | <0.04 |
| Bismuto Total | | | | | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 |
| Boro Disuelto | | | | | 0,010 | <0.01 | 0,010 | <0.01 | 0,361 | <0.01 | 1,8 | 0,11 | <0.01 | <0.01 | 0,010 | <0.01 |
| Boro Total | | | | | 0,010 | <0.01 | 0,02 | <0.01 | 0,379 | <0.01 | 1,93 | 0,1 | 0,013 | <0.01 | 0,02 | <0.01 |
| Cadmio Disuelto | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Cadmio Total | | 0.003 | | 0.1 | <0.0001 | <0.0001 | <0.0001 | <0.0002 | <0.0001 | <0.0001 | 0,0002 | <0.0002 | <0.0001 | <0.0001 | 0,0003 | <0.0001 |
| Calcio Disuelto | | | | | 7,9 | 3,400 | 13,700 | 7,9 | 15,1 | 5,400 | 38,900 | 10,9 | 23,1 | 11,200 | 38,100 | 15,7 |
| Calcio Total | | | | | 7,73 | 3,400 | 13,100 | 8,1 | 14,81 | 5,900 | 37,500 | 11,2 | 23,04 | 11,500 | 36,700 | 15,7 |
| Cromo Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Cromo Total | | 0.1 | | 0.1 | 0,01 | <0.01 | 0,020 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0,020 | <0.01 |
| Cobalto Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0,01 | <0.01 | <0.01 | <0.01 | 0,01 | <0.01 |
| Cobalto Total | | | | | <0.01 | <0.01 | 0,010 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0,010 | <0.01 |
| Cobre Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Cobre Total | | 1.3 | | 3 | <0.01 | <0.01 | 0,04 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Galio Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Galio Total | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Hierro Disuelto | | | | | 0,055 | 0,030 | 0,09 | 0,04 | 0,097 | <0.02 | 0,28 | 0,05 | 0,022 | <0.02 | 0,07 | 0,06 |
| Hierro Total | | 0.3 | | | 0,7 | 0,160 | 1,8 | 0,31 | 1,3 | 0,330 | 4,8 | 0,38 | 1,8 | 0,080 | 9,5 | 0,73 |
| Plomo Disuelto | | | | | <0.0001 | <0.0001 | 0,0001 | <0.0001 | 0,0002 | <0.0001 | 0,0014 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Plomo Total | | 0.015 | | 0.4 | 0,0003 | <0.0001 | 0,0012 | <0.0001 | 0,0007 | <0.0001 | 0,0028 | <0.0002 | 0,0015 | <0.0001 | 0,0083 | 0,0007 |
| Litio Disuelto | | | | | <0.02 | <0.02 | <0.02 | <0.02 | 0,13 | <0.02 | 0,670 | 0,04 | <0.02 | <0.02 | <0.02 | <0.02 |
| Litio Total | | | | | <0.02 | <0.02 | <0.02 | <0.02 | 0,133 | <0.02 | 0,680 | 0,04 | <0.02 | <0.02 | <0.02 | <0.02 |
| Magnesio Disuelto | | | | | 1,5 | 0,8 | 2,5 | 1,4 | 3,0 | 1,4 | 7,4 | 2,3 | 4,1 | 2,2 | 6,4 | 2,8 |
| Magnesio Total | | | | | 1,5 | 0,9 | 2,5 | 1,5 | 3,1 | 1,8 | 7,5 | 2,4 | 4,3 | 2,6 | 6,5 | 2,9 |
| Manganeso Disuelto | | | | | 0,025 | 0,006 | 0,047 | 0,021 | 0,114 | <0.005 | 0,551 | 0,024 | 0,032 | 0,014 | 0,074 | 0,065 |
| Manganeso Total | | 0.4 | | | 0,0406 | 0,014 | 0,062 | 0,019 | 0,1482 | 0,040 | 0,543 | 0,026 | 0,0981 | 0,019 | 0,342 | 0,082 |
| Mercurio Disuelto | | | | | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| Mercurio Total | | 0.002 | | 0.01 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0,0002 |
| Molibdeno Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 |
| Molibdeno Total | | | | | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 |
| Níquel Disuelto | | | | | <0.01 | <0.01 | 0,010 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Níquel Total | | 0.61 | | 2 | 0,013 | <0.01 | 0,030 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0,040 | <0.01 |

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| Parámetros | Unidades | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | SW5-E | | | | SW6-E | | | | SW7-E | | | |
|-----------------------------|----------|--------------------|---------------------------|------------------|-----------------------------|----------|----------|----------|---------------|----------|----------|----------|-------------------|----------|----------|----------|
| | | | | | Río Tapalapa – Aguas arriba | | | | Río Los Vados | | | | Quebrada La Honda | | | |
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | |
| Potasio Disuelto | | | | | 3,0 | 2,5 | 3,7 | 2,7 | 4,1 | 3,2 | 7,1 | 3,2 | 4,1 | 3,6 | 5,4 | 3,4 |
| Potasio Total | | | | | 3,0 | 2,2 | 4,1 | 2,8 | 4,2 | 3,1 | 7,5 | 3,4 | 4,5 | 3,6 | 7,0 | 3,5 |
| Escandio Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Escandio Total | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Selenio Disuelto | | | | | <0.0001 | <0.0001 | 0,0003 | <0.0001 | <0.0001 | <0.0001 | 0,0003 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Selenio Total | | 0.17 | | | <0.0001 | <0.0001 | <0.0001 | <0.0002 | <0.0001 | <0.0001 | 0,0001 | <0.0002 | <0.0001 | <0.0001 | 0,0002 | <0.0001 |
| Plata Disuelta | | | | | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 |
| Plata Total | | | | | <0.00005 | <0.00005 | <0.00005 | <0.0003 | <0.00005 | <0.00005 | <0.00005 | <0.0001 | <0.00005 | <0.00005 | 0,00006 | <0.00005 |
| Sodio Disuelto | | | | | 6,34 | 3,700 | 10,800 | 5,2 | 32,16 | 6,000 | 135,000 | 13,4 | 11,69 | 8,700 | 15,400 | 8,5 |
| Sodio Total | | | | | 5,99 | 3,400 | 9,400 | 5,2 | 31,11 | 5,300 | 124,000 | 13,7 | 11,45 | 8,300 | 15,500 | 8,4 |
| Estroncio Disuelto | | | | | 0,06 | 0,02 | 0,0900 | 0,06 | 0,12 | 0,03 | 0,3300 | 0,08 | 0,17 | 0,07 | 0,2900 | 0,12 |
| Estroncio Total | | | | | 0,057 | 0,02 | 0,0800 | 0,06 | 0,122 | 0,04 | 0,3500 | 0,08 | 0,174 | 0,09 | 0,2800 | 0,11 |
| Talio Disuelto | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0,0001 | <0.0001 | <0.0001 | <0.0001 | 0,0001 | <0.0001 |
| Talio Total | | 0.002 | | | <0.0001 | <0.0001 | <0.0001 | <0.0002 | 0,00010 | <0.0001 | 0,0004 | <0.0002 | <0.0001 | <0.0001 | 0,0002 | <0.0001 |
| Estaño Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Estaño Total | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Titanio Disuelto | | | | | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | 0,007 | <0.005 | <0.005 | <0.005 | 0,006 | <0.005 |
| Titanio Total | | | | | 0,027 | <0.005 | 0,094 | 0,006 | 0,050 | <0.005 | 0,220 | 0,015 | 0,069 | <0.005 | 0,325 | 0,037 |
| Uranio Disuelto | | | | | <0.0001 | <0.0001 | <0.0002 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Uranio Total | | | | | <0.0001 | <0.0001 | 0,0002 | <0.0002 | <0.0001 | <0.0001 | 0,0003 | <0.0002 | 0,00013 | <0.0001 | 0,0005 | <0.0001 |
| Vanadio Disuelto | | | | | <0.005 | <0.005 | 0,007 | <0.005 | <0.005 | <0.005 | 0,010 | <0.005 | <0.0005 | <0.0005 | 0,008 | <0.005 |
| Vanadio Total | | | | | <0.005 | <0.005 | 0,009 | <0.005 | <0.005 | <0.005 | 0,005 | <0.005 | 0,0047 | <0.0005 | 0,018 | <0.005 |
| Zinc Disuelto | | | | | 0,040 | <0.01 | 0,10 | <0.01 | <0.1 | <0.1 | 0,40 | <0.01 | 0,131 | <0.01 | 0,81 | <0.01 |
| Zinc Total | | 7.4 | | 10 | 0,197 | <0.01 | 1,60 | <0.01 | <0.1 | <0.1 | 0,22 | <0.01 | 0,339 | <0.01 | 1,87 | <0.01 |
| Grasas y Aceites | | | | 10 | <2.062 | <2.02 | <2.084 | <2 | <2.062 | <2.02 | <2.084 | <2 | <2.062 | <2.02 | <2.084 | <2 |
| DQO | | | 125 | | 6,5 | <10 | 20,0 | <10 | <10 | <10 | 30,0 | <10 | 10 | <10 | 40 | 40 |
| Cloruros | | 250 | | | 1,8 | 1,0 | 3,0 | 2 | 43,9 | 3,0 | 230,0 | 14 | 3,0 | 5,0 | 3 | 5 |
| Cianuro Total | | 0.14 | | 1 | 0,003 | <0.003 | 0,014 | <0.003 | <0.003 | <0.003 | 0,014 | <0.003 | <0.003 | 0,015 | <0.003 | <0.003 |
| Fluoruros | | 4 | | | <0.1 | <0.1 | <0.1 | <0.1 | 0,11 | <0.1 | 0,3 | <0.1 | <0.1 | 0,2 | 0,1 | <0.1 |
| Nitratos/Nitritos como N | | | | | 0,13 | 0,03 | 0,42 | 0,07 | 0,30 | <0.02 | 1,22 | 0,12 | <0.1 | 3,53 | 0,19 | 0,31 |
| Amonio | | | | | <0.05 | <0.05 | <0.05 | 0,08 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0,100 | <0.05 | <0.05 |
| Nitrógeno Kjeldahl (TKN) | | | | | 0,21 | <0.1 | 0,4 | 0,4 | 0,20 | 0,10 | 0,5 | 0,3 | <0.1 | 0,7 | 0,4 | 0,4 |
| Fosfatos | | | | | 0,04 | <0.03 | 0,2 | 0,06 | 0,08 | <0.03 | 0,3 | 0,06 | 0,1 | 0,2 | 0,09 | 0,09 |
| Fósforo Disuelto (Orto) | | | | | 0,15 | <0.01 | 0,06 | 0,01 | 0,03 | <0.01 | 0,09 | 0,02 | 0,03 | 0,08 | 0,03 | 0,04 |
| Fósforo Total | | | 2 | 10 | 0,02 | <0.01 | 0,05 | 0,02 | 0,04 | 0,02 | 0,08 | 0,03 | 0,03 | 0,19 | 0,19 | 0,04 |
| STD (TDS) | | 500 | | | 84 | 60 | 110 | 70 | 187 | 90 | 540 | 100 | 140 | 240 | 100 | 170 |
| SST (TSS) | | | 50 | 100 | 9 | <5 | 32,0 | <5 | 21 | <5 | 105,0 | <5 | <5 | 330,0 | 6 | 6 |
| ST (TS) | | | | | 97,0 | 70,0 | 130,0 | 80 | 221,0 | 120,0 | 550,0 | 120 | 150,0 | 610,0 | 140 | 180 |
| Sulfatos | | 250 | | | 16,5 | <10 | 47,0 | 14,5 | 14,0 | <10 | 23,0 | 15,2 | 9,0 | 38,0 | 19,4 | 33,7 |
| Alcalinidad Total | | | | | 25 | 13,0 | 43,0 | 27 | 48 | 22,0 | 108,0 | 40 | 30,0 | 101,0 | 54 | 47 |
| Hidrocarburos totales (TPH) | | | | | <0.1 | <0.09 | <0.09 | <0.1 | 11,54375 | <0.1 | 92,0 | <0.1 | <0.09 | <0.1 | <0.1 | <0.1 |

Dónde: **u.e.**: unidades exponenciales; **mg/L**: miligramos por litro; **µS/cm**: micro siemens por centímetro. **°C**: grados centígrados. **NMP/100ml**: número más probable en 100ml. **u Pt/Co**: unidades platino cobalto. **NA**: no analizado. **NR** = Cálculo No Realizado por falta de datos de línea base. Fuente: MSR, 2014.

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Cuadro 4-4: Resultados de la Calidad del Agua Superficial, Proyecto Minero Escobal (4/4)

| Parámetros | Unidades | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | SW8-E | | | | SW6-E | | | | | | | |
|--------------------------|-----------|--------------------|---------------------------|------------------|--|-------------------|-------------------|---------------------|-------------------|-------------------|-------------------|---------------------|---|--|--|--|
| | | | | | Aguas debajo de la confluencia del Río San Rafael Y el Río El Dorado | | | | | | | | Río Tapalapa, aguas debajo de la confluencia del Río San Rafael Río Los Vados y Quebrada La Honda | | | |
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | | | | |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | | | | |
| pH de campo | u.e. | 5.0-9.0 | 6.0-9.0 | 6.0-9.0 | 7,49 | 7,0 | 9,8 | 7,46 | 7,86 | 7,5 | 10,7 | 8,19 | | | | |
| Temperatura (campo) | °C | | | | 22,1 | 18,9 | 25,1 | 24,7 | 21,8 | 19,1 | 24,2 | 19,6 | | | | |
| Conductividad (campo) | µS/cm | | | | 363,7 | 186,8 | 807,6 | 745,9 | 267,4 | 121,8 | 518,0 | 516,1 | | | | |
| Oxígeno disuelto (campo) | | | | | 5,14 | 0,28 | 7,48 | 5,64 | 6,2 | 0,8 | 8,5 | 8,09 | | | | |
| Cr VI | mg/L | | | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | | | | |
| DBO | | | | | 15 | 15 | 25 | <10 | <10 | <10 | <10 | <10 | | | | |
| Coliformes Fecales | NMP/100ml | | | | 2x10 ⁶ | 2x10 ⁴ | 5x10 ⁶ | 2.3x10 ¹ | 9x10 ⁴ | 1x10 ² | 2x10 ⁵ | 1.5x10 ³ | | | | |
| Color Aparente | U Pt/Co | | | | 172 | 19 | 351 | 83 | 342 | 29 | 824 | 35 | | | | |
| Color Real | | | | | 20 | 22 | 36 | 1 | 43 | 10 | 60 | 3 | | | | |
| Turbidez | NTU | | | | <0.05 | <0.05 | <0.05 | <0.05 | 25,72 | 4,93 | 46,50 | 6,57 | | | | |
| Aluminio Disuelto | | | | | 0,033 | <0.03 | 0,06 | <0.03 | 0,087 | <0.03 | 0,22 | 0,04 | | | | |
| Aluminio Total | 0.2 | | | | 2,39 | 0,04 | 7,35 | 0,35 | 2,96 | 0,4 | 8,6 | 0,62 | | | | |
| Antimonio Disuelto | | | | | 0,0010 | <0.0004 | 0,0033 | 0,0016 | 0,0006 | <0.0004 | 0,0013 | 0,0005 | | | | |
| Antimonio Total | 0.006 | | | | 0,0010 | <0.0004 | 0,0027 | 0,0016 | 0,0007 | <0.0004 | 0,0012 | 0,0005 | | | | |
| Arsénico Disuelto | | | | | 0,0043 | 0,0025 | 0,0064 | 0,0056 | 0,0040 | 0,0023 | 0,0057 | 0,0039 | | | | |
| Arsénico Total | 0.01 | | | 0.1 | 0,0060 | 0,0041 | 0,0096 | 0,0064 | 0,0042 | 0,0020 | 0,0060 | 0,004 | | | | |
| Bario Disuelto | | | | | 0,107 | 0,074 | 0,143 | 0,122 | 0,094 | 0,056 | 0,135 | 0,087 | | | | |
| Bario Total | 1 | | | | 0,136 | 0,102 | 0,185 | 0,134 | 0,121 | 0,090 | 0,154 | 0,088 | | | | |
| Berilio Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | |
| Berilio Total | 0.004 | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | |
| Bismuto Disuelto | | | | | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | | | | |
| Bismuto Total | | | | | <0.04 | <0.04 | <0.04 | 0,04 | <0.04 | <0.04 | <0.04 | <0.04 | | | | |
| Boro Disuelto | | | | | 0,022 | <0.01 | 0,050 | 0,06 | 0,043 | <0.01 | 0,09 | 0,10 | | | | |
| Boro Total | | | | | 0,023 | <0.01 | 0,06 | 0,05 | 0,041 | <0.01 | 0,10 | 0,1 | | | | |
| Cadmio Disuelto | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | |
| Cadmio Total | 0.003 | | | 0.1 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0,0002 | 0,0016 | | | | |
| Calcio Disuelto | | | | | 50,4 | 17,5 | 156,0 | 127 | 35,7 | 18,2 | 78,3 | 55,7 | | | | |
| Calcio Total | | | | | 52,1 | 18,6 | 156,0 | 125 | 36,2 | 18,5 | 79,7 | 54,5 | | | | |
| Cromo Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | |
| Cromo Total | 0.1 | | | 0.1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | |
| Cobalto Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | |
| Cobalto Total | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | |
| Cobre Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | |
| Cobre Total | 1.3 | | | 3 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | |
| Galio Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | |
| Galio Total | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | |
| Hierro Disuelto | | | | | 0,06 | 0,02 | 0,11 | 0,05 | 0,09 | <0.02 | 0,17 | 0,04 | | | | |
| Hierro Total | 0.3 | | | | 1,53 | 0,05 | 4,36 | 0,42 | 1,0 | 0,250 | 2,2 | 0,36 | | | | |
| Plomo Disuelto | | | | | 0,0001 | <0.0001 | 0,0003 | <0.0001 | 0,0002 | <0.0001 | 0,0005 | 0,0001 | | | | |
| Plomo Total | 0.015 | | | 0.4 | 0,0030 | <0.0001 | 0,0089 | 0,0005 | 0,0022 | 0,0002 | 0,0080 | 0,0005 | | | | |
| Litio Disuelto | | | | | <0.02 | <0.02 | 0,04 | 0,03 | <0.02 | <0.02 | 0,040 | 0,04 | | | | |
| Litio Total | | | | | <0.02 | <0.02 | 0,04 | 0,03 | <0.02 | <0.02 | 0,040 | 0,04 | | | | |
| Magnesio Disuelto | | | | | 6,3 | 3,2 | 14,7 | 9,5 | 6,0 | 3,3 | 9,7 | 6,7 | | | | |
| Magnesio Total | | | | | 6,6 | 3,3 | 14,8 | 9,6 | 6,2 | 3,4 | 10,1 | 6,7 | | | | |
| Manganeso Disuelto | | | | | 0,095 | 0,009 | 0,118 | 0,147 | 0,057 | 0,023 | 0,148 | 0,021 | | | | |
| Manganeso Total | 0.4 | | | | 0,1808 | 0,047 | 0,349 | 0,178 | 0,115 | 0,043 | 0,187 | 0,032 | | | | |
| Mercurio Disuelto | | | | | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | | | | |
| Mercurio Total | 0.002 | | | 0.01 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | | | | |
| Molibdeno Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 | | | | |
| Molibdeno Total | | | | | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 | | | | |

| Parámetros | Unidades | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | SW8-E | | | | SW6-E | | | |
|-----------------------------|----------|--------------------|---------------------------|------------------|--|----------|----------|----------|---|----------|----------|----------|
| | | | | | Aguas debajo de la confluencia del Río San Rafael Y el Río El Dorado | | | | Río Tapalapa, aguas debajo de la confluencia del Río San Rafael Río Los Vados y Quebrada La Honda | | | |
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | |
| Níquel Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | |
| Níquel Total | | 0.61 | | 2 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | |
| Potasio Disuelto | | | | | 6,5 | 5,8 | 7,4 | 8,6 | 6,0 | 4,5 | 8,1 | 5,3 |
| Potasio Total | | | | | 6,8 | 6,4 | 7,8 | 8,9 | 6,1 | 4,8 | 8,5 | 5,3 |
| Escandio Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Escandio Total | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Selenio Disuelto | | | | | <0.0001 | <0.0001 | 0,0002 | 0,0003 | <0.0001 | <0.0001 | 0,0001 | <0.0001 |
| Selenio Total | | 0.17 | | | 0,00011 | <0.0001 | 0,0002 | 0,0002 | <0.0001 | <0.0001 | 0,0001 | <0.0001 |
| Plata Disuelta | | | | | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 |
| Plata Total | | | | | <0.00005 | <0.00005 | 0,00007 | <0.00005 | <0.00005 | <0.00005 | 0,00007 | <0.00005 |
| Sodio Disuelto | | | | | 18,8 | 12,3 | 33,7 | 36,0 | 17,6 | 10,7 | 26,9 | 25 |
| Sodio Total | | | | | 18,4 | 12,9 | 34,3 | 36,6 | 17,4 | 11,0 | 28,5 | 25,2 |
| Estroncio Disuelto | | | | | 0,44 | 0,16 | 1,50 | 1,31 | 0,29 | 0,14 | 0,7100 | 0,55 |
| Estroncio Total | | | | | 0,44 | 0,16 | 1,48 | 1,28 | 0,295 | 0,14 | 0,7300 | 0,53 |
| Talio Disuelto | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Talio Total | | 0.002 | | | <0.0001 | <0.0001 | 0,0003 | <0.0001 | <0.0001 | <0.0001 | 0,0002 | <0.0001 |
| Estaño Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Estaño Total | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Titanio Disuelto | | | | | <0.005 | <0.005 | 0,005 | <0.005 | <0.005 | <0.005 | 0,009 | 0,008 |
| Titanio Total | | | | | 0,069 | <0.005 | 0,195 | 0,016 | 0,084 | 0,015 | 0,237 | 0,023 |
| Uranio Disuelto | | | | | 0,00014 | <0.0001 | 0,0003 | 0,0001 | 0,00014 | <0.0001 | 0,0002 | 0,0001 |
| Uranio Total | | | | | 0,00022 | 0,0001 | 0,0003 | 0,0001 | 0,00022 | 0,0002 | 0,0003 | 0,0001 |
| Vanadio Disuelto | | | | | <0.005 | <0.005 | 0,006 | <0.005 | <0.005 | <0.005 | 0,006 | <0.005 |
| Vanadio Total | | | | | <0.005 | <0.005 | 0,010 | <0.005 | 0,0054 | <0.005 | 0,012 | 0,005 |
| Zinc Disuelto | | | | | <0.01 | <0.01 | 0,03 | 0,03 | <0.01 | <0.01 | 0,03 | <0.01 |
| Zinc Total | | 7.4 | | 10 | 0,015 | <0.01 | 0,04 | <0.01 | <0.01 | <0.01 | 0,03 | <0.01 |
| Grasas y Aceites | | | 10 | 10 | <2.04 | <2.02 | <2.062 | <2 | <2.02 | <2.02 | <5 | <2 |
| DQO | | | 125 | | 20,0 | <10 | 40,0 | <10 | 17,8 | <10 | 35 | 10 |
| Cloruros | | 250 | | | 10 | 7 | 19 | 28 | 12 | 6 | 20 | 22 |
| Cianuro Total | | 0.14 | | 1 | 0,007 | <0.003 | 0,014 | <0.003 | 0,006 | <0.003 | 0,013 | <0.003 |
| Fluoruros | | 4 | | | 0,27 | 0,1 | 0,6 | 0,5 | 0,006 | <0.003 | 0,013 | <0.003 |
| Nitratos/Nitritos como N | | | | | 3,07 | 2,01 | 5,23 | 2,88 | 1,97 | 1,14 | 3,85 | 1,13 |
| Amonio | | | | | 0,24 | <0.05 | 0,58 | 0,5 | 0,129 | <0.05 | 0,220 | <0.05 |
| Nitrógeno Kjeldahl (TKN) | | | | | 0,74 | <0.1 | 1,6 | 1,2 | 0,57 | 0,30 | 0,9 | 0,5 |
| Fosfatos | | | | | 0,55 | 0,3 | 1,0 | 0,68 | 0,49 | 0,22 | 1,30 | 0,25 |
| Fósforo Disuelto (Orto) | | | | | 0,18 | 0,08 | 0,33 | 0,19 | 0,18 | 0,09 | 0,49 | 0,08 |
| Fósforo Total | | | 2 | 10 | 0,27 | 0,12 | 0,51 | 0,28 | 0,25 | 0,09 | 0,58 | 0,02 |
| STD (TDS) | | 500 | | | 312 | 160 | 750 | 670 | 255 | 160 | 440 | 340 |
| SST (TSS) | | | 50 | 100 | 34 | <5 | 102 | 10 | 73 | <5 | 340 | <5 |
| ST (TS) | | | | | 362 | 180 | 750 | 680 | 310 | 200 | 450 | 370 |
| Sulfatos | | 250 | | | 91 | 22 | 360 | 323 | 60 | 25 | 169 | 124 |
| Alcalinidad Total | | | | | 79 | 50 | 110 | 84 | 70 | 45 | 90 | 69 |
| Hidrocarburos totales (TPH) | | | | | <0.01 | <0.01 | <0.01 | <0.1 | 70 | 45 | 90 | 69 |

Dónde: **u.e.**: unidades exponenciales; **mg/L**: miligramos por litro; **µS/cm**: micro siemens por centímetro. **°C**: grados centígrados. **NMP/100ml**: número más probable en 100ml. **u Pt/Co**: unidades platino cobalto. **NA**: no analizado. **NR** = Cálculo No Realizado por falta de datos de línea base. Fuente: MSR, 2014.

4.3.3 Agua Subterránea

En el Cuadro 4-5 se presentan los resultados de la calidad del agua subterránea (manantiales) y los resultados de laboratorio se presentan en el Anexo 11.5.2. En términos generales los parámetros analizados en las estaciones GW-1A, GW-2, GW-3, GW-4 y GW-5 cumplen con el Acuerdo 236-2006 y todos los valores se encuentran dentro del rango estadístico de la línea base. Únicamente los valores de color real y aparente en las estaciones GW4 y GW5 están sobre los límites establecidos.

La temperatura de las estaciones muestreadas se encontró entre 16.3 y 24.2 °C. La lectura menor de pH se obtuvo en la estación GW-4 (5.73 u.e.) y la mayor en la estación GW-1A (6.8 u.e.). Los Sólidos Suspendidos Totales (**SST**) se registraron en las estaciones GW-1A (37 mg/L), GW-3 (42 mg/L) y GW-5 (5 mg/L) por debajo de las guías del Acuerdo (100 mg/L) y del Banco Mundial (50 mg/L). Las concentraciones registradas de Cloruros y Fluoruros están por debajo de las guías de la USEPA (250 mg/L).

La concentración de sulfatos está por debajo de las guías de la USEPA (250mg/L) en todas las estaciones de monitoreo. Los sólidos disueltos totales (**TDS**) están por debajo de las directrices de la USEPA (500mg/L) en la mayoría de las estaciones a excepción de GW-4 (570mg/L); se dará seguimiento a este parámetro en la presente estación en futuros muestreos para comprobar o descartar que dicho aumento se deba a las actividades realizadas dentro del Proyecto. De corroborarse que el aumento se deba a las actividades generadas dentro del proyecto, se procederá a tomar las medidas necesarias para su corrección.

El Cianuro, Berilio, Bismuto, Boro, Cobalto, Cobre, Cromo, Galio, Litio, Cromo hexavalente, Mercurio, Molibdeno, Níquel, Escandio, Talio, Estaño y Plata no fueron detectados en ninguna de las estaciones. El Selenio fue detectado en las estaciones GW-2 (0.0001 mg/L), GW-3 (0.0002 mg/L) y GW-5 (0.0001) por debajo de la guía de la USEPA (0.17mg/L). El Antimonio fue detectado en las estaciones GW2 (0.0007 mg/L) y en GW3 (0.0005 mg/L) en concentraciones por debajo de la guía dada por la USEPA (0.01 mg/L). El Cadmio se detectó únicamente en las estación GW-5 (0.0002 mg/L) en concentraciones menores a lo establecido por USEPA y Acuerdo (0.003 y 0.1 mg/l respectivamente). El Plomo se registró únicamente en la estación GW-5 en concentración por debajo de la guía de la USEPA y Acuerdo (0.015 y 0.4 mg/L respectivamente). En todas las estaciones se registró Arsénico. Sin embargo las concentraciones registradas se encuentran por debajo de los valores máximos establecidos durante la línea base y todos por debajo de las guías sugeridas por USEPA (0.01 mg/L) y el Acuerdo (0.1 mg/L).

| Parámetros | Unidades | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | GW1-A | | | | GW-2 | | | | GW-3 | | | | GW-4 | | | | GW-5 | | | |
|--------------------------|----------|--------------------|---------------------------|------------------|--------------------------------|--------|--------|--------|---------------------------|--------|--------|--------|---|--------|--------|--------|--|--------|--------|--------|---|--------|--------|--------|
| | | | | | Nacimiento Aldea El Volcancito | | | | Nacimiento Aldea El Fucío | | | | Nacimiento – Zona central del Proyecto (frente al portal oeste) | | | | Manantial – Aguas arriba del depósito de colas | | | | Manantial – Aguas arriba del depósito de colas debajo de GW-4 | | | |
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | |
| Amonio | mg/L | | | | <0.05 | <0.05 | 0,07 | <0.05 | 0,059 | <0.05 | 0,16 | <0.05 | 0,065 | <0.05 | 0,14 | <0.05 | <0.05 | <0.05 | <0.05 | NR | NR | NR | 0.09 | |
| Nitrógeno Kjeldahl (TKN) | | | | | 0,70 | 0,30 | 1,10 | 1 | 0,63 | 0,20 | 0,90 | 0,2 | 0,46 | <0.05 | 1,20 | 1,7 | 0,3 | 0,3 | 0,3 | 0,7 | | | | 0.6 |
| Fosfatos | | | | | 0,2 | 0,1 | 0,2 | 0,09 | 0,4 | 0,1 | 0,7 | 0,19 | 0,3 | 0,1 | 0,5 | 0,21 | 0,09 | 0,09 | 0,09 | <0.03 | | | | 0.06 |
| Fósforo Total | | | 2 | 10 | 0,10 | 0,02 | 0,17 | 0,13 | 0,18 | 0,09 | 0,27 | 0,08 | 0,10 | 0,05 | 0,15 | 0,06 | 0,03 | 0,03 | 0,03 | 0,07 | | | | 0.03 |
| STD (TDS) | | 500 | | | 190 | 190 | 190 | 180 | 223 | 130 | 350 | 180 | 213 | 190 | 260 | 230 | 170 | 170 | 170 | 570 | NR | NR | NR | 308 |
| SST (TSS) | | | 50 | 100 | 6,5 | 6 | 7 | 37 | 7,7 | 6 | 9 | <5 | 39,0 | 5 | 105 | 42 | 206 | 206 | 206 | <5 | | | | 5 |
| ST (TS) | | | | | 200,0 | 180 | 220 | 240 | 237,5 | 140 | 380 | 210 | 217,5 | 170 | 270 | 280 | 360 | 360 | 360 | 590 | | | | 340 |
| Sulfatos | | | 250 | | 12,5 | 11,0 | 14,0 | 4.4 | 43,0 | 7,0 | 90,0 | 28.5 | 30,0 | 16,0 | 71,0 | 28 | 7 | 7 | 7 | 9.0 | | | | 30.5 |
| Alcalinidad Total | | | | | 31 | 31 | 31 | 29 | 0,18 | 0,09 | 0,27 | 0,08 | 83 | 71 | 97 | 67 | 35 | 35 | 35 | 39 | | | | 29 |

u.e.: unidades exponenciales. mg/L: miligramos por litro. µS/cm: micro siemens por centímetro. °C: grados centígrados. NMP/100ml: número más probable en 100ml. u Pt/Co: unidades platino cobalto. NR = Cálculo No Realizado por falta de datos de línea base. ND = no determinado. Fuente: MSR, 2014.

Cuadro 4-6: Resultados de la medición de calidad de agua subterránea (Pozos de Monitoreo, Producción y Artesanal), Proyecto Minero Escobal (1/3)

| Parámetros | Unidades | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | MW-2 | | | | MW-3 | | | | MW-4 | | | | MW-5 | | | | |
|---------------------------|-----------|--------------------|---------------------------|--------------------|------------|----------|----------|----------|------------|----------|----------|----------|------------|----------|----------|----------|------------|----------|----------|----------|---------|
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | |
| pH de campo | u.e. | 5.0-9.0 | 6.0-9.0 | 6.0-9.0 | 6,56 | 6,37 | 6,77 | 6,63 | 6,44 | 6,34 | 6,49 | 6,64 | 6,32 | 6,23 | 6,41 | 6,61 | 6,19 | 6,04 | 6,34 | 6,27 | |
| Temperatura de campo | °C | | | | 24,4 | 23,4 | 25,1 | 25 | 24,1 | 23,7 | 24,5 | 24,4 | 23,3 | 22,2 | 24,4 | 26,3 | 23,4 | 23,0 | 24,6 | 23,1 | |
| Conductividad de campo | µS/cm | | | | 427,5 | 211,9 | 1001,3 | 165 | 803,9 | 741,6 | 829,1 | 551,3 | 916,9 | 872,1 | 944,8 | 708,1 | 469,7 | 401,4 | 494,1 | 772,3 | |
| Oxígeno Disuelto de campo | mg/L | | | | 0,75 | 0,30 | 1,21 | 6,03 | 0,65 | 0,11 | 1,44 | 5,64 | 0,97 | 0,48 | 1,93 | 4,71 | 0,82 | 0,19 | 1,77 | 3,98 | |
| Turbidez | NTU | | | | | | | 28,5 | | | | | | | | 3,9 | | | | 2,16 | |
| Materia flotante | Visual | | | Ausente | | | | Ausente | | | | | | | | Ausente | | | | Ausente | |
| Color Aparente | u Pt/Co | | | 500 | NR | NR | NR | 19 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | |
| Color Real | | | | | | | | | | | | | | | | | | | | | |
| Cr (VI) | mg/L | | | 0.1 | | | | <0.05 | | | | | | | | | | | | <0.05 | |
| Coliformes Fecales | NMP/100mL | | | <1x10 ⁴ | | | | 6,8 | | | | | | | | 240 | | | | 23 | |
| Aluminio Disuelto | mg/L | 0.2 | | | 0,038 | <0.03 | 0,07 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | |
| Antimonio Disuelto | | 0.01 | | | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 |
| Arsénico Disuelto | | 0.01 | 0.1 | | 0,0011 | 0,0008 | 0,0014 | 0,0011 | 0,0023 | 0,0021 | 0,0027 | 0,0026 | 0,0023 | 0,0021 | 0,0028 | 0,0023 | 0,0013 | 0,0010 | 0,0016 | 0,0009 | |
| Bario Disuelto | | 1 | | | 0,030 | 0,024 | 0,039 | 0,031 | 0,036 | 0,032 | 0,041 | 0,031 | 0,042 | 0,038 | 0,047 | 0,037 | 0,162 | 0,157 | 0,166 | 0,090 | |
| Berilio Disuelto | | 0.004 | | | <0.002 | <0.002 | 0,003 | <0.01 | <0.002 | <0.002 | 0,003 | <0.01 | <0.002 | <0.002 | 0,003 | <0.01 | <0.002 | <0.002 | 0,003 | <0.01 | |
| Bismuto Disuelto | | | | | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | |
| Boro Disuelto | | | | | 0,014 | <0.01 | 0,04 | <0.01 | 0,060 | 0,050 | 0,070 | 0,05 | 0,078 | 0,060 | 0,090 | 0,07 | 0,015 | <0.01 | 0,030 | 0,03 | |
| Cadmio Disuelto | | 0.003 | 0.1 | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | |
| Calcio Disuelto | | | | | 20,6 | 9,4 | 48,7 | 6,8 | 80,3 | 76,4 | 83,3 | 66 | 100 | 93 | 107 | 92,4 | 40,8 | 39,2 | 42,2 | 99,9 | |
| Cromo Disuelto | | 0.1 | 0.1 | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | |
| Cobalto Disuelto | | | | | <0.01 | <0.01 | <0.1 | <0.01 | <0.01 | <0.01 | <0.1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | |
| Cobre Disuelto | | 1.3 | 3 | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0,01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | |
| Galio Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | |
| Hierro Disuelto | | 0.3 | | | <0.02 | <0.02 | 0,02 | 0,05 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | |
| Plomo Disuelto | | 0.015 | 0.4 | | <0.0001 | <0.0001 | 0,0001 | <0.0001 | <0.0001 | <0.0001 | 0,0001 | <0.0001 | <0.0001 | <0.0001 | 0,0002 | <0.0001 | <0.0001 | <0.0001 | 0,0002 | <0.0001 | |
| Litio Disuelto | | | | | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0,02 | <0.02 | <0.02 | <0.02 | 0,02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | |
| Magnesio Disuelto | | | | | 3,5 | 2,4 | 6,1 | 2,4 | 10,3 | 10,1 | 10,7 | 8,2 | 11,3 | 10,9 | 11,6 | 10,1 | 7,3 | 6,8 | 7,6 | 14,7 | |
| Manganeso Disuelto | | 0.05 | | | 0,108 | 0,03 | 0,308 | 0,115 | <0.005 | <0.005 | 0,008 | <0.005 | 0,0090 | <0.005 | 0,021 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | |
| Mercurio Disuelto | | 0.002 | 0.01 | | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | |
| Molibdeno Disuelto | | | | | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | <0.02 | |
| Níquel Disuelto | | 0.61 | 2 | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | |
| Potasio Disuelto | | | | | 2,2 | 1,9 | 2,4 | 2,7 | 4,2 | 3,9 | 4,6 | 3,8 | 4,7 | 4,5 | 5,2 | 4,5 | 6,0 | 5,5 | 6,5 | 7,1 | |
| Escandio Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | |
| Selenio Disuelto | | 0.17 | | | 0,0002 | 0,0001 | 0,0002 | 0,0002 | 0,0002 | 0,0002 | 0,0002 | 0,0003 | 0,0003 | 0,0002 | 0,0003 | 0,0003 | 0,0004 | 0,0003 | 0,0004 | 0,0005 | |
| Plata Disuelta | | | | | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | |
| Sodio Disuelto | | | | | 22,0 | 17,4 | 33,6 | 14,7 | 29,5 | 28,2 | 30,9 | 26,1 | 32,3 | 30,4 | 35,8 | 30,1 | 16,9 | 15,6 | 19,1 | 22,9 | |
| Estroncio Disuelto | | | | | 0,18 | 0,07 | 0,46 | 0,05 | 0,74 | 0,71 | 0,77 | 0,64 | 0,89 | 0,84 | 0,98 | 0,87 | 0,27 | 0,26 | 0,29 | 0,48 | |
| Talio Disuelto | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | |
| Estaño Disuelto | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | |
| Titanio Disuelto | | | | | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | |
| Uranio Disuelto | | | | 0,00016 | <0.0001 | 0,0005 | <0.0001 | 0,00020 | 0,0002 | 0,0002 | 0,0001 | <0.0002 | <0.0002 | 0,0002 | 0,0002 | 0,00033 | 0,0001 | 0,0010 | 0,0004 | | |
| Vanadio Disuelto | | | | 0,0059 | <0.005 | 0,008 | 0,008 | 0,0055 | <0.005 | 0,009 | 0,007 | 0,006 | <0.005 | 0,009 | 0,005 | <0.005 | <0.005 | <0.005 | <0.005 | | |
| Zinc Disuelto | 7.4 | 10 | | 0,031 | <0.01 | 0,11 | <0.01 | 0,053 | <0.01 | 0,1 | 0,03 | <0.01 | <0.01 | 0,1 | 0,01 | <0.01 | <0.01 | 0,1 | 0,02 | | |
| Cloruros | 250 | | | 12 | 3 | 28 | 4 | 16 | 16 | 17 | 15 | 20 | 19 | 21 | 20 | 9 | 8 | 9 | 21 | | |

| Parámetros | Unidades | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | MW-2 | | | | MW-3 | | | | MW-4 | | | | MW-5 | | | | |
|--------------------------|----------|--------------------|---------------------------|------------------|------------|--------|--------|--------|------------|--------|--------|--------|------------|--------|--------|--------|------------|--------|--------|--------|-------|
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | |
| Cianuro Total | mg/L | 0.14 | | 1 | 0,0039 | <0.003 | 0,011 | <0.003 | 0,0050 | <0.003 | 0,014 | <0.003 | 0,005 | <0.003 | 0,015 | <0.003 | 0,005 | <0.003 | 0,015 | <0.003 | |
| Fluoruros | | | | | 0,35 | 0,2 | 0,7 | 0.4 | 0,80 | 0,8 | 0,8 | 0.7 | 0,80 | 0,8 | 0,8 | 0.9 | 0,18 | 0,1 | 0,2 | 0.2 | |
| Nitratos/Nitritos como N | | | | | 2,48 | 2,04 | 2,93 | 2.91 | 2,20 | 2,08 | 2,26 | 2.58 | 2,13 | 1,98 | 2,32 | 2.47 | 3,32 | 3,00 | 3,57 | 4.81 | |
| Amonio | | | | | <0.05 | <0.05 | <0.05 | 0.09 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Nitrógeno Kjeldahl (TKN) | | | | | 0,56 | <0.1 | 1,10 | 0.2 | <0.1 | <0.1 | 0,20 | <0.1 | <0.1 | <0.1 | 0,30 | <0.1 | <0.1 | <0.1 | 0,30 | <0.1 | |
| Fosfatos | | | | | 0,233 | 0,21 | 0,27 | 0.19 | 0,315 | 0,27 | 0,37 | 0.25 | 0,248 | 0,24 | 0,27 | 0.22 | 0,203 | 0,15 | 0,24 | 0.12 | |
| Fósforo Total | | | 2 | 10 | 0,24 | 0,06 | 0,44 | 0.08 | 0,09 | 0,08 | 0,10 | 0.08 | 0,07 | 0,06 | 0,08 | 0.06 | 0,06 | 0,05 | 0,07 | 0.03 | |
| STD (TDS) | | 500 | | | 253 | 190 | 360 | 180 | 470 | 460 | 480 | 400 | 553 | 540 | 560 | 500 | 305 | 290 | 320 | 550 | |
| SST (TSS) | | | 50 | 100 | 345,8 | 137 | 584 | 74 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | |
| ST (TS) | | | | | 597,5 | 350 | 810 | 250 | 487,5 | 450 | 510 | 440 | 555 | 520 | 580 | 550 | 325 | 280 | 350 | 610 | |
| Sulfatos | | 250 | | | 28,5 | 4 | 97 | 5.1 | 166 | 162 | 169 | 138 | 212,5 | 210 | 220 | 189 | 72,3 | 64 | 76 | 232 | |
| Alcalinidad Total | | | | | 64 | 56 | 80 | 43 | 84 | 82 | 86 | 78 | 85 | 83 | 88 | 87 | 66 | 61 | 68 | 82 | |

u.e.: unidades exponenciales. mg/L: miligramos por litro. µS/cm: micro siemens por centímetro. °C: grados centígrados. NMP/100ml: número más probable en 100ml. u Pt/Co: unidades platino cobalto. NR = Cálculo No Realizado por falta de datos de línea base. ND = no determinado. Fuente: MSR, 2014.

| Parámetros | Unidades | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | MW-6 | | | | MW-7 | | | | MW-8 | | | | MW-9 | | | |
|--------------------------|----------|--------------------|---------------------------|------------------|------------|--------|--------|--------|------------|--------|--------|--------|------------|--------|--------|--------|------------|--------|--------|--------|
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | |
| Fluoruros | mg/L | | | | 0,18 | 0,1 | 0,2 | 0.1 | 0,13 | 0,1 | 0,2 | <0.1 | 0,17 | 0,1 | 0,2 | 0.1 | 2,55 | 2,50 | 2,60 | 1 |
| Nitratos/Nitritos como N | | | | | 5,08 | 4,42 | 6,15 | 21.8 | 4,75 | 4,08 | 5,24 | 1.60 | 2,76 | 2,63 | 2,83 | 4.21 | <0.02 | <0.02 | <0.02 | <0.02 |
| Amonio | | | | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Nitrógeno Kjeldahl (TKN) | | | | | <0.1 | <0.1 | 0,20 | <0.1 | 0,21 | <0.1 | 0,40 | 0.2 | 0,09 | <0.1 | 0,20 | <0.1 | 0,23 | <0.1 | 0,40 | <0.1 |
| Fosfatos | | | | | 0,173 | 0,15 | 0,21 | 0.12 | 0,113 | 0,09 | 0,18 | 0.06 | 0,230 | 0,21 | 0,24 | 0.16 | <0.03 | <0.03 | <0.03 | 0.12 |
| Fósforo Total | | | 2 | 10 | 0,05 | 0,04 | 0,06 | 0.04 | 0,04 | 0,01 | 0,07 | 0.02 | 0,07 | 0,06 | 0,08 | 0.04 | <0.01 | <0.01 | 0,02 | 0.04 |
| STD (TDS) | | 500 | | | 340 | 260 | 440 | 710 | 233 | 220 | 250 | 320 | 277 | 270 | 290 | 520 | 905 | 890 | 920 | 480 |
| SST (TSS) | | | 50 | 100 | <5 | <5 | <5 | <5 | 19,75 | 7,00 | 45,00 | <5 | 9,00 | 6,00 | 14,00 | <5 | 27,0 | 25 | 29 | 26 |
| ST (TS) | | | | | 345 | 240 | 450 | 760 | 260 | 230 | 280 | 360 | 300 | 290 | 310 | 530 | 940 | 910 | 970 | 520 |
| Sulfatos | | 250 | | | 85,3 | 33,0 | 153,0 | 271 | 19,3 | 17,0 | 23,0 | 88.8 | 54,7 | 54,0 | 55,0 | 189 | 440,0 | 440,0 | 440,0 | 174 |
| Alcalinidad Total | | | | | 65 | 62 | 68 | 106 | 48 | 41 | 60 | 72 | 68 | 66 | 70 | 77 | 147 | 136 | 157 | 146 |

u.e.: unidades exponenciales. mg/L: miligramos por litro. μ S/cm: micro siemens por centímetro. °C: grados centígrados. NMP/100ml: número más probable en 100ml. u Pt/Co: unidades platino cobalto. NR = Cálculo No Realizado por falta de datos de línea base. ND = no determinado. Fuente: MSR, 2014.

Cuadro 4-6: Resultados de la medición de calidad de agua subterránea (Pozos de Monitoreo, Producción y Artesanal), Proyecto Minero Escobal (3/3)

| Parámetros | Unidad | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | MW11 | | | | PSA-SR | | | | HW-1 | | | | RW-1 | | | | |
|---------------------------|-----------|--------------------|---------------------------|--------------------|------------|----------|----------|--------|------------|----------|----------|----------|------------|--------|--------|----------|------------|--------|--------|----------|-------|
| | | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | |
| pH de campo | u.e. | 5.0-9.0 | 6.0-9.0 | 6.0-9.0 | 7,05 | 7,05 | 7,05 | | 7,45 | 7,45 | 7,45 | 7,34 | | | | 7,45 | | | | 7,14 | |
| Temperatura de campo | °C | | | | 30,4 | 30,4 | 30,4 | | 27,8 | 27,8 | 27,8 | 28,1 | | | | 24,6 | | | | 20,2 | |
| Conductividad de campo | µS/cm | | | | 2,243 | 2,243 | 2,243 | | 663,9 | 663,9 | 663,9 | 1005 | | | | 581,9 | | | | 435,6 | |
| Oxígeno Disuelto de campo | mg/L | | | | 0,09 | 0,09 | 0,09 | | 0,05 | 0,05 | 0,05 | 1,77 | | | | 6,37 | | | | 5,46 | |
| Turbidez | NTU | | | | | | | | | | | 0,61 | | | | NR | | | | 11,7 | |
| Materia flotante | Visual | | | Ausente | | | | | | | | | | | | NR | | | | Presente | |
| Color Aparente | u Pt/Co | | | 500 | NR | NR | NR | | NR | NR | NR | ND | | | | <1 | | | | 74 | |
| Color Real | | | | | | | | | | | | | | | | <1 | | | | <1 | |
| Cr (VI) | mg/L | | | 0.1 | | | | | | | | | | | | <0.05 | | | | <0.05 | |
| Coliformes Fecales | NMP/100mL | | | <1x10 ⁴ | | | | | | | | | | | | <2 | | | | 580 | |
| Aluminio Disuelto | | 0.2 | | | <0.03 | <0.03 | <0.03 | | 0,06 | 0,06 | 0,06 | <0.03 | | | | <0.03 | | | | 0.04 | |
| Antimonio Disuelto | | 0.01 | | | 0,001 | 0,001 | 0,001 | | <0.0004 | <0.0004 | <0.0004 | <0.0004 | | | | <0.004 | | | | <0.0004 | |
| Arsénico Disuelto | | 0.01 | | 0.1 | 0,0022 | 0,0022 | 0,0022 | | 0,0136 | 0,0136 | 0,0136 | 0,0134 | | | | 0,0063 | | | | 0.0012 | |
| Bario Disuelto | | 1 | | | 0,033 | 0,033 | 0,033 | | 0,125 | 0,125 | 0,125 | 0,109 | | | | 0,131 | | | | 0.239 | |
| Berilio Disuelto | | 0.004 | | | <0.01 | <0.01 | <0.01 | | <0.01 | <0.01 | <0.01 | <0.01 | | | | <0.01 | | | | <0.01 | |
| Bismuto Disuelto | | | | | <0.08 | <0.08 | <0.08 | | <0.04 | <0.04 | <0.04 | <0.04 | | | | <0.04 | | | | <0.04 | |
| Boro Disuelto | | | | | 0,18 | 0,18 | 0,18 | | 0,07 | 0,07 | 0,07 | 0,11 | | | | 0,06 | | | | 0.01 | |
| Cadmio Disuelto | | 0.003 | | 0.1 | <0.0001 | <0.0001 | <0.0001 | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | | | | <0.0001 | |
| Calcio Disuelto | | | | | 271 | 271 | 271 | | 47,5 | 47,5 | 47,5 | 112 | | | | 63,2 | | | | 51.4 | |
| Cromo Disuelto | | 0.1 | | 0.1 | <0.01 | <0.01 | <0.01 | | <0.01 | <0.01 | <0.01 | <0.01 | | | | <0.01 | | | | <0.01 | |
| Cobalto Disuelto | | | | | <0.01 | <0.01 | <0.01 | | <0.01 | <0.01 | <0.01 | <0.01 | | | | <0.01 | | | | <0.01 | |
| Cobre Disuelto | | 1.3 | | 3 | <0.01 | <0.01 | <0.01 | | <0.01 | <0.01 | <0.01 | <0.01 | | | | <0.01 | | | | <0.01 | |
| Galio Disuelto | | | | | <0.1 | <0.1 | <0.1 | | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 | | | | <0.1 | |
| Hierro Disuelto | | 0.3 | | | 0,21 | 0,21 | 0,21 | | 0,05 | 0,05 | 0,05 | <0.02 | | | | <0.02 | | | | <0.02 | |
| Plomo Disuelto | | 0.015 | | 0.4 | 0,0001 | 0,0001 | 0,0001 | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | | | | <0.0001 | |
| Litio Disuelto | | | | | 0,06 | 0,06 | 0,06 | ND | 0,08 | 0,08 | 0,08 | 0,15 | | NR | NR | NR | 0,07 | | NR | NR | <0.02 |
| Magnesio Disuelto | | | | | 41,3 | 41,3 | 41,3 | | 4,1 | 4,1 | 4,1 | 7,8 | | | | 5,9 | | | | 6.7 | |
| Manganeso Disuelto | | 0.05 | | | 0,044 | 0,044 | 0,044 | | 0,03 | 0,03 | 0,03 | 0,037 | | | | <0.005 | | | | <0.005 | |
| Mercurio Disuelto | | 0.002 | | 0.01 | <0.0002 | <0.0002 | <0.0002 | | <0.0002 | <0.0002 | <0.0002 | <0.0002 | | | | <0.0002 | | | | <0.0002 | |
| Molibdeno Disuelto | | | | | 0,01 | 0,01 | 0,01 | | <0.01 | <0.01 | <0.01 | <0.02 | | | | <0.02 | | | | <0.02 | |
| Níquel Disuelto | mg/L | 0.61 | | 2 | <0.01 | <0.01 | <0.01 | | <0.01 | <0.01 | <0.01 | <0.01 | | | | <0.01 | | | | <0.01 | |
| Potasio Disuelto | | | | | 5 | 5 | 5 | | 2,5 | 2,5 | 2,5 | 2,6 | | | | 4,2 | | | | 11.9 | |
| Escandio Disuelto | | | | | <0.1 | <0.1 | <0.1 | | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.01 | | | | <0.1 | |
| Selenio Disuelto | | 0.17 | | | 0,0006 | 0,0006 | 0,0006 | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | | | | <0.0001 | |
| Plata Disuelta | | | | | <0.00005 | <0.00005 | <0.00005 | | <0.00005 | <0.00005 | <0.00005 | <0.00005 | | | | <0.00005 | | | | <0.00005 | |
| Sodio Disuelto | | | | | 77,4 | 77,4 | 77,4 | | 55,2 | 55,2 | 55,2 | 85,6 | | | | 46,1 | | | | 17.7 | |
| Estroncio Disuelto | | | | | 2,23 | 2,23 | 2,23 | | 1,33 | 1,33 | 1,33 | 4,82 | | | | 2,19 | | | | 0.41 | |
| Talio Disuelto | | | | | 0,0002 | 0,0002 | 0,0002 | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.001 | | | | <0.0001 | |
| Estaño Disuelto | | | | | <0.1 | <0.1 | <0.1 | | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 | | | | <0.1 | |
| Titanio Disuelto | | | | | <0.005 | <0.005 | <0.005 | | <0.005 | <0.005 | <0.005 | <0.005 | | | | <0.005 | | | | 0.006 | |
| Uranio Disuelto | | | | | 0,0007 | 0,0007 | 0,0007 | | 0,0002 | 0,0002 | 0,0002 | 0,0002 | | | | <0.0001 | | | | 0.0001 | |
| Vanadio Disuelto | | | | | <0.005 | <0.005 | <0.005 | | 0,005 | 0,005 | 0,005 | <0.005 | | | | <0.005 | | | | <0.005 | |
| Zinc Disuelto | | 7.4 | | 10 | 0,04 | 0,04 | 0,04 | | 0,12 | 0,12 | 0,12 | 0,02 | | | | 0,01 | | | | 0.02 | |
| Cloruros | | 250 | | | 68 | 68 | 68 | | 32 | 32 | 32 | 5 | | | | 6 | | | | 11 | |
| Cianuro Total | | 0.14 | | 1 | <0.003 | <0.003 | <0.003 | | 0,003 | 0,003 | 0,003 | <0.003 | | | | <0.003 | | | | <0.003 | |
| Fluoruros | | | | | 2,7 | 2,7 | 2,7 | | 0,7 | 0,7 | 0,7 | 0,7 | | | | 0,4 | | | | 0.1 | |
| Nitratos/Nitritos como N | | | | | 0,19 | 0,19 | 0,19 | | <0.02 | <0.02 | <0.02 | <0.02 | | | | 2,78 | | | | 2.91 | |
| Amonio | | | | | <0.05 | <0.05 | <0.05 | | 0,06 | 0,06 | 0,06 | <0.05 | | | | <0.05 | | | | <0.05 | |
| Nitrógeno Kjeldahl (TKN) | | | | | <0.1 | <0.1 | <0.1 | | <0.1 | <0.1 | <0.1 | <0.1 | | | | <0.1 | | | | 0.2 | |
| Fosfatos | | | | | 0,03 | 0,03 | 0,03 | | 0,06 | 0,06 | 0,06 | <0.03 | | | | 0,09 | | | | 0.19 | |

| Parámetros | Unidad | USEPA Salud Humana | IFC Agua Residual Tratada | Acuerdo 236-2006 | MW11 | | | Dic-13 | PSA-SR | | | | HW-1 | | | | RW-1 | | | | | |
|-------------------|--------|--------------------|---------------------------|------------------|------------|--------|--------|--------|------------|--------|--------|--------|------------|--------|--------|--------|------------|--------|--------|--------|------|------|
| | | | | | Línea Base | | | | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | Línea Base | | | Dic-13 | | |
| | | | | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | Promedio | Mínimo | Máximo | | | |
| Fósforo Total | mg/L | | 2 | 10 | 0,06 | 0,06 | 0,06 | ND | 0,02 | 0,02 | 0,02 | <0.01 | NR | NR | NR | NR | NR | NR | NR | 0.03 | 0.07 | |
| STD (TDS) | | 500 | | | 1370 | 1370 | 1370 | | 320 | 320 | 320 | 670 | | | | | | | | 430 | | 300 |
| SST (TSS) | | | 50 | 100 | 145 | 145 | 145 | | <5 | <5 | <5 | <5 | | | | | | | | <5 | | 6 |
| ST (TS) | | | | | 1000 | 1000 | 1000 | | 300 | 300 | 300 | 720 | | | | | | | | 460 | | 320 |
| Sulfatos | | 250 | | | 700 | 700 | 700 | | 45 | 45 | 45 | 335 | | | | | | | | 167 | | 95.7 |
| Alcalinidad Total | | | | | 133 | 133 | 133 | | 186 | 186 | 186 | 185 | | | | | | | | 96 | | 89 |

u.e.: unidades exponenciales. mg/L: miligramos por litro. µS/cm: micro siemens por centímetro. °C: grados centígrados. NMP/100ml: número más probable en 100ml. u Pt/Co: unidades platino cobalto. NR = Cálculo No Realizado por falta de datos de línea base. ND = no determinado. Fuente: MSR, 2014.

En el Cuadro 4-6 se presentan los resultados de la calidad del agua subterránea (Pozos de Monitoreo, Producción y Artesanal) correspondientes al mes de Diciembre 2013. Los resultados de laboratorio se presentan en el Anexo 11.5.2. La mayoría de los pozos monitoreados cumplen con los valores establecidos en el Acuerdo 236-2006 para entes generadores nuevos y los valores en general se encuentran dentro del rango estadístico de la línea base.

Los valores de pH estuvieron en el rango de 6.02 a 7.45 u.e. y la temperatura en el rango de 20.2 a 28.1 °C. Las concentraciones registradas de Cloruros y Fluoruros están por debajo de las directrices de la USEPA (250 mg/L).

En los pozos MW-6 y PSA-SR los valores registrados de sulfatos se encuentran por encima de los valores establecidos durante el levantamiento de línea base y por las guías de USEPA (250 mg/L). Todos los demás pozos se encuentran por debajo de las directrices que establece la USEPA.

Se reportaron valores de Sólidos Suspendidos Totales (**SST**) en los pozos MW9 y RW1, los cuales se encuentran debajo de las guías establecidas por el Banco Mundial y el Acuerdo (50 y 100 mg/L respectivamente) y dentro de los rangos establecidos en la línea base.

El Aluminio, Berilio, Bismuto, Cadmio, Cobre, Galio, Cromo, Cromo Hexavalente, Mercurio, Níquel, Plata, Talio, Estaño, Escandio y Plomo no fueron detectados en ninguno de los pozos monitoreados.

El Antimonio se detectó en los pozos MW6, MW7 y MW8, en concentraciones por debajo de la guía establecida por la USEPA (0.01 mg/L). El Bario fue detectado en todas las estaciones en concentraciones menores a la guía de la USEPA (1 mg/L).

El Hierro fue detectado en los pozos MW-2, MW-7 y MW-9. En los pozos MW-2 y MW-7 las concentraciones se encuentran por debajo de lo establecido por USEPA (0.3 mg/L). El pozo MW-9 presenta una concentración por encima de lo establecido por USEPA.

El Arsénico fue detectado en todas las estaciones de pozos de monitoreo y las concentraciones se encuentran dentro los mínimos y máximos establecidos en la línea base y por debajo de lo estipulado por la USEPA (0.01 mg/L).

5 Sedimentos

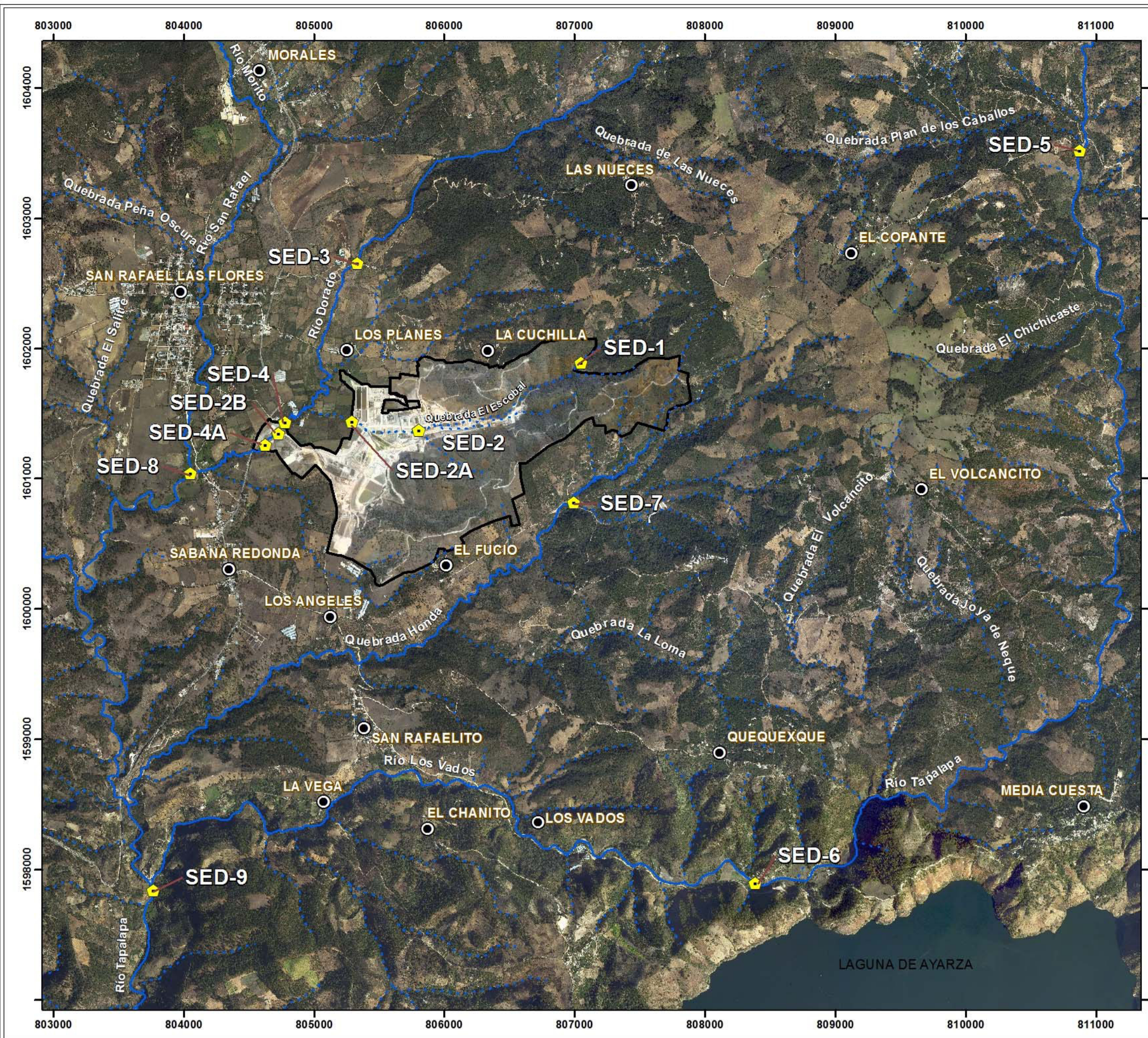
5.1 Sitios de Monitoreo

En el Cuadro 5-1 se enlistan las estaciones de monitoreo de sedimentos de las quebradas y ríos ubicados dentro o cercanas al área de influencia (AI) del Proyecto y su ubicación se presenta en la Figura 5-1.

Cuadro 5-1: Sitios de Monitoreo de Sedimento, Proyecto Minero Escobal

| Estación | Coordenadas | | Sitio |
|----------|-------------|-----------|---|
| SED1 | 807,053 | 1,601,682 | Quebrada El Escobal, aguas arriba del proyecto. |
| SED2 | 805,811 | 1,601,164 | Quebrada El Escobal, en medio del proyecto. |
| SED2A | 805,295 | 1,601,230 | Quebrada El Escobal, Salida de la Propiedad |
| SED3 | 805,337 | 1,602,453 | Río El Dorado, aguas arriba |
| SED4 | 804,781 | 1,601,228 | Río El Dorado, aguas abajo |
| SED4A | 804,629 | 1,601,052 | Río El Dorado, por puente de acceso al Proyecto (Suandys) |
| SED5 | 810,882 | 1,603,313 | Río Tapalapa, aguas arriba |
| SED6 | 808,391 | 1,597,689 | Río Los Vados, aguas abajo |
| SED7 | 806,989 | 1,600,618 | Quebrada La Honda. |
| SED8 | 804,054 | 1,600,834 | Unión Río San Rafael y El Dorado |
| SED9 | 803,772 | 1,597,635 | Río Tapalapa, aguas abajo (cercano a la Ceibita) |

Nota: en ninguna de las estaciones monitoreadas se cuenta con línea base de metales en sedimentos. Sistema de coordenadas proyectadas UTM, NAD27 ZONA 15. Msnm: metros sobre el nivel del mar. Fuente: MSR, 2014.



MAPA DE LOCALIZACIÓN ESTACIONES DE MONITOREO DE SEDIMENTOS

PROYECTO MINERO ESCOBAL
SAN RAFAEL LAS FLORES, SANTAROSA

Minera San Rafael, S.A.
GUATEMALA

DEPARTAMENTO DE AMBIENTE

Sistema de coordenadas: WGS 1984 UTM Zone 15N
Proyección: Transverse Mercator
Dato: WGS 1984

LEYENDA

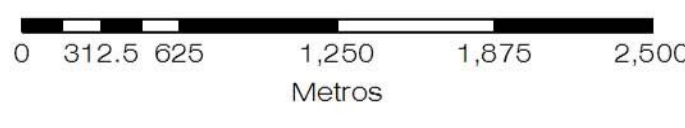
| Símbolo | Descripción |
|---------|-----------------------|
| | Polígono del Proyecto |
| | Centro Poblado |
| | Río Permanente |
| | Quebrada Intermitente |

ESTACIONES DE MONITOREO

| Símbolo | Estación | X | Y |
|---------|----------|--------|---------|
| | SED-1 | 807047 | 1601885 |
| | SED-2 | 805805 | 1601367 |
| | SED-2A | 805289 | 1601433 |
| | SED-2B | 804728 | 1601341 |
| | SED-3 | 805331 | 1602656 |
| | SED-4 | 804775 | 1601431 |
| | SED-4A | 804623 | 1601255 |
| | SED-5 | 810876 | 1603516 |
| | SED-6 | 808385 | 1597892 |
| | SED-7 | 806995 | 1600815 |
| | SED-8 | 804048 | 1601037 |
| | SED-9 | 803766 | 1597838 |

FUENTE: Capas digitales del proyecto ESPREDE/MAGA/IGN del año 2000. Hojas catográficas año 2010 Mataquesuintla (2159-1) y Laguna de Ayarza (2159-II) del IGN, Ortofotos año 2006 del MAGA y Fotografía aérea del proyecto el Escobal año 2013, datos de campo del departamento de Ambiente.

| | |
|---|--|
| Fecha de Elaboración: Enero de 2014 | |
| Distancia Horizontal y Vertical de Grilla: 1,000 metros | |
| Escala 1:30,000 | |



5.2 Metodología

En el Cuadro 5-2 se describe los parámetros analizados en las muestras de sedimento.

Cuadro 5-2: Parámetros analizados en sedimentos, Proyecto Minero Escobal.

| Parámetros utilizados | |
|-------------------------------|---|
| Análisis | Metales Totales, Cianuro Total, Fósforo Total. |
| Laboratorio contratado | |
| Nombre | Las muestras fueron analizadas en el laboratorio ACZ, 2773 Downhill Drive Steamboat Springs, Colorado USA, el cual se encuentra acreditado y avalado por la USEPA |

Fuente: MSR, 2014.

5.3 Resultados

En el Cuadro 5-3 se presenta los resultados de metales registrados para el mes de Diciembre 2013. Los resultados del laboratorio se presentan en el Anexo 11.6

El porcentaje de fósforo total se encuentra en el rango de 0.006% (SED-5 y SED-7) a 0.053% (SED-4A). No se detectó cianuro en ninguna de las estaciones muestreadas.

El mercurio solo se detectó en SED-1 (0.06 mg/kg), en SED-2 (0.07 mg/kg) y en SD-5 (0.09 mg/Kg) en concentraciones por debajo de lo establecido (25 mg/kg) para la disposición de lodos en el suelo establecidos por el Acuerdo 236-2006. Las concentraciones de Cadmio, Cromo y Plomo registradas están muy por debajo de los valores guía. Todas las estaciones muestreadas registraron concentraciones de Arsénico menor al valor sugerido (50 mg/Kg), excepto en la estación SED-2, en donde se sobrepasa ligeramente el valor de la concentración.

Cuadro 5-3: Resultados de sedimentos, Proyecto Minero Escobal

| Parámetro | Unidades | Acuerdo 236-2006 | SED-1 | SED-2 | SED-2A | SED-3 | SED-4 | SED-4A |
|----------------|----------|---------------------|--------|--------|--------|--------|--------|--------|
| | | Aplicación al suelo | Dic-13 | Dic-13 | Dic-13 | Dic-13 | Dic-13 | Dic-13 |
| Arsénico Total | mg/Kg** | 50 | 15,2 | 66,9 | 34,8 | 13,7 | 16,5 | 36 |
| Cadmio Total | | 50 | 0,29 | 3,3 | 1,61 | 0,17 | 0,25 | 1,01 |
| Cromo Total | | 1500 | 3,8 | 4,1 | 6,2 | 2,9 | 4,2 | 6,7 |
| Plomo Total | | 500 | 14,6 | 178 | 74,7 | 14,3 | 11,3 | 56,7 |
| Mercurio Total | | 25 | 0,06 | 0,07 | <0.07 | <0.05 | <0.06 | <0.1 |
| Cianuro Total | | | | <0.2 | <0.2 | <0.1 | <0.1 | <0.1 |
| Fósforo Total | % | | 0,016 | 0,023 | 0,025 | 0,007 | 0,013 | 0,053 |

| Parámetro | Unidades | Acuerdo 236-2006 | SED-5 | SED-6 | SED-7 | SED-8 | SED-9 |
|----------------|----------|---------------------|--------|--------|--------|--------|--------|
| | | Aplicación al suelo | Dic-13 | Dic-13 | Dic-13 | Dic-13 | Dic-13 |
| Arsénico Total | mg/Kg** | 50 | 10,2 | 32,9 | 8,3 | 22,4 | 7,4 |
| Cadmio Total | | 50 | 0,12 | 0,12 | 0,12 | 0,67 | 0,28 |
| Cromo Total | | 1500 | 0,9 | 3,9 | 1,5 | 9,6 | 4,9 |
| Plomo Total | | 500 | 7,61 | 5,97 | 11,1 | 16,5 | 9,99 |
| Mercurio Total | | 25 | 0,09 | <0.06 | <0.05 | 0,08 | <0.07 |
| Cianuro Total | | | | <0.2 | <0.2 | <0.1 | <0.1 |
| Fósforo Total | % | | 0,006 | 0,01 | 0,006 | 0,021 | 0,017 |

mg/Kg: miligramo por kilogramo. ** mg/kg de materia seca a 104°C. %: porcentaje. *LMP para suelos con pH < 7 unidades, en los suelos que posean pH>7 se podrán disponer lodos hasta un 50% mayor de los valores presentados como LMP. Fuente: MSR, 2014.

6 Calidad de Efluentes

6.1 Sitios de Monitoreo

En el Cuadro 6-1 se describe la estación de monitoreo del efluente hacia la quebrada El Escobal del agua proveniente de la planta de tratamiento de aguas especiales. Su ubicación se presenta en la Figura 6-1.

Cuadro 6-1: Sitio de Monitoreo de Calidad de Agua del Efluente de Planta de Tratamiento, Proyecto Minero Escobal

| Estación | Coordenadas | | Sitio |
|----------|-------------|-----------|---|
| WW9 | 805,467 | 1,601,111 | Dispositivo para toma de muestras de la planta de tratamiento de aguas residuales de tipo especial del proceso de minado. |

Sistema de coordenadas proyectadas UTM, NAD27 ZONA 15. Msnm: metros sobre el nivel del mar. Fuente: MSR, 2014.

805000 806000



805000 806000

MAPA DE LOCALIZACIÓN
ESTACIONES DE MONITOREO
EFLUENTES PLANTA DE TRATAMIENTO
DE AGUAS RESIDUALES

PROYECTO MINERO ESCOBAL
SAN RAFAEL LAS FLORES, SANTAROSA

Minera San Rafael, S.A.
GUATEMALA

DEPARTAMENTO DE AMBIENTE

Sistema de coordenadas: WGS 1984 UTM Zone 15N
Proyección: Transverse Mercator
Dato: WGS 1984

LEYENDA

| Símbolo | Descripción |
|---------|-----------------------|
| | Polígono del Proyecto |
| | Centro Poblado |
| | Río Permanente |
| | Quebrada Intermitente |

ESTACIÓN DE MONITOREO

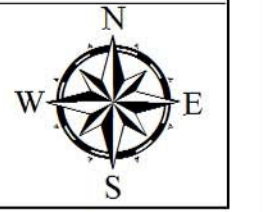
| Símbolo | Estación | X | Y |
|---------|----------|--------|---------|
| | WW9 | 805461 | 1601314 |

FUENTE: Capas digitales del proyecto ESPREDE/MAGA/IGN del año 2000. Hojas catográficas año 2010 Mataquesuintia (2159-1) y Laguna de Ayarza (2159-II) del IGN, Ortofotos año 2006 del MAGA y Fotografía aérea del proyecto el Escobal año 2013, datos de campo del departamento de Ambiente.

Fecha de Elaboración: Enero de 2014

Distancia Horizontal y Vertical de Grilla: 1,000 metros

Escala 1:8,000



6.2 Metodología

En el Cuadro 6-2 se describe el procedimiento y equipo utilizado para la toma de muestras de agua.

Cuadro 6-2: Procedimiento y equipo utilizado para medir parámetros *in situ* de muestras de agua residual, Proyecto Minero Escobal

| Parámetros analizados | |
|---|--|
| <i>In Situ</i> | pH y temperatura |
| Laboratorio | Metales pesados Totales y Disueltos, Aceites y Grasas, DQO, DBO, Coliformes totales, Color, Sólidos Disueltos, Sólidos Sedimentables, Cianuro Total. |
| Procedimiento | |
| Basado en el procedimiento de toma de muestra dado por Water Management Consultants y el laboratorio ACZ para el análisis de Cianuro, y en el procedimiento dado por <i>Standard Methods for the Examination of Water and Wastewater, part 1060 B</i> para los demás parámetros | |
| Equipo utilizado | |
| Nombre | Automuestreador |
| Modelo | 6712 Full-size con módulo integrado 701 para medición continua de pH y temperatura. |
| Fabricante | ISCO |

Fuente: MSR, 2014.

Laboratorio empleado y valores de referencia: Las muestras de cianuro fueron analizadas en el laboratorio ACZ, 2773 Downhill Drive Steamboat Springs, Colorado USA, el cual se encuentra acreditado y avalado por la USEPA. Las muestras de agua residual fueron analizadas en el laboratorio Ecosistemas Proyectos Ambientales, S.A., laboratorio respaldado por un Sistema de Calidad ISO 17025, otorgado por la Oficina Guatemalteca de Acreditación (OGA); y con ello los análisis acreditados cuentan con validez internacional según OGA-LE 006-04.

6.3 Resultados

Durante los monitoreos correspondientes, se emplearon muestras control para determinar la confiabilidad de los resultados de parámetros analizados por el laboratorio encargado del análisis de las muestras. En total se efectuaron 3 muestras blanco y una muestra duplicado; los resultados obtenidos se presentan en el Cuadro 6-3.

Cuadro 6-3: Resultados de control de calidad para muestras de Efluentes de Planta de Tratamiento, Proyecto Minero Escobal.

| Mes | Unidades | LMP Acuerdo 236-2006 | Noviembre | Diciembre | Enero | | |
|-----------------------|-----------|-------------------------|-----------|-----------|---------|-----------|----------|
| Control de Calidad | | | Blanco | Blanco | Blanco | Duplicado | Original |
| ID Muestra | | | WW10 | WW10 | WW10 | WW11 | WW9 |
| No. Reporte Lab. | | | 1776-13 | 053-14 | 284-14 | 282-14 | 286-14 |
| Grasas y Aceites | mg/L | 10 | <5 | <5 | <5 | <5 | <5 |
| Materia Flotante | NL | Ausente | Ausente | Ausente | Ausente | Ausente | Ausente |
| DBO | mg/L | 200 | < 10 | < 10 | < 10 | < 10 | < 10 |
| DQO | | < 25 | < 25 | < 25 | < 25 | < 25 | |
| SST (TSS) | | 100 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Sólidos Sedimentables | | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | |
| Nitrógeno Total | | 20 | <1 | <1 | <1 | 11,4 | 12,5 |
| Fósforo Total | | 10 | <0.05 | <0.05 | <0.05 | N.D. | N.D. |
| Arsénico | | 0,1 | <0.002 | <0.002 | <0.002 | 0,006 | 0,007 |
| Cadmio | | 0,1 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| Cobre | | 3 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| Cromo Hexavalente | | 0,1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Cianuro Total* | | 1 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 |
| Mercurio | | 0,01 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| Níquel | | 2 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Plomo | | 0,4 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Zinc | | 10 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Color Aparente | u Pt/Co | 500 | < 1 | < 1 | < 1 | 11 | 11 |
| Color Real | | | < 1 | < 1 | < 1 | < 1 | < 1 |
| Coliformes Fecales | NMP/100ml | <1x10 ⁴ | < 2 | < 2 | < 2 | < 2 | 49 |

*análisis realizado por laboratorio AZC. u.e. unidades electroquímicas. °C: grados centígrados. mg/L: miligramos por litro. U Pt/Co: unidades de Platino-Cobalto. NMP/100ml: número más probable en 100 mililitros. NA: no analizado. NL = no hay límite establecido para este parámetro. Fuente: MSR, 2014.

Para la preparación de blancos analíticos de los parámetros fisicoquímicos y metales se utilizó agua desmineralizada y para los parámetros microbiológicos se utilizó agua salvavidas embotellada. Todos los parámetros analizados por los dos laboratorios son confiables en manipulación de las muestras y precisión del análisis.

En el Cuadro 6-4 se pueden observar los resultados de la calidad del efluente de la planta de tratamiento del Proyecto Minero Escobal. Los resultados de laboratorio se presentan en el Anexo 11.6.

Los valores de pH se encontraron en el rango de 7.47 a 8.47 u.e., cumpliendo con el rango establecido en el Acuerdo 6.0-9.0 u.e.

La concentración de Cianuro Total, Grasas y Aceites, Demanda Bioquímica de Oxígeno (**DBO**), Demanda Química de Oxígeno (**DQO**), sólidos sedimentables totales (**SST**), Arsénico Total, Plomo Total, Cadmio Total, Cobre Total, Cromo Hexavalente, Mercurio Total, Níquel Total y Coliformes fecales están por debajo de los valores establecidos por el acuerdo.

Por lo tanto los resultados obtenidos durante las descargas de la planta de tratamiento cumplen con el Acuerdo Gubernativo 236-2006 para entes generadores nuevos, Banco Mundial para el sector minero y la USEPA.

Cuadro 6-4: Calidad del Efluente de la Planta de Tratamiento, Proyecto Minero Escobal

| Mes | Unidades | LMP Acuerdo 236-2006 | Valores Indicador Banco Mundial Sector Minero | LMP EPA. CFR 440, Subparte J, 440.102, (a) | Noviembre | Diciembre | Enero | |
|----------------------------------|-----------|-----------------------------|---|--|-----------|-----------|---------|-----|
| Fecha Muestreo | | | | | 7-11-13 | 17-12-13 | 27-1-14 | |
| ID Muestra | | | | | WW9 | WW9 | WW9 | |
| No. Reporte Lab. | | | | | 1775-13 | 052-14 | 286-14 | |
| pH de campo | u.e. | 6.0-9.0 | 6.0-9.0 | 6.0-9.0 | 8,38 | 8,15 | 7,47 | |
| Temperatura de campo | °C | | +/- 3 | | 25.4 | 25,1 | 24,3 | |
| Temperatura. Quebrada El Escobal | | | | | 27.2 | 25.75 | 25.93 | |
| Grasas y Aceites | mg/L | 10 | 10 | | <5 | <5 | <5 | |
| Materia Flotante | | Ausente | | | Ausente | Ausente | Ausente | |
| DBO | mg/L | 200 | 50 | | < 10 | < 10 | < 10 | |
| DQO | | | 150 | | < 25 | < 25 | < 25 | |
| SST (TSS) | | 100 | 50 | 30 | < 10 | < 10 | < 10 | |
| Sólidos Sedimentables | | | | | < 0.1 | < 0.1 | < 0.1 | |
| Nitrógeno Total | | 20 | 10 | | 5,6 | 6,9 | 12,5 | |
| Fósforo Total | | 10 | 2 | | <0.05 | <0.05 | <0.05 | |
| Arsénico | | 0,1 | 0,1 | | 0,003 | 0,003 | 0,007 | |
| Cadmio | | 0,1 | 0,05 | | <0.02 | <0.02 | <0.02 | |
| Cobre | | 3 | 0,3 | 0,3 | <0.03 | <0.03 | <0.03 | |
| Cromo Hexavalente | | 0,1 | 0,1 | | <0.05 | <0.05 | <0.05 | |
| Cianuro Total* | | 1 | 1 | | <0.003 | <0.003 | <0.003 | |
| Mercurio | | 0,01 | 0,002 | 0,002 | <0.004 | <0.004 | <0.004 | |
| Níquel | | 2 | 0,5 | | <0.05 | <0.05 | <0.05 | |
| Plomo | | 0,4 | 0,2 | 0,6 | <0.05 | <0.05 | <0.05 | |
| Zinc | | 10 | 0,5 | 1,5 | <0.01 | <0.01 | <0.01 | |
| Color Aparente | | u Pt/Co | 500 | | | 7 | 17 | 11 |
| Color Real | | | | | | < 1 | < 1 | < 1 |
| Coliformes Fecales | NMP/100ml | <1x10⁴ | 400 | | 4,5 | 49 | 49 | |

NA: no analizado. SF= sin flujo de agua. u.e. unidades electroquímicas. °C: grados centígrados. mg/L: miligramos por litro. U Pt/Co: unidades de Platino-Cobalto. NMP/100ml: número más probable en 100 mililitros. *: análisis efectuados en laboratorio ACZ. Fuente: MSR, 2014.

7 Vibraciones

7.1 Sitios de Monitoreo

La Empresa instaló tres equipos para la medición de vibraciones por medio del equipo eXPeak Seismograph modelo eXAD-8 de la empresa Physical Measurement Technologies, Inc. Estos equipos son automatizados y registran la velocidad (mm/s) y la frecuencia (Hz) de forma constante. La ubicación de las estaciones de monitoreo se presenta en la Figura 7-1 y en el Cuadro 7-1 se presenta la descripción de cada una de las estaciones.

Cuadro 7-1: Estaciones de monitoreo de vibraciones, Proyecto Minero Escobal

| Estación | Coordenadas | | Sitio |
|----------|-------------|-----------|-----------------------------------|
| BS-1 | 806,424 | 1,601,608 | Colindancia con Aldea La Cuchilla |
| BS-2 | 806,366 | 1,601,291 | Entre ambos portales |
| BS-3 | 805,798 | 1,601,563 | Depósito de Suelo |

Sistema de coordenadas proyectadas UTM, NAD27 ZONA 15. Msnm: metros sobre el nivel del mar.
Fuente: MSR, 2014.



MAPA DE LOCALIZACIÓN ESTACIONES DE MONITOREO DE VIBRACIONES PERMANENTE

PROYECTO MINERO ESCOBAL
SAN RAFAEL LAS FLORES, SANTAROSA

Minera San Rafael S.A.
GUATEMALA

DEPARTAMENTO DE AMBIENTE

Sistema de coordenadas: WGS 1984 UTM Zone 15N
Proyección: Transverse Mercator
Dato: WGS 1984

LEYENDA

| Símbolo | Descripción |
|---------|-----------------------|
| | Polígono del Proyecto |
| | Centro Poblado |
| | Portal de Acceso |
| | Río Permanente |
| | Quebrada Intermitente |

ESTACIONES DE MONITOREO

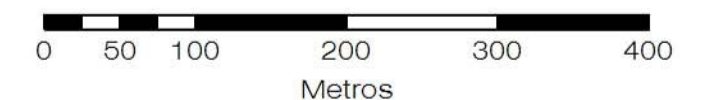
| Símbolo | Estación | X | Y |
|---------|----------|--------|---------|
| | BS-1 | 806419 | 1601819 |
| | BS-2 | 806361 | 1601492 |
| | BS-3 | 805791 | 1601785 |

FUENTE: Capas digitales del proyecto ESPREDE/MAGA/IGN del año 2000
Hojas catográficas año 2010 Mataquesuinta (2159-I) y Laguna de Ayarza (2159-II) del IGN,
Ortofotos año 2006 del MAGA y Fotografía aérea del proyecto el Escobal año 2013,
datos de campo del departamento de Ambiente.

Fecha de Elaboración: Enero de 2014

Distancia Horizontal y Vertical
de Grilla: 1,000 metros

Escala 1:5,000



7.2 Metodología

En el Cuadro 7-2 se describe el procedimiento y equipo utilizado para el registro de vibraciones.

Cuadro 7-2. Procedimiento y equipo utilizado para medir vibraciones, Proyecto Minero Escobal

| | |
|---|---|
| PARAMETROS ANALIZADOS | |
| Velocidad | Velocidad de partícula |
| PROCEDIMIENTO | |
| Se registraron todas las voladuras realizadas en ambos portales durante los meses de mayo a julio 2013. Y se enlistan las velocidades de partículas registrados por los equipos de vibraciones. | |
| EQUIPO UTILIZADO | |
| Equipo | eXPeak Seismograph modelo eXAD-8 |
| Fabricante | Physical Measurement Technologies, Inc. |

Fuente: MSR, 2014.

7.3 Resultados

En el Cuadro 7-3 se presentan todas las mediciones de las voladuras registradas en los instrumentos, y los resultados se encuentran por debajo del límite de detección del equipo (1.3 mm/s). Según la norma del United States Bureau of Mines, el límite a partir del cual las vibraciones inducidas por una voladura pueden ocasionar daños a estructuras es de 50.8 mm/s. Por lo que se puede determinar que las mismas no son sensibles y por lo tanto no representan un impacto para en el ambiente.

Cuadro 7-3 Resultados de medición de vibraciones, Proyecto Minero Escobal.

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|----------------|---------------------------|-------|-------|-------------------------------|
| Noviembre | 1265-7040 | 1 | 5:20 | <1.3 |
| | 1315-c/f este | 1 | 5:30 | <1.3 |
| | 1315-6760 | 1 | 5:35 | <1.3 |
| | CHIMINEA DUMAS | 1 | 5:20 | <1.3 |
| | 1290, Ventana 8 | 1 | 17:50 | <1.3 |
| | 1215 Ac. R/E. | 1 | 18:00 | <1.3 |
| | 1315 C/F.W. R/W. | 1 | 18:10 | <1.3 |
| | 1315-6620 R/W. | 1 | 18:20 | <1.3 |
| | 13156520 R/W. | 1 | 18:30 | <1.3 |
| | 1340 C/F. E.R/W. | 1 | 18:40 | <1.3 |
| | 1290-6920 R/W. | 2 | 5:20 | <1.3 |
| | 1315-6680 R/W. | 2 | 5:30 | <1.3 |
| | 1315-6760 R/E. | 2 | 5:35 | <1.3 |
| | 1340 C/F.E.R/W. | 2 | 5:20 | <1.3 |
| | 1290-6360 R/W. | 2 | 17:50 | <1.3 |
| | R/Principal R/W. | 2 | 18:00 | <1.3 |
| | 1315-6520 R/W. | 2 | 18:10 | <1.3 |
| | 1315-6560 R/E. | 2 | 18:20 | <1.3 |
| | 1340-6620 R/E. | 2 | 18:30 | <1.3 |
| | 1340 R/E. Desguinche | 2 | 18:40 | <1.3 |
| | RAMPA PRINCIPAL OESTE | 3 | 17:30 | <1.3 |
| | 1315-6420 ESGUINCHE OESTE | 3 | 17:35 | <1.3 |
| | 1315-C/F ESTE OESTE | 3 | 17:40 | <1.3 |
| | 1315-6760 ESTE | 3 | 17:40 | <1.3 |
| 1265-7020 ESTE | 3 | 17:40 | <1.3 | |

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-----------|---------------------------|-----|-------|-------------------------------|
| Noviembre | 1315-6560 | 5 | 5:20 | <1.3 |
| | 1315-6920 | 5 | 5:30 | <1.3 |
| | 1340-este esguinche | 5 | 5:35 | <1.3 |
| | 1290-6960 | 5 | 5:35 | <1.3 |
| | 1290-6720 Producción R/W. | 5 | 17:50 | <1.3 |
| | 1290-6920 R/W. | 5 | 18:00 | <1.3 |
| | 1315 C/F. E. R/E. | 5 | 18:10 | <1.3 |
| | 1315-6800 R/E. | 5 | 18:20 | <1.3 |
| | 1340 C/F. E. R/W. | 5 | 18:30 | <1.3 |
| | 1340-6620 | 14 | 5:30 | <1.3 |
| | OESTE ACCESO | 14 | 5:35 | <1.3 |
| | 1315-VENTILACION | 14 | 5:40 | <1.3 |
| | 1315-6760 | 14 | 5:45 | <1.3 |
| | 1315-6520 | 14 | 17:50 | <1.3 |
| | 1315-6700 | 14 | 18:00 | <1.3 |
| | 1340-c/f este | 14 | 18:10 | <1.3 |
| | 1290- 6520 chimenea | 14 | 17:50 | <1.3 |
| | 1340-6640 | 15 | 5:30 | <1.3 |
| | 1340-6600 | 15 | 5:35 | <1.3 |
| | 1315-C/O | 15 | 5:40 | <1.3 |
| | CHIMINEA | 15 | 5:45 | <1.3 |
| | 1315-6440 | 15 | 17:50 | <1.3 |
| | 1340-C/F ESTE | 15 | 18:00 | <1.3 |
| | ESTE-1340 C/E | 16 | 5:30 | <1.3 |
| | OESTE-1340 C/O | 16 | 5:35 | <1.3 |

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-----------|-------------------|-----|-------|-------------------------------|
| Noviembre | 1315-6680 | 16 | 5:40 | <1.3 |
| | ESTE PRINCIPAL | 16 | 5:45 | <1.3 |
| | 1340-6440 | 16 | 17:50 | <1.3 |
| | 1315-C/E | 16 | 18:00 | <1.3 |
| | 1200-RAMPA ESTE | 16 | 18:10 | <1.3 |
| | 1315-6440 REQUEMA | 16 | 17:50 | <1.3 |
| | 1340-C/O | 17 | 5:30 | <1.3 |
| | 1315-CE | 17 | 5:35 | <1.3 |
| | 1315-6420 | 17 | 5:40 | <1.3 |
| | OESTE-1200 | 17 | 5:45 | <1.3 |
| | 1315-6380 | 17 | 17:50 | <1.3 |
| | 1265-6960 | 17 | 18:00 | <1.3 |
| | 1315-6380 | 18 | 5:30 | <1.3 |
| | ESTE PRINCIPAL | 18 | 5:35 | <1.3 |
| | ANIMK | 18 | 5:40 | <1.3 |
| | 1340-6600 | 18 | 5:45 | <1.3 |
| | 1265-6360 | 18 | 17:50 | <1.3 |
| | 1315-6820 | 18 | 17:50 | <1.3 |
| | 1340-6640 | 18 | 17:50 | <1.3 |
| | DUMAS-CHIMINEA | 18 | 17:50 | <1.3 |
| | 6640-1315 | 20 | 5:30 | <1.3 |
| | 6680-1315 | 20 | 5:35 | <1.3 |
| | c/e-1315 | 20 | 5:40 | <1.3 |
| | 1340-c/e este | 20 | 5:45 | <1.3 |
| | 1340-6600 | 20 | 5:50 | <1.3 |
| | 1340-6660 ESTE | 20 | 17:50 | <1.3 |
| | 1315-6440 | 20 | 17:50 | <1.3 |
| | 1315-6820 | 20 | 17:50 | <1.3 |
| | dumas chimenea | 21 | 5:30 | <1.3 |

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-----------|----------------------|-----|-------|-------------------------------|
| Noviembre | 1340-C/F E WEST. | 21 | 5:35 | <1.3 |
| | 1340-6660 | 21 | 5:40 | <1.3 |
| | 1315-6440 | 21 | 5:45 | <1.3 |
| | 1265-6960 | 21 | 5:50 | <1.3 |
| | RAMPA PRINCIPAL ESTE | 21 | 17:50 | <1.3 |
| | 1315-C/F W | 21 | 17:50 | <1.3 |
| | 1315-6380 | 21 | 17:50 | <1.3 |
| | 1265-6360 | 21 | 18:00 | <1.3 |
| | 1340-C/F E WEST. | 21 | 18:30 | <1.3 |
| | 1340-6520 R/ WEST. | 21 | 18:30 | <1.3 |
| | 1315-6680 | 23 | 5:30 | <1.3 |
| | 1315-6760 | 23 | 5:35 | <1.3 |
| | 1340w- C/FW | 23 | 5:40 | <1.3 |
| | 1340W-6520 | 23 | 5:45 | <1.3 |
| | 1340W-6500 | 23 | 5:50 | <1.3 |
| | 1215 E.C. R/E. | 23 | 17:20 | <1.3 |
| | 1315 C/F. E. R/E. | 23 | 17:30 | <1.3 |
| | 1315-6820 R/E. | 23 | 17:40 | <1.3 |
| | 1340 C/F. E. R/E. | 23 | 17:50 | <1.3 |
| | 1340 -660 R/E. | 23 | 18:00 | <1.3 |
| | 1315-6380 | 24 | 5:30 | <1.3 |
| | 1315-C/F.E. | 24 | 5:35 | <1.3 |
| | 1340-6500 w. | 24 | 5:40 | <1.3 |
| | 1200-R/P. R/E. | 24 | 17:20 | <1.3 |
| | 1315 C/F.w R/W | 24 | 17:30 | <1.3 |
| | 1315-6640 R/W. | 24 | 17:40 | <1.3 |
| | 1340-6680 R/W. | 24 | 17:50 | <1.3 |
| | 1340-6680 R/E. | 24 | 18:00 | <1.3 |
| | Chimenea Dumas | 24 | 18:10 | <1.3 |

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| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|------------------|----------------------------|----------|-------|-------------------------------|
| Noviembre | RAMPA PRINCIPAL OESTE 1200 | 25 | 5:30 | <1.3 |
| | 1265-6980 | 25 | 5:35 | <1.3 |
| | 1340-6680 | 25 | 5:40 | <1.3 |
| | 1315 C/F.W R/W. | 25 | 17:20 | <1.3 |
| | 1315-6820 | 25 | 17:30 | <1.3 |
| | 1340-6480 | 25 | 17:40 | <1.3 |
| | 1215-cfw RQAMPA ESTE | 26 | 5:30 | <1.3 |
| | 1315E-6820 | 26 | 5:35 | <1.3 |
| | 1340-6520 WESTE | 26 | 5:40 | <1.3 |
| | CHIMINEA DUMAS | 26 | 5:40 | <1.3 |
| | 1265-6360 R/W. | 26 | 17:20 | <1.3 |
| | 1340-6640 R/E. | 26 | 17:30 | <1.3 |
| | 1340- 6540 R/W. | 26 | 17:40 | <1.3 |
| | Diciembre | 1315-600 | 5 | 5:25 |
| 1315-6840 | | 5 | 5:30 | <1.3 |
| 1315-C/E | | 5 | 5:35 | <1.3 |
| 1340-ESTE C/E | | 5 | 5:40 | <1.3 |
| 1340-6580 | | 5 | 5:45 | <1.3 |
| ESTE PRINCIPAL | | 5 | 17:20 | <1.3 |
| 1315-6640 | | 5 | 17:30 | <1.3 |
| 1315-6440 | | 5 | 17:40 | <1.3 |
| 1315-6760 | | 5 | 17:20 | <1.3 |
| 1340-6600 | | 5 | 17:30 | <1.3 |
| 1340-6640 | | 5 | 17:40 | <1.3 |
| 1340-6680 | | 5 | 17:40 | <1.3 |
| ventilacion-1340 | | 6 | 5:30 | <1.3 |
| 6600-1340 | | 6 | 5:35 | <1.3 |
| 6600-1315 | 6 | 5:40 | <1.3 | |

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-----------|-----------------|------|-------|-------------------------------|
| Diciembre | 1315-6800 | 6 | 17:20 | <1.3 |
| | 1315-6520 | 6 | 17:30 | <1.3 |
| | 1340-CFOESTE | 6 | 17:40 | <1.3 |
| | 1340-6540 | 6 | 17:20 | <1.3 |
| | 1340-OESTE | 7 | 5:30 | <1.3 |
| | 1315-C/E | 7 | 5:35 | <1.3 |
| | 1315-6760 | 7 | 5:40 | <1.3 |
| | 1340-6580 | 7 | 5:45 | <1.3 |
| | 1340-DESGUICHE | 7 | 5:50 | <1.3 |
| | PRINCIPAL OESTE | 7 | 17:20 | <1.3 |
| | 1315-6440 | 7 | 17:30 | <1.3 |
| | 1340-CFESTE | 7 | 17:40 | <1.3 |
| | 1315-CFOEESTE | 7 | 17:20 | <1.3 |
| | 1340-OESTE | 8 | 5:30 | <1.3 |
| | 1315-C/E | 8 | 5:35 | <1.3 |
| | 1315-6760 | 8 | 5:40 | <1.3 |
| | 1340-6580 | 8 | 5:45 | <1.3 |
| | 1340-DESGUICHE | 8 | 5:50 | <1.3 |
| | PRINCIPAL OESTE | 8 | 17:20 | <1.3 |
| | 1315-6440 | 8 | 17:30 | <1.3 |
| | 1340-CFESTE | 8 | 17:40 | <1.3 |
| | 1315-CFOEESTE | 8 | 17:20 | <1.3 |
| | este principal | 9 | 5:30 | <1.3 |
| | 6640-1340 este | 9 | 5:35 | <1.3 |
| | 6340-1315 | 9 | 5:40 | <1.3 |
| | 1340-6540 | 9 | 17:20 | <1.3 |
| | 1340-6440 | 9 | 17:30 | <1.3 |
| | 1315-6600 | 9 | 17:40 | <1.3 |
| 6680-1340 | 10 | 5:30 | <1.3 | |

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-----------|------------------|-----|-------|-------------------------------|
| Diciembre | 6600-1315 | 10 | 5:35 | <1.3 |
| | 6640-1340 | 10 | 5:40 | <1.3 |
| | 6700-1340 | 10 | 5:45 | <1.3 |
| | 1315-CF ESTE | 10 | 17:20 | <1.3 |
| | 1340-CF ESTE | 10 | 17:30 | <1.3 |
| | PRODUCCION | 10 | 17:30 | <1.3 |
| | 6520-1340 | 11 | 5:30 | <1.3 |
| | 6480-1340 | 11 | 5:35 | <1.3 |
| | 6460-1340 | 11 | 5:40 | <1.3 |
| | c/e-1340 | 11 | 5:45 | <1.3 |
| | c/o-1315 | 11 | 5:50 | <1.3 |
| | 6600-1315 | 11 | 5:55 | <1.3 |
| | 1315-6440 | 11 | 17:20 | <1.3 |
| | 1315-6800 | 11 | 17:30 | <1.3 |
| | 1315-CF OESTE | 11 | 17:30 | <1.3 |
| | 1340-6600 | 11 | 17:30 | <1.3 |
| | 1315-6440 | 12 | 5:30 | <1.3 |
| | 1315-6560 | 12 | 5:35 | <1.3 |
| | R/principal E. | 12 | 16:10 | <1.3 |
| | 1315-6800 | 12 | 16:15 | <1.3 |
| | 1315-CF OESTE | 12 | 16:25 | <1.3 |
| | 1290-680 R/W. | 12 | 16:30 | <1.3 |
| | 1340-6680 R/E. | 12 | 16:40 | <1.3 |
| | 1340-6600 R/E. | 12 | 16:45 | <1.3 |
| | 1386- rampa este | 13 | 17:30 | <1.3 |
| | 1315-6440 | 13 | 17:35 | <1.3 |
| | 1340-6460 | 13 | 17:30 | <1.3 |
| | 1315-CF ESTE | 13 | 17:35 | <1.3 |
| | 1340-6480 | 13 | 17:30 | <1.3 |

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-----------|--------------------------|-----|-------|-------------------------------|
| Diciembre | ESGUINCHE 1340 | 13 | 17:35 | <1.3 |
| | 1290-6680 R/W Producción | 13 | 17:30 | <1.3 |
| | 1315 C/F.W R/W. | 13 | 17:35 | <1.3 |
| | 1315-6600 R/W. | 13 | 17:40 | <1.3 |
| | 1340-6640 R/E. | 13 | 17:45 | <1.3 |
| | 1340-6520 R/W. | 13 | 17:50 | <1.3 |
| | Chimenea Alimak, Dumas | 13 | 18:00 | <1.3 |
| | 1340-W. 6520 | 14 | 5:30 | <1.3 |
| | CF ESTE- 1315 | 14 | 5:35 | <1.3 |
| | 1340 OESTE-6520 | 14 | 5:30 | <1.3 |
| | 1340ESTE-6600 | 14 | 5:35 | <1.3 |
| | 1290-6680 R/W Producción | 14 | 17:30 | <1.3 |
| | 1215 R/W.. | 14 | 17:35 | <1.3 |
| | 1315-6600 R/W. | 14 | 17:40 | <1.3 |
| | 1315-6800 R/E. | 14 | 17:45 | <1.3 |
| | 1340-6680 R/W. | 14 | 17:50 | <1.3 |
| | 1340 C/F. W. R/E. | 14 | 18:00 | <1.3 |
| | 1340-W. 6520 | 15 | 5:30 | <1.3 |
| | CF ESTE- 1315 | 15 | 5:35 | <1.3 |
| | 1340 OESTE-6520 | 15 | 5:30 | <1.3 |
| | 1340ESTE-6600 | 15 | 5:35 | <1.3 |
| | 1315-6340 R/W. | 15 | 17:30 | <1.3 |
| | 1315-6600 R/W.. | 15 | 17:35 | <1.3 |
| | 1315-6800 R/E. | 15 | 17:40 | <1.3 |
| | 1386 R/E. | 15 | 17:45 | <1.3 |
| | 1340-6640 R/W. | 15 | 17:50 | <1.3 |

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-----------------|-----------------------------|-------|-------|-------------------------------|
| Diciembre | 1340-6560R/W.. | 15 | 18:00 | <1.3 |
| | Chimenea Alimak Dumas | 15 | 18:10 | <1.3 |
| | 6340-1315 | 16 | 5:30 | <1.3 |
| | 1215-principal oeste | 16 | 5:35 | <1.3 |
| | CF ESTE-1340 ESTE | 16 | 5:30 | <1.3 |
| | 6640-1340 ESTE | 16 | 5:35 | <1.3 |
| | Rampa principal R/E. | 16 | 17:30 | <1.3 |
| | 1290-6520 R/E Producción | 16 | 17:35 | <1.3 |
| | 1340-7700 | 16 | 17:40 | <1.3 |
| | Chimenea Alimak Dumas | 16 | 17:45 | <1.3 |
| | 1215-RAMPA ESTE | 17 | 5:30 | <1.3 |
| | 1340-6480 ESTE | 17 | 5:35 | <1.3 |
| | 1315-6560 OESTE | 17 | 5:30 | <1.3 |
| | 1340-ESTE-6640 | 17 | 5:35 | <1.3 |
| | 1290-6400 R/E Producción | 17 | 17:30 | <1.3 |
| | 1315-6560 R/W | 17 | 17:35 | <1.3 |
| | 1340-6600 R/W. | 17 | 17:40 | <1.3 |
| | Chimenea Alimak Dumas | 17 | 17:45 | <1.3 |
| | 1315 C-FE.R/E | 24 | 5:35 | <1.3 |
| | 1340-6640 R/E | 24 | 5:40 | <1.3 |
| 6720-1290 | 24 | 17:30 | <1.3 | |
| oeste principal | 24 | 17:35 | <1.3 | |
| 6520-1340 oeste | 24 | 17:40 | <1.3 | |
| 6800-1315- este | 24 | 17:30 | <1.3 | |
| Enero | 6680-1340 | 1 | 5:35 | <1.3 |
| | 1315-c/e | 1 | 5:40 | <1.3 |
| | c/e-1340 este | 1 | 6:35 | <1.3 |

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-------|-----------------------|-----|-------|-------------------------------|
| Enero | 6740-1340 este | 1 | 5:41 | <1.3 |
| | 1315-6400 | 1 | 17:30 | <1.3 |
| | 1340-CFOESTE | 1 | 17:35 | <1.3 |
| | 1340-6520 | 1 | 17:40 | <1.3 |
| | 1340-6560 | 1 | 17:55 | <1.3 |
| | 1340ESTE-6680 | 1 | 17:55 | <1.3 |
| | 1340ESTE-6640 | 1 | 17:55 | <1.3 |
| | 1315-6840 | 1 | 17:55 | <1.3 |
| | RAMPA PRINCIPAL ESTE | 2 | 5:35 | <1.3 |
| | 1340-6520 OESTE | 2 | 5:40 | <1.3 |
| | 1340-6640RAMPA ESTE | 2 | 5:40 | <1.3 |
| | 1340-6720 RAMPA ESTE | 2 | 5:40 | <1.3 |
| | 1315 OESTE-6400 | 2 | 5:40 | <1.3 |
| | CHIMINEA DUMAS | 2 | 5:40 | <1.3 |
| | Rampa Principal W. | 2 | 17:30 | <1.3 |
| | 1290-6320 R/W. | 2 | 17:35 | <1.3 |
| | 1340-6600 R/E. | 2 | 17:40 | <1.3 |
| | 1340-6680 R/E. | 2 | 17:55 | <1.3 |
| | Chimenea Alimak Dumas | 2 | 18:00 | <1.3 |
| | 1340-6640 OESTE | 3 | 5:35 | <1.3 |
| | 1340-6640 ESTE | 3 | 5:40 | <1.3 |
| | 1340-6780 ESTE | 3 | 5:40 | <1.3 |
| | 1340-6560 OESTE | 3 | 5:40 | <1.3 |
| | 1315 C/F. E R/E. | 3 | 17:30 | <1.3 |
| | 1315-6880 R/E. | 3 | 17:35 | <1.3 |
| | 1340 C/F. E. R/E. | 3 | 17:40 | <1.3 |
| | 1340 C/F.W. R/ W. | 3 | 17:55 | <1.3 |
| | 1340-6480 R/W. | 3 | 18:00 | <1.3 |
| | 1340 OESTE-6560 | 5 | 5:35 | <1.3 |

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-------|--------------------------|-----|-------|-------------------------------|
| Enero | 1340 ESTE-6740 | 5 | 5:40 | <1.3 |
| | 1315-6840 | 5 | 5:40 | <1.3 |
| | 1290-6680 R/W Producción | 5 | 17:30 | <1.3 |
| | 1315-6400 R/W. | 5 | 17:35 | <1.3 |
| | 1340-6600 R/E. | 5 | 17:40 | <1.3 |
| | 1340-6680 R/W. | 5 | 17:55 | <1.3 |
| | 6740-1340 ESTE | 7 | 5:35 | <1.3 |
| | CFE-1340 ESTE | 7 | 5:40 | <1.3 |
| | DUMAS CHIMINEA | 7 | 5:40 | <1.3 |
| | Rampa Principal R/E. | 7 | 17:30 | <1.3 |
| | 1315 C/F.E. R/E. | 7 | 17:35 | <1.3 |
| | 1340-6520 R/W. | 7 | 17:40 | <1.3 |
| | 1315-CFE ESTE | 8 | 5:35 | <1.3 |
| | 1340-6440 OESTE | 8 | 5:40 | <1.3 |
| | 1340-6680 R/E. | 8 | 17:30 | <1.3 |
| | 1340-6480 R/W. | 8 | 17:35 | <1.3 |
| | 1315-6220 R/E. | 15 | 5:35 | <1.3 |
| | 1315-6800 R/E. | 15 | 5:40 | <1.3 |
| | 1386 R/E. | 15 | 5:45 | <1.3 |
| | 1340C/F. E. R/E. | 15 | 5:50 | <1.3 |
| | 1340-6420 R/W. | 15 | 5:55 | <1.3 |
| | 1340-6600 R/W. | 15 | 6:00 | <1.3 |
| | 1195-DDST-E.C. | 15 | 17:30 | <1.3 |
| | C/E-1340 ESTE | 15 | 17:35 | <1.3 |
| | C/E-1315 | 15 | 17:40 | <1.3 |
| | 6680-1340 ESTE | 15 | 17:30 | <1.3 |
| | ANIMAK - CHIMENEA | 15 | 17:30 | <1.3 |
| | 6440-1340 OESTE | 15 | 17:35 | <1.3 |

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-------|-----------------------------|-----|-------|-------------------------------|
| Enero | 6480-1340 OESTE | 15 | 17:40 | <1.3 |
| | chimenea-dumas | 16 | 5:35 | <1.3 |
| | 6480-1340-oeste | 16 | 5:40 | <1.3 |
| | 6680-1340-este | 16 | 5:45 | <1.3 |
| | 1315-6320 | 16 | 5:50 | <1.3 |
| | 1315-6800 | 16 | 5:55 | <1.3 |
| | oeste principal | 16 | 6:00 | <1.3 |
| | 6840-1315 ESTE | 16 | 17:30 | <1.3 |
| | 6900-1315ESTE | 16 | 17:35 | <1.3 |
| | 6360-1315 OESTE | 16 | 17:40 | <1.3 |
| | 1340-6440 OESTE | 16 | 17:30 | <1.3 |
| | 6700-1265 ESTE | 16 | 17:30 | <1.3 |
| | 6740-1340 ESTE | 16 | 17:35 | <1.3 |
| | C/E-1315 | 17 | 5:35 | <1.3 |
| | 1340-6740 | 17 | 5:40 | <1.3 |
| | 6880-1315 este | 17 | 17:30 | <1.3 |
| | 6600-1315 este | 17 | 17:35 | <1.3 |
| | 1386-RAMPA Z. E (ZONA ESTE) | 17 | 17:40 | <1.3 |
| | 1340-C/F OESTE W | 17 | 17:30 | <1.3 |
| | 1340-C/F ESTE DEL ESTE | 17 | 17:30 | <1.3 |
| | CHIMINEA DUMAS | 17 | 17:35 | <1.3 |
| | 1290-6660 | 18 | 5:35 | <1.3 |
| | C/E-1315 | 18 | 5:40 | <1.3 |
| | 6600-1315 | 18 | 5:45 | <1.3 |
| | CAMARA 1265-6400 F4 | 18 | 17:30 | <1.3 |
| | 1386-RAMPA ZONA ESTE | 18 | 17:35 | <1.3 |
| | 1340-6680 ETE | 18 | 17:40 | <1.3 |
| | 1265-7000 ESTE | 18 | 17:30 | <1.3 |

80

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-------|----------------------------|-----|-------|-------------------------------|
| Enero | 1340-CFE ESTE | 18 | 17:30 | <1.3 |
| | 6840-1315 ESTE | 18 | 17:35 | <1.3 |
| | 6800-1315 ESTE | 18 | 18:00 | <1.3 |
| | 6900-1315 ESTE | 18 | 18:00 | <1.3 |
| | 6360-1315-OESTE | 18 | 19:00 | <1.3 |
| | 1340-6440-oeste | 21 | 5:35 | <1.3 |
| | 6880-1315 | 21 | 5:40 | <1.3 |
| | 1265-6400 | 21 | 5:45 | <1.3 |
| | 1340E-CF/ESTE | 21 | 17:30 | <1.3 |
| | RAMPA PRINCIPAL ESTE | 21 | 17:35 | <1.3 |
| | C/E-1340 REQUEMA | 22 | 5:35 | <1.3 |
| | 1340-6680-ESTE | 22 | 5:40 | <1.3 |
| | 6720-1340-ESTE | 22 | 5:45 | <1.3 |
| | 6900-1315 | 22 | 5:50 | <1.3 |
| | 6880-1315 | 22 | 5:55 | <1.3 |
| | 1340E-CF/ESTE | 22 | 17:30 | <1.3 |
| | RAMPA PRINCIPAL ESTE | 22 | 17:35 | <1.3 |
| | 1340-6560 OESTE | 23 | 5:35 | <1.3 |
| | 1340-CFE ESTE | 23 | 5:40 | <1.3 |
| | 1315-6900 | 23 | 5:45 | <1.3 |
| | 1315-CONTRAFRENTE ESTE | 23 | 5:50 | <1.3 |
| | 1265-6660 R/W. | 23 | 17:30 | <1.3 |
| | 1290-6660 R/W. | 23 | 17:35 | <1.3 |
| | 1315-6320 R/W. | 23 | 17:40 | <1.3 |
| | 1315-6360 R/W. | 23 | 17:45 | <1.3 |
| | 1340-6660 R/W. | 23 | 17:50 | <1.3 |
| | Chimenea Alimak Dumas | 23 | 17:55 | <1.3 |
| | requema en principal oeste | 24 | 5:35 | <1.3 |

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-------|-----------------------|-----|-------|-------------------------------|
| Enero | 1340-6400 oeste | 24 | 5:40 | <1.3 |
| | 1315-6520 oeste | 24 | 5:45 | <1.3 |
| | 1315-6360 oeste | 24 | 5:50 | <1.3 |
| | 1315-6880 este | 24 | 6:00 | <1.3 |
| | Rampa principal Oeste | 24 | 17:30 | <1.3 |
| | 1290-6660 R/W. | 24 | 17:35 | <1.3 |
| | 1290-6760 producción | 24 | 17:40 | <1.3 |
| | 1340-6680 R/E. | 24 | 17:45 | <1.3 |
| | 1340-6720 R/w. | 24 | 17:50 | <1.3 |
| | 1290-6320 oeste | 25 | 5:35 | <1.3 |
| | 1315-6880 este | 25 | 5:40 | <1.3 |
| | 6660-1265 este | 25 | 5:45 | <1.3 |
| | 1340-6720 este | 25 | 5:50 | <1.3 |
| | chimenea dumas | 25 | 6:00 | <1.3 |
| | 1290-6760 producción | 25 | 17:30 | <1.3 |
| | 1290-6660 R/W. | 25 | 17:35 | <1.3 |
| | 1315 C/F.E. | 25 | 17:40 | <1.3 |
| | 1340 C/F. E R/E. | 25 | 17:45 | <1.3 |
| | 1340-6480 R/E. | 25 | 17:50 | <1.3 |
| | 1340-6400 R/E. | 25 | 17:55 | <1.3 |
| | 1386- ZONA ESTE | 26 | 5:35 | <1.3 |
| | 1315-6880 ESTE | 26 | 5:40 | <1.3 |
| | 1315-6920 ESTE | 26 | 5:45 | <1.3 |
| | 1340-6560 OESTE | 26 | 5:50 | <1.3 |
| | chimenea dumas | 26 | 6:00 | <1.3 |
| | Rampa principal E. | 26 | 17:30 | <1.3 |

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-------|------------------------|-----|-------|-------------------------------|
| Enero | 1185 R/E. | 26 | 17:35 | <1.3 |
| | 1290-6660 | 26 | 17:40 | <1.3 |
| | 1315 C/F. E. | 26 | 17:45 | <1.3 |
| | 1340-6760 R/E. | 26 | 17:50 | <1.3 |
| | 1340-6680 R/E. | 26 | 17:55 | <1.3 |
| | Chimenea Alimak, dumas | 26 | 18:00 | <1.3 |
| | 1290-6660 ESTE | 27 | 5:35 | <1.3 |

Donde mm/s: milímetros por segundo; NR: no registrado
 Fuente: MSR, 2014.

| Mes | Sitio | Día | Hora | Velocidad de Partícula (mm/s) |
|-------|-----------------------|-----|-------|-------------------------------|
| Enero | 1265-6740 ESTE | 27 | 5:40 | <1.3 |
| | 1290-6440 Producción | 27 | 17:30 | <1.3 |
| | 1315 C/F. E. Rampa E. | 27 | 17:35 | <1.3 |
| | 1340 C/F. E. Rampa E. | 27 | 17:40 | <1.3 |

8 Geoquímica de Roca Estéril

8.1 Sitios de Monitoreo

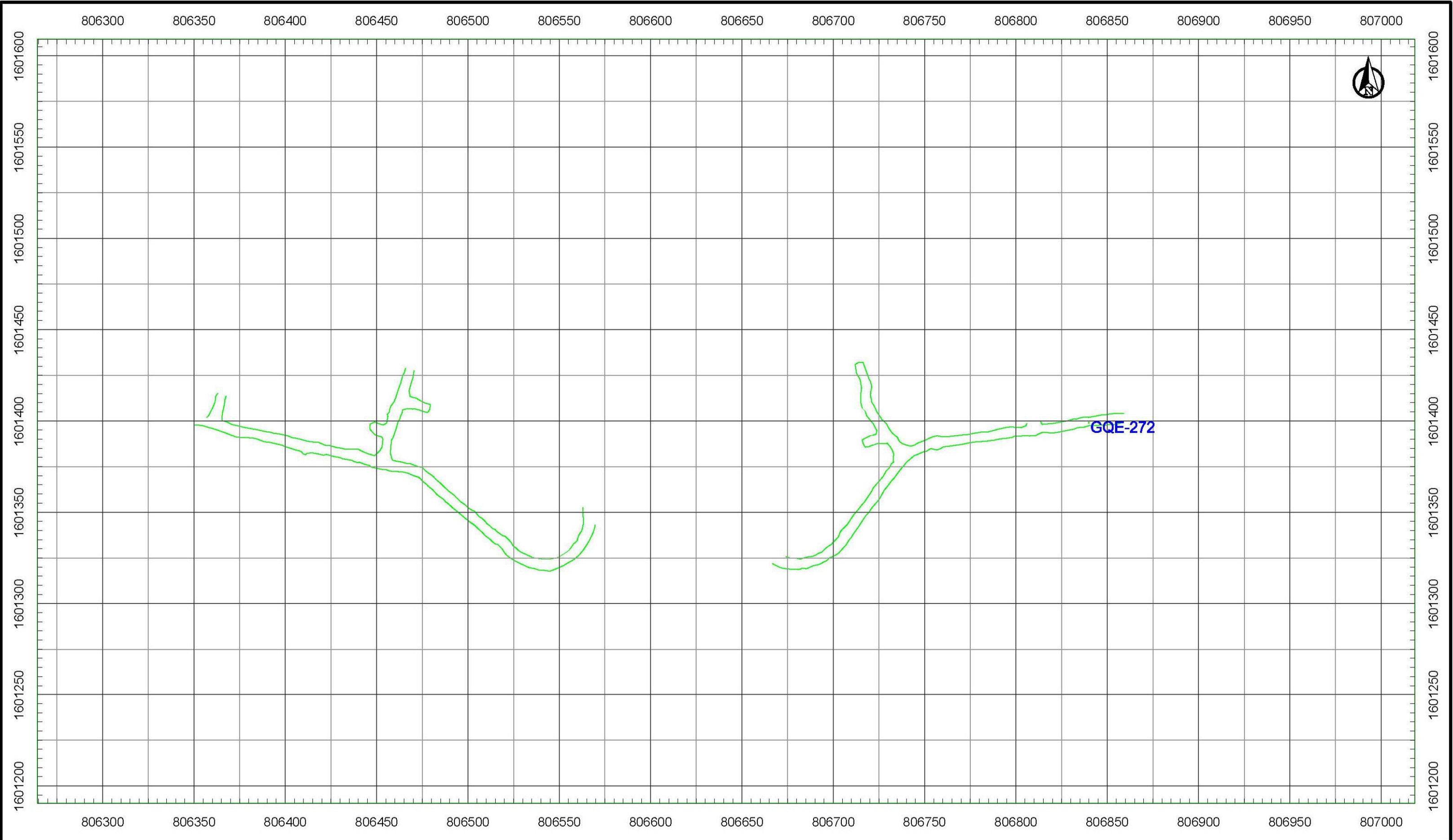
En el Cuadro 8-1 se enlistan las muestras analizadas de material extraído de los túneles del proyecto, rampa oeste y rampa este, durante los meses de Noviembre 2013 a Enero 2014. La ubicación de la extracción de las muestras se presenta en la Figura 8-1, Figura 8-2, Figura 8-3 y Figura 8-4

Cuadro 8-1: Sitios de Material Extraído de los Túneles, Proyecto Minero Escobal

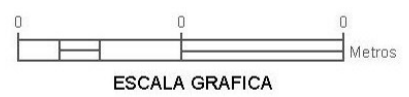
| Código de Muestra | Área | Coordenadas | | |
|-------------------|---------------|-------------|------------|---------|
| | | X | Y | Z |
| GQE-242 | 1315-6800-EC | 806800,00 | 1601388,50 | 1317 |
| GQE-243 | 1315-CFTE-EC | 806835,00 | 1601380,00 | |
| GQE-244 | 1315-6620-EC | 806619,00 | 1601376,50 | |
| GQE-245 | 1315-6720-EC | 806720,00 | 1601398,00 | |
| GQE-246 | 1340-6620-EC | 806620,00 | 1601363,00 | 1342 |
| GQE-247 | 1340-6640-EC | 806641,00 | 1601361,00 | |
| GQE-248 | 1340-6660-EC | 806661,50 | 1601352,50 | |
| GQE-249 | 1340- CFTE-EC | 806570,00 | 1601364,00 | |
| GQE-250 | 1390-ZE | 807029,00 | 1601370,00 | 1392 |
| GQE-251 | 1315-SERV-OC | 806511,60 | 1601368,20 | 1317 |
| GQE-252 | 1315-6580 | 806577,00 | 1601395,50 | |
| GQE-253 | 1315-6600 | 806601,50 | 1601389,50 | |
| GQE-254 | 1315-VENT-EC | 806596,50 | 1601354,00 | |
| GQE-255 | 1315-CFTE-EC | 806593,50 | 1601368,50 | |
| GQE-256 | 1340-CFTE-EC | 806646,70 | 1601340,00 | 1342 |
| GQE-257 | 1340-6600 | 806595,50 | 1601367,50 | |
| GQE-258 | 1265-7020-EC | 807017,50 | 1601450,50 | 1266,00 |
| GQE-259 | 1265-7040-EC | 807038,50 | 1601451,00 | |
| GQE-260 | 1265-CFTE-EC | 807048,50 | 1601447,00 | |
| GQE-261 | 1315-6800-EC | 806801,00 | 1601390,00 | 1315 |
| GQE-262 | 1315-6820-EC | 806821,00 | 1601392,00 | |
| GQE-263 | 1340-CFTE-EC | 806691,00 | 1601338,00 | 1340,00 |
| GQE-264 | 1340-6680-EC | 806681,00 | 1601355,00 | |

| Código de Muestra | Área | Coordenadas | | |
|-------------------|--------------|-------------|------------|---------|
| | | X | Y | Z |
| GQE-265 | 1340-6460-OC | 806460,00 | 1601410,00 | 1340,00 |
| GQE-266 | 1340-6480-OC | 806480,00 | 1601460,00 | |
| GQE-267 | 1340-6500-OC | 8026500,00 | 1601406,00 | |
| GQE-268 | 1340-6520-OC | 806520,00 | 1601397,00 | |
| GQE-269 | 1340-6540-OC | 806540,00 | 1601390,00 | |
| GQE-270 | 1315-CFTO-OC | 806316,00 | 1601439,00 | 1316 |
| GQE-271 | 1315-6360-OC | 806356,50 | 1601449,00 | |
| GQE-272 | 1215-REC-EC | 806840,00 | 1601399,00 | 1195 |
| GQE-273 | 1340-CFTO-OC | 806421,50 | 1601403,50 | 1341,00 |
| GQE-274 | 1315-CFTE-EC | 806893,23 | 1601392,50 | 1316,50 |
| GQE-275 | 1315-6840 | 806839,50 | 1601406,50 | |
| GQE-276 | 1315-CFTE-EC | 806675,00 | 1601376,00 | |
| GQE-277 | 1315-6340 | 806380,00 | 1601445,30 | |
| GQE-278 | 1315-6340 | 806340,00 | 1601454,20 | |
| GQE-279 | 1315-CFTO-OC | 806370,00 | 1601431,30 | |
| GQE-280 | 1340-CFTE-EC | 806740,00 | 1601335,50 | 1341 |
| GQE-281 | 1315-6880-EC | 806880,90 | 1601403,57 | 1317 |
| GQE-282 | 1340-6440-OC | 806440,00 | 1601422,00 | 1341 |
| GQE-283 | 1340-6720-EC | 806719,50 | 1601348,00 | |
| GQE-284 | ROC | 806305,00 | 1601408,50 | 1193 |
| GQE-285 | 1340-6560-OC | 806559,00 | 1601388,80 | 1341 |
| GQE-286 | 1340-6700-EC | 806699,00 | 1601350,90 | |
| GQE-287 | 1315-6320-OC | 806319,21 | 1601458,76 | 1316 |
| GQE-288 | 1315-CFTE-EC | 806792,30 | 1601377,90 | |
| GQE-289 | 1315-CFTE-EC | 806946,50 | 1601403,40 | |
| GQE-290 | REC | 806903,00 | 1601403,50 | 1195 |
| GQE-291 | 1340-6420-OC | 806419,40 | 1601419,80 | 1341,50 |
| GQE-292 | 1315-6860-EC | 806860,00 | 1601401,00 | 1317 |
| GQE-293 | 1315-6900-EC | 806902,50 | 1601409,50 | |

Fuente: MSR, 2014.

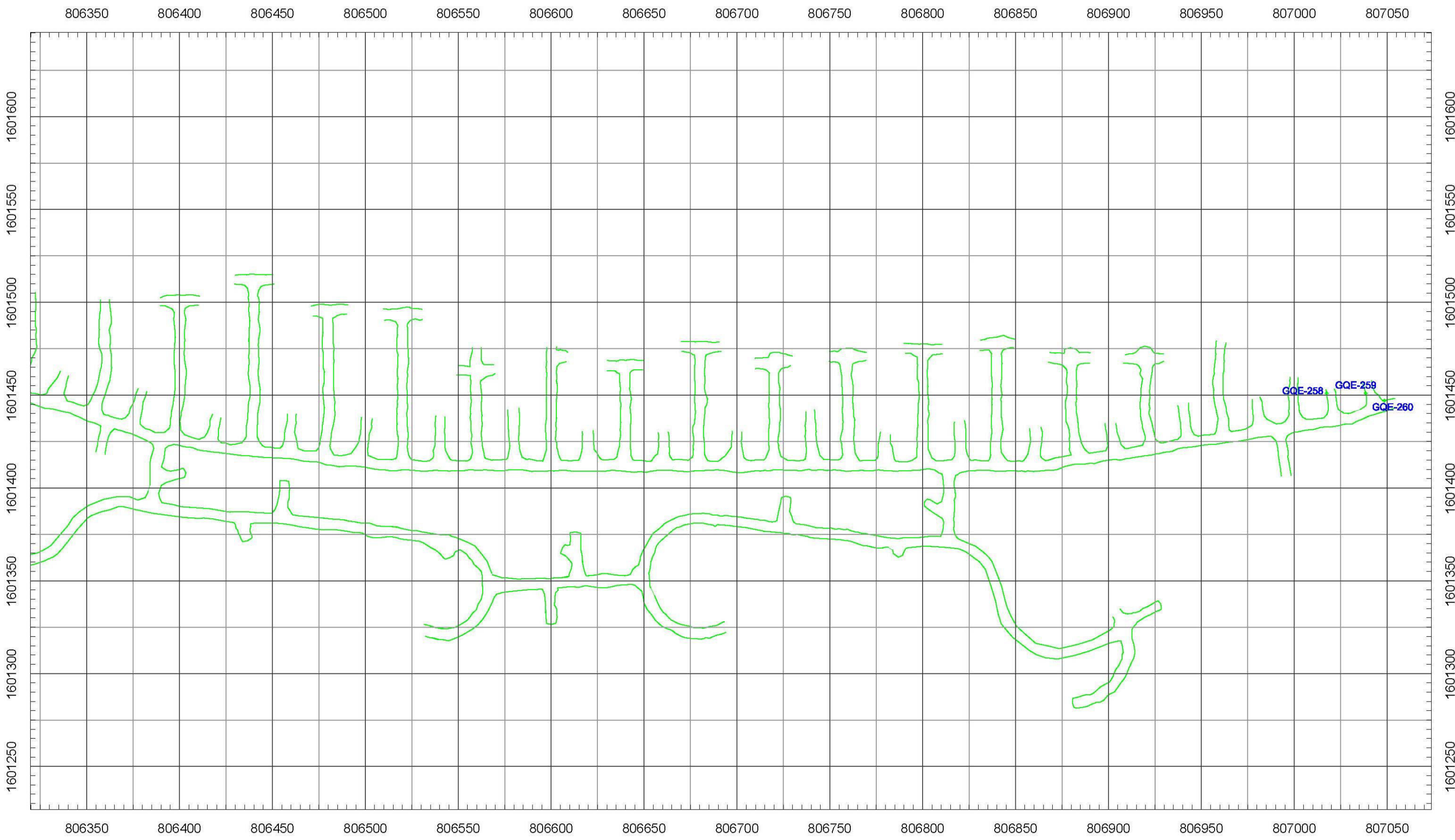


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Guatemala

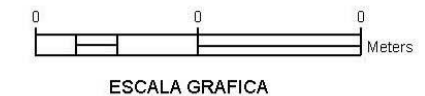


Plano ARD Nivel 1215 Nov. 2013 a Enero 2014

| Departamento | Realizó | Dibujo | Autorizó | Escala | Fecha |
|---------------|---------------------------|--------|----------------|--------|----------|
| Geología Mina | RT/MCH/GL/BL/ HC/WY/NH | FS | Richard Yancey | 1:2000 | OCT 2014 |

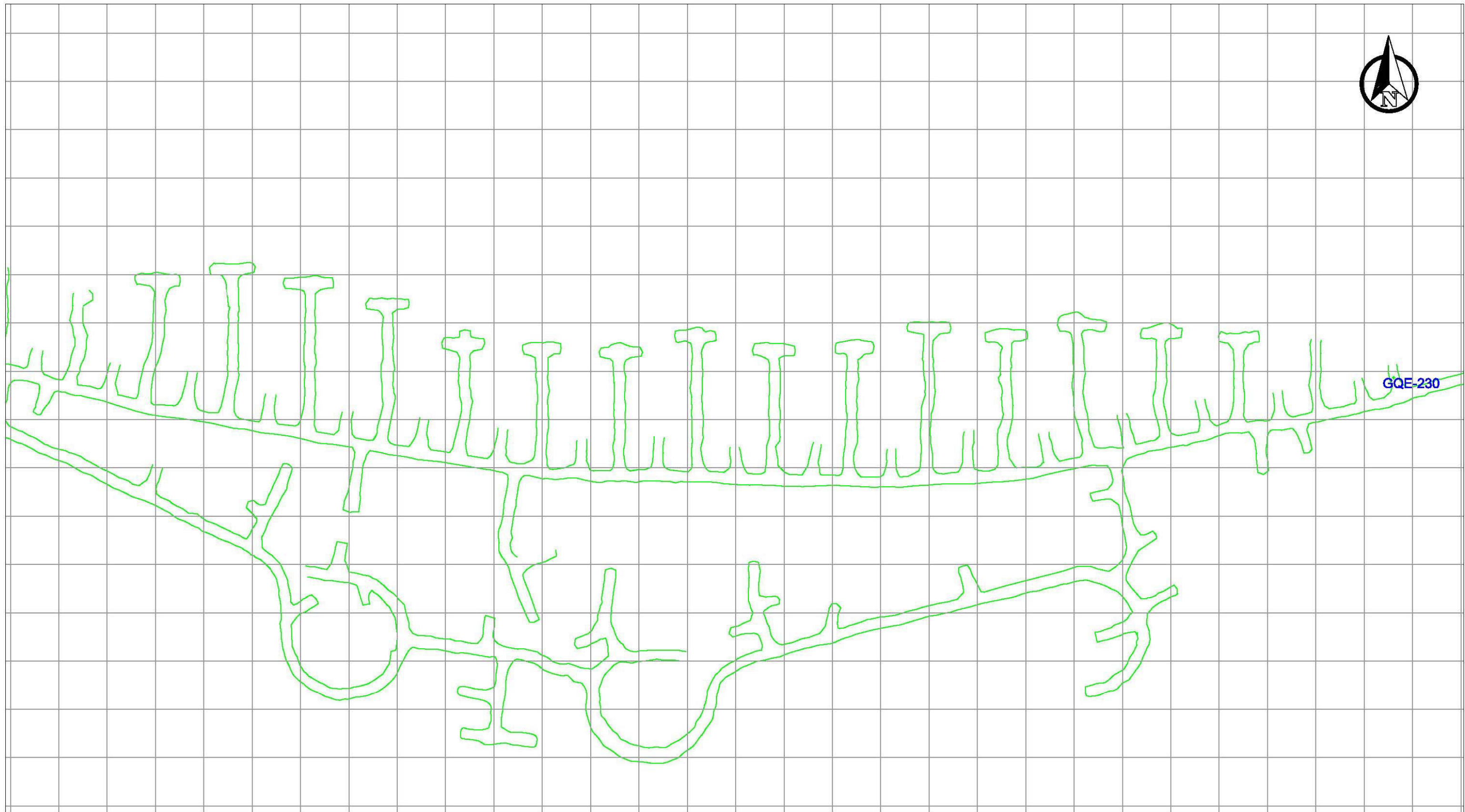
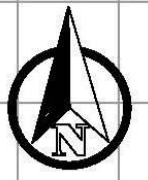


Minera San Rafael
Guatemala



Plano ARD Nivel 1265 Nov. 2013 a Enero 2014

| Departamento | Realizó | Dibujo | Autorizó | Escala | Fecha |
|---------------|---------------------------|--------|----------------|--------|----------|
| Geología Mina | RT/MCH/GL/BL/ HC/WY/NH | FS | Richard Yancey | 1:2000 | OCT 2014 |



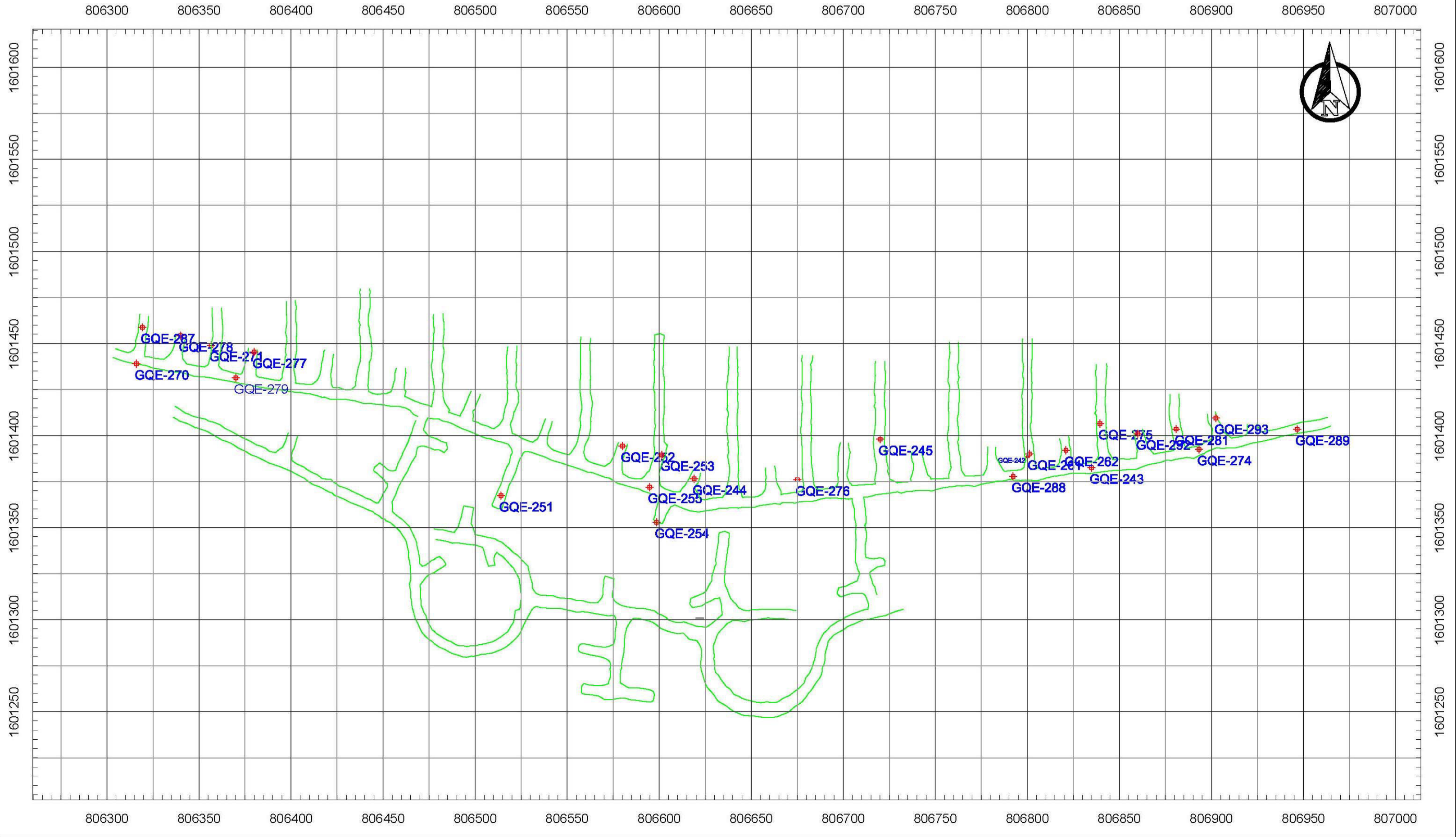
GQE-230

 **Minera San Rafael**
Guatemala



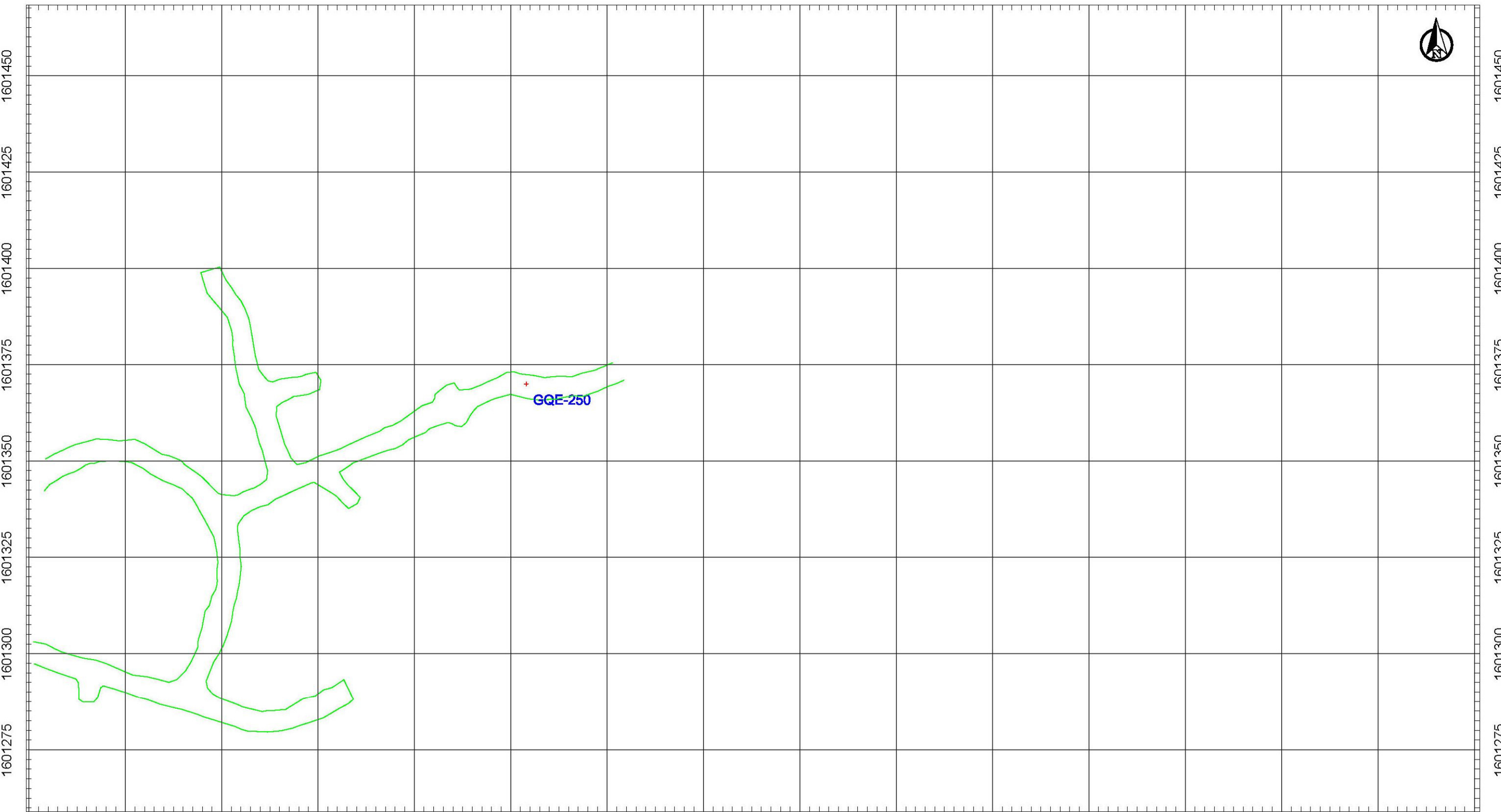
Plano ARD Nivel 1290 Nov 2013 a Enero 2014

| Departamento | Realizó | Dibujo | Autorizó | Escala | Fecha |
|---------------|---------------------------|--------|----------------|--------|----------|
| Geología Mina | RT/MCH/GL/BL/ HC/WV/NH | FS | Richard Yancey | 1:2000 | OCT 2014 |



| Departamento | Realizó | Dibujo | Autorizó | Escala | Fecha |
|---------------|-------------------------|--------|----------------|--------|----------|
| Geología Mina | RT/MCh/GLJ/BL/ HC/WV | FS | Richard Yancey | 1:2000 | OCT 2014 |

806900 806925 806950 806975 807000 807025 807050 807075 807100 807125 807150 807175 807200 807225 807250 807275



806900 806925 806950 806975 807000 807025 807050 807075 807100 807125 807150 807175 807200 807225 807250 807275

 **Minera San Rafael**
Guatemala



Plano ARD Rampa Zona Este Nov 2014 a Enero 2014

| Departamento | Realizó | Dibujo | Autorizó | Escala | Fecha |
|---------------|---------------------------|--------|----------------|--------|----------|
| Geología Mina | RT/MCh/GL/BL/ HC/WV/NG | FS | Richard Yancey | 1:1000 | OCT 2014 |

8.2 Metodología

En el Cuadro 8-2 se describe el procedimiento y equipo utilizado para la toma de muestras en pasta de material extraído en túneles.

Cuadro 8-2: Procedimiento y equipo utilizado para monitorear pH en pasta de material extraído de los túneles, Proyecto Minero Escobal

| Parámetros analizados | |
|--|-----------------------|
| pH | pH en pasta. |
| Procedimiento | |
| Basados en el método ASTM D4972-01(2007) Standard Test Method for pH of Soils. Se determinó el pH en suspensión de Roca-Agua 1:1 p/v: esto se logró tomando 50 gramos de roca pulverizada y agregándole 50 ml de agua desmineralizada, se agita por 10 minutos y se deja reposar por 10 minutos más, luego se hace lectura directa de pH sobre la suspensión con la ayuda de un potenciómetro previamente calibrado. | |
| Equipo utilizado | |
| Nombre | Potenciómetro pH & EC |
| Modelo | H-series H170G |
| Fabricante | HACH |

Fuente: MSR, 2014.

8.3 Resultados

Los resultados de pH en pasta se presentan en el Cuadro 8-3. Los valores de pH se encontraron en el rango de 8.1 a 11.26 u.e. los cuales no dieron indicios de un potencial de generación ácida. Por lo que no fue necesario realizar pruebas de laboratorio para el cálculo de ácido base modificado (ABA por sus siglas en inglés) para descartar o confirmar resultados.

Cuadro 8-3: Resultados de pH en Pasta en muestras de material extraído de Túneles, Proyecto Minero Escobal.

| Código de Muestra | Fecha Toma de Muestra | Fecha Lectura pH | pH pasta | Temperatura (°C) |
|-------------------|-----------------------|------------------|----------|------------------|
| GQE-242 | 16/11/2013 | 27/11/2013 | 8,97 | 20,2 |
| GQE-243 | 16/11/2013 | 27/11/2013 | 9,09 | 20,3 |
| GQE-244 | 16/11/2013 | 27/11/2013 | 9,13 | 19,8 |
| GQE-245 | 16/11/2013 | 27/11/2013 | 9,43 | 20,6 |
| GQE-246 | 19/11/2013 | 27/11/2013 | 9,3 | 19,8 |
| GQE-247 | 19/11/2013 | 27/11/2013 | 9,19 | 19,9 |
| GQE-248 | 19/11/2013 | 27/11/2013 | 9,01 | 22,1 |
| GQE-249 | 19/11/2013 | 27/11/2013 | 9,15 | 20,3 |
| GQE-250 | 22/11/2013 | 27/11/2013 | 9,71 | 20,9 |
| GQE-251 | 23/11/2013 | 27/11/2013 | 11,26 | 19,2 |
| GQE-252 | 23/11/2013 | 27/11/2013 | 9,05 | 20,8 |

| Código de Muestra | Fecha Toma de Muestra | Fecha Lectura pH | pH pasta | Temperatura (°C) |
|-------------------|-----------------------|------------------|----------|------------------|
| GQE-253 | 23/11/2013 | 27/11/2013 | 9,21 | 19,5 |
| GQE-254 | 23/11/2013 | 27/11/2013 | 9,08 | 20,3 |
| GQE-255 | 23/11/2013 | 27/11/2013 | 9,03 | 19,4 |
| GQE-256 | 23/11/2013 | 27/11/2013 | 9,11 | 20,4 |
| GQE-257 | 23/11/2013 | 27/11/2013 | 9,26 | 19,5 |
| GQE-258 | 03/12/2013 | 14/12/2013 | 8,49 | 24,9 |
| GQE-259 | 03/12/2013 | 14/12/2013 | 8,31 | 26,1 |
| GQE-260 | 04/12/2013 | 14/12/2013 | 8,42 | 25,6 |
| GQE-261 | 13/12/2013 | 20/12/2013 | 8,39 | 16,6 |
| GQE-262 | 13/12/2013 | 20/12/2013 | 8,57 | 18,1 |
| GQE-263 | 15/12/2013 | 20/12/2013 | 8,13 | 17,5 |
| GQE-264 | 15/12/2013 | 20/12/2013 | 8,6 | 16,3 |
| GQE-265 | 15/12/2013 | 20/12/2013 | 8,69 | 17,8 |
| GQE-266 | 15/12/2013 | 20/12/2013 | 8,84 | 16,9 |
| GQE-267 | 15/12/2013 | 20/12/2013 | 8,81 | 17,3 |
| GQE-268 | 15/12/2013 | 20/12/2013 | 8,88 | 18,1 |
| GQE-269 | 15/12/2013 | 20/12/2013 | 8,93 | 16,7 |
| GQE-270 | 17/12/2013 | 29/12/2013 | 8,57 | 23,4 |
| GQE-271 | 17/12/2013 | 29/12/2013 | 8,10 | 22,8 |
| GQE-272 | 18/12/2013 | 29/12/2013 | 8,77 | 23,2 |
| GQE-273 | 20/12/2013 | 29/12/2013 | 8,12 | 23,5 |
| GQE-274 | 21/12/2013 | 29/12/2013 | 8,60 | 23,5 |
| GQE-275 | 21/12/2013 | 29/12/2013 | 8,55 | 23,8 |
| GQE-276 | 21/12/2013 | 29/12/2013 | 8,77 | 23,4 |
| GQE-277 | 21/12/2013 | 29/12/2013 | 8,28 | 23,5 |
| GQE-278 | 21/12/2013 | 29/12/2013 | 8,48 | 23,2 |
| GQE-279 | 21/12/2013 | 29/12/2013 | 8,49 | 23,5 |
| GQE-280 | 25/12/2013 | 30/12/2013 | 8,41 | 19,3 |
| GQE-281 | 10/01/2014 | 28/01/2014 | 8,77 | 21,3 |
| GQE-282 | 13/01/2014 | 28/01/2014 | 8,91 | 21,1 |
| GQE-283 | 13/01/2014 | 28/01/2014 | 9,15 | 21,2 |
| GQE-284 | 21/01/2014 | 28/01/2014 | 9,36 | 21,2 |
| GQE-285 | 22/01/2014 | 28/01/2014 | 9,08 | 20,4 |
| GQE-286 | 22/01/2014 | 28/01/2014 | 8,89 | 21,2 |
| GQE-287 | 22/01/2014 | 28/01/2014 | 8,71 | 20,8 |
| GQE-288 | 22/01/2014 | 28/01/2014 | 8,83 | 21,3 |
| GQE-289 | 22/01/2014 | 28/01/2014 | 8,96 | 21,1 |
| GQE-290 | 22/01/2014 | 28/01/2014 | 9,09 | 20,8 |
| GQE-291 | 23/01/2014 | 28/01/2014 | 8,89 | 20,0 |
| GQE-292 | 28/01/2014 | 30/01/2014 | 8,55 | 21,9 |
| GQE-293 | 28/01/2014 | 30/01/2014 | 8,84 | 21,8 |

Fuente: MSR, 2014.

9 Mediciones de Seguridad Industrial y Salud Ocupacional

9.1 Presión Sonora

La medición de Presión Sonora en el trimestre de Noviembre 2013 a Enero 2014 se muestra en el Cuadro 9-1. Se hicieron monitoreos mediante el uso de dosímetros portables y posteriormente se realizan comparaciones con la norma OSHA. Los resultados muestran que se está dentro de parámetros aceptables OSHA en los puntos evaluados. Se debe considerar que el parámetro Leq está acumulado para periodo de 10.6 y 12 horas lo que implica una mayor dosis recibida por efecto de acumulación. Sin embargo los datos se encuentran dentro de parámetros aceptables; lo que indica que si con 24 horas de exposición es aceptable, al estar expuesto a un periodo menor se cumple con las normas establecidas.

Para este trimestre también se han incluido mediciones realizadas al interior de la Mina bajo un método puntual, las cuales se muestran en el Cuadro 9-2 y donde los resultados fueron satisfactorios, ya que la dosis recibida para los trabajadores con uso del protector auditivo, está dentro de niveles aceptables.

Cuadro 9-1: Resultados de Presión Sonora de Salud Ocupacional, Proyecto Minero Escobal

| Puesto de Operador de Jumbo | | | | Puesto de Operador de Scoop | | | |
|---|---|---|---|---|---|---|---|
| Trimestre | 2013 | | | 2014 | | | |
| | Nov | Dic | Ene | | | | |
| Mes | IV | | | Mes | IV | | |
| Fecha | 11/11/2013 | 16/12/2013 | 13/01/2014 | Fecha | 11/11/2013 | 16/12/2013 | 13/1/14 |
| Hora Inicio | 7:00am | 7:00am | 19:00 | Hora Inicio | 7:00am | 19:00 | 7:00am |
| Duración | 12 hrs | 12 hrs | 12 hrs | Duración | 12 hrs | 12 hrs | 12 hrs |
| Lmax dBA | 141.5 | 142.7 | 140.5 | Lmax dBA | 143.2 | 142.2 | 142.75 |
| Lmin dBA | 60 | 60 | 60 | Lmin dBA | 60 | 60 | 60 |
| Prom. Diurno dBA | 91.5 | 92 | - | Prom. Diurno dBA | - | 92.9 | - |
| Prom. Nocturno dBA | - | - | 90.9 | Prom. Nocturno dBA | 94.4 | - | 93.6 |
| Límite Nivel de Sonido Ponderado-A dBA acorde a OSHA para 12 horas (12.1 horas y 10.6 horas)* | 86 | 86 | 86 | Límite Nivel de Sonido Ponderado-A dBA acorde a OSHA para 12 horas (12.1 horas y 10.6 horas)* | 86 | 86 | 86 |
| Límite Nivel de Sonido Ponderado-A dBA acorde a OSHA para 24 horas (24.3 horas y 21.1 horas)* | 87 | 87 | 87 | Límite Nivel de Sonido Ponderado-A dBA acorde a OSHA para 24 horas (24.3 horas y 21.1 horas)* | 87 | 87 | 87 |
| Duración de Referencia OSHA | 24.3h | 24.3h | 24.3h | Duración de Referencia OSHA | 24.3h | 24.3h | 24.3h |
| Leq (Normal sin uso de EPP) | 21.1h | 21.1h | 21.1h | Leq (Normal sin uso de EPP) | 21.1h | 21.1h | 21.1h |
| Leq ajustado (Con EPP, homologación 29 dBA a 50% = NRR 14.5 c) | 90.8 | 93.1 | 90 | Leq ajustado (Con EPP, homologación 29 dBA a 50% = NRR 14.5 c) | 88.97 | 90 | 91.4 |
| Leq ajustado (Con EPP, homologación 29 dBA a 50% = NRR 14.5 c) | 76.3 | 78.6 | 75.5 | Leq ajustado (Con EPP, homologación 29 dBA a 50% = NRR 14.5 c) | 74.47 | 75.5 | 76.9 |
| Observación/Comentario | Sin EPP reprobare a la dBA, considerando que el tiempo efectivo del turno es < 10.6 hr. | Sin EPP reprobare a la dBA, considerando que el tiempo efectivo del turno es < 10.6 hr. | Sin EPP reprobare a la dBA, considerando que el tiempo efectivo del turno es < 10.6 hr. | Observación/Comentario | Sin EPP reprobare a la dBA, considerando que el tiempo efectivo del turno es < 10.6 hr. | Sin EPP reprobare a la dBA, considerando que el tiempo efectivo del turno es < 10.6 hr. | Sin EPP reprobare a la dBA, considerando que el tiempo efectivo del turno es < 10.6 hr. |
| Resultado (Leq ajustado < Límite, entonces es Aceptable) | Aceptable | Aceptable | Aceptable | Resultado (Leq ajustado < Límite, entonces es Aceptable) | Aceptable | Aceptable | Aceptable |

| Puesto de Operador de Boltec | | | Puesto de Supervisión Mina | | |
|---|---|---|---|---|--|
| Trimestre | 2013 | | 2014 | | |
| | Nov | Ene | Nov | Ene | |
| Mes | IV | | IV | | |
| Fecha | 11/11/2013 | | 13/01/2014 | | |
| Hora Inicio | 19:00 | 7:00 | 19:00 | 7:00 | |
| Duración | 12 hrs | 12 hrs | 12 hrs | 12 hrs | |
| Lmax dBA | 140.2 | 144.1 | 144 | 143.6 | |
| Lmin dBA | 60 | 60 | 60 | 60 | |
| Prom. Diurno dBA | - | - | - | - | |
| Prom. Nocturno dBA | 90.9 | 94.7 | 94.1 | 93.4 | |
| Límite Nivel de Sonido Ponderado-A dBA acorde a OSHA para 12 horas (12.1 horas y 10.6 horas)* | 86 | 86 | 86 | 86 | |
| Límite Nivel de Sonido Ponderado-A dBA acorde a OSHA para 24 horas (24.3 horas y 21.1 horas)* | 87 | 87 | 87 | 87 | |
| Duración de Referencia OSHA | 24.3h | 24.3h | 24.3h | 24.3h | |
| Leq (Normal sin uso de EPP) | 21.1h | 21.1h | 21.1h | 21.1h | |
| Leq (Normal sin uso de EPP) | 94.7 | 89 | 89 | 89.3 | |
| Leq ajustado (Con EPP, homologación 29 dBA a 50% = NRR 14.5 c) | 80.2 | 74.5 | 74.5 | 74.8 | |
| Leq ajustado (Con EPP, homologación 29 dBA a 50% = NRR 14.5 c) | 74.5 | 74.5 | 74.5 | 74.8 | |
| Observación/Comentario | Sin EPP reprobare a la dBA, considerando que el tiempo efectivo del turno es < 10.6 hr. | Sin EPP reprobare a la dBA, considerando que el tiempo efectivo del turno es < 10.6 hr. | Sin EPP reprobare a la dBA, considerando que el tiempo efectivo del turno es < 10.6 hr. | Sin EPP reprobare a la dBA, considerando que el tiempo efectivo del turno es < 10.6 hr. | |
| Resultado (Leq ajustado < Límite, entonces es Aceptable) | Aceptable | Aceptable | Aceptable | Aceptable | |

Fuente: MSR, 2014.

Cuadro 9-2: Resultados de Mediciones de Presión Sonora en Mina Subterránea, Proyecto Minero Escobal

| Ciclo | PASO BÁSICO DEL CICLO | CICLO DE MINADO | Tiempo de exposición al nivel de ruido en horas = C | Nivel máximo permitido 12.1 horas OSHA dbA (T1) | Nivel máximo permitido 10.6 horas OSHA dbA (T2) | Nivel de Ruido en dbA en Fast/Hi | Nivel de Ruido dbA en Slow/Low | Exposición | | Promedio del Tiempo de exposición máximo permisible OSHA en el nivel de ruido promedio para E1 en horas = T1 sin EPP | Promedio del Tiempo de exposición máximo permisible OSHA en el nivel de ruido promedio para E2 en horas = T2 con EPP | d = % de la dosis permitida sin epp (C/T1) | % Dosis diaria acumulada sin EPP | d = % de la dosis permitida con epp (C/T2) | % Dosis diaria acumulada con EPP | | |
|--|-----------------------|-------------------------|---|---|---|----------------------------------|--------------------------------|---|---|--|--|--|----------------------------------|--|----------------------------------|---------|---------|
| | | | | | | | | Exposición Promedio Sin epp= E1 dbA Medido en modo Lento/Bajo | Exposición Promedio con epp (50% atenuación proyectada del NRR 29dbA = 14.5 dbA) = E2 | | | | | | | | |
| | | | Variable | Variable | Medido | Fijo | Fijo | Variable | Variable | Medido | Fórmula | Tabla | Tabla | Fórmula | Fórmula | Fórmula | Fórmula |
| Trimestre IV (Noviembre, Diciembre, Enero) | 1 | Rezagado/Acarreo | 1.5 | 87 | 88 | 95 | 92 | 77.5 | 6.2 | 32 | 24.19% | 24.19% | 4.69% | 4.69% | | | |
| | 2 | Fortificación/Sostenier | 2.5 | 87 | 88 | 94 | 92 | 77.5 | 6.2 | 32 | 40.32% | 64.52% | 7.81% | 12.50% | | | |
| | 3 | Lanzado | 3 | 87 | 88 | 90 | 89 | 74.5 | 9.2 | 32 | 32.61% | 97.12% | 9.38% | 21.88% | | | |
| | 4 | Perforando | 3 | 87 | 88 | 103 | 101 | 86.5 | 1.7 | 13 | 176.47% | 273.60% | 23.08% | 44.95% | | | |
| | 5 | Cargando | 1 | 87 | 88 | 83 | 80 | 65.5 | 21.1 | 32 | 4.74% | 278.33% | 3.13% | 48.08% | | | |
| TOTALES | | | 11 | Horas de ciclo óptimo calculado | | | | | | | | | | | | | |
| EQUIPO UTILIZADO: | | | SOUND LEVEL METER | | | | | | | | | | | | | | |
| MARCA: | | | RadioShack Technology PLUS | | | | | | | | | | | | | | |
| MODELO: | | | 3300099 | | | | | | | | | | | | | | |
| SERIAL | | | 03A12 | | | | | | | | | | | | | | |
| CALIBRADOR: | | | ACOUSTIC CALIBRATOR CLASS 1 | | | | | | | | | | | | | | |
| MARCA: | | | 3M QUEST | | | | | | | | | | | | | | |
| MODELO: | | | AC-300 | | | | | | | | | | | | | | |
| SERIAL | | | AC-300001349 | | | | | | | | | | | | | | |
| CLASE Y REFERENCIA: | | | IEC 60942 2003, ANSI S1.40 (R2011), 114db - 1kHz, 250 Hz | | | | | | | | | | | | | | |
| CONCLUSIÓN: | | | De acuerdo a cálculos y estudios, se concluye que con el uso de EPP tapon auditivo que tiene atenuación de 29dbA y una efectividad proyectada de NRR 14.5 dbA, entonces se está recibiendo solo un 35% de la dosis marcada por OSHA, en este sentido el no usar el EPP, implicará excederse mas de 45% de la dosis. | | | | | | | | | | | | | | |

D1= 278%
D1= 2.7833 Sin EPP
D2= 48%
D2= 0.4808 Con EPP

D1 ≥ 1 Entonces aplicar controles, máquinas, medio ambiente, EPP.

D2 ≥ 1 Fuera de norma. D2 < 1 Aceptable

RESULTADO FINAL: D2 < 1 ACEPTABLE

Fuente: MSR, 2014.

9.2 Mediciones de Partículas Respirables

Debido al proceso de cierre de construcción, el monitoreo de partículas respirables se dejó de realizar en los puntos EA-1A y EA-2A. Los resultados se muestran en el Cuadro 9-3 y son exclusivos del área Subterránea, Superficie y Planta de Proceso. En este trimestre los resultados fueron satisfactorios y se está dentro de parámetros aceptables, en algunos casos de manera normal y otros después de la aplicación del factor de compensación por homologación de EPP, por lo tanto se está dentro de rango y en ningún momento se excede el límite normal, que es el parámetro que refiere el fabricante para el respirador usado en las áreas de monitoreo, marca 3M código 8210 N95 Homologación NIOSH.

Cuadro 9-3: Resultados de Material Particulado de Salud Ocupacional, Proyecto Minero Escobal

| Superficie Planta de Proceso | | | | 2013 | |
|--|-------------------|--|--|----------|------------|
| Trimestre | | | | IV | |
| Mes | Unidades | NORMA DE REFERENCIA PARA SILICE/SILICONA | AJUSTE DE EXPOSICION CON LA CERTIFICACION DEL FILTRO 7093C/37173 3M P100 (99.97% DE EFICIENCIA MÍNIMA) CON EPP | Nov | Dic |
| Fecha | | | | 29/11/13 | 23/12/13 |
| Hora Inicio | | | | 14:37 | 11:37 |
| Duración | | | | OSHA | 99.97% |
| OSHA Fraccion Respirable PM ₄ | mg/m ³ | 5 | 16667 | 0.10 | 0.27 |
| OSHA Polvo Total @ PM ₁₀ | mg/m ³ | 15 | 50000 | 0.16 | 0.43 |
| <p>Nota: OSHA Fracción respirable no fue tomado en esta ocasión, sin embargo sea con el uso de EPP o sin el uso de el (ajustando con la norma OSHA) del respirador mismo, ajuste recomendado por el fabricante, estamos dentro de parámetros, es decir que si comparamos aún la norma para fracción respirable con el resultado de Polvo Total, estamos mas que seguros de estar dentro de norma.</p> | | | | | |
| Interior Mina General | | | | 2013 | 2014 |
| Trimestre | | | | IV | |
| Mes | Unidades | NORMA DE REFERENCIA PARA SILICE/SILICONA | AJUSTE DE EXPOSICION CON LA CERTIFICACION DEL FILTRO 7093C/37173 3M P100 (99.97% DE EFICIENCIA MÍNIMA) CON EPP | Dic | Ene |
| Fecha | | | | 28/12/13 | 17/01/2014 |
| Hora Inicio | | | | 14:37 | 15:22 |
| Duración | | | | OSHA | 99.97% |
| OSHA Fraccion Respirable PM ₄ | mg/m ³ | 5 | 16667 | 0.95 | 2.43 |
| OSHA Polvo Total @ PM ₁₀ | mg/m ³ | 15 | 50000 | 1.11 | 3.58 |
| <p>Nota: OSHA Fracción respirable no fue tomado en esta ocasión, sin embargo sea con el uso de EPP o sin el uso de el (ajustando con la norma OSHA) del respirador mismo, ajuste recomendado por el fabricante, estamos dentro de parámetros, es decir que si comparamos aún la norma para fracción respirable con el resultado de Polvo Total, estamos mas que seguros de estar dentro de norma.</p> | | | | | |

Fuente: MSR, 2014.

9.3 Mediciones de Gas

Las mediciones de Gas, se hacen en forma rutinaria (turno a turno) y debido a que no se ha rebasado los límites permisibles cuando se encuentra maquinaria presente trabajando en las áreas según norma OSHA (Tabla Z1 1910.100 Límites para aires contaminados), es la razón por la que se ha mantenido los sistemas de ventilación de manera normal. Como se puede apreciar en el Cuadro 9-4 se siguió monitoreando la no presencia de Ácido Sulhídrico - Sulfuro de Hidrógeno (H_2S) y se omitirá hasta detectarse la primera vez. De igual forma, para efectos de publicación de informes, se seleccionará la primera etapa del ciclo que aparezca en las mediciones rutinarias, por lo que en los resultados se ha colocado como mínimo 3 turnos de alguno de los meses del trimestre, a fin de tener información más compacta y sistematizada.

Cuadro 9-4: Extracto de las mediciones del IV trimestre 2013, acorde a procedimiento de tomar la primera etapa del ciclo que aparezca.

| MEDICIONES DE CALIDAD DE AIRE Y TEMPERATURA EN INTERIOR MINA 2013 | | | | | | | |
|---|----------------------------|----------------------|------------------------|--|-------|----------|-------------------|
| FECHA | Lugar | Maquinaria | Etapas de Ciclo | CO (PPM) | Hora | Turno | Reportado por |
| | | | | Límite Máximo Turno 25ppm, Exposición Breve 50 ppm | | | |
| 16-dic-13 | Este 1340 CFE | Ninguna | Pegada turno anterior | 20 | 07:00 | Diurno | Antonio Sapon |
| | Este 1340 6880 | Ninguna | Pegada turno anterior | 30 | 07:00 | | |
| | Oeste 1315 6560 | Ninguna | Pegada turno anterior | 8 | 07:10 | | |
| | Este 1315 6860 | Ninguna | Pegada turno anterior | 20 | 07:00 | | |
| | Este 1340 6800 | RB-01 | Fertilización | 1 | 08:50 | | |
| | 1340 CFE | Scoop y camión | Reza | 8 | 10:55 | | |
| | 1265 6800 | HT y LL | Acumulando mineral | 33 | 11:35 | | |
| | 1315 CFQ | RB-06 | Fertilización | 0 | 12:00 | | |
| | 1315 6600 | RB-05 | Fertilización | 7 | 12:25 | | |
| | 1315 6340 | ST-02 y CM-03 | Zarpo | 8 | 13:15 | | |
| | 1340 6680 | RB-04 | Fertilización | 7 | 13:30 | | |
| | 1215 ACC Oeste | LM-55 | Sondeo UD | 0 | 13:55 | | |
| 17-dic-13 | 1340-6520 | Ninguna | Ninguna | 18 | 18:24 | Nocturno | Jose Carrillo |
| | 1315-6600 | Ninguna | Ninguna | 0 | 18:36 | | |
| | 1315-6600 | DB-05 | Fertilización | 10 | 01:25 | | |
| | 1315-6560 | JD-02 | Perforación | 0 | 02:30 | | |
| | 1215-Ramp. Oeste | RB-04 | Fertilización | 0 | 03:55 | | |
| | 1315-6340 | ST-02 | Zarpo | 17 | 04:35 | | |
| | 1290-6920 | FT-01 | Inyección de cables | 12 | 04:50 | | |
| | 1340-6560 | LL-05 | Reza | 27 | 04:30 | | |
| 18-dic-13 | Este 1240 6840 | Ninguna | Pegada turno anterior | 17 | 06:28 | Diurno | Amarildo Mijangos |
| | Este 1215 Rampa | Ninguna | Pegada turno anterior | 6 | 06:30 | | |
| | Oeste 1340 6380 | Ninguna | Pegada turno anterior | 0 | 06:40 | | |
| | Oeste 1315 6660 | Ninguna | Pegada turno anterior | 1 | 06:45 | | |
| | 1340 6440 O | ST02 | Lanzado | 6 | 10:15 | | |
| | 1315 Frense | JD03 | Perforando | 8 | 10:35 | | |
| | 1340 6640 Este | RD06 | Fertilizando | 12 | 12:00 | | |
| | 1315 CFE | AT10 | Cargado | 2 | 12:50 | | |
| 1340 6660 O | RD06 | Fertilizando | 5 | 13:00 | | | |
| 18-dic-13 | 1340 6520 | Ninguna | Ninguna | 6 | 18:30 | Nocturno | Augusto Santizo |
| | 1315 6340 | Ninguna | Ninguna | 30 | 18:35 | | |
| | 1340 6660 | Ninguna | Ninguna | 36 | 18:40 | | |
| | 1315 CFTE | Ninguna | Ninguna | 27 | 18:55 | | |
| | 1315 6660 | Ninguna | Ninguna | 27 | 18:55 | | |
| | 1340 | Ninguna | Ninguna | 11 | 20:50 | | |
| | 1366 | LL-30 | Rezagado | 11 | 20:30 | | |
| | 1215 Acceso Este | LM-75 | Sondeo | 1 | 20:45 | | |
| | Frente Principal del Este | LL-03 | Limpando frente | 2 | 21:10 | | |
| | 1315 6600 | JD-22 | Perforando para cargar | 10 | 21:40 | | |
| | 1315 6800 | JD-05 | Perforando para cargar | 14 | 22:10 | | |
| | 1340 CF TE | RB-06 | Fertilizando | 11 | 23:00 | | |
| 19-dic-13 | Este 1340 CF TO | Ninguna | Pegada turno anterior | 9 | 06:20 | Diurno | Amarildo Mijangos |
| | Este 1340 6440 | Ninguna | Pegada turno anterior | 9 | 06:28 | | |
| | Oeste 1315 6800 | Ninguna | Pegada turno anterior | 7 | 06:32 | | |
| | Oeste 1315 CFE | Ninguna | Pegada turno anterior | 8 | 06:38 | | |
| | 1265-6800 E | ST02 | Lanzado | 12 | 10:40 | | |
| | Rampa Principal del Este | RD03 | Fertilizando | 10 | 11:00 | | |
| | 1315 Este | LM05 | Perforando | 9 | 11:30 | | |
| | 1340 CFE Este | JD06 | Perforando | 9 | 12:05 | | |
| | 1340-6600 E | JD03 | Perforando | 6 | 12:35 | | |
| | 1340 CF TO Este | TI 02 | Servicio | 6 | 13:00 | | |
| 19-dic-13 | 1315 CF TO | Ninguna | Ninguna | 30 | 18:40 | Nocturno | Augusto Santizo |
| | 1315 6600 | Ninguna | Ninguna | 48 | 18:45 | | |
| | 1340 CF TE | Ninguna | Ninguna | 24 | 18:55 | | |
| | 1340 6600 | Ninguna | Ninguna | 12 | 18:56 | | |
| | 1340 6720 | Ninguna | Ninguna | 24 | 18:55 | | |
| | Frente Principal del Este | LL-03 | Limpando frente | 4 | 21:00 | | |
| | Frente principal del oeste | JD-03 | Perforando | 1 | 21:15 | | |
| | 1215 Acceso Oeste | LM-55 | Sondeo | 2 | 21:35 | | |
| | 1290 6660 | Cubex | Perforando | 4 | 22:00 | | |
| | 1315 CF TE | RB-05 | Fertilizando | 10 | 22:30 | | |
| | 1315 6800 | RB-04 | Fertilizando | 12 | 23:00 | | |
| | 20-dic-13 | Este 1340-6700 | Ninguna | Pegada turno anterior | 19 | | |
| Este 1240-6520 | | Ninguna | Pegada turno anterior | 6 | 06:35 | | |
| Oeste 1315 | | Ninguna | Pegada turno anterior | 4 | 06:39 | | |
| 1315-6560 O | | Ninguna | Pegada turno anterior | 10 | 06:45 | | |
| 1315-6840 | | Ninguna | Pegada turno anterior | 32 | 06:50 | | |
| 1340-6560 O | | LM75 | Perforando | 2 | 09:20 | | |
| 1340 Subestacion O. | | LI08 | Trabajo de Concreto | 7 | 08:45 | | |
| 1340 CFQ O | | LI08 | Rezagado | 7 | 09:00 | | |
| 1315 CFE | | JD06 | Perforando | 8 | 10:14 | | |
| 1340-6600 E | | RD02 | Fertilizando | 11 | 11:38 | | |
| 1340-6600 E | AT01 | Marcado | 12 | 12:20 | | | |
| 1315 6560 O | RD05 | Fertilizando | 6 | 13:35 | | | |
| 21-dic-13 | 1340-CFD | Ninguna | Ninguna | 12 | 06:24 | Diurno | Jose Carrillo |
| | 1340-CFE | Ninguna | Ninguna | 44 | 06:36 | | |
| | 1340-6700 | Ninguna | Ninguna | 22 | 06:38 | | |
| | 1340-6880 | Ninguna | Ninguna | 17 | 06:45 | | |
| | 1340-6800 | Ninguna | Ninguna | 19 | 07:05 | | |
| | 1215-Ramp. EC | Ninguna | Ninguna | 0 | 07:08 | | |
| | 1315-CFE | Ninguna | Ninguna | 10 | 07:10 | | |
| | 1315-6600 | Ninguna | Ninguna | 15 | 07:12 | | |
| | 1315-6560 | Ninguna | Ninguna | 11 | 07:15 | | |
| | 1215-Ramp. EC | ST-02 | Zarpo | 18 | 08:25 | | |
| | Acceso 1215-EC | LM-55 | Sondeo | 10 | 09:30 | | |
| | 1315-CFD | RB-05 | Fertilización | 10 | 10:55 | | |
| | 1315-CFD | LL-05 | Reza | 27 | 11:35 | | |
| | 1290-6760 | LH-02 | Perforación | 12 | 12:50 | | |
| | 1290-6920 | RB-02 | Fertilización | 11 | 13:30 | | |
| 1315-6840 | AT-02 | Cargue de explosivos | 16 | 14:55 | | | |
| 1315-6860 | JD-02 | Perforación | 7 | 16:15 | | | |
| 21-dic-13 | 1340 6880 | Ninguna | Ninguna | 0 | 19:04 | Nocturno | Augusto Santizo |
| | 1340 6840 | Ninguna | Ninguna | 25 | 19:08 | | |
| | 1290 6880 | Ninguna | Ninguna | 45 | 19:30 | | |
| | 1315 6800 | Ninguna | Ninguna | 25 | 19:15 | | |
| | 1315 6840 | Ninguna | Ninguna | 0 | 19:18 | | |
| | 1265 6880 | TL-01 | Colocando manga | 20 | 20:25 | | |
| | 1290 6800 | ST-02 | Lanzado | 10 | 20:40 | | |
| | Rampa Este | Patrol | Mantenimiento de rampa | 14 | 21:00 | | |
| | 1290 6960 | Cubex | Perforando | 25 | 23:10 | | |
| | 1340 6560 | DD-01 | Sondeo | 7 | 00:10 | | |

Fuente: MSR, 2014.

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10 Conclusiones

10.1 Mediciones del aire en el ambiente

- 1) El material particulado (**PM₁₀**), los gases de combustión (**SO₂** y **NO₂**) y los niveles de presión sonora (**NPS**) presentaron valores por debajo de las guías establecidos por la USEPA (**PM₁₀**, **SO₂** y **NO₂**), Banco Mundial (**PM₁₀**, **SO₂**, **NO₂** y **NPS**), OMS (**SO₂** y **NO₂**) y British Columbia (**SO₂** y **NO₂**). Los niveles de **PM₁₀** se encontraron dentro de los valores máximos y mínimos registrados durante el establecimiento de la línea base del Proyecto y el mercurio en **PM₁₀** se detectó en cuatro (EA-1B, EA-3A, EA-4A y EA-7A) de siete estaciones, encontrándose ligeramente arriba del límite de detección del método.

10.2 Mediciones del agua, sedimentos y efluentes en el ambiente

- 2) Del control de calidad (blancos de campo) realizado a los dos laboratorios subcontratados (Laboratorio Ecosistemas Proyectos Ambientales S.A. y ACZ Laboratories, Inc.) para el análisis de agua superficial y efluentes, se obtuvieron resultados confiables tanto en la manipulación de las muestras como en los resultados de los análisis.
- 3) El agua superficial (**SW**), subterránea (**GW**) y los pozos de monitoreo (**MW**) presentaron un pH alcalino y dentro del rango establecido por la USEPA para la salud humana. No se detectó mercurio en ninguna categoría de agua (SW, GW y MW). Se registraron sólidos suspendidos totales en SW, GW y MW y los resultados encontrados están por debajo de lo establecido por las guías del banco mundial (50 mg/L). Se detectaron cloruros y fluoruros en SW, GW y MW, todos los valores por debajo de lo sugerido por la USEPA (250 mg/L y 4 mg/L respectivamente). Se detectó arsénico en todas las categorías de agua (SW, GW y MW) y todos los resultados se encontraron por debajo de los establecido por la USEPA (0.01 mg/L) y dentro del rango registrado durante el establecimiento de la línea base. No se encontró plomo en MW y se detectó en SW y GW en concentraciones por debajo de lo sugerido por la USEPA y por debajo del rango de lo establecido durante la línea base. Los sólidos disueltos totales y sulfatos totales se detectaron en GW y SW en concentraciones por debajo de lo establecido por la USEPA y de lo registrado durante el establecimiento de la línea base respectivamente.
- 4) De los sedimentos analizados, se reporta la presencia de As, Cd, Cr, Pb, Hg y CN. Todas las concentraciones se encontraron por debajo de lo establecido por el Acuerdo Gubernativo 236-2006, a excepción de la estación SED-2 la cual obtuvo una concentración ligeramente arriba del valor sugerido.

- 5) El efluente (**WW9**) de la planta de tratamiento de aguas residuales de tipo especial del proceso de minado cumple con el Acuerdo Gubernativo 236-2006 para entes generadores nuevos para todas las muestras tomadas durante Noviembre 2013 a Enero 2014.

10.3 Vibraciones, geoquímica de roca estéril y mediciones de seguridad industrial y salud ocupacional

- 6) Las vibraciones generadas por las voladuras registradas se encuentran por debajo de los límites de detección del equipo (1.3 mm/s); el cual incluso es menor al límite a partir del cual, las vibraciones inducidas por voladuras (50.8 mm/s), pueden ocasionar daños según la norma establecida por United States Bureau of Mines.
- 7) Las lecturas de pH en pasta obtenidas de las muestras de material extraídas de mina subterránea fueron alcalinas, lo que indica que no hay indicios de un potencial de generación ácida dentro los túneles.
- 8) Los resultados obtenidos en los niveles de presión sonora para ambientes laborales, indican que se está por debajo de los límites de nivel de sonido ponderado "A" acorde a OSHA para 24 horas (82-83 dBA) y los resultados de partículas respirables en las estaciones de monitoreo, cumplen con el rango de aceptación que el fabricante establece basado en el equipo marca 3M código 8210 N95 Homologación NIOSH.

11 Anexos

11.1 Caudal Bombeado de Túneles a Planta de Tratamiento y su Descarga Hacia la Quebrada El Escobal

En las siguientes tablas se presentan las lecturas diarias realizadas a los flujómetros instalados en las cuatro tuberías provenientes de los portales (2 tuberías por portal) y el flujómetro instalado en el clarificador de la Planta de tratamiento de aguas residuales especiales, así como los cálculos del volumen bombeado durante el día de medición y el caudal proyectado por día en cada una de estas tuberías.

El volumen bombeado por día se determinó restando el volumen acumulado del día anterior al volumen acumulado de ese día. El caudal proyectado se determinó suponiendo que el bombeo de agua es constante durante las 24 horas del día (caudal = volumen/tiempo).

Los flujómetros instalados son de tipo ultrasónicos o de efecto Doppler, los cuales tienen la característica de medir el flujo en dos direcciones. Las bombas empleadas para descargar agua procedente de los sumideros ubicados en los portales trabajan a nivel, por tanto se descartan las lecturas de caudal instantáneo ya que los flujómetros instalados registran tanto el caudal instantáneo de ida (signo positivo) como el caudal instantáneo de retorno (signo negativo), lo que conllevaría a reportar caudales menores a los observados en campo.

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| Noviembre 2013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Descarga/fecha | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| LECTURA FLUJÓMETRO (m ³) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Portal Este (tubería 6") | 220179 | 220560 | 220977 | 221743 | 222282 | 222834 | 223265 | 223522 | 223857 | 224409 | 224756 | 225173 | 225460 | 225811 | 226100 | 226513 | 226835 | 227292 | 228028 | 228999 | 229885 | 230757 | 231667 | 232478 | 233406 | 234175 | 235206 | 235981 | 236517 | 237028 |
| Total Este (tubería 8") | 79505 | 84047 | 80083 | 80276 | 80363 | 80417 | 80487 | 80593 | 80679 | 80750 | 80801 | 80842 | 80853 | 80862 | 80870 | 80880 | 80894 | 80906 | 80921 | 80942 | 80956 | 80972 | 80991 | 81012 | 81027 | 81064 | 81101 | 81149 | 81199 | 81256 |
| Portal Oeste (tubería 6") | 203077 | 203077 | 202529 | 202469 | 202472 | 202472 | 202481 | 202532 | 202635 | 202778 | 202840 | 202903 | 202906 | 202959 | 202967 | 203079 | 203146 | 203199 | 203210 | 203222 | 202483 | 202598 | 202650 | 202664 | 202709 | 202719 | 202727 | 202858 | 202870 | 202888 |
| Portal Oeste (tubería 8") | 906487 | 907470 | 908092 | 909005 | 909818 | 910698 | 911484 | 912502 | 913812 | 914743 | 915726 | 917191 | 918692 | 919902 | 921262 | 922817 | 924212 | 925715 | 926963 | 928134 | 929192 | 930358 | 931579 | 932644 | 933744 | 934905 | 935801 | 937086 | 938444 | 939980 |
| Clarificador | 1796114 | 1797385 | 1798352 | 1799373 | 1800494 | 1801762 | 1802768 | 1803687 | 1804778 | 1805474 | 1806942 | 1808238 | 1809550 | 1810793 | 1811405 | 1812597 | 1813582 | 1814997 | 1815903 | 1817438 | 1818566 | 1819959 | 1820834 | 1821926 | 1822998 | 1824264 | 1825533 | 1827189 | 1828158 | 1829570 |
| VOLUMEN BOMBEADO (m ³) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Portal Este (tubería 6") | 43 | 381 | 417 | 766 | 539 | 552 | 431 | 257 | 335 | 552 | 347 | 417 | 287 | 351 | 289 | 413 | 322 | 457 | 736 | 971 | 886 | 872 | 910 | 811 | 928 | 769 | 1031 | 775 | 536 | 511 |
| Total Este (tubería 8") | 281 | 4542 | -3964 | 193 | 88 | 53 | 70 | 106 | 86 | 71 | 51 | 41 | 11 | 9 | 8 | 10 | 14 | 12 | 15 | 21 | 14 | 17 | 19 | 20 | 15 | 37 | 37 | 47 | 50 | 57 |
| Portal Oeste (tubería 6") | 27 | 0 | -548 | -60 | 3 | 0 | 9 | 51 | 103 | 143 | 62 | 63 | 3 | 53 | 8 | 112 | 67 | 53 | 11 | 12 | -739 | 115 | 52 | 14 | 45 | 10 | 8 | 131 | 12 | 18 |
| Portal Oeste (tubería 8") | 2012 | 983 | 622 | 913 | 813 | 880 | 786 | 1018 | 1310 | 931 | 983 | 1465 | 1501 | 1210 | 1360 | 1555 | 1395 | 1503 | 1248 | 1171 | 1058 | 1166 | 1221 | 1065 | 1100 | 1161 | 896 | 1285 | 1358 | 1536 |
| Clarificador | 2092 | 1271 | 967 | 1021 | 1121 | 1268 | 1006 | 919 | 1091 | 696 | 1468 | 1296 | 1312 | 1243 | 612 | 1192 | 985 | 1415 | 906 | 1535 | 1128 | 1393 | 875 | 1092 | 1072 | 1266 | 1269 | 1656 | 969 | 1412 |
| CAUDAL PROYECTADO (gpm) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Portal Este (tubería 6") | 16 | 140 | 153 | 281 | 99 | 101 | 79 | 47 | 61 | 101 | 64 | 76 | 53 | 64 | 53 | 76 | 59 | 84 | 135 | 178 | 162 | 160 | 167 | 149 | 170 | 141 | 189 | 142 | 98 | 94 |
| Total Este (tubería 8") | 103 | 1665 | -1453 | 71 | 16 | 10 | 13 | 19 | 16 | 26 | 19 | 15 | 4 | 3 | 3 | 4 | 3 | 2 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 7 | 7 | 9 | 9 | 10 |
| Portal Oeste (tubería 6") | 10 | 0 | -201 | -22 | 1 | 0 | 2 | 9 | 19 | 26 | 11 | 12 | 1 | 10 | 1 | 21 | 12 | 10 | 2 | 2 | -135 | 21 | 10 | 3 | 8 | 2 | 1 | 24 | 2 | 3 |
| Portal Oeste (tubería 8") | 738 | 360 | 228 | 335 | 149 | 161 | 144 | 187 | 240 | 171 | 180 | 269 | 275 | 222 | 249 | 285 | 256 | 276 | 229 | 215 | 194 | 214 | 224 | 195 | 202 | 213 | 164 | 236 | 249 | 282 |
| Clarificador | 267 | 233 | 177 | 187 | 206 | 232 | 184 | 168 | 200 | 128 | 269 | 238 | 241 | 228 | 112 | 219 | 181 | 259 | 166 | 281 | 207 | 255 | 160 | 200 | 197 | 232 | 233 | 304 | 178 | 259 |

m³: metro cúbico. gpm: galones por minuto. Flujómetro presentó fallos al registrar el volumen acumulado, y éste fue menor al día previo. Fuente: MSR, 2014.

| Diciembre 2013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Descarga/fecha | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| LECTURA FLUJÓMETRO (m ³) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Portal Este (tubería 6") | 237477 | 237886 | 238302 | 238745 | 239381 | 240114 | 240665 | 241203 | 241686 | 242199 | 242690 | 243229 | 243754 | 244532 | 245720 | 246802 | 247960 | 249365 | 250895 | 251929 | 252936 | 253520 | 253985 | 254617 | 255416 | 256698 | 257250 | 258199 | 258966 | 259527 | 260267 |
| Total Este (tubería 8") | 81304 | 81354 | 81389 | 81407 | 81439 | 81744 | 81983 | 82311 | 82614 | 82933 | 83231 | 83373 | 83509 | 83719 | 84083 | 85001 | 86055 | 86407 | 86638 | 86848 | 86848 | 87182 | 87547 | 87906 | 88249 | 88611 | 88947 | 89280 | 89587 | 89942 | 90309 |
| Portal Oeste (tubería 6") | 202888 | 202891 | 202944 | 202957 | 202964 | 202999 | 202508 | 202558 | 202572 | 202576 | 202578 | 202583 | 202591 | 202592 | 202595 | 202599 | 202608 | 202624 | 202632 | 202645 | 202659 | 202696 | 202707 | 202717 | 202734 | 202757 | 202770 | 202772 | 202853 | 202971 | 203157 |
| Portal Oeste (tubería 8") | 941634 | 943174 | 944565 | 946027 | 947299 | 948702 | 950240 | 951531 | 952866 | 954350 | 955820 | 957196 | 958573 | 959811 | 960667 | 961705 | 962632 | 963484 | 964504 | 965456 | 966052 | 967506 | 968824 | 970079 | 971144 | 972236 | 973299 | 974586 | 975539 | 976987 | 977913 |
| Clarificador | 1831040 | 1832597 | 1833596 | 1834806 | 1835938 | 1837557 | 1839198 | 1840215 | 1841566 | 1842569 | 1843440 | 1844349 | 1845691 | 1847169 | 1848686 | 1850517 | 1852318 | 1854227 | 1855743 | 1857130 | 1857603 | 1859298 | 1860476 | 1862084 | 1863779 | 1864950 | 1866170 | 1868876 | 1870428 | 1872040 | 1873680 |
| VOLUMEN BOMBEADO (m ³) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Portal Este (tubería 6") | 449 | 409 | 416 | 443 | 636 | 733 | 551 | 538 | 483 | 513 | 491 | 539 | 525 | 778 | 1188 | 1082 | 1158 | 1405 | 1530 | 1034 | 1007 | 584 | 465 | 632 | 799 | 1282 | 552 | 949 | 767 | 561 | 740 |
| Total Este (tubería 8") | 48 | 50 | 35 | 19 | 32 | 305 | 239 | 328 | 303 | 319 | 298 | 143 | 136 | 210 | 364 | 918 | 1054 | 352 | 231 | 210 | 1 | 334 | 365 | 359 | 343 | 362 | 336 | 333 | 307 | 356 | 367 |
| Portal Oeste (tubería 6") | 0 | 3 | 53 | 13 | 7 | 35 | -491 | 50 | 14 | 4 | 2 | 5 | 8 | 1 | 3 | 4 | 9 | 16 | 8 | 13 | 14 | 37 | 11 | 10 | 17 | 23 | 13 | 2 | 81 | 118 | 186 |
| Portal Oeste (tubería 8") | 1654 | 1540 | 1391 | 1462 | 1272 | 1403 | 1538 | 1291 | 1335 | 1484 | 1470 | 1376 | 1377 | 1238 | 856 | 1038 | 927 | 852 | 1020 | 952 | 596 | 1454 | 1318 | 1255 | 1065 | 1092 | 1063 | 1287 | 953 | 1448 | 926 |
| Clarificador | 1470 | 1557 | 999 | 1210 | 1132 | 1619 | 1641 | 1017 | 1351 | 1003 | 871 | 909 | 1342 | 1478 | 1517 | 1831 | 1801 | 1909 | 1516 | 1387 | 473 | 1695 | 1178 | 1608 | 1695 | 1171 | 1220 | 2706 | 1552 | 1612 | 1640 |
| CAUDAL PROYECTADO (gpm) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Portal Este (tubería 6") | 82 | 75 | 76 | 81 | 117 | 134 | 101 | 99 | 89 | 94 | 90 | 99 | 96 | 143 | 218 | 198 | 212 | 258 | 281 | 190 | 185 | 107 | 85 | 116 | 146 | 235 | 101 | 174 | 141 | 103 | 136 |
| Total Este (tubería 8") | 9 | 9 | 6 | 3 | 6 | 56 | 44 | 60 | 56 | 59 | 55 | 26 | 25 | 38 | 67 | 168 | 193 | 65 | 42 | 38 | 0 | 61 | 67 | 66 | 63 | 66 | 62 | 61 | 56 | 65 | 67 |
| Portal Oeste (tubería 6") | 0 | 1 | 10 | 2 | 1 | 6 | -90 | 9 | 3 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 3 | 1 | 2 | 3 | 7 | 2 | 2 | 3 | 4 | 2 | 0 | 15 | 22 | 34 |
| Portal Oeste (tubería 8") | 303 | 282 | 255 | 268 | 233 | 257 | 282 | 237 | 245 | 272 | 270 | 252 | 252 | 227 | 157 | 190 | 170 | 156 | 187 | 175 | 109 | 267 | 242 | 230 | 195 | 200 | 195 | 236 | 175 | 265 | 170 |
| Clarificador | 270 | 285 | 183 | 222 | 208 | 297 | 301 | 186 | 248 | 184 | 160 | 167 | 246 | 271 | 278 | 336 | 330 | 350 | 278 | 254 | 87 | 311 | 216 | 295 | 311 | 215 | 224 | 496 | 285 | 296 | 301 |

m³: metro cúbico. gpm: galones por minuto. Flujómetro presentó fallos al registrar el volumen acumulado, y éste fue menor al día previo. Fuente: MSR, 2014.

| | | Enero 2014 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|--|--------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Descarga/fecha | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| | | LECTURA FLUJÓMETRO (m ³) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Portal Este (tubería 6") | | 261112 | 262143 | 262802 | 263501 | 263985 | 264456 | 264890 | 265377 | 266227 | 266990 | 267793 | 268588 | 269179 | 270000 | 270644 | 271470 | 272887 | 273984 | 274731 | 275554 | 276425 | 277315 | 278126 | 279120 | 280026 | 280928 | 281695 | 282323 | 282960 | 283559 | 284316 |
| Total Este (tubería 8") | | 90650 | 90980 | 91343 | 91580 | 92021 | 92395 | 92716 | 93000 | 93300 | 93987 | 94101 | 94562 | 94704 | 94832 | 94939 | 95040 | 95063 | 95146 | 95183 | 95228 | SD | 95398 | 95502 | 95603 | 95849 | 96071 | 96309 | 96696 | 97046 | 97627 | 98260 |
| Portal Oeste (tubería 6") | | 203215 | 203308 | 203438 | 203632 | 203835 | 204107 | 204393 | 204524 | 204605 | 204634 | 204809 | 202575 | 202656 | 202745 | 202778 | 202781 | 202796 | 202879 | 202906 | 203035 | 203117 | 203257 | 203290 | 203404 | 202739 | 202881 | 203090 | 203245 | 202505 | 202509 | 202587 |
| Portal Oeste (tubería 8") | | 978391 | 979272 | 980176 | 981323 | 982336 | 983376 | 984584 | 985897 | 911297 | 912582 | 914085 | 915237 | 916553 | 918293 | 919983 | 921589 | 923088 | 924810 | 925944 | 927215 | 928798 | 929957 | 931357 | 932360 | 933395 | 934630 | 935846 | 937280 | 938803 | 940760 | 942331 |
| Clarificador | | 1875118 | 1876921 | 1878547 | 1880149 | 1881540 | 1883792 | 1885591 | 1887465 | 1888999 | 1892328 | 1894835 | 1896641 | 1898206 | 1899083 | 1899083 | 1899083 | 1901564 | 1903878 | 1905608 | 1907930 | 1910572 | 1913259 | 1915357 | 1916946 | 1918467 | 1920556 | 1922728 | 1925211 | 1928069 | 1930707 | 1933403 |
| | | VOLUMEN BOMBEO (m ³) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Portal Este (tubería 6") | | 845 | 1031 | 659 | 699 | 484 | 471 | 434 | 487 | 850 | 763 | 803 | 795 | 591 | 821 | 644 | 826 | 1417 | 1097 | 747 | 823 | 871 | 890 | 811 | 994 | 906 | 902 | 767 | 628 | 637 | 599 | 757 |
| Total Este (tubería 8") | | 340 | 331 | 362 | 238 | 441 | 374 | 321 | 283 | 300 | 687 | 114 | 461 | 142 | 128 | 107 | 101 | 23 | 83 | 37 | 45 | SD | 170 | 104 | 102 | 246 | 222 | 239 | 387 | 350 | 581 | 633 |
| Portal Oeste (tubería 6") | | 58 | 93 | 130 | 194 | 203 | 272 | 286 | 131 | 81 | 29 | 175 | -2234 | 81 | 89 | 33 | 3 | 15 | 83 | 27 | 129 | 82 | 140 | 33 | 114 | -665 | 142 | 209 | 155 | -740 | 4 | 78 |
| Portal Oeste (tubería 8") | | 478 | 881 | 904 | 1147 | 1013 | 1040 | 1208 | 1313 | -74600 | 1285 | 1503 | 1152 | 1316 | 1740 | 1690 | 1606 | 1499 | 1722 | 1134 | 1271 | 1583 | 1159 | 1400 | 1003 | 1035 | 1235 | 1216 | 1434 | 1523 | 1957 | 1571 |
| Clarificador | | 1438 | 1803 | 1626 | 1602 | 1391 | 2252 | 1799 | 1874 | 1534 | 3329 | 2507 | 1806 | 1565 | 877 | 0 | 0 | 2481 | 2314 | 1730 | 2322 | 2642 | 2687 | 2098 | 1589 | 1521 | 2089 | 2172 | 2483 | 2858 | 2638 | 2696 |
| | | CAUDAL PROYECTADO (gpm) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Portal Este (tubería 6") | | 155 | 189 | 121 | 128 | 89 | 86 | 80 | 89 | 156 | 140 | 147 | 146 | 108 | 151 | 118 | 151 | 260 | 201 | 137 | 151 | 160 | 163 | 149 | 182 | 166 | 165 | 141 | 115 | 117 | 110 | 139 |
| Total Este (tubería 8") | | 62 | 61 | 66 | 44 | 81 | 69 | 59 | 52 | 55 | 126 | 21 | 85 | 26 | 23 | 20 | 19 | 4 | 15 | 7 | 8 | SD | 16 | 19 | 19 | 45 | 41 | 44 | 71 | 64 | 106 | 116 |
| Portal Oeste (tubería 6") | | 11 | 17 | 24 | 36 | 37 | 50 | 52 | 24 | 15 | 5 | 32 | -410 | 15 | 16 | 6 | 1 | 3 | 15 | 5 | 24 | 15 | 26 | 6 | 21 | -122 | 26 | 38 | 28 | -136 | 1 | 14 |
| Portal Oeste (tubería 8") | | 88 | 162 | 166 | 210 | 186 | 191 | 221 | 241 | -13677 | 236 | 276 | 211 | 241 | 319 | 310 | 294 | 275 | 316 | 208 | 233 | 290 | 212 | 257 | 184 | 190 | 226 | 223 | 263 | 279 | 359 | 288 |
| Clarificador | | 264 | 331 | 298 | 294 | 255 | 413 | 330 | 344 | 281 | 610 | 460 | 331 | 287 | 161 | 0 | 0 | 455 | 424 | 317 | 426 | 484 | 493 | 385 | 291 | 279 | 383 | 398 | 455 | 524 | 484 | 494 |

m³: metro cúbico. gpm: galones por minuto. Fluómetro presentó fallos al registrar el volumen acumulado, y éste fue menor al día previo. Fallo del flujómetro, no se reportó que el clarificador dejara de funcionar estos días. SD: Sin dato por flujómetro apagado, cálculo de caudal del 22 de enero se realizó tomando como referencia la lectura del 20 de enero. Fuente: MSR, 2014.

11.2 Análisis In Situ y Kit de Cianuro (CN) en Efluentes

| | | Noviembre 2013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|----------|--|-------|-------|--------|-------|-------|--------|-------|-------|-------|--------|-------|-------|--------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| Parámetro | Unidades | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
| | | Efluente Planta de Tratamiento Agua de Túneles (WW9) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH | u.e. | 8,1 | 7,51 | 7,15 | 7,62 | 8,67 | 9,39 | 8,38 | 8,09 | 8,36 | 7,56 | 7,85 | 7,98 | 7,78 | 7,87 | 8,26 | 10,56 | 9,46 | 8,47 | 7,86 | 7,7 | 8,27 | 7,9 | 7,99 | 7,96 | 7,86 | 7,89 | 9,05 | 7,36 | 7,76 | 7,95 | |
| Temperatura | °C | 23,5 | 26,2 | 25,1 | 24,2 | 24,8 | 25,8 | 25,4 | 25 | 25 | 25 | 27,2 | 24,3 | 25,4 | 26 | 24,7 | 25 | 24,2 | 26 | 24,5 | 25,8 | 24,4 | 24,3 | 24,4 | 24,4 | 24,5 | 24,8 | 23,5 | 23,5 | 21,3 | 22,8 | |
| Conductividad | µS/cm | 1295 | 1291 | 1140 | 1165 | 1153 | 1165 | 1287 | 1369 | 1353 | 1304 | 1373 | 1316 | 1483 | 1427 | 1476 | 1586 | 1307 | 1326 | 1272 | 1363 | 1304 | 1373 | 1393 | 1439 | 1441 | 1461 | 1404 | 1453 | 1434 | 1436 | |
| Turbidez | NTU | 2,3 | 3,17 | 2,64 | 3,1 | 2,5 | 9,26 | 3,14 | 2,41 | 2,44 | 2,65 | 1,88 | 2,74 | 2,01 | 1,8 | 4 | 8,7 | 2,98 | 3,28 | 4,29 | 4,52 | 3,52 | 3,38 | 5,69 | 6,6 | 6,99 | 6,31 | 3,41 | 12,2 | 9,7 | 5,71 | |
| Kit CN | mg/L | 0,003 | 0,003 | 0,001 | 0,001 | 0,003 | 0,001 | 0,004 | 0,024 | 0,017 | 0,021 | 0,003 | 0,001 | 0,002 | 0,003 | 0,006 | 0,005 | 0,002 | 0,004 | 0,003 | 0,004 | 0,016 | 0,008 | 0,007 | 0,006 | 0,006 | 0,003 | 0,003 | 0,004 | 0,002 | 0,007 | |
| CN Total | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | | Pileta de Cumplimiento Ambiental (EP-3 o pileta 3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH | u.e. | 8,6 | 8,84 | 8,17 | 8,23 | 8,89 | 8,93 | 8,91 | 9 | 8,99 | 9,01 | 8,97 | 9 | 9,05 | 9,08 | 8,24 | 9,07 | 8,8 | 8,8 | 9 | 8,88 | 8,97 | 8,45 | 8,5 | 8,69 | 8,61 | 8,57 | 8,49 | 8,17 | 8,08 | 7,85 | |
| Temperatura | °C | 25,1 | 26,6 | 24 | 22,1 | 22,8 | 24,2 | 21,3 | 22 | 23,2 | 20 | 21,3 | 21 | 21,5 | 23,1 | 21,5 | 21,5 | 21,6 | 20 | 22 | 23,8 | 22,9 | 22,5 | 21,8 | 21,3 | 23 | 21,7 | 19,8 | 17,7 | 14,5 | 15 | |
| Conductividad | µS/cm | 257 | 339 | 359 | 345 | 330 | 331 | 370 | 370 | 371 | 368 | 372 | 371 | 392 | 412 | 379 | 372 | 370 | 377 | 376 | 380 | 377 | 950 | 572 | 596 | 604 | 604 | 606 | 626 | 626 | 629 | |
| Turbidez | NTU | 2,8 | 4,12 | 4,87 | 2,26 | 1,95 | 4,73 | 6,2 | 2,19 | 2,29 | 1,86 | 2,3 | 2,03 | 2,38 | 1,65 | 1,78 | 2,71 | 8 | 2,28 | 6,18 | 3,99 | 3,05 | 6,52 | 5,95 | 5,99 | 3,24 | 2,89 | 8,85 | 17,4 | 6,91 | 14,3 | |
| Kit CN | mg/L | 0,040 | 0,038 | 0,040 | 0,030 | 0,029 | 0,031 | 0,035 | 0,035 | 0,035 | 0,031 | 0,027 | 0,016 | 0,021 | 0,021 | 0,015 | 0,018 | 0,017 | 0,018 | 0,017 | 0,015 | 0,020 | 0,177 | 0,084 | 0,129 | 0,134 | 0,065 | 0,059 | 0,072 | 0,061 | 0,050 | |
| CN Total | mg/L | ND | ND | ND | <0,003 | ND | ND | <0,003 | ND | ND | ND | <0,003 | ND | ND | <0,003 | ND | ND | ND | <0,003 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |

u.e.: unidades exponenciales. mg/L: miligramos por litro. µS/cm: micro siemens por centímetro. °C: grados centígrados. NTU: unidades naftalométricas de turbidez. ND: no determinado. Fuente: MSR, 2014.

| Diciembre 2013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----------|-------|-------|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Parámetro | Unidades | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| Efluente Planta de Tratamiento Agua de Túneles (WW9) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH | u.e. | 8,07 | 8,69 | 7,57 | 7,97 | 8,82 | 9,21 | 8,42 | 8,85 | 8,81 | 8,58 | 8,22 | 10,34 | 9,21 | 10,03 | 7,92 | 9,55 | 8,15 | 8,06 | 8,82 | 6,76 | 8,92 | 9,18 | 7,15 | 8,61 | 3,91 | 4,51 | 7,21 | 9,25 | 11,14 | 9,3 | 8,86 |
| Temperatura | °C | 23 | 23,8 | 24,5 | 25,6 | 2,54 | 24,4 | 25,3 | 26,2 | 27,2 | 26,4 | 23,7 | 25,6 | 23,5 | 23,6 | 24,3 | 19,4 | 25,1 | 23,7 | 26,8 | 27,9 | 25,2 | 27,1 | 25,7 | 23,5 | 22,6 | 20,7 | 23,4 | 24,5 | 23,3 | 27 | 23,4 |
| Conductividad | µS/cm | 1452 | 1360 | 1458 | 1398 | 1448 | 1422 | 1375 | 1533 | 1461 | 1436 | 1371 | 1764 | 1366 | 1452 | 1729 | 1588 | 1503 | 1436 | 1681 | 1560 | 2083 | 1512 | 2348 | 1908 | 1849 | 1883 | 1607 | 1607 | 1735 | 1547 | 1642 |
| Turbidez | NTU | 3,17 | 5,24 | 1,63 | | 5,39 | 4,71 | 4,5 | 3,73 | 2,64 | 5,32 | 3,32 | 4,53 | 13,5 | 4 | 9,3 | 1,36 | 5,35 | 14,1 | 4,95 | 3,78 | 6,21 | 6,69 | 3,2 | 1,66 | 5,02 | 5,37 | 1,66 | 2,87 | 1,45 | 3,09 | 8,43 |
| kit CN | mg/L | 0,002 | 0,006 | 0,002 | | 0,015 | 0,028 | 0,012 | 0,045 | 0,021 | 0,004 | 0,007 | 0,003 | 0,002 | 0,002 | 0,003 | 0,002 | 0,002 | 0,001 | 0,004 | 0,006 | 0,021 | 0,011 | 0,008 | 0,006 | 0,019 | 0,035 | 0,025 | 0,032 | 0,026 | 0,029 | 0,028 |
| CN Total | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Pileta de Cumplimiento Ambiental (EP-3 o pileta 3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH | u.e. | 7,8 | 7,71 | 7,64 | 7,5 | 7,89 | 8,21 | 8,19 | 8,13 | 8,24 | 8,32 | 8,23 | 8,04 | 8,22 | 8,2 | 8,27 | 8,44 | 8,27 | 8,3 | 8,14 | 8,34 | 6,82 | 8,53 | 8,16 | 8,31 | 9,21 | 8,15 | 7,96 | 8,03 | 7,87 | 7,76 | 8,06 |
| Temperatura | °C | 16 | 21,3 | 18,8 | 19,6 | 22,2 | 22,3 | 20,9 | 23,5 | 24,6 | 22,3 | 20,2 | 21,6 | 20,3 | 19,8 | 20,8 | 19,1 | 19,5 | 18,8 | 22,3 | 21,7 | 21 | 21,2 | 20,2 | 18,9 | 19,3 | 18 | 18,6 | 18,2 | 18,7 | 18,4 | 18,5 |
| Conductividad | µS/cm | 625 | 633 | 627 | 628 | 632 | 822,8 | 631,9 | 655 | 647 | 647 | 660 | 986,8 | 767,5 | 733,5 | 747,2 | 708,7 | 722,7 | 762,1 | 762,8 | 748,2 | 702 | 839,4 | 722,3 | 730,6 | 719,1 | 729,6 | 883,1 | 921,3 | 964,9 | 967,7 | 1234 |
| Turbidez | NTU | 4,94 | 3,81 | 2,34 | | 2,34 | 2,5 | 1,95 | 5,17 | 5,01 | 6,52 | 4,3 | 7,51 | 2,67 | 4,19 | 4,4 | 3,17 | 2,25 | 1,94 | 4,93 | 4,3 | 3,48 | 4,95 | 2,65 | 2,58 | 4,22 | 3,43 | 2,58 | 2,38 | 3,33 | 2,19 | 7,43 |
| Kit CN | mg/L | 0,065 | 0,066 | 0,062 | | 0,058 | 0,061 | 0,051 | 0,031 | 0,047 | 0,037 | 0,037 | 0,036 | 0,031 | 0,026 | 0,027 | 0,015 | 0,027 | 0,018 | 0,018 | 0,019 | 0,019 | 0,026 | 0,035 | 0,027 | 0,029 | 0,025 | 0,159 | 0,19 | 0,186 | 0,19 | 0,158 |
| CN Total | | ND | ND | <0.003 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | <0.003 | ND | ND | 0,01 | ND | ND | ND | 0 | ND | ND | 0,009 |

u.e.: unidades exponenciales. mg/L: miligramos por litro. µS/cm: micro siemens por centímetro. °C: grados centígrados. NTU: unidades naftalométricas de turbidez. ND: no determinado. Fuente: MSR, 2014.

| Enero 2014 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----------|-------|-------|-------|-------|-------|--------------|-------|-------|--------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|--------|-------|--------|-------|-------|-------|-------|--------|-------|-------|--------|
| Parámetro | Unidades | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| Efluente Planta de Tratamiento Agua de Túneles (WW9) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH | u.e. | 9,23 | 5,87 | 7,3 | 9,96 | 8,34 | Sin descarga | 9,08 | 7,33 | 6,91 | 10,08 | 10,54 | 6,94 | 5,3 | 8,16 | 7,51 | 7,52 | 6,84 | 6,83 | 7,36 | 6,63 | 7,41 | 7,29 | 6,75 | 6,2 | 8,79 | 6,03 | 7,47 | 7,16 | 8,95 | 7,77 | 9,86 |
| Temperatura | °C | 23,6 | 25,2 | 23,6 | 23,4 | 27,8 | | 22,7 | 22,3 | 23,4 | 24,3 | 20,3 | 22,1 | 26,4 | 25,5 | 23,4 | 21,7 | 25 | 25,5 | 23 | 23,2 | 26,7 | 25,9 | 23,3 | 23,3 | 25,3 | 26 | 24,3 | 24,3 | 27,8 | 1460 | 23,2 |
| Conductividad | µS/cm | 1575 | 1490 | 2475 | 1601 | 1266 | | 1411 | 1471 | 1528 | 1725 | 1804 | 1497 | 1376 | 1659 | 1543 | 1606 | 1962 | 1432 | 1705 | 1472 | 1616 | 1362 | 1572 | 1670 | 1645 | 1609 | 1650 | 1446 | 1681 | 7,09 | 1569 |
| Turbidez | NTU | 7,51 | 8,98 | 5,35 | 6,67 | 2,64 | | 2,79 | 1,69 | 3,37 | 4,77 | 2,2 | 5,27 | 3,23 | 4,73 | 3,97 | 8,39 | 5,29 | 5,42 | 9,97 | 3,15 | 2,36 | 4,15 | 3,78 | 2,95 | 4,28 | 4,44 | 4,61 | 6,23 | 5,21 | 3,31 | 5,36 |
| kit CN | mg/L | 0,022 | 0,007 | 0,010 | 0,025 | ND | | ND | ND | ND | ND | 0,035 | 0,002 | 0,002 | 0,002 | 0,003 | 0,010 | 0,005 | 0,004 | 0,005 | 0,002 | 0,005 | 0,004 | 0,005 | 0,007 | 0,004 | 0,002 | 0,008 | 0,006 | 0,000 | 0,000 | |
| CN Total | | ND | ND | ND | ND | ND | ND | ND | ND | <0.003 | ND | ND | ND | ND | ND | ND | <0.003 | ND | ND | ND | ND | <0.003 | ND | <0.003 | ND | ND | ND | ND | <0.003 | ND | ND | <0.003 |
| Pileta de Cumplimiento Ambiental (EP-3 o pileta 3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH | u.e. | 8,14 | 7,84 | 8,09 | 8,23 | 8,19 | 8,38 | 7,83 | 7,96 | 8,03 | 7,94 | 8,13 | 8,11 | 8,19 | 8,24 | 8,27 | 8,09 | 7,8 | 7,46 | 7,91 | 8,08 | 8,04 | 8,05 | 8,06 | 8,07 | 8 | 8,36 | 8,41 | 8,36 | 8,37 | 8,23 | 8,31 |
| Temperatura | °C | 18,5 | 21,9 | 18,6 | 18,6 | 22,9 | 20 | 17,5 | 16,3 | 17,5 | 19,2 | 18,3 | 18,4 | 21,0 | 22,2 | 19,5 | 13,7 | 13,1 | 15,9 | 17 | 18,4 | 20 | 20,1 | 18 | 17,7 | 17,9 | 20,9 | 21,4 | 21,9 | 20,1 | 19,4 | 19,4 |
| Conductividad | µS/cm | 1056 | 2619 | 954,8 | 954,1 | 935,1 | 930,8 | 953,8 | 1136 | 953,3 | 1014 | 1248 | 985,7 | 987,0 | 975,9 | 977,4 | 1008 | 1024 | 2459 | 1160 | 1139 | 1170 | 1263 | 1181 | 1213 | 1246 | 1205 | 1419 | 1185 | 1209 | 1227 | 1238 |
| Turbidez | NTU | 2,93 | 14,3 | 28,1 | 19,7 | 7,64 | 2,53 | 5,95 | 7,58 | 2,63 | 6,37 | 1,4 | 2,22 | 1,70 | 6,88 | 4,01 | 9,52 | 4,54 | 5,6 | 15,1 | 2,78 | 3,38 | 6,82 | 2,95 | 3,45 | 8,26 | 3,09 | 6,26 | 6,26 | 4,48 | 5,34 | 3,15 |
| kit CN | mg/L | 0,175 | 0,173 | 0,177 | 0,161 | 0,143 | 0,135 | 0,133 | 0,147 | 0,135 | 0,128 | 0,128 | 0,111 | 0,056 | 0,056 | 0,063 | 0,065 | 0,076 | 0,067 | 0,121 | 0,153 | 0,117 | 0,081 | 0,113 | 0,078 | 0,134 | 0,112 | 0,089 | 0,096 | 0,014 | 0,000 | 0,000 |
| CN Total | | ND | ND | ND | ND | 0 | 0,01 | ND | ND | 0,01 | ND | ND | ND | 0,01 | ND | ND | 0 | ND | ND | ND | ND | 0,02 | ND | ND | 0,01 | ND | ND | 0,011 | ND | ND | ND | 0,01 |

u.e.: unidades exponenciales. mg/L: miligramos por litro. µS/cm: micro siemens por centímetro. °C: grados centígrados. NTU: unidades naftalométricas de turbidez. ND: no determinado. Fuente: MSR, 2014.

Con el objetivo de verificar si los resultados obtenidos con el método colorimétrico empleado para la determinación rápida de Cianuro (kit de CN), desde el mes de Octubre 2013 se enviaron varias muestras duplicado al laboratorio ACZ para realizar análisis de Cianuro Total.

Según los resultados obtenidos, con el kit colorimétrico se obtienen resultados no confiables debido a que presentan una gran desviación positiva con respecto a los resultados obtenidos en el laboratorio acreditado. Como medida correctiva se investigarán las fuentes de dicha desviación; entre las cuales se contemplan la contaminación cruzada, sustancias contenidas en las aguas analizadas que puedan interferir en el análisis, error humano al realizar el análisis, entre otras. Se realizarán los cambios necesarios para obtener resultados más confiables.

11.3 Resultados crudos de calidad de aire

11.3.1 Material Particulado (PM₁₀)

BGI PQ200 Air Sampling System

Downloaded November 2013

Job Details:

Job Name: EA-1A
Version: PQ200
Serial No: 2.00
Pump Time:
Flags: NA

Job Code: EA-1A
Site Name: Los Planes (Top Soil Deposit)
Station Code:
Operators: SA/FB
User1: NA
User2: NA

| | Max | Min | Avg | Units |
|----|------|------|-------|-------|
| BP | 648 | 644 | 646 | mmHg |
| TA | 28.5 | 13.1 | 19.7 | °C |
| Q | --- | --- | 16.71 | Lpm |

Timer Information:

| | Date | Time |
|--------|-----------|----------|
| | dd-mmm | hh:mm:ss |
| Start: | 18-Nov-13 | 0:00:00 |
| Stop: | 19-Nov-13 | 0:00:00 |
| ET: | 23:59:00 | |

Mass Concentration Data:

| | |
|-------------|----------------------|
| Filter ID: | 2232-1001 |
| Final Wt: | 161.940 mg |
| Initial Wt: | 161.470 mg |
| Delta Wt: | 0.470 mg |
| Total Vol: | 20.82 m ³ |

| | | |
|--------------|----|----|
| QCV | NA | % |
| Max overheat | NA | °C |
| occured NA | | |

Mass Conc: 22.57 µg/m³

Notes 1: Depósito de Suelos, Proyecto El Escobal
Notes 2: Minera San Rafael, S.A.

BGI PQ200 Air Sampling System

Downloaded November 2013

Job Details:

Job Name: EA-2A
Version: PQ200
Serial No: 1.00
Pump Time:
Flags: NA

Job Code: EA-2A
Site Name: La Cuchilla.
Station Code:
Operators: FB/SA
User1: NA
User2: NA

| | Max | Min | Avg | Units |
|----|------|------|-------|-------|
| BP | 630 | 625 | 628 | mmHg |
| TA | 24.3 | 15.2 | 17.9 | °C |
| Q | --- | --- | 16.71 | Lpm |

Timer Information:

| | Date | Time |
|--------|-----------|----------|
| | dd-mmm | hh:mm:ss |
| Start: | 26-Nov-13 | 15:10:00 |
| Stop: | 27-Nov-13 | 15:10:00 |
| ET: | 23:59:00 | |

Mass Concentration Data:

| | |
|-------------|----------------------|
| Filter ID: | 2271-0223 |
| Final Wt: | 160.420 mg |
| Initial Wt: | 159.840 mg |
| Delta Wt: | 0.580 mg |
| Total Vol: | 20.37 m ³ |

| | | |
|--------------|----|----|
| QCV | NA | % |
| Max overheat | NA | °C |
| occured NA | | |

Mass Conc: 28.48 µg/m³

Notes 1: Aldea La Cuchilla, San Rafael Las Flores, Santa Rosa.
Notes 2: Minera San Rafael, S.A.

BGI PQ200 Air Sampling System

Downloaded November 2013

Job Details:

Job Name: EA-3
Version: PQ200
Serial No: 2.00
Pump Time:
Flags: NA

Job Code: EA-3
Site Name: El Fucío, zona este.
Station Code:
Operators: FB
User1: NA
User2: NA

| | Max | Min | Avg | Units |
|----|------|------|-------|-------|
| BP | 625 | 621 | 623 | mmHg |
| TA | 24.9 | 14.7 | 17.9 | °C |
| Q | --- | --- | 16.71 | Lpm |

Timer Information:

| | Date | Time |
|--------|-----------|----------|
| | dd-mmm | hh:mm:ss |
| Start: | 21-Nov-13 | 15:40:00 |
| Stop: | 22-Nov-13 | 15:40:00 |
| ET: | 23:59:00 | |

Mass Concentration Data:

| | |
|-------------|----------------------|
| Filter ID: | 2236-1404 |
| Final Wt: | 163.630 mg |
| Initial Wt: | 162.630 mg |
| Delta Wt: | 1.000 mg |
| Total Vol: | 20.21 m ³ |

| | | |
|--------------|----|----|
| QCV | NA | % |
| Max overheat | NA | °C |
| occured NA | | |

Mass Conc: 49.49 µg/m³

Notes 1: Aldea El Fucío, San Rafael Las Flores, Santa Rosa.
Notes 2: Minera San Rafael, S.A.

BGI PQ200 Air Sampling System

Downloaded November 2013

| | | | | | | | |
|--|---------|---|---------|------------|--|--|--|
| Job Details: Job Name: EA-4A Version: PQ200 Serial No: 1.00 Pump Time: Flags: NA | | Job Code: EA-4A Site Name: Aldea Los Ángeles Station Code: Operators: FB User1: NA User2: NA | | | | | |
| BP | Max 648 | Min 644 | Avg 647 | Units mmHg | Timer Information: Date dd-mmm Time hh:mm:ss Start: 12-Nov-13 12:40:00 Stop: 13-Nov-13 12:40:00 ET: 20:02:00 | Mass Concentration Data: Filter ID: 2230-0808 Final Wt: 161.710 mg Initial Wt: 160.470 mg Delta Wt: 1.240 mg Total Vol: 17.42 m ³ | |
| TA | 28.3 | 15.9 | 19.5 | °C | | | |
| Q | --- | --- | 16.71 | Lpm | | | |
| QCV | | NA | % | | Mass Conc: 71.18 µg/m³ | | |
| Max overheat | | NA | °C | | Notes 1: Caserío El Portón de los Ángeles, San Rafael Las Flores, Santa Rosa | | |
| occured NA | | | | | | Notes 2: Minera San Rafael, S.A. | |

BGI PQ200 Air Sampling System

Downloaded November 2013

| | | | | | | | |
|--|---------|--|---------|------------|--|--|--|
| Job Details: Job Name: EA-5A Version: PQ200 Serial No: 1.00 Pump Time: Flags: NA | | Job Code: EA-5A Site Name: Sabana Redonda Station Code: Operators: FB User1: NA User2: NA | | | | | |
| BP | Max 650 | Min 645 | Avg 648 | Units mmHg | Timer Information: Date dd-mmm Time hh:mm:ss Start: 5-Nov-13 14:42:00 Stop: 6-Nov-13 14:42:00 ET: 19:58:00 | Mass Concentration Data: Filter ID: 2229-0717 Final Wt: 162.180 mg Initial Wt: 161.720 mg Delta Wt: 0.460 mg Total Vol: 17.50 m ³ | |
| TA | 26.3 | 13.0 | 17.7 | °C | | | |
| Q | --- | --- | 16.71 | Lpm | | | |
| QCV | | NA | % | | Mass Conc: 26.29 µg/m³ | | |
| Max overheat | | NA | °C | | Notes 1: Aldea Sabana Redonda, San Rafael Las Flores, Santa Rosa | | |
| occured NA | | | | | | Notes 2: Minera San Rafael, S.A. | |

BGI PQ200 Air Sampling System

Downloaded November 2013

| | | | | | | | |
|---|---------|--|---------|------------|--|--|--|
| Job Details: Job Name: EA-6 Version: PQ200 Serial No: 2.00 Pump Time: Flags: NA | | Job Code: EA-6 Site Name: Carretera a Mataquesquintla Station Code: Operators: FB User1: NA User2: NA | | | | | |
| BP | Max 641 | Min 638 | Avg 639 | Units mmHg | Timer Information: Date dd-mmm Time hh:mm:ss Start: 12-Nov-13 11:55:00 Stop: 13-Nov-13 11:55:00 ET: 23:59:00 | Mass Concentration Data: Filter ID: 2234-1212 Final Wt: 162.990 mg Initial Wt: 162.690 mg Delta Wt: 0.300 mg Total Vol: 20.63 m ³ | |
| TA | 25.3 | 15.6 | 19.2 | °C | | | |
| Q | --- | --- | 16.71 | Lpm | | | |
| QCV | | NA | % | | Mass Conc: 14.54 µg/m³ | | |
| Max overheat | | NA | °C | | Notes 1: Carretera a Mataquesquintla, al norte del Proyecto, San Rafael Las Flores Santa Rosa | | |
| occured NA | | | | | | Notes 2: Minera San Rafael, S.A. | |

BGI PQ200 Air Sampling System

Downloaded November 2013

Job Details:

Job Name: EA-7A
Version: PQ200
Serial No: 1.00
Pump Time:
Flags: NA

Job Code: EA-7A
Site Name: Los Planes
Station Code:
Operators: FB
User1: NA
User2: NA

| | Max | Min | Avg | Units |
|----|------|------|-------|-------|
| BP | 650 | 647 | 648 | mmHg |
| TA | 24.6 | 16.4 | 19.7 | °C |
| Q | --- | --- | 16.71 | Lpm |

Timer Information:

| | Date | Time |
|--------|-----------|----------|
| | dd-mmm | hh:mm:ss |
| Start: | 24-Nov-13 | 8:00:00 |
| Stop: | 25-Nov-13 | 8:00:00 |

Mass Concentration Data:

| | |
|-------------|----------------------|
| Filter ID: | 2272-0303 |
| Final Wt: | 160.240 mg |
| Initial Wt: | 160.010 mg |
| Delta Wt: | 0.230 mg |
| Total Vol: | 20.89 m ³ |

| | | |
|--------------|----|----|
| QCV | NA | % |
| Max overheat | NA | °C |
| occured | NA | |

ET: 23:59:00

Mass Conc: 11.01 $\mu\text{g}/\text{m}^3$

Notes 1: Aldea Los Planes, San Rafael Las Flores, Santa Rosa.

Notes 2: Minera San Rafael, S.A.

BGI PQ200 Air Sampling System

Downloaded November 2013

Job Details:

Job Name: EA-1B
Version: PQ200
Serial No: 2.00
Pump Time:
Flags: NA

Job Code: EA-1B
Site Name: San Rafael Las Flores
Station Code:
Operators: FB
User1: NA
User2: NA

| | Max | Min | Avg | Units |
|----|------|------|-------|-------|
| BP | 649 | 645 | 647 | mmHg |
| TA | 28.3 | 12.9 | 19.2 | °C |
| Q | --- | --- | 16.71 | Lpm |

Timer Information:

| | Date | Time |
|--------|----------|----------|
| | dd-mmm | hh:mm:ss |
| Start: | 5-Nov-13 | 14:05:00 |
| Stop: | 6-Nov-13 | 14:05:00 |

Mass Concentration Data:

| | |
|-------------|----------------------|
| Filter ID: | 2233-1119 |
| Final Wt: | 162.380 mg |
| Initial Wt: | 161.500 mg |
| Delta Wt: | 0.880 mg |
| Total Vol: | 20.89 m ³ |

| | | |
|--------------|----|----|
| QCV | NA | % |
| Max overheat | NA | °C |
| occured | NA | |

ET: 23:59:00

Mass Conc: 42.12 $\mu\text{g}/\text{m}^3$

Notes 1: San Rafael Las Flores, Santa Rosa.

Notes 2: Minera San Rafael, S.A.

BGI PQ200 Air Sampling System

Downloaded November 2013

Job Details:

Job Name: EA-3A
Version: PQ200
Serial No: 2.00
Pump Time:
Flags: NA

Job Code: EA-3A
Site Name: Aldea El Fucío
Station Code:
Operators: SA
User1: NA
User2: NA

| | Max | Min | Avg | Units |
|----|------|------|-------|-------|
| BP | 643 | 638 | 641 | mmHg |
| TA | 23.9 | 16.7 | 18.9 | °C |
| Q | --- | --- | 16.71 | Lpm |

Timer Information:

| | Date | Time |
|--------|-----------|----------|
| | dd-mmm | hh:mm:ss |
| Start: | 26-Nov-13 | 15:55:00 |
| Stop: | 27-Nov-13 | 15:55:00 |

Mass Concentration Data:

| | |
|-------------|----------------------|
| Filter ID: | 2273-0440 |
| Final Wt: | 161.200 mg |
| Initial Wt: | 159.170 mg |
| Delta Wt: | 2.030 mg |
| Total Vol: | 20.50 m ³ |

| | | |
|--------------|----|----|
| QCV | NA | % |
| Max overheat | NA | °C |
| occured | NA | |

ET: 23:45:00

Mass Conc: 99.01 $\mu\text{g}/\text{m}^3$

Notes 1: Aldea El Fucío, San Rafael Las Flores, Santa Rosa.

Notes 2: Minera San Rafael, S.A.

Cliente: Minera San Rafael
Dirección: Boulevard Los Próceres, 18 calle 24-69 z. 10, Centro Empresarial Zona Pradera, Oficina 1406 torre IV
Proyecto: 178-031 (El Escobal)
Análisis de muestras: Diciembre, 03-04 de 2013
Emisión del reporte: Diciembre, 10 de 2013

Tipo de muestra: Filtros de cuarzo utilizados para colección de material particulado en aire.

Análisis: Gravimetría de partículas en filtro de calidad del aire.

Método analítico: 40 CFR, Apéndice J, Parte 50, Capítulo 1, Edición 07-1-97, EPA. Reference Method for the Determination of Particulate Matter as PM10 in the Atmosphere.

Acreditado ISO 17025 según resolución OGA-LE-050-12.

| No. | Identificación de la muestra | Código del filtro ¹ | Peso inicial* (gramos) | Peso final (gramos) | LDM (gramos) |
|-----|------------------------------|--------------------------------|------------------------|---------------------|--------------|
| 1 | EA-1A | 2232-1001 | 0.16147 | 0.16194 | 0.00017 |
| 2 | EA-1B | 2233-1119 | 0.16150 | 0.16238 | |
| 3 | EA-2A | 2271-0223 | 0.15984 | 0.16042 | |
| 4 | EA-3 | 2236-1404 | 0.16263 | 0.16363 | |
| 5 | EA-3A | 2273-0440 | 0.15917 | 0.16120 | |
| 6 | EA-4A | 2230-0808 | 0.16047 | 0.16171 | |
| 7 | EA-5A | 2229-0717 | 0.16172 | 0.16218 | |
| 8 | EA-6 | 2234-1212 | 0.16269 | 0.16299 | |
| 9 | EA-7A | 2272-0303 | 0.16001 | 0.16024 | |

¹: Código asignado por Laboratorio Ambiental, S.A. *: corresponde a los pesos iniciales indicados en los reportes analíticos RA-13-11059 y RA-13-11067. LDM: límite de detección del método.

Anexos:

Anexo 1. Cadena de Custodia R-02-000333

Este Reporte Analítico ha sido elaborado para uso confidencial y exclusivo del cliente; se prohíbe su reproducción, sin la aprobación escrita del Laboratorio. Los resultados aquí expresados representan el mejor juicio del Laboratorio y son válidos únicamente para la porción de muestra presentada a éste. Laboratorio Ambiental, S.A. no asume ninguna responsabilidad ni garantiza la utilización final que se le dé a la información aquí presentada. Laboratorio Ambiental, S.A. no se responsabiliza por el proceso de muestreo.

Inga. Vivian Salazar
Ingeniera Química, Encargado Químico
Colegiado 1849

MSc. BSc. Ana Gabriela Juárez
Especialista ambiental, Director de Laboratorio

| | | | | |
|---------------------------|-----------------------------------|---|-----------------------------------|--------------------------------------|
| Redacción: V.S. | Fecha: Diciembre, 10/13 | Revisión y aprobación: A.G.J. | Fecha: Diciembre, 10/13 | Versión Cliente: 01 |
|---------------------------|-----------------------------------|---|-----------------------------------|--------------------------------------|

BGI PQ200 Air Sampling System

Downloaded December 2013

| | | | | |
|--|----------|---|------------------------|------------|
| Job Details: Job Name: EA-1A Version: PQ200 Serial No: 1.00 Pump Time: Flags: NA | | Job Code: EA-1A Site Name: Los Planes (Top Soil Deposit) Station Code: Operators: LF User1: NA User2: NA | | |
| BP | Max 650 | Min 646 | Avg 648 | Units mmHg |
| TA | 28.6 | 13.7 | 19.5 | °C |
| Q | --- | --- | 16.71 | Lpm |
| QCV | | NA | % | |
| Max overheat | | NA | °C | |
| occured NA | | ET: 23:59:00 | | |
| Notes 1: Depósito de Suelos, Proyecto El Escobal | | Notes 2: Minera San Rafael | | |
| Timer Information: | | Mass Concentration Data: | | |
| Date | Time | | Filter ID: 2303-0505 | |
| dd-mmm | hh:mm:ss | | Final Wt: 158.290 mg | |
| Start: 23-Dec-13 | 11:05:00 | | Initial Wt: 157.940 mg | |
| Stop: 24-Dec-13 | 11:05:00 | | Delta Wt: 0.350 mg | |
| | | Total Vol: 20.90 m ³ | | |
| | | Mass Conc: 16.74 µg/m ³ | | |

BGI PQ200 Air Sampling System

Downloaded December 2013

| | | | | |
|--|----------|--|------------------------|------------|
| Job Details: Job Name: EA-2A Version: PQ200 Serial No: 2.00 Pump Time: Flags: NA | | Job Code: EA-2A Site Name: La Cuchilla. Station Code: Operators: LF User1: NA User2: NA | | |
| BP | Max 632 | Min 628 | Avg 630 | Units mmHg |
| TA | 25.0 | 13.0 | 16.8 | °C |
| Q | --- | --- | 16.71 | Lpm |
| QCV | | NA | % | |
| Max overheat | | NA | °C | |
| occured NA | | ET: 23:59:00 | | |
| Notes 1: Aldea La Cuchilla, San Rafael Las Flores, Santa Rosa. | | Notes 2: Minera San Rafael | | |
| Timer Information: | | Mass Concentration Data: | | |
| Date | Time | | Filter ID: 2300-0202 | |
| dd-mmm | hh:mm:ss | | Final Wt: 159.760 mg | |
| Start: 18-Dec-13 | 14:30:00 | | Initial Wt: 159.500 mg | |
| Stop: 19-Dec-13 | 14:30:00 | | Delta Wt: 0.260 mg | |
| | | Total Vol: 20.51 m ³ | | |
| | | Mass Conc: 12.68 µg/m ³ | | |

BGI PQ200 Air Sampling System

Downloaded December 2013

| | | | | |
|---|----------|---|------------------------|------------|
| Job Details: Job Name: EA-3 Version: PQ200 Serial No: 1.00 Pump Time: Flags: NA | | Job Code: EA-3 Site Name: El Fucio, zona este. Station Code: Operators: LF User1: NA User2: NA | | |
| BP | Max 625 | Min 620 | Avg 623 | Units mmHg |
| TA | 24.8 | 12.3 | 16.1 | °C |
| Q | --- | --- | 16.71 | Lpm |
| QCV | | NA | % | |
| Max overheat | | NA | °C | |
| occured NA | | ET: 23:59:00 | | |
| Notes 1: Aldea El Fucio, San Rafael Las Flores, Santa Rosa. | | Notes 2: Minera San Rafael | | |
| Timer Information: | | Mass Concentration Data: | | |
| Date | Time | | Filter ID: 2299-0141 | |
| dd-mmm | hh:mm:ss | | Final Wt: 160.210 mg | |
| Start: 18-Dec-13 | 15:10:00 | | Initial Wt: 159.720 mg | |
| Stop: 19-Dec-13 | 15:10:00 | | Delta Wt: 0.490 mg | |
| | | Total Vol: 20.33 m ³ | | |
| | | Mass Conc: 24.10 µg/m ³ | | |

BGI PQ200 Air Sampling System

Downloaded December 2013

Job Details:

Job Name: EA-7A
Version: PQ200
Serial No: 1.00
Pump Time:
Flags: NA

Job Code: EA-7A
Site Name: Los Planes
Station Code:
Operators: LFB
User1: NA
User2: NA

| | Max | Min | Avg | Units |
|----|------|------|-------|-------|
| BP | 651 | 647 | 648 | mmHg |
| TA | 26.8 | 16.7 | 20.4 | °C |
| Q | --- | --- | 16.71 | Lpm |

Timer Information:

| | Date | Time |
|--------|-----------|----------|
| | dd-mmm | hh:mm:ss |
| Start: | 12-Dec-13 | 8:25:00 |
| Stop: | 13-Dec-13 | 8:25:00 |
| ET: | 23:59:00 | |

Mass Concentration Data:

| | |
|-------------|----------------------|
| Filter ID: | 2277-0808 |
| Final Wt: | 160.980 mg |
| Initial Wt: | 160.670 mg |
| Delta Wt: | 0.310 mg |
| Total Vol: | 20.84 m ³ |

QCV NA %

Max overheat NA °C
occured NA

Mass Conc: **14.88** µg/m³

Notes 1: NE piletas aua de proceso, aledaño a Aldea Los Planes, San Rafael Las Flores, Santa Rosa.

Notes 2: Minera San Rafael

Reporte Analítico RA-14-11128

Cliente: Minera San Rafael
Dirección: Boulevard Los Próceres, 18 calle 24-69 z. 10, Centro Empresarial Zona Pradera, Oficina 1406 torre IV
Proyecto: 178-031 (El Escobal)
Análisis de muestras: Enero, 06-07 de 2014
Emisión del reporte: Enero, 08 de 2014

Tipo de muestra: Filtros de cuarzo utilizados para colección de material particulado en aire.

Análisis: Gravimetría de partículas en filtro de calidad del aire.

Método analítico: 40 CFR, Apéndice J, Parte 50, Capítulo 1, Edición 07-1-97, EPA. Reference Method for the Determination of Particulate Matter as PM10 in the Atmosphere.

Acreditado ISO 17025 según resolución OGA-LE-050-12.

| No. | LDM (gramos) | Identificación de la muestra | Código del filtro ¹ | Peso inicial* (gramos) | Peso final (gramos) |
|-----|--------------|------------------------------|--------------------------------|------------------------|---------------------|
| 1 | 0.00017 | EA-1A | 2303-0505 | 0.15794 | 0.15829 |
| 2 | | EA-2A | 2300-0202 | 0.15950 | 0.15976 |
| 3 | | EA-3 | 2299-0141 | 0.15972 | 0.16021 |
| 4 | | EA-7A | 2277-0808 | 0.16067 | 0.16098 |

¹: Código asignado por Laboratorio Ambiental, S.A. *: corresponde a los pesos iniciales indicados en los reportes analíticos RA-13-11080 y RA-13-11067. LDM: límite de detección del método.

Anexos:

Anexo 1. Cadena de Custodia R-02-000335

Este Reporte Analítico ha sido elaborado para uso confidencial y exclusivo del cliente; se prohíbe su reproducción, sin la aprobación escrita del Laboratorio. Los resultados aquí expresados representan el mejor juicio del Laboratorio y son válidos únicamente para la porción de muestra presentada a éste. Laboratorio Ambiental, S.A. no asume ninguna responsabilidad ni garantiza la utilización final que se le dé a la información aquí presentada. Laboratorio Ambiental, S.A. no se responsabiliza por el proceso de muestreo.

Inga. Vivian Salazar
Ingeniera Química, Encargado Químico
Colegiado 1849

MSc. BSc. Ana Gabriela Juárez
Especialista ambiental, Director de Laboratorio

| | | | | |
|-------------------|---------------|-------------------------------|---------------|-------------------------|
| Redacción: | Fecha: | Revisión y aprobación: | Fecha: | Versión Cliente: |
| V.S. | Enero, 08/14 | A.G.J. | Enero, 08/14 | 01 |

BGI PQ200 Air Sampling System

Downloaded January 2014

Job Details:

Job Name: EA-1A
Version: PQ200
Serial No: 1.00
Pump Time:
Flags: NA

Job Code: EA-1A
Site Name: Los Planes (Top Soil Deposit)
Station Code:
Operators:
User1: NA
User2: NA

| | Max | Min | Avg | Units |
|----|------|------|-------|-------|
| BP | 649 | 644 | 647 | mmHg |
| TA | 27.7 | 14.3 | 19.0 | °C |
| Q | --- | --- | 16.71 | Lpm |

Timer Information:

| Date | Time |
|------------------|----------|
| dd-mmm | hh:mm:ss |
| Start: 14-Jan-14 | 14:30:00 |
| Stop: 15-Jan-14 | 14:30:00 |

Mass Concentration Data:

| | |
|-------------|----------------------|
| Filter ID: | 2301-0333 |
| Final Wt: | 160.940 mg |
| Initial Wt: | 160.400 mg |
| Delta Wt: | 0.540 mg |
| Total Vol: | 20.91 m ³ |

QCV NA %

Max overheat NA °C

occured NA

ET: 23:59:00

Mass Conc: **25.83** µg/m³

Notes 1: Depósito de Suelos, Proyecto El Escobal

Notes 2: Minera San Rafael

BGI PQ200 Air Sampling System

Downloaded January 2014

Job Details:

Job Name: EA-2A
Version: PQ200
Serial No: 2.00
Pump Time:
Flags: NA

Job Code: EA-2A
Site Name: La Cuchilla.
Station Code:
Operators:
User1: NA
User2: NA

| | Max | Min | Avg | Units |
|----|------|------|-------|-------|
| BP | 631 | 627 | 628 | mmHg |
| TA | 30.5 | 12.7 | 18.2 | °C |
| Q | --- | --- | 16.71 | Lpm |

Timer Information:

| Date | Time |
|-----------------|----------|
| dd-mmm | hh:mm:ss |
| Start: 2-Jan-14 | 8:05:00 |
| Stop: 3-Jan-14 | 8:05:00 |

Mass Concentration Data:

| | |
|-------------|----------------------|
| Filter ID: | 2305-0717 |
| Final Wt: | 160.140 mg |
| Initial Wt: | 159.750 mg |
| Delta Wt: | 0.390 mg |
| Total Vol: | 20.35 m ³ |

QCV NA %

Max overheat NA °C

occured NA

ET: 23:59:00

Mass Conc: **19.17** µg/m³

Notes 1: Aldea La Cuchilla, San Rafael Las Flores, Santa Rosa.

Notes 2: Minera San Rafael

BGI PQ200 Air Sampling System

Downloaded January 2014

Job Details:

Job Name: EA-3
Version: PQ200
Serial No: 1.00
Pump Time:
Flags: NA

Job Code: EA-3
Site Name: El Fucio, zona este.
Station Code:
Operators:
User1: NA
User2: NA

| | Max | Min | Avg | Units |
|----|------|------|-------|-------|
| BP | 624 | 621 | 622 | mmHg |
| TA | 25.9 | 12.1 | 17.1 | °C |
| Q | --- | --- | 16.71 | Lpm |

Timer Information:

| Date | Time |
|-----------------|----------|
| dd-mmm | hh:mm:ss |
| Start: 2-Jan-14 | 9:05:00 |
| Stop: 3-Jan-14 | 9:05:00 |

Mass Concentration Data:

| | |
|-------------|----------------------|
| Filter ID: | 2304-0606 |
| Final Wt: | 161.230 mg |
| Initial Wt: | 160.150 mg |
| Delta Wt: | 1.080 mg |
| Total Vol: | 20.23 m ³ |

QCV NA %

Max overheat NA °C

occured NA

ET: 23:59:00

Mass Conc: **53.39** µg/m³

Notes 1: Aldea El Fucio, San Rafael Las Flores, Santa Rosa.

Notes 2: Minera San Rafael

BGI PQ200 Air Sampling System

Downloaded January 2014

Job Details:

Job Name: EA-7A
Version: PQ200
Serial No: 1.00
Pump Time:
Flags: NA

Job Code: EA-7A
Site Name: Los Planes
Station Code:
Operators:
User1: NA
User2: NA

| | Max | Min | Avg | Units |
|----|------|------|-------|-------|
| BP | 650 | 645 | 648 | mmHg |
| TA | 26.0 | 14.8 | 19.2 | °C |
| Q | --- | --- | 16.71 | Lpm |

Timer Information:

| | Date | Time |
|--------|-----------|----------|
| | dd-mmm | hh:mm:ss |
| Start: | 14-Jan-14 | 14:50:00 |
| Stop: | 15-Jan-14 | 14:50:00 |
| ET: | 23:59:00 | |

Mass Concentration Data:

| | |
|-------------|----------------------|
| Filter ID: | 2302-0414 |
| Final Wt: | 160.570 mg |
| Initial Wt: | 160.080 mg |
| Delta Wt: | 0.490 mg |
| Total Vol: | 20.92 m ³ |

QCV NA %

Max overheat NA °C
occured NA

Mass Conc: **23.42** µg/m³

Notes 1: NE piletas aua de proceso, aledaño a Aldea Los Planes, San Rafael Las Flores, Santa Rosa.

Notes 2: Minera San Rafael

Reporte Analítico RA-14-11142

Cliente: Minera San Rafael
Dirección: Boulevard Los Próceres, 18 calle 24-69 z. 10, Centro Empresarial Zona Pradera, Oficina 1406 torre IV
Proyecto: 178-031 (El Escobal)
Análisis de muestras: Enero, 20-21 de 2014
Emisión del reporte: Enero, 23 de 2014

Tipo de muestra: Filtros de cuarzo utilizados para colección de material particulado en aire.

Análisis: Gravimetría de partículas en filtro de calidad del aire.

Método analítico: 40 CFR, Apéndice J, Parte 50, Capítulo 1, Edición 07-1-97, EPA. Reference Method for the Determination of Particulate Matter as PM10 in the Atmosphere.

Acreditado ISO 17025 según resolución OGA-LE-050-12.

| No. | LDM (gramos) | Identificación de la muestra | Código del filtro ¹ | Peso inicial* (gramos) | Peso final (gramos) |
|-----|--------------|------------------------------|--------------------------------|------------------------|---------------------|
| 1 | 0.00017 | EA-1A | 2301-0333 | 0.16040 | 0.16094 |
| 2 | | EA-2A | 2305-0717 | 0.15975 | 0.16014 |
| 3 | | EA-3 | 2304-0606 | 0.16015 | 0.16123 |
| 4 | | EA-7A | 2302-0414 | 0.16008 | 0.16057 |

¹: Código asignado por Laboratorio Ambiental, S.A. *: corresponde a los pesos iniciales indicados en el reporte analítico RA-13-11080. LDM: límite de detección del método.

Reporte Analítico RA-14-11142

Anexos:

Anexo 1. Cadena de Custodia R-02-000336

Este Reporte Analítico ha sido elaborado para uso confidencial y exclusivo del cliente; se prohíbe su reproducción, sin la aprobación escrita del Laboratorio. Los resultados aquí expresados representan el mejor juicio del Laboratorio y son válidos únicamente para la porción de muestra presentada a éste. Laboratorio Ambiental, S.A. no asume ninguna responsabilidad ni garantiza la utilización final que se le dé a la información aquí presentada. Laboratorio Ambiental, S.A. no se responsabiliza por el proceso de muestreo.

Inga. Vivian Salazar
Ingeniera Química, Encargado Químico
Colegiado 1849

MSc. BSc. Ana Gabriela Juárez
Especialista ambiental, Director de Laboratorio

| | | | | |
|-------------------------------|-----------------------------------|---|-----------------------------------|--|
| Redacción: V.S. | Fecha: Enero, 23/14 | Revisión y aprobación: A.G.J. | Fecha: Enero, 24/14 | Versión Cliente: 01 |
|-------------------------------|-----------------------------------|---|-----------------------------------|--|



CADENA DE CUSTODIA

Laboratorio Ambiental, S.A.
Tronco 1, Sector E, Lote 14 El Encinal, zona 7 de Mixco, Guatemala, Guatemala.
Teléfono: 24318187, Fax 24318108 ext. 102
www.laboratorio-ambiental.com

| Información General | | | | Información para el Reporte | | | |
|---------------------|--|------|----|-----------------------------|-------------------------------------|-------------------|-------------------------|
| Empresa | Minera San Rafael, S.A. | | | Word | <input type="checkbox"/> | Reportar a: | Miguel Berganza |
| Contacto | Miguel Berganza | | | PDF | <input checked="" type="checkbox"/> | Proyecto: | Proyecto Minero Escoba |
| Dirección | Bulevar los Próceros 18 calle 24-693. 10 Zona Empresarial, Zona Pradera Torre IV of 1406 | | | Excel | <input type="checkbox"/> | Orden de Trabajo: | |
| Ciudad | Guatemala | País | GT | Impresión | <input type="checkbox"/> | Dirección: | Ver información general |
| Teléfono | 5951 5248 | Fax | - | Otro | <input type="checkbox"/> | | |
| e-mail | M.Berganza@sanrafael.com.gt | | | Observaciones | | | |

| Plazo de entrega de Reporte (PER) ² | |
|--|--|
| PER Regular: | <input checked="" type="checkbox"/> 6 a 8 días Laborales |
| PER agilizado: (previa aprobación vía e-mail) | <input type="checkbox"/> 48 a 72 horas |
| | <input type="checkbox"/> 72 a 96 horas |
| Otro: | |

| Cadena de Custodia No. | |
|---------------------------|--|
| R-02-000336 | |
| Pág. <u>1</u> de <u>1</u> | |

Instrucciones:

- Completar la información solicitada con letra legible.
- Para uso exclusivo de Laboratorio Ambiental dejar en blanco.
- Marque con una "x" sobre las opciones que desee sean tomadas en consideración.
- Colocar el número de recipientes que correspondan a la descripción del encabezado.

| No. | Identificación de las Muestra | Identificación laboratorio ¹ | Fecha del muestreo | No. Total recipiente | Parámetros a analizar ² | | | | | | | | | | | | | | | | | | | Observaciones | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|-------------------------------|---|--------------------|----------------------|-------------------------------------|---------------|----------|-----------------------------|------|------|---------|--------------------------|-------|---------------|-------|------------------------|------|-------|-----|------|--------|------|-------------|---------------|--------------------|-----------------|---------------|-------------------|----------|---|-------------------------|-------------|--------|-----|-----------------|-----------------------------|---------------------------|----------------|--------------|---------------------|------------------|-----------------------------------|-----------------------------|----------------|-----------------------|--------------|-------|--|--|--|------------------|--|--|--|------------------|
| | | | | | Descripción recipiente ³ | | | Tipo de Matriz ³ | | | | Preservante ³ | | | | Físico-químico de Agua | | | | | | | | | | | Filtros | Aire | Biología | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | EA-1A | 2301-0333 | 14/01/14 | 1 | Vidrio | Porta filtros | Plástico | Otros | Agua | Aire | Filtros | Macroinvertebrados | Peces | Fauna y Flora | Otros | Frio | HNO3 | H2SO4 | HCl | NaOH | Etanol | Otro | Alcalinidad | Dureza Total | Nitrógeno Kjeldahl | Nitrógeno total | Fósforo Total | Cromo hexavalente | Color | Aniones: F ⁻ , Cl ⁻ , SO ₄ ²⁻ , NO ₃ ⁻ , NO ₂ ⁻ | Cationes: Mg, K, Ca, Na | Cromo total | Amonio | TOC | Sólidos totales | Sólidos Suspendedos Totales | Sólidos Disueltos Totales | Pesado Inicial | Pesado final | Si, C, Hg o Metales | PM ₁₀ | NO ₂ y SO ₂ | Id. Tax. Macroinvertebrados | Id. Tax. Peces | Id. Tax. Herpetofauna | Ecotoxicidad | Otro: | | | | | | | | |
| 2 | EA-2A | 2305-0717 | 02/01/14 | 1 | | ✓ | | | | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Devolver filtro. |
| 3 | EA-3 | 2304-0600 | 02/01/14 | 1 | | ✓ | | | | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Devolver filtro. | | | | |
| 4 | EA-7A | 2302-0414 | 14/01/14 | 1 | | ✓ | | | | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Devolver filtro. | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---------|------------------------------|-----------------------|-------|------------|------|-------|---|--|-------------------------------|--------------------------------|--|--|--|--|--|-----|-----------|--|--|--|--|
| Ingreso | Material Entregado por/Firma | Wisa Fernanda Barrios | Fecha | 16/01/2014 | Hora | 13:00 | Para Uso Exclusivo del laboratorio ¹ | | | | | | | | | | | | | | |
| | Material Recibido por/Firma | Lexus Donald CP | Fecha | 16/01/2014 | Hora | 17:00 | Estado de las muestras | Bueno <input checked="" type="checkbox"/> | Malo <input type="checkbox"/> | (especificar en observaciones) | | | | | | | | | | | |
| Egreso | Material Entregado por/Firma | | Fecha | | Hora | | Temperatura de muestras: | No aplica | | | | | | | | pH: | No aplica | | | | |
| | Material Recibido por/Firma | | Fecha | | Hora | | Observaciones: | 2302-0414 orilla doblada 2304-0606 y 2305-0717 orilla respaldada | | | | | | | | | | | | | |

Nota: F=fluoruros; Cl=cloruros; SO₄²⁻=sulfatos; NO₃⁻=nitratos; NO₂⁻=nitritos; Mg=magnesio; K=potasio; Ca=calcio; Na=sodio; Si=silicio; Hg=mercurio; C=carbono. TOC=carbón orgánico total; Id.Tax.=identificación taxonómica. HNO₃=ácido nítrico; H₂SO₄=ácido sulfúrico; HCl=ácido clorhídrico. Agregar % de la solución de etanol empleada para preservar o "+ G" si se utiliza en solución con glicerina.

11.3.2 Informe de Metales en PM10

Cliente: Minera San Rafael
Dirección: Boulevard Los Próceres, 18 calle 24-69 z. 10, Centro Empresarial Zona Pradera, Oficina 1406 torre IV
Proyecto: 178-032 (El Escobal)
Análisis de muestras: Diciembre, 16-17 de 2013
Emisión del reporte: Diciembre, 18 de 2013

Tipo de muestras: Filtros de cuarzo utilizados para colección de material particulado en aire.

Análisis:

1. Gravimetría de partículas en filtro de calidad del aire (blanco).
2. Cuantificación de Mercurio en filtros de calidad del aire.

Métodos analíticos:

1. 40 CFR, Apéndice J, Parte 50, Capítulo 1, Edición 07-1-97, EPA. Reference Method for the Determination of Particulate Matter as PM₁₀ in the Atmosphere. * **Acreditado ISO 17025 según resolución OGA-LE-050-12.**
2. EPA 7470: Mercury (Cold Vapor Technique): atomic spectroscopy.

Peso inicial y final del filtro (blanco)

| Código del filtro ¹ | Peso inicial* (gramos) | Peso final* (gramos) |
|--------------------------------|------------------------|----------------------|
| 2307-0996 | 0.15916 | 0.15918 |

¹: Código asignado por Laboratorio Ambiental, S.A. para el blanco analítico. La determinación de los pesos inicial y final se realizó el 01 de octubre y 04 de diciembre de 2013, respectivamente.

Mercurio en filtros²

| Elemento (µg) | LD | Código de los filtros | | | | | | | |
|----------------------|-------|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | EA-1B | EA-2A | EA-3A | EA-4A | EA-5A | EA-6 | EA-7A | BLANCO |
| | | 2233-1119 | 2271-0223 | 2273-0440 | 2230-0808 | 2229-0717 | 2234-1212 | 2272-0303 | 2307-0996 |
| Mercurio (Hg) | 0.002 | 0.017 | 0.005 | 0.008 | 0.019 | 0.007 | 0.007 | 0.007 | 0.005 |

²Análisis realizados por laboratorio subcontratado. LD = Límite de detección.

Reporte Analítico RA-13-11122

Anexos:

Anexo 1. Cadena de Custodia R-02-000333

Este Reporte Analítico ha sido elaborado para uso confidencial y exclusivo del cliente; se prohíbe su reproducción, sin la aprobación escrita del Laboratorio. Los resultados aquí expresados representan el mejor juicio del Laboratorio y son válidos únicamente para la porción de muestra presentada a éste. Laboratorio Ambiental S.A. no asume ninguna responsabilidad ni garantiza la utilización final que se le dé a la información aquí presentada. Laboratorio Ambiental, S.A. no se responsabiliza por el proceso de muestreo.

Inga. Vivian Salazar
Ingeniera Química, Encargado Químico
Colegiado 1849

MSc. BSc. Ana Gabriela Juárez
Especialista ambiental, Director de Laboratorio

| | | | | |
|---------------------------|-----------------------------------|---|-----------------------------------|--------------------------------------|
| Redacción: V.S. | Fecha: Diciembre, 18/13 | Revisión y aprobación: A.G.J. | Fecha: Diciembre, 19/13 | Versión Cliente: 01 |
|---------------------------|-----------------------------------|---|-----------------------------------|--------------------------------------|

CADENA DE CUSTODIA

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Teléfono: 24318187, Fax 24318108 ext. 102
www.laboratorio-ambiental.com



Formulario de Información General con campos para Empresa, Contacto, Dirección, Ciudad, Teléfono y e-mail. Datos de Minera San Rafael, S.A.

Formulario de Información para el Reporte con campos para Word, PDF, Excel, Impresión, Otro, Reportar a, Proyecto, Orden de Trabajo y Dirección. Datos de Miguel Berganza.

Formulario de Plazo de entrega de Reporte (PER) con opciones para Regular (6 a 8 días) y Agilizado (48 a 96 horas).

Formulario de Cadena de Custodia No. con número R-02-000333 y página 1 de 1.

Instrucciones:
1. Para uso exclusivo de Laboratorio Ambiental dejar en blanco
2. Marque con una 'x' sobre las opciones que desee sean tomadas en consideración.
3. Colocar el número de recipientes que correspondan a la descripción del encabezado.

Tabla principal de análisis con 20 filas de muestra y columnas para descripción de recipientes, tipo de matriz, preservante, y parámetros a analizar (Físico-químico de Agua, Filtros, Aire, Biología).

Tabla de Egreso e Ingreso con campos para Material Entregado/Recibido por/Firma, Fecha, Hora, Estado de las muestras y Observaciones.

Nota: F--fluoruros; Cl--cloruros; SO4^2--sulfatos; NO3--nitratos; NO2--nitritos; Mg=magnesio; K=potasio; Ca=calcio; Na = sodio; Si = silicio; Hg = mercurio; C = carbono. TOC = carbón orgánico total; Id.Tax. = identificación taxonómica. HNO3 = ácido nítrico; H2SO4 = ácido sulfúrico; HCl = ácido clorhídrico.

11.3.3 Informe sobre PST y Gases de Combustión.



**MONITOREO DE NO₂, SO₂ Y PARTÍCULAS
SEDIMENTABLES TOTALES
PROYECTO MINERO EL ESCOBAL**

Diciembre 2013 – Enero 2014

San Rafael Las Flores, Santa Rosa, Guatemala

Enero de 2014

Este resumen presenta los resultados del monitoreo de calidad del aire realizado para el proyecto minero El Escobal (**el Proyecto**). El monitoreo fue realizado por Consultoría y Tecnología Ambiental, S.A. (**CTA**) del 02 al 05 de diciembre para gases de combustión y del 05 de diciembre de 2013 al 06 de enero de 2014 para PST, en San Rafael Las Flores, Santa Rosa, donde se ubica el Proyecto. El propósito del monitoreo fue determinar la calidad de aire ambiental en comunidades aledañas mediante la medición de la concentración de:

- Gases de combustión (**SO₂** y **NO₂**); y
- Partículas Sedimentables Totales (**PST**).

Las estaciones de medición se presentan en el Cuadro 1 y la metodología utilizada en el Cuadro 2.

Cuadro 1: Estaciones de monitoreo de SO₂ y NO₂ y PST

| Marzo y Abril 2013 | | |
|--------------------|--|------------------------------------|
| Estación | Ubicación | Coordenadas |
| EA-1C | Frente a Escuela San Rafael | E (m): 803,887 N (m): 1,601,801 |
| EA-2B | Aldea La Cuchilla | E (m): 806,470 N (m): 1,601,796 |
| EA-3B | Aldea El Fucío | E (m): 806,538 N (m): 1,600,367 |
| EA-4A | Aldea La Puerta de Los Ángeles | E (m): 805,142 N (m): 1,599,903 |
| EA-5A | Aldea Sabana Redonda | E (m): 804,342 N (m): 1,600,404 |
| EA-6 | Norte del proyecto, ruta a Mataquescuintla | E (m): 805,168 N (m): 1,603,247 |
| EA-7A | Perímetro del Proyecto colindante con aldea Los Planes | E (m): 805,425 N (m): 1,601,523 |

Coordenadas en metros (**m**). Datum: WGS84 UTM zona 16 N. Fuente: CTA, 2013.

Cuadro 2: Metodologías utilizadas para SO₂ y NO₂ y PST

| | |
|----------------------------|--|
| Gases de Combustión | <p>SO₂: Se utilizó el análisis espectrofotométrico, descrito en el Título 40, Parte 50, Apéndice A de la USEPA.</p> <p>NO₂: Se utilizó el análisis espectrofotométrico. Método de referencia designado por la USEPA: No. EQN-1277-026.</p> |
| PST | ASTM D 1739-98 (re-aprobación 2004). |

Fuente: CTA, 2013.

Los resultados obtenidos para los gases de combustión se compararon con los valores guía reportados en: Calidad de Aire Ambiental: Guías del Banco Mundial (**el Banco**)¹ para SO₂ y NO₂, tomadas de International Finance Corporation (**IFC**) Industry Sector Guidelines for Mining, December 10, 2007 y General Environment Health and Safety Guidelines, December 19/2008. Para PST se utilizó como guía de comparación el valor presentado en el Ministerio de Ambiente de British Columbia, Canadá, agosto 2013².

En el Cuadro 3 se presentan los resultados obtenidos de la medición de gases de combustión realizada en diciembre de 2013; y en el Cuadro 4 se presentan los resultados de la medición de PST para el período de 30 días de diciembre 2013 a enero 2014.

Cuadro 3: Resultados de la medición de gases de combustión en µg/m³

| Estaciones de Muestreo | EA-1C | EA-2B | EA-3B | EA-4A | EA-5A | EA-6 | EA-7A | Guías del Banco |
|------------------------|-------|-------|-------|-------|-------|------|-------|----------------------|
| SO₂ | <13 | <13 | <13 | <13 | <13 | <13 | <13 | 20 µg/m ³ |
| NO₂ | 14 | 17 | 10 | 22 | 16 | 13 | 14 | *40µg/m ³ |

SO₂: dióxido de azufre. NO₂: dióxido de nitrógeno. *: Promedio anual. Fuente: Laboratorio Ambiental, S. A., 2013.

Cuadro 4: Resultados de la medición de PST (g/m² x 30 días)

| Estaciones de Muestreo | EA-1C | EA-2B | EA-3B | EA-4A | EA-5A | EA-6 | EA-7A | Guía de BC |
|------------------------|-------|-------|-------|-------|-------|------|-------|------------|
| S. Insolubles | 8.63 | 6.47 | 9.36 | 38.87 | 19.39 | 1.17 | 3.20 | -- |
| S. Solubles | 1.61 | 2.26 | 1.44 | 1.49 | 1.55 | 1.74 | 1.66 | -- |
| S. Totales | 10.24 | 8.74 | 10.80 | 40.36 | 20.94 | 2.91 | 4.86 | 8.7 |

Fuente: Laboratorio Ambiental, S. A., 2013.

¹ Guías del Banco Mundial: www.ifc.org/ifcext/EnvironmentalGuidelines

² Guía de BC: <http://www.bcairquality.ca/reports/pdfs/aqotable.pdf>

Gases de Combustión

Como se puede apreciar en el Cuadro 3 el SO₂ se presentó por debajo del límite de detección del método analítico utilizado en todas las estaciones monitoreadas. Mientras que el NO₂ se detectó en todas las estaciones en concentraciones por debajo de la guía de comparación utilizada (40 µg/m³), presentándose el valor más alto en la estación EA-4A (22 µg/m³) y el más bajo en la estación EA-3B (10 µg/m³).

Partículas Sedimentables Totales

La estación que presentó la mayor concentración de partículas sedimentables totales fue la EA-4A (40.36 g/m² x 30 días). Se pudo observar en esta estación que durante el período de monitoreo se realizó el apilamiento de materiales de construcción, lo que combinado con los fuertes vientos reportados por los vecinos pudieron influir en el resultado obtenido. La estación que presentó la menor concentración de PST durante el período de monitoreo fue la EA-6 (2.91 g/m² x 30 días).



Anexos

Anexo 1-1: Reportes analíticos

Reporte Analítico RA-13-11123

Cliente: Consultoría y Tecnología Ambiental, S.A.
Dirección: Tronco I, sector E, lote 14, el Encinal Z. 7 de Mixco.
Proyecto: 178-030
Análisis de muestras: Diciembre, 23 de 2013
Emisión del reporte: Diciembre, 26 de 2013

Tipo de muestras: 1. Soluciones absorbentes SO₂
 2. Soluciones absorbentes NO₂

Análisis: Determinación de dióxido de azufre (SO₂) y dióxido de nitrógeno (NO₂) en la atmósfera, por métodos espectrofotométricos.

Métodos analíticos: SO₂: 40 CFR, parte 50, Apéndice A-2, EPA. Reference Method for the determination of Sulfur Dioxide in the atmosphere (Pararosaniline Method). NO₂: EPA Designated Equivalent Method No. EQN-1277-026. Sodium Arsenite method for the determination of Nitrogen Dioxide in the atmosphere.

| Parámetro | Unidades | LDM | Concentración ¹ | | | | | | | | | | |
|-----------------|-------------------|-------|----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|----|----|
| | | | EA-6 | EA-5A | EA-4A | EA-2B | EA-3B | EA-1C | EA-7A | DEA-5A | DEA-3B | MB | |
| SO ₂ | µg/m ³ | 13 | <13 | <13 | <13 | <13 | <13 | <13 | <13 | <13 | <13 | NA | ND |
| | ppm | 0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | NA | ND |
| NO ₂ | µg/m ³ | 9 | 13 | 16 | 22 | 17 | 10 | 14 | 14 | NA | 11 | ND | |
| | ppm | 0.005 | 0.007 | 0.009 | 0.012 | 0.009 | 0.006 | 0.007 | 0.007 | NA | 0.006 | ND | |

¹: Las concentraciones de SO₂ y NO₂ fueron calculadas con los datos de campo proporcionados por el cliente. **LDM**: límite de detección del método. **MB**: muestra blanco de viaje. **µg/m³**: microgramos por metro cúbico, **ppm**: partes por millón. **DEA-5A**: duplicado analítico de la muestra EA-5A. **DEA-3B**: duplicado analítico de la muestra EA-3B. **NA**: no aplica. **ND**: no detectado.

| Parámetro | Unidades | Concentración | |
|-----------------|------------------------|---------------|-------|
| | | CDL | |
| | | Teórico | Real |
| SO ₂ | µg SO ₂ | 19.05 | 18.91 |
| NO ₂ | µg NO ₂ /mL | 1.00 | 1.03 |

CDL: control de laboratorio. La diferencia entre las concentraciones teóricas y reales de los controles no deben ser mayores a 1 µg SO₂ y a 0.1 µg/mL de NO₂, respectivamente.

Anexos:

Anexo 1. Cadena de Custodia R-02-000367

Este Reporte Analítico ha sido elaborado para uso confidencial y exclusivo del cliente; se prohíbe su reproducción, sin la aprobación escrita del Laboratorio. Los resultados aquí expresados representan el mejor juicio del Laboratorio y son válidos únicamente para la porción de muestra presentada a éste. Laboratorio Ambiental S.A. no asume ninguna responsabilidad ni garantiza la utilización final que se le dé a la información aquí presentada. Laboratorio Ambiental, S.A. no se responsabiliza por el proceso de muestreo.



Inga. Vivian Salazar
Ingeniera Química, Encargado Químico
Colegiado 1849



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Especialista ambiental, Director de Laboratorio

| | | | | |
|---------------------------|-----------------------------------|---|-----------------------------------|--------------------------------------|
| Redacción: V.S. | Fecha: Diciembre, 26/13 | Revisión y aprobación: A.G.J. | Fecha: Diciembre, 26/13 | Versión Cliente: 01 |
|---------------------------|-----------------------------------|---|-----------------------------------|--------------------------------------|

Cliente: Consultoría y Tecnología Ambiental, S.A.
Dirección: Tronco I, sector E, lote 14, el Encinal Z. 7 de Mixco
Proyecto: 178-030
Fecha de análisis: Enero, 07-08 de 2014
Emisión del reporte: Enero, 08 de 2014

Tipo de muestras: Partículas sedimentadas durante un período de 30 días.
Análisis: Medición de material particulado total sedimentable en el aire (tasa de sedimentación).
Método analítico: ASTM D1739-98 (Reapproved 2004) Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter).

| No. | Identificación de la muestra | Tasa de sedimentación para un período de 30 días g/(m ² • 30 días) | | |
|-----|------------------------------|--|------------------|---|
| | | Material insoluble | Material soluble | Total (material soluble e insoluble) |
| 1 | EA-1C | 8.63 | 1.61 | 10.24 |
| 2 | EA-2B | 6.47 | 2.26 | 8.74 |
| 3 | EA-3B | 9.36 | 1.44 | 10.80 |
| 4 | EA-4A | 38.87 | 1.49 | 40.36 |
| 5 | EA-5A | 19.39 | 1.55 | 20.94 |
| 6 | EA-6 | 1.17 | 1.74 | 2.91 |
| 7 | EA-7A | 3.20 | 1.66 | 4.86 |

g: gramos; m²: metros cuadrados.

Reporte Analítico RA-14-11132

Anexos:

Anexo 1. Cadena de Custodia R-02-000372

Este Reporte Analítico ha sido elaborado para uso confidencial y exclusivo del cliente; se prohíbe su reproducción, sin la aprobación escrita del Laboratorio. Los resultados aquí expresados representan el mejor juicio del Laboratorio y son válidos únicamente para la porción de muestra presentada a éste. Laboratorio Ambiental, S.A. no asume ninguna responsabilidad ni garantiza la utilización final que se le dé a la información aquí presentada. Laboratorio Ambiental, S.A. no se responsabiliza por el proceso de muestreo.



Inga. Vivian Salazar
Ingeniera Química, Encargado Químico
Colegiado 1849



MSc. BSc. Ana Gabriela Juárez
Especialista ambiental, Director de Laboratorio

| | | | | |
|-------------------------------|-----------------------------------|---|-----------------------------------|--|
| Redacción: V.S. | Fecha: Enero, 08/14 | Revisión y aprobación: A.G.J. | Fecha: Enero, 08/14 | Versión Cliente: 01 |
|-------------------------------|-----------------------------------|---|-----------------------------------|--|

CADENA DE CUSTODIA

Laboratorio Ambiental, S.A.
Tronco 1, Sector E, Lote 14 El Encinal, zona 7 de Mixco, Guatemala, Guatemala.
Teléfono: 24318187, Fax 24318108 ext. 102
www.laboratorio-ambiental.com

| Información General | | | | Información para el Reporte | | | | |
|---------------------|--|------|-----------|--------------------------------------|--------------------------|-------------------------------------|-------------------|-------------------|
| Empresa | Consultoría y Tecnología Ambiental S.A. | | | Formato para el Reporte ² | Word | <input type="checkbox"/> | Reportar a: | Empresa |
| Contacto | David Cano | | | | PDF | <input checked="" type="checkbox"/> | Proyecto: | 178-030 |
| Dirección | Tronco 1. Sector E, Lote 14, El Encinal, Zona 7 de Mixco | | | | Excel | <input type="checkbox"/> | Orden de Trabajo: | |
| Ciudad | Guatemala | Pais | Guatemala | | Impresión | <input type="checkbox"/> | Dirección: | Ver Info. General |
| Teléfono | 24318103 | Fax | | Otro | <input type="checkbox"/> | | | |
| e-mail | ingeniero@cs2@cta-consultora.com | | | Observaciones | | | | |

Plazo de entrega de Reporte (PER)²

PER Regular:

6 a 8 días Laborales

PER agilizado: (previa aprobación vía e-mail)

48 a 72 horas

72 a 96 horas

Otro: _____

Cadena de Custodia No.

R-02-000372

Pág. 1 de 1

Instrucciones:

1. Para uso exclusivo de Laboratorio Ambiental dejar en blanco
2. Marque con una "x" sobre las opciones que desee sean tomadas en consideración.
3. Colocar el número de recipientes que correspondan a la descripción del encabezado.

| No. | Identificación de las Muestra | Identificación laboratorio ¹ | Fecha del muestreo | No. Total recipiente | Descripción recipiente ³ | | Tipo de Matriz ² | | | | | | Preservante ³ | | Parámetros a analizar ² | | | | | | | | | | | | | | | | | | | | | Observaciones | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|-------------------------------|---|--------------------|----------------------|-------------------------------------|---------------|-----------------------------|-------|------|------|---------|--------------------|--------------------------|-------|------------------------------------|------|-------|-----|------|--------|------|------------------------|--|--|--|--|--|--|---------|------|----------|-------|--|--|--|---------------|--|--|--|--|--|--|--|--|--|--|--|---|---|--------------------------------|--|--|--|--|--|--|--|--|--|--|
| | | | | | Vidrio | Porta filtros | Plástico | Otros | Agua | Aire | Filtros | Macroinvertebrados | Fauna y Flora | Otros | Frio | HNO3 | H2SO4 | HCl | NaOH | Etanol | Otro | Físico-químico de Agua | | | | | | | Filtros | Aire | Biología | Otro: | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | EA-1C | 1003-14-01 | 06/01/14 | 1 | | I | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | Muestreo de 5/12/13 - 06/01/14 | | | | | | | | | | |
| 2 | EA-2B | 1004-14-01 | 06/01/14 | 1 | | I | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | " | | | | | | | | | | |
| 3 | EA-3B | 1005-14-01 | 06/01/14 | 1 | | I | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | " | | | | | | | | | | |
| 4 | EA-4A | 1006-14-01 | 06/01/14 | 1 | | I | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | " | | | | | | | | | | | |
| 5 | EA-5A | 1007-14-01 | 06/01/14 | 1 | | I | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | " | | | | | | | | | | | |
| 6 | EA-6 | 1008-14-01 | 06/01/14 | 1 | | I | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | " | | | | | | | | | | | |
| 7 | EA-7A | 1009-14-01 | 06/01/14 | 1 | | I | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | " | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Nota: F=fluoruros; Cl=cloruros; SO₄²⁻=sulfatos; NO₃=nitratos; NO₂=nitritos; Mg=magnesio; K=potasio; Ca=calcio; Na=sodio; Si=silicio; Hg=mercurio; C=carbono. TOC=carbón orgánico total; Id.Tax.=identificación taxonómica. HNO₃=ácido nítrico; H₂SO₄=ácido sulfúrico; HCl=ácido clorhídrico. Agregar % de la solución de etanol empleada para preservar o "G" si se utiliza en solución con glicerina.

11.3.4 Presión Sonora

ER-1

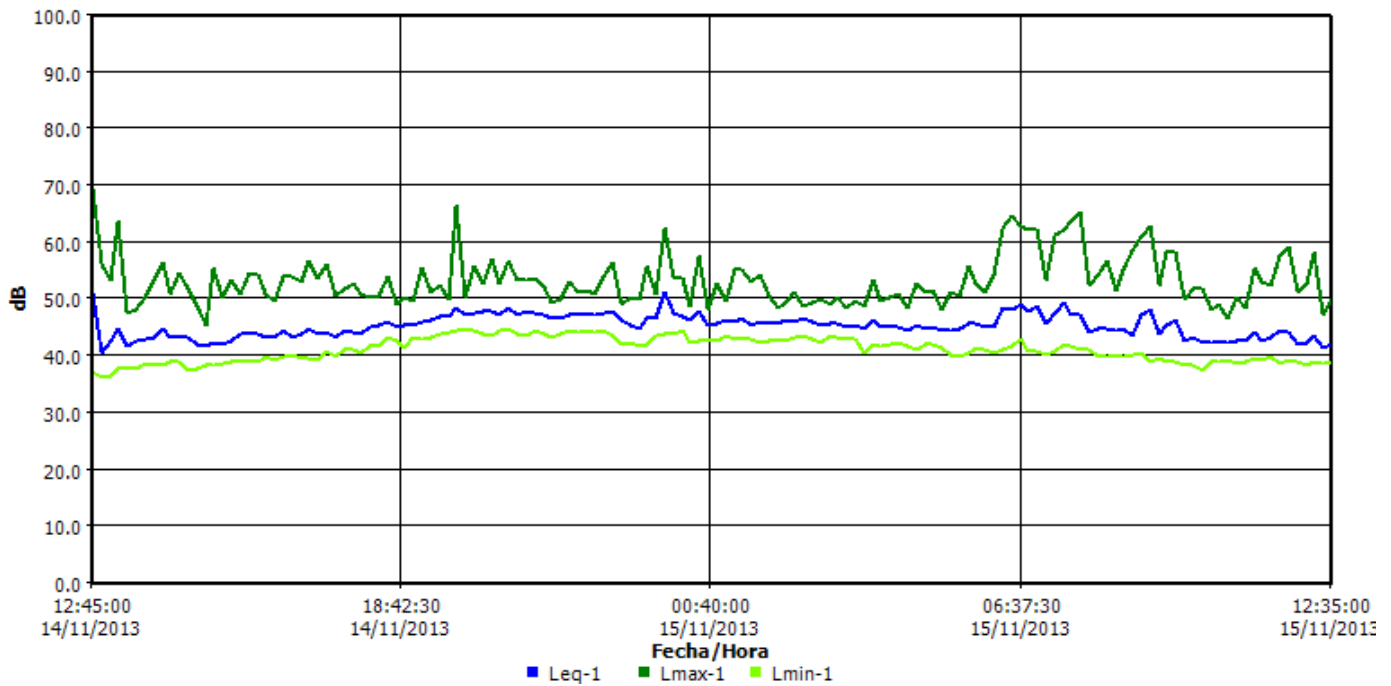
Panel de información

Ubicación Depósito de Suelos norte, Proyecto Minero Escobal
Nombre ER-1
Sesión padre S117
Hora de inicio Jueves, 14 de Noviembre de 2013 12:35:00
Hora de paro Viernes, 15 de Noviembre de 2013 12:35:00
Nombre del usuario Inga. Susana Aroche

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 36.3 dB | Lmax | 1 | 69.2 dB |
| Lpk | 1 | 101.9 dB | Leq | 1 | 45.7 dB |

Gráfica de datos de registro



ER-1A

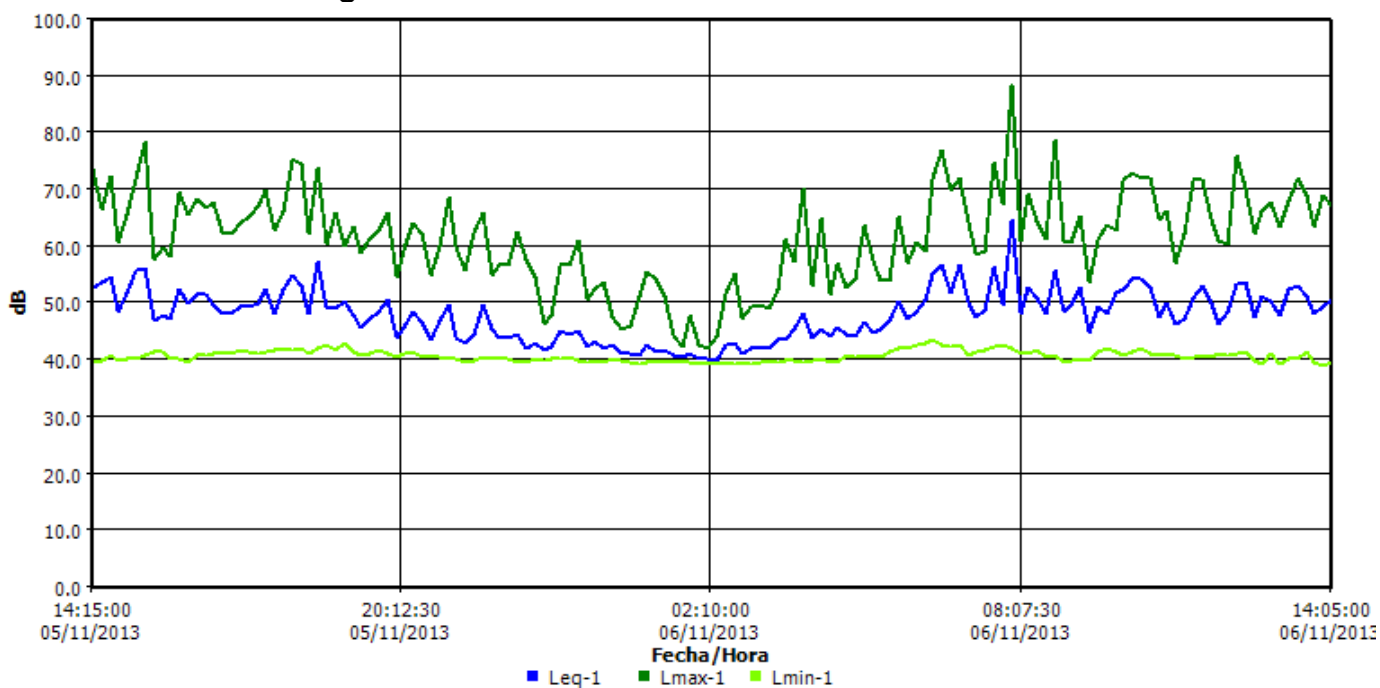
Panel de información

Ubicación San Rafael Las Flores
Nombre ER-1A
Sesión padre S115
Hora de inicio Martes, 05 de Noviembre de 2013 14:05:00
Hora de paro Miércoles, 06 de Noviembre de 2013 14:05:00
Nombre del usuario Inga. Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 39.1 dB | Lmax | 1 | 88.5 dB |
| Lpk | 1 | 106.4 dB | Leq | 1 | 50.7 dB |

Gráfica de datos de registro



ER-2

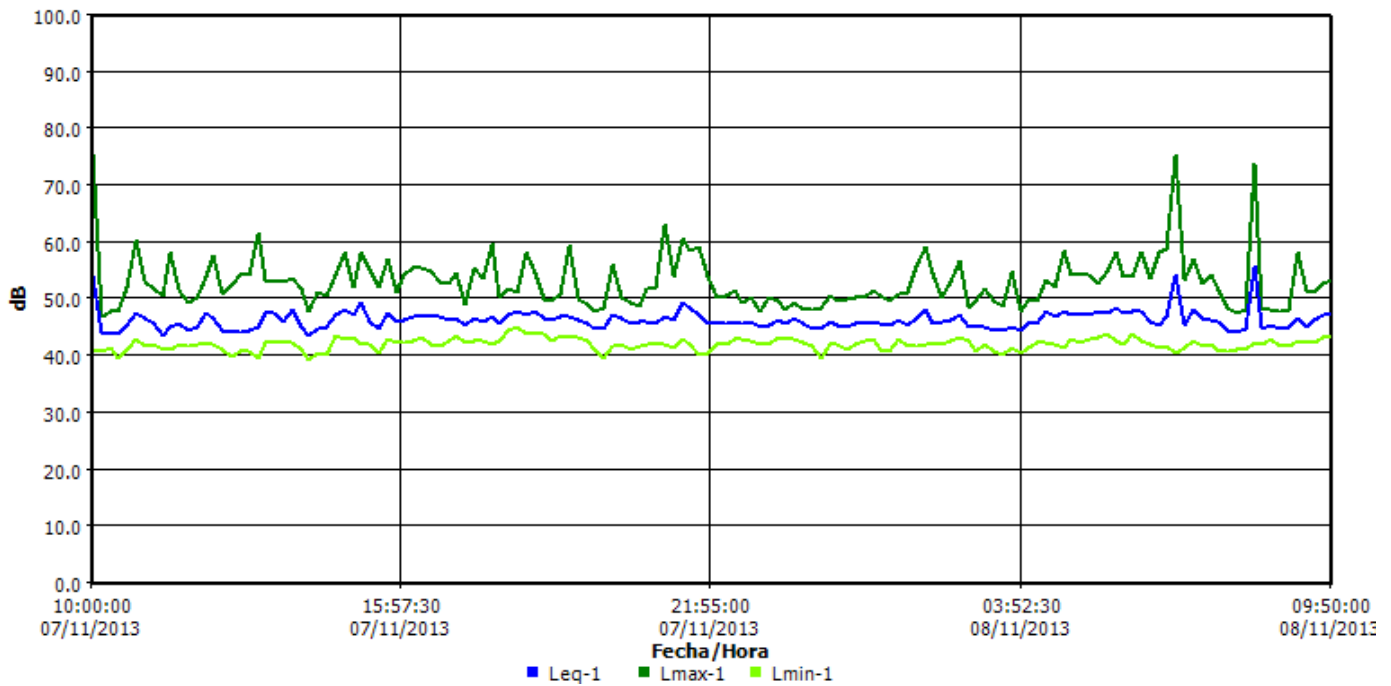
Panel de información

Ubicación Aldea La Cuchilla
Nombre ER-2
Sesión padre S009
Hora de inicio Jueves, 07 de Noviembre de 2013 09:50:00
Hora de paro Viernes, 08 de Noviembre de 2013 09:50:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 39.3 dB | Lmax | 1 | 75.8 dB |
| Lpk | 1 | 98.7 dB | Leq | 1 | 46.8 dB |

Gráfica de datos de registro



ER-3

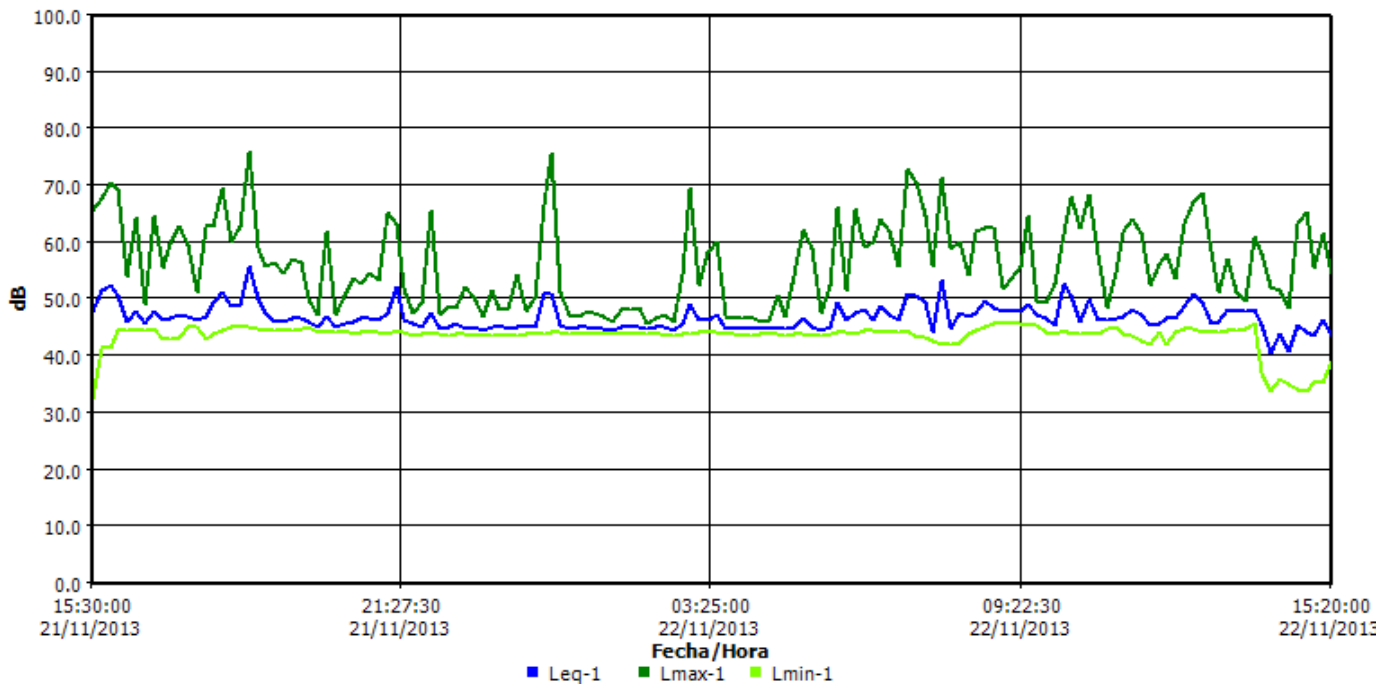
Panel de información

Ubicación Zona Este, Proyecto Minero Escobal
Nombre ER-3
Sesión padre S118
Hora de inicio Jueves, 21 de Noviembre de 2013 15:20:00
Hora de paro Viernes, 22 de Noviembre de 2013 15:20:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 32.6 dB | Lmax | 1 | 76.1 dB |
| Lpk | 1 | 100 dB | Leq | 1 | 47.5 dB |

Gráfica de datos de registro



ER-3A

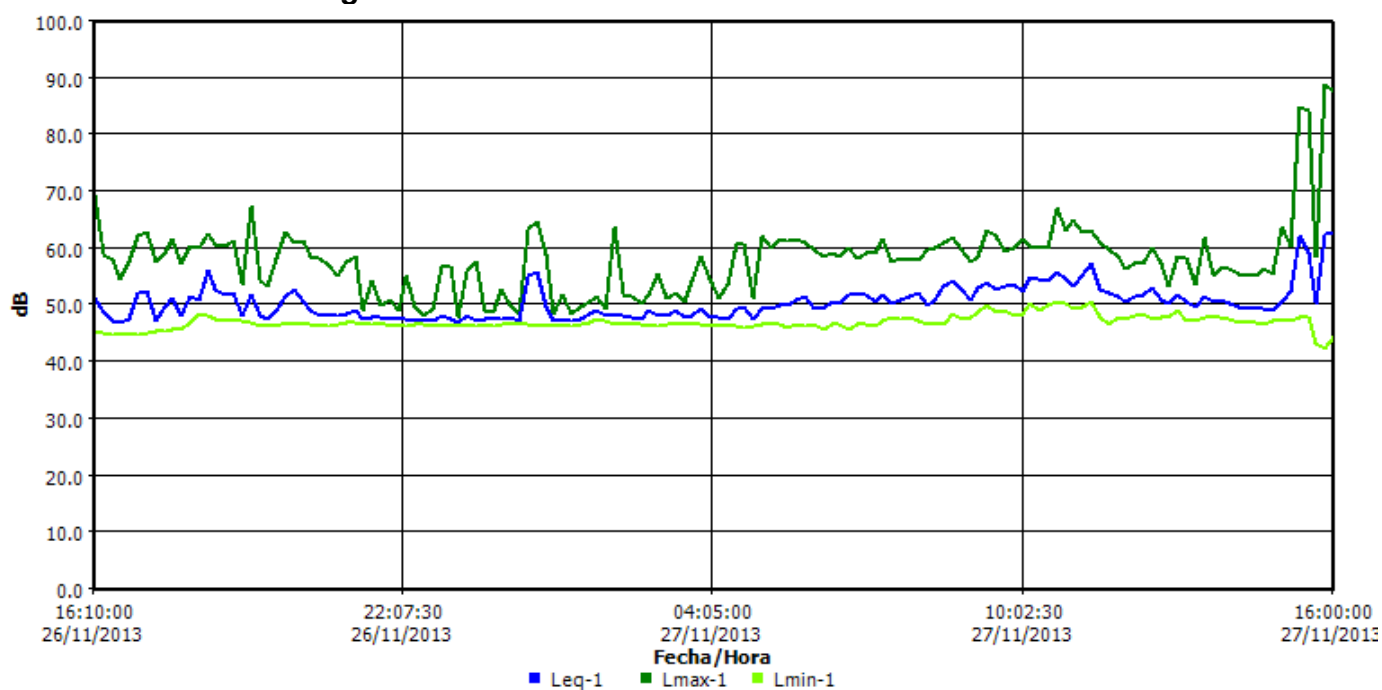
Panel de información

Ubicación Aldea El Fucío
Nombre ER-3A
Sesión padre S012
Hora de inicio Martes, 26 de Noviembre de 2013 16:00:00
Hora de paro Miércoles, 27 de Noviembre de 2013 16:00:00
Nombre del usuario Inga. Susana Aroche

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 42.4 dB | Lmax | 1 | 88.7 dB |
| Lpk | 1 | 123.2 dB | Leq | 1 | 52 dB |

Gráfica de datos de registro



ER-4A

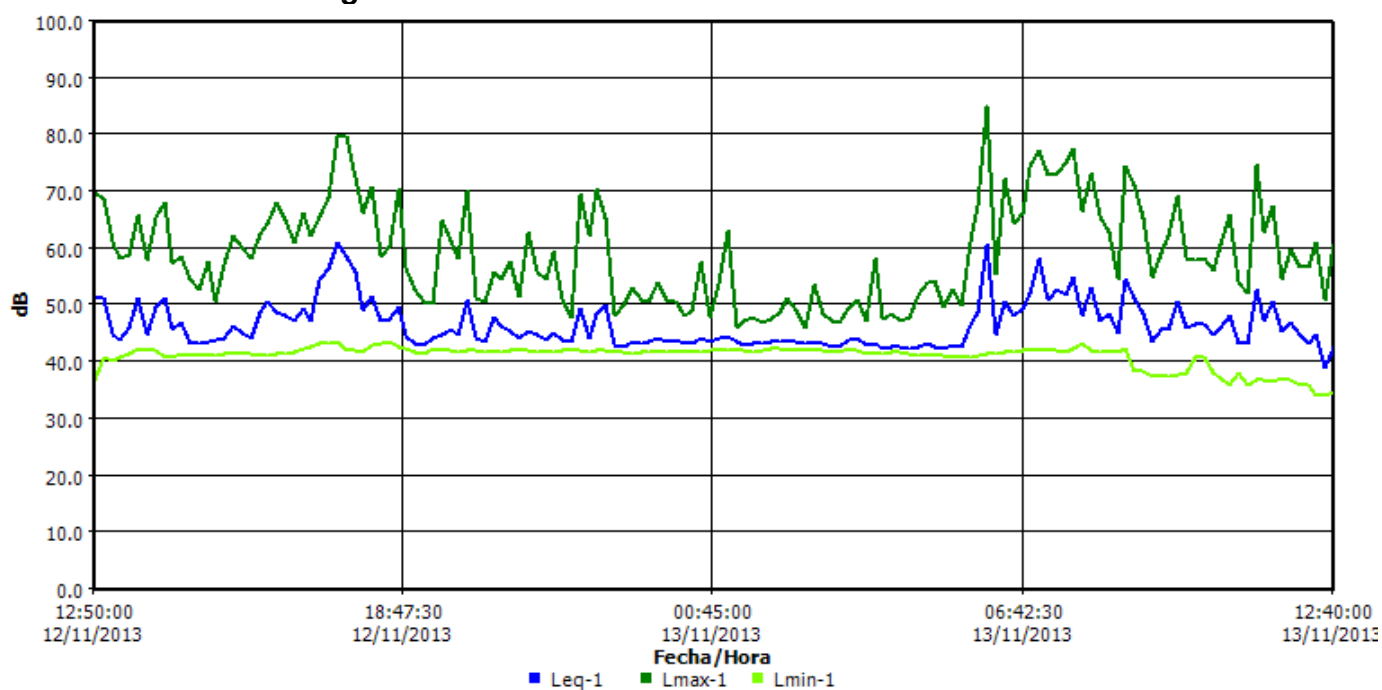
Panel de información

Ubicación Aldea Port[on de Los Ángeles
Nombre ER-4A
Sesión padre S010
Hora de inicio Martes, 12 de Noviembre de 2013 12:40:00
Hora de paro Miércoles, 13 de Noviembre de 2013 12:40:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 34 dB | Lmax | 1 | 85.3 dB |
| Lpk | 1 | 110.4 dB | Leq | 1 | 49.2 dB |

Gráfica de datos de registro



ER-5A

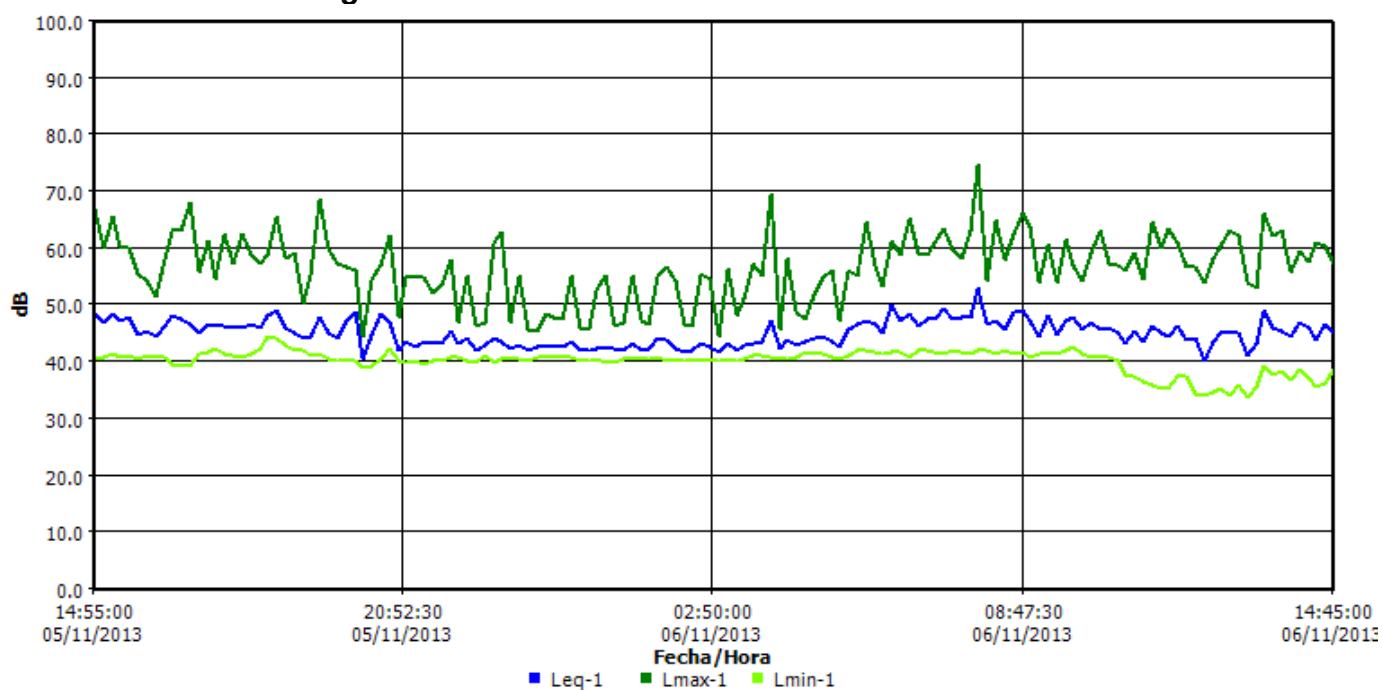
Panel de información

Ubicación Aldea Sabana Redonda
Nombre ER-5A
Sesión padre S008
Hora de inicio Martes, 05 de Noviembre de 2013 14:45:00
Hora de paro Miércoles, 06 de Noviembre de 2013 14:45:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 33.9 dB | Lmax | 1 | 74.8 dB |
| Lpk | 1 | 95.7 dB | Leq | 1 | 45.7 dB |

Gráfica de datos de registro



ER-6

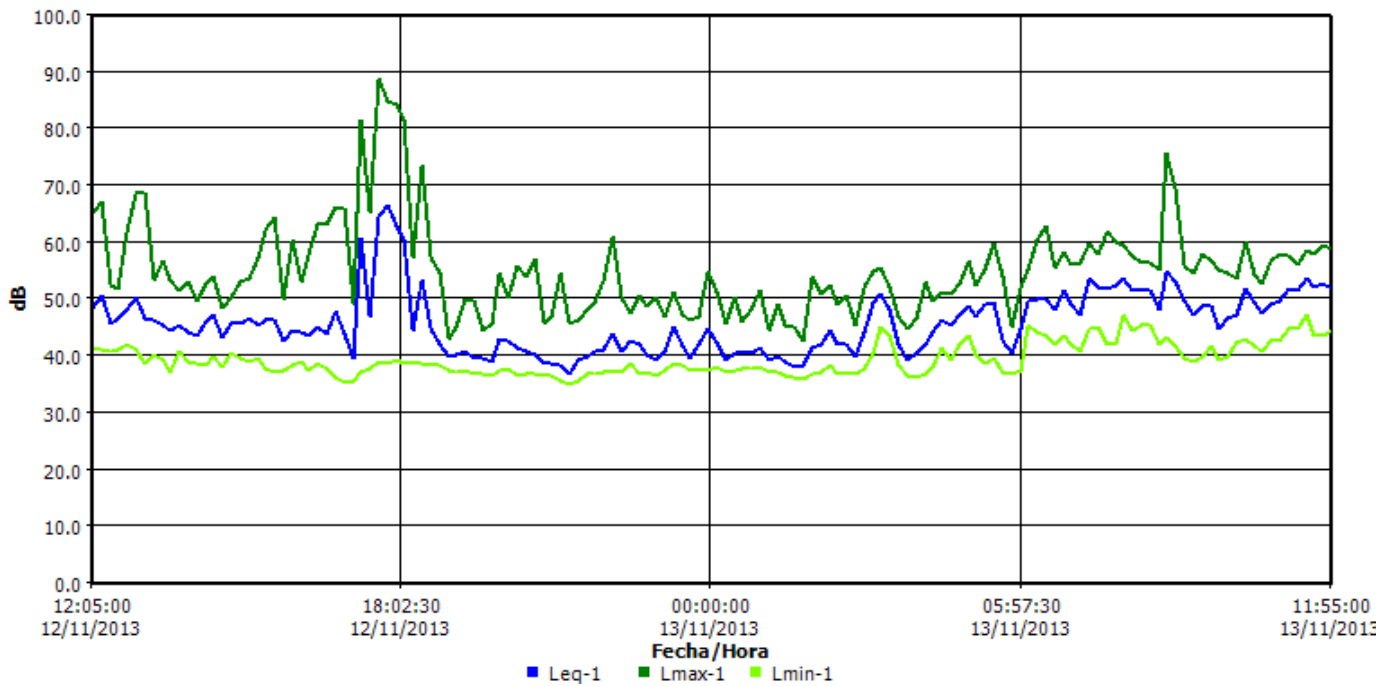
Panel de información

Ubicación Al norte del Proyecto, ruta a Mataquesquintla
Nombre ER-6
Sesión padre S116
Hora de inicio Martes, 12 de Noviembre de 2013 11:55:00
Hora de paro Miércoles, 13 de Noviembre de 2013 11:55:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 35.1 dB | Lmax | 1 | 88.8 dB |
| Lpk | 1 | 106.1 dB | Leq | 1 | 51.2 dB |

Gráfica de datos de registro



ER-7A

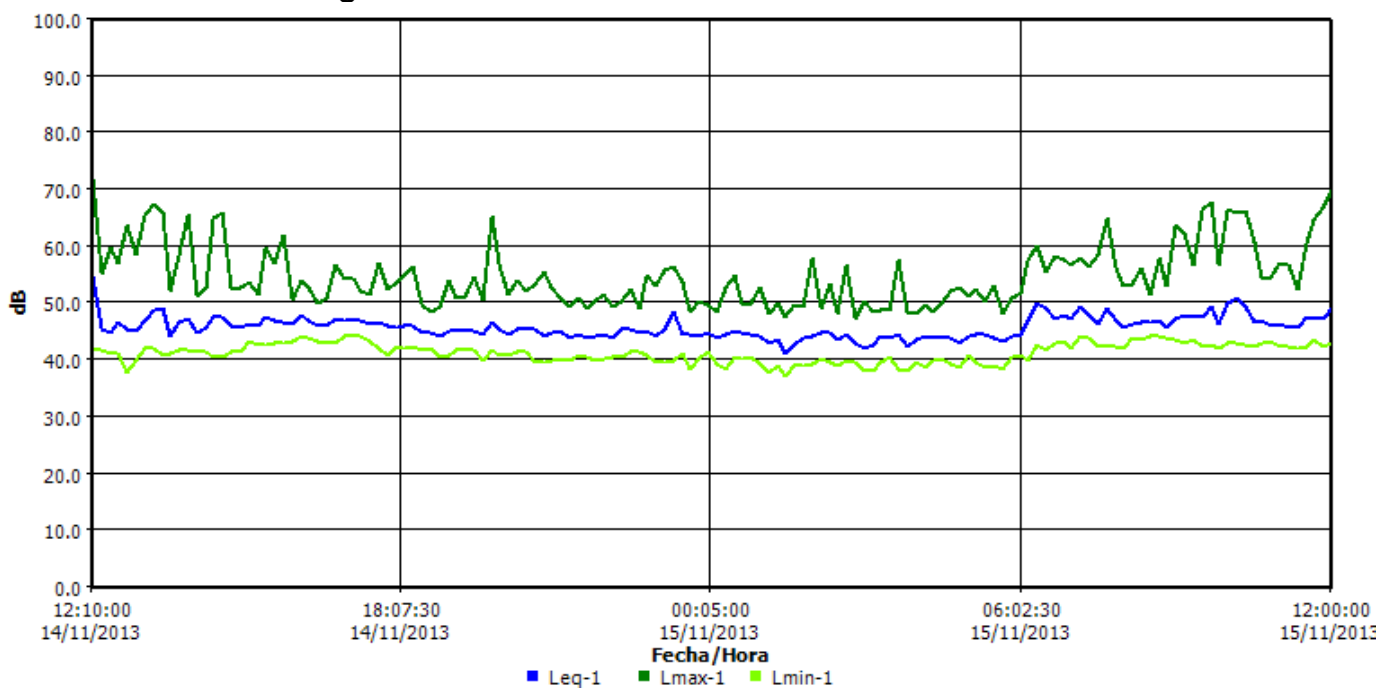
Panel de información

Ubicación Aldea Los Planes
Nombre ER-7A
Sesión padre S011
Hora de inicio Jueves, 14 de Noviembre de 2013 12:00:00
Hora de paro Viernes, 15 de Noviembre de 2013 12:00:00
Nombre del usuario Inga. Susana Aroche

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 37.3 dB | Lmax | 1 | 71.6 dB |
| Lpk | 1 | 95 dB | Leq | 1 | 46.2 dB |

Gráfica de datos de registro



ER-1

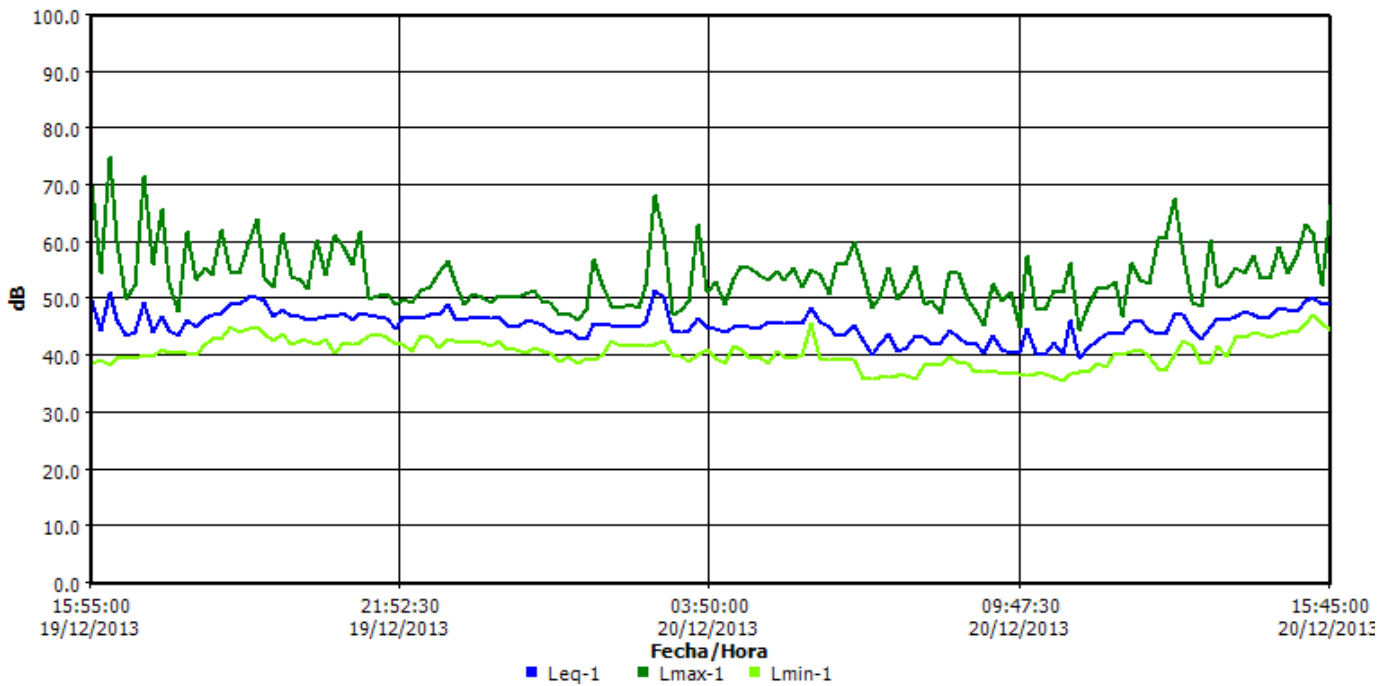
Panel de información

Ubicación Depósito de suelos norte, Proyecto Minero Escobal
Nombre ER-1
Sesión padre S016
Hora de inicio Jueves, 19 de Diciembre de 2013 15:45:00
Hora de paro Viernes, 20 de Diciembre de 2013 15:45:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 35.5 dB | Lmax | 1 | 75.2 dB |
| Lpk | 1 | 104.7 dB | Leq | 1 | 46.1 dB |

Gráfica de datos de registro



ER-2

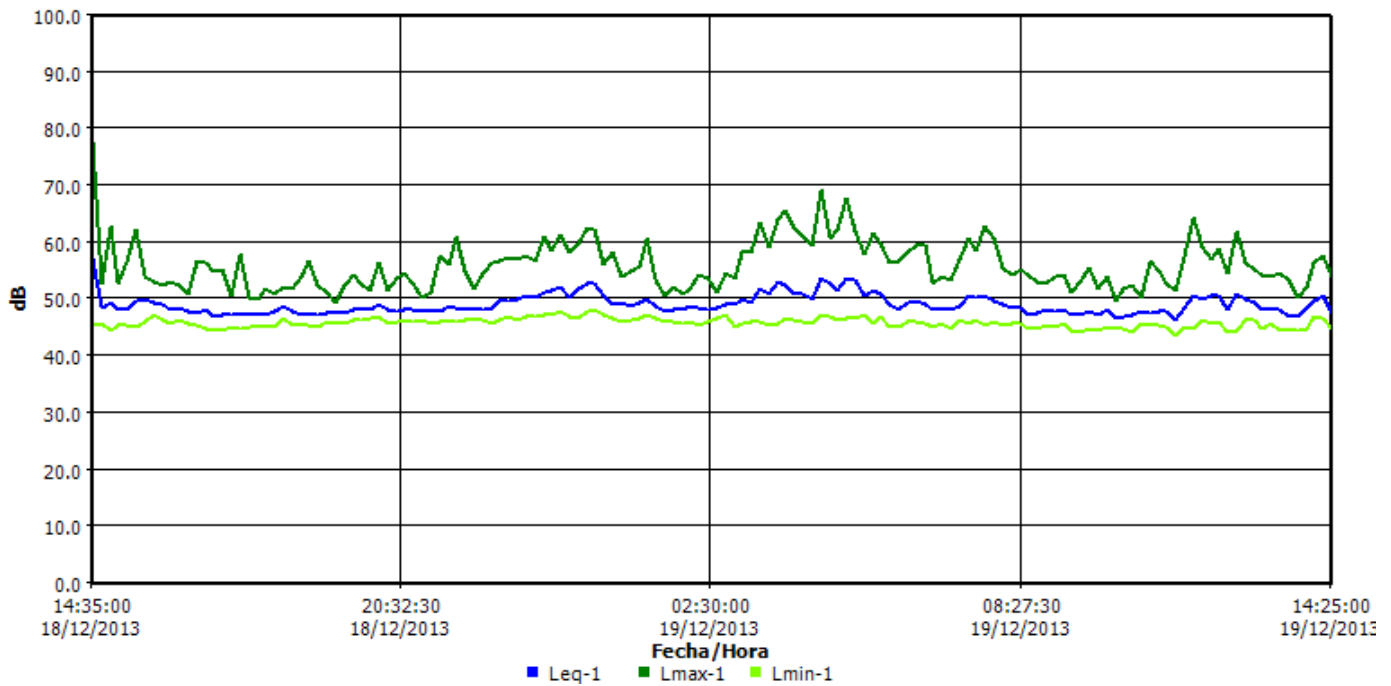
Panel de información

Ubicación Aldea La Cuchilla
Nombre ER-2
Sesión padre S014
Hora de inicio Miércoles, 18 de Diciembre de 2013 14:25:00
Hora de paro Jueves, 19 de Diciembre de 2013 14:25:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 43.6 dB | Lmax | 1 | 77.6 dB |
| Lpk | 1 | 102.4 dB | Leq | 1 | 49.4 dB |

Gráfica de datos de registro



ER-3

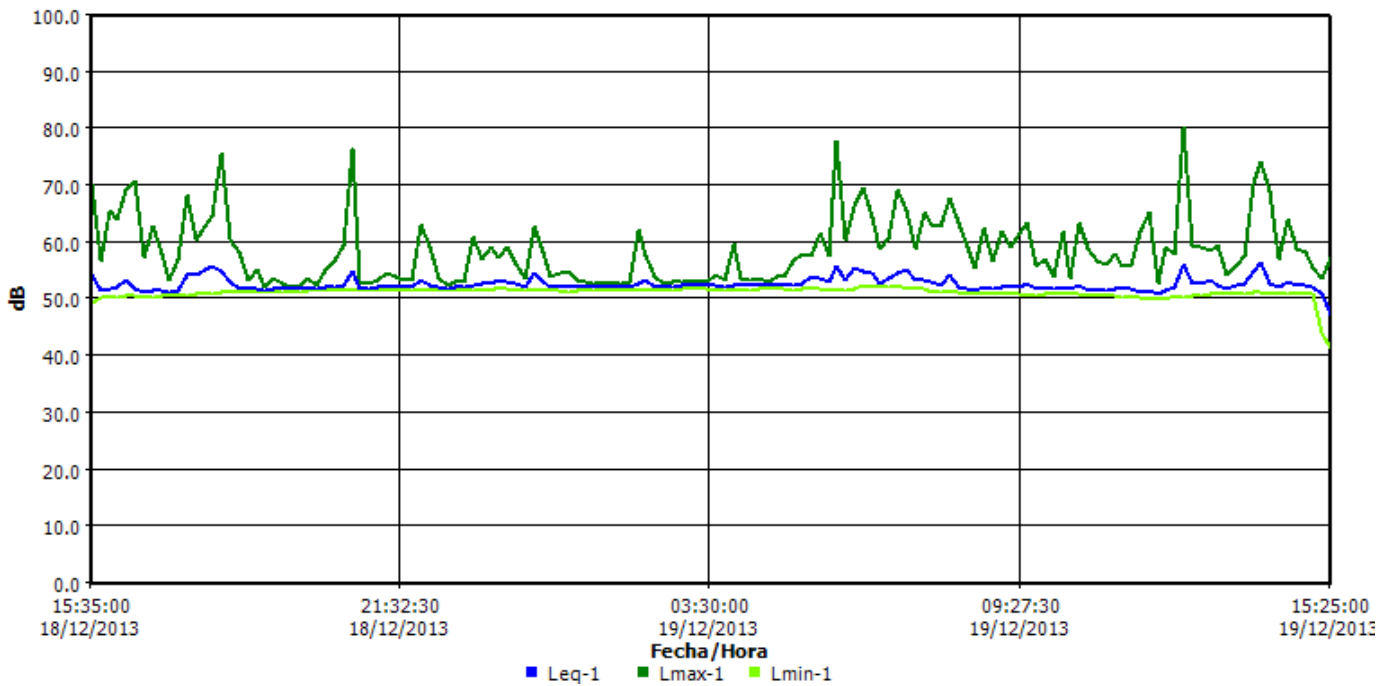
Panel de información

Ubicación Zona Este, Proyecto Minero Escobal
Nombre ER-3
Sesión padre S120
Hora de inicio Miércoles, 18 de Diciembre de 2013 15:25:00
Hora de paro Jueves, 19 de Diciembre de 2013 15:25:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 41.5 dB | Lmax | 1 | 80.2 dB |
| Lpk | 1 | 98.5 dB | Leq | 1 | 52.7 dB |

Gráfica de datos de registro



ER-7A

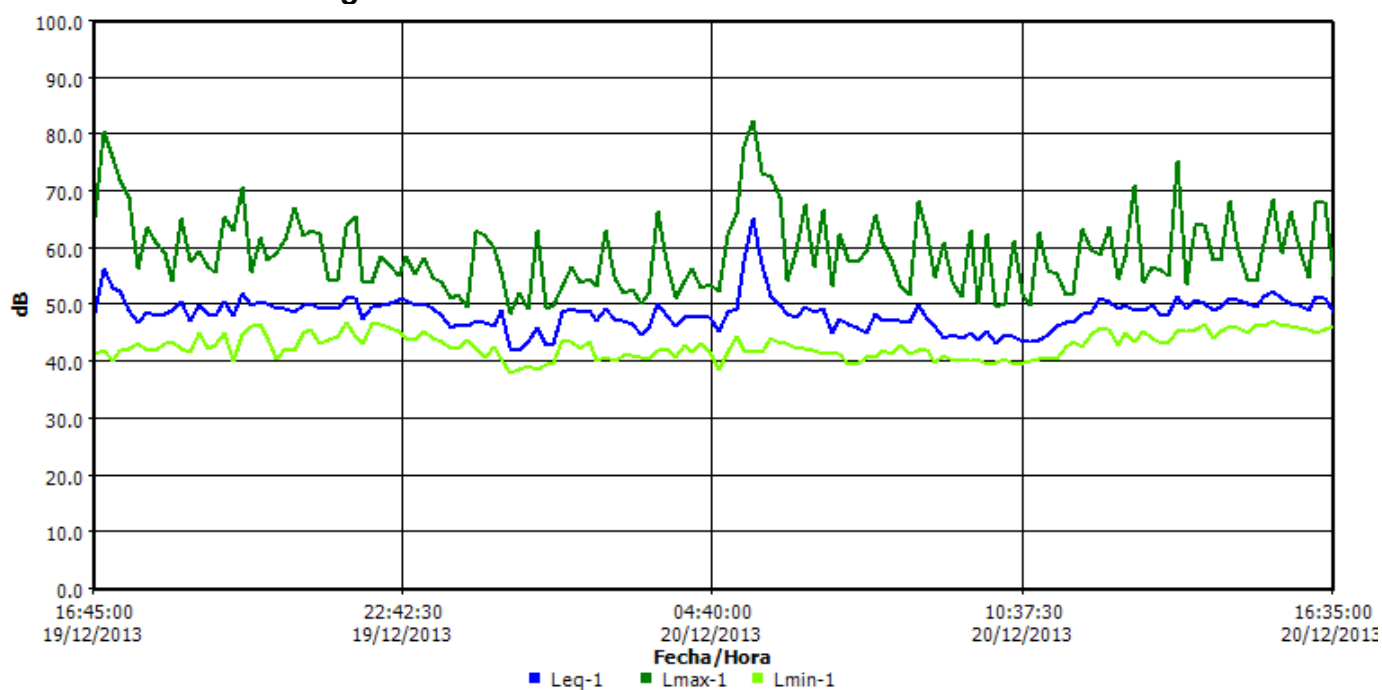
Panel de información

Ubicación Aldea Los Planes
Nombre ER-7A
Sesión padre S121
Hora de inicio Jueves, 19 de Diciembre de 2013 16:35:00
Hora de paro Viernes, 20 de Diciembre de 2013 16:35:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 38.2 dB | Lmax | 1 | 82.4 dB |
| Lpk | 1 | 108.8 dB | Leq | 1 | 50.3 dB |

Gráfica de datos de registro



ER-1

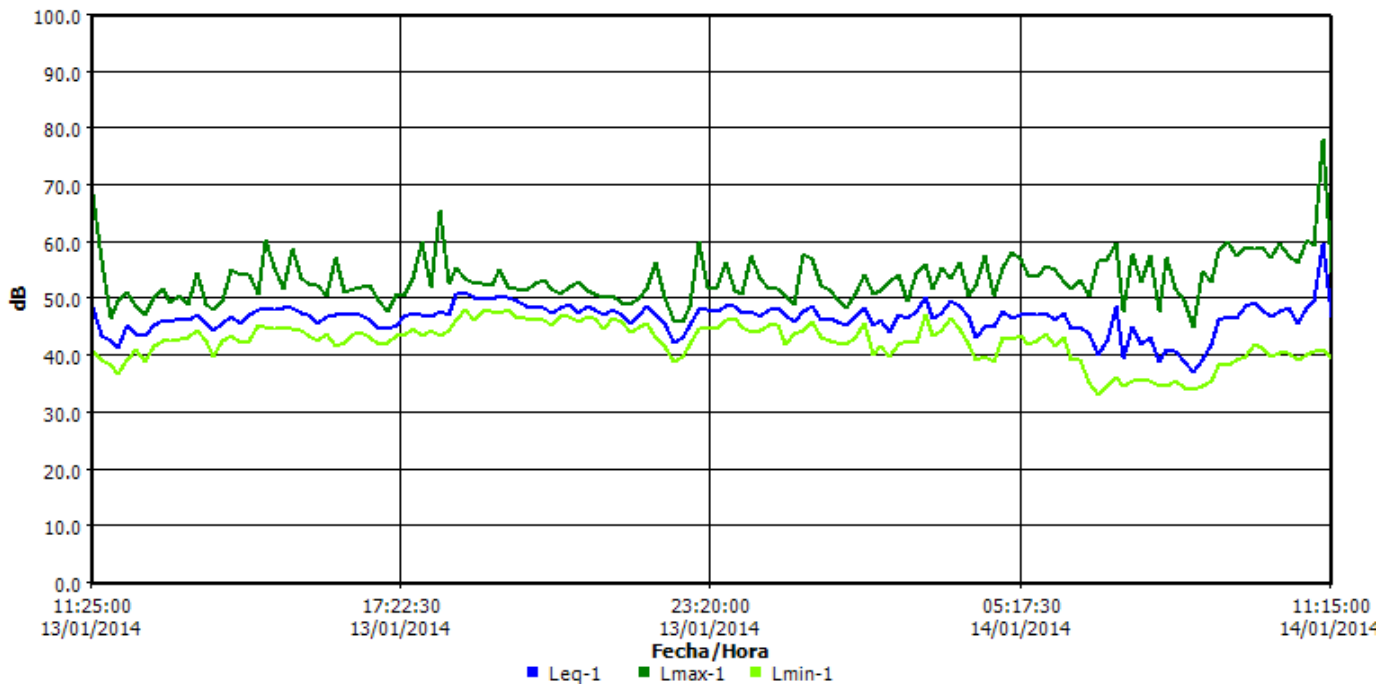
Panel de información

Ubicación Depósito de suelos norte, Proyecto Minero Escobal
Nombre ER-1
Sesión padre S018
Hora de inicio Lunes, 13 de Enero de 2014 11:15:00
Hora de paro Martes, 14 de Enero de 2014 11:15:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 33.1 dB | Lmax | 1 | 78 dB |
| Lpk | 1 | 99.4 dB | Leq | 1 | 47.6 dB |

Gráfica de datos de registro



ER-2

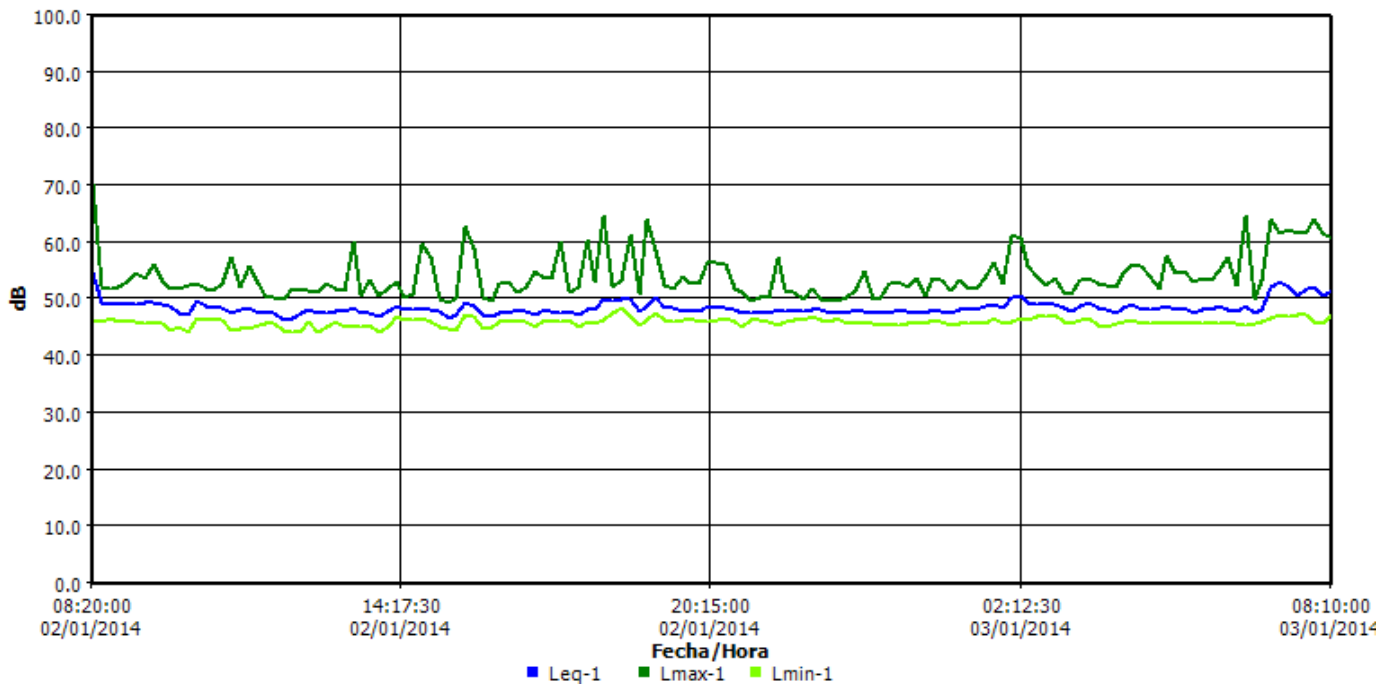
Panel de información

Ubicación Aldea La Cuchilla
Nombre ER-2
Sesión padre S122
Hora de inicio Jueves, 02 de Enero de 2014 08:10:00
Hora de paro Viernes, 03 de Enero de 2014 08:10:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 44.2 dB | Lmax | 1 | 70.2 dB |
| Lpk | 1 | 96.1 dB | Leq | 1 | 48.6 dB |

Gráfica de datos de registro



ER-3

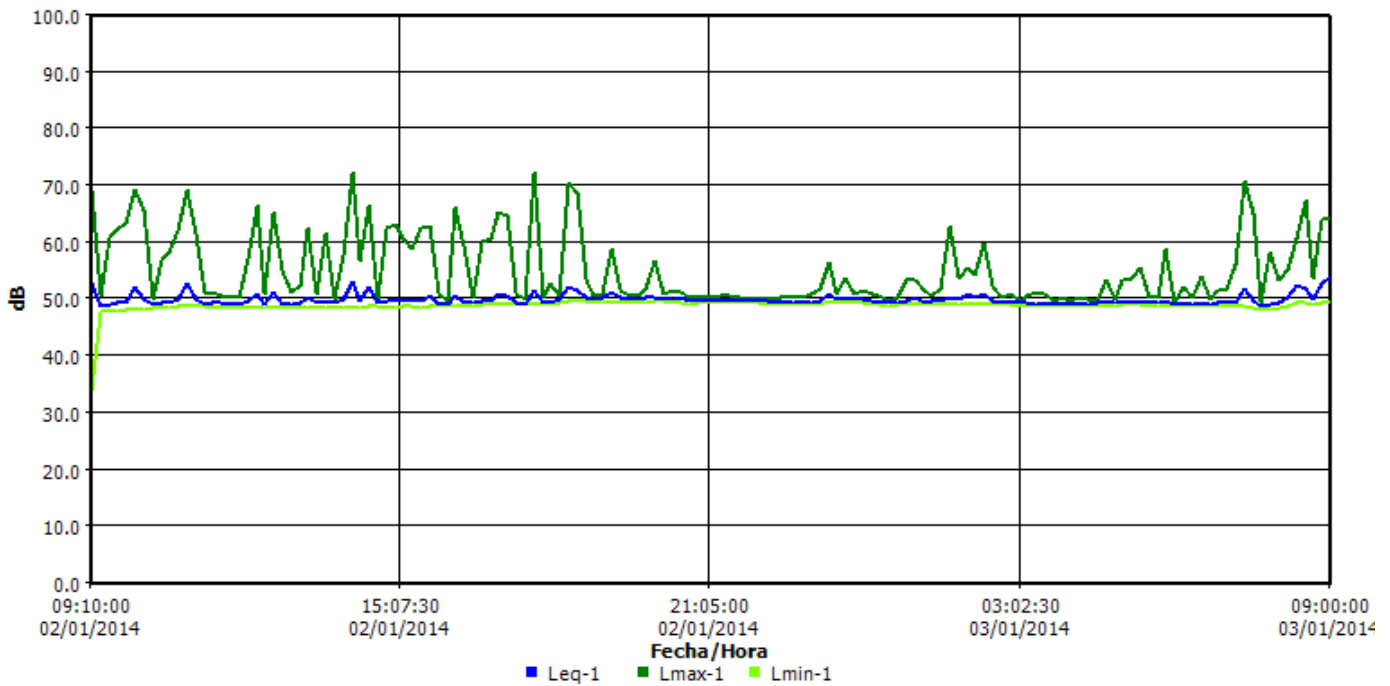
Panel de información

Ubicación Zona Este, Proyecto Minero Escobal
Nombre ER-3
Sesión padre S017
Hora de inicio Jueves, 02 de Enero de 2014 09:00:00
Hora de paro Viernes, 03 de Enero de 2014 09:00:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 34.1 dB | Lmax | 1 | 72.4 dB |
| Lpk | 1 | 97.5 dB | Leq | 1 | 50 dB |

Gráfica de datos de registro



ER-7A

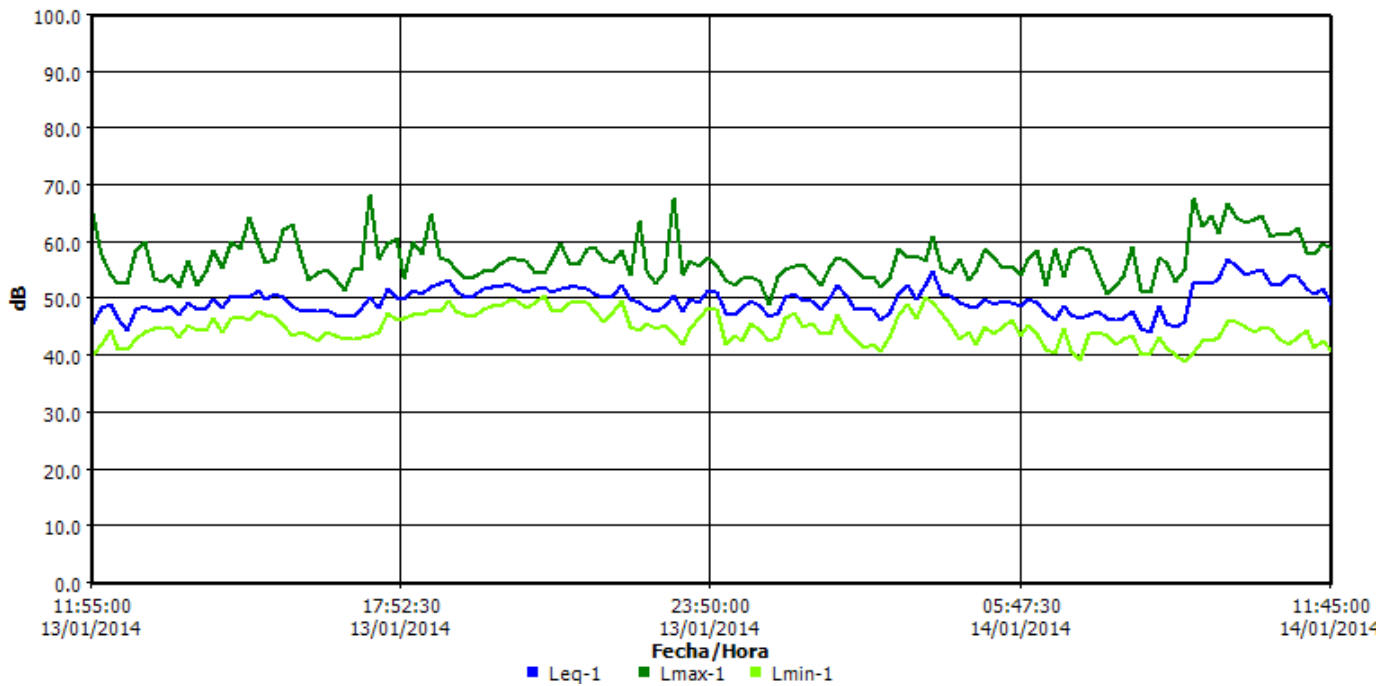
Panel de información

Ubicación Aldea Los Planes
Nombre ER-7A
Sesión padre S123
Hora de inicio Lunes, 13 de Enero de 2014 11:45:00
Hora de paro Martes, 14 de Enero de 2014 11:45:00
Nombre del usuario Inga. Luisa Fernanda Barrios

Panel general de datos

| <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> | <u>Descripción</u> | <u>Medidor/Sensor</u> | <u>Valor</u> |
|-----------------------|-----------------------|--------------|--------------------|-----------------------|--------------|
| Índice de intercambio | 1 | 3 dB | Umbral int. | 1 | 100 dB |
| Ponderación | 1 | A | Respuesta | 1 | SLOW |
| Lmin | 1 | 38.9 dB | Lmax | 1 | 68.4 dB |
| Lpk | 1 | 96 dB | Leq | 1 | 50.4 dB |

Gráfica de datos de registro



11.4 Certificados de verificación de los equipos utilizados

11.4.1 Material Particulado (PM₁₀) y Presión Sonora

Verificación Equipo PQ200

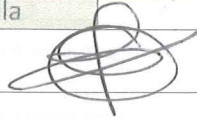
| Información del Equipo: | | | | | |
|--------------------------------|----------|------------|------|-------------------------------|----------|
| No. Equipo | Air-001 | N/S | 0958 | Fecha | 04/11/13 |
| Calibrador | tetraCAL | N/S | 508 | Hora | 13:00 |
| Caudal (Lpm) | | | | | |
| Equipo | 16.72 | %dif | | %dif Permitido = 4% | |
| Calibrador | 16.31 | Pasa | | Falla | |
| Temperatura Ambiental (°C) | | | | | |
| Equipo | 23.7 | Diferencia | 0.5 | Diferencia Permitido = ± 2 °C | |
| Calibrador | 24.2 | Pasa | ✓ | Falla | |
| Presión Barométrica (mm de Hg) | | | | | |
| Equipo | 648 | Diferencia | 0 | Diferencia Permitida= ±10mm | |
| Calibrador | 648 | Pasa | ✓ | Falla | |
| Nombre y Firma de Responsable | | B. Solís | | | |

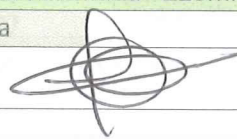
| Información del Equipo: | | | | | |
|--------------------------------|----------|------------|-----|-------------------------------|----------|
| No. Equipo | Air-002 | N/S | | Fecha | 04/11/13 |
| Calibrador | tetraCAL | N/S | 508 | Hora | 13:14 |
| Caudal (Lpm) | | | | | |
| Equipo | 16.67 | %dif | | %dif Permitido = 4% | |
| Calibrador | 16.81 | Pasa | | Falla | |
| Temperatura Ambiental (°C) | | | | | |
| Equipo | 23.6 | Diferencia | 0.7 | Diferencia Permitido = ± 2 °C | |
| Calibrador | 24.3 | Pasa | ✓ | Falla | |
| Presión Barométrica (mm de Hg) | | | | | |
| Equipo | 648 | Diferencia | 0 | Diferencia Permitida= ±10mm | |
| Calibrador | 648 | Pasa | ✓ | Falla | |
| Nombre y Firma de Responsable | | B. Solís | | | |

| Información del Equipo: | | | | | |
|--------------------------------|--|------------|--|-------------------------------|--|
| No. Equipo | | N/S | | Fecha | |
| Calibrador | | N/S | | Hora | |
| Caudal (Lpm) | | | | | |
| Equipo | | %dif | | %dif Permitido = 4% | |
| Calibrador | | Pasa | | Falla | |
| Temperatura Ambiental (°C) | | | | | |
| Equipo | | Diferencia | | Diferencia Permitido = ± 2 °C | |
| Calibrador | | Pasa | | Falla | |
| Presión Barométrica (mm de Hg) | | | | | |
| Equipo | | Diferencia | | Diferencia Permitida= ±10mm | |
| Calibrador | | Pasa | | Falla | |
| Nombre y Firma de Responsable | | | | | |

$\%dif. = [(calibrador - equipo)/calibrador] \times 100$

Verificación Equipo PQ200


| Información del Equipo: | | | | | |
|--------------------------------|----------|--|------|-------------------------------|------------|
| No. Equipo | AIR-001 | N/S | 0938 | Fecha | 02/12/2013 |
| Calibrador | Tetracal | N/S | 508 | Hora | 17:09 |
| Caudal (Lpm) | | | | | |
| Equipo | 16.70 | %dif | 1.33 | %dif Permitido = 4% | |
| Calibrador | 16.48 | Pasa | ✓ | Falla | |
| Temperatura Ambiental (°C) | | | | | |
| Equipo | 19.2 | Diferencia | 0.3 | Diferencia Permitido = ± 2 °C | |
| Calibrador | 19.5 | Pasa | ✓ | Falla | |
| Presión Barométrica (mm de Hg) | | | | | |
| Equipo | 647 | Diferencia | 0.0 | Diferencia Permitida= ±10mm | |
| Calibrador | 647.0 | Pasa | ✓ | Falla | |
| Nombre y Firma de Responsable | | Inga. Fernanda Barrios  | | | |

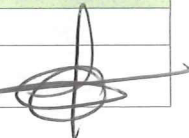
| Información del Equipo: | | | | | |
|--------------------------------|----------|--|------|-------------------------------|------------|
| No. Equipo | AIR-002 | N/S | 0877 | Fecha | 02/12/2013 |
| Calibrador | Tetracal | N/S | 508 | Hora | 17:28 |
| Caudal (Lpm) | | | | | |
| Equipo | 16.70 | %dif | 0.48 | %dif Permitido = 4% | |
| Calibrador | 16.78 | Pasa | ✓ | Falla | |
| Temperatura Ambiental (°C) | | | | | |
| Equipo | 19.3 | Diferencia | 0.1 | Diferencia Permitido = ± 2 °C | |
| Calibrador | 19.2 | Pasa | ✓ | Falla | |
| Presión Barométrica (mm de Hg) | | | | | |
| Equipo | 647 | Diferencia | 0.5 | Diferencia Permitida= ±10mm | |
| Calibrador | 647.5 | Pasa | ✓ | Falla | |
| Nombre y Firma de Responsable | | Inga. Fernanda Barrios  | | | |

| Información del Equipo: | | | | | |
|--------------------------------|--|------------|--|-------------------------------|--|
| No. Equipo | | N/S | | Fecha | |
| Calibrador | | N/S | | Hora | |
| Caudal (Lpm) | | | | | |
| Equipo | | %dif | | %dif Permitido = 4% | |
| Calibrador | | Pasa | | Falla | |
| Temperatura Ambiental (°C) | | | | | |
| Equipo | | Diferencia | | Diferencia Permitido = ± 2 °C | |
| Calibrador | | Pasa | | Falla | |
| Presión Barométrica (mm de Hg) | | | | | |
| Equipo | | Diferencia | | Diferencia Permitida= ±10mm | |
| Calibrador | | Pasa | | Falla | |
| Nombre y Firma de Responsable | | | | | |

$\%dif. = [(calibrador - equipo)/calibrador] \times 100$

Verificación Equipo PQ200

| Información del Equipo: | | | | | |
|--------------------------------|----------|--|------|-------------------------------|------------|
| No. Equipo | AIR-001 | N/S | 0938 | Fecha | 01/01/2014 |
| Calibrador | TetraCal | N/S | 508 | Hora | 14:51 |
| Caudal (Lpm) | | | | | |
| Equipo | 16.70 | %dif | 1.25 | %dif Permitido = 4% | |
| Calibrador | 16.49 | Pasa | ✓ | Falla | |
| Temperatura Ambiental (°C) | | | | | |
| Equipo | 23.3 | Diferencia | 0.1 | Diferencia Permitido = ± 2 °C | |
| Calibrador | 23.2 | Pasa | ✓ | Falla | |
| Presión Barométrica (mm de Hg) | | | | | |
| Equipo | 647 | Diferencia | 0 | Diferencia Permitida= ±10mm | |
| Calibrador | 647.0 | Pasa | ✓ | Falla | |
| Nombre y Firma de Responsable | | Inga. Luisa Fernanda Barrios  | | | |

| Información del Equipo: | | | | | |
|--------------------------------|----------|--|------|-------------------------------|------------|
| No. Equipo | AIR-002 | N/S | 0877 | Fecha | 01/01/2014 |
| Calibrador | TetraCal | N/S | 508 | Hora | 15:08 |
| Caudal (Lpm) | | | | | |
| Equipo | 16.70 | %dif | 0.95 | %dif Permitido = 4% | |
| Calibrador | 16.86 | Pasa | ✓ | Falla | |
| Temperatura Ambiental (°C) | | | | | |
| Equipo | 20.9 | Diferencia | 0.4 | Diferencia Permitido = ± 2 °C | |
| Calibrador | 21.3 | Pasa | ✓ | Falla | |
| Presión Barométrica (mm de Hg) | | | | | |
| Equipo | 647 | Diferencia | 0 | Diferencia Permitida= ±10mm | |
| Calibrador | 647.0 | Pasa | ✓ | Falla | |
| Nombre y Firma de Responsable | | Inga. Luisa Fernanda Barrios  | | | |

| Información del Equipo: | | | | | |
|--------------------------------|--|------------|--|-------------------------------|--|
| No. Equipo | | N/S | | Fecha | |
| Calibrador | | N/S | | Hora | |
| Caudal (Lpm) | | | | | |
| Equipo | | %dif | | %dif Permitido = 4% | |
| Calibrador | | Pasa | | Falla | |
| Temperatura Ambiental (°C) | | | | | |
| Equipo | | Diferencia | | Diferencia Permitido = ± 2 °C | |
| Calibrador | | Pasa | | Falla | |
| Presión Barométrica (mm de Hg) | | | | | |
| Equipo | | Diferencia | | Diferencia Permitida= ±10mm | |
| Calibrador | | Pasa | | Falla | |
| Nombre y Firma de Responsable | | | | | |

$\%dif. = [(calibrador - equipo)/calibrador] \times 100$



Certificate of Calibration

Certificate No: 5504965BGK080007

Submitted By: CTA SA
TRONCO 1 LOT 14E
EL EMCINAL ZONA 7 DE MIXCO, GUATEMALA

Serial Number: BGK080007 Date Received: 4/1/2014
Customer ID: N/A Date Issued: 4/4/2014
Model: SOUNDPRO DL-2 SLM Valid Until: 4/4/2015

Test Conditions: Model Conditions:
Temperature: 18°C to 29°C As Found: OUT OF TOLERANCE
Humidity: 20% to 80% As Left: IN TOLERANCE
Barometric Pressure: 890 mbar to 1050 mbar

SubAssemblies:

| Description: | Serial Number: |
|-------------------------------------|----------------|
| TYPE 2 PREAMP | 0811 6065 |
| MICROPHONE QE 7052 1/2 IN. ELECTRET | 44610 |

Calibration Procedure: 53V899

Reference Standard(s):

| I.D. Number | Device | Last Calibration Date | Calibration Due |
|-------------|--------------|-----------------------|-----------------|
| EF000176 | QUEST-CAL | 12/16/2013 | 12/16/2014 |
| ET0000556 | B&K ENSEMBLE | 5/10/2013 | 5/10/2014 |

Measurement Uncertainty:

+/- 2.2% ACOUSTIC (0.19DB)
Estimated at 95% Confidence Level (k=2)

Calibrated By: Brian X. Bayer 4/4/2014
BRIAN BAYER Service Technician

Reviewed/Approved By: [Signature] 4/4/2014
Technical Manager/Deputy

This report certifies that all calibration equipment used in the test is traceable to NIST or other NMI, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of 3M Detection Solutions.



BGI INCORPORATED 58 GUINAN STREET WALTHAM, MA 02451
NIST Traceable Calibration Facility, ISO 9001:2008 Registered



CERTIFICATE OF CALIBRATION - NIST TRACEABILITY

(Refer to instruction manual for further details of calibration)

tetraCal Serial Number: **508** DATE: 4-Apr-14

Calibration Operator: Brian DeVoe

Critical Venturi Flow Meter: Max Uncertainty = 0.346%
Serial Number: 1 CEESI NVLAP NIST Data File 04BGI151
Serial Number: 2 CEESI NVLAP NIST Data File 04BGI152
Serial Number: 3 CEESI NVLAP NIST Data File 04BGI153

Room Temperature: Uncertainty=0.071% Room Temperature: 21.3 C

Brand: Ever-Safe Serial Number: 016076

NIST Traceability No. 516837

tetraCal:

Ambient Temperature (set): 21.3 C

Aux (filter) Temperature (set): C

Barometric Pressure and Absolute Pressure

Vaisala Model PTB330(50-1100) Digital Accuracy: 0.03371%

S/N D4310002

NIST Traceable (Princo Primary Standard Model 453 S/N W12537) Certificate No. P-7485

tetraCal:

Barometric pressure (set): 763.5 mm of Hg

Results of Venturi Calibration

Flow Rate (Q) vs. Pressure Drop (ΔP).

Where: Q=Lpm, ΔP = Cm of H2O

No. 1 Q = 5.86711 ΔP ^ 0.52262

No. 2 Q = 1.14635 ΔP ^ 0.52677

No. 3 Q = 0.33436 ΔP ^ 0.55734

Overall Uncertainty: 0.35%

Date Placed In Service _____

(To be filled in by operator upon receipt)

Recommended Recalibration Date _____

(12 months from date placed in service)

Revised: July 2012

11.5 Informe Original de los Resultados Analíticos Obtenidos de Muestras de Agua del Laboratorio ACZ Laboratories, INC. Correspondiente al Monitoreo de Diciembre 2013.

11.5.1 Muestras de Agua Superficial (SW)

December 26, 2013

Report to:

Miguel Berganza

Tahoe Resources, Inc.

Km 8.6 carrtera Antigua a El Salvador

Centro corporativo Muxbal

Torre Oeste.Apto 503y504 Guatemala, GT

Bill to:

Miguel Berganza

Tahoe Resources, Inc.

5310 Kietzke Lane

Suite 200

Reno, NV 89511

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L15944

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 11, 2013. This project has been assigned to ACZ's project number, L15944. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L15944. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

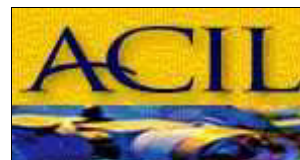
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after January 25, 2014. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed
and approved this report.



Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW1-EACZ Sample ID: **L15944-01**
Date Sampled: 12/05/13 14:05
Date Received: 12/11/13
Sample Matrix: *Surface Water*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/16/13 15:36 | mpb |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:32 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/13/13 12:14 | bsu |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/14/13 9:18 | bsu |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/16/13 16:40 | mpb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | | | | | 12/18/13 13:22 | las |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/17/13 10:05 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW1-E

ACZ Sample ID: **L15944-01**

Date Sampled: 12/05/13 14:05

Date Received: 12/11/13

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/16/13 22:32 | aeb |
| Aluminum, total | M200.7 ICP | 1 | 0.25 | | | mg/L | 0.03 | 0.2 | 12/18/13 21:52 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/14/13 5:45 | pmc |
| Antimony, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/19/13 12:42 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0023 | | | mg/L | 0.0002 | 0.001 | 12/14/13 5:45 | pmc |
| Arsenic, total | M200.8 ICP-MS | 1 | 0.0024 | | | mg/L | 0.0002 | 0.001 | 12/19/13 12:42 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.090 | | | mg/L | 0.003 | 0.02 | 12/16/13 22:32 | aeb |
| Barium, total | M200.7 ICP | 1 | 0.098 | | | mg/L | 0.003 | 0.02 | 12/18/13 21:52 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:32 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 21:52 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/16/13 22:32 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 21:52 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | 0.01 | B | | mg/L | 0.01 | 0.05 | 12/16/13 22:32 | aeb |
| Boron, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 11:47 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/14/13 5:45 | pmc |
| Cadmium, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 12:42 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 24.3 | | | mg/L | 0.2 | 1 | 12/16/13 22:32 | aeb |
| Calcium, total | M200.7 ICP | 1 | 25.4 | | | mg/L | 0.2 | 1 | 12/18/13 21:52 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:32 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 21:52 | aeb |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:32 | aeb |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 21:52 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:32 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 21:52 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/16/13 22:32 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 21:52 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/16/13 22:32 | aeb |
| Iron, total | M200.7 ICP | 1 | 0.10 | | | mg/L | 0.02 | 0.05 | 12/18/13 21:52 | aeb |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/14/13 5:45 | pmc |
| Lead, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 12:42 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/16/13 22:32 | aeb |
| Lithium, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 21:52 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 2.8 | | | mg/L | 0.2 | 1 | 12/16/13 22:32 | aeb |
| Magnesium, total | M200.7 ICP | 1 | 2.9 | | | mg/L | 0.2 | 1 | 12/18/13 21:52 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/16/13 22:32 | aeb |
| Manganese, total | M200.7 ICP | 1 | 0.005 | B | | mg/L | 0.005 | 0.03 | 12/18/13 21:52 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/16/13 13:27 | mfm |
| Mercury, total | M245.1 CVAA | 1 | | U | * | mg/L | 0.0002 | 0.001 | 12/16/13 15:31 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/16/13 22:32 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 21:52 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:32 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 21:52 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 3.8 | | | mg/L | 0.3 | 2 | 12/16/13 22:32 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW1-E

ACZ Sample ID: **L15944-01**
Date Sampled: 12/05/13 14:05
Date Received: 12/11/13
Sample Matrix: Surface Water

| | | | | | | | | | |
|----------------------|---------------|---|-------|-----|------|---------|--------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | 4 | | mg/L | 0.3 | 2 | 12/18/13 21:52 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/16/13 22:32 | aeb |
| Scandium, total | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/18/13 21:52 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0003 | 12/14/13 5:45 | pmc |
| Selenium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0003 | 12/19/13 12:42 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/17/13 4:22 | pmc |
| Silver, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/19/13 12:42 | msh |
| Sodium, dissolved | M200.7 ICP | 1 | 8.2 | | mg/L | 0.3 | 2 | 12/16/13 22:32 | aeb |
| Sodium, total | M200.7 ICP | 1 | 8.4 | | mg/L | 0.3 | 2 | 12/18/13 21:52 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 0.12 | | mg/L | 0.01 | 0.05 | 12/16/13 22:32 | aeb |
| Strontium, total | M200.7 ICP | 1 | 0.12 | | mg/L | 0.01 | 0.05 | 12/18/13 21:52 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/14/13 5:45 | pmc |
| Thallium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/19/13 12:42 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/16/13 22:32 | aeb |
| Tin, total | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/18/13 21:52 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/16/13 22:32 | aeb |
| Titanium, total | M200.7 ICP | 1 | 0.009 | B | mg/L | 0.005 | 0.03 | 12/18/13 21:52 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/14/13 5:45 | pmc |
| Uranium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/19/13 12:42 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/16/13 22:32 | aeb |
| Vanadium, total | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/18/13 21:52 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/16/13 22:32 | aeb |
| Zinc, total | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/18/13 21:52 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW1-E

ACZ Sample ID: **L15944-01**
 Date Sampled: 12/05/13 14:05
 Date Received: 12/11/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 68 | | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Total Alkalinity | | 1 | 68 | | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 0.0 | | | % | | | 12/26/13 16:02 | calc |
| Sum of Anions | | | 1.9 | | | meq/L | 0.1 | 0.5 | 12/26/13 16:02 | calc |
| Sum of Cations | | | 1.9 | | | meq/L | 0.1 | 0.5 | 12/26/13 16:02 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | | U | * | mg/L | 10 | 20 | 12/18/13 11:26 | khw |
| Chloride | SM4500Cl-E | 1 | 6 | | * | mg/L | 1 | 5 | 12/20/13 16:24 | mpb |
| Conductivity @25C | SM2510B | 1 | 196 | | * | umhos/cm | 1 | 10 | 12/12/13 0:23 | khw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/17/13 16:40 | bsu |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:43 | tcd |
| Fluoride | SM4500F-C | 1 | 0.1 | B | * | mg/L | 0.1 | 0.5 | 12/16/13 12:29 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 72 | | | mg/L | 1 | 7 | 12/26/13 16:02 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 0.86 | | * | mg/L | 0.02 | 0.1 | 12/18/13 0:12 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/18/13 17:47 | bsu |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.4 | B | * | mg/L | 0.1 | 0.5 | 12/14/13 0:09 | pjb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8.2 | H | * | units | 0.1 | 0.1 | 12/12/13 0:00 | khw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/12/13 0:00 | khw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.12 | B | | mg/L | 0.03 | 0.15 | 12/26/13 16:02 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.04 | B | * | mg/L | 0.01 | 0.05 | 12/14/13 13:14 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.04 | BH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:10 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.04 | B | * | mg/L | 0.01 | 0.05 | 12/18/13 1:38 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 180 | | * | mg/L | 10 | 20 | 12/12/13 13:06 | abm |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/11/13 17:02 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 190 | | * | mg/L | 10 | 20 | 12/11/13 16:02 | dcw |
| Sulfate | D516-02 - Turbidimetric | 1 | 18.6 | | * | mg/L | 1 | 5 | 12/16/13 17:41 | bsu |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/12/13 11:11 | dcw |
| TDS (calculated) | Calculation | | 105 | | | mg/L | 10 | 50 | 12/26/13 16:02 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.71 | | | | | | 12/26/13 16:02 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW2A-E

ACZ Sample ID: **L15944-02**
Date Sampled: 12/05/13 15:30
Date Received: 12/11/13
Sample Matrix: Surface Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/16/13 15:43 | mpb |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:32 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/13/13 12:23 | bsu |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/14/13 9:30 | bsu |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/16/13 16:50 | mpb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | | | | | 12/18/13 13:31 | las |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/17/13 10:40 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW2A-E

ACZ Sample ID: **L15944-02**

Date Sampled: 12/05/13 15:30

Date Received: 12/11/13

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | 0.06 | B | | mg/L | 0.03 | 0.2 | 12/16/13 22:47 | aeb |
| Aluminum, total | M200.7 ICP | 1 | 0.08 | B | | mg/L | 0.03 | 0.2 | 12/18/13 22:01 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0050 | | | mg/L | 0.0004 | 0.002 | 12/14/13 5:49 | pmc |
| Antimony, total | M200.8 ICP-MS | 1 | 0.0043 | | | mg/L | 0.0004 | 0.002 | 12/19/13 12:45 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0087 | | | mg/L | 0.0002 | 0.001 | 12/14/13 5:49 | pmc |
| Arsenic, total | M200.8 ICP-MS | 1 | 0.0084 | | | mg/L | 0.0002 | 0.001 | 12/19/13 12:45 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.046 | | | mg/L | 0.003 | 0.02 | 12/16/13 22:47 | aeb |
| Barium, total | M200.7 ICP | 1 | 0.050 | | | mg/L | 0.003 | 0.02 | 12/18/13 22:01 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:47 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:01 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/16/13 22:47 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 22:01 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | 0.16 | | | mg/L | 0.01 | 0.05 | 12/16/13 22:47 | aeb |
| Boron, total | M200.7 ICP | 1 | 0.15 | | | mg/L | 0.01 | 0.05 | 12/19/13 11:56 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/14/13 5:49 | pmc |
| Cadmium, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 12:45 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 328 | | | mg/L | 0.2 | 1 | 12/16/13 22:47 | aeb |
| Calcium, total | M200.7 ICP | 1 | 347 | | | mg/L | 0.2 | 1 | 12/18/13 22:01 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:47 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:01 | aeb |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:47 | aeb |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:01 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:47 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:01 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/16/13 22:47 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 22:01 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/16/13 22:47 | aeb |
| Iron, total | M200.7 ICP | 1 | 0.02 | B | | mg/L | 0.02 | 0.05 | 12/18/13 22:01 | aeb |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/14/13 5:49 | pmc |
| Lead, total | M200.8 ICP-MS | 1 | 0.0001 | B | | mg/L | 0.0001 | 0.0005 | 12/19/13 12:45 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | 0.08 | B | | mg/L | 0.02 | 0.1 | 12/16/13 22:47 | aeb |
| Lithium, total | M200.7 ICP | 1 | 0.09 | B | | mg/L | 0.02 | 0.1 | 12/18/13 22:01 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 19.5 | | | mg/L | 0.2 | 1 | 12/16/13 22:47 | aeb |
| Magnesium, total | M200.7 ICP | 1 | 20.7 | | | mg/L | 0.2 | 1 | 12/18/13 22:01 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | 0.106 | | | mg/L | 0.005 | 0.03 | 12/16/13 22:47 | aeb |
| Manganese, total | M200.7 ICP | 1 | 0.116 | | | mg/L | 0.005 | 0.03 | 12/18/13 22:01 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/16/13 13:29 | mfm |
| Mercury, total | M245.1 CVAA | 1 | | U | * | mg/L | 0.0002 | 0.001 | 12/16/13 15:38 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/16/13 22:47 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | 0.02 | B | | mg/L | 0.02 | 0.1 | 12/18/13 22:01 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:47 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:01 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 8.8 | | | mg/L | 0.3 | 2 | 12/16/13 22:47 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW2A-E

ACZ Sample ID: **L15944-02**
Date Sampled: 12/05/13 15:30
Date Received: 12/11/13
Sample Matrix: Surface Water

| | | | | | | | | | |
|----------------------|---------------|---|--------|-----|------|---------|--------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | 9.3 | | mg/L | 0.3 | 2 | 12/18/13 22:01 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/16/13 22:47 | aeb |
| Scandium, total | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/18/13 22:01 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0007 | | mg/L | 0.0001 | 0.0003 | 12/14/13 5:49 | pmc |
| Selenium, total | M200.8 ICP-MS | 1 | 0.0005 | | mg/L | 0.0001 | 0.0003 | 12/19/13 12:45 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/17/13 4:32 | pmc |
| Silver, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/19/13 12:45 | msh |
| Sodium, dissolved | M200.7 ICP | 1 | 73.8 | | mg/L | 0.3 | 2 | 12/16/13 22:47 | aeb |
| Sodium, total | M200.7 ICP | 1 | 77.3 | | mg/L | 0.3 | 2 | 12/18/13 22:01 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 3.53 | | mg/L | 0.01 | 0.05 | 12/16/13 22:47 | aeb |
| Strontium, total | M200.7 ICP | 1 | 3.63 | | mg/L | 0.01 | 0.05 | 12/18/13 22:01 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/14/13 5:49 | pmc |
| Thallium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/19/13 12:45 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/16/13 22:47 | aeb |
| Tin, total | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/18/13 22:01 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/16/13 22:47 | aeb |
| Titanium, total | M200.7 ICP | 1 | 0.007 | B | mg/L | 0.005 | 0.03 | 12/18/13 22:01 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | mg/L | 0.0001 | 0.0005 | 12/14/13 5:49 | pmc |
| Uranium, total | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/19/13 12:45 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | 0.011 | B | mg/L | 0.005 | 0.03 | 12/16/13 22:47 | aeb |
| Vanadium, total | M200.7 ICP | 1 | 0.009 | B | mg/L | 0.005 | 0.03 | 12/18/13 22:01 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/16/13 22:47 | aeb |
| Zinc, total | M200.7 ICP | 1 | 0.01 | B | mg/L | 0.01 | 0.05 | 12/18/13 22:01 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW2A-E

ACZ Sample ID: **L15944-02**
 Date Sampled: 12/05/13 15:30
 Date Received: 12/11/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 79 | | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Total Alkalinity | | 1 | 79 | | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 2.3 | | | % | | | 12/26/13 16:02 | calc |
| Sum of Anions | | | 21 | | | meq/L | 0.1 | 0.5 | 12/26/13 16:02 | calc |
| Sum of Cations | | | 22 | | | meq/L | 0.1 | 0.5 | 12/26/13 16:02 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | | U | * | mg/L | 10 | 20 | 12/18/13 11:31 | khw |
| Chloride | SM4500Cl-E | 1 | 55 | | * | mg/L | 1 | 5 | 12/20/13 16:24 | mpb |
| Conductivity @25C | SM2510B | 1 | 1820 | | * | umhos/cm | 1 | 10 | 12/12/13 0:31 | khw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/17/13 16:41 | bsu |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:44 | tcd |
| Fluoride | SM4500F-C | 1 | 1.4 | | * | mg/L | 0.1 | 0.5 | 12/16/13 12:43 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 900 | | | mg/L | 1 | 7 | 12/26/13 16:02 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 2.63 | | * | mg/L | 0.02 | 0.1 | 12/17/13 23:49 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | 0.73 | | * | mg/L | 0.05 | 0.5 | 12/18/13 17:49 | bsu |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 1.5 | | * | mg/L | 0.1 | 0.5 | 12/14/13 0:10 | pjb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8.1 | H | * | units | 0.1 | 0.1 | 12/12/13 0:00 | khw |
| pH measured at | | 1 | 23 | | * | C | 0.1 | 0.1 | 12/12/13 0:00 | khw |
| Phosphate | Calculation based on dissolved Phosphorus | | | U | | mg/L | 0.03 | 0.15 | 12/26/13 16:02 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | | U | * | mg/L | 0.01 | 0.05 | 12/14/13 13:16 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | | UH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:13 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.01 | B | * | mg/L | 0.01 | 0.05 | 12/18/13 1:39 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 1530 | | * | mg/L | 10 | 20 | 12/12/13 13:07 | abm |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/11/13 17:03 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 1580 | | * | mg/L | 10 | 20 | 12/11/13 16:03 | dcw |
| Sulfate | D516-02 - Turbidimetric | 50 | 859 | | * | mg/L | 50 | 250 | 12/16/13 17:47 | bsu |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/12/13 11:15 | dcw |
| TDS (calculated) | Calculation | | 1400 | | | mg/L | 10 | 50 | 12/26/13 16:02 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.09 | | | | | | 12/26/13 16:02 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW4A-E

ACZ Sample ID: **L15944-03**
Date Sampled: 12/05/13 16:30
Date Received: 12/11/13
Sample Matrix: *Surface Water*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/16/13 15:50 | mpb |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:32 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/13/13 12:31 | bsu |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/14/13 9:42 | bsu |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/16/13 17:00 | mpb |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/17/13 10:52 | aeb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | | | | | 12/18/13 13:41 | las |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW4A-E

ACZ Sample ID: **L15944-03**
Date Sampled: 12/05/13 16:30
Date Received: 12/11/13
Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.03 | 0.2 | 12/16/13 22:50 | aeb |
| Aluminum, total | M200.7 ICP | 1 | 0.14 | B | | mg/L | 0.03 | 0.2 | 12/18/13 22:04 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0041 | | | mg/L | 0.0004 | 0.002 | 12/14/13 5:52 | pmc |
| Antimony, total | M200.8 ICP-MS | 1 | 0.0035 | | | mg/L | 0.0004 | 0.002 | 12/19/13 12:49 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0073 | | | mg/L | 0.0002 | 0.001 | 12/14/13 5:52 | pmc |
| Arsenic, total | M200.8 ICP-MS | 1 | 0.0065 | | | mg/L | 0.0002 | 0.001 | 12/19/13 12:49 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.100 | | | mg/L | 0.003 | 0.02 | 12/16/13 22:50 | aeb |
| Barium, total | M200.7 ICP | 1 | 0.106 | | | mg/L | 0.003 | 0.02 | 12/18/13 22:04 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:50 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:04 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/16/13 22:50 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 22:04 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | 0.09 | | | mg/L | 0.01 | 0.05 | 12/16/13 22:50 | aeb |
| Boron, total | M200.7 ICP | 1 | 0.08 | | | mg/L | 0.01 | 0.05 | 12/19/13 11:59 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/14/13 5:52 | pmc |
| Cadmium, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 12:49 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 220 | | | mg/L | 0.2 | 1 | 12/16/13 22:50 | aeb |
| Calcium, total | M200.7 ICP | 1 | 230 | | | mg/L | 0.2 | 1 | 12/18/13 22:04 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:50 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:04 | aeb |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:50 | aeb |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:04 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:50 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:04 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/16/13 22:50 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 22:04 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/16/13 22:50 | aeb |
| Iron, total | M200.7 ICP | 1 | 0.11 | | | mg/L | 0.02 | 0.05 | 12/18/13 22:04 | aeb |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/14/13 5:52 | pmc |
| Lead, total | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0005 | 12/19/13 12:49 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | 0.05 | B | | mg/L | 0.02 | 0.1 | 12/16/13 22:50 | aeb |
| Lithium, total | M200.7 ICP | 1 | 0.05 | B | | mg/L | 0.02 | 0.1 | 12/18/13 22:04 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 13.8 | | | mg/L | 0.2 | 1 | 12/16/13 22:50 | aeb |
| Magnesium, total | M200.7 ICP | 1 | 14.4 | | | mg/L | 0.2 | 1 | 12/18/13 22:04 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | 0.109 | | | mg/L | 0.005 | 0.03 | 12/16/13 22:50 | aeb |
| Manganese, total | M200.7 ICP | 1 | 0.123 | | | mg/L | 0.005 | 0.03 | 12/18/13 22:04 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/16/13 13:31 | mfm |
| Mercury, total | M245.1 CVAA | 1 | | U | * | mg/L | 0.0002 | 0.001 | 12/16/13 15:40 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/16/13 22:50 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 22:04 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 22:50 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:04 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 9 | | | mg/L | 0.3 | 2 | 12/16/13 22:50 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW4A-E

ACZ Sample ID: **L15944-03**
Date Sampled: 12/05/13 16:30
Date Received: 12/11/13
Sample Matrix: Surface Water

| | | | | | | | | | |
|----------------------|---------------|---|--------|-----|------|---------|--------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | 9.3 | | mg/L | 0.3 | 2 | 12/18/13 22:04 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/16/13 22:50 | aeb |
| Scandium, total | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/18/13 22:04 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0005 | | mg/L | 0.0001 | 0.0003 | 12/14/13 5:52 | pmc |
| Selenium, total | M200.8 ICP-MS | 1 | 0.0004 | | mg/L | 0.0001 | 0.0003 | 12/19/13 12:49 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/17/13 4:35 | pmc |
| Silver, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/19/13 12:49 | msh |
| Sodium, dissolved | M200.7 ICP | 1 | 51 | | mg/L | 0.3 | 2 | 12/16/13 22:50 | aeb |
| Sodium, total | M200.7 ICP | 1 | 52.6 | | mg/L | 0.3 | 2 | 12/18/13 22:04 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 2.23 | | mg/L | 0.01 | 0.05 | 12/16/13 22:50 | aeb |
| Strontium, total | M200.7 ICP | 1 | 2.28 | | mg/L | 0.01 | 0.05 | 12/18/13 22:04 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/14/13 5:52 | pmc |
| Thallium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/19/13 12:49 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/16/13 22:50 | aeb |
| Tin, total | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/18/13 22:04 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/16/13 22:50 | aeb |
| Titanium, total | M200.7 ICP | 1 | 0.010 | B | mg/L | 0.005 | 0.03 | 12/18/13 22:04 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | mg/L | 0.0001 | 0.0005 | 12/14/13 5:52 | pmc |
| Uranium, total | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/19/13 12:49 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | 0.008 | B | mg/L | 0.005 | 0.03 | 12/16/13 22:50 | aeb |
| Vanadium, total | M200.7 ICP | 1 | 0.007 | B | mg/L | 0.005 | 0.03 | 12/18/13 22:04 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/16/13 22:50 | aeb |
| Zinc, total | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/18/13 22:04 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW4A-E

ACZ Sample ID: **L15944-03**
 Date Sampled: 12/05/13 16:30
 Date Received: 12/11/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 71 | | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Total Alkalinity | | 1 | 71 | | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 3.4 | | | % | | | 12/26/13 16:03 | calc |
| Sum of Anions | | | 14 | | | meq/L | 0.1 | 0.5 | 12/26/13 16:03 | calc |
| Sum of Cations | | | 15 | | | meq/L | 0.1 | 0.5 | 12/26/13 16:03 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | | U | * | mg/L | 10 | 20 | 12/18/13 11:37 | khw |
| Chloride | SM4500Cl-E | 1 | 37 | | * | mg/L | 1 | 5 | 12/20/13 16:26 | mpb |
| Conductivity @25C | SM2510B | 1 | 1310 | | * | umhos/cm | 1 | 10 | 12/12/13 0:39 | khw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/17/13 16:42 | bsu |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:45 | tcd |
| Fluoride | SM4500F-C | 1 | 0.9 | | * | mg/L | 0.1 | 0.5 | 12/16/13 12:48 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 607 | | | mg/L | 1 | 7 | 12/26/13 16:03 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 3.99 | | * | mg/L | 0.02 | 0.1 | 12/17/13 23:50 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | 0.44 | B | * | mg/L | 0.05 | 0.5 | 12/18/13 17:51 | bsu |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 1.2 | | * | mg/L | 0.1 | 0.5 | 12/14/13 0:11 | pjb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8 | H | * | units | 0.1 | 0.1 | 12/12/13 0:00 | khw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/12/13 0:00 | khw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.5 | | | mg/L | 0.03 | 0.15 | 12/26/13 16:03 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.16 | | * | mg/L | 0.01 | 0.05 | 12/14/13 13:19 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.14 | H | * | mg/L | 0.01 | 0.05 | 12/12/13 21:15 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.17 | | * | mg/L | 0.01 | 0.05 | 12/18/13 1:40 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 1060 | | * | mg/L | 10 | 20 | 12/12/13 13:09 | abm |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/11/13 17:05 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 1100 | | * | mg/L | 10 | 20 | 12/11/13 16:05 | dcw |
| Sulfate | D516-02 - Turbidimetric | 50 | 545 | | * | mg/L | 50 | 250 | 12/16/13 17:47 | bsu |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/12/13 11:19 | dcw |
| TDS (calculated) | Calculation | | 922 | | | mg/L | 10 | 50 | 12/26/13 16:03 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.15 | | | | | | 12/26/13 16:03 | calc |



Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|--------------|--|--------------|--|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LCSWD</i> | Laboratory Control Sample - Water Duplicate |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFB</i> | Laboratory Fortified Blank |
| <i>CCB</i> | Continuing Calibration Blank | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>CCV</i> | Continuing Calibration Verification standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>ICB</i> | Initial Calibration Blank | <i>MS</i> | Matrix Spike |
| <i>ICV</i> | Initial Calibration Verification standard | <i>MSD</i> | Matrix Spike Duplicate |
| <i>ICSAB</i> | Inter-element Correction Standard - A plus B solutions | <i>PBS</i> | Prep Blank - Soil |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>PBW</i> | Prep Blank - Water |
| <i>LCSSD</i> | Laboratory Control Sample - Soil Duplicate | <i>PQV</i> | Practical Quantitation Verification standard |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>SDL</i> | Serial Dilution |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |
| Standard | Verifies the validity of the calibration. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L15944**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|-------------------------------------|---|------|---|
| L15944-01 | WG356422 | Mercury, total | M245.1 CVAA | MA | Recovery for either the spike or spike duplicate was outside of the acceptance limits; the RPD was within the acceptance limits. |
| | WG356281 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356606 | Chemical Oxygen Demand | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356798 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356281 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356566 | Cyanide, total | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356722 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | N1 | See Case Narrative. |
| | | | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356281 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356578 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356643 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG356440 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356281 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG356449 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356580 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | WG356343 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| | WG356292 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356284 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| | WG356506 | Sulfate | D516-02 - Turbidimetric | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15944**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|----------|------------------|-----------|---------------------|------|---|
| WG356323 | Sulfide as S | | SM4500S2-D | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356281 | Total Alkalinity | | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | | SM2320B - Titration | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |

Tahoe Resources, Inc.

ACZ Project ID: **L15944**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|-------------------------------------|--|--|---|
| L15944-02 | WG356422 | Mercury, total | M245.1 CVAA | MA | Recovery for either the spike or spike duplicate was outside of the acceptance limits; the RPD was within the acceptance limits. |
| | WG356281 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356606 | Chemical Oxygen Demand | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356798 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356281 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356566 | Cyanide, total | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356722 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | N1 | See Case Narrative. |
| | | | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356281 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356578 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356643 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG356440 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356281 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG356449 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356580 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | WG356343 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| | WG356292 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356284 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| WG356506 | Sulfate | D516-02 - Turbidimetric | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. | |

Tahoe Resources, Inc.

ACZ Project ID: **L15944**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|----------|------------------|-----------|---------------------|------|---|
| WG356323 | Sulfide as S | | SM4500S2-D | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356281 | Total Alkalinity | | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | | SM2320B - Titration | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |

Tahoe Resources, Inc.

ACZ Project ID: **L15944**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------------------------|---------------------------------|--|---|---|
| L15944-03 | WG356422 | Mercury, total | M245.1 CVAA | MA | Recovery for either the spike or spike duplicate was outside of the acceptance limits; the RPD was within the acceptance limits. |
| | WG356281 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356606 | Chemical Oxygen Demand | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356798 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356281 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356566 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356722 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | N1 | See Case Narrative. |
| | | | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356281 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356578 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356643 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG356440 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356281 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG356449 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356580 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | WG356343 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| WG356292 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. | |
| | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356284 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. | |
| WG356506 | Sulfate | D516-02 - Turbidimetric | M1 | Matrix spike recovery was high, the recovery of the | |

Tahoe Resources, Inc.

ACZ Project ID: **L15944**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|-------------------------|------|---|
| | | | | | associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | WG356323 | Sulfide as S | SM4500S2-D | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | | | | | |
| | | | | | |
| | | | | | |
| | WG356281 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | | SM2320B - Titration | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW1-EACZ Sample ID: **L15944-01**
Date Sampled: 12/05/13 14:05
Date Received: 12/11/13
Sample Matrix: *Surface Water***Diesel Range Organics (C10-C28)**Analysis Method: **M8015D GC/FID**
Extract Method: **M3520****Workgroup:** WG356565Analyst: jad
Extract Date: 12/12/13 6:16
Analysis Date: 12/17/13 2:28

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 79.6 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW1-EACZ Sample ID: **L15944-01**
Date Sampled: 12/05/13 14:05
Date Received: 12/11/13
Sample Matrix: *Surface Water***Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**
Extract Method:**Workgroup:** WG356586

Analyst: wpr

Extract Date:

Analysis Date: 12/18/13 8:45

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|-----|-----|
| Oil and Grease | | | U | 1 | * | mg/L | 2 | 10 |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW2A-E

ACZ Sample ID: **L15944-02**
Date Sampled: 12/05/13 15:30
Date Received: 12/11/13
Sample Matrix: Surface Water

Diesel Range Organics (C10-C28)

Analysis Method: **M8015D GC/FID**
Extract Method: **M3520**

Workgroup: WG356565

Analyst: jad
Extract Date: 12/12/13 7:06
Analysis Date: 12/17/13 2:54

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 83.2 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW2A-EACZ Sample ID: **L15944-02**
Date Sampled: 12/05/13 15:30
Date Received: 12/11/13
Sample Matrix: Surface Water**Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**
Extract Method:**Workgroup:** WG356586

Analyst: wpr

Extract Date:

Analysis Date: 12/18/13 8:45

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|-----|-----|
| Oil and Grease | | | U | 1 | * | mg/L | 2 | 10 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW4A-EACZ Sample ID: **L15944-03**
Date Sampled: 12/05/13 16:30
Date Received: 12/11/13
Sample Matrix: *Surface Water***Diesel Range Organics (C10-C28)**Analysis Method: **M8015D GC/FID**
Extract Method: **M3520****Workgroup:** WG356565Analyst: jad
Extract Date: 12/12/13 7:55
Analysis Date: 12/17/13 3:20

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 84.2 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW4A-EACZ Sample ID: **L15944-03**
Date Sampled: 12/05/13 16:30
Date Received: 12/11/13
Sample Matrix: *Surface Water***Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**
Extract Method:**Workgroup:** WG356586

Analyst: wpr

Extract Date:

Analysis Date: 12/18/13 8:45

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|-----|-----|
| Oil and Grease | | | U | 1 | * | mg/L | 2 | 10 |

Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>LCL</i> | Lower Control Limit |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>UCL</i> | Upper Control Limit |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|-------------|-----------------------------------|---------------|---------------------------------------|
| <i>SURR</i> | Surrogate | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>INTS</i> | Internal Standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>MS/MSD</i> | Matrix Spike/Matrix Spike Duplicate |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>PBS</i> | Prep Blank - Soil |
| <i>LFB</i> | Laboratory Fortified Blank | <i>PBW</i> | Prep Blank - Water |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| O | Analyte concentration is estimated due to result exceeding calibration range. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| J | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/4-90/020. Methods for the Determination of Organic Compounds in Drinking Water (I), July 1990.
- (3) EPA 600/R-92/129. Methods for the Determination of Organic Compounds in Drinking Water (II), July 1990.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Excluding Oil & Grease, solid & biological matrices for organic analyses are reported on a wet weight basis.
- (3) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (4) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L15944**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|------------------|----------|-----------------|---------------------|------|--|
| L15944-01 | WG356565 | *All Compounds* | M8015D GC/FID | Q6 | Sample was received above recommended temperature. |
| | | TPH C10 to C28 | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356586 | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | WG356300 | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |
| L15944-02 | WG356565 | *All Compounds* | M8015D GC/FID | Q6 | Sample was received above recommended temperature. |
| | | TPH C10 to C28 | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356586 | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | WG356300 | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |
| L15944-03 | WG356565 | *All Compounds* | M8015D GC/FID | Q6 | Sample was received above recommended temperature. |
| | | TPH C10 to C28 | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356586 | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | WG356300 | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |

Tahoe Resources, Inc.

ACZ Project ID: **L15944**

Metals Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|---------------------|------------|
| Bismuth, dissolved | M200.7 ICP |
| Bismuth, total | M200.7 ICP |
| Gallium, dissolved | M200.7 ICP |
| Gallium, total | M200.7 ICP |
| Scandium, dissolved | M200.7 ICP |
| Scandium, total | M200.7 ICP |

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|--------------|------------|
| Sulfide as S | SM4500S2-D |
|--------------|------------|

Tahoe Resources, Inc.
 Escobal

ACZ Project ID: L15944
 Date Received: 12/11/2013 09:49
 Received By: mtb
 Date Printed: 12/12/2013

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | | | X |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? | | X | |

Samples/Containers

| | YES | NO | NA |
|--|-----|----|----|
| 8) Are all containers intact and with no leaks? | X | | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | X | | |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? | | X | |

Some parameters were received past hold time.

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| 4062 | 10.3 | 13 | N/A |

Was ice present in the shipment container(s)?
 Yes - Gel ice was present in the shipment container(s) but was thawed by receipt at ACZ.
 Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.



Laboratories, Inc.

15944

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: Mberganza@sanrafael.com.gt

Address: Boulevard Los Próceres, 18 calle 24-69 z. 10
Zona Empresarial, Zona Pradera, Torre IV, Of. 1406
Telephone: (502) 5951 5248

Copy of Report to:

Name: Charlie Muerhoff
Company: Tahoe Resources Inc.

E-mail: cmuerhoff@tahoeresourcesinc.com
Telephone:

Invoice to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: Mberganza@sanrafael.com.gt

Address: Boulevard Los Próceres, 18 calle 24-69 z. 10
Zona Empresarial, Zona Pradera, Torre IV, Of. 1406
Telephone: (502) 5951 5248

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring? Yes No

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: Fernanda Ramos Sampler's site Information State: Zip code Time Zone

Check box if observe Daylight Savings Time

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: Water Quality
PO#: Escobal
Reporting state for compliance testing:
Check box if samples include NRC licensed material?

Table with columns for # of Containers, Matrix, and various analysis results. Includes handwritten 'SW' and checkmarks.

Table with columns for SAMPLE IDENTIFICATION, DATE:TIME, and Matrix. Includes handwritten entries like SW1-E, SW2A-E, SW4A-E.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns for RELINQUISHED BY, DATE:TIME, RECEIVED BY, and DATE:TIME. Includes handwritten signatures and dates.

15944 Chain of Custody

January 06, 2014

Report to:

Miguel Berganza

Tahoe Resources, Inc.

Km 8.6 carrtera Antigua a El Salvador

Centro corporativo Muxbal

Torre Oeste.Apto 503y504 Guatemala, GT

Bill to:

Miguel Berganza

Tahoe Resources, Inc.

5310 Kietzke Lane

Suite 200

Reno, NV 89511

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L16073

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 18, 2013. This project has been assigned to ACZ's project number, L16073. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L16073. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

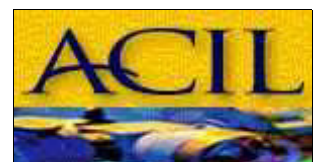
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after February 05, 2014. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and approved this report.



Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW2-E

ACZ Sample ID: **L16073-01**
Date Sampled: 12/16/13 12:00
Date Received: 12/18/13
Sample Matrix: *Surface Water*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/23/13 12:02 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/26/13 13:02 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/26/13 16:17 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:45 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:31 | mpb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | | | | | 01/03/14 10:59 | las |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/23/13 11:29 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW2-E

ACZ Sample ID: **L16073-01**

Date Sampled: 12/16/13 12:00

Date Received: 12/18/13

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/23/13 22:03 | aeb |
| Aluminum, total | M200.7 ICP | 1 | | U | * | mg/L | 0.03 | 0.2 | 12/23/13 19:35 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0004 | B | | mg/L | 0.0004 | 0.002 | 12/23/13 18:05 | las |
| Antimony, total | M200.8 ICP-MS | 1 | 0.0005 | B | | mg/L | 0.0004 | 0.002 | 12/30/13 20:18 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0152 | | | mg/L | 0.0002 | 0.001 | 12/23/13 18:05 | las |
| Arsenic, total | M200.8 ICP-MS | 1 | 0.0156 | | | mg/L | 0.0002 | 0.001 | 12/30/13 20:18 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.041 | | | mg/L | 0.003 | 0.02 | 12/23/13 22:03 | aeb |
| Barium, total | M200.7 ICP | 1 | 0.040 | | | mg/L | 0.003 | 0.02 | 12/23/13 19:35 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:03 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:35 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 22:03 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 19:35 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | 0.26 | | | mg/L | 0.01 | 0.05 | 12/23/13 22:03 | aeb |
| Boron, total | M200.7 ICP | 1 | 0.25 | | | mg/L | 0.01 | 0.05 | 12/23/13 19:35 | aeb |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 18:05 | las |
| Cadmium, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/30/13 20:18 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 430 | | | mg/L | 0.2 | 1 | 12/23/13 22:03 | aeb |
| Calcium, total | M200.7 ICP | 1 | 437 | | | mg/L | 0.2 | 1 | 12/23/13 19:35 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:03 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/26/13 14:36 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/30/13 14:28 | jjc |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:35 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:03 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:35 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 22:03 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 19:35 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/23/13 22:03 | aeb |
| Iron, total | M200.7 ICP | 1 | 0.20 | | | mg/L | 0.02 | 0.05 | 12/26/13 14:36 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 18:05 | las |
| Lead, total | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0005 | 12/30/13 20:18 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | 0.13 | | | mg/L | 0.02 | 0.1 | 12/23/13 22:03 | aeb |
| Lithium, total | M200.7 ICP | 1 | 0.14 | | | mg/L | 0.02 | 0.1 | 12/23/13 19:35 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 27.7 | | | mg/L | 0.2 | 1 | 12/23/13 22:03 | aeb |
| Magnesium, total | M200.7 ICP | 1 | 28.6 | | | mg/L | 0.2 | 1 | 12/23/13 19:35 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | 0.501 | | | mg/L | 0.005 | 0.03 | 12/23/13 22:03 | aeb |
| Manganese, total | M200.7 ICP | 1 | 0.529 | | | mg/L | 0.005 | 0.03 | 12/23/13 19:35 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 14:17 | mfm |
| Mercury, total | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 15:32 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 22:03 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 19:35 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:03 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:35 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 4.7 | | | mg/L | 0.3 | 2 | 12/23/13 22:03 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW2-E

ACZ Sample ID: **L16073-01**
Date Sampled: 12/16/13 12:00
Date Received: 12/18/13
Sample Matrix: *Surface Water*

| | | | | | | | | | |
|----------------------|---------------|---|--------|-----|------|---------|--------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | 4.8 | | mg/L | 0.3 | 2 | 12/23/13 19:35 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 22:03 | aeb |
| Scandium, total | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 19:35 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0003 | 12/23/13 18:05 | las |
| Selenium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0003 | 12/30/13 20:18 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/23/13 18:05 | las |
| Silver, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 01/04/14 1:49 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 90 | | mg/L | 0.3 | 2 | 12/23/13 22:03 | aeb |
| Sodium, total | M200.7 ICP | 1 | 92 | | mg/L | 0.3 | 2 | 12/23/13 19:35 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 5.20 | | mg/L | 0.01 | 0.05 | 12/23/13 22:03 | aeb |
| Strontium, total | M200.7 ICP | 1 | 5.28 | | mg/L | 0.01 | 0.05 | 12/23/13 19:35 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/23/13 18:05 | las |
| Thallium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/30/13 20:18 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 22:03 | aeb |
| Tin, total | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 19:35 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | 0.018 | B | mg/L | 0.005 | 0.03 | 12/23/13 22:03 | aeb |
| Titanium, total | M200.7 ICP | 1 | 0.015 | B | mg/L | 0.005 | 0.03 | 12/23/13 19:35 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/23/13 18:05 | las |
| Uranium, total | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/30/13 20:18 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 22:03 | aeb |
| Vanadium, total | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 19:35 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | 0.02 | B | mg/L | 0.01 | 0.05 | 12/23/13 22:03 | aeb |
| Zinc, total | M200.7 ICP | 1 | 0.02 | B | mg/L | 0.01 | 0.05 | 12/23/13 19:35 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW2-E

ACZ Sample ID: **L16073-01**
 Date Sampled: 12/16/13 12:00
 Date Received: 12/18/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 114 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Total Alkalinity | | 1 | 114 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 1.8 | | | % | | | 01/06/14 11:59 | calc |
| Sum of Anions | | | 27 | | | meq/L | 0.1 | 0.5 | 01/06/14 11:59 | calc |
| Sum of Cations | | | 28 | | | meq/L | 0.1 | 0.5 | 01/06/14 11:59 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | | U | * | mg/L | 10 | 20 | 12/23/13 12:13 | dcw |
| Chloride | SM4500Cl-E | 1 | 72 | | * | mg/L | 1 | 5 | 12/23/13 16:47 | mpb |
| Conductivity @25C | SM2510B | 1 | 2190 | | * | umhos/cm | 1 | 10 | 12/18/13 21:17 | abm |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/23/13 16:42 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/28/13 15:05 | pjb |
| Fluoride | SM4500F-C | 1 | 1.6 | | * | mg/L | 0.1 | 0.5 | 12/23/13 9:32 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 1190 | | | mg/L | 1 | 7 | 01/06/14 11:59 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 0.02 | B | * | mg/L | 0.02 | 0.1 | 12/30/13 15:15 | jlf |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/26/13 15:38 | jlf |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.2 | B | * | mg/L | 0.1 | 0.5 | 01/02/14 15:36 | tcd |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8.2 | H | * | units | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.06 | B | | mg/L | 0.03 | 0.15 | 01/06/14 11:59 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.02 | B | * | mg/L | 0.01 | 0.05 | 12/28/13 0:15 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | | UH | * | mg/L | 0.01 | 0.05 | 12/18/13 23:16 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.03 | B | * | mg/L | 0.01 | 0.05 | 12/28/13 0:54 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 1890 | | * | mg/L | 10 | 20 | 12/20/13 13:28 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/20/13 12:56 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 1960 | | * | mg/L | 10 | 20 | 12/18/13 14:51 | abm |
| Sulfate | D516-02 - Turbidimetric | 50 | 1060 | | * | mg/L | 50 | 250 | 12/27/13 17:47 | mpb |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 12:34 | abm |
| TDS (calculated) | Calculation | | 1760 | | | mg/L | 10 | 50 | 01/06/14 11:59 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.07 | | | | | | 01/06/14 11:59 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW3-E

ACZ Sample ID: **L16073-02**
Date Sampled: 12/16/13 11:30
Date Received: 12/18/13
Sample Matrix: *Surface Water*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/23/13 12:02 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/26/13 13:02 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/26/13 16:25 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:50 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:36 | mpb |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/23/13 11:40 | aeb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | | | | | 01/03/14 11:08 | las |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW3-E

ACZ Sample ID: **L16073-02**
Date Sampled: 12/16/13 11:30
Date Received: 12/18/13
Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | 0.03 | B | | mg/L | 0.03 | 0.2 | 12/23/13 22:07 | aeb |
| Aluminum, total | M200.7 ICP | 1 | 0.55 | | * | mg/L | 0.03 | 0.2 | 12/23/13 19:38 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/23/13 18:08 | las |
| Antimony, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/30/13 20:28 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0119 | | | mg/L | 0.0002 | 0.001 | 12/23/13 18:08 | las |
| Arsenic, total | M200.8 ICP-MS | 1 | 0.0119 | | | mg/L | 0.0002 | 0.001 | 12/30/13 20:28 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.087 | | | mg/L | 0.003 | 0.02 | 12/23/13 22:07 | aeb |
| Barium, total | M200.7 ICP | 1 | 0.092 | | | mg/L | 0.003 | 0.02 | 12/23/13 19:38 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:07 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:38 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 22:07 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 19:38 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:07 | aeb |
| Boron, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:38 | aeb |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 18:08 | las |
| Cadmium, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/30/13 20:28 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 27.9 | | | mg/L | 0.2 | 1 | 12/23/13 22:07 | aeb |
| Calcium, total | M200.7 ICP | 1 | 29.1 | | | mg/L | 0.2 | 1 | 12/23/13 19:38 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:07 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/26/13 14:39 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/30/13 14:37 | jjc |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:38 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:07 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:38 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 22:07 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 19:38 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | 0.03 | B | | mg/L | 0.02 | 0.05 | 12/23/13 22:07 | aeb |
| Iron, total | M200.7 ICP | 1 | 0.29 | | | mg/L | 0.02 | 0.05 | 12/26/13 14:39 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 18:08 | las |
| Lead, total | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0005 | 12/30/13 20:28 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 22:07 | aeb |
| Lithium, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 19:38 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 2.2 | | | mg/L | 0.2 | 1 | 12/23/13 22:07 | aeb |
| Magnesium, total | M200.7 ICP | 1 | 2.3 | | | mg/L | 0.2 | 1 | 12/23/13 19:38 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | 0.025 | B | | mg/L | 0.005 | 0.03 | 12/23/13 22:07 | aeb |
| Manganese, total | M200.7 ICP | 1 | 0.033 | | | mg/L | 0.005 | 0.03 | 12/23/13 19:38 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 14:19 | mfm |
| Mercury, total | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 15:34 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 22:07 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 19:38 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:07 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:38 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 3.6 | | | mg/L | 0.3 | 2 | 12/23/13 22:07 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW3-E

ACZ Sample ID: **L16073-02**
Date Sampled: 12/16/13 11:30
Date Received: 12/18/13
Sample Matrix: Surface Water

| | | | | | | | | | |
|----------------------|---------------|---|--------|-----|------|---------|--------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | 3.7 | | mg/L | 0.3 | 2 | 12/23/13 19:38 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 22:07 | aeb |
| Scandium, total | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 19:38 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0003 | 12/23/13 18:08 | las |
| Selenium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0003 | 12/30/13 20:28 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/23/13 18:08 | las |
| Silver, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 01/04/14 1:52 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 10.6 | | mg/L | 0.3 | 2 | 12/23/13 22:07 | aeb |
| Sodium, total | M200.7 ICP | 1 | 10.7 | | mg/L | 0.3 | 2 | 12/23/13 19:38 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 0.19 | | mg/L | 0.01 | 0.05 | 12/23/13 22:07 | aeb |
| Strontium, total | M200.7 ICP | 1 | 0.19 | | mg/L | 0.01 | 0.05 | 12/23/13 19:38 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/23/13 18:08 | las |
| Thallium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/30/13 20:28 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 22:07 | aeb |
| Tin, total | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 19:38 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | 0.005 | B | mg/L | 0.005 | 0.03 | 12/23/13 22:07 | aeb |
| Titanium, total | M200.7 ICP | 1 | 0.017 | B | mg/L | 0.005 | 0.03 | 12/23/13 19:38 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/23/13 18:08 | las |
| Uranium, total | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/30/13 20:28 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 22:07 | aeb |
| Vanadium, total | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 19:38 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/23/13 22:07 | aeb |
| Zinc, total | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/23/13 19:38 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW3-E

ACZ Sample ID: **L16073-02**
 Date Sampled: 12/16/13 11:30
 Date Received: 12/18/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 86 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Total Alkalinity | | 1 | 86 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | -2.2 | | | % | | | 01/06/14 11:59 | calc |
| Sum of Anions | | | 2.3 | | | meq/L | 0.1 | 0.5 | 01/06/14 11:59 | calc |
| Sum of Cations | | | 2.2 | | | meq/L | 0.1 | 0.5 | 01/06/14 11:59 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | | U | * | mg/L | 10 | 20 | 12/23/13 12:24 | dcw |
| Chloride | SM4500Cl-E | 1 | 2 | B | * | mg/L | 1 | 5 | 12/23/13 16:47 | mpb |
| Conductivity @25C | SM2510B | 1 | 213 | | * | umhos/cm | 1 | 10 | 12/18/13 21:26 | abm |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/23/13 16:43 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/28/13 15:06 | pjb |
| Fluoride | SM4500F-C | 1 | 0.1 | B | * | mg/L | 0.1 | 0.5 | 12/23/13 9:40 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 79 | | | mg/L | 1 | 7 | 01/06/14 11:59 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 0.26 | | * | mg/L | 0.02 | 0.1 | 12/30/13 15:17 | jlf |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | 0.05 | B | * | mg/L | 0.05 | 0.5 | 12/26/13 15:39 | jlf |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.3 | B | * | mg/L | 0.1 | 0.5 | 01/02/14 15:37 | tcd |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8.2 | H | * | units | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.09 | B | | mg/L | 0.03 | 0.15 | 01/06/14 11:59 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.03 | B | * | mg/L | 0.01 | 0.05 | 12/28/13 0:16 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.03 | BH | * | mg/L | 0.01 | 0.05 | 12/18/13 23:17 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.08 | | * | mg/L | 0.01 | 0.05 | 12/28/13 0:57 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 180 | | * | mg/L | 10 | 20 | 12/20/13 13:34 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/20/13 12:59 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 190 | | * | mg/L | 10 | 20 | 12/18/13 14:52 | abm |
| Sulfate | D516-02 - Turbidimetric | 1 | 22.5 | | * | mg/L | 1 | 5 | 12/27/13 17:27 | mpb |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 12:38 | abm |
| TDS (calculated) | Calculation | | 121 | | | mg/L | 10 | 50 | 01/06/14 11:59 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.49 | | | | | | 01/06/14 11:59 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW4-E

ACZ Sample ID: **L16073-03**
Date Sampled: 12/16/13 11:00
Date Received: 12/18/13
Sample Matrix: Surface Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/23/13 12:02 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/26/13 13:02 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/26/13 16:34 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:55 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:40 | mpb |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/23/13 11:52 | aeb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | * | | | | 01/03/14 11:18 | las |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW4-E

ACZ Sample ID: **L16073-03**

Date Sampled: 12/16/13 11:00

Date Received: 12/18/13

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/23/13 22:10 | aeb |
| Aluminum, total | M200.7 ICP | 1 | 0.66 | | | mg/L | 0.03 | 0.2 | 12/23/13 19:41 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0020 | | | mg/L | 0.0004 | 0.002 | 12/23/13 18:18 | las |
| Antimony, total | M200.8 ICP-MS | 2 | 0.0020 | B | | mg/L | 0.0008 | 0.004 | 12/30/13 20:31 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0079 | | | mg/L | 0.0002 | 0.001 | 12/23/13 18:18 | las |
| Arsenic, total | M200.8 ICP-MS | 2 | 0.0083 | | | mg/L | 0.0004 | 0.002 | 12/30/13 20:31 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.114 | | | mg/L | 0.003 | 0.02 | 12/23/13 22:10 | aeb |
| Barium, total | M200.7 ICP | 1 | 0.124 | | | mg/L | 0.003 | 0.02 | 12/23/13 19:41 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:10 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:41 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 22:10 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 19:41 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | 0.12 | | | mg/L | 0.01 | 0.05 | 12/23/13 22:10 | aeb |
| Boron, total | M200.7 ICP | 1 | 0.11 | | | mg/L | 0.01 | 0.05 | 12/23/13 19:41 | aeb |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 18:18 | las |
| Cadmium, total | M200.8 ICP-MS | 2 | | U | | mg/L | 0.0002 | 0.001 | 12/30/13 20:31 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 248 | | | mg/L | 0.2 | 1 | 12/23/13 22:10 | aeb |
| Calcium, total | M200.7 ICP | 1 | 257 | | | mg/L | 0.2 | 1 | 12/23/13 19:41 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:10 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/26/13 14:42 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/30/13 14:40 | jjc |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:41 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:10 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:41 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 22:10 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 19:41 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/23/13 22:10 | aeb |
| Iron, total | M200.7 ICP | 1 | 0.49 | | | mg/L | 0.02 | 0.05 | 12/26/13 14:42 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 18:18 | las |
| Lead, total | M200.8 ICP-MS | 2 | 0.0012 | | | mg/L | 0.0002 | 0.001 | 12/30/13 20:31 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | 0.07 | B | | mg/L | 0.02 | 0.1 | 12/23/13 22:10 | aeb |
| Lithium, total | M200.7 ICP | 1 | 0.07 | B | | mg/L | 0.02 | 0.1 | 12/23/13 19:41 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 16 | | | mg/L | 0.2 | 1 | 12/23/13 22:10 | aeb |
| Magnesium, total | M200.7 ICP | 1 | 16.8 | | | mg/L | 0.2 | 1 | 12/23/13 19:41 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | 0.099 | | | mg/L | 0.005 | 0.03 | 12/23/13 22:10 | aeb |
| Manganese, total | M200.7 ICP | 1 | 0.152 | | | mg/L | 0.005 | 0.03 | 12/23/13 19:41 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 14:21 | mfm |
| Mercury, total | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 15:36 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 22:10 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 19:41 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:10 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:41 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 7.8 | | | mg/L | 0.3 | 2 | 12/23/13 22:10 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW4-E

ACZ Sample ID: **L16073-03**
Date Sampled: 12/16/13 11:00
Date Received: 12/18/13
Sample Matrix: *Surface Water*

| | | | | | | | | | |
|----------------------|---------------|---|--------|-----|------|---------|--------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | 8.2 | | mg/L | 0.3 | 2 | 12/23/13 19:41 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 22:10 | aeb |
| Scandium, total | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 19:41 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0003 | | mg/L | 0.0001 | 0.0003 | 12/23/13 18:18 | las |
| Selenium, total | M200.8 ICP-MS | 2 | 0.0003 | B | mg/L | 0.0002 | 0.0005 | 12/30/13 20:31 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/23/13 18:18 | las |
| Silver, total | M200.8 ICP-MS | 5 | | U | mg/L | 0.0003 | 0.001 | 01/04/14 1:55 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 54.4 | | mg/L | 0.3 | 2 | 12/23/13 22:10 | aeb |
| Sodium, total | M200.7 ICP | 1 | 55.6 | | mg/L | 0.3 | 2 | 12/23/13 19:41 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 2.76 | | mg/L | 0.01 | 0.05 | 12/23/13 22:10 | aeb |
| Strontium, total | M200.7 ICP | 1 | 2.81 | | mg/L | 0.01 | 0.05 | 12/23/13 19:41 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/23/13 18:18 | las |
| Thallium, total | M200.8 ICP-MS | 2 | | U | mg/L | 0.0002 | 0.001 | 12/30/13 20:31 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 22:10 | aeb |
| Tin, total | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 19:41 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | 0.018 | B | mg/L | 0.005 | 0.03 | 12/23/13 22:10 | aeb |
| Titanium, total | M200.7 ICP | 1 | 0.036 | | mg/L | 0.005 | 0.03 | 12/23/13 19:41 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | mg/L | 0.0001 | 0.0005 | 12/23/13 18:18 | las |
| Uranium, total | M200.8 ICP-MS | 2 | | U | mg/L | 0.0002 | 0.001 | 12/30/13 20:31 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | 0.005 | B | mg/L | 0.005 | 0.03 | 12/23/13 22:10 | aeb |
| Vanadium, total | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 19:41 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/23/13 22:10 | aeb |
| Zinc, total | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/23/13 19:41 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW4-E

ACZ Sample ID: **L16073-03**
 Date Sampled: 12/16/13 11:00
 Date Received: 12/18/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 91 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Total Alkalinity | | 1 | 91 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | -3.0 | | | % | | | 01/06/14 12:00 | calc |
| Sum of Anions | | | 17 | | | meq/L | 0.1 | 0.5 | 01/06/14 12:00 | calc |
| Sum of Cations | | | 16 | | | meq/L | 0.1 | 0.5 | 01/06/14 12:00 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | | U | * | mg/L | 10 | 20 | 12/23/13 12:34 | dcw |
| Chloride | SM4500Cl-E | 1 | 42 | | * | mg/L | 1 | 5 | 12/23/13 16:47 | mpb |
| Conductivity @25C | SM2510B | 1 | 1420 | | * | umhos/cm | 1 | 10 | 12/18/13 21:43 | abm |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/23/13 16:43 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/28/13 15:07 | pjb |
| Fluoride | SM4500F-C | 1 | 0.9 | | * | mg/L | 0.1 | 0.5 | 12/23/13 9:43 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 686 | | | mg/L | 1 | 7 | 01/06/14 12:00 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 2.76 | | * | mg/L | 0.02 | 0.1 | 12/30/13 15:19 | jlf |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | 0.08 | B | * | mg/L | 0.05 | 0.5 | 12/26/13 15:40 | jlf |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.3 | B | * | mg/L | 0.1 | 0.5 | 01/02/14 15:38 | tcd |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8 | H | * | units | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| pH measured at | | 1 | 23 | | * | C | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.59 | | | mg/L | 0.03 | 0.15 | 01/06/14 12:00 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.19 | | * | mg/L | 0.01 | 0.05 | 12/28/13 0:17 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.18 | H | * | mg/L | 0.01 | 0.05 | 12/18/13 23:18 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | | U | * | mg/L | 0.01 | 0.05 | 12/28/13 0:59 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 1120 | | * | mg/L | 10 | 20 | 12/20/13 13:36 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | 9 | B | * | mg/L | 5 | 20 | 12/20/13 13:01 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 1210 | | * | mg/L | 10 | 20 | 12/18/13 14:53 | abm |
| Sulfate | D516-02 - Turbidimetric | 20 | 648 | | * | mg/L | 20 | 100 | 12/27/13 17:47 | mpb |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 12:43 | abm |
| TDS (calculated) | Calculation | | 1070 | | | mg/L | 10 | 50 | 01/06/14 12:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.05 | | | | | | 01/06/14 12:00 | calc |



Report Header Explanations

Table with 2 columns: Term and Definition. Includes terms like Batch, Found, Limit, Lower, MDL, PCN/SCN, PQL, QC, Rec, RPD, Upper, and Sample.

QC Sample Types

Table with 4 columns: Code, Description, Code, Description. Lists various QC sample types such as AS, ASD, CCB, CCV, DUP, ICB, ICV, ICSAB, LCSS, LCSSD, LCSW, LCSWD, LFB, LFM, LFMD, LRB, MS, MSD, PBS, PBW, PQV, and SDL.

QC Sample Type Explanations

Table with 2 columns: Sample Type and Explanation. Explains Blanks, Control Samples, Duplicates, Spikes/Fortified Matrix, and Standard.

ACZ Qualifiers (Qual)

Table with 2 columns: Qualifier and Description. Lists B, H, L, and U with their respective meanings.

Method References

- List of 5 method references including EPA 600/4-83-020, EPA 600/R-93-100, EPA 600/R-94-111, EPA SW-846, and Standard Methods for the Examination of Water and Wastewater.

Comments

- List of 5 comments regarding QC results, reporting basis (dry weight vs as received), asterisks in XQ column, and MDL/PQL reporting.

For a complete list of ACZ's Extended Qualifiers, please click: <http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L16073**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|----------------------------------|-------------------|--------------------------------------|--|---|---|
| L16073-01 | WG356884 | Aluminum, total | M200.7 ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG356640 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356848 | Chemical Oxygen Demand | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356894 | Chloride | SM4500CI-E | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356640 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356896 | Cyanide, total | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357015 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356835 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG357046 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | | | M353.2 - H2SO4 preserved | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356933 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG357192 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG357007 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356666 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| M365.1 - Automated Ascorbic Acid | | | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG357008 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |

Tahoe Resources, Inc.

ACZ Project ID: **L16073**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|-------------------------------------|--------------------------------------|------|---|
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356784 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| | WG356770 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356631 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| | WG357004 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | | | D516-02 - Turbidimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356778 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L16073**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------|--------------------------------------|--|---|---|
| L16073-02 | WG356884 | Aluminum, total | M200.7 ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG356640 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356848 | Chemical Oxygen Demand | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356894 | Chloride | SM4500CI-E | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356640 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356896 | Cyanide, total | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357015 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356835 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG357046 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | | | M353.2 - H2SO4 preserved | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356933 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG357192 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG357007 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356666 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG357008 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |

Tahoe Resources, Inc.

ACZ Project ID: **L16073**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|-------------------------------------|--------------------------------------|------|---|
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356784 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| | WG356770 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356631 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| | WG357004 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | | | D516-02 - Turbidimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356778 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L16073**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------------------------------------|---------------------------------|-----------------------------|--|---|---|
| L16073-03 | WG357231 | Total Hot Plate Digestion | M200.2 ICP-MS | DJ | Sample dilution required due to insufficient sample. |
| | WG356640 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356848 | Chemical Oxygen Demand | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356894 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356896 | Cyanide, total | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357015 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356835 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG357046 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | | | M353.2 - H2SO4 preserved | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356933 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG357192 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG357007 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356666 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357008 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| M365.1 - Auto Ascorbic Acid (digest) | | | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356784 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |

Tahoe Resources, Inc.

ACZ Project ID: **L16073**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|-------------------------------------|-------------------------|------|---|
| | WG356770 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356631 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| | WG357004 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | | | D516-02 - Turbidimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356778 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW2-EACZ Sample ID: **L16073-01**
Date Sampled: 12/16/13 12:00
Date Received: 12/18/13
Sample Matrix: *Surface Water***Diesel Range Organics (C10-C28)**Analysis Method: **M8015D GC/FID**
Extract Method: **M3520****Workgroup:** WG356966Analyst: jad
Extract Date: 12/19/13 19:11
Analysis Date: 12/26/13 15:31

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 81.5 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW2-EACZ Sample ID: **L16073-01**
Date Sampled: 12/16/13 12:00
Date Received: 12/18/13
Sample Matrix: *Surface Water***Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**
Extract Method:**Workgroup:** WG356845

Analyst: wpr

Extract Date:

Analysis Date: 12/23/13 9:02

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|-----|-----|
| Oil and Grease | | | U | 1 | * | mg/L | 2 | 10 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW3-EACZ Sample ID: **L16073-02**
Date Sampled: 12/16/13 11:30
Date Received: 12/18/13
Sample Matrix: *Surface Water***Diesel Range Organics (C10-C28)**Analysis Method: **M8015D GC/FID**
Extract Method: **M3520****Workgroup:** WG356966Analyst: jad
Extract Date: 12/19/13 19:12
Analysis Date: 12/26/13 15:57

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 79.9 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW3-EACZ Sample ID: **L16073-02**
Date Sampled: 12/16/13 11:30
Date Received: 12/18/13
Sample Matrix: *Surface Water***Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**
Extract Method:**Workgroup:** WG356845

Analyst: wpr

Extract Date:

Analysis Date: 12/23/13 9:02

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|------|------|
| Oil and Grease | | | U | 1.01 | * | mg/L | 2.02 | 10.1 |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW4-E

ACZ Sample ID: **L16073-03**
Date Sampled: 12/16/13 11:00
Date Received: 12/18/13
Sample Matrix: *Surface Water*

Diesel Range Organics (C10-C28)

Analysis Method: **M8015D GC/FID**
Extract Method: **M3520**

Workgroup: WG356966

Analyst: jad
Extract Date: 12/19/13 19:13
Analysis Date: 12/26/13 16:23

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 82.8 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW4-EACZ Sample ID: **L16073-03**
Date Sampled: 12/16/13 11:00
Date Received: 12/18/13
Sample Matrix: *Surface Water***Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**
Extract Method:**Workgroup:** WG356845

Analyst: wpr

Extract Date:

Analysis Date: 12/23/13 9:02

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|-----|-----|
| Oil and Grease | | | U | 1 | * | mg/L | 2 | 10 |

Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>LCL</i> | Lower Control Limit |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>UCL</i> | Upper Control Limit |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|-------------|-----------------------------------|---------------|---------------------------------------|
| <i>SURR</i> | Surrogate | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>INTS</i> | Internal Standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>MS/MSD</i> | Matrix Spike/Matrix Spike Duplicate |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>PBS</i> | Prep Blank - Soil |
| <i>LFB</i> | Laboratory Fortified Blank | <i>PBW</i> | Prep Blank - Water |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| O | Analyte concentration is estimated due to result exceeding calibration range. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| J | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/4-90/020. Methods for the Determination of Organic Compounds in Drinking Water (I), July 1990.
- (3) EPA 600/R-92/129. Methods for the Determination of Organic Compounds in Drinking Water (II), July 1990.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Excluding Oil & Grease, solid & biological matrices for organic analyses are reported on a wet weight basis.
- (3) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (4) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L16073**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|------------------|----------|-----------------|---------------------|------|--|
| L16073-01 | WG356966 | *All Compounds* | M8015D GC/FID | Q6 | Sample was received above recommended temperature. |
| | | | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356845 | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | WG356741 | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |
| L16073-02 | WG356966 | *All Compounds* | M8015D GC/FID | Q6 | Sample was received above recommended temperature. |
| | | | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356845 | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | WG356741 | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |
| L16073-03 | WG356966 | *All Compounds* | M8015D GC/FID | Q6 | Sample was received above recommended temperature. |
| | | | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356845 | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | WG356741 | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |

Tahoe Resources, Inc.

ACZ Project ID: **L16073**

Metals Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|---------------------|------------|
| Bismuth, dissolved | M200.7 ICP |
| Bismuth, total | M200.7 ICP |
| Gallium, dissolved | M200.7 ICP |
| Gallium, total | M200.7 ICP |
| Scandium, dissolved | M200.7 ICP |
| Scandium, total | M200.7 ICP |

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|--------------|------------|
| Sulfide as S | SM4500S2-D |
|--------------|------------|

Tahoe Resources, Inc.
 Escobal

ACZ Project ID: L16073
 Date Received: 12/18/2013 12:07
 Received By: mtb
 Date Printed: 12/19/2013

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | | | X |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? | | X | |

Samples/Containers

| | YES | NO | NA |
|--|-----|----|----|
| 8) Are all containers intact and with no leaks? | X | | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | X | | |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? | | X | |

Some parameters were received past hold time.

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| 3188 | 10.9 | 13 | N/A |

Was ice present in the shipment container(s)?

Yes - Gel ice was present in the shipment container(s) but was thawed by receipt at ACZ.

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.



Laboratories, Inc. L16073

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: Mberganza@sanrafael.com.gt

Address: Bulvar los Proceres 13 calle 24-69 z.10
Zona Empresarial Zona Fradera Dne IV01406
Telephone: (502) 5951 5248

Copy of Report to:

Name: Charlie Muerhoff
Company: Tahoe Resources Inc.

E-mail: cmuerhoff@tahoeresourcesinc.com
Telephone:

Invoice to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: Mberganza@sanrafael.com.gt

Address:
Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring? Yes No

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: SUSANG AROCKE Sampler's site information State: _____ Zip code _____ Time Zone _____

Check box if observe Daylight Savings Time

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: Water Quality
PO#: Escobal
Reporting state for compliance testing:
Check box if samples include NRC licensed material?

| SAMPLE IDENTIFICATION | DATE:TIME | Matrix | # of Containers | | | | | | | | | | | | | | | |
|-----------------------|----------------|--------|-----------------------------------|----|---|--|--|--|--|--|--|--|--|--|--|--|--|--|
| SW2-E | 16/12/13 12:00 | SW | 10 | MS | ✓ | | | | | | | | | | | | | |
| SW3-E | 16/12/13 11:30 | SW | 10 | | ✓ | | | | | | | | | | | | | |
| SW4-E | 16/12/13 11:00 | SW | 10 | | ✓ | | | | | | | | | | | | | |
| | | | added per containers WPL 12-18-13 | | | | | | | | | | | | | | | |

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

| RELINQUISHED BY: | DATE:TIME | RECEIVED BY: | DATE:TIME |
|----------------------|-----------------------|---------------------------|-----------------------|
| <u>Amanda Barnes</u> | <u>16022013 16:30</u> | <u>Eric Holaz</u> | <u>16/12/13 16:30</u> |
| | | <u>WPL 12-18-13 12:07</u> | |



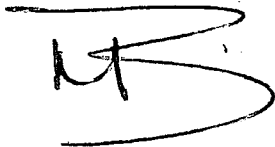
Guatemala December 16th, 2013

To whom it may concern:

Minera San Rafael, S.A is sending a case with samples of water, which is not contaminated, that are going to be analyzed by the ACZ Laboratories in Steamboat Springs, Colorado, USA.

If you have any question or doubt, please contact Miguel Berganza at Minera San Rafael, S.A. (502 - 5951-5248) ofr Sue Webber at ACZ Laboratories (970-879-6590).

Best regards,

A handwritten signature in black ink, consisting of a stylized 'M' and 'B' connected together, with a long horizontal stroke underneath.

Miguel Berganza
Environment Department.
Proyecto Escobal, S. A.

January 06, 2014

Report to:

Miguel Berganza

Tahoe Resources, Inc.

Km 8.6 carrtera Antigua a El Salvador

Centro corporativo Muxbal

Torre Oeste.Apto 503y504 Guatemala, GT

Bill to:

Miguel Berganza

Tahoe Resources, Inc.

5310 Kietzke Lane

Suite 200

Reno, NV 89511

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L16074

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 18, 2013. This project has been assigned to ACZ's project number, L16074. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L16074. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

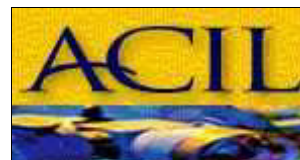
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after February 05, 2014. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and approved this report.



Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW5-E

ACZ Sample ID: **L16074-01**
Date Sampled: 12/16/13 07:45
Date Received: 12/18/13
Sample Matrix: Surface Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/23/13 12:03 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/26/13 13:02 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/26/13 16:59 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 19:00 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:45 | mpb |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/23/13 12:04 | aeb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | * | | | | 01/03/14 11:27 | las |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW5-E

ACZ Sample ID: **L16074-01**

Date Sampled: 12/16/13 07:45

Date Received: 12/18/13

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/23/13 22:19 | aeb |
| Aluminum, total | M200.7 ICP | 1 | 0.28 | | | mg/L | 0.03 | 0.2 | 12/23/13 19:44 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/23/13 22:01 | scp |
| Antimony, total | M200.8 ICP-MS | 2 | | U | | mg/L | 0.0008 | 0.004 | 12/30/13 20:35 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0020 | | | mg/L | 0.0002 | 0.001 | 12/23/13 22:01 | scp |
| Arsenic, total | M200.8 ICP-MS | 2 | 0.0021 | | | mg/L | 0.0004 | 0.002 | 12/30/13 20:35 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.045 | | | mg/L | 0.003 | 0.02 | 12/23/13 22:19 | aeb |
| Barium, total | M200.7 ICP | 1 | 0.049 | | | mg/L | 0.003 | 0.02 | 12/23/13 19:44 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:19 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:44 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 22:19 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 19:44 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:19 | aeb |
| Boron, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:44 | aeb |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 22:01 | scp |
| Cadmium, total | M200.8 ICP-MS | 2 | | U | | mg/L | 0.0002 | 0.001 | 12/30/13 20:35 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 7.9 | | | mg/L | 0.2 | 1 | 12/23/13 22:19 | aeb |
| Calcium, total | M200.7 ICP | 1 | 8.1 | | | mg/L | 0.2 | 1 | 12/23/13 19:44 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:19 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/26/13 14:45 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/30/13 14:43 | jjc |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:44 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:19 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:44 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 22:19 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 19:44 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.02 | 0.05 | 12/23/13 22:19 | aeb |
| Iron, total | M200.7 ICP | 1 | 0.31 | | | mg/L | 0.02 | 0.05 | 12/26/13 14:45 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 22:01 | scp |
| Lead, total | M200.8 ICP-MS | 2 | | U | | mg/L | 0.0002 | 0.001 | 12/30/13 20:35 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 22:19 | aeb |
| Lithium, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 19:44 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 1.4 | | | mg/L | 0.2 | 1 | 12/23/13 22:19 | aeb |
| Magnesium, total | M200.7 ICP | 1 | 1.5 | | | mg/L | 0.2 | 1 | 12/23/13 19:44 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | 0.021 | B | | mg/L | 0.005 | 0.03 | 12/23/13 22:19 | aeb |
| Manganese, total | M200.7 ICP | 1 | 0.019 | B | | mg/L | 0.005 | 0.03 | 12/23/13 19:44 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 14:24 | mfm |
| Mercury, total | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 15:39 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 22:19 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 19:44 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:19 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:44 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 2.7 | | | mg/L | 0.3 | 2 | 12/23/13 22:19 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW5-E

ACZ Sample ID: **L16074-01**
Date Sampled: 12/16/13 07:45
Date Received: 12/18/13
Sample Matrix: Surface Water

| | | | | | | | | | |
|----------------------|---------------|---|-------|-----|------|---------|--------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | 2.8 | | mg/L | 0.3 | 2 | 12/23/13 19:44 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 22:19 | aeb |
| Scandium, total | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 19:44 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0003 | 12/23/13 22:01 | scp |
| Selenium, total | M200.8 ICP-MS | 2 | | U | mg/L | 0.0002 | 0.0005 | 12/30/13 20:35 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/23/13 22:01 | scp |
| Silver, total | M200.8 ICP-MS | 5 | | U | mg/L | 0.0003 | 0.001 | 01/04/14 1:58 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 5.2 | | mg/L | 0.3 | 2 | 12/23/13 22:19 | aeb |
| Sodium, total | M200.7 ICP | 1 | 5.2 | | mg/L | 0.3 | 2 | 12/23/13 19:44 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 0.06 | | mg/L | 0.01 | 0.05 | 12/23/13 22:19 | aeb |
| Strontium, total | M200.7 ICP | 1 | 0.06 | | mg/L | 0.01 | 0.05 | 12/23/13 19:44 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/23/13 22:01 | scp |
| Thallium, total | M200.8 ICP-MS | 2 | | U | mg/L | 0.0002 | 0.001 | 12/30/13 20:35 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 22:19 | aeb |
| Tin, total | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 19:44 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 22:19 | aeb |
| Titanium, total | M200.7 ICP | 1 | 0.006 | B | mg/L | 0.005 | 0.03 | 12/23/13 19:44 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/23/13 22:01 | scp |
| Uranium, total | M200.8 ICP-MS | 2 | | U | mg/L | 0.0002 | 0.001 | 12/30/13 20:35 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 22:19 | aeb |
| Vanadium, total | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 19:44 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/23/13 22:19 | aeb |
| Zinc, total | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/23/13 19:44 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW5-E

ACZ Sample ID: **L16074-01**
 Date Sampled: 12/16/13 07:45
 Date Received: 12/18/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 27 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Total Alkalinity | | 1 | 27 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | -5.9 | | | % | | | 01/06/14 12:08 | calc |
| Sum of Anions | | | 0.9 | | | meq/L | 0.1 | 0.5 | 01/06/14 12:08 | calc |
| Sum of Cations | | | 0.8 | | | meq/L | 0.1 | 0.5 | 01/06/14 12:08 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | | U | * | mg/L | 10 | 20 | 12/23/13 12:45 | dcw |
| Chloride | SM4500Cl-E | 1 | 2 | B | * | mg/L | 1 | 5 | 12/23/13 16:47 | mpb |
| Conductivity @25C | SM2510B | 1 | 88 | | * | umhos/cm | 1 | 10 | 12/18/13 21:51 | abm |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/23/13 16:45 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/28/13 15:08 | pjb |
| Fluoride | SM4500F-C | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 9:51 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 25 | | | mg/L | 1 | 7 | 01/06/14 12:08 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 0.07 | B | * | mg/L | 0.02 | 0.1 | 12/30/13 15:20 | jlf |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | 0.08 | B | * | mg/L | 0.05 | 0.5 | 12/26/13 15:41 | jlf |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.4 | B | * | mg/L | 0.1 | 0.5 | 01/02/14 15:42 | tcd |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.9 | H | * | units | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| pH measured at | | 1 | 23 | | * | C | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.06 | B | | mg/L | 0.03 | 0.15 | 01/06/14 12:08 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.02 | B | * | mg/L | 0.01 | 0.05 | 12/28/13 0:18 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.01 | BH | * | mg/L | 0.01 | 0.05 | 12/18/13 23:19 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.02 | B | * | mg/L | 0.01 | 0.05 | 12/28/13 1:00 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 70 | | * | mg/L | 10 | 20 | 12/20/13 13:39 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/20/13 15:28 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 80 | | * | mg/L | 10 | 20 | 12/20/13 15:13 | khw |
| Sulfate | D516-02 - Turbidimetric | 1 | 14.5 | | * | mg/L | 1 | 5 | 12/27/13 17:27 | mpb |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 12:56 | abm |
| TDS (calculated) | Calculation | | 50 | | | mg/L | 10 | 50 | 01/06/14 12:08 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.40 | | | | | | 01/06/14 12:08 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW6-E

ACZ Sample ID: **L16074-02**
Date Sampled: 12/16/13 08:15
Date Received: 12/18/13
Sample Matrix: Surface Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/23/13 12:03 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/26/13 13:02 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/26/13 17:17 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/27/13 10:03 | jif |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:50 | mpb |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/23/13 12:38 | aeb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | * | | | | 01/03/14 11:37 | las |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW6-E

ACZ Sample ID: **L16074-02**
Date Sampled: 12/16/13 08:15
Date Received: 12/18/13
Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/23/13 22:22 | aeb |
| Aluminum, total | M200.7 ICP | 1 | 0.54 | | | mg/L | 0.03 | 0.2 | 12/23/13 19:54 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/23/13 22:04 | scp |
| Antimony, total | M200.8 ICP-MS | 2 | | U | | mg/L | 0.0008 | 0.004 | 12/30/13 20:38 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0026 | | | mg/L | 0.0002 | 0.001 | 12/23/13 22:04 | scp |
| Arsenic, total | M200.8 ICP-MS | 2 | 0.0029 | | | mg/L | 0.0004 | 0.002 | 12/30/13 20:38 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.049 | | | mg/L | 0.003 | 0.02 | 12/23/13 22:22 | aeb |
| Barium, total | M200.7 ICP | 1 | 0.053 | | | mg/L | 0.003 | 0.02 | 12/23/13 19:54 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:22 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:54 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 22:22 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 19:54 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | 0.11 | | | mg/L | 0.01 | 0.05 | 12/23/13 22:22 | aeb |
| Boron, total | M200.7 ICP | 1 | 0.10 | | | mg/L | 0.01 | 0.05 | 12/23/13 19:54 | aeb |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 22:04 | scp |
| Cadmium, total | M200.8 ICP-MS | 2 | | U | | mg/L | 0.0002 | 0.001 | 12/30/13 20:38 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 10.9 | | | mg/L | 0.2 | 1 | 12/23/13 22:22 | aeb |
| Calcium, total | M200.7 ICP | 1 | 11.2 | | | mg/L | 0.2 | 1 | 12/23/13 19:54 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:22 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/26/13 14:55 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/30/13 14:46 | jjc |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:54 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:22 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:54 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 22:22 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 19:54 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | 0.05 | | | mg/L | 0.02 | 0.05 | 12/23/13 22:22 | aeb |
| Iron, total | M200.7 ICP | 1 | 0.38 | | | mg/L | 0.02 | 0.05 | 12/26/13 14:55 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 22:04 | scp |
| Lead, total | M200.8 ICP-MS | 2 | | U | | mg/L | 0.0002 | 0.001 | 12/30/13 20:38 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.02 | 0.1 | 12/23/13 22:22 | aeb |
| Lithium, total | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.02 | 0.1 | 12/23/13 19:54 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 2.3 | | | mg/L | 0.2 | 1 | 12/23/13 22:22 | aeb |
| Magnesium, total | M200.7 ICP | 1 | 2.4 | | | mg/L | 0.2 | 1 | 12/23/13 19:54 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | 0.024 | B | | mg/L | 0.005 | 0.03 | 12/23/13 22:22 | aeb |
| Manganese, total | M200.7 ICP | 1 | 0.026 | B | | mg/L | 0.005 | 0.03 | 12/23/13 19:54 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 14:27 | mfm |
| Mercury, total | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 15:41 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 22:22 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 19:54 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:22 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:54 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 3.2 | | | mg/L | 0.3 | 2 | 12/23/13 22:22 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW6-E

ACZ Sample ID: **L16074-02**
Date Sampled: 12/16/13 08:15
Date Received: 12/18/13
Sample Matrix: Surface Water

| | | | | | | | | | |
|----------------------|---------------|---|-------|-----|------|---------|--------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | 3.4 | | mg/L | 0.3 | 2 | 12/23/13 19:54 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 22:22 | aeb |
| Scandium, total | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 19:54 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0003 | 12/23/13 22:04 | scp |
| Selenium, total | M200.8 ICP-MS | 2 | | U | mg/L | 0.0002 | 0.0005 | 12/30/13 20:38 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/23/13 22:04 | scp |
| Silver, total | M200.8 ICP-MS | 2 | | U | mg/L | 0.0001 | 0.0005 | 01/04/14 2:08 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 13.4 | | mg/L | 0.3 | 2 | 12/23/13 22:22 | aeb |
| Sodium, total | M200.7 ICP | 1 | 13.7 | | mg/L | 0.3 | 2 | 12/23/13 19:54 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 0.08 | | mg/L | 0.01 | 0.05 | 12/23/13 22:22 | aeb |
| Strontium, total | M200.7 ICP | 1 | 0.08 | | mg/L | 0.01 | 0.05 | 12/23/13 19:54 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/23/13 22:04 | scp |
| Thallium, total | M200.8 ICP-MS | 2 | | U | mg/L | 0.0002 | 0.001 | 12/30/13 20:38 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 22:22 | aeb |
| Tin, total | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 19:54 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 22:22 | aeb |
| Titanium, total | M200.7 ICP | 1 | 0.015 | B | mg/L | 0.005 | 0.03 | 12/23/13 19:54 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/23/13 22:04 | scp |
| Uranium, total | M200.8 ICP-MS | 2 | | U | mg/L | 0.0002 | 0.001 | 12/30/13 20:38 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 22:22 | aeb |
| Vanadium, total | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 19:54 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/23/13 22:22 | aeb |
| Zinc, total | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/23/13 19:54 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW6-E

ACZ Sample ID: **L16074-02**
 Date Sampled: 12/16/13 08:15
 Date Received: 12/18/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 40 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Total Alkalinity | | 1 | 40 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | -3.4 | | | % | | | 01/06/14 12:08 | calc |
| Sum of Anions | | | 1.5 | | | meq/L | 0.1 | 0.5 | 01/06/14 12:08 | calc |
| Sum of Cations | | | 1.4 | | | meq/L | 0.1 | 0.5 | 01/06/14 12:08 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | | U | * | mg/L | 10 | 20 | 12/23/13 12:55 | dcw |
| Chloride | SM4500Cl-E | 1 | 14 | | * | mg/L | 1 | 5 | 12/23/13 16:47 | mpb |
| Conductivity @25C | SM2510B | 1 | 154 | | * | umhos/cm | 1 | 10 | 12/18/13 21:58 | abm |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/23/13 16:47 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/28/13 15:09 | pjb |
| Fluoride | SM4500F-C | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 10:09 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 37 | | | mg/L | 1 | 7 | 01/06/14 12:08 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 0.12 | | * | mg/L | 0.02 | 0.1 | 12/30/13 15:21 | jlf |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/26/13 15:43 | jlf |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.3 | B | * | mg/L | 0.1 | 0.5 | 01/02/14 16:02 | tcd |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.9 | H | * | units | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| pH measured at | | 1 | 23 | | * | C | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.06 | B | | mg/L | 0.03 | 0.15 | 01/06/14 12:08 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.02 | B | * | mg/L | 0.01 | 0.05 | 12/31/13 11:47 | mpb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.02 | BH | * | mg/L | 0.01 | 0.05 | 12/18/13 23:21 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.03 | B | * | mg/L | 0.01 | 0.05 | 12/28/13 1:01 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 5 | 100 | | * | mg/L | 50 | 100 | 12/20/13 13:41 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/20/13 15:31 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 120 | | * | mg/L | 10 | 20 | 12/20/13 15:14 | khw |
| Sulfate | D516-02 - Turbidimetric | 1 | 15.2 | | * | mg/L | 1 | 5 | 12/27/13 17:28 | mpb |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 13:09 | abm |
| TDS (calculated) | Calculation | | 83 | | | mg/L | 10 | 50 | 01/06/14 12:08 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.20 | | | | | | 01/06/14 12:08 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW7-E

ACZ Sample ID: **L16074-03**
Date Sampled: 12/16/13 10:25
Date Received: 12/18/13
Sample Matrix: Surface Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/23/13 12:03 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/26/13 13:03 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/26/13 17:34 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/27/13 10:08 | jif |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:55 | mpb |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/23/13 12:50 | aeb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | * | | | | 01/03/14 11:47 | las |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW7-E

ACZ Sample ID: **L16074-03**

Date Sampled: 12/16/13 10:25

Date Received: 12/18/13

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/23/13 22:26 | aeb |
| Aluminum, total | M200.7 ICP | 1 | 1.55 | | | mg/L | 0.03 | 0.2 | 12/23/13 19:57 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0006 | B | | mg/L | 0.0004 | 0.002 | 12/23/13 22:07 | scp |
| Antimony, total | M200.8 ICP-MS | 1 | 0.0007 | B | | mg/L | 0.0004 | 0.002 | 12/30/13 20:48 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0045 | | | mg/L | 0.0002 | 0.001 | 12/23/13 22:07 | scp |
| Arsenic, total | M200.8 ICP-MS | 1 | 0.0052 | | | mg/L | 0.0002 | 0.001 | 12/30/13 20:48 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.071 | | | mg/L | 0.003 | 0.02 | 12/23/13 22:26 | aeb |
| Barium, total | M200.7 ICP | 1 | 0.080 | | | mg/L | 0.003 | 0.02 | 12/23/13 19:57 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:26 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:57 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 22:26 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 19:57 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:26 | aeb |
| Boron, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:57 | aeb |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 22:07 | scp |
| Cadmium, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/30/13 20:48 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 15.7 | | | mg/L | 0.2 | 1 | 12/23/13 22:26 | aeb |
| Calcium, total | M200.7 ICP | 1 | 15.7 | | | mg/L | 0.2 | 1 | 12/23/13 19:57 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:26 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/26/13 14:58 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/30/13 14:49 | jjc |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:57 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:26 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:57 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 22:26 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 19:57 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | 0.06 | | | mg/L | 0.02 | 0.05 | 12/23/13 22:26 | aeb |
| Iron, total | M200.7 ICP | 1 | 0.73 | | | mg/L | 0.02 | 0.05 | 12/26/13 14:58 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 22:07 | scp |
| Lead, total | M200.8 ICP-MS | 1 | 0.0007 | | | mg/L | 0.0001 | 0.0005 | 12/30/13 20:48 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 22:26 | aeb |
| Lithium, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 19:57 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 2.8 | | | mg/L | 0.2 | 1 | 12/23/13 22:26 | aeb |
| Magnesium, total | M200.7 ICP | 1 | 2.9 | | | mg/L | 0.2 | 1 | 12/23/13 19:57 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | 0.065 | | | mg/L | 0.005 | 0.03 | 12/23/13 22:26 | aeb |
| Manganese, total | M200.7 ICP | 1 | 0.082 | | | mg/L | 0.005 | 0.03 | 12/23/13 19:57 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 14:38 | mfm |
| Mercury, total | M245.1 CVAA | 1 | 0.0002 | B | | mg/L | 0.0002 | 0.001 | 12/23/13 15:43 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 22:26 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 19:57 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:26 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:57 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 3.4 | | | mg/L | 0.3 | 2 | 12/23/13 22:26 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW7-E

ACZ Sample ID: **L16074-03**
Date Sampled: 12/16/13 10:25
Date Received: 12/18/13
Sample Matrix: Surface Water

| | | | | | | | | | |
|----------------------|---------------|---|-------|-----|------|---------|--------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | 3.5 | | mg/L | 0.3 | 2 | 12/23/13 19:57 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 22:26 | aeb |
| Scandium, total | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 19:57 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0003 | 12/23/13 22:07 | scp |
| Selenium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0003 | 12/30/13 20:48 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/23/13 22:07 | scp |
| Silver, total | M200.8 ICP-MS | 2 | | U | mg/L | 0.0001 | 0.0005 | 01/04/14 2:11 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 8.5 | | mg/L | 0.3 | 2 | 12/23/13 22:26 | aeb |
| Sodium, total | M200.7 ICP | 1 | 8.4 | | mg/L | 0.3 | 2 | 12/23/13 19:57 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 0.12 | | mg/L | 0.01 | 0.05 | 12/23/13 22:26 | aeb |
| Strontium, total | M200.7 ICP | 1 | 0.11 | | mg/L | 0.01 | 0.05 | 12/23/13 19:57 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/23/13 22:07 | scp |
| Thallium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/30/13 20:48 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 22:26 | aeb |
| Tin, total | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 19:57 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 22:26 | aeb |
| Titanium, total | M200.7 ICP | 1 | 0.037 | | mg/L | 0.005 | 0.03 | 12/23/13 19:57 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/23/13 22:07 | scp |
| Uranium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/30/13 20:48 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 22:26 | aeb |
| Vanadium, total | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 19:57 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/23/13 22:26 | aeb |
| Zinc, total | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/23/13 19:57 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW7-E

ACZ Sample ID: **L16074-03**
 Date Sampled: 12/16/13 10:25
 Date Received: 12/18/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 54 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Total Alkalinity | | 1 | 54 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | -3.2 | | | % | | | 01/06/14 12:08 | calc |
| Sum of Anions | | | 1.6 | | | meq/L | 0.1 | 0.5 | 01/06/14 12:08 | calc |
| Sum of Cations | | | 1.5 | | | meq/L | 0.1 | 0.5 | 01/06/14 12:08 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | 10 | B | * | mg/L | 10 | 20 | 12/23/13 13:26 | dcw |
| Chloride | SM4500Cl-E | 1 | 3 | B | * | mg/L | 1 | 5 | 12/23/13 16:47 | mpb |
| Conductivity @25C | SM2510B | 1 | 150 | | * | umhos/cm | 1 | 10 | 12/18/13 22:06 | abm |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/23/13 16:48 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/28/13 15:10 | pjb |
| Fluoride | SM4500F-C | 1 | 0.1 | B | * | mg/L | 0.1 | 0.5 | 12/23/13 10:16 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 51 | | | mg/L | 1 | 7 | 01/06/14 12:08 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 0.19 | | * | mg/L | 0.02 | 0.1 | 12/30/13 15:22 | jlf |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/26/13 15:44 | jlf |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.4 | B | * | mg/L | 0.1 | 0.5 | 01/02/14 16:04 | tcd |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.9 | H | * | units | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| pH measured at | | 1 | 23 | | * | C | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.09 | B | | mg/L | 0.03 | 0.15 | 01/06/14 12:08 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.03 | B | * | mg/L | 0.01 | 0.05 | 12/31/13 12:12 | mpb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.03 | BH | * | mg/L | 0.01 | 0.05 | 12/18/13 23:23 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.19 | | * | mg/L | 0.01 | 0.05 | 12/28/13 1:02 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 5 | 100 | | * | mg/L | 50 | 100 | 12/20/13 13:44 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | 6 | B | * | mg/L | 5 | 20 | 12/20/13 15:34 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 140 | | * | mg/L | 10 | 20 | 12/20/13 15:15 | khw |
| Sulfate | D516-02 - Turbidimetric | 1 | 19.4 | | * | mg/L | 1 | 5 | 12/27/13 17:28 | mpb |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 13:13 | abm |
| TDS (calculated) | Calculation | | 86 | | | mg/L | 10 | 50 | 01/06/14 12:08 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.16 | | | | | | 01/06/14 12:08 | calc |



Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|--------------|--|--------------|--|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LCSWD</i> | Laboratory Control Sample - Water Duplicate |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFB</i> | Laboratory Fortified Blank |
| <i>CCB</i> | Continuing Calibration Blank | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>CCV</i> | Continuing Calibration Verification standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>ICB</i> | Initial Calibration Blank | <i>MS</i> | Matrix Spike |
| <i>ICV</i> | Initial Calibration Verification standard | <i>MSD</i> | Matrix Spike Duplicate |
| <i>ICSAB</i> | Inter-element Correction Standard - A plus B solutions | <i>PBS</i> | Prep Blank - Soil |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>PBW</i> | Prep Blank - Water |
| <i>LCSSD</i> | Laboratory Control Sample - Soil Duplicate | <i>PQV</i> | Practical Quantitation Verification standard |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>SDL</i> | Serial Dilution |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |
| Standard | Verifies the validity of the calibration. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L16074**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|-------------------------------------|---|------|---|
| L16074-01 | WG357231 | Total Hot Plate Digestion | M200.2 ICP-MS | DJ | Sample dilution required due to insufficient sample. |
| | WG356640 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356848 | Chemical Oxygen Demand | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356894 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356896 | Cyanide, total | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357015 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356835 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG357046 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | | | M353.2 - H2SO4 preserved | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356933 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG357192 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG357007 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356666 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357008 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356784 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| | WG356797 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |

Tahoe Resources, Inc.

ACZ Project ID: **L16074**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|----------------------------|-------------------------|------|---|
| | WG356795 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| | | | SM2540B | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357004 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | | | D516-02 - Turbidimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356778 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L16074**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------------------------|--------------------------------------|--|---|---|
| L16074-02 | WG357231 | Total Hot Plate Digestion | M200.2 ICP-MS | DJ | Sample dilution required due to insufficient sample. |
| | WG356640 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356848 | Chemical Oxygen Demand | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356894 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356896 | Cyanide, total | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357015 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356835 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG357046 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | | | M353.2 - H2SO4 preserved | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356933 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG357192 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | | pH measured at | SM4500H+ B | Q6 |
| | WG357112 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | WG356666 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG357008 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356784 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |
| WG356797 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. | |
| | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356795 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. | |
| | | SM2540B | RA | Relative Percent Difference (RPD) was not used for data | |

Tahoe Resources, Inc.

ACZ Project ID: **L16074**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|-------------------------|------|---|
| | | | | | validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357004 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | | | D516-02 - Turbidimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356778 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L16074**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------------------------------------|-------------------------------------|-----------------------------|--|---|---|
| L16074-03 | WG357231 | Total Hot Plate Digestion | M200.2 ICP-MS | DJ | Sample dilution required due to insufficient sample. |
| | WG356640 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356848 | Chemical Oxygen Demand | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356894 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356896 | Cyanide, total | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357015 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356835 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG357046 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | | | M353.2 - H2SO4 preserved | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356933 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG357192 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | | pH measured at | SM4500H+ B | Q6 |
| | WG357112 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | WG356666 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357008 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| M365.1 - Auto Ascorbic Acid (digest) | | | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356784 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |
| WG356797 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. | |
| | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356795 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. | |
| | | SM2540B | RA | Relative Percent Difference (RPD) was not used for data | |

Tahoe Resources, Inc.

ACZ Project ID: **L16074**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|-------------------------|------|---|
| | | | | | validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357004 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | | | D516-02 - Turbidimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356778 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW5-E

ACZ Sample ID: **L16074-01**

Date Sampled: 12/16/13 7:45

Date Received: 12/18/13

Sample Matrix: *Surface Water*

Diesel Range Organics (C10-C28)

Analysis Method: **M8015D GC/FID**

Extract Method: **M3520**

Workgroup: WG356966

Analyst: jad

Extract Date: 12/19/13 19:14

Analysis Date: 12/26/13 16:49

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 84.3 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW5-EACZ Sample ID: **L16074-01**

Date Sampled: 12/16/13 7:45

Date Received: 12/18/13

Sample Matrix: *Surface Water***Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**

Extract Method:

Workgroup: WG356845

Analyst: wpr

Extract Date:

Analysis Date: 12/23/13 9:02

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|-----|-----|
| Oil and Grease | | | U | 1 | * | mg/L | 2 | 10 |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW6-E

ACZ Sample ID: **L16074-02**

Date Sampled: 12/16/13 8:15

Date Received: 12/18/13

Sample Matrix: *Surface Water*

Diesel Range Organics (C10-C28)

Analysis Method: **M8015D GC/FID**

Extract Method: **M3520**

Workgroup: WG356966

Analyst: jad

Extract Date: 12/19/13 19:15

Analysis Date: 12/26/13 17:41

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 82 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW6-EACZ Sample ID: **L16074-02**

Date Sampled: 12/16/13 8:15

Date Received: 12/18/13

Sample Matrix: *Surface Water***Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**

Extract Method:

Workgroup: WG356845

Analyst: wpr

Extract Date:

Analysis Date: 12/23/13 9:02

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|-----|-----|
| Oil and Grease | | | U | 1 | * | mg/L | 2 | 10 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW7-EACZ Sample ID: **L16074-03**
Date Sampled: 12/16/13 10:25
Date Received: 12/18/13
Sample Matrix: *Surface Water***Diesel Range Organics (C10-C28)**Analysis Method: **M8015D GC/FID**
Extract Method: **M3520****Workgroup:** WG356966Analyst: jad
Extract Date: 12/19/13 19:16
Analysis Date: 12/26/13 18:07

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 85.9 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: SW7-E

ACZ Sample ID: **L16074-03**

Date Sampled: 12/16/13 10:25

Date Received: 12/18/13

Sample Matrix: *Surface Water***Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**

Extract Method:

Workgroup: WG356845

Analyst: wpr

Extract Date:

Analysis Date: 12/23/13 9:02

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|-----|-----|
| Oil and Grease | | | U | 1 | * | mg/L | 2 | 10 |

Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>LCL</i> | Lower Control Limit |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>UCL</i> | Upper Control Limit |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|-------------|-----------------------------------|---------------|---------------------------------------|
| <i>SURR</i> | Surrogate | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>INTS</i> | Internal Standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>MS/MSD</i> | Matrix Spike/Matrix Spike Duplicate |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>PBS</i> | Prep Blank - Soil |
| <i>LFB</i> | Laboratory Fortified Blank | <i>PBW</i> | Prep Blank - Water |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| O | Analyte concentration is estimated due to result exceeding calibration range. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| J | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/4-90/020. Methods for the Determination of Organic Compounds in Drinking Water (I), July 1990.
- (3) EPA 600/R-92/129. Methods for the Determination of Organic Compounds in Drinking Water (II), July 1990.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Excluding Oil & Grease, solid & biological matrices for organic analyses are reported on a wet weight basis.
- (3) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (4) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L16074**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|------------------|----------|-----------------|---------------------|------|--|
| L16074-01 | WG356966 | *All Compounds* | M8015D GC/FID | Q6 | Sample was received above recommended temperature. |
| | | | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356845 | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | WG356741 | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |
| L16074-02 | WG356966 | *All Compounds* | M8015D GC/FID | Q6 | Sample was received above recommended temperature. |
| | | | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356845 | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | WG356741 | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |
| L16074-03 | WG356966 | *All Compounds* | M8015D GC/FID | Q6 | Sample was received above recommended temperature. |
| | | | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356845 | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | WG356741 | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |

Tahoe Resources, Inc.

ACZ Project ID: **L16074**

Metals Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|---------------------|------------|
| Bismuth, dissolved | M200.7 ICP |
| Bismuth, total | M200.7 ICP |
| Gallium, dissolved | M200.7 ICP |
| Gallium, total | M200.7 ICP |
| Scandium, dissolved | M200.7 ICP |
| Scandium, total | M200.7 ICP |

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|--------------|------------|
| Sulfide as S | SM4500S2-D |
|--------------|------------|

Tahoe Resources, Inc.
 Escobal

ACZ Project ID: L16074
 Date Received: 12/18/2013 12:07
 Received By: mtb
 Date Printed: 12/19/2013

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | | | X |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? | | X | |

Samples/Containers

| | YES | NO | NA |
|--|-----|----|----|
| 8) Are all containers intact and with no leaks? | X | | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | X | | |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? | | X | |

Some parameters were received past hold time.

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| 2761 | 12.3 | 13 | N/A |

Was ice present in the shipment container(s)?
 Yes - Gel ice was present in the shipment container(s) but was thawed by receipt at ACZ.
 Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

L16074



Laboratories, Inc. *L18*

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493 *LPL 12/18/13*

Report to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: Mberganza@sanrafael.com.gt

Address: Bulevar Los Proceros Calle 24-69 2.10
Zona Empremarial Zona Proadera Torre IV of 1406
Telephone: (502) 59515248

Copy of Report to:

Name: Onanie Muehloff
Company: Tahoe Resources Inc.

E-mail: omuehloff@tahoeresourcesinc.com
Telephone:

Invoice to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: Mberganza@sanrafael.com.gt

Address:

Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring? Yes No

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: Susana Arche Sampler's site Information State: _____ Zip code _____ Time Zone _____

Check box if observe Daylight Savings Time

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: Water Quality
PO#: Escoba!
Reporting state for compliance testing:
Check box if samples include NRC licensed material?

| SAMPLE IDENTIFICATION | DATE:TIME | Matrix | # of Containers | | | | | | | | | | | |
|-----------------------|----------------|--------|-----------------|---|--|--|--|--|--|--|--|--|--|--|
| SWS-E | 16/12/13 07:45 | SW | 10 | ✓ | | | | | | | | | | |
| SW6-E | 16/12/13 08:15 | SW | 10 | ✓ | | | | | | | | | | |
| SW7-E | 16/12/13 10:25 | SW | 10 | ✓ | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

| RELINQUISHED BY: | DATE:TIME | RECEIVED BY: | DATE:TIME |
|-----------------------|-------------------------|---------------------------|-----------------------|
| <u>Fernanda Ramos</u> | <u>16/02/2013 16:30</u> | <u>Eric Stolu</u> | <u>16/12/13 16:30</u> |
| | | <u>LPL 12-18-13 12:10</u> | |

L16074 Chain of Custody

Guatemala December 16th, 2013

To whom it may concern:

Minera San Rafael, S.A is sending a case with samples of water, which is not contaminated, that are going to be analyzed by the ACZ Laboratories in Steamboat Springs, Colorado, USA.

If you have any question or doubt, please contact Miguel Berganza at Minera San Rafael, S.A. (502 - 5951-5248) ofr Sue Webber at ACZ Laboratories (970-879-6590).

Best regards,

A handwritten signature in black ink, consisting of a stylized 'M' and 'B' connected by a horizontal line, with a large flourish underneath.

Miguel Berganza
Environment Department.
Proyecto Escobal, S. A.

December 27, 2013

Report to:

Miguel Berganza

Tahoe Resources, Inc.

Km 8.6 carrtera Antigua a El Salvador

Centro corporativo Muxbal

Torre Oeste.Apto 503y504 Guatemala, GT

Bill to:

Miguel Berganza

Tahoe Resources, Inc.

5310 Kietzke Lane

Suite 200

Reno, NV 89511

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L15967

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 11, 2013. This project has been assigned to ACZ's project number, L15967. Please reference this number in all future inquiries.

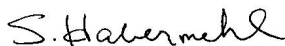
All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L15967. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

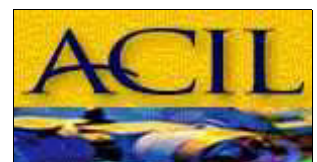
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after January 26, 2014. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed
and approved this report.



Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW8-E

ACZ Sample ID: **L15967-01**
Date Sampled: 12/05/13 14:00
Date Received: 12/11/13
Sample Matrix: *Surface Water*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/16/13 16:34 | mpb |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/16/13 19:18 | mpb |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/17/13 12:35 | bsu |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/14/13 10:54 | bsu |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/17/13 14:45 | mpb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | | | | | 12/20/13 12:17 | las |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/17/13 12:15 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW8-E

ACZ Sample ID: **L15967-01**

Date Sampled: 12/05/13 14:00

Date Received: 12/11/13

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/16/13 23:31 | aeb |
| Aluminum, total | M200.7 ICP | 1 | 0.35 | | * | mg/L | 0.03 | 0.2 | 12/18/13 22:32 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0016 | B | | mg/L | 0.0004 | 0.002 | 12/19/13 3:01 | pmc |
| Antimony, total | M200.8 ICP-MS | 1 | 0.0016 | B | | mg/L | 0.0004 | 0.002 | 12/23/13 15:59 | las |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0056 | | | mg/L | 0.0002 | 0.001 | 12/19/13 3:01 | pmc |
| Arsenic, total | M200.8 ICP-MS | 1 | 0.0064 | | | mg/L | 0.0002 | 0.001 | 12/23/13 15:59 | las |
| Barium, dissolved | M200.7 ICP | 1 | 0.122 | | | mg/L | 0.003 | 0.02 | 12/16/13 23:31 | aeb |
| Barium, total | M200.7 ICP | 1 | 0.134 | | | mg/L | 0.003 | 0.02 | 12/18/13 22:32 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 23:31 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:32 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/16/13 23:31 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 22:32 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | 0.06 | | | mg/L | 0.01 | 0.05 | 12/16/13 23:31 | aeb |
| Boron, total | M200.7 ICP | 1 | 0.05 | | | mg/L | 0.01 | 0.05 | 12/19/13 12:27 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:01 | pmc |
| Cadmium, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 15:59 | las |
| Calcium, dissolved | M200.7 ICP | 1 | 127 | | | mg/L | 0.2 | 1 | 12/16/13 23:31 | aeb |
| Calcium, total | M200.7 ICP | 1 | 125 | | | mg/L | 0.2 | 1 | 12/18/13 22:32 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 23:31 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:32 | aeb |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 23:31 | aeb |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:32 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 23:31 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:32 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/16/13 23:31 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 22:32 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | 0.05 | | | mg/L | 0.02 | 0.05 | 12/16/13 23:31 | aeb |
| Iron, total | M200.7 ICP | 1 | 0.42 | | | mg/L | 0.02 | 0.05 | 12/18/13 22:32 | aeb |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:01 | pmc |
| Lead, total | M200.8 ICP-MS | 1 | 0.0005 | | | mg/L | 0.0001 | 0.0005 | 12/23/13 15:59 | las |
| Lithium, dissolved | M200.7 ICP | 1 | 0.03 | B | | mg/L | 0.02 | 0.1 | 12/16/13 23:31 | aeb |
| Lithium, total | M200.7 ICP | 1 | 0.03 | B | | mg/L | 0.02 | 0.1 | 12/18/13 22:32 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 9.5 | | | mg/L | 0.2 | 1 | 12/16/13 23:31 | aeb |
| Magnesium, total | M200.7 ICP | 1 | 9.6 | | | mg/L | 0.2 | 1 | 12/18/13 22:32 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | 0.147 | | | mg/L | 0.005 | 0.03 | 12/16/13 23:31 | aeb |
| Manganese, total | M200.7 ICP | 1 | 0.178 | | | mg/L | 0.005 | 0.03 | 12/18/13 22:32 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 11:45 | mfm |
| Mercury, total | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 13:58 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/16/13 23:31 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 22:32 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 23:31 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:32 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 8.6 | | | mg/L | 0.3 | 2 | 12/16/13 23:31 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW8-E

ACZ Sample ID: **L15967-01**
Date Sampled: 12/05/13 14:00
Date Received: 12/11/13
Sample Matrix: Surface Water

| | | | | | | | | | |
|----------------------|---------------|---|--------|-----|------|---------|--------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | 8.9 | | mg/L | 0.3 | 2 | 12/18/13 22:32 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/16/13 23:31 | aeb |
| Scandium, total | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/18/13 22:32 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0003 | | mg/L | 0.0001 | 0.0003 | 12/19/13 3:01 | pmc |
| Selenium, total | M200.8 ICP-MS | 1 | 0.0002 | B | mg/L | 0.0001 | 0.0003 | 12/23/13 15:59 | las |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/19/13 3:01 | pmc |
| Silver, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/23/13 15:59 | las |
| Sodium, dissolved | M200.7 ICP | 1 | 36 | | mg/L | 0.3 | 2 | 12/16/13 23:31 | aeb |
| Sodium, total | M200.7 ICP | 1 | 36.6 | | mg/L | 0.3 | 2 | 12/18/13 22:32 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 1.31 | | mg/L | 0.01 | 0.05 | 12/16/13 23:31 | aeb |
| Strontium, total | M200.7 ICP | 1 | 1.28 | | mg/L | 0.01 | 0.05 | 12/18/13 22:32 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/19/13 3:01 | pmc |
| Thallium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/23/13 15:59 | las |
| Tin, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/16/13 23:31 | aeb |
| Tin, total | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/18/13 22:32 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/16/13 23:31 | aeb |
| Titanium, total | M200.7 ICP | 1 | 0.016 | B | mg/L | 0.005 | 0.03 | 12/18/13 22:32 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/19/13 3:01 | pmc |
| Uranium, total | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/23/13 15:59 | las |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/16/13 23:31 | aeb |
| Vanadium, total | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/18/13 22:32 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | 0.03 | B | mg/L | 0.01 | 0.05 | 12/16/13 23:31 | aeb |
| Zinc, total | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/18/13 22:32 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW8-E

ACZ Sample ID: **L15967-01**
 Date Sampled: 12/05/13 14:00
 Date Received: 12/11/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 84 | | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Total Alkalinity | | 1 | 84 | | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | -1.6 | | | % | | | 12/26/13 16:31 | calc |
| Sum of Anions | | | 9.3 | | | meq/L | 0.1 | 0.5 | 12/26/13 16:31 | calc |
| Sum of Cations | | | 9.0 | | | meq/L | 0.1 | 0.5 | 12/26/13 16:31 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | | U | * | mg/L | 10 | 20 | 12/18/13 12:25 | khw |
| Chloride | SM4500Cl-E | 1 | 28 | | * | mg/L | 1 | 5 | 12/20/13 16:54 | mpb |
| Conductivity @25C | SM2510B | 1 | 862 | | * | umhos/cm | 1 | 10 | 12/12/13 2:28 | khw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/17/13 16:49 | bsu |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/17/13 17:27 | bsu |
| Fluoride | SM4500F-C | 1 | 0.5 | | * | mg/L | 0.1 | 0.5 | 12/16/13 13:48 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 357 | | | mg/L | 1 | 7 | 12/26/13 16:31 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 2.88 | | * | mg/L | 0.02 | 0.1 | 12/19/13 1:23 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | 0.50 | | * | mg/L | 0.05 | 0.5 | 12/20/13 15:04 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 1.2 | | * | mg/L | 0.1 | 0.5 | 12/19/13 13:30 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8 | H | * | units | 0.1 | 0.1 | 12/12/13 0:00 | khw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/12/13 0:00 | khw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.68 | | | mg/L | 0.03 | 0.15 | 12/26/13 16:31 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.22 | | * | mg/L | 0.01 | 0.05 | 12/14/13 13:34 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.19 | H | * | mg/L | 0.01 | 0.05 | 12/12/13 21:31 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.28 | | * | mg/L | 0.01 | 0.05 | 12/19/13 0:04 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 670 | | * | mg/L | 10 | 20 | 12/12/13 13:13 | abm |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | 10 | B | * | mg/L | 5 | 20 | 12/11/13 17:11 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 680 | | * | mg/L | 10 | 20 | 12/11/13 16:11 | dcw |
| Sulfate | D516-02 - Turbidimetric | 20 | 323 | | * | mg/L | 20 | 100 | 12/17/13 12:31 | tcd |
| Sulfide as S | SM4500S2-D | 1 | 0.02 | B | * | mg/L | 0.02 | 0.1 | 12/12/13 11:26 | dcw |
| TDS (calculated) | Calculation | | 585 | | | mg/L | 10 | 50 | 12/26/13 16:31 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.15 | | | | | | 12/26/13 16:31 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW11-E

ACZ Sample ID: **L15967-02**
Date Sampled: 12/05/13 15:00
Date Received: 12/11/13
Sample Matrix: *Surface Water*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/16/13 16:41 | mpb |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/16/13 19:23 | mpb |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/17/13 12:44 | bsu |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/14/13 11:00 | bsu |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/17/13 14:54 | mpb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | | | | | 12/20/13 12:27 | las |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/17/13 12:27 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW11-E

ACZ Sample ID: **L15967-02**
Date Sampled: 12/05/13 15:00
Date Received: 12/11/13
Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | 0.06 | B | | mg/L | 0.03 | 0.2 | 12/16/13 23:34 | aeb |
| Aluminum, total | M200.7 ICP | 1 | 0.08 | B | * | mg/L | 0.03 | 0.2 | 12/18/13 22:35 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0049 | | | mg/L | 0.0004 | 0.002 | 12/19/13 3:05 | pmc |
| Antimony, total | M200.8 ICP-MS | 1 | 0.0050 | | | mg/L | 0.0004 | 0.002 | 12/23/13 16:02 | las |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0088 | | | mg/L | 0.0002 | 0.001 | 12/19/13 3:05 | pmc |
| Arsenic, total | M200.8 ICP-MS | 1 | 0.0098 | | | mg/L | 0.0002 | 0.001 | 12/23/13 16:02 | las |
| Barium, dissolved | M200.7 ICP | 1 | 0.046 | | | mg/L | 0.003 | 0.02 | 12/16/13 23:34 | aeb |
| Barium, total | M200.7 ICP | 1 | 0.050 | | | mg/L | 0.003 | 0.02 | 12/18/13 22:35 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 23:34 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:35 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/16/13 23:34 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 22:35 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | 0.16 | | | mg/L | 0.01 | 0.05 | 12/16/13 23:34 | aeb |
| Boron, total | M200.7 ICP | 1 | 0.15 | | | mg/L | 0.01 | 0.05 | 12/19/13 12:30 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:05 | pmc |
| Cadmium, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 16:02 | las |
| Calcium, dissolved | M200.7 ICP | 1 | 329 | | | mg/L | 0.2 | 1 | 12/16/13 23:34 | aeb |
| Calcium, total | M200.7 ICP | 1 | 345 | | | mg/L | 0.2 | 1 | 12/18/13 22:35 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 23:34 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:35 | aeb |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 23:34 | aeb |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:35 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 23:34 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:35 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/16/13 23:34 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 22:35 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/16/13 23:34 | aeb |
| Iron, total | M200.7 ICP | 1 | 0.02 | B | | mg/L | 0.02 | 0.05 | 12/18/13 22:35 | aeb |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:05 | pmc |
| Lead, total | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0005 | 12/23/13 16:02 | las |
| Lithium, dissolved | M200.7 ICP | 1 | 0.08 | B | | mg/L | 0.02 | 0.1 | 12/16/13 23:34 | aeb |
| Lithium, total | M200.7 ICP | 1 | 0.09 | B | | mg/L | 0.02 | 0.1 | 12/18/13 22:35 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 19.6 | | | mg/L | 0.2 | 1 | 12/16/13 23:34 | aeb |
| Magnesium, total | M200.7 ICP | 1 | 20.6 | | | mg/L | 0.2 | 1 | 12/18/13 22:35 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | 0.107 | | | mg/L | 0.005 | 0.03 | 12/16/13 23:34 | aeb |
| Manganese, total | M200.7 ICP | 1 | 0.115 | | | mg/L | 0.005 | 0.03 | 12/18/13 22:35 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 11:47 | mfm |
| Mercury, total | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 14:01 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/16/13 23:34 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 22:35 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/16/13 23:34 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 22:35 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 8.9 | | | mg/L | 0.3 | 2 | 12/16/13 23:34 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW11-E

ACZ Sample ID: **L15967-02**
Date Sampled: 12/05/13 15:00
Date Received: 12/11/13
Sample Matrix: *Surface Water*

| | | | | | | | | | |
|----------------------|---------------|---|--------|-----|------|---------|--------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | 9.3 | | mg/L | 0.3 | 2 | 12/18/13 22:35 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/16/13 23:34 | aeb |
| Scandium, total | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/18/13 22:35 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0006 | | mg/L | 0.0001 | 0.0003 | 12/19/13 3:05 | pmc |
| Selenium, total | M200.8 ICP-MS | 1 | 0.0005 | | mg/L | 0.0001 | 0.0003 | 12/23/13 16:02 | las |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/19/13 3:05 | pmc |
| Silver, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/23/13 16:02 | las |
| Sodium, dissolved | M200.7 ICP | 1 | 74.4 | | mg/L | 0.3 | 2 | 12/16/13 23:34 | aeb |
| Sodium, total | M200.7 ICP | 1 | 77.4 | | mg/L | 0.3 | 2 | 12/18/13 22:35 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 3.55 | | mg/L | 0.01 | 0.05 | 12/16/13 23:34 | aeb |
| Strontium, total | M200.7 ICP | 1 | 3.64 | | mg/L | 0.01 | 0.05 | 12/18/13 22:35 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/19/13 3:05 | pmc |
| Thallium, total | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/23/13 16:02 | las |
| Tin, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/16/13 23:34 | aeb |
| Tin, total | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/18/13 22:35 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/16/13 23:34 | aeb |
| Titanium, total | M200.7 ICP | 1 | 0.007 | B | mg/L | 0.005 | 0.03 | 12/18/13 22:35 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | mg/L | 0.0001 | 0.0005 | 12/19/13 3:05 | pmc |
| Uranium, total | M200.8 ICP-MS | 1 | 0.0002 | B | mg/L | 0.0001 | 0.0005 | 12/23/13 16:02 | las |
| Vanadium, dissolved | M200.7 ICP | 1 | 0.011 | B | mg/L | 0.005 | 0.03 | 12/16/13 23:34 | aeb |
| Vanadium, total | M200.7 ICP | 1 | 0.010 | B | mg/L | 0.005 | 0.03 | 12/18/13 22:35 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/16/13 23:34 | aeb |
| Zinc, total | M200.7 ICP | 1 | 0.01 | B | mg/L | 0.01 | 0.05 | 12/18/13 22:35 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW11-E

ACZ Sample ID: **L15967-02**
 Date Sampled: 12/05/13 15:00
 Date Received: 12/11/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 67 | | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Total Alkalinity | | 1 | 67 | | * | mg/L | 2 | 20 | 12/12/13 0:00 | khw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 0.0 | | | % | | | 12/26/13 16:31 | calc |
| Sum of Anions | | | 22 | | | meq/L | 0.1 | 0.5 | 12/26/13 16:31 | calc |
| Sum of Cations | | | 22 | | | meq/L | 0.1 | 0.5 | 12/26/13 16:31 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | | U | * | mg/L | 10 | 20 | 12/18/13 12:41 | khw |
| Chloride | SM4500Cl-E | 1 | 55 | | * | mg/L | 1 | 5 | 12/20/13 16:54 | mpb |
| Conductivity @25C | SM2510B | 1 | 1820 | | * | umhos/cm | 1 | 10 | 12/12/13 2:36 | khw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/17/13 16:50 | bsu |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/17/13 17:28 | bsu |
| Fluoride | SM4500F-C | 1 | 1.4 | | * | mg/L | 0.1 | 0.5 | 12/16/13 13:51 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 903 | | | mg/L | 1 | 7 | 12/26/13 16:31 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 2.32 | | * | mg/L | 0.02 | 0.1 | 12/19/13 1:24 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | 0.68 | | * | mg/L | 0.05 | 0.5 | 12/20/13 15:06 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 1.3 | | * | mg/L | 0.1 | 0.5 | 12/19/13 13:31 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8.1 | H | * | units | 0.1 | 0.1 | 12/12/13 0:00 | khw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/12/13 0:00 | khw |
| Phosphate | Calculation based on dissolved Phosphorus | | | U | | mg/L | 0.03 | 0.15 | 12/26/13 16:31 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | | U | * | mg/L | 0.01 | 0.05 | 12/14/13 13:38 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | | UH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:32 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.01 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 0:07 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 1530 | | * | mg/L | 10 | 20 | 12/12/13 13:14 | abm |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/11/13 17:13 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 1560 | | * | mg/L | 10 | 20 | 12/11/13 16:13 | dcw |
| Sulfate | D516-02 - Turbidimetric | 50 | 892 | | * | mg/L | 50 | 250 | 12/17/13 12:42 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/12/13 11:30 | dcw |
| TDS (calculated) | Calculation | | 1420 | | | mg/L | 10 | 50 | 12/26/13 16:31 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.08 | | | | | | 12/26/13 16:31 | calc |



Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|--------------|--|--------------|--|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LCSWD</i> | Laboratory Control Sample - Water Duplicate |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFB</i> | Laboratory Fortified Blank |
| <i>CCB</i> | Continuing Calibration Blank | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>CCV</i> | Continuing Calibration Verification standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>ICB</i> | Initial Calibration Blank | <i>MS</i> | Matrix Spike |
| <i>ICV</i> | Initial Calibration Verification standard | <i>MSD</i> | Matrix Spike Duplicate |
| <i>ICSAB</i> | Inter-element Correction Standard - A plus B solutions | <i>PBS</i> | Prep Blank - Soil |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>PBW</i> | Prep Blank - Water |
| <i>LCSSD</i> | Laboratory Control Sample - Soil Duplicate | <i>PQV</i> | Practical Quantitation Verification standard |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>SDL</i> | Serial Dilution |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |
| Standard | Verifies the validity of the calibration. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L15967**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|------------------|-------------------------------------|-----------------------------|--|---|---|
| L15967-01 | WG356561 | Aluminum, total | M200.7 ICP | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG356281 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356606 | Chemical Oxygen Demand | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356799 | Chloride | SM4500Cl-E | Q6 | Sample was received above recommended temperature. |
| | WG356281 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356566 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356567 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356281 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356668 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356790 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG356705 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | WG356281 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG356449 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356669 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356343 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |
| WG356292 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. | |
| | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356284 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. | |
| WG356534 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. | |
| WG356323 | Sulfide as S | SM4500S2-D | M2 | Matrix spike recovery was low, the recovery of the | |

Tahoe Resources, Inc.

ACZ Project ID: **L15967**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|---------------------|------|---|
| | | | | | associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356281 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15967**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------------------------|--------------------------------------|--|---|---|
| L15967-02 | WG356561 | Aluminum, total | M200.7 ICP | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG356281 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356606 | Chemical Oxygen Demand | M410.4 | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356799 | Chloride | SM4500Cl-E | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500Cl-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500Cl-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356281 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356566 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356567 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356281 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356668 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356790 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG356705 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | WG356281 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG356449 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356669 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356343 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |
| WG356292 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. | |
| | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |

Tahoe Resources, Inc.

ACZ Project ID: **L15967**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|----------------------------|-------------------------|------|---|
| | WG356284 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| | WG356534 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | WG356323 | Sulfide as S | SM4500S2-D | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356281 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW8-E

ACZ Sample ID: **L15967-01**
Date Sampled: 12/05/13 14:00
Date Received: 12/11/13
Sample Matrix: *Surface Water*

Diesel Range Organics (C10-C28)

Analysis Method: **M8015D GC/FID**
Extract Method: **M3520**

Workgroup: WG356565

Analyst: jad
Extract Date: 12/12/13 10:23
Analysis Date: 12/17/13 4:38

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 77.5 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW8-EACZ Sample ID: **L15967-01**
Date Sampled: 12/05/13 14:00
Date Received: 12/11/13
Sample Matrix: *Surface Water***Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**
Extract Method:**Workgroup:** WG356672

Analyst: WPR

Extract Date:

Analysis Date: 12/19/13 8:00

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|-----|-----|
| Oil and Grease | | | U | 1 | * | mg/L | 2 | 10 |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW11-E

ACZ Sample ID: **L15967-02**
Date Sampled: 12/05/13 15:00
Date Received: 12/11/13
Sample Matrix: Surface Water

Diesel Range Organics (C10-C28)

Analysis Method: **M8015D GC/FID**
Extract Method: **M3520**

Workgroup: WG356565

Analyst: jad
Extract Date: 12/12/13 11:12
Analysis Date: 12/17/13 5:04

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 82.9 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW11-EACZ Sample ID: **L15967-02**
Date Sampled: 12/05/13 15:00
Date Received: 12/11/13
Sample Matrix: *Surface Water***Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**
Extract Method:**Workgroup:** WG356672

Analyst: WPR

Extract Date:

Analysis Date: 12/19/13 8:00

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|-----|-----|
| Oil and Grease | | | U | 1 | * | mg/L | 2 | 10 |

Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>LCL</i> | Lower Control Limit |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>UCL</i> | Upper Control Limit |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|-------------|-----------------------------------|---------------|---------------------------------------|
| <i>SURR</i> | Surrogate | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>INTS</i> | Internal Standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>MS/MSD</i> | Matrix Spike/Matrix Spike Duplicate |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>PBS</i> | Prep Blank - Soil |
| <i>LFB</i> | Laboratory Fortified Blank | <i>PBW</i> | Prep Blank - Water |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| O | Analyte concentration is estimated due to result exceeding calibration range. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| J | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/4-90/020. Methods for the Determination of Organic Compounds in Drinking Water (I), July 1990.
- (3) EPA 600/R-92/129. Methods for the Determination of Organic Compounds in Drinking Water (II), July 1990.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Excluding Oil & Grease, solid & biological matrices for organic analyses are reported on a wet weight basis.
- (3) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (4) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L15967**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|------------------|------------------|-----------------|---------------------|---------------|--|
| L15967-01 | WG356565 | *All Compounds* | M8015D GC/FID | Q6 | Sample was received above recommended temperature. |
| | | TPH C10 to C28 | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356672 | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | | | 1664A - Gravimetric | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356300 | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |
| | L15967-02 | WG356565 | *All Compounds* | M8015D GC/FID | Q6 |
| TPH C10 to C28 | | | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| WG356672 | | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | | | 1664A - Gravimetric | Q9 | Insufficient sample received to meet method QC requirements. |
| WG356300 | | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |

Tahoe Resources, Inc.

ACZ Project ID: **L15967**

Metals Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|---------------------|------------|
| Bismuth, dissolved | M200.7 ICP |
| Bismuth, total | M200.7 ICP |
| Gallium, dissolved | M200.7 ICP |
| Gallium, total | M200.7 ICP |
| Scandium, dissolved | M200.7 ICP |
| Scandium, total | M200.7 ICP |

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|--------------|------------|
| Sulfide as S | SM4500S2-D |
|--------------|------------|

Tahoe Resources, Inc.
 Escobal

ACZ Project ID: L15967
 Date Received: 12/11/2013 09:48
 Received By: mtb
 Date Printed: 12/12/2013

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | | | X |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? | | X | |

Samples/Containers

| | YES | NO | NA |
|--|-----|----|----|
| 8) Are all containers intact and with no leaks? | X | | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | X | | |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? | | X | |

Some parameters were received past hold time.

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| 3848 | 13.7 | 12 | N/A |

Was ice present in the shipment container(s)?
 Yes - Gel ice was present in the shipment container(s) but was thawed by receipt at ACZ.
 Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.



Laboratories, Inc.

115967

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Miguel Berganza
Company: Tanco Resources
E-mail: MBerganza@santafael.com.gt

Address: Boulevard los Proceres, 18 calle 24-69 2-10
Zona Empresarial Zona Pradera Torre W.O.F. (406)
Telephone: (502) 5951 5248

Copy of Report to:

Name: Charlie Muerhoff
Company: Tanco Resources Inc.

E-mail: CMuerhoff@tancoresourcesinc.com
Telephone:

Invoice to:

Name: Miguel Berganza
Company: Tanco Resources Inc.
E-mail: MBerganza@santafael.com.gt

Address: Boulevard los Proceres 18 calle 24-69-210
Zona Empresarial - Zona Pradera Torre W.O.F. 1406
Telephone: (502) 5951 5248

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring? Yes No

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: Fernanda Barrios Sampler's site Information State: Zip code Time Zone

Check box if observe Daylight Savings Time

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: Water Quality
PO#: Escobal
Reporting state for compliance testing:
Check box if samples include NRC licensed material?

Table with columns for # of Containers, Matrix, and various analysis results. Includes handwritten 'SW' and checkmarks.

Table with columns for SAMPLE IDENTIFICATION, DATE:TIME, and Matrix. Includes handwritten entries like SWB-E and SWII-E.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

MARKS

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns for RELINQUISHED BY, DATE:TIME, RECEIVED BY, and DATE:TIME. Includes handwritten signatures and dates.

115967 Chain of Custody

January 06, 2014

Report to:

Miguel Berganza

Tahoe Resources, Inc.

Km 8.6 carrtera Antigua a El Salvador

Centro corporativo Muxbal

Torre Oeste.Apto 503y504 Guatemala, GT

Bill to:

Miguel Berganza

Tahoe Resources, Inc.

5310 Kietzke Lane

Suite 200

Reno, NV 89511

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L16072

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 18, 2013. This project has been assigned to ACZ's project number, L16072. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L16072. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

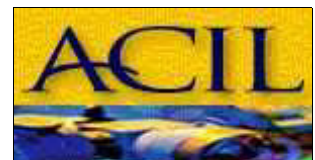
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after February 05, 2014. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and approved this report.



Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW9-E

ACZ Sample ID: **L16072-01**
Date Sampled: 12/16/13 09:10
Date Received: 12/18/13
Sample Matrix: Surface Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/23/13 12:02 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/26/13 13:01 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/26/13 15:51 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:36 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:16 | mpb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | | | | | 01/03/14 10:39 | las |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/23/13 11:06 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW9-E

ACZ Sample ID: **L16072-01**
Date Sampled: 12/16/13 09:10
Date Received: 12/18/13
Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.03 | 0.2 | 12/23/13 21:51 | aeb |
| Aluminum, total | M200.7 ICP | 1 | 0.62 | | * | mg/L | 0.03 | 0.2 | 12/23/13 19:28 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0005 | B | | mg/L | 0.0004 | 0.002 | 12/23/13 17:58 | las |
| Antimony, total | M200.8 ICP-MS | 1 | 0.0005 | B | | mg/L | 0.0004 | 0.002 | 12/30/13 20:11 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0039 | | | mg/L | 0.0002 | 0.001 | 12/23/13 17:58 | las |
| Arsenic, total | M200.8 ICP-MS | 1 | 0.0040 | | | mg/L | 0.0002 | 0.001 | 12/30/13 20:11 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.087 | | | mg/L | 0.003 | 0.02 | 12/23/13 21:51 | aeb |
| Barium, total | M200.7 ICP | 1 | 0.088 | | | mg/L | 0.003 | 0.02 | 12/23/13 19:28 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 21:51 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:28 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 21:51 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 19:28 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | 0.10 | | | mg/L | 0.01 | 0.05 | 12/23/13 21:51 | aeb |
| Boron, total | M200.7 ICP | 1 | 0.10 | | | mg/L | 0.01 | 0.05 | 12/23/13 19:28 | aeb |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 17:58 | las |
| Cadmium, total | M200.8 ICP-MS | 1 | 0.0016 | | | mg/L | 0.0001 | 0.0005 | 12/30/13 20:11 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 55.7 | | | mg/L | 0.2 | 1 | 12/23/13 21:51 | aeb |
| Calcium, total | M200.7 ICP | 1 | 54.5 | | | mg/L | 0.2 | 1 | 12/23/13 19:28 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 21:51 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/26/13 14:29 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/30/13 14:21 | jjc |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:28 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 21:51 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:28 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 21:51 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 19:28 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.02 | 0.05 | 12/23/13 21:51 | aeb |
| Iron, total | M200.7 ICP | 1 | 0.36 | | | mg/L | 0.02 | 0.05 | 12/26/13 14:29 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | 0.0001 | B | | mg/L | 0.0001 | 0.0005 | 12/23/13 17:58 | las |
| Lead, total | M200.8 ICP-MS | 1 | 0.0005 | | | mg/L | 0.0001 | 0.0005 | 12/30/13 20:11 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.02 | 0.1 | 12/23/13 21:51 | aeb |
| Lithium, total | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.02 | 0.1 | 12/23/13 19:28 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 6.7 | | | mg/L | 0.2 | 1 | 12/23/13 21:51 | aeb |
| Magnesium, total | M200.7 ICP | 1 | 6.7 | | | mg/L | 0.2 | 1 | 12/23/13 19:28 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | 0.021 | B | | mg/L | 0.005 | 0.03 | 12/23/13 21:51 | aeb |
| Manganese, total | M200.7 ICP | 1 | 0.032 | | | mg/L | 0.005 | 0.03 | 12/23/13 19:28 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 14:13 | mfm |
| Mercury, total | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 15:28 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 21:51 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 19:28 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 21:51 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:28 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 5.3 | | | mg/L | 0.3 | 2 | 12/23/13 21:51 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW9-E

ACZ Sample ID: **L16072-01**
Date Sampled: 12/16/13 09:10
Date Received: 12/18/13
Sample Matrix: Surface Water

| | | | | | | | | | |
|----------------------|---------------|---|--------|-----|------|---------|--------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | 5.3 | | mg/L | 0.3 | 2 | 12/23/13 19:28 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 21:51 | aeb |
| Scandium, total | M200.7 ICP | 1 | | U * | mg/L | 0.1 | 0.5 | 12/23/13 19:28 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0003 | 12/23/13 17:58 | las |
| Selenium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0003 | 12/30/13 20:11 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 12/23/13 17:58 | las |
| Silver, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.00005 | 0.0003 | 01/04/14 1:42 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 25 | | mg/L | 0.3 | 2 | 12/23/13 21:51 | aeb |
| Sodium, total | M200.7 ICP | 1 | 25.2 | | mg/L | 0.3 | 2 | 12/23/13 19:28 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 0.55 | | mg/L | 0.01 | 0.05 | 12/23/13 21:51 | aeb |
| Strontium, total | M200.7 ICP | 1 | 0.53 | | mg/L | 0.01 | 0.05 | 12/23/13 19:28 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/23/13 17:58 | las |
| Thallium, total | M200.8 ICP-MS | 1 | | U | mg/L | 0.0001 | 0.0005 | 12/30/13 20:11 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 21:51 | aeb |
| Tin, total | M200.7 ICP | 1 | | U | mg/L | 0.1 | 0.5 | 12/23/13 19:28 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | 0.008 | B | mg/L | 0.005 | 0.03 | 12/23/13 21:51 | aeb |
| Titanium, total | M200.7 ICP | 1 | 0.023 | B | mg/L | 0.005 | 0.03 | 12/23/13 19:28 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/23/13 17:58 | las |
| Uranium, total | M200.8 ICP-MS | 1 | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 12/30/13 20:11 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.005 | 0.03 | 12/23/13 21:51 | aeb |
| Vanadium, total | M200.7 ICP | 1 | 0.005 | B | mg/L | 0.005 | 0.03 | 12/23/13 19:28 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/23/13 21:51 | aeb |
| Zinc, total | M200.7 ICP | 1 | | U | mg/L | 0.01 | 0.05 | 12/23/13 19:28 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW9-E

ACZ Sample ID: **L16072-01**
 Date Sampled: 12/16/13 09:10
 Date Received: 12/18/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 69 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Total Alkalinity | | 1 | 69 | | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 0.0 | | | % | | | 01/06/14 11:49 | calc |
| Sum of Anions | | | 4.6 | | | meq/L | 0.1 | 0.5 | 01/06/14 11:49 | calc |
| Sum of Cations | | | 4.6 | | | meq/L | 0.1 | 0.5 | 01/06/14 11:49 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | 10 | B | * | mg/L | 10 | 20 | 12/23/13 11:53 | dcw |
| Chloride | SM4500Cl-E | 1 | 22 | | * | mg/L | 1 | 5 | 12/23/13 16:45 | mpb |
| Conductivity @25C | SM2510B | 1 | 456 | | * | umhos/cm | 1 | 10 | 12/18/13 21:03 | abm |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/23/13 16:40 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/28/13 15:02 | pjb |
| Fluoride | SM4500F-C | 1 | 0.3 | B | * | mg/L | 0.1 | 0.5 | 12/23/13 9:08 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 167 | | | mg/L | 1 | 7 | 01/06/14 11:49 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 1.13 | | * | mg/L | 0.02 | 0.1 | 12/30/13 16:43 | jlf |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/26/13 15:36 | jlf |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.5 | | * | mg/L | 0.1 | 0.5 | 01/02/14 15:33 | tcd |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8.2 | H | * | units | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| pH measured at | | 1 | 23 | | * | C | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.25 | | | mg/L | 0.03 | 0.15 | 01/06/14 11:49 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.08 | | * | mg/L | 0.01 | 0.05 | 12/28/13 0:13 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.08 | H | * | mg/L | 0.01 | 0.05 | 12/18/13 23:11 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.02 | B | * | mg/L | 0.01 | 0.05 | 12/28/13 0:51 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 340 | | * | mg/L | 10 | 20 | 12/20/13 13:23 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/20/13 12:51 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 370 | | * | mg/L | 10 | 20 | 12/18/13 14:48 | abm |
| Sulfate | D516-02 - Turbidimetric | 5 | 124 | | * | mg/L | 5 | 25 | 12/31/13 15:26 | jlf |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 12:25 | abm |
| TDS (calculated) | Calculation | | 281 | | | mg/L | 10 | 50 | 01/06/14 11:49 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.21 | | | | | | 01/06/14 11:49 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW10-E

ACZ Sample ID: **L16072-02**
Date Sampled: 12/16/13 12:00
Date Received: 12/18/13
Sample Matrix: Surface Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|---------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/23/13 12:02 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/26/13 13:01 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/26/13 16:08 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:40 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 18:26 | mpb |
| Total Hot Plate Digestion | M200.2 ICP-MS | | | | | | | | 01/03/14 10:49 | las |
| Total Hot Plate Digestion | M200.2 ICP | | | | | | | | 12/23/13 11:17 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW10-E

ACZ Sample ID: **L16072-02**
Date Sampled: 12/16/13 12:00
Date Received: 12/18/13
Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/23/13 22:00 | aeb |
| Aluminum, total | M200.7 ICP | 1 | | U | * | mg/L | 0.03 | 0.2 | 12/23/13 19:31 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/23/13 18:02 | las |
| Antimony, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/30/13 20:15 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 18:02 | las |
| Arsenic, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/30/13 20:15 | msh |
| Barium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.003 | 0.02 | 12/23/13 22:00 | aeb |
| Barium, total | M200.7 ICP | 1 | | U | | mg/L | 0.003 | 0.02 | 12/23/13 19:31 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:00 | aeb |
| Beryllium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:31 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 22:00 | aeb |
| Bismuth, total | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/23/13 19:31 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:00 | aeb |
| Boron, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:31 | aeb |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 18:02 | las |
| Cadmium, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/30/13 20:15 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.2 | 1 | 12/23/13 22:00 | aeb |
| Calcium, total | M200.7 ICP | 1 | | U | | mg/L | 0.2 | 1 | 12/23/13 19:31 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:00 | aeb |
| Chromium, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/26/13 14:33 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/30/13 14:24 | jjc |
| Cobalt, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:31 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:00 | aeb |
| Copper, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:31 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 22:00 | aeb |
| Gallium, total | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 19:31 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/23/13 22:00 | aeb |
| Iron, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/26/13 14:33 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/23/13 18:02 | las |
| Lead, total | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/30/13 20:15 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 22:00 | aeb |
| Lithium, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 19:31 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.2 | 1 | 12/23/13 22:00 | aeb |
| Magnesium, total | M200.7 ICP | 1 | | U | | mg/L | 0.2 | 1 | 12/23/13 19:31 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/23/13 22:00 | aeb |
| Manganese, total | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/23/13 19:31 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 14:15 | mfm |
| Mercury, total | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/23/13 15:30 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 22:00 | aeb |
| Molybdenum, total | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/23/13 19:31 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 22:00 | aeb |
| Nickel, total | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/23/13 19:31 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.3 | 2 | 12/23/13 22:00 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW10-E

ACZ Sample ID: **L16072-02**
Date Sampled: 12/16/13 12:00
Date Received: 12/18/13
Sample Matrix: Surface Water

| | | | | | | | | | |
|----------------------|---------------|---|---|------|---------|--------|----------------|----------------|-----|
| Potassium, total | M200.7 ICP | 1 | U | mg/L | 0.3 | 2 | 12/23/13 19:31 | aeb | |
| Scandium, dissolved | M200.7 ICP | 1 | U | * | mg/L | 0.1 | 0.5 | 12/23/13 22:00 | aeb |
| Scandium, total | M200.7 ICP | 1 | U | * | mg/L | 0.1 | 0.5 | 12/23/13 19:31 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | U | mg/L | 0.0001 | 0.0003 | 12/23/13 18:02 | las | |
| Selenium, total | M200.8 ICP-MS | 1 | U | mg/L | 0.0001 | 0.0003 | 12/30/13 20:15 | msh | |
| Silver, dissolved | M200.8 ICP-MS | 1 | U | mg/L | 0.00005 | 0.0003 | 12/23/13 18:02 | las | |
| Silver, total | M200.8 ICP-MS | 1 | U | mg/L | 0.00005 | 0.0003 | 01/04/14 1:45 | pmc | |
| Sodium, dissolved | M200.7 ICP | 1 | U | mg/L | 0.3 | 2 | 12/23/13 22:00 | aeb | |
| Sodium, total | M200.7 ICP | 1 | U | mg/L | 0.3 | 2 | 12/23/13 19:31 | aeb | |
| Strontium, dissolved | M200.7 ICP | 1 | U | mg/L | 0.01 | 0.05 | 12/23/13 22:00 | aeb | |
| Strontium, total | M200.7 ICP | 1 | U | mg/L | 0.01 | 0.05 | 12/23/13 19:31 | aeb | |
| Thallium, dissolved | M200.8 ICP-MS | 1 | U | mg/L | 0.0001 | 0.0005 | 12/23/13 18:02 | las | |
| Thallium, total | M200.8 ICP-MS | 1 | U | mg/L | 0.0001 | 0.0005 | 12/30/13 20:15 | msh | |
| Tin, dissolved | M200.7 ICP | 1 | U | mg/L | 0.1 | 0.5 | 12/23/13 22:00 | aeb | |
| Tin, total | M200.7 ICP | 1 | U | mg/L | 0.1 | 0.5 | 12/23/13 19:31 | aeb | |
| Titanium, dissolved | M200.7 ICP | 1 | U | mg/L | 0.005 | 0.03 | 12/23/13 22:00 | aeb | |
| Titanium, total | M200.7 ICP | 1 | U | mg/L | 0.005 | 0.03 | 12/23/13 19:31 | aeb | |
| Uranium, dissolved | M200.8 ICP-MS | 1 | U | mg/L | 0.0001 | 0.0005 | 12/23/13 18:02 | las | |
| Uranium, total | M200.8 ICP-MS | 1 | U | mg/L | 0.0001 | 0.0005 | 12/30/13 20:15 | msh | |
| Vanadium, dissolved | M200.7 ICP | 1 | U | mg/L | 0.005 | 0.03 | 12/23/13 22:00 | aeb | |
| Vanadium, total | M200.7 ICP | 1 | U | mg/L | 0.005 | 0.03 | 12/23/13 19:31 | aeb | |
| Zinc, dissolved | M200.7 ICP | 1 | U | mg/L | 0.01 | 0.05 | 12/23/13 22:00 | aeb | |
| Zinc, total | M200.7 ICP | 1 | U | mg/L | 0.01 | 0.05 | 12/23/13 19:31 | aeb | |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: SW10-E

ACZ Sample ID: **L16072-02**
 Date Sampled: 12/16/13 12:00
 Date Received: 12/18/13
 Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Total Alkalinity | | 1 | | U | * | mg/L | 2 | 20 | 12/18/13 0:00 | abm |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | n/a | | | % | | | 01/06/14 11:49 | calc |
| Sum of Anions | | | N/A | | | meq/L | 0.1 | 0.5 | 01/06/14 11:49 | calc |
| Sum of Cations | | | | U | | meq/L | 0.1 | 0.5 | 01/06/14 11:49 | calc |
| Chemical Oxygen Demand | M410.4 | 1 | | U | * | mg/L | 10 | 20 | 12/23/13 12:03 | dcw |
| Chloride | SM4500Cl-E | 1 | | U | * | mg/L | 1 | 5 | 12/23/13 16:47 | mpb |
| Conductivity @25C | SM2510B | 1 | 1 | B | * | umhos/cm | 1 | 10 | 12/18/13 21:08 | abm |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/23/13 16:41 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/28/13 15:03 | pjb |
| Fluoride | SM4500F-C | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/23/13 9:15 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | | U | | mg/L | 1 | 7 | 01/06/14 11:49 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/31/13 22:28 | jlf |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/26/13 15:37 | jlf |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 01/02/14 15:35 | tcd |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 6.4 | H | * | units | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| pH measured at | | 1 | 23 | | * | C | 0.1 | 0.1 | 12/18/13 0:00 | abm |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.03 | B | | mg/L | 0.03 | 0.15 | 01/06/14 11:49 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.01 | B | * | mg/L | 0.01 | 0.05 | 12/28/13 0:14 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | | UH | * | mg/L | 0.01 | 0.05 | 12/18/13 23:12 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.02 | B | * | mg/L | 0.01 | 0.05 | 12/28/13 0:53 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | | U | * | mg/L | 10 | 20 | 12/20/13 13:26 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/20/13 12:54 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | | U | * | mg/L | 10 | 20 | 12/18/13 14:50 | abm |
| Sulfate | D516-02 - Turbidimetric | 1 | | U | * | mg/L | 1 | 5 | 12/27/13 17:27 | mpb |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 12:29 | abm |
| TDS (calculated) | Calculation | | | U | | mg/L | 10 | 50 | 01/06/14 11:49 | calc |
| TDS (ratio - measured/calculated) | Calculation | | n/a | | | | | | 01/06/14 11:49 | calc |



Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|--------------|--|--------------|--|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LCSWD</i> | Laboratory Control Sample - Water Duplicate |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFB</i> | Laboratory Fortified Blank |
| <i>CCB</i> | Continuing Calibration Blank | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>CCV</i> | Continuing Calibration Verification standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>ICB</i> | Initial Calibration Blank | <i>MS</i> | Matrix Spike |
| <i>ICV</i> | Initial Calibration Verification standard | <i>MSD</i> | Matrix Spike Duplicate |
| <i>ICSAB</i> | Inter-element Correction Standard - A plus B solutions | <i>PBS</i> | Prep Blank - Soil |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>PBW</i> | Prep Blank - Water |
| <i>LCSSD</i> | Laboratory Control Sample - Soil Duplicate | <i>PQV</i> | Practical Quantitation Verification standard |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>SDL</i> | Serial Dilution |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |
| Standard | Verifies the validity of the calibration. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L16072**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-----------------------------|--------------------------------------|--|---|---|
| L16072-01 | WG356884 | Aluminum, total | M200.7 ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG356640 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356848 | Chemical Oxygen Demand | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356894 | Chloride | SM4500CI-E | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356640 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356896 | Cyanide, total | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357015 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356835 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG357046 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356933 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG357192 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG357007 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356666 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. | |
| | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG357008 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |

Tahoe Resources, Inc.

ACZ Project ID: **L16072**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|----------|---------|-------------------------------------|-------------------------|------|---|
| WG356784 | | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| WG356770 | | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356631 | | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| WG357120 | | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | | | D516-02 - Turbidimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356778 | | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356640 | | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L16072**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|-----------------------------|--|------|---|
| L16072-02 | WG356884 | Aluminum, total | M200.7 ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG356640 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356848 | Chemical Oxygen Demand | M410.4 | Q6 | Sample was received above recommended temperature. |
| | | | M410.4 | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356894 | Chloride | SM4500CI-E | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356640 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356896 | Cyanide, total | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357015 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356835 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG357046 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | | | M353.2 - H2SO4 preserved | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356933 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | WG357192 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG357007 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356666 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357008 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L16072**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|-------------------------------------|--------------------------------------|------|---|
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356784 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| | WG356770 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356631 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| | WG357004 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | | | D516-02 - Turbidimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356778 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356640 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW9-EACZ Sample ID: **L16072-01**

Date Sampled: 12/16/13 9:10

Date Received: 12/18/13

Sample Matrix: *Surface Water***Diesel Range Organics (C10-C28)**Analysis Method: **M8015D GC/FID**Extract Method: **M3520****Workgroup:** WG356966

Analyst: jad

Extract Date: 12/19/13 19:09

Analysis Date: 12/26/13 14:39

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 81.6 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW9-EACZ Sample ID: **L16072-01**

Date Sampled: 12/16/13 9:10

Date Received: 12/18/13

Sample Matrix: *Surface Water***Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**

Extract Method:

Workgroup: WG356845

Analyst: wpr

Extract Date:

Analysis Date: 12/23/13 9:02

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|-----|-----|
| Oil and Grease | | | U | 1 | * | mg/L | 2 | 10 |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SW10-E

ACZ Sample ID: **L16072-02**
Date Sampled: 12/16/13 12:00
Date Received: 12/18/13
Sample Matrix: *Surface Water*

Diesel Range Organics (C10-C28)

Analysis Method: **M8015D GC/FID**
Extract Method: **M3520**

Workgroup: WG356966

Analyst: jad
Extract Date: 12/19/13 19:10
Analysis Date: 12/26/13 15:05

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------------|---------|------------|------|----------|----|-------|-----|-----|
| TPH C10 to C28 | | | U | 1 | * | mg/L | 0.1 | 0.5 |
| Surrogate Recoveries | CAS | % Recovery | | Dilution | XQ | Units | LCL | UCL |
| OTP | 84-15-1 | 81.7 | | 1 | * | % | 70 | 130 |

Tahoe Resources, Inc.Project ID: Escobal
Sample ID: SW10-EACZ Sample ID: **L16072-02**
Date Sampled: 12/16/13 12:00
Date Received: 12/18/13
Sample Matrix: *Surface Water***Oil & Grease, Total Recoverable**Analysis Method: **1664A - Gravimetric**
Extract Method:**Workgroup:** WG356845

Analyst: wpr

Extract Date:

Analysis Date: 12/23/13 9:02

| Compound | CAS | Result | QUAL | Dilution | XQ | Units | MDL | PQL |
|----------------|-----|--------|------|----------|----|-------|-----|-----|
| Oil and Grease | | | U | 1 | * | mg/L | 2 | 10 |

Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>LCL</i> | Lower Control Limit |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>UCL</i> | Upper Control Limit |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|-------------|-----------------------------------|---------------|---------------------------------------|
| <i>SURR</i> | Surrogate | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>INTS</i> | Internal Standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>MS/MSD</i> | Matrix Spike/Matrix Spike Duplicate |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>PBS</i> | Prep Blank - Soil |
| <i>LFB</i> | Laboratory Fortified Blank | <i>PBW</i> | Prep Blank - Water |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| O | Analyte concentration is estimated due to result exceeding calibration range. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| J | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/4-90/020. Methods for the Determination of Organic Compounds in Drinking Water (I), July 1990.
- (3) EPA 600/R-92/129. Methods for the Determination of Organic Compounds in Drinking Water (II), July 1990.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Excluding Oil & Grease, solid & biological matrices for organic analyses are reported on a wet weight basis.
- (3) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (4) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L16072**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|------------------|----------|-----------------|---------------------|------|--|
| L16072-01 | WG356966 | *All Compounds* | M8015D GC/FID | Q6 | Sample was received above recommended temperature. |
| | | | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356845 | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | WG356741 | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |
| L16072-02 | WG356966 | *All Compounds* | M8015D GC/FID | Q6 | Sample was received above recommended temperature. |
| | | | M8015D GC/FID | Q9 | Insufficient sample received to meet method QC requirements. |
| | WG356845 | Oil and Grease | 1664A - Gravimetric | Q6 | Sample was received above recommended temperature. |
| | WG356741 | *All Compounds* | M3520 | Q9 | Insufficient sample received to meet method QC requirements. |

Tahoe Resources, Inc.

ACZ Project ID: **L16072**

Metals Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|---------------------|------------|
| Bismuth, dissolved | M200.7 ICP |
| Bismuth, total | M200.7 ICP |
| Gallium, dissolved | M200.7 ICP |
| Gallium, total | M200.7 ICP |
| Scandium, dissolved | M200.7 ICP |
| Scandium, total | M200.7 ICP |

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|--------------|------------|
| Sulfide as S | SM4500S2-D |
|--------------|------------|

Tahoe Resources, Inc.
 Escobal

ACZ Project ID: L16072
 Date Received: 12/18/2013 12:06
 Received By: mtb
 Date Printed: 12/19/2013

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | | | X |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? | | X | |

Samples/Containers

| | YES | NO | NA |
|--|-----|----|----|
| 8) Are all containers intact and with no leaks? | X | | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | X | | |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? | | X | |

Some parameters were received past hold time.

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| 3020 | 9.5 | 13 | N/A |

Was ice present in the shipment container(s)?
 Yes - Gel ice was present in the shipment container(s) but was thawed by receipt at ACZ.
 Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

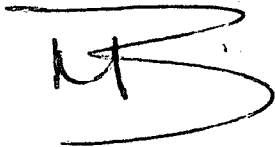
Guatemala December 16th, 2013

To whom it may concern:

Minera San Rafael, S.A is sending a case with samples of water, which is not contaminated, that are going to be analyzed by the ACZ Laboratories in Steamboat Springs, Colorado, USA.

If you have any question or doubt, please contact Miguel Berganza at Minera San Rafael, S.A. (502 - 5951-5248) or Sue Webber at ACZ Laboratories (970-879-6590).

Best regards,

A handwritten signature in black ink, consisting of a stylized 'M' and 'B' connected by a horizontal line.

Miguel Berganza
Environment Department.
Proyecto Escobal, S. A.

REG 016 Resultados de Análisis

Muestra: 5 muestras de agua simple
Análisis solicitado por: Ing. Miguel Berganza
Dirección: Km. 97.5 carretera Mataquesuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa
Procedencia de la muestra: Proyecto Escobal
Fecha de muestreo: 051213
Fecha de ingreso de muestras: 061213
Fecha de análisis: 061213-181213
Fecha de informe: 181213

Resultados:

| Correlativo Ecosistemas | Identificación de la Muestra | Color Aparente (UC HZ equiv. Unid. Pt-Co) | Color Real (UC HZ equiv. Unid. Pt-Co) | Demanda Bioquímica de Oxígeno DBO ₅ mg/L | * Demanda Química de Oxígeno DQO mg/L | Cromo Hexavalente Cr(VI) mg/L | ** Coliformes Fecales (NMP/100ml) |
|-------------------------|------------------------------|---|---------------------------------------|---|---------------------------------------|-------------------------------|-----------------------------------|
| 3167 | SW1-E | 21 | 5 | < 10 | < 25 | N.D. | 430 |
| 3168 | SW2A-E | 5 | < 1 | < 10 | < 25 | N.D. | 1.6 x 10 ⁴ |
| 3169 | SW4A-E | 12 | < 1 | < 10 | < 25 | N.D. | 1.6 x 10 ⁴ |
| 3170 | SW8-E | 83 | 1 | < 10 | < 25 | N.D. | 23 |
| 3171 | SW11-E | 5 | < 1 | < 10 | < 25 | N.D. | 2.2 x 10 ³ |

Notas:

Captación de muestras: Las muestras fueron captadas por personal ajeno a Ecosistemas Proyectos Ambientales.

Transporte y preservación de la muestra: Refrigeración.

Metodología: Espectrofotométricos / SMWW: Standard Methods for water and wastewater APHA. AWWA. 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977.

Fotométricos Merck. NMP: Número Mas Probable.

N.D. No detectable. Debajo del límite de detección.

Límites de detección: Cromo hexavalente (0.05 mg/L)

Los resultados obtenidos corresponden únicamente a las muestras recibidas por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

** Análisis acreditado COGUANOR NGR/COPANT/ISO/IEC 17025 según OGA LE 006-04*

*** Análisis referido.*



Ing. Fernando Fuentes
Gerente Técnico

REG 016 Resultados de Análisis

Muestra: 10 muestras de agua simple
 Análisis solicitado por: Ing. Miguel Berganza
 Dirección: Km. 97.5 carretera Mataquescuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa
 Procedencia de la muestra: Proyecto Escobal
 Fecha de muestreo: 161213
 Fecha de ingreso de muestras: 171213
 Fecha de análisis: 171213-301213
 Fecha de informe: 301213

Resultados:

| Correlativo Ecosistemas | Identificación de la Muestra | Color Aparente (UC HZ equiv. Unid. Pt-Co) | Color Real (UC HZ equiv. Unid. Pt-Co) | Demanda Bioquímica de Oxígeno DBO ₅ mg/L | * Demanda Química de Oxígeno DQO mg/L | Cromo Hexavalente Cr(VI) mg/L | ** Coliformes Fecales (NMP/100ml) |
|-------------------------|------------------------------|---|---------------------------------------|---|---------------------------------------|-------------------------------|-----------------------------------|
| 3304 | DW4 | 95 | < 1 | < 10 | < 25 | N.D | < 2 |
| 3308 | GWE-1 | 20 | < 1 | < 10 | < 25 | N.D | 4.5 |
| 3309 | SW2-E | < 1 | < 1 | < 10 | < 25 | N.D | 5400 |
| 3311 | SW3-E | 44 | 7 | < 10 | < 25 | N.D | 5400 |
| 3312 | SW4-E | 29 | < 1 | < 10 | < 25 | N.D | 2.2 x 10 ⁴ |
| 3313 | SW5-E | 30 | 7 | < 10 | < 25 | N.D | 310 |
| 3314 | SW6-E | 46 | 10 | < 10 | < 25 | N.D | 1.6 x 10 ⁴ |
| 3315 | SW7-E | 68 | 18 | < 10 | < 25 | N.D | 9200 |
| 3316 | SW9-E | 35 | 3 | < 10 | < 25 | N.D | 1500 |
| 3317 | SW10-E | < 1 | < 1 | < 10 | < 25 | N.D | < 2 |

Notas:

Captación de muestras: Las muestras fueron captadas por personal ajeno a Ecosistemas Proyectos Ambientales.

Transporte y preservación de la muestra: Refrigeración.

Metodología: Espectrofotométricos / SMWW: Standard Methods for water and wastewater APHA, AWWA, 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977.

Fotométricos Merck. NMP: Número Mas Probable.

N.D. No detectable. Debajo del límite de detección.

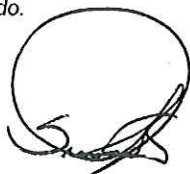
Límites de detección: Cromo hexavalente (0.05 mg/L)

Los resultados obtenidos corresponden únicamente a las muestras recibidas por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

** Análisis acreditado COGUANOR NGR/COPANT/ISO/IEC 17025 según OGA LE 006-04*

*** Análisis referido.*



Ing. Silvia Argueta
Gerente de Calidad

11.5.2 Muestras de Agua Subterránea (GW), pozos de monitoreo y de suministro

December 27, 2013

Report to:

Miguel Berganza

Tahoe Resources, Inc.

Km 8.6 carrtera Antigua a El Salvador

Centro corporativo Muxbal

Torre Oeste.Apto 503y504 Guatemala, GT

Bill to:

Miguel Berganza

Tahoe Resources, Inc.

5310 Kietzke Lane

Suite 200

Reno, NV 89511

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L15974

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 12, 2013. This project has been assigned to ACZ's project number, L15974. Please reference this number in all future inquiries.

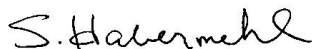
All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L15974. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

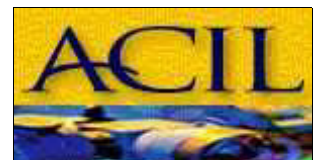
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after January 26, 2014. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed
and approved this report.



Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: GW1A

ACZ Sample ID: **L15974-01**
Date Sampled: 12/10/13 05:30
Date Received: 12/12/13
Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/18/13 9:33 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/17/13 13:57 | bsu |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 12:39 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 17:16 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 15:43 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/19/13 3:34 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/19/13 3:47 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0017 | | | mg/L | 0.0002 | 0.001 | 12/19/13 3:47 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.035 | | | mg/L | 0.003 | 0.02 | 12/19/13 3:34 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:34 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/19/13 3:34 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/20/13 19:22 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:47 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 5.1 | | | mg/L | 0.2 | 1 | 12/19/13 3:34 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:34 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:34 | jjc |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:34 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:34 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/19/13 3:34 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:47 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:34 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 2.1 | | | mg/L | 0.2 | 1 | 12/19/13 3:34 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:34 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 12:15 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:34 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:34 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 4.5 | | | mg/L | 0.3 | 2 | 12/19/13 3:34 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:34 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0003 | 12/19/13 3:47 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 3:47 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 7.8 | | | mg/L | 0.3 | 2 | 12/19/13 3:34 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.05 | | | mg/L | 0.01 | 0.05 | 12/19/13 3:34 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:47 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/19/13 3:34 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:34 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:47 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:34 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:34 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: GW1A

ACZ Sample ID: **L15974-01**
 Date Sampled: 12/10/13 05:30
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 29 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | 29 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 6.3 | | | % | | | 12/27/13 12:32 | calc |
| Sum of Anions | | | 0.784 | | | meq/L | 0.1 | 0.5 | 12/27/13 12:32 | calc |
| Sum of Cations | | | 0.889 | | | meq/L | 0.1 | 0.5 | 12/27/13 12:32 | calc |
| Chloride | SM4500Cl-E | 1 | 4 | B | * | mg/L | 1 | 5 | 12/23/13 13:58 | mpb |
| Conductivity @25C | SM2510B | 1 | 97 | | * | umhos/cm | 1 | 10 | 12/13/13 22:19 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 14:59 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 13:53 | tcd |
| Fluoride | SM4500F-C | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/16/13 16:05 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 21 | | | mg/L | 1 | 7 | 12/27/13 12:32 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 1.66 | | * | mg/L | 0.02 | 0.1 | 12/20/13 0:12 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:22 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 1 | | * | mg/L | 0.1 | 0.5 | 12/19/13 15:15 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.7 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 23 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.09 | B | | mg/L | 0.03 | 0.15 | 12/27/13 12:32 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.03 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 1:03 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.04 | BH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:45 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.13 | | * | mg/L | 0.01 | 0.05 | 12/19/13 21:46 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 180 | | * | mg/L | 10 | 20 | 12/12/13 16:43 | dcw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | 37 | | * | mg/L | 5 | 20 | 12/13/13 10:42 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 240 | | * | mg/L | 10 | 20 | 12/13/13 10:21 | abm |
| Sulfate | D516-02 - Turbidimetric | 1 | 4.4 | B | * | mg/L | 1 | 5 | 12/18/13 17:36 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 14:45 | khw |
| TDS (calculated) | Calculation | | 45 | B | | mg/L | 10 | 50 | 12/27/13 12:32 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 4.00 | | | | | | 12/27/13 12:32 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: GW2

ACZ Sample ID: **L15974-02**
Date Sampled: 12/09/13 08:40
Date Received: 12/12/13
Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/18/13 9:33 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/17/13 14:06 | bsu |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 12:50 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 17:24 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 15:50 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | 0.05 | B | | mg/L | 0.03 | 0.2 | 12/19/13 3:43 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0007 | B | | mg/L | 0.0004 | 0.002 | 12/19/13 3:50 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0089 | | | mg/L | 0.0002 | 0.001 | 12/19/13 3:50 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.143 | | | mg/L | 0.003 | 0.02 | 12/19/13 3:43 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:43 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/19/13 3:43 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/20/13 19:32 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:50 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 20.9 | | | mg/L | 0.2 | 1 | 12/19/13 3:43 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:43 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:43 | jjc |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:43 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:43 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | 0.03 | B | | mg/L | 0.02 | 0.05 | 12/19/13 3:43 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:50 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:43 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 3.4 | | | mg/L | 0.2 | 1 | 12/19/13 3:43 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | 0.032 | | | mg/L | 0.005 | 0.03 | 12/19/13 3:43 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 12:17 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:43 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:43 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 2.3 | | | mg/L | 0.3 | 2 | 12/19/13 3:43 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:43 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0001 | B | | mg/L | 0.0001 | 0.0003 | 12/19/13 3:50 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 3:50 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 9.3 | | | mg/L | 0.3 | 2 | 12/19/13 3:43 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.17 | | | mg/L | 0.01 | 0.05 | 12/19/13 3:43 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:50 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/19/13 3:43 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:43 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:50 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:43 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | 0.17 | | | mg/L | 0.01 | 0.05 | 12/19/13 3:43 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: GW2

ACZ Sample ID: **L15974-02**
 Date Sampled: 12/09/13 08:40
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 55 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | 55 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 0.0 | | | % | | | 12/27/13 12:32 | calc |
| Sum of Anions | | | 1.8 | | | meq/L | 0.1 | 0.5 | 12/27/13 12:32 | calc |
| Sum of Cations | | | 1.8 | | | meq/L | 0.1 | 0.5 | 12/27/13 12:32 | calc |
| Chloride | SM4500Cl-E | 1 | 3 | B | * | mg/L | 1 | 5 | 12/23/13 13:58 | mpb |
| Conductivity @25C | SM2510B | 1 | 185 | | * | umhos/cm | 1 | 10 | 12/13/13 22:27 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:00 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 13:54 | tcd |
| Fluoride | SM4500F-C | 1 | 0.1 | B | * | mg/L | 0.1 | 0.5 | 12/16/13 16:13 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 66 | | | mg/L | 1 | 7 | 12/27/13 12:32 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 0.30 | | * | mg/L | 0.02 | 0.1 | 12/20/13 0:13 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:25 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1.25 | 0.2 | B | * | mg/L | 0.1 | 0.6 | 12/19/13 18:04 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.7 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 23 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.19 | | | mg/L | 0.03 | 0.15 | 12/27/13 12:32 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.06 | | * | mg/L | 0.01 | 0.05 | 12/19/13 1:07 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.06 | H | * | mg/L | 0.01 | 0.05 | 12/12/13 21:50 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.08 | | * | mg/L | 0.01 | 0.05 | 12/19/13 21:47 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 180 | | * | mg/L | 10 | 20 | 12/12/13 16:44 | dcw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 10:45 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 210 | | * | mg/L | 10 | 20 | 12/13/13 10:22 | abm |
| Sulfate | D516-02 - Turbidimetric | 1 | 28.5 | | * | mg/L | 1 | 5 | 12/18/13 17:38 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 14:48 | khw |
| TDS (calculated) | Calculation | | 101 | | | mg/L | 10 | 50 | 12/27/13 12:32 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.78 | | | | | | 12/27/13 12:32 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: GW3

ACZ Sample ID: **L15974-03**

Date Sampled: 12/09/13 12:30

Date Received: 12/12/13

Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/18/13 9:33 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/17/13 14:14 | bsu |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 13:01 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 17:31 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 15:57 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/19/13 3:46 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0005 | B | | mg/L | 0.0004 | 0.002 | 12/19/13 3:53 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0025 | | | mg/L | 0.0002 | 0.001 | 12/19/13 3:53 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.118 | | | mg/L | 0.003 | 0.02 | 12/19/13 3:46 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:46 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/19/13 3:46 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | 0.01 | B | | mg/L | 0.01 | 0.05 | 12/20/13 19:35 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:53 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 58.2 | | | mg/L | 0.2 | 1 | 12/19/13 3:46 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:46 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:46 | jjc |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:46 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:46 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/19/13 3:46 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:53 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:46 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 9.5 | | | mg/L | 0.2 | 1 | 12/19/13 3:46 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | 0.193 | | | mg/L | 0.005 | 0.03 | 12/19/13 3:46 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 12:19 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:46 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:46 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 7 | | | mg/L | 0.3 | 2 | 12/19/13 3:46 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:46 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0003 | 12/19/13 3:53 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 3:53 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 19 | | | mg/L | 0.3 | 2 | 12/19/13 3:46 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.33 | | | mg/L | 0.01 | 0.05 | 12/19/13 3:46 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:53 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/19/13 3:46 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:46 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:53 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:46 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:46 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: GW3

ACZ Sample ID: **L15974-03**
 Date Sampled: 12/09/13 12:30
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 92 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | 92 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 1.1 | | | % | | | 12/27/13 12:33 | calc |
| Sum of Anions | | | 4.6 | | | meq/L | 0.1 | 0.5 | 12/27/13 12:33 | calc |
| Sum of Cations | | | 4.7 | | | meq/L | 0.1 | 0.5 | 12/27/13 12:33 | calc |
| Chloride | SM4500Cl-E | 1 | 7 | | * | mg/L | 1 | 5 | 12/23/13 13:58 | mpb |
| Conductivity @25C | SM2510B | 1 | 478 | | * | umhos/cm | 1 | 10 | 12/13/13 22:36 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:01 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 13:55 | tcd |
| Fluoride | SM4500F-C | 1 | 0.2 | B | * | mg/L | 0.1 | 0.5 | 12/16/13 16:16 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 185 | | | mg/L | 1 | 7 | 12/27/13 12:33 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 2.55 | | * | mg/L | 0.02 | 0.1 | 12/20/13 0:15 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:26 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.2 | B | * | mg/L | 0.1 | 0.5 | 12/19/13 18:05 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.8 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.06 | B | | mg/L | 0.03 | 0.15 | 12/27/13 12:33 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.02 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 1:08 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.03 | BH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:51 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.02 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 21:48 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 390 | | * | mg/L | 10 | 20 | 12/12/13 16:46 | dcw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 10:47 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 410 | | * | mg/L | 10 | 20 | 12/13/13 10:23 | abm |
| Sulfate | D516-02 - Turbidimetric | 5 | 123 | | * | mg/L | 5 | 25 | 12/18/13 17:45 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 14:52 | khw |
| TDS (calculated) | Calculation | | 280 | | | mg/L | 10 | 50 | 12/27/13 12:33 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.39 | | | | | | 12/27/13 12:33 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: GW4

ACZ Sample ID: **L15974-04**
Date Sampled: 12/09/13 11:20
Date Received: 12/12/13
Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/18/13 9:33 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/17/13 14:22 | bsu |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 13:12 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 17:38 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 16:04 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | 0.06 | B | | mg/L | 0.03 | 0.2 | 12/19/13 3:49 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/19/13 3:56 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0004 | B | | mg/L | 0.0002 | 0.001 | 12/19/13 3:56 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.096 | | | mg/L | 0.003 | 0.02 | 12/19/13 3:49 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:49 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/19/13 3:49 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/20/13 19:38 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:56 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 4.2 | | | mg/L | 0.2 | 1 | 12/19/13 3:49 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:49 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:49 | jjc |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:49 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:49 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | 0.27 | | | mg/L | 0.02 | 0.05 | 12/19/13 3:49 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:56 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:49 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 2.7 | | | mg/L | 0.2 | 1 | 12/19/13 3:49 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | 0.105 | | | mg/L | 0.005 | 0.03 | 12/19/13 3:49 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 12:21 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:49 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:49 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 4.7 | | | mg/L | 0.3 | 2 | 12/19/13 3:49 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:49 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0003 | 12/19/13 3:56 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 3:56 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 9.9 | | | mg/L | 0.3 | 2 | 12/19/13 3:49 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.05 | | | mg/L | 0.01 | 0.05 | 12/19/13 3:49 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:56 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/19/13 3:49 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:49 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 3:56 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:49 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:49 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: GW4

ACZ Sample ID: **L15974-04**

Date Sampled: 12/09/13 11:20

Date Received: 12/12/13

Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 39 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | 39 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | -4.8 | | | % | | | 12/27/13 12:33 | calc |
| Sum of Anions | | | 1.1 | | | meq/L | 0.1 | 0.5 | 12/27/13 12:33 | calc |
| Sum of Cations | | | 1.0 | | | meq/L | 0.1 | 0.5 | 12/27/13 12:33 | calc |
| Chloride | SM4500Cl-E | 1 | 3 | B | * | mg/L | 1 | 5 | 12/23/13 13:58 | mpb |
| Conductivity @25C | SM2510B | 1 | 104 | | * | umhos/cm | 1 | 10 | 12/13/13 22:44 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:01 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 13:56 | tcd |
| Fluoride | SM4500F-C | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/16/13 16:24 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 22 | | | mg/L | 1 | 7 | 12/27/13 12:33 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 0.02 | B | * | mg/L | 0.02 | 0.1 | 12/20/13 0:18 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:27 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.7 | | * | mg/L | 0.1 | 0.5 | 12/19/13 18:06 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.3 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | | U | | mg/L | 0.03 | 0.15 | 12/27/13 12:33 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | | U | * | mg/L | 0.01 | 0.05 | 12/19/13 1:09 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.02 | BH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:52 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.07 | | * | mg/L | 0.01 | 0.05 | 12/19/13 21:49 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 570 | | * | mg/L | 10 | 20 | 12/12/13 16:48 | dcw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 10:50 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 590 | | * | mg/L | 10 | 20 | 12/13/13 10:23 | abm |
| Sulfate | D516-02 - Turbidimetric | 1 | 9.0 | | * | mg/L | 1 | 5 | 12/18/13 17:38 | tcd |
| Sulfide as S | SM4500S2-D | 1.5 | | U | * | mg/L | 0.03 | 0.2 | 12/16/13 14:55 | khw |
| TDS (calculated) | Calculation | | 57 | | | mg/L | 10 | 50 | 12/27/13 12:33 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 10.00 | | | | | | 12/27/13 12:33 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: GW5

ACZ Sample ID: **L15974-05**
Date Sampled: 12/09/13 12:00
Date Received: 12/12/13
Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/18/13 9:33 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/17/13 14:31 | bsu |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 13:23 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 17:45 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 16:12 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | 3.53 | | | mg/L | 0.03 | 0.2 | 12/19/13 3:52 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/19/13 4:06 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0006 | B | | mg/L | 0.0002 | 0.001 | 12/19/13 4:06 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.127 | | | mg/L | 0.003 | 0.02 | 12/19/13 3:52 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:52 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/19/13 3:52 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/20/13 19:41 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:06 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 4.3 | | | mg/L | 0.2 | 1 | 12/19/13 3:52 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:52 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:52 | jjc |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:52 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:52 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | 1.30 | | * | mg/L | 0.02 | 0.05 | 12/19/13 3:52 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | 0.0022 | | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:06 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:52 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 2.6 | | | mg/L | 0.2 | 1 | 12/19/13 3:52 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | 0.015 | B | * | mg/L | 0.005 | 0.03 | 12/19/13 3:52 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 12:23 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:52 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:52 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 5.9 | | | mg/L | 0.3 | 2 | 12/19/13 3:52 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:52 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0003 | 12/19/13 4:06 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 4:06 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 10.5 | | | mg/L | 0.3 | 2 | 12/19/13 3:52 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.01 | 0.05 | 12/19/13 3:52 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:06 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/19/13 3:52 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | 0.079 | | | mg/L | 0.005 | 0.03 | 12/19/13 3:52 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0007 | | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:06 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | 0.006 | B | | mg/L | 0.005 | 0.03 | 12/19/13 3:52 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | 0.03 | B | | mg/L | 0.01 | 0.05 | 12/19/13 3:52 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: GW5

ACZ Sample ID: **L15974-05**
 Date Sampled: 12/09/13 12:00
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 38 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | 38 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 3.4 | | | % | | | 12/27/13 12:33 | calc |
| Sum of Anions | | | 1.4 | | | meq/L | 0.1 | 0.5 | 12/27/13 12:33 | calc |
| Sum of Cations | | | 1.5 | | | meq/L | 0.1 | 0.5 | 12/27/13 12:33 | calc |
| Chloride | SM4500Cl-E | 1 | 6 | | * | mg/L | 1 | 5 | 12/23/13 13:58 | mpb |
| Conductivity @25C | SM2510B | 1 | 106 | | * | umhos/cm | 1 | 10 | 12/13/13 22:52 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:02 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 13:57 | tcd |
| Fluoride | SM4500F-C | 1 | 0.1 | B | * | mg/L | 0.1 | 0.5 | 12/16/13 16:30 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 21 | | | mg/L | 1 | 7 | 12/27/13 12:33 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 0.23 | | * | mg/L | 0.02 | 0.1 | 12/20/13 0:19 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:28 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.6 | | * | mg/L | 0.1 | 0.5 | 12/19/13 18:07 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.4 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.12 | B | | mg/L | 0.03 | 0.15 | 12/27/13 12:33 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.04 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 1:10 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.02 | BH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:53 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.05 | | * | mg/L | 0.01 | 0.05 | 12/19/13 21:53 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 410 | | * | mg/L | 10 | 20 | 12/12/13 16:49 | dcw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 10:53 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 440 | | * | mg/L | 10 | 20 | 12/13/13 10:24 | abm |
| Sulfate | D516-02 - Turbidimetric | 1 | 22.0 | | * | mg/L | 1 | 5 | 12/18/13 17:38 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 15:05 | khw |
| TDS (calculated) | Calculation | | 79 | | | mg/L | 10 | 50 | 12/27/13 12:33 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 5.19 | | | | | | 12/27/13 12:33 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: GW10

ACZ Sample ID: **L15974-06**
Date Sampled: 12/09/13 12:00
Date Received: 12/12/13
Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/18/13 9:34 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:32 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 13:34 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 17:52 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 16:19 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/19/13 3:55 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/19/13 4:09 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/19/13 4:09 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.003 | 0.02 | 12/19/13 3:55 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:55 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/19/13 3:55 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/20/13 19:45 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:09 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.2 | 1 | 12/19/13 3:55 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:55 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:55 | jjc |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:55 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:55 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.02 | 0.05 | 12/19/13 3:55 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:09 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:55 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.2 | 1 | 12/19/13 3:55 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.005 | 0.03 | 12/19/13 3:55 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 12:25 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:55 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:55 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.3 | 2 | 12/19/13 3:55 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:55 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0003 | 12/19/13 4:09 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 4:09 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.3 | 2 | 12/19/13 3:55 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:55 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:09 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/19/13 3:55 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:55 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:09 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:55 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:55 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: GW10

ACZ Sample ID: **L15974-06**
 Date Sampled: 12/09/13 12:00
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | n/a | | | % | | | 12/27/13 12:34 | calc |
| Sum of Anions | | | N/A | | | meq/L | 0.1 | 0.5 | 12/27/13 12:34 | calc |
| Sum of Cations | | | | U | | meq/L | 0.1 | 0.5 | 12/27/13 12:34 | calc |
| Chloride | SM4500Cl-E | 1 | | U | * | mg/L | 1 | 5 | 12/23/13 13:58 | mpb |
| Conductivity @25C | SM2510B | 1 | 1 | B | * | umhos/cm | 1 | 10 | 12/13/13 22:57 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:05 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:45 | tcd |
| Fluoride | SM4500F-C | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/16/13 16:38 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | | U | | mg/L | 1 | 7 | 12/27/13 12:34 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 0:21 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:29 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 18:08 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 6.2 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | | U | | mg/L | 0.03 | 0.15 | 12/27/13 12:34 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | | U | * | mg/L | 0.01 | 0.05 | 12/19/13 1:11 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | | UH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:54 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | | U | * | mg/L | 0.01 | 0.05 | 12/19/13 21:54 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | | U | * | mg/L | 10 | 20 | 12/12/13 16:50 | dcw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 10:55 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | | U | * | mg/L | 10 | 20 | 12/13/13 10:25 | abm |
| Sulfate | D516-02 - Turbidimetric | 1 | | U | * | mg/L | 1 | 5 | 12/18/13 17:38 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 15:08 | khw |
| TDS (calculated) | Calculation | | | U | | mg/L | 10 | 50 | 12/27/13 12:34 | calc |
| TDS (ratio - measured/calculated) | Calculation | | n/a | | | | | | 12/27/13 12:34 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: GW11

ACZ Sample ID: **L15974-07**

Date Sampled: 12/09/13 13:00

Date Received: 12/12/13

Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/19/13 10:00 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:33 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 13:56 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 18:00 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 16:26 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/19/13 3:59 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0005 | B | | mg/L | 0.0004 | 0.002 | 12/19/13 4:19 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0025 | | | mg/L | 0.0002 | 0.001 | 12/19/13 4:19 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.122 | | | mg/L | 0.003 | 0.02 | 12/19/13 3:59 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:59 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/19/13 3:59 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | 0.01 | B | | mg/L | 0.01 | 0.05 | 12/20/13 19:54 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:19 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 59.3 | | | mg/L | 0.2 | 1 | 12/19/13 3:59 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:59 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:59 | jjc |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:59 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:59 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.02 | 0.05 | 12/19/13 3:59 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:19 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:59 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 9.6 | | | mg/L | 0.2 | 1 | 12/19/13 3:59 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | 0.197 | | * | mg/L | 0.005 | 0.03 | 12/19/13 3:59 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 12:32 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:59 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:59 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 7.1 | | | mg/L | 0.3 | 2 | 12/19/13 3:59 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:59 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0003 | 12/19/13 4:19 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 4:19 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 19.3 | | | mg/L | 0.3 | 2 | 12/19/13 3:59 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.33 | | | mg/L | 0.01 | 0.05 | 12/19/13 3:59 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:19 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/19/13 3:59 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:59 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:19 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:59 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | 0.01 | B | | mg/L | 0.01 | 0.05 | 12/19/13 3:59 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: GW11

ACZ Sample ID: **L15974-07**
 Date Sampled: 12/09/13 13:00
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 90 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | 90 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 2.1 | | | % | | | 12/27/13 12:34 | calc |
| Sum of Anions | | | 4.6 | | | meq/L | 0.1 | 0.5 | 12/27/13 12:34 | calc |
| Sum of Cations | | | 4.8 | | | meq/L | 0.1 | 0.5 | 12/27/13 12:34 | calc |
| Chloride | SM4500Cl-E | 1 | 7 | | * | mg/L | 1 | 5 | 12/23/13 13:58 | mpb |
| Conductivity @25C | SM2510B | 1 | 479 | | * | umhos/cm | 1 | 10 | 12/13/13 23:06 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 16:07 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:47 | tcd |
| Fluoride | SM4500F-C | 1 | 0.2 | B | * | mg/L | 0.1 | 0.5 | 12/16/13 16:43 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 188 | | | mg/L | 1 | 7 | 12/27/13 12:34 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 2.53 | | * | mg/L | 0.02 | 0.1 | 12/20/13 0:22 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:31 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 19:19 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.8 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.06 | B | | mg/L | 0.03 | 0.15 | 12/27/13 12:34 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.02 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 1:12 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.03 | BH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:55 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.02 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 21:55 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 380 | | * | mg/L | 10 | 20 | 12/12/13 16:52 | dcw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 10:58 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 400 | | * | mg/L | 10 | 20 | 12/13/13 10:26 | abm |
| Sulfate | D516-02 - Turbidimetric | 5 | 125 | | * | mg/L | 5 | 25 | 12/18/13 17:45 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 15:11 | khw |
| TDS (calculated) | Calculation | | 282 | | | mg/L | 10 | 50 | 12/27/13 12:34 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.35 | | | | | | 12/27/13 12:34 | calc |



Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|--------------|--|--------------|--|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LCSWD</i> | Laboratory Control Sample - Water Duplicate |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFB</i> | Laboratory Fortified Blank |
| <i>CCB</i> | Continuing Calibration Blank | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>CCV</i> | Continuing Calibration Verification standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>ICB</i> | Initial Calibration Blank | <i>MS</i> | Matrix Spike |
| <i>ICV</i> | Initial Calibration Verification standard | <i>MSD</i> | Matrix Spike Duplicate |
| <i>ICSAB</i> | Inter-element Correction Standard - A plus B solutions | <i>PBS</i> | Prep Blank - Soil |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>PBW</i> | Prep Blank - Water |
| <i>LCSSD</i> | Laboratory Control Sample - Soil Duplicate | <i>PQV</i> | Practical Quantitation Verification standard |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>SDL</i> | Serial Dilution |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |
| Standard | Verifies the validity of the calibration. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L15974**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------------------------|--|---------------------|---|---|
| L15974-01 | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| WG356866 | | Chloride | SM4500CI-E | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. | |
| WG356718 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. | |
| WG356708 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. | |
| WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. | |
| | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. | |
| WG356752 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. | |
| WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. | |
| | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. | |
| | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356411 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| WG356670 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. | |
| | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356377 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |
| WG356392 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. | |
| | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356403 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. | |
| WG356657 | Sulfate | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. | |
| WG356484 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. | |
| | | SM4500S2-D | QD | Reported value is the background-corrected concentration, as described by the method. | |
| | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data | |

Tahoe Resources, Inc.

ACZ Project ID: **L15974**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|---------------------|------|---|
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | validation because the sample concentration is too low for accurate evaluation (< 10x MDL). Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15974**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------------------------|--|---------------------|---|---|
| L15974-02 | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| WG356866 | | Chloride | SM4500CI-E | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. | |
| WG356718 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. | |
| WG356708 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. | |
| WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. | |
| | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. | |
| WG356752 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. | |
| WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. | |
| | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. | |
| | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356411 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| WG356670 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. | |
| | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356377 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |
| WG356392 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. | |
| | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356403 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. | |
| WG356657 | Sulfate | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. | |
| WG356484 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. | |
| | | SM4500S2-D | QD | Reported value is the background-corrected concentration, as described by the method. | |
| | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data | |

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| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|---------------------|------|---|
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | validation because the sample concentration is too low for accurate evaluation (< 10x MDL). Sample was received above recommended temperature. |

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ACZ Project ID: **L15974**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------------------------|--|---------------------|---|---|
| L15974-03 | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| WG356866 | | Chloride | SM4500CI-E | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. | |
| WG356718 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. | |
| WG356708 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. | |
| WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. | |
| | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. | |
| WG356752 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. | |
| WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. | |
| | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. | |
| | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356411 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| WG356670 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. | |
| | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356377 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |
| WG356392 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. | |
| | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356403 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. | |
| WG356657 | Sulfate | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. | |
| WG356484 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. | |
| | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |

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| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|---------------------|------|--|
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

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ACZ Project ID: **L15974**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------------------------|--|---------------------|---|---|
| L15974-04 | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| WG356866 | | Chloride | SM4500CI-E | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. | |
| WG356718 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. | |
| WG356708 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. | |
| WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. | |
| | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. | |
| WG356752 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. | |
| WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. | |
| | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. | |
| | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356411 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| WG356670 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. | |
| | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356377 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |
| WG356392 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. | |
| | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356403 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. | |
| WG356657 | Sulfate | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. | |
| WG356484 | Sulfide as S | SM4500S2-D | D1 | Sample required dilution due to matrix. | |
| | | SM4500S2-D | Q6 | Sample was received above recommended temperature. | |
| | | SM4500S2-D | QD | Reported value is the background-corrected concentration, as described by the method. | |

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| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|---------------------|------|---|
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

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| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|-------------------------------------|--|------|---|
| L15974-05 | WG356622 | Iron, dissolved | M200.7 ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Manganese, dissolved | M200.7 ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356866 | Chloride | SM4500CI-E | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356718 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | WG356708 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356752 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG356670 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356377 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| | WG356392 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for |

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| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|----------|---------|----------------------------|-------------------------|------|---|
| | | | | | accurate evaluation (< 10x MDL). |
| WG356403 | | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| WG356657 | | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| WG356484 | | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | QD | Reported value is the background-corrected concentration, as described by the method. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

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ACZ Project ID: **L15974**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|---------------------------------|--|------|---|
| L15974-06 | WG356622 | Iron, dissolved | M200.7 ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Manganese, dissolved | M200.7 ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356866 | Chloride | SM4500CI-E | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356718 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | WG356722 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356752 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG356670 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356377 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15974**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|-------------------------------------|--------------------------|----------|---|
| | WG356392 | Residue, Non-Filterable (TSS) @105C | SM2540D SM2540D | Q6 RA | Sample was received above recommended temperature. Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356403 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| | WG356657 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | WG356484 | Sulfide as S | SM4500S2-D SM4500S2-D | Q6 RA | Sample was received above recommended temperature. Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15974**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|---------------------------------|--|------|---|
| L15974-07 | WG356622 | Iron, dissolved | M200.7 ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Manganese, dissolved | M200.7 ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356866 | Chloride | SM4500CI-E | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356726 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356722 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356752 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG356670 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356377 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15974**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|-------------------------------------|-------------------------|------|---|
| | WG356392 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356403 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| | WG356657 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | WG356484 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15974**

Metals Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|---------------------|------------|
| Bismuth, dissolved | M200.7 ICP |
| Gallium, dissolved | M200.7 ICP |
| Scandium, dissolved | M200.7 ICP |

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|--------------|------------|
| Sulfide as S | SM4500S2-D |
|--------------|------------|

Tahoe Resources, Inc.
 Escobal

ACZ Project ID: L15974
 Date Received: 12/12/2013 09:29
 Received By: mtb
 Date Printed: 12/12/2013

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | | | X |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? | | X | |

Samples/Containers

| | YES | NO | NA |
|--|-----|----|----|
| 8) Are all containers intact and with no leaks? | X | | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | X | | |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? | | X | |

Some parameters were received past hold time.

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| 3687 | 8.9 | 13 | N/A |

Was ice present in the shipment container(s)?
 Yes - Gel ice was present in the shipment container(s) but was thawed by receipt at ACZ.
 Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.



Laboratories, Inc.

L15974

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Miguel Berganza
Company: Tahoe Resources Inc
E-mail: mberganza@sanrafael.com.gt

Address: Boulevard los Proceres, 13 calle 24-692.10
Zona Empresarial, zona Prodera, Torre IV of 1406
Telephone: (502) 5951 5248

Copy of Report to:

Name: Charlie Muernhoff
Company: Tahoe Resources Inc.

E-mail: cmuernhoff@tahoeresourcesinc.com
Telephone:

Invoice to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: mberganza@sanrafael.com.gt

Address: Boulevard los Proceres, 13 calle 24-692.10
Zona Empresarial, zona Prodera, Torre IV of 1406
Telephone: (502) 5951 5248

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring? Yes No

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: Fernando Barios Sampler's site information State: Zip code Time Zone

Check box if observe Daylight Savings Time

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: Water Quality
PO#: Escobal
Reporting state for compliance testing:
Check box if samples include NRC licensed material?

Table with columns for # of Containers, Matrix, and analysis results. Includes handwritten 'GW' and checkmarks.

Table with columns for SAMPLE IDENTIFICATION, DATE:TIME, and Matrix. Includes handwritten entries for GW1A through GW11.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

EMARKS

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns for RELINQUISHED BY, DATE:TIME, RECEIVED BY, and DATE:TIME. Includes handwritten signatures and dates.



L15974 Chain of Custody

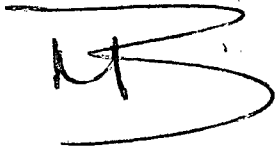
Guatemala December 10th, 2013

To whom it may concern:

Minera San Rafael, S.A is sending a case with samples of water, which is not contaminated, that are going to be analyzed by the ACZ Laboratories in Steamboat Springs, Colorado, USA.

If you have any question or doubt, please contact Miguel Berganza at Minera San Rafael, S.A. (502 - 5951-5248) ofr Sue Webber at ACZ Laboratories (970-879-6590).

Best regards,

A handwritten signature in black ink, consisting of a stylized 'M' and 'B' with a horizontal line above the 'M' and a large loop at the end of the 'B'.

Miguel Berganza
Environment Department.
Proyecto Escobal, S. A.

REG 016 Resultados de Análisis

Muestras: 12 muestras de agua
 Análisis solicitado por: Ing. Miguel Berganza
 Dirección: Km. 97.5 carretera Mataquesuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa
 Procedencia de la muestra: Proyecto Escobal
 Fecha de muestreo: 101213
 Fecha de ingreso de muestras: 111213
 Fecha de análisis: 111213-181213
 Fecha de informe: 181213

Resultados:

| Correlativo Ecosistemas | Identificación de la Muestra | Color Aparente (UC HZ equiv. Unid. Pt-Co) | Color Real (UC HZ equiv. Unid. Pt-Co) | Cromo Hexavalente Cr(VI) mg/L | * Coliformes Fecales (NMP/100ml) |
|-------------------------|------------------------------|---|---------------------------------------|-------------------------------|----------------------------------|
| 3221 | MW2 | 19 | < 1 | N.D. | 6.8 |
| 3222 | MW3 | < 1 | < 1 | N.D. | 4.5 |
| 3223 | MW4 | < 1 | < 1 | N.D. | 240 |
| 3224 | MW5 | < 1 | < 1 | N.D. | 23 |
| 3225 | MW6 | < 1 | < 1 | N.D. | 4.5 |
| 3226 | MW7 | 5 | < 1 | N.D. | 1.6 x 10 ⁴ |
| 3227 | MW8 | < 1 | < 1 | N.D. | 4.5 |
| 3228 | MW9 | 325 | 89 | N.D. | < 2 |
| 3229 | MW20 | < 1 | < 1 | N.D. | < 2 |
| 3230 | MW21 | 246 | 107 | N.D. | 4.5 |
| 3231 | GW1A | 410 | 67 | N.D. | 1.7 x 10 ³ |
| 3232 | PSA-1 | 485 | < 1 | N.D. | < 2 |

Notas:

Captación de muestras: Las muestras fueron captadas por personal ajeno a Ecosistemas.

Transporte y preservación de la muestra: Refrigeración.

Metodología: Espectrofotométricos / SMWW: Standard Methods for water and wastewater APHA, AWWA, 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977.

Fotométricos Merck. NMP: Número Mas Probable.

N.D. No detectable. Debajo del límite de detección.

Límites de detección: Cromo hexavalente (0.05 mg/L)

Los resultados obtenidos corresponden únicamente a las muestras recibidas por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

** Análisis referidos.*



Ing. Fernando Fuentes
Gerente Técnico

REG 016 Resultados de Análisis

Muestras: 8 muestras de agua
 Análisis solicitado por: Ing. Miguel Berganza
 Dirección: Km. 97.5 carretera Mataquescuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa
 Procedencia de la muestra: Proyecto Escobal
 Fecha de muestreo: 091213
 Fecha de ingreso de muestras: 101213
 Fecha de análisis: 101213-181213
 Fecha de informe: 181213

Resultados:

| Correlativo Ecosistemas | Identificación de la Muestra | Color Aparente (UC HZ equiv. Unid. Pt-Co) | Color Real (UC HZ equiv. Unid. Pt-Co) | Cromo Hexavalente Cr(VI) mg/L | * Coliformes Fecales (NMP/100ml) |
|-------------------------|------------------------------|---|---------------------------------------|-------------------------------|----------------------------------|
| 3209 | GW2 | 137 | 7 | N.D. | 94 |
| 3210 | GW3 | < 1 | < 1 | N.D. | < 2 |
| 3211 | GW4 | 1202 | 729 | N.D. | 94 |
| 3212 | GW5 | 776 | 438 | N.D. | 23 |
| 3216 | GW10 | < 1 | < 1 | N.D. | < 2 |
| 3217 | GW11 | < 1 | < 1 | N.D. | < 2 |
| 3218 | PSASR | < 1 | < 1 | N.D. | < 2 |
| 3219 | HW1 | < 1 | < 1 | N.D. | < 2 |

Notas:

Captación de muestras: Las muestras fueron captadas por personal ajeno a Ecosistemas

Transporte y preservación de la muestra: Refrigeración.

Metodología: Espectrofotométricos / SMWW: Standard Methods for water and wastewater APHA, AWWA, 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977.

Se trabajaron diluciones.

Fotométricos Merck. NMP: Número Mas Probable.

N.D. No detectable. Debajo del límite de detección.

Límites de detección: Cromo hexavalente (0.05 mg/L)

Los resultados obtenidos corresponden únicamente a las muestras recibidas por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

* Análisis referidos.



Ing. Fernando Fuentes
Gerente Técnico

January 03, 2014

Report to:

Miguel Berganza

Tahoe Resources, Inc.

Km 8.6 carrtera Antigua a El Salvador

Centro corporativo Muxbal

Torre Oeste.Apto 503y504 Guatemala, GT

Bill to:

Miguel Berganza

Tahoe Resources, Inc.

5310 Kietzke Lane

Suite 200

Reno, NV 89511

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L15975

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 12, 2013. This project has been assigned to ACZ's project number, L15975. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L15975. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

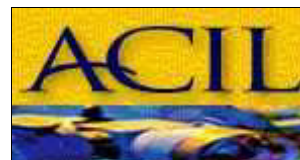
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after February 02, 2014. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and approved this report.



Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: MW2

ACZ Sample ID: **L15975-01**

Date Sampled: 12/10/13 11:40

Date Received: 12/12/13

Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/19/13 10:00 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:33 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 14:18 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 17:09 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 16:33 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/18/13 0:00 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/19/13 4:22 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0011 | | | mg/L | 0.0002 | 0.001 | 12/19/13 4:22 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.031 | | | mg/L | 0.003 | 0.02 | 12/18/13 0:00 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:00 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 0:00 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:00 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:22 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 6.8 | | | mg/L | 0.2 | 1 | 12/18/13 0:00 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:00 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 12:40 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:00 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:00 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | 0.05 | | | mg/L | 0.02 | 0.05 | 12/18/13 0:00 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:22 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:00 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 2.4 | | | mg/L | 0.2 | 1 | 12/18/13 0:00 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | 0.115 | | | mg/L | 0.005 | 0.03 | 12/18/13 0:00 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/18/13 13:36 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:00 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:00 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 2.7 | | | mg/L | 0.3 | 2 | 12/18/13 0:00 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:00 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0003 | 12/19/13 4:22 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 4:22 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 14.7 | | | mg/L | 0.3 | 2 | 12/18/13 0:00 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.05 | | | mg/L | 0.01 | 0.05 | 12/18/13 0:00 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:22 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/18/13 0:00 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:00 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:22 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | 0.008 | B | | mg/L | 0.005 | 0.03 | 12/18/13 0:00 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:00 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: MW2

ACZ Sample ID: **L15975-01**
 Date Sampled: 12/10/13 11:40
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 43 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | 43 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 8.3 | | | % | | | 01/03/14 14:01 | calc |
| Sum of Anions | | | 1.1 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:01 | calc |
| Sum of Cations | | | 1.3 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:01 | calc |
| Chloride | SM4500Cl-E | 1 | 4 | B | * | mg/L | 1 | 5 | 12/23/13 14:00 | mpb |
| Conductivity @25C | SM2510B | 1 | 131 | | * | umhos/cm | 1 | 10 | 12/13/13 23:45 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 16:09 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:49 | tcd |
| Fluoride | SM4500F-C | 1 | 0.4 | B | * | mg/L | 0.1 | 0.5 | 12/16/13 16:59 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 27 | | | mg/L | 1 | 7 | 01/03/14 14:01 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 2.91 | | * | mg/L | 0.02 | 0.1 | 12/20/13 22:33 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | 0.09 | B | * | mg/L | 0.05 | 0.5 | 12/20/13 16:34 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.2 | B | * | mg/L | 0.1 | 0.5 | 12/19/13 18:13 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.7 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.19 | | | mg/L | 0.03 | 0.15 | 01/03/14 14:01 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.06 | | * | mg/L | 0.01 | 0.05 | 12/27/13 23:49 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.06 | H | * | mg/L | 0.01 | 0.05 | 12/12/13 21:56 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.08 | | * | mg/L | 0.01 | 0.05 | 12/19/13 21:56 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 180 | | * | mg/L | 10 | 20 | 12/13/13 12:46 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | 74 | | * | mg/L | 5 | 20 | 12/13/13 15:50 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 250 | | * | mg/L | 10 | 20 | 12/13/13 10:27 | abm |
| Sulfate | D516-02 - Turbidimetric | 1 | 5.1 | | * | mg/L | 1 | 5 | 12/18/13 17:38 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 15:25 | khw |
| TDS (calculated) | Calculation | | 62 | | | mg/L | 10 | 50 | 01/03/14 14:01 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 2.90 | | | | | | 01/03/14 14:01 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: MW3

ACZ Sample ID: **L15975-02**
Date Sampled: 12/10/13 10:45
Date Received: 12/12/13
Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/19/13 10:01 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:33 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 14:29 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 17:19 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 16:40 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/18/13 0:09 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/19/13 4:25 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0026 | | | mg/L | 0.0002 | 0.001 | 12/19/13 4:25 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.031 | | | mg/L | 0.003 | 0.02 | 12/18/13 0:09 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:09 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 0:09 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | 0.05 | | | mg/L | 0.01 | 0.05 | 12/18/13 0:09 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:25 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 66 | | | mg/L | 0.2 | 1 | 12/18/13 0:09 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:09 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 12:50 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:09 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:09 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/18/13 0:09 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:25 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:09 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 8.2 | | | mg/L | 0.2 | 1 | 12/18/13 0:09 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:09 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/18/13 13:38 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:09 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:09 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 3.8 | | | mg/L | 0.3 | 2 | 12/18/13 0:09 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:09 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0003 | | | mg/L | 0.0001 | 0.0003 | 12/19/13 4:25 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 4:25 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 26.1 | | | mg/L | 0.3 | 2 | 12/18/13 0:09 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.64 | | | mg/L | 0.01 | 0.05 | 12/18/13 0:09 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:25 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/18/13 0:09 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:09 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0001 | B | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:25 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | 0.007 | B | | mg/L | 0.005 | 0.03 | 12/18/13 0:09 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | 0.03 | B | | mg/L | 0.01 | 0.05 | 12/18/13 0:09 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: MW3

ACZ Sample ID: **L15975-02**
 Date Sampled: 12/10/13 10:45
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 78 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | 78 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 3.0 | | | % | | | 01/03/14 14:01 | calc |
| Sum of Anions | | | 4.9 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:01 | calc |
| Sum of Cations | | | 5.2 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:01 | calc |
| Chloride | SM4500Cl-E | 1 | 15 | | * | mg/L | 1 | 5 | 12/23/13 14:00 | mpb |
| Conductivity @25C | SM2510B | 1 | 518 | | * | umhos/cm | 1 | 10 | 12/13/13 23:53 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 16:10 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:50 | tcd |
| Fluoride | SM4500F-C | 1 | 0.7 | | * | mg/L | 0.1 | 0.5 | 12/16/13 17:02 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 199 | | | mg/L | 1 | 7 | 01/03/14 14:01 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 2.58 | | * | mg/L | 0.02 | 0.1 | 12/20/13 22:34 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:38 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 18:14 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.7 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.25 | | | mg/L | 0.03 | 0.15 | 01/03/14 14:01 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.08 | | * | mg/L | 0.01 | 0.05 | 12/27/13 23:51 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.10 | H | * | mg/L | 0.01 | 0.05 | 12/17/13 21:33 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.08 | | * | mg/L | 0.01 | 0.05 | 12/19/13 21:57 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 400 | | * | mg/L | 10 | 20 | 12/13/13 12:48 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 15:53 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 440 | | * | mg/L | 10 | 20 | 12/13/13 10:28 | abm |
| Sulfate | D516-02 - Turbidimetric | 5 | 138 | | * | mg/L | 5 | 25 | 12/18/13 17:45 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 15:28 | khw |
| TDS (calculated) | Calculation | | 305 | | | mg/L | 10 | 50 | 01/03/14 14:01 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.31 | | | | | | 01/03/14 14:01 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: MW4

ACZ Sample ID: **L15975-03**

Date Sampled: 12/10/13 12:50

Date Received: 12/12/13

Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/19/13 10:01 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:34 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 14:41 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 17:28 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 16:55 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/18/13 0:12 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/19/13 4:29 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0023 | | | mg/L | 0.0002 | 0.001 | 12/19/13 4:29 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.037 | | | mg/L | 0.003 | 0.02 | 12/18/13 0:12 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:12 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 0:12 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | 0.07 | | | mg/L | 0.01 | 0.05 | 12/18/13 0:12 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:29 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 92.4 | | | mg/L | 0.2 | 1 | 12/18/13 0:12 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:12 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 12:53 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:12 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:12 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/18/13 0:12 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:29 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:12 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 10.1 | | | mg/L | 0.2 | 1 | 12/18/13 0:12 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:12 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/18/13 13:40 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:12 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:12 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 4.5 | | | mg/L | 0.3 | 2 | 12/18/13 0:12 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:12 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0003 | | | mg/L | 0.0001 | 0.0003 | 12/19/13 4:29 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 4:29 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 30.1 | | | mg/L | 0.3 | 2 | 12/18/13 0:12 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.87 | | | mg/L | 0.01 | 0.05 | 12/18/13 0:12 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:29 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/18/13 0:12 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:12 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:29 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | 0.005 | B | | mg/L | 0.005 | 0.03 | 12/18/13 0:12 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | 0.01 | B | | mg/L | 0.01 | 0.05 | 12/18/13 0:12 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: MW4

ACZ Sample ID: **L15975-03**
 Date Sampled: 12/10/13 12:50
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 87 | | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Total Alkalinity | | 1 | 87 | | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 4.5 | | | % | | | 01/03/14 14:02 | calc |
| Sum of Anions | | | 6.3 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:02 | calc |
| Sum of Cations | | | 6.9 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:02 | calc |
| Chloride | SM4500Cl-E | 1 | 20 | | * | mg/L | 1 | 5 | 12/23/13 14:00 | mpb |
| Conductivity @25C | SM2510B | 1 | 665 | | * | umhos/cm | 1 | 10 | 12/14/13 0:01 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 16:11 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:52 | tcd |
| Fluoride | SM4500F-C | 1 | 0.9 | | * | mg/L | 0.1 | 0.5 | 12/17/13 12:38 | khw |
| Hardness as CaCO3 | SM2340B - Calculation | | 273 | | | mg/L | 1 | 7 | 01/03/14 14:02 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 2.47 | | * | mg/L | 0.02 | 0.1 | 12/20/13 22:35 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:39 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 18:55 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.8 | H | * | units | 0.1 | 0.1 | 12/14/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/14/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.22 | | | mg/L | 0.03 | 0.15 | 01/03/14 14:02 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.07 | | * | mg/L | 0.01 | 0.05 | 12/27/13 23:53 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.08 | H | * | mg/L | 0.01 | 0.05 | 12/17/13 21:36 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.06 | | * | mg/L | 0.01 | 0.05 | 12/19/13 21:59 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 500 | | * | mg/L | 10 | 20 | 12/13/13 12:54 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 15:56 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 550 | | * | mg/L | 10 | 20 | 12/13/13 10:29 | abm |
| Sulfate | D516-02 - Turbidimetric | 5 | 189 | | * | mg/L | 5 | 25 | 12/18/13 17:45 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 15:31 | khw |
| TDS (calculated) | Calculation | | 400 | | | mg/L | 10 | 50 | 01/03/14 14:02 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.25 | | | | | | 01/03/14 14:02 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: MW5

ACZ Sample ID: **L15975-04**
Date Sampled: 12/10/13 09:30
Date Received: 12/12/13
Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/19/13 10:01 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:34 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 14:52 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 17:33 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 17:09 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/18/13 0:15 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/19/13 4:32 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0009 | B | | mg/L | 0.0002 | 0.001 | 12/19/13 4:32 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.090 | | | mg/L | 0.003 | 0.02 | 12/18/13 0:15 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:15 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 0:15 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | 0.03 | B | | mg/L | 0.01 | 0.05 | 12/18/13 0:15 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:32 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 99.9 | | | mg/L | 0.2 | 1 | 12/18/13 0:15 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:15 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 12:56 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:15 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:15 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/18/13 0:15 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:32 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:15 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 14.7 | | | mg/L | 0.2 | 1 | 12/18/13 0:15 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:15 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/18/13 13:46 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:15 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:15 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 7.1 | | | mg/L | 0.3 | 2 | 12/18/13 0:15 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:15 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0005 | | | mg/L | 0.0001 | 0.0003 | 12/19/13 4:32 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 4:32 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 22.9 | | | mg/L | 0.3 | 2 | 12/18/13 0:15 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.48 | | | mg/L | 0.01 | 0.05 | 12/18/13 0:15 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:32 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/18/13 0:15 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:15 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0004 | B | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:32 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:15 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | 0.02 | B | | mg/L | 0.01 | 0.05 | 12/18/13 0:15 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: MW5

ACZ Sample ID: **L15975-04**
 Date Sampled: 12/10/13 09:30
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 82 | | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Total Alkalinity | | 1 | 82 | | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 2.1 | | | % | | | 01/03/14 14:02 | calc |
| Sum of Anions | | | 7.1 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:02 | calc |
| Sum of Cations | | | 7.4 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:02 | calc |
| Chloride | SM4500Cl-E | 1 | 21 | | * | mg/L | 1 | 5 | 12/23/13 14:00 | mpb |
| Conductivity @25C | SM2510B | 1 | 721 | | * | umhos/cm | 1 | 10 | 12/14/13 0:10 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 16:12 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:53 | tcd |
| Fluoride | SM4500F-C | 1 | 0.2 | B | * | mg/L | 0.1 | 0.5 | 12/17/13 12:52 | khw |
| Hardness as CaCO3 | SM2340B - Calculation | | 310 | | | mg/L | 1 | 7 | 01/03/14 14:02 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 3 | 4.81 | | * | mg/L | 0.06 | 0.3 | 12/20/13 23:11 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:40 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 19:24 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.6 | H | * | units | 0.1 | 0.1 | 12/14/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/14/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.12 | B | | mg/L | 0.03 | 0.15 | 01/03/14 14:02 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.04 | B | * | mg/L | 0.01 | 0.05 | 12/27/13 23:55 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.05 | H | * | mg/L | 0.01 | 0.05 | 12/17/13 21:37 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.03 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 22:02 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 550 | | * | mg/L | 10 | 20 | 12/13/13 12:56 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 15:58 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 610 | H | * | mg/L | 10 | 20 | 12/18/13 14:32 | abm |
| Sulfate | D516-02 - Turbidimetric | 20 | 232 | | * | mg/L | 20 | 100 | 12/18/13 18:35 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 15:34 | khw |
| TDS (calculated) | Calculation | | 448 | | | mg/L | 10 | 50 | 01/03/14 14:02 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.23 | | | | | | 01/03/14 14:02 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: MW6

ACZ Sample ID: **L15975-05**
Date Sampled: 12/10/13 08:50
Date Received: 12/12/13
Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/19/13 10:01 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:34 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 15:03 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 17:38 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 17:16 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/18/13 0:18 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0004 | B | | mg/L | 0.0004 | 0.002 | 12/19/13 4:41 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0027 | | | mg/L | 0.0002 | 0.001 | 12/19/13 4:41 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.132 | | | mg/L | 0.003 | 0.02 | 12/18/13 0:18 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:18 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 0:18 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.01 | 0.05 | 12/18/13 0:18 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:41 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 141 | | | mg/L | 0.2 | 1 | 12/18/13 0:18 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:18 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 12:59 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:18 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:18 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/18/13 0:18 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:41 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:18 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 16.2 | | | mg/L | 0.2 | 1 | 12/18/13 0:18 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:18 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/18/13 13:48 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:18 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:18 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 9.1 | | | mg/L | 0.3 | 2 | 12/18/13 0:18 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:18 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0014 | | | mg/L | 0.0001 | 0.0003 | 12/19/13 4:41 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 4:41 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 28.5 | | | mg/L | 0.3 | 2 | 12/18/13 0:18 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.51 | | | mg/L | 0.01 | 0.05 | 12/18/13 0:18 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:41 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/18/13 0:18 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | 0.005 | B | | mg/L | 0.005 | 0.03 | 12/18/13 0:18 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0007 | | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:41 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:18 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.01 | 0.05 | 12/18/13 0:18 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: MW6

ACZ Sample ID: **L15975-05**
 Date Sampled: 12/10/13 08:50
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 106 | | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Total Alkalinity | | 1 | 106 | | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 8.8 | | | % | | | 01/03/14 0:00 | calc |
| Sum of Anions | | | 8.3 | | | meq/L | 0.1 | 0.5 | 01/03/14 0:00 | calc |
| Sum of Cations | | | 9.9 | | | meq/L | 0.1 | 0.5 | 01/03/14 0:00 | calc |
| Chloride | SM4500Cl-E | 1 | 17 | | * | mg/L | 1 | 5 | 12/23/13 14:00 | mpb |
| Conductivity @25C | SM2510B | 1 | 923 | | * | umhos/cm | 1 | 10 | 12/14/13 0:18 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 16:13 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:54 | tcd |
| Fluoride | SM4500F-C | 1 | 0.1 | B | * | mg/L | 0.1 | 0.5 | 12/17/13 12:58 | khw |
| Hardness as CaCO3 | SM2340B - Calculation | | 419 | | | mg/L | 1 | 7 | 01/03/14 0:00 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 15 | 21.8 | | * | mg/L | 0.3 | 2 | 12/20/13 23:12 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:41 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 19:25 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.4 | H | * | units | 0.1 | 0.1 | 12/14/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/14/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.12 | B | | mg/L | 0.03 | 0.15 | 01/03/14 0:00 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.04 | B | * | mg/L | 0.01 | 0.05 | 12/27/13 23:56 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.06 | H | * | mg/L | 0.01 | 0.05 | 12/17/13 21:38 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.04 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 22:03 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 710 | | * | mg/L | 10 | 20 | 12/13/13 12:59 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 16:04 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 760 | H | * | mg/L | 10 | 20 | 12/18/13 14:33 | abm |
| Sulfate | D516-02 - Turbidimetric | 20 | 271 | | * | mg/L | 20 | 100 | 12/18/13 18:35 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 15:44 | khw |
| TDS (calculated) | Calculation | | 547 | | | mg/L | 10 | 50 | 01/03/14 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.30 | | | | | | 01/03/14 0:00 | calc |

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: MW7

ACZ Sample ID: **L15975-06**

Date Sampled: 12/10/13 08:10

Date Received: 12/12/13

Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/19/13 10:02 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:34 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 15:14 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 17:43 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 17:24 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/18/13 0:21 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0005 | B | | mg/L | 0.0004 | 0.002 | 12/19/13 4:44 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0019 | | | mg/L | 0.0002 | 0.001 | 12/19/13 4:44 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.521 | | | mg/L | 0.003 | 0.02 | 12/18/13 0:21 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:21 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 0:21 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:21 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:44 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 34.2 | | | mg/L | 0.2 | 1 | 12/18/13 0:21 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:21 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 13:02 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:21 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:21 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | 0.13 | | | mg/L | 0.02 | 0.05 | 12/18/13 0:21 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:44 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:21 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 10.4 | | | mg/L | 0.2 | 1 | 12/18/13 0:21 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | 0.023 | B | | mg/L | 0.005 | 0.03 | 12/18/13 0:21 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/18/13 13:50 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:21 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:21 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 9.1 | | | mg/L | 0.3 | 2 | 12/18/13 0:21 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:21 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0003 | | | mg/L | 0.0001 | 0.0003 | 12/19/13 4:44 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 4:44 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 20.7 | | | mg/L | 0.3 | 2 | 12/18/13 0:21 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.25 | | | mg/L | 0.01 | 0.05 | 12/18/13 0:21 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:44 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/18/13 0:21 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:21 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:44 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:21 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | 0.10 | | | mg/L | 0.01 | 0.05 | 12/18/13 0:21 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: MW7

ACZ Sample ID: **L15975-06**
 Date Sampled: 12/10/13 08:10
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 72 | | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Total Alkalinity | | 1 | 72 | | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | -1.3 | | | % | | | 01/03/14 14:02 | calc |
| Sum of Anions | | | 3.8 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:02 | calc |
| Sum of Cations | | | 3.7 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:02 | calc |
| Chloride | SM4500Cl-E | 1 | 16 | | * | mg/L | 1 | 5 | 12/23/13 14:00 | mpb |
| Conductivity @25C | SM2510B | 1 | 392 | | * | umhos/cm | 1 | 10 | 12/14/13 0:27 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 16:15 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:55 | tcd |
| Fluoride | SM4500F-C | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/17/13 13:04 | khw |
| Hardness as CaCO3 | SM2340B - Calculation | | 128 | | | mg/L | 1 | 7 | 01/03/14 14:02 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 1.60 | | * | mg/L | 0.02 | 0.1 | 12/20/13 22:41 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:42 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.2 | B | * | mg/L | 0.1 | 0.5 | 12/19/13 19:26 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.3 | H | * | units | 0.1 | 0.1 | 12/14/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/14/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.06 | B | | mg/L | 0.03 | 0.15 | 01/03/14 14:02 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.02 | B | * | mg/L | 0.01 | 0.05 | 12/27/13 23:57 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.03 | BH | * | mg/L | 0.01 | 0.05 | 12/17/13 21:39 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.02 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 22:06 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 320 | | * | mg/L | 10 | 20 | 12/13/13 13:01 | id |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 16:06 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 360 | H | * | mg/L | 10 | 20 | 12/18/13 14:35 | abm |
| Sulfate | D516-02 - Turbidimetric | 5 | 88.8 | | * | mg/L | 5 | 25 | 12/18/13 17:47 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 15:48 | khw |
| TDS (calculated) | Calculation | | 223 | | | mg/L | 10 | 50 | 01/03/14 14:02 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.43 | | | | | | 01/03/14 14:02 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: MW8

ACZ Sample ID: **L15975-07**
Date Sampled: 12/10/13 09:45
Date Received: 12/12/13
Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/19/13 10:02 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:34 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 15:25 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 17:48 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 17:31 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/18/13 0:24 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | 0.0007 | B | | mg/L | 0.0004 | 0.002 | 12/19/13 4:48 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0016 | | | mg/L | 0.0002 | 0.001 | 12/19/13 4:48 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.157 | | | mg/L | 0.003 | 0.02 | 12/18/13 0:24 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:24 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 0:24 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | 0.03 | B | | mg/L | 0.01 | 0.05 | 12/18/13 0:24 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:48 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 83.5 | | | mg/L | 0.2 | 1 | 12/18/13 0:24 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:24 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 13:05 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:24 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:24 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/18/13 0:24 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:48 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:24 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 14.4 | | | mg/L | 0.2 | 1 | 12/18/13 0:24 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:24 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/18/13 13:57 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:24 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:24 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 6.5 | | | mg/L | 0.3 | 2 | 12/18/13 0:24 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:24 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0004 | | | mg/L | 0.0001 | 0.0003 | 12/19/13 4:48 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 4:48 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 21.4 | | | mg/L | 0.3 | 2 | 12/18/13 0:24 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.47 | | | mg/L | 0.01 | 0.05 | 12/18/13 0:24 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:48 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/18/13 0:24 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:24 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:48 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:24 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | 0.01 | B | | mg/L | 0.01 | 0.05 | 12/18/13 0:24 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: MW8

ACZ Sample ID: **L15975-07**
 Date Sampled: 12/10/13 09:45
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 77 | | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Total Alkalinity | | 1 | 77 | | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 3.2 | | | % | | | 01/03/14 14:03 | calc |
| Sum of Anions | | | 6.1 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:03 | calc |
| Sum of Cations | | | 6.5 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:03 | calc |
| Chloride | SM4500Cl-E | 1 | 19 | | * | mg/L | 1 | 5 | 12/23/13 14:00 | mpb |
| Conductivity @25C | SM2510B | 1 | 642 | | * | umhos/cm | 1 | 10 | 12/14/13 0:35 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 16:16 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:56 | tcd |
| Fluoride | SM4500F-C | 1 | 0.1 | B | * | mg/L | 0.1 | 0.5 | 12/17/13 13:12 | khw |
| Hardness as CaCO3 | SM2340B - Calculation | | 268 | | | mg/L | 1 | 7 | 01/03/14 14:03 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 2 | 4.21 | | * | mg/L | 0.04 | 0.2 | 12/20/13 23:13 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:44 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 19:00 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.7 | H | * | units | 0.1 | 0.1 | 12/14/13 0:00 | dcw |
| pH measured at | | 1 | 23 | | * | C | 0.1 | 0.1 | 12/14/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.16 | | | mg/L | 0.03 | 0.15 | 01/03/14 14:03 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.05 | | * | mg/L | 0.01 | 0.05 | 12/28/13 0:00 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.06 | H | * | mg/L | 0.01 | 0.05 | 12/17/13 21:40 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.04 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 22:07 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 520 | | * | mg/L | 10 | 20 | 12/14/13 14:03 | khw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 16:09 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 530 | H | * | mg/L | 10 | 20 | 12/18/13 14:36 | abm |
| Sulfate | D516-02 - Turbidimetric | 20 | 189 | | * | mg/L | 20 | 100 | 12/20/13 13:35 | mpb |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 15:51 | khw |
| TDS (calculated) | Calculation | | 381 | | | mg/L | 10 | 50 | 01/03/14 14:03 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.36 | | | | | | 01/03/14 14:03 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: MW9

ACZ Sample ID: **L15975-08**

Date Sampled: 12/10/13 13:20

Date Received: 12/12/13

Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/19/13 10:02 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/19/13 8:35 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 15:36 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/26/13 17:52 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 17:38 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/18/13 0:34 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/19/13 4:57 | pmc |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0011 | | | mg/L | 0.0002 | 0.001 | 12/19/13 4:57 | pmc |
| Barium, dissolved | M200.7 ICP | 1 | 0.048 | | | mg/L | 0.003 | 0.02 | 12/18/13 0:34 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:34 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/18/13 0:34 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | 0.05 | | | mg/L | 0.01 | 0.05 | 12/18/13 0:34 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:57 | pmc |
| Calcium, dissolved | M200.7 ICP | 1 | 84.6 | | | mg/L | 0.2 | 1 | 12/18/13 0:34 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:34 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 16:18 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:34 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:34 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | 8.20 | | | mg/L | 0.02 | 0.05 | 12/18/13 0:34 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:57 | pmc |
| Lithium, dissolved | M200.7 ICP | 1 | 0.02 | B | | mg/L | 0.02 | 0.1 | 12/18/13 0:34 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 15 | | | mg/L | 0.2 | 1 | 12/18/13 0:34 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | 0.297 | | | mg/L | 0.005 | 0.03 | 12/18/13 0:34 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/18/13 13:59 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/18/13 0:34 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:34 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 4.5 | | | mg/L | 0.3 | 2 | 12/18/13 0:34 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/18/13 0:34 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0003 | 12/19/13 4:57 | pmc |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/19/13 4:57 | pmc |
| Sodium, dissolved | M200.7 ICP | 1 | 31.8 | | | mg/L | 0.3 | 2 | 12/18/13 0:34 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.71 | | | mg/L | 0.01 | 0.05 | 12/18/13 0:34 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:57 | pmc |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/18/13 0:34 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:34 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0005 | 12/19/13 4:57 | pmc |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/18/13 0:34 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/18/13 0:34 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: MW9

ACZ Sample ID: **L15975-08**
 Date Sampled: 12/10/13 13:20
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 146 | | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Total Alkalinity | | 1 | 146 | | * | mg/L | 2 | 20 | 12/14/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 2.7 | | | % | | | 01/03/14 14:03 | calc |
| Sum of Anions | | | 7.1 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:03 | calc |
| Sum of Cations | | | 7.5 | | | meq/L | 0.1 | 0.5 | 01/03/14 14:03 | calc |
| Chloride | SM4500Cl-E | 1 | 18 | | * | mg/L | 1 | 5 | 12/23/13 14:00 | mpb |
| Conductivity @25C | SM2510B | 1 | 658 | | * | umhos/cm | 1 | 10 | 12/14/13 0:44 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 16:17 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 15:56 | tcd |
| Fluoride | SM4500F-C | 1 | 1 | | * | mg/L | 0.1 | 0.5 | 12/17/13 13:19 | khw |
| Hardness as CaCO3 | SM2340B - Calculation | | 273 | | | mg/L | 1 | 7 | 01/03/14 14:03 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 22:43 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:45 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 19:01 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8 | H | * | units | 0.1 | 0.1 | 12/14/13 0:00 | dcw |
| pH measured at | | 1 | 23 | | * | C | 0.1 | 0.1 | 12/14/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.12 | B | | mg/L | 0.03 | 0.15 | 01/03/14 14:03 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.04 | B | * | mg/L | 0.01 | 0.05 | 12/28/13 0:01 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.01 | BH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:58 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.04 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 22:09 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 480 | | * | mg/L | 10 | 20 | 12/14/13 14:05 | khw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | 26 | | * | mg/L | 5 | 20 | 12/13/13 16:11 | dcw |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 520 | H | * | mg/L | 10 | 20 | 12/18/13 14:37 | abm |
| Sulfate | D516-02 - Turbidimetric | 5 | 174 | | * | mg/L | 5 | 25 | 12/20/13 13:23 | mpb |
| Sulfide as S | SM4500S2-D | 1 | 0.26 | | * | mg/L | 0.02 | 0.1 | 12/16/13 15:54 | khw |
| TDS (calculated) | Calculation | | 426 | | | mg/L | 10 | 50 | 01/03/14 14:03 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.13 | | | | | | 01/03/14 14:03 | calc |



Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|--------------|--|--------------|--|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LCSWD</i> | Laboratory Control Sample - Water Duplicate |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFB</i> | Laboratory Fortified Blank |
| <i>CCB</i> | Continuing Calibration Blank | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>CCV</i> | Continuing Calibration Verification standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>ICB</i> | Initial Calibration Blank | <i>MS</i> | Matrix Spike |
| <i>ICV</i> | Initial Calibration Verification standard | <i>MSD</i> | Matrix Spike Duplicate |
| <i>ICSAB</i> | Inter-element Correction Standard - A plus B solutions | <i>PBS</i> | Prep Blank - Soil |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>PBW</i> | Prep Blank - Water |
| <i>LCSSD</i> | Laboratory Control Sample - Soil Duplicate | <i>PQV</i> | Practical Quantitation Verification standard |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>SDL</i> | Serial Dilution |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |
| Standard | Verifies the validity of the calibration. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L15975**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|-------------------------------------|--|------|---|
| L15975-01 | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| WG356866 | | Chloride | SM4500CI-E | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| WG356726 | | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356722 | | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356475 | | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| WG356820 | | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| WG356796 | | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356714 | | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| WG357007 | | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356384 | | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | HE | Analysis performed past holding time. Method holding time is less than or equal to 7 days and sample was received with less than half of the holding time remaining (refer to item C5 of ACZ's Terms & Conditions). |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356746 | | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356418 | | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| WG356426 | | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356403 | | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15975**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|-------------------------|------|---|
| | WG356657 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | WG356484 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15975**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|-------------------------------------|--|------|---|
| L15975-02 | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| WG356866 | | Chloride | SM4500CI-E | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| WG356726 | | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356722 | | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356475 | | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| WG356820 | | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| WG356796 | | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356714 | | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| WG357007 | | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356575 | | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | HE | Analysis performed past holding time. Method holding time is less than or equal to 7 days and sample was received with less than half of the holding time remaining (refer to item C5 of ACZ's Terms & Conditions). |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| WG356746 | | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356418 | | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| WG356426 | | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356403 | | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| WG356657 | | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS |

Tahoe Resources, Inc.

ACZ Project ID: **L15975**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|-------------------------|------|---|
| | | | | | or LFB) was acceptable. |
| | WG356484 | Sulfide as S | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15975**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|-------------------------------------|--|------|---|
| L15975-03 | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| WG356866 | | Chloride | SM4500CI-E | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | | | SM4500CI-E | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| WG356726 | | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356722 | | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356533 | | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| WG356820 | | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| WG356796 | | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356714 | | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| WG357007 | | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356575 | | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | HE | Analysis performed past holding time. Method holding time is less than or equal to 7 days and sample was received with less than half of the holding time remaining (refer to item C5 of ACZ's Terms & Conditions). |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| WG356746 | | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356418 | | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| WG356426 | | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356403 | | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| WG356657 | | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS |

Tahoe Resources, Inc.

ACZ Project ID: **L15975**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|-------------------------|------|---|
| | | | | | or LFB) was acceptable. |
| | WG356484 | Sulfide as S | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15975**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|--------------|-------------------------------------|--|---|---|
| L15975-04 | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356866 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356726 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356722 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356533 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356820 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | | pH measured at | SM4500H+ B | Q6 |
| | WG357007 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356575 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356418 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| | WG356426 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356631 | Residue, Total (TS) @ 105C | SM2540B | HC | Initial analysis within holding time. Reanalysis was past holding time, which was required due to a QC failure during the initial analysis. |
| | | | SM2540B | Q6 | Sample was received above recommended temperature. |
| WG356657 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. | |
| WG356484 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. | |

Tahoe Resources, Inc.

ACZ Project ID: **L15975**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|---------------------|------|---|
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15975**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|--------------|-------------------------------------|--|---|---|
| L15975-05 | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356866 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356726 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356722 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356533 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356820 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | | pH measured at | SM4500H+ B | Q6 |
| | WG357007 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356575 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356418 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| | WG356426 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356631 | Residue, Total (TS) @ 105C | SM2540B | HC | Initial analysis within holding time. Reanalysis was past holding time, which was required due to a QC failure during the initial analysis. |
| | | | SM2540B | Q6 | Sample was received above recommended temperature. |
| WG356657 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. | |
| WG356484 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. | |

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| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|---------------------|------|---|
| | | | SM4500S2-D | QD | Reported value is the background-corrected concentration, as described by the method. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

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ACZ Project ID: **L15975**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------------------------|-------------------------------------|--|---|---|
| L15975-06 | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356866 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356726 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356722 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356533 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356820 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG357007 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356575 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356418 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| | WG356426 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| SM2540D | | | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356631 | Residue, Total (TS) @ 105C | SM2540B | HC | Initial analysis within holding time. Reanalysis was past holding time, which was required due to a QC failure during the initial analysis. | |
| | | SM2540B | Q6 | Sample was received above recommended temperature. | |
| WG356657 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. | |
| WG356484 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. | |

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| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|---------------------|------|---|
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

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| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------------------------|---|---|---|---|
| L15975-07 | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356866 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356726 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356722 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356533 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356820 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | | pH measured at SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG357007 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356575 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | HE | Analysis performed past holding time. Method holding time is less than or equal to 7 days and sample was received with less than half of the holding time remaining (refer to item C5 of ACZ's Terms & Conditions). |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356450 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |
| WG356426 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. | |
| | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356631 | Residue, Total (TS) @ 105C | SM2540B | HC | Initial analysis within holding time. Reanalysis was past holding time, which was required due to a QC failure during the initial analysis. | |
| | | SM2540B | Q6 | Sample was received above recommended temperature. | |
| WG356777 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. | |

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| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|-------------------------|------|---|
| | | | D516-02 - Turbidimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356484 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

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| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------------------------|-------------------------------------|--|---|---|
| L15975-08 | WG356411 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356866 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356726 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356722 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356533 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356820 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | | | pH measured at SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG357007 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | HE | Analysis performed past holding time. Method holding time is less than or equal to 7 days and sample was received with less than half of the holding time remaining (refer to item C5 of ACZ's Terms & Conditions). |
| | | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. |
| | | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356450 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. |
| | WG356426 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| SM2540D | | | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356631 | Residue, Total (TS) @ 105C | SM2540B | HC | Initial analysis within holding time. Reanalysis was past holding time, which was required due to a QC failure during the initial analysis. | |
| | | SM2540B | Q6 | Sample was received above recommended temperature. | |
| WG356777 | Sulfate | D516-02 - Turbidimetric | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike | |

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| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|----------|---------|------------------|-------------------------|------|---|
| | | | D516-02 - Turbidimetric | Q6 | level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | D516-02 - Turbidimetric | RA | Sample was received above recommended temperature. |
| | | | | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356484 | | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

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Metals Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|---------------------|------------|
| Bismuth, dissolved | M200.7 ICP |
| Gallium, dissolved | M200.7 ICP |
| Scandium, dissolved | M200.7 ICP |

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|--------------|------------|
| Sulfide as S | SM4500S2-D |
|--------------|------------|

Tahoe Resources, Inc.
 Escobal

ACZ Project ID: L15975
 Date Received: 12/12/2013 09:33
 Received By: mtb
 Date Printed: 12/12/2013

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | | | X |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? | | X | |

Samples/Containers

| | YES | NO | NA |
|--|-----|----|----|
| 8) Are all containers intact and with no leaks? | X | | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | X | | |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? | | X | |

Some parameters were received past hold time.

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| 3853 | 9.6 | 14 | N/A |

Was ice present in the shipment container(s)?
 Yes - Gel ice was present in the shipment container(s) but was thawed by receipt at ACZ.
 Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.



Laboratories, Inc.

L15975

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Miguel Berganza
Company: Tahoe Resources Inc
E-mail: mberganza@sanrafael.com.gt

Address: Boulevard Los Proceres 18 calle 24-692.10
Zona Empresarial, Zona Pradera, Torre IV, Of 1406
Telephone: (502) 59515240

Copy of Report to:

Name: Charlie Muenhoff
Company: Tahoe Resources Inc.

E-mail: cmuenhoff@tahoeresourcesinc.com
Telephone:

Invoice to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: mberganza@sanrafael.com.gt

Address: Boulevard Los Proceres 18 calle 24-692.10
Zona Empresarial, Zona Pradera, Torre IV, Of 1406
Telephone: (502) 59515240

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring? Yes No

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: Susana Arce Sampler's site information State: Zip code Time Zone

Check box if observe Daylight Savings Time

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: Water Quality
PO#: Escobal
Reporting state for compliance testing:
Check box if samples include NRC licensed material?

Table with columns: # of Containers, and 10 empty columns for analyses. Includes handwritten 'GW' in the first container column.

Table with columns: SAMPLE IDENTIFICATION, DATE:TIME, Matrix, # of Containers. Contains rows for MW2 through MW9.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns: RELINQUISHED BY, DATE:TIME, RECEIVED BY, DATE:TIME. Includes signatures and dates for Fernanda Ramos and Erick Jansen.



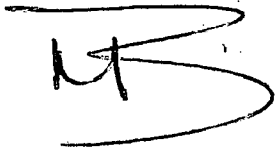
Guatemala December 10th, 2013

To whom it may concern:

Minera San Rafael, S.A is sending a case with samples of water, which is not contaminated, that are going to be analyzed by the ACZ Laboratories in Steamboat Springs, Colorado, USA.

If you have any question or doubt, please contact Miguel Berganza at Minera San Rafael, S.A. (502 - 5951-5248) or Sue Webber at ACZ Laboratories (970-879-6590).

Best regards,

A handwritten signature in black ink, consisting of a stylized 'M' and 'B' connected together, with a horizontal line above and below the letters.

Miguel Berganza
Environment Department.
Proyecto Escobal, S. A.

December 27, 2013

Report to:

Miguel Berganza

Tahoe Resources, Inc.

Km 8.6 carrtera Antigua a El Salvador

Centro corporativo Muxbal

Torre Oeste.Apto 503y504 Guatemala, GT

Bill to:

Miguel Berganza

Tahoe Resources, Inc.

5310 Kietzke Lane

Suite 200

Reno, NV 89511

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L15973

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 12, 2013. This project has been assigned to ACZ's project number, L15973. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L15973. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

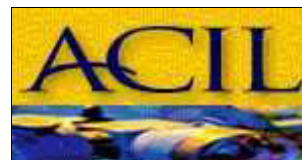
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after January 26, 2014. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed
and approved this report.



Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: MW20

ACZ Sample ID: **L15973-01**

Date Sampled: 12/10/13 12:00

Date Received: 12/12/13

Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/18/13 9:32 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/17/13 13:15 | bsu |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 11:22 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/14/13 11:06 | bsu |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/17/13 16:43 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/19/13 3:12 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | * | mg/L | 0.0004 | 0.002 | 12/18/13 21:38 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | | U | * | mg/L | 0.0002 | 0.001 | 12/18/13 21:38 | msh |
| Barium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.003 | 0.02 | 12/19/13 3:12 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:12 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/19/13 3:12 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/20/13 19:00 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:38 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.2 | 1 | 12/19/13 3:12 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:12 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:12 | jjc |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:12 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:12 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/19/13 3:12 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:38 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:12 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.2 | 1 | 12/19/13 3:12 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:12 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 11:59 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:12 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:12 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.3 | 2 | 12/19/13 3:12 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:12 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0003 | 12/18/13 21:38 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | * | mg/L | 0.00005 | 0.0003 | 12/18/13 21:38 | msh |
| Sodium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.3 | 2 | 12/19/13 3:12 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:12 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:38 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/19/13 3:12 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:12 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:38 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:12 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:12 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: MW20

ACZ Sample ID: **L15973-01**
Date Sampled: 12/10/13 12:00
Date Received: 12/12/13
Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | n/a | | | % | | | 12/27/13 0:00 | calc |
| Sum of Anions | | | N/A | | | meq/L | 0.1 | 0.5 | 12/27/13 0:00 | calc |
| Sum of Cations | | | | U | | meq/L | 0.1 | 0.5 | 12/27/13 0:00 | calc |
| Chloride | SM4500Cl-E | 1 | | U | * | mg/L | 1 | 5 | 12/20/13 17:02 | mpb |
| Conductivity @25C | SM2510B | 1 | 1 | B | * | umhos/cm | 1 | 10 | 12/13/13 21:27 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 14:55 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 13:47 | tcd |
| Fluoride | SM4500F-C | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/16/13 15:25 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | | U | | mg/L | 1 | 7 | 12/27/13 0:00 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 0:04 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:14 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 15:07 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 6.2 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | | U | | mg/L | 0.03 | 0.15 | 12/27/13 0:00 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | | U | * | mg/L | 0.01 | 0.05 | 12/14/13 13:39 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | | UH | * | mg/L | 0.01 | 0.05 | 12/17/13 21:31 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | | U | * | mg/L | 0.01 | 0.05 | 12/19/13 0:23 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | | U | * | mg/L | 10 | 20 | 12/12/13 16:36 | dcw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 10:26 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | | U | * | mg/L | 10 | 20 | 12/13/13 10:16 | abm |
| Sulfate | D516-02 - Turbidimetric | 1 | | U | * | mg/L | 1 | 5 | 12/18/13 17:36 | tcd |
| Sulfide as S | SM4500S2-D | 1.5 | | U | * | mg/L | 0.03 | 0.2 | 12/16/13 14:16 | khw |
| TDS (calculated) | Calculation | | | U | | mg/L | 10 | 50 | 12/27/13 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | | n/a | | | | | | 12/27/13 0:00 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: MW21

ACZ Sample ID: **L15973-02**
Date Sampled: 12/10/13 13:30
Date Received: 12/12/13
Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/18/13 9:32 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/17/13 13:24 | bsu |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 11:44 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/14/13 11:12 | bsu |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/17/13 16:51 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.03 | 0.2 | 12/19/13 3:21 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | * | mg/L | 0.0004 | 0.002 | 12/18/13 21:42 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0012 | | * | mg/L | 0.0002 | 0.001 | 12/18/13 21:42 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.049 | | | mg/L | 0.003 | 0.02 | 12/19/13 3:21 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:21 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/19/13 3:21 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | 0.05 | | | mg/L | 0.01 | 0.05 | 12/20/13 19:10 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:42 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 82.8 | | | mg/L | 0.2 | 1 | 12/19/13 3:21 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:21 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:21 | jjc |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:21 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:21 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | 8.09 | | | mg/L | 0.02 | 0.05 | 12/19/13 3:21 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:42 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | 0.03 | B | | mg/L | 0.02 | 0.1 | 12/19/13 3:21 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 14.7 | | | mg/L | 0.2 | 1 | 12/19/13 3:21 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | 0.290 | | | mg/L | 0.005 | 0.03 | 12/19/13 3:21 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 12:07 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:21 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:21 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 4.5 | | | mg/L | 0.3 | 2 | 12/19/13 3:21 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:21 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0003 | 12/18/13 21:42 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | * | mg/L | 0.00005 | 0.0003 | 12/18/13 21:42 | msh |
| Sodium, dissolved | M200.7 ICP | 1 | 31.4 | | | mg/L | 0.3 | 2 | 12/19/13 3:21 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 0.71 | | | mg/L | 0.01 | 0.05 | 12/19/13 3:21 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:42 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/19/13 3:21 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:21 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0001 | B | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:42 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:21 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | 0.01 | B | | mg/L | 0.01 | 0.05 | 12/19/13 3:21 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: MW21

ACZ Sample ID: **L15973-02**
 Date Sampled: 12/10/13 13:30
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 143 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | 143 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 4.3 | | | % | | | 12/27/13 0:00 | calc |
| Sum of Anions | | | 6.7 | | | meq/L | 0.1 | 0.5 | 12/27/13 0:00 | calc |
| Sum of Cations | | | 7.3 | | | meq/L | 0.1 | 0.5 | 12/27/13 0:00 | calc |
| Chloride | SM4500Cl-E | 1 | 18 | | * | mg/L | 1 | 5 | 12/20/13 17:02 | mpb |
| Conductivity @25C | SM2510B | 1 | 646 | | * | umhos/cm | 1 | 10 | 12/13/13 21:35 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 14:56 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 13:50 | tcd |
| Fluoride | SM4500F-C | 1 | 1 | | * | mg/L | 0.1 | 0.5 | 12/16/13 15:29 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 267 | | | mg/L | 1 | 7 | 12/27/13 0:00 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 0:05 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:15 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 15:09 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 7.9 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.09 | B | | mg/L | 0.03 | 0.15 | 12/27/13 0:00 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.03 | B | * | mg/L | 0.01 | 0.05 | 12/14/13 13:40 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.03 | BH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:38 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.04 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 0:24 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 460 | | * | mg/L | 10 | 20 | 12/12/13 16:37 | dcw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | 27 | | * | mg/L | 5 | 20 | 12/13/13 10:29 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 530 | | * | mg/L | 10 | 20 | 12/13/13 10:16 | abm |
| Sulfate | D516-02 - Turbidimetric | 5 | 156 | | * | mg/L | 5 | 25 | 12/18/13 17:42 | tcd |
| Sulfide as S | SM4500S2-D | 1 | 0.23 | | * | mg/L | 0.02 | 0.1 | 12/16/13 14:25 | khw |
| TDS (calculated) | Calculation | | 403 | | | mg/L | 10 | 50 | 12/27/13 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.14 | | | | | | 12/27/13 0:00 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: PSA-1

ACZ Sample ID: **L15973-03**

Date Sampled: 12/10/13 12:00

Date Received: 12/12/13

Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/18/13 9:32 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/17/13 13:32 | bsu |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 12:06 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/14/13 11:18 | bsu |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/17/13 17:00 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/19/13 3:24 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | * | mg/L | 0.0004 | 0.002 | 12/18/13 21:45 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0043 | | * | mg/L | 0.0002 | 0.001 | 12/18/13 21:45 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.029 | | | mg/L | 0.003 | 0.02 | 12/19/13 3:24 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:24 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/19/13 3:24 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | 0.10 | | | mg/L | 0.01 | 0.05 | 12/20/13 19:13 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:45 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 167 | | | mg/L | 0.2 | 1 | 12/19/13 3:24 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:24 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:24 | jjc |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:24 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:24 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | 1.60 | | | mg/L | 0.02 | 0.05 | 12/19/13 3:24 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:45 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | 0.08 | B | | mg/L | 0.02 | 0.1 | 12/19/13 3:24 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 32.3 | | | mg/L | 0.2 | 1 | 12/19/13 3:24 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | 0.123 | | | mg/L | 0.005 | 0.03 | 12/19/13 3:24 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 12:09 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:24 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:24 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 4.7 | | | mg/L | 0.3 | 2 | 12/19/13 3:24 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:24 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0003 | 12/18/13 21:45 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | * | mg/L | 0.00005 | 0.0003 | 12/18/13 21:45 | msh |
| Sodium, dissolved | M200.7 ICP | 1 | 44.8 | | | mg/L | 0.3 | 2 | 12/19/13 3:24 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 1.72 | | | mg/L | 0.01 | 0.05 | 12/19/13 3:24 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:45 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/19/13 3:24 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:24 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:45 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:24 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:24 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: PSA-1

ACZ Sample ID: **L15973-03**

Date Sampled: 12/10/13 12:00

Date Received: 12/12/13

Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 139 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | 139 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | -3.7 | | | % | | | 12/27/13 0:00 | calc |
| Sum of Anions | | | 14 | | | meq/L | 0.1 | 0.5 | 12/27/13 0:00 | calc |
| Sum of Cations | | | 13 | | | meq/L | 0.1 | 0.5 | 12/27/13 0:00 | calc |
| Chloride | SM4500Cl-E | 1 | 38 | | * | mg/L | 1 | 5 | 12/20/13 17:02 | mpb |
| Conductivity @25C | SM2510B | 1 | 1160 | | * | umhos/cm | 1 | 10 | 12/13/13 21:53 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 14:56 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 13:51 | tcd |
| Fluoride | SM4500F-C | 1 | 2.4 | | * | mg/L | 0.1 | 0.5 | 12/16/13 15:32 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 550 | | | mg/L | 1 | 7 | 12/27/13 0:00 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 0.09 | B | * | mg/L | 0.02 | 0.1 | 12/20/13 0:06 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:17 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 15:12 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8.1 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | | U | | mg/L | 0.03 | 0.15 | 12/27/13 0:00 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | | U | * | mg/L | 0.01 | 0.05 | 12/14/13 13:41 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | | UH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:40 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.01 | B | * | mg/L | 0.01 | 0.05 | 12/19/13 0:25 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 830 | | * | mg/L | 10 | 20 | 12/12/13 16:39 | dcw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 10:32 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 910 | | * | mg/L | 10 | 20 | 12/13/13 10:17 | abm |
| Sulfate | D516-02 - Turbidimetric | 20 | 453 | | * | mg/L | 20 | 100 | 12/18/13 18:34 | tcd |
| Sulfide as S | SM4500S2-D | 1 | 0.14 | | * | mg/L | 0.02 | 0.1 | 12/16/13 14:35 | khw |
| TDS (calculated) | Calculation | | 829 | | | mg/L | 10 | 50 | 12/27/13 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.00 | | | | | | 12/27/13 0:00 | calc |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: PSASR

ACZ Sample ID: **L15973-04**
Date Sampled: 12/09/13 10:20
Date Received: 12/12/13
Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/18/13 9:32 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/17/13 13:40 | bsu |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 12/18/13 12:17 | mpb |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/14/13 11:24 | bsu |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/18/13 15:14 | mpb |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.03 | 0.2 | 12/19/13 3:27 | jjc |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | * | mg/L | 0.0004 | 0.002 | 12/18/13 21:48 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0134 | | * | mg/L | 0.0002 | 0.001 | 12/18/13 21:48 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.109 | | | mg/L | 0.003 | 0.02 | 12/19/13 3:27 | jjc |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:27 | jjc |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/19/13 3:27 | jjc |
| Boron, dissolved | M200.7 ICP | 1 | 0.11 | | | mg/L | 0.01 | 0.05 | 12/20/13 19:16 | jjc |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:48 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 112 | | | mg/L | 0.2 | 1 | 12/19/13 3:27 | jjc |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:27 | jjc |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:27 | jjc |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:27 | jjc |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:27 | jjc |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/19/13 3:27 | jjc |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:48 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | 0.15 | | | mg/L | 0.02 | 0.1 | 12/19/13 3:27 | jjc |
| Magnesium, dissolved | M200.7 ICP | 1 | 7.8 | | | mg/L | 0.2 | 1 | 12/19/13 3:27 | jjc |
| Manganese, dissolved | M200.7 ICP | 1 | 0.037 | | | mg/L | 0.005 | 0.03 | 12/19/13 3:27 | jjc |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/17/13 12:11 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/19/13 3:27 | jjc |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/19/13 3:27 | jjc |
| Potassium, dissolved | M200.7 ICP | 1 | 2.6 | | | mg/L | 0.3 | 2 | 12/19/13 3:27 | jjc |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 3:27 | jjc |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0003 | 12/18/13 21:48 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | * | mg/L | 0.00005 | 0.0003 | 12/18/13 21:48 | msh |
| Sodium, dissolved | M200.7 ICP | 1 | 85.6 | | | mg/L | 0.3 | 2 | 12/19/13 3:27 | jjc |
| Strontium, dissolved | M200.7 ICP | 1 | 4.82 | | | mg/L | 0.01 | 0.05 | 12/19/13 3:27 | jjc |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:48 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/19/13 3:27 | jjc |
| Titanium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:27 | jjc |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0002 | B | | mg/L | 0.0001 | 0.0005 | 12/18/13 21:48 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/19/13 3:27 | jjc |
| Zinc, dissolved | M200.7 ICP | 1 | 0.02 | B | | mg/L | 0.01 | 0.05 | 12/19/13 3:27 | jjc |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: PSASR

ACZ Sample ID: **L15973-04**
 Date Sampled: 12/09/13 10:20
 Date Received: 12/12/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 185 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Total Alkalinity | | 1 | 185 | | * | mg/L | 2 | 20 | 12/13/13 0:00 | dcw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | -4.8 | | | % | | | 12/27/13 0:00 | calc |
| Sum of Anions | | | 11 | | | meq/L | 0.1 | 0.5 | 12/27/13 0:00 | calc |
| Sum of Cations | | | 10 | | | meq/L | 0.1 | 0.5 | 12/27/13 0:00 | calc |
| Chloride | SM4500Cl-E | 1 | 5 | | * | mg/L | 1 | 5 | 12/20/13 17:02 | mpb |
| Conductivity @25C | SM2510B | 1 | 948 | | * | umhos/cm | 1 | 10 | 12/13/13 22:03 | dcw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 14:57 | tcd |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/19/13 13:52 | tcd |
| Fluoride | SM4500F-C | 1 | 0.7 | | * | mg/L | 0.1 | 0.5 | 12/16/13 15:36 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 312 | | | mg/L | 1 | 7 | 12/27/13 0:00 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 0:07 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/20/13 16:19 | tcd |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/19/13 15:13 | mpb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8.2 | H | * | units | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| pH measured at | | 1 | 22 | | * | C | 0.1 | 0.1 | 12/13/13 0:00 | dcw |
| Phosphate | Calculation based on dissolved Phosphorus | | | U | | mg/L | 0.03 | 0.15 | 12/27/13 0:00 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | | U | * | mg/L | 0.01 | 0.05 | 12/14/13 13:42 | pjb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | | UH | * | mg/L | 0.01 | 0.05 | 12/12/13 21:41 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | | U | * | mg/L | 0.01 | 0.05 | 12/19/13 21:42 | pjb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 670 | | * | mg/L | 10 | 20 | 12/12/13 16:40 | dcw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | | U | * | mg/L | 5 | 20 | 12/13/13 10:34 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 720 | | * | mg/L | 10 | 20 | 12/13/13 10:18 | abm |
| Sulfate | D516-02 - Turbidimetric | 20 | 335 | | * | mg/L | 20 | 100 | 12/18/13 18:34 | tcd |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/16/13 14:39 | khw |
| TDS (calculated) | Calculation | | 665 | | | mg/L | 10 | 50 | 12/27/13 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.01 | | | | | | 12/27/13 0:00 | calc |



Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|--------------|--|--------------|--|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LCSWD</i> | Laboratory Control Sample - Water Duplicate |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFB</i> | Laboratory Fortified Blank |
| <i>CCB</i> | Continuing Calibration Blank | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>CCV</i> | Continuing Calibration Verification standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>ICB</i> | Initial Calibration Blank | <i>MS</i> | Matrix Spike |
| <i>ICV</i> | Initial Calibration Verification standard | <i>MSD</i> | Matrix Spike Duplicate |
| <i>ICSAB</i> | Inter-element Correction Standard - A plus B solutions | <i>PBS</i> | Prep Blank - Soil |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>PBW</i> | Prep Blank - Water |
| <i>LCSSD</i> | Laboratory Control Sample - Soil Duplicate | <i>PQV</i> | Practical Quantitation Verification standard |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>SDL</i> | Serial Dilution |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |
| Standard | Verifies the validity of the calibration. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L15973**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------------------------|--|---|---|---|
| L15973-01 | WG356636 | Antimony, dissolved | M200.8 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Arsenic, dissolved | M200.8 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Silver, dissolved | M200.8 ICP-MS | MA | Recovery for either the spike or spike duplicate was outside of the acceptance limits; the RPD was within the acceptance limits. |
| | WG356411 | Bicarbonate as CaCO3 Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356799 | Chloride | SM4500CI-E | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356718 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356708 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356752 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | pH pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| | | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| WG356449 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356575 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | HE | Analysis performed past holding time. Method holding time is less than or equal to 7 days and sample was received with less than half of the holding time remaining (refer to item C5 of ACZ's Terms & Conditions). | |
| | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. | |
| WG356669 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| WG356377 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |
| WG356392 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. | |
| | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data | |

Tahoe Resources, Inc.

ACZ Project ID: **L15973**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|----------|---------|----------------------------|-------------------------|------|---|
| | | | | | validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356403 | | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| WG356657 | | Sulfate | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| WG356484 | | Sulfide as S | SM4500S2-D | D1 | Sample required dilution due to matrix. |
| | | | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| WG356411 | | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15973**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|---------------------------------|--|---|---|---|
| L15973-02 | WG356636 | Antimony, dissolved | M200.8 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Arsenic, dissolved | M200.8 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Silver, dissolved | M200.8 ICP-MS | MA | Recovery for either the spike or spike duplicate was outside of the acceptance limits; the RPD was within the acceptance limits. |
| | WG356411 | Bicarbonate as CaCO3 Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356799 | Chloride | SM4500CI-E | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356718 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356708 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356752 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | pH pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| | | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| WG356449 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | HE | Analysis performed past holding time. Method holding time is less than or equal to 7 days and sample was received with less than half of the holding time remaining (refer to item C5 of ACZ's Terms & Conditions). | |
| | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356669 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| WG356377 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |

Tahoe Resources, Inc.

ACZ Project ID: **L15973**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|-------------------------------------|-------------------------|----------|---|
| | WG356392 | Residue, Non-Filterable (TSS) @105C | SM2540D SM2540D | Q6 RA | Sample was received above recommended temperature. Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356403 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| | WG356657 | Sulfate | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | WG356484 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15973**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|---------------------------------|--|---|---|---|
| L15973-03 | WG356636 | Antimony, dissolved | M200.8 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Arsenic, dissolved | M200.8 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Silver, dissolved | M200.8 ICP-MS | MA | Recovery for either the spike or spike duplicate was outside of the acceptance limits; the RPD was within the acceptance limits. |
| | WG356411 | Bicarbonate as CaCO3 Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356799 | Chloride | SM4500CI-E | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356718 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356708 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356752 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | pH pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| | | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| WG356449 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | HE | Analysis performed past holding time. Method holding time is less than or equal to 7 days and sample was received with less than half of the holding time remaining (refer to item C5 of ACZ's Terms & Conditions). | |
| | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356669 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| WG356377 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |

Tahoe Resources, Inc.

ACZ Project ID: **L15973**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|-------------------------------------|-------------------------|------|---|
| | WG356392 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. |
| | | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356403 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| | WG356657 | Sulfate | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | WG356484 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15973**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|---------------------------------|--|---|---|---|
| L15973-04 | WG356636 | Antimony, dissolved | M200.8 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Arsenic, dissolved | M200.8 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Silver, dissolved | M200.8 ICP-MS | MA | Recovery for either the spike or spike duplicate was outside of the acceptance limits; the RPD was within the acceptance limits. |
| | WG356411 | Bicarbonate as CaCO3 Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356799 | Chloride | SM4500CI-E | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG356718 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356708 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356475 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | WG356411 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356752 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | WG356796 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356714 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | | | M351.2 - TKN by Block Digester | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG356411 | pH pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| | | SM4500H+ B | Q6 | Sample was received above recommended temperature. | |
| WG356449 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356384 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. | |
| | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356746 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356377 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |

Tahoe Resources, Inc.

ACZ Project ID: **L15973**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|-------------------------------------|--------------------------|----------|---|
| | WG356392 | Residue, Non-Filterable (TSS) @105C | SM2540D SM2540D | Q6 RA | Sample was received above recommended temperature. Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356403 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. |
| | WG356657 | Sulfate | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. |
| | WG356484 | Sulfide as S | SM4500S2-D SM4500S2-D | Q6 RA | Sample was received above recommended temperature. Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356411 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |

Tahoe Resources, Inc.

ACZ Project ID: **L15973**

Metals Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|---------------------|------------|
| Bismuth, dissolved | M200.7 ICP |
| Gallium, dissolved | M200.7 ICP |
| Scandium, dissolved | M200.7 ICP |

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|--------------|------------|
| Sulfide as S | SM4500S2-D |
|--------------|------------|

Tahoe Resources, Inc.
 Escobal

ACZ Project ID: L15973
 Date Received: 12/12/2013 09:28
 Received By: mtb
 Date Printed: 12/12/2013

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | | | X |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? A change was made in the time section prior to ACZ custody. | X | | |

Samples/Containers

| | YES | NO | NA |
|--|-----|----|----|
| 8) Are all containers intact and with no leaks? | X | | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | X | | |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? Some parameters were received past hold time. | | X | |

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| 3858 | 10.2 | 13 | N/A |

Was ice present in the shipment container(s)?

Yes - Gel ice was present in the shipment container(s) but was thawed by receipt at ACZ.

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.



Laboratories, Inc.

L15973

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Miguel Berganza
Company: Tahoe Resources Inc
E-mail: mberganza@sanrafael.com.gt

Address: Bulvar los Pinos 18 calle 24-693.10
Zona Empresarial Zona Pradera Torre IV J1406
Telephone: (502) 5951 5248

Copy of Report to:

Name: Charlie Muehloff
Company: Tahoe Resources Inc.

E-mail: cmuehloff@tahoeresourcesinc.com
Telephone:

Invoice to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: mberganza@sanrafael.com.gt

Address:
Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring? Yes No

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: Susana Roche Sampler's site information State: Zip code Time Zone

Check box if observe Daylight Savings Time

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: Water Quality
PO#: Escobal
Reporting state for compliance testing:
Check box if samples include NRC licensed material?

Table with columns for # of Containers and analysis results. Includes handwritten '3' and 'EQ' in the # of Containers column.

Table with columns for SAMPLE IDENTIFICATION, DATE:TIME, Matrix, and # of Containers. Includes rows for MW20, MW21, PSA-1, PSASR, and HWI.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns for RELINQUISHED BY, DATE:TIME, RECEIVED BY, and DATE:TIME. Includes signatures and dates for Fernando Barron and Erick Hoell.



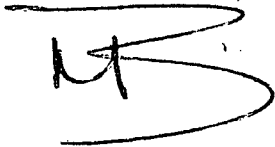
Guatemala December 10th, 2013

To whom it may concern:

Minera San Rafael, S.A is sending a case with samples of water, which is not contaminated, that are going to be analyzed by the ACZ Laboratories in Steamboat Springs, Colorado, USA.

If you have any question or doubt, please contact Miguel Berganza at Minera San Rafael, S.A. (502 - 5951-5248) or Sue Webber at ACZ Laboratories (970-879-6590).

Best regards,

A handwritten signature in black ink, consisting of a stylized 'M' and 'B' with a horizontal line above and below the letters.

Miguel Berganza
Environment Department.
Proyecto Escobal, S. A.

January 07, 2014

Report to:

Miguel Berganza

Tahoe Resources, Inc.

Km 8.6 carrtera Antigua a El Salvador

Centro corporativo Muxbal

Torre Oeste.Apto 503y504 Guatemala, GT

Bill to:

Miguel Berganza

Tahoe Resources, Inc.

5310 Kietzke Lane

Suite 200

Reno, NV 89511

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L16120

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 19, 2013. This project has been assigned to ACZ's project number, L16120. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L16120. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

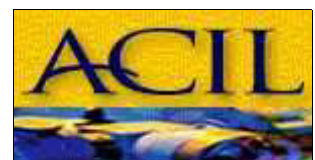
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after February 06, 2014. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and approved this report.



Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: RW1

ACZ Sample ID: **L16120-01**
 Date Sampled: 12/17/13 07:45
 Date Received: 12/19/13
 Sample Matrix: Ground Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|-------------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/26/13 14:02 | tcd |
| Cyanide, WAD | SM4500-CN I- distillation | | | | | | | | 12/27/13 12:38 | jif |
| Nitrogen, total Kjeldahl | M351.2 - Block Digestor | | | | | | | | 01/02/14 16:04 | tcd/mp b |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/27/13 11:06 | jif |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 12/30/13 16:13 | mpb/bs u |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------------|---------------|----------|--------|------|----|-------|---------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 1 | 0.04 | B | | mg/L | 0.03 | 0.2 | 12/31/13 11:53 | aeb |
| Antimony, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0004 | 0.002 | 12/27/13 19:58 | msh |
| Arsenic, dissolved | M200.8 ICP-MS | 1 | 0.0012 | | | mg/L | 0.0002 | 0.001 | 12/27/13 19:58 | msh |
| Barium, dissolved | M200.7 ICP | 1 | 0.239 | | | mg/L | 0.003 | 0.02 | 12/31/13 11:53 | aeb |
| Beryllium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/31/13 11:53 | aeb |
| Bismuth, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.04 | 0.2 | 12/31/13 11:53 | aeb |
| Boron, dissolved | M200.7 ICP | 1 | 0.01 | B | | mg/L | 0.01 | 0.05 | 12/31/13 11:53 | aeb |
| Cadmium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/27/13 19:58 | msh |
| Calcium, dissolved | M200.7 ICP | 1 | 51.4 | | | mg/L | 0.2 | 1 | 12/31/13 11:53 | aeb |
| Chromium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/31/13 11:53 | aeb |
| Cobalt, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/31/13 11:53 | aeb |
| Copper, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/31/13 11:53 | aeb |
| Gallium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/31/13 11:53 | aeb |
| Iron, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.05 | 12/31/13 11:53 | aeb |
| Lead, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/27/13 19:58 | msh |
| Lithium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/31/13 11:53 | aeb |
| Magnesium, dissolved | M200.7 ICP | 1 | 6.7 | | | mg/L | 0.2 | 1 | 12/31/13 11:53 | aeb |
| Manganese, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/31/13 11:53 | aeb |
| Mercury, dissolved | M245.1 CVAA | 1 | | U | | mg/L | 0.0002 | 0.001 | 12/30/13 13:35 | mfm |
| Molybdenum, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.02 | 0.1 | 12/31/13 11:53 | aeb |
| Nickel, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.01 | 0.05 | 12/31/13 11:53 | aeb |
| Potassium, dissolved | M200.7 ICP | 1 | 11.9 | | | mg/L | 0.3 | 2 | 12/31/13 11:53 | aeb |
| Scandium, dissolved | M200.7 ICP | 1 | | U | * | mg/L | 0.1 | 0.5 | 12/31/13 11:53 | aeb |
| Selenium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0003 | 12/27/13 19:58 | msh |
| Silver, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.00005 | 0.0003 | 12/31/13 1:17 | msh |
| Sodium, dissolved | M200.7 ICP | 1 | 17.7 | | | mg/L | 0.3 | 2 | 12/31/13 11:53 | aeb |
| Strontium, dissolved | M200.7 ICP | 1 | 0.41 | | | mg/L | 0.01 | 0.05 | 12/31/13 11:53 | aeb |
| Thallium, dissolved | M200.8 ICP-MS | 1 | | U | | mg/L | 0.0001 | 0.0005 | 12/27/13 19:58 | msh |
| Tin, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.1 | 0.5 | 12/31/13 11:53 | aeb |
| Titanium, dissolved | M200.7 ICP | 1 | 0.006 | B | | mg/L | 0.005 | 0.03 | 12/31/13 11:53 | aeb |
| Uranium, dissolved | M200.8 ICP-MS | 1 | 0.0001 | B | | mg/L | 0.0001 | 0.0005 | 12/27/13 19:58 | msh |
| Vanadium, dissolved | M200.7 ICP | 1 | | U | | mg/L | 0.005 | 0.03 | 12/31/13 11:53 | aeb |
| Zinc, dissolved | M200.7 ICP | 1 | 0.02 | B | | mg/L | 0.01 | 0.05 | 12/31/13 11:53 | aeb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: RW1

ACZ Sample ID: **L16120-01**
 Date Sampled: 12/17/13 07:45
 Date Received: 12/19/13
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|---|----------|--------|------|----|----------|-------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | | | |
| Bicarbonate as CaCO3 | | 1 | 89 | | * | mg/L | 2 | 20 | 12/21/13 0:00 | khw |
| Carbonate as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/21/13 0:00 | khw |
| Hydroxide as CaCO3 | | 1 | | U | * | mg/L | 2 | 20 | 12/21/13 0:00 | khw |
| Total Alkalinity | | 1 | 89 | | * | mg/L | 2 | 20 | 12/21/13 0:00 | khw |
| Cation-Anion Balance | Calculation | | | | | | | | | |
| Cation-Anion Balance | | | 1.2 | | | % | | | 01/06/14 16:26 | calc |
| Sum of Anions | | | 4.1 | | | meq/L | 0.1 | 0.5 | 01/06/14 16:26 | calc |
| Sum of Cations | | | 4.2 | | | meq/L | 0.1 | 0.5 | 01/06/14 16:26 | calc |
| Chloride | SM4500Cl-E | 1 | 11 | | * | mg/L | 1 | 5 | 12/27/13 15:48 | mpb |
| Conductivity @25C | SM2510B | 1 | 447 | | * | umhos/cm | 1 | 10 | 12/21/13 20:50 | khw |
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/28/13 15:41 | pjb |
| Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/28/13 16:06 | pjb |
| Fluoride | SM4500F-C | 1 | 0.1 | B | * | mg/L | 0.1 | 0.5 | 12/23/13 12:53 | abm |
| Hardness as CaCO3 | SM2340B - Calculation | | 156 | | | mg/L | 1 | 7 | 01/06/14 16:26 | calc |
| Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | 1 | 2.91 | | * | mg/L | 0.02 | 0.1 | 01/03/14 0:55 | pjb |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 1 | | U | * | mg/L | 0.05 | 0.5 | 12/26/13 17:00 | jif |
| Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | 1 | 0.2 | B | * | mg/L | 0.1 | 0.5 | 01/04/14 14:33 | pjb |
| pH (lab) | SM4500H+ B | | | | | | | | | |
| pH | | 1 | 8.2 | H | * | units | 0.1 | 0.1 | 12/21/13 0:00 | khw |
| pH measured at | | 1 | 23 | | * | C | 0.1 | 0.1 | 12/21/13 0:00 | khw |
| Phosphate | Calculation based on dissolved Phosphorus | | 0.19 | | | mg/L | 0.03 | 0.15 | 01/06/14 16:26 | calc |
| Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.06 | | * | mg/L | 0.01 | 0.05 | 12/31/13 12:06 | mpb |
| Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | 1 | 0.08 | H | * | mg/L | 0.01 | 0.05 | 12/21/13 15:16 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 1 | 0.07 | | * | mg/L | 0.01 | 0.05 | 12/31/13 13:28 | mpb |
| Residue, Filterable (TDS) @180C | SM2540C | 1 | 300 | | * | mg/L | 10 | 20 | 12/20/13 16:34 | dcw |
| Residue, Non-Filterable (TSS) @105C | SM2540D | 1 | 6 | B | * | mg/L | 5 | 20 | 12/20/13 16:05 | id |
| Residue, Total (TS) @ 105C | SM2540B | 1 | 320 | | * | mg/L | 10 | 20 | 12/20/13 15:18 | khw |
| Sulfate | D516-02 - Turbidimetric | 5 | 95.7 | | * | mg/L | 5 | 25 | 01/02/14 15:20 | bsu |
| Sulfide as S | SM4500S2-D | 1 | | U | * | mg/L | 0.02 | 0.1 | 12/20/13 13:31 | abm |
| TDS (calculated) | Calculation | | 248 | | | mg/L | 10 | 50 | 01/06/14 16:26 | calc |
| TDS (ratio - measured/calculated) | Calculation | | 1.21 | | | | | | 01/06/14 16:26 | calc |



Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|--------------|--|--------------|--|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LCSWD</i> | Laboratory Control Sample - Water Duplicate |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFB</i> | Laboratory Fortified Blank |
| <i>CCB</i> | Continuing Calibration Blank | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>CCV</i> | Continuing Calibration Verification standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>ICB</i> | Initial Calibration Blank | <i>MS</i> | Matrix Spike |
| <i>ICV</i> | Initial Calibration Verification standard | <i>MSD</i> | Matrix Spike Duplicate |
| <i>ICSAB</i> | Inter-element Correction Standard - A plus B solutions | <i>PBS</i> | Prep Blank - Soil |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>PBW</i> | Prep Blank - Water |
| <i>LCSSD</i> | Laboratory Control Sample - Soil Duplicate | <i>PQV</i> | Practical Quantitation Verification standard |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>SDL</i> | Serial Dilution |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |
| Standard | Verifies the validity of the calibration. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L16120**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|------------|-------------------------------------|---|---|---|---|
| L16120-01 | WG356783 | Bicarbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | Carbonate as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG356993 | Chloride | SM4500CI-E | Q6 | Sample was received above recommended temperature. |
| | WG356783 | Conductivity @25C | SM2510B | Q6 | Sample was received above recommended temperature. |
| | WG357016 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357017 | Cyanide, WAD | SM4500-CN I-Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | SM4500-CN I-Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356835 | Fluoride | SM4500F-C | Q6 | Sample was received above recommended temperature. |
| | | | SM4500F-C | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356783 | Hydroxide as CaCO3 | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | WG357229 | Nitrate/Nitrite as N | M353.2 - H2SO4 preserved | Q6 | Sample was received above recommended temperature. |
| | | | M353.2 - H2SO4 preserved | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356939 | Nitrogen, ammonia | M350.1 - Automated Phenate | Q6 | Sample was received above recommended temperature. |
| | | | M350.1 - Automated Phenate | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357299 | Nitrogen, total Kjeldahl | M351.2 - TKN by Block Digester | M1 | Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M351.2 - TKN by Block Digester | Q6 | Sample was received above recommended temperature. |
| | WG356783 | pH | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| | WG357112 | pH measured at | SM4500H+ B | Q6 | Sample was received above recommended temperature. |
| SM4500H+ B | | | Q6 | Sample was received above recommended temperature. | |
| WG357112 | Phosphorus, dissolved | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| | | M365.1 - Auto Ascorbic Acid (digest) | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356831 | Phosphorus, ortho dissolved | M365.1 - Automated Ascorbic Acid | H3 | Sample was received and analyzed past holding time. | |
| | | M365.1 - Automated Ascorbic Acid | Q6 | Sample was received above recommended temperature. | |
| | | M365.1 - Automated Ascorbic Acid | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG357123 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | Q6 | Sample was received above recommended temperature. | |
| WG356804 | Residue, Filterable (TDS) @180C | SM2540C | Q6 | Sample was received above recommended temperature. | |
| WG356797 | Residue, Non-Filterable (TSS) @105C | SM2540D | Q6 | Sample was received above recommended temperature. | |
| | | SM2540D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG356795 | Residue, Total (TS) @ 105C | SM2540B | Q6 | Sample was received above recommended temperature. | |
| | | SM2540B | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG357194 | Sulfate | D516-02 - Turbidimetric | Q6 | Sample was received above recommended temperature. | |
| | | D516-02 - Turbidimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |

Tahoe Resources, Inc.

ACZ Project ID: **L16120**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------|----------|------------------|---------------------|------|---|
| | WG356778 | Sulfide as S | SM4500S2-D | Q6 | Sample was received above recommended temperature. |
| | | | SM4500S2-D | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG356783 | Total Alkalinity | SM2320B - Titration | Q6 | Sample was received above recommended temperature. |
| | | | SM2320B - Titration | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |

Tahoe Resources, Inc.

ACZ Project ID: **L16120**

Metals Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|---------------------|------------|
| Bismuth, dissolved | M200.7 ICP |
| Gallium, dissolved | M200.7 ICP |
| Scandium, dissolved | M200.7 ICP |

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|--------------|------------|
| Sulfide as S | SM4500S2-D |
|--------------|------------|

Tahoe Resources, Inc.
 Escobal

ACZ Project ID: L16120
 Date Received: 12/19/2013 12:08
 Received By: mtb
 Date Printed: 12/20/2013

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | | | X |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? | | X | |

Samples/Containers

| | YES | NO | NA |
|--|-----|----|----|
| 8) Are all containers intact and with no leaks? | X | | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | X | | |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? | | X | |

Some parameters were received past hold time.

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| 3405 | 14.1 | 11 | N/A |

Was ice present in the shipment container(s)?

Yes - Gel ice was present in the shipment container(s) but was thawed by receipt at ACZ.

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.



Laboratories, Inc.

L1620

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: mberganza@sanrafael.com.gt

Address: Boulevard los Proceres 18 calle 24-69 z. 10
Tona Empresarial, Zona Industrial, Torre IV of 1406
Telephone: (502) 5951 5248

Copy of Report to:

Name: Charlie Muehoff
Company: Tahoe Resources Inc.

E-mail: cmuehoff@tahoeresources.com
Telephone:

Invoice to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: mberganza@sanrafael.com.gt

Address:
Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring? Yes No

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: Susana Arcoche Sampler's site Information State: Zip code Time Zone

Check box if observe Daylight Savings Time

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: Water Quality
PO#: Escobal
Reporting state for compliance testing:
Check box if samples include NRC licensed material?

Table with columns for # of Containers, Matrix, and various analysis results. Includes handwritten 'GW' and a checkmark.

Table with columns: SAMPLE IDENTIFICATION, DATE:TIME, Matrix. Includes handwritten 'RWI', '17/12/13 09:45', and 'GW'.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

EMARKS

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY: DATE:TIME RECEIVED BY: DATE:TIME

Handwritten signatures and dates: Fernanda Camojo, 17/12/13 17:00, Frances, 17.12.13 17:00, 12.12.13 12:08

16120 Chain of Custody

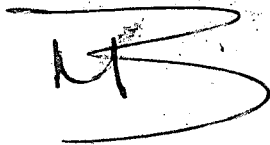
Guatemala December 17th, 2013

To whom it may concern:

Minera San Rafael, S.A is sending a case with samples of water, which is not contaminated, that are going to be analyzed by the ACZ Laboratories in Steamboat Springs, Colorado, USA.

If you have any question or doubt, please contact Miguel Berganza at Minera San Rafael, S.A. (502 - 5951-5248) or Sue Webber at ACZ Laboratories (970-879-6590).

Best regards,

A handwritten signature in black ink, consisting of a stylized 'M' and 'B' intertwined, with a horizontal line above and below the letters.

Miguel Berganza
Environment Department.
Proyecto Escobal, S. A.

REG 016 Resultados de Análisis

Muestras: 12 muestras de agua
 Análisis solicitado por: Ing. Miguel Berganza
 Dirección: Km. 97.5 carretera Mataquesuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa
 Procedencia de la muestra: Proyecto Escobal
 Fecha de muestreo: 101213
 Fecha de ingreso de muestras: 111213
 Fecha de análisis: 111213-181213
 Fecha de informe: 181213

Resultados:

| Correlativo Ecosistemas | Identificación de la Muestra | Color Aparente (UC HZ equiv. Unid. Pt-Co) | Color Real (UC HZ equiv. Unid. Pt-Co) | Cromo Hexavalente Cr(VI) mg/L | * Coliformes Fecales (NMP/100ml) |
|-------------------------|------------------------------|---|---------------------------------------|-------------------------------|----------------------------------|
| 3221 | MW2 | 19 | < 1 | N.D. | 6.8 |
| 3222 | MW3 | < 1 | < 1 | N.D. | 4.5 |
| 3223 | MW4 | < 1 | < 1 | N.D. | 240 |
| 3224 | MW5 | < 1 | < 1 | N.D. | 23 |
| 3225 | MW6 | < 1 | < 1 | N.D. | 4.5 |
| 3226 | MW7 | 5 | < 1 | N.D. | 1.6 x 10 ⁴ |
| 3227 | MW8 | < 1 | < 1 | N.D. | 4.5 |
| 3228 | MW9 | 325 | 89 | N.D. | < 2 |
| 3229 | MW20 | < 1 | < 1 | N.D. | < 2 |
| 3230 | MW21 | 246 | 107 | N.D. | 4.5 |
| 3231 | GW1A | 410 | 67 | N.D. | 1.7 x 10 ³ |
| 3232 | PSA-1 | 485 | < 1 | N.D. | < 2 |

Notas:

Captación de muestras: Las muestras fueron captadas por personal ajeno a Ecosistemas.

Transporte y preservación de la muestra: Refrigeración.

Metodología: Espectrofotométricos / SMWW: Standard Methods for water and wastewater APHA, AWWA, 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977.

Fotométricos Merck. NMP: Número Mas Probable.

N.D. No detectable. Debajo del límite de detección.

Límites de detección: Cromo hexavalente (0.05 mg/L)

Los resultados obtenidos corresponden únicamente a las muestras recibidas por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

** Análisis referidos.*



Ing. Fernando Fuentes
Gerente Técnico

REG 016 Resultados de Análisis

Muestras: 8 muestras de agua
 Análisis solicitado por: Ing. Miguel Berganza
 Dirección: Km. 97.5 carretera Mataquescuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa
 Procedencia de la muestra: Proyecto Escobal
 Fecha de muestreo: 091213
 Fecha de ingreso de muestras: 101213
 Fecha de análisis: 101213-181213
 Fecha de informe: 181213

Resultados:

| Correlativo Ecosistemas | Identificación de la Muestra | Color Aparente (UC HZ equiv. Unid. Pt-Co) | Color Real (UC HZ equiv. Unid. Pt-Co) | Cromo Hexavalente Cr(VI) mg/L | * Coliformes Fecales (NMP/100ml) |
|-------------------------|------------------------------|---|---------------------------------------|-------------------------------|----------------------------------|
| 3209 | GW2 | 137 | 7 | N.D. | 94 |
| 3210 | GW3 | < 1 | < 1 | N.D. | < 2 |
| 3211 | GW4 | 1202 | 729 | N.D. | 94 |
| 3212 | GW5 | 776 | 438 | N.D. | 23 |
| 3216 | GW10 | < 1 | < 1 | N.D. | < 2 |
| 3217 | GW11 | < 1 | < 1 | N.D. | < 2 |
| 3218 | PSASR | < 1 | < 1 | N.D. | < 2 |
| 3219 | HW1 | < 1 | < 1 | N.D. | < 2 |

Notas:

Captación de muestras: Las muestras fueron captadas por personal ajeno a Ecosistemas

Transporte y preservación de la muestra: Refrigeración.

Metodología: Espectrofotométricos / SMWW: Standard Methods for water and wastewater APHA, AWWA, 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977.

Se trabajaron diluciones.

Fotométricos Merck. NMP: Número Mas Probable.

N.D. No detectable. Debajo del límite de detección.

Límites de detección: Cromo hexavalente (0.05 mg/L)

Los resultados obtenidos corresponden únicamente a las muestras recibidas por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

* Análisis referidos.



Ing. Fernando Fuentes
Gerente Técnico

REG 016 Resultados de Análisis

Muestra: 1 muestra de agua simple
Análisis solicitado por: Ing. Miguel Berganza
Dirección: Km. 97.5 carretera Mataquescuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa
Procedencia de la muestra: Proyecto Escobal
Fecha de muestreo: 171213
Fecha de ingreso de muestras: 181213
Fecha de análisis: 181213-020114
Fecha de informe: 030114

Resultados:

| Correlativo Ecosistemas | Identificación de la Muestra | Color Aparente (UC HZ equiv. Unid. Pt-Co) | Color Real (UC HZ equiv. Unid. Pt-Co) | Demanda Bioquímica de Oxígeno DBO ₅ mg/L | * Demanda Química de Oxígeno DQO mg/L | Cromo Hexavalente Cr(VI) mg/L | ** Coliformes Fecales (NMP/100ml) |
|-------------------------|------------------------------|---|---------------------------------------|---|---------------------------------------|-------------------------------|-----------------------------------|
| 3361 | RW1 | 74 | < 1 | < 10 | < 25 | N.D | 580 |

Notas:

Captación de muestras: Las muestras fueron captadas por personal ajeno a Ecosistemas Proyectos Ambientales.

Transporte y preservación de la muestra: Refrigeración.

Metodología: Espectrofotométricos / SMWW: Standard Methods for water and wastewater APHA, AWWA, 22 edic. Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977.

Fotométricos Merck. NMP: Número Mas Probable.

N.D. No detectable. Debajo del límite de detección.

Límites de detección: Cromo hexavalente (0.05 mg/L)

Los resultados obtenidos corresponden únicamente a las muestras recibidas por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

** Análisis acreditado COGUANOR NGR/COPANT/ISO/IEC 17025 según OGA LE 006-04*

*** Análisis referido.*



Ing. Silvia Argueta
Gerente de Calidad.

11.6 Informes Originales de los Resultados Analíticos Obtenidos del muestreo de sedimentos, Diciembre 2013.

January 16, 2014

Report to:

Miguel Berganza
Tahoe Resources, Inc.
Boulevard Los Proceres 18 c. 24-69 zona 10
Centro
Corporativo Zona Pradera, Torre 4 Of. 1408 Guatemala

Bill to:

Miguel Berganza
Tahoe Resources, Inc.
Boulevard Los Proceres 18 c. 24-69 zona 10
Centro
Corporativo Zona Pradera, Torre 4 Of. 1408 Guatemala

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L16203

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 27, 2013. This project has been assigned to ACZ's project number, L16203. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L16203. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

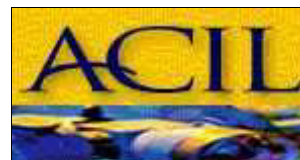
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after February 15, 2014. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and approved this report.



Tahoe Resources, Inc.

January 16, 2014

Project ID: Escobal

ACZ Project ID: L16203

Sample Receipt

ACZ Laboratories, Inc. (ACZ) received 11 sediment samples from Tahoe Resources, Inc. on December 27, 2013. The samples were received in good condition. Upon receipt, the sample custodian removed the samples from the cooler, inspected the contents, and logged the samples into ACZ's computerized Laboratory Information Management System (LIMS). The samples were assigned ACZ LIMS project number L16203. The custodian verified the sample information entered into the computer against the chain of custody (COC) forms and sample bottle labels.

Holding Times

All analyses were performed within EPA recommended holding times except for parameters flagged with "H" flags (H1, H3), received either after the hold time expired or too close to the hold time.

Sample Analysis

These samples were analyzed for inorganic parameters. The individual methods are referenced on both, the ACZ invoice and the analytical reports. The following anomaly required further explanation not provided by the Extended Qualifier Report:

1. For Total Manganese values flagged with an "N1", the ICSA recovered high. No further action was taken since a better quality standard is not available and manganese is not considered an interferent.

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SED-1

ACZ Sample ID: **L16203-01**
Date Sampled: 12/05/13 14:05
Date Received: 12/27/13
Sample Matrix: *Sediment*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M9013 - Manual Distillation | | | | | | | | 01/10/14 14:20 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 01/08/14 11:36 | bsu |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|--------------|----------|--------|------|----|-------|------|-----|----------------|---------|
| Aluminum, total (3050) | M6020 ICP-MS | 20200 | 11900 | | * | mg/Kg | 20 | 100 | 01/14/14 0:07 | msh |
| Antimony, total (3050) | M6020 ICP-MS | 505 | 0.8 | B | * | mg/Kg | 0.2 | 1 | 01/10/14 21:50 | msh |
| Arsenic, total (3050) | M6020 ICP-MS | 505 | 15.2 | | | mg/Kg | 0.1 | 0.5 | 01/10/14 21:50 | msh |
| Barium, total (3050) | M6020 ICP-MS | 505 | 223 | | | mg/Kg | 0.3 | 1 | 01/10/14 21:50 | msh |
| Boron, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 1 | 5 | 01/09/14 22:37 | aeb |
| Cadmium, total (3050) | M6020 ICP-MS | 505 | 0.29 | B | | mg/Kg | 0.05 | 0.3 | 01/10/14 21:50 | msh |
| Calcium, total (3050) | M6010B ICP | 101 | 3420 | | | mg/Kg | 20 | 100 | 01/09/14 22:37 | aeb |
| Chromium, total (3050) | M6020 ICP-MS | 505 | 3.8 | | * | mg/Kg | 0.3 | 1 | 01/10/14 21:50 | msh |
| Copper, total (3050) | M6020 ICP-MS | 505 | 11.5 | | | mg/Kg | 0.3 | 1 | 01/10/14 21:50 | msh |
| Iron, total (3050) | M6010B ICP | 101 | 14500 | | * | mg/Kg | 2 | 5 | 01/09/14 22:37 | aeb |
| Lead, total (3050) | M6020 ICP-MS | 505 | 14.60 | | * | mg/Kg | 0.05 | 0.3 | 01/10/14 21:50 | msh |
| Magnesium, total (3050) | M6010B ICP | 101 | 1290 | | | mg/Kg | 20 | 100 | 01/09/14 22:37 | aeb |
| Manganese, total (3050) | M6020 ICP-MS | 20200 | 830 | | * | mg/Kg | 10 | 50 | 01/14/14 0:07 | msh |
| Mercury, total | M7471A CVAA | 262 | 0.06 | B | * | mg/Kg | 0.05 | 0.3 | 12/31/13 10:51 | mfm |
| Molybdenum, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 2 | 10 | 01/09/14 22:37 | aeb |
| Nickel, total (3050) | M6020 ICP-MS | 505 | 5.6 | | | mg/Kg | 0.3 | 2 | 01/10/14 21:50 | msh |
| Potassium, total (3050) | M6010B ICP | 101 | 2190 | | | mg/Kg | 30 | 200 | 01/09/14 22:37 | aeb |
| Selenium, total (3050) | M6020 ICP-MS | 505 | 0.14 | | | mg/Kg | 0.05 | 0.1 | 01/10/14 21:50 | msh |
| Silver, total (3050) | M6020 ICP-MS | 505 | 0.10 | | | mg/Kg | 0.03 | 0.1 | 01/10/14 21:50 | msh |
| Zinc, total (3050) | M6020 ICP-MS | 505 | 44 | | * | mg/Kg | 1 | 3 | 01/10/14 21:50 | msh |

Soil Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------|-------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Solids, Percent | CLPSOW390, PART F, D-98 | 1 | 72.1 | | * | % | 0.1 | 0.5 | 01/06/14 15:22 | mss2 |

Soil Preparation

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------|--------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Air Dry at 34 Degrees C | USDA No. 1, 1972 | | | | | | | | 01/06/14 14:00 | mss2 |
| Digestion - Hot Plate | M3050B ICP | | | | | | | | 01/08/14 12:15 | cdb |
| Digestion - Hot Plate | M3050B ICP-MS | | | | | | | | 01/08/14 12:15 | cdb |
| Sieve-2000 um (2.0mm) | ASA No.9, 15-4.2.2 | | | | | | | | 01/08/14 10:00 | cdb |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: SED-1

ACZ Sample ID: **L16203-01**

Date Sampled: 12/05/13 14:05

Date Received: 12/27/13

Sample Matrix: *Sediment*

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|--------------------------------------|----------|--------|------|----|-------|-------|------|----------------|---------|
| Cyanide, total | M9012B - Automated Colorimetric | 31.5 | | UH | * | mg/Kg | 0.2 | 0.8 | 01/11/14 13:02 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 200 | 0.016 | H | * | % | 0.002 | 0.01 | 01/09/14 14:44 | bsu |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SED-2

ACZ Sample ID: **L16203-02**
Date Sampled: 12/16/13 12:00
Date Received: 12/27/13
Sample Matrix: *Sediment*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M9013 - Manual Distillation | | | | | | | | 01/10/14 14:30 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 01/08/14 12:13 | bsu |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|--------------|----------|--------|------|----|-------|------|-----|----------------|---------|
| Aluminum, total (3050) | M6020 ICP-MS | 10100 | 8340 | | * | mg/Kg | 10 | 50 | 01/14/14 0:14 | msh |
| Antimony, total (3050) | M6020 ICP-MS | 505 | 3.7 | | * | mg/Kg | 0.2 | 1 | 01/10/14 21:57 | msh |
| Arsenic, total (3050) | M6020 ICP-MS | 505 | 66.9 | | | mg/Kg | 0.1 | 0.5 | 01/10/14 21:57 | msh |
| Barium, total (3050) | M6020 ICP-MS | 505 | 136 | | | mg/Kg | 0.3 | 1 | 01/10/14 21:57 | msh |
| Boron, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 1 | 5 | 01/09/14 22:46 | aeb |
| Cadmium, total (3050) | M6020 ICP-MS | 505 | 3.30 | | | mg/Kg | 0.05 | 0.3 | 01/10/14 21:57 | msh |
| Calcium, total (3050) | M6010B ICP | 505 | 99400 | | | mg/Kg | 100 | 500 | 01/10/14 11:56 | aeb |
| Chromium, total (3050) | M6020 ICP-MS | 505 | 4.1 | | * | mg/Kg | 0.3 | 1 | 01/10/14 21:57 | msh |
| Copper, total (3050) | M6020 ICP-MS | 505 | 15.6 | | | mg/Kg | 0.3 | 1 | 01/10/14 21:57 | msh |
| Iron, total (3050) | M6010B ICP | 101 | 15800 | | * | mg/Kg | 2 | 5 | 01/09/14 22:46 | aeb |
| Lead, total (3050) | M6020 ICP-MS | 505 | 178 | | * | mg/Kg | 0.05 | 0.3 | 01/10/14 21:57 | msh |
| Magnesium, total (3050) | M6010B ICP | 101 | 2610 | | | mg/Kg | 20 | 100 | 01/09/14 22:46 | aeb |
| Manganese, total (3050) | M6020 ICP-MS | 20200 | 2660 | | * | mg/Kg | 10 | 50 | 01/14/14 18:18 | msh |
| Mercury, total | M7471A CVAA | 281 | 0.07 | B | | mg/Kg | 0.06 | 0.3 | 01/03/14 13:20 | mfm |
| Molybdenum, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 2 | 10 | 01/09/14 22:46 | aeb |
| Nickel, total (3050) | M6020 ICP-MS | 505 | 4 | | | mg/Kg | 0.3 | 2 | 01/10/14 21:57 | msh |
| Potassium, total (3050) | M6010B ICP | 101 | 1490 | | | mg/Kg | 30 | 200 | 01/09/14 22:46 | aeb |
| Selenium, total (3050) | M6020 ICP-MS | 505 | 0.09 | B | | mg/Kg | 0.05 | 0.1 | 01/10/14 21:57 | msh |
| Silver, total (3050) | M6020 ICP-MS | 505 | 11.10 | | | mg/Kg | 0.03 | 0.1 | 01/10/14 21:57 | msh |
| Zinc, total (3050) | M6020 ICP-MS | 10100 | 1170 | | * | mg/Kg | 20 | 50 | 01/14/14 0:14 | msh |

Soil Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------|-------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Solids, Percent | CLPSOW390, PART F, D-98 | 1 | 59.7 | | * | % | 0.1 | 0.5 | 01/06/14 18:07 | mss2 |

Soil Preparation

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------|--------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Air Dry at 34 Degrees C | USDA No. 1, 1972 | | | | | | | | 01/06/14 14:04 | mss2 |
| Digestion - Hot Plate | M3050B ICP-MS | | | | | | | | 01/08/14 13:00 | cdb |
| Digestion - Hot Plate | M3050B ICP | | | | | | | | 01/08/14 13:00 | cdb |
| Sieve-2000 um (2.0mm) | ASA No.9, 15-4.2.2 | | | | | | | | 01/08/14 10:04 | cdb |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: SED-2

ACZ Sample ID: **L16203-02**

Date Sampled: 12/16/13 12:00

Date Received: 12/27/13

Sample Matrix: *Sediment*

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|--------------------------------------|----------|--------|------|----|-------|-------|-------|----------------|---------|
| Cyanide, total | M9012B - Automated Colorimetric | 34.3 | | UH | * | mg/Kg | 0.2 | 0.9 | 01/11/14 13:02 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 130 | 0.023 | | * | % | 0.001 | 0.007 | 01/09/14 15:00 | bsu |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SED-3

ACZ Sample ID: **L16203-03**
Date Sampled: 12/16/13 11:30
Date Received: 12/27/13
Sample Matrix: *Sediment*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M9013 - Manual Distillation | | | | | | | | 01/10/14 14:40 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 01/08/14 12:50 | bsu |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|--------------|----------|--------|------|----|-------|------|-----|----------------|---------|
| Aluminum, total (3050) | M6020 ICP-MS | 10100 | 7030 | | * | mg/Kg | 10 | 50 | 01/14/14 0:25 | msh |
| Antimony, total (3050) | M6020 ICP-MS | 505 | 1.8 | | * | mg/Kg | 0.2 | 1 | 01/10/14 22:07 | msh |
| Arsenic, total (3050) | M6020 ICP-MS | 505 | 13.7 | | | mg/Kg | 0.1 | 0.5 | 01/10/14 22:07 | msh |
| Barium, total (3050) | M6020 ICP-MS | 505 | 150 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:07 | msh |
| Boron, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 1 | 5 | 01/09/14 22:50 | aeb |
| Cadmium, total (3050) | M6020 ICP-MS | 505 | 0.17 | B | | mg/Kg | 0.05 | 0.3 | 01/10/14 22:07 | msh |
| Calcium, total (3050) | M6010B ICP | 101 | 3280 | | | mg/Kg | 20 | 100 | 01/09/14 22:50 | aeb |
| Chromium, total (3050) | M6020 ICP-MS | 505 | 2.9 | | * | mg/Kg | 0.3 | 1 | 01/10/14 22:07 | msh |
| Copper, total (3050) | M6020 ICP-MS | 505 | 5.1 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:07 | msh |
| Iron, total (3050) | M6010B ICP | 101 | 9410 | | * | mg/Kg | 2 | 5 | 01/09/14 22:50 | aeb |
| Lead, total (3050) | M6020 ICP-MS | 505 | 14.30 | | * | mg/Kg | 0.05 | 0.3 | 01/10/14 22:07 | msh |
| Magnesium, total (3050) | M6010B ICP | 101 | 770 | | | mg/Kg | 20 | 100 | 01/09/14 22:50 | aeb |
| Manganese, total (3050) | M6020 ICP-MS | 10100 | 943 | | * | mg/Kg | 5 | 30 | 01/14/14 0:25 | msh |
| Mercury, total | M7471A CVAA | 231 | | U | | mg/Kg | 0.05 | 0.2 | 01/03/14 13:26 | mfm |
| Molybdenum, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 2 | 10 | 01/09/14 22:50 | aeb |
| Nickel, total (3050) | M6020 ICP-MS | 505 | 2.6 | | | mg/Kg | 0.3 | 2 | 01/10/14 22:07 | msh |
| Potassium, total (3050) | M6010B ICP | 101 | 1810 | | | mg/Kg | 30 | 200 | 01/09/14 22:50 | aeb |
| Selenium, total (3050) | M6020 ICP-MS | 505 | 0.05 | B | | mg/Kg | 0.05 | 0.1 | 01/10/14 22:07 | msh |
| Silver, total (3050) | M6020 ICP-MS | 505 | 0.04 | B | | mg/Kg | 0.03 | 0.1 | 01/10/14 22:07 | msh |
| Zinc, total (3050) | M6020 ICP-MS | 505 | 29 | | * | mg/Kg | 1 | 3 | 01/10/14 22:07 | msh |

Soil Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------|-------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Solids, Percent | CLPSOW390, PART F, D-98 | 1 | 82.5 | | * | % | 0.1 | 0.5 | 01/06/14 19:30 | mss2 |

Soil Preparation

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------|--------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Air Dry at 34 Degrees C | USDA No. 1, 1972 | | | | | | | | 01/06/14 14:08 | mss2 |
| Digestion - Hot Plate | M3050B ICP | | | | | | | | 01/08/14 13:45 | cdb |
| Digestion - Hot Plate | M3050B ICP-MS | | | | | | | | 01/08/14 13:45 | cdb |
| Sieve-2000 um (2.0mm) | ASA No.9, 15-4.2.2 | | | | | | | | 01/08/14 10:08 | cdb |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: SED-3

ACZ Sample ID: **L16203-03**

Date Sampled: 12/16/13 11:30

Date Received: 12/27/13

Sample Matrix: *Sediment*

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|--------------------------------------|----------|--------|------|----|-------|-------|-------|----------------|---------|
| Cyanide, total | M9012B - Automated Colorimetric | 27.6 | | UH | * | mg/Kg | 0.1 | 0.7 | 01/11/14 13:03 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 110 | 0.007 | | * | % | 0.001 | 0.006 | 01/09/14 14:47 | bsu |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SED-4

ACZ Sample ID: **L16203-04**
Date Sampled: 12/16/13 11:00
Date Received: 12/27/13
Sample Matrix: *Sediment*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M9013 - Manual Distillation | | | | | | | | 01/10/14 14:50 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 01/08/14 13:08 | bsu |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|--------------|----------|--------|------|----|-------|------|-----|----------------|---------|
| Aluminum, total (3050) | M6020 ICP-MS | 10100 | 9240 | | * | mg/Kg | 10 | 50 | 01/14/14 0:35 | msh |
| Antimony, total (3050) | M6020 ICP-MS | 505 | 3.9 | | * | mg/Kg | 0.2 | 1 | 01/10/14 22:17 | msh |
| Arsenic, total (3050) | M6020 ICP-MS | 505 | 16.5 | | | mg/Kg | 0.1 | 0.5 | 01/10/14 22:17 | msh |
| Barium, total (3050) | M6020 ICP-MS | 505 | 153 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:17 | msh |
| Boron, total (3050) | M6010B ICP | 101 | 1 | B | | mg/Kg | 1 | 5 | 01/09/14 22:53 | aeb |
| Cadmium, total (3050) | M6020 ICP-MS | 505 | 0.25 | B | | mg/Kg | 0.05 | 0.3 | 01/10/14 22:17 | msh |
| Calcium, total (3050) | M6010B ICP | 101 | 4770 | | | mg/Kg | 20 | 100 | 01/09/14 22:53 | aeb |
| Chromium, total (3050) | M6020 ICP-MS | 505 | 4.2 | | * | mg/Kg | 0.3 | 1 | 01/10/14 22:17 | msh |
| Copper, total (3050) | M6020 ICP-MS | 505 | 6.2 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:17 | msh |
| Iron, total (3050) | M6010B ICP | 101 | 13400 | | * | mg/Kg | 2 | 5 | 01/09/14 22:53 | aeb |
| Lead, total (3050) | M6020 ICP-MS | 505 | 11.30 | | * | mg/Kg | 0.05 | 0.3 | 01/10/14 22:17 | msh |
| Magnesium, total (3050) | M6010B ICP | 101 | 1290 | | | mg/Kg | 20 | 100 | 01/09/14 22:53 | aeb |
| Manganese, total (3050) | M6020 ICP-MS | 10100 | 428 | | * | mg/Kg | 5 | 30 | 01/14/14 0:35 | msh |
| Mercury, total | M7471A CVAA | 276 | | U | | mg/Kg | 0.06 | 0.3 | 01/03/14 13:28 | mfm |
| Molybdenum, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 2 | 10 | 01/09/14 22:53 | aeb |
| Nickel, total (3050) | M6020 ICP-MS | 505 | 3.1 | | | mg/Kg | 0.3 | 2 | 01/10/14 22:17 | msh |
| Potassium, total (3050) | M6010B ICP | 101 | 1830 | | | mg/Kg | 30 | 200 | 01/09/14 22:53 | aeb |
| Selenium, total (3050) | M6020 ICP-MS | 505 | | U | | mg/Kg | 0.05 | 0.1 | 01/10/14 22:17 | msh |
| Silver, total (3050) | M6020 ICP-MS | 505 | 0.35 | | | mg/Kg | 0.03 | 0.1 | 01/10/14 22:17 | msh |
| Zinc, total (3050) | M6020 ICP-MS | 505 | 43 | | * | mg/Kg | 1 | 3 | 01/10/14 22:17 | msh |

Soil Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------|-------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Solids, Percent | CLPSOW390, PART F, D-98 | 1 | 64.4 | | * | % | 0.1 | 0.5 | 01/06/14 20:52 | mss2 |

Soil Preparation

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------|--------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Air Dry at 34 Degrees C | USDA No. 1, 1972 | | | | | | | | 01/06/14 14:12 | mss2 |
| Digestion - Hot Plate | M3050B ICP-MS | | | | | | | | 01/08/14 14:00 | cdb |
| Digestion - Hot Plate | M3050B ICP | | | | | | | | 01/08/14 14:00 | cdb |
| Sieve-2000 um (2.0mm) | ASA No.9, 15-4.2.2 | | | | | | | | 01/08/14 10:12 | cdb |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: SED-4

ACZ Sample ID: **L16203-04**

Date Sampled: 12/16/13 11:00

Date Received: 12/27/13

Sample Matrix: *Sediment*

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|--------------------------------------|----------|--------|------|----|-------|-------|-------|----------------|---------|
| Cyanide, total | M9012B - Automated Colorimetric | 28.8 | | UH | * | mg/Kg | 0.1 | 0.7 | 01/11/14 13:04 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 130 | 0.013 | | * | % | 0.001 | 0.007 | 01/09/14 14:48 | bsu |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SED-4A

ACZ Sample ID: **L16203-05**

Date Sampled: 12/16/13 00:00

Date Received: 12/27/13

Sample Matrix: *Sediment*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M9013 - Manual Distillation | | | | | | | | 01/10/14 15:00 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 01/08/14 13:26 | bsu |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|--------------|----------|--------|------|----|-------|------|-----|----------------|---------|
| Aluminum, total (3050) | M6020 ICP-MS | 20200 | 18300 | | * | mg/Kg | 20 | 100 | 01/14/14 0:38 | msh |
| Antimony, total (3050) | M6020 ICP-MS | 505 | 3 | | * | mg/Kg | 0.2 | 1 | 01/10/14 22:20 | msh |
| Arsenic, total (3050) | M6020 ICP-MS | 505 | 36 | | | mg/Kg | 0.1 | 0.5 | 01/10/14 22:20 | msh |
| Barium, total (3050) | M6020 ICP-MS | 505 | 224 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:20 | msh |
| Boron, total (3050) | M6010B ICP | 101 | 2 | B | | mg/Kg | 1 | 5 | 01/09/14 22:56 | aeb |
| Cadmium, total (3050) | M6020 ICP-MS | 505 | 1.01 | | | mg/Kg | 0.05 | 0.3 | 01/10/14 22:20 | msh |
| Calcium, total (3050) | M6010B ICP | 101 | 30700 | | | mg/Kg | 20 | 100 | 01/09/14 22:56 | aeb |
| Chromium, total (3050) | M6020 ICP-MS | 505 | 6.7 | | * | mg/Kg | 0.3 | 1 | 01/10/14 22:20 | msh |
| Copper, total (3050) | M6020 ICP-MS | 505 | 14.6 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:20 | msh |
| Iron, total (3050) | M6010B ICP | 101 | 18100 | | * | mg/Kg | 2 | 5 | 01/09/14 22:56 | aeb |
| Lead, total (3050) | M6020 ICP-MS | 505 | 56.70 | | * | mg/Kg | 0.05 | 0.3 | 01/10/14 22:20 | msh |
| Magnesium, total (3050) | M6010B ICP | 101 | 2060 | | | mg/Kg | 20 | 100 | 01/09/14 22:56 | aeb |
| Manganese, total (3050) | M6020 ICP-MS | 20200 | 2280 | | * | mg/Kg | 10 | 50 | 01/14/14 0:38 | msh |
| Mercury, total | M7471A CVAA | 620 | | U | | mg/Kg | 0.1 | 0.6 | 01/03/14 13:30 | mfm |
| Molybdenum, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 2 | 10 | 01/09/14 22:56 | aeb |
| Nickel, total (3050) | M6020 ICP-MS | 505 | 4.9 | | | mg/Kg | 0.3 | 2 | 01/10/14 22:20 | msh |
| Potassium, total (3050) | M6010B ICP | 101 | 2130 | | | mg/Kg | 30 | 200 | 01/09/14 22:56 | aeb |
| Selenium, total (3050) | M6020 ICP-MS | 505 | 0.23 | | | mg/Kg | 0.05 | 0.1 | 01/10/14 22:20 | msh |
| Silver, total (3050) | M6020 ICP-MS | 505 | 2.34 | | | mg/Kg | 0.03 | 0.1 | 01/10/14 22:20 | msh |
| Zinc, total (3050) | M6020 ICP-MS | 505 | 359 | | * | mg/Kg | 1 | 3 | 01/10/14 22:20 | msh |

Soil Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------|-------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Solids, Percent | CLPSOW390, PART F, D-98 | 1 | 30.7 | | * | % | 0.1 | 0.5 | 01/06/14 22:15 | mss2 |

Soil Preparation

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------|--------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Air Dry at 34 Degrees C | USDA No. 1, 1972 | | | | | | | | 01/06/14 14:17 | mss2 |
| Digestion - Hot Plate | M3050B ICP-MS | | | | | | | | 01/08/14 14:15 | cdb |
| Digestion - Hot Plate | M3050B ICP | | | | | | | | 01/08/14 14:15 | cdb |
| Sieve-2000 um (2.0mm) | ASA No.9, 15-4.2.2 | | | | | | | | 01/08/14 10:17 | cdb |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: SED-4A

ACZ Sample ID: **L16203-05**

Date Sampled: 12/16/13 00:00

Date Received: 12/27/13

Sample Matrix: *Sediment*

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|--------------------------------------|----------|--------|------|----|-------|-------|------|----------------|---------|
| Cyanide, total | M9012B - Automated Colorimetric | 76.3 | | UH | * | mg/Kg | 0.4 | 2 | 01/11/14 13:05 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 330 | 0.053 | | * | % | 0.003 | 0.02 | 01/09/14 14:49 | bsu |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SED-5

ACZ Sample ID: **L16203-06**
Date Sampled: 12/16/13 07:45
Date Received: 12/27/13
Sample Matrix: *Sediment*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M9013 - Manual Distillation | | | | | | | | 01/10/14 15:20 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 01/08/14 13:45 | bsu |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|--------------|----------|--------|------|----|-------|------|-----|----------------|---------|
| Aluminum, total (3050) | M6020 ICP-MS | 10000 | 5710 | | * | mg/Kg | 10 | 50 | 01/14/14 0:42 | msh |
| Antimony, total (3050) | M6020 ICP-MS | 500 | 0.4 | B | * | mg/Kg | 0.2 | 1 | 01/10/14 22:23 | msh |
| Arsenic, total (3050) | M6020 ICP-MS | 500 | 10.2 | | | mg/Kg | 0.1 | 0.5 | 01/10/14 22:23 | msh |
| Barium, total (3050) | M6020 ICP-MS | 500 | 94.4 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:23 | msh |
| Boron, total (3050) | M6010B ICP | 100 | | U | | mg/Kg | 1 | 5 | 01/09/14 23:05 | aeb |
| Cadmium, total (3050) | M6020 ICP-MS | 500 | 0.12 | B | | mg/Kg | 0.05 | 0.3 | 01/10/14 22:23 | msh |
| Calcium, total (3050) | M6010B ICP | 100 | 890 | | | mg/Kg | 20 | 100 | 01/09/14 23:05 | aeb |
| Chromium, total (3050) | M6020 ICP-MS | 500 | 0.9 | B | * | mg/Kg | 0.3 | 1 | 01/10/14 22:23 | msh |
| Copper, total (3050) | M6020 ICP-MS | 500 | 4.1 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:23 | msh |
| Iron, total (3050) | M6010B ICP | 100 | 9140 | | * | mg/Kg | 2 | 5 | 01/09/14 23:05 | aeb |
| Lead, total (3050) | M6020 ICP-MS | 500 | 7.61 | | * | mg/Kg | 0.05 | 0.3 | 01/10/14 22:23 | msh |
| Magnesium, total (3050) | M6010B ICP | 100 | 330 | | | mg/Kg | 20 | 100 | 01/09/14 23:05 | aeb |
| Manganese, total (3050) | M6020 ICP-MS | 10000 | 399 | | * | mg/Kg | 5 | 30 | 01/14/14 0:42 | msh |
| Mercury, total | M7471A CVAA | 288 | 0.09 | B | | mg/Kg | 0.06 | 0.3 | 01/03/14 13:32 | mfm |
| Molybdenum, total (3050) | M6010B ICP | 100 | | U | | mg/Kg | 2 | 10 | 01/09/14 23:05 | aeb |
| Nickel, total (3050) | M6020 ICP-MS | 500 | 0.5 | B | | mg/Kg | 0.3 | 2 | 01/10/14 22:23 | msh |
| Potassium, total (3050) | M6010B ICP | 100 | 1890 | | | mg/Kg | 30 | 200 | 01/09/14 23:05 | aeb |
| Selenium, total (3050) | M6020 ICP-MS | 500 | | U | | mg/Kg | 0.05 | 0.1 | 01/10/14 22:23 | msh |
| Silver, total (3050) | M6020 ICP-MS | 500 | | U | | mg/Kg | 0.03 | 0.1 | 01/10/14 22:23 | msh |
| Zinc, total (3050) | M6020 ICP-MS | 500 | 17 | | * | mg/Kg | 1 | 3 | 01/10/14 22:23 | msh |

Soil Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------|-------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Solids, Percent | CLPSOW390, PART F, D-98 | 1 | 59.5 | | * | % | 0.1 | 0.5 | 01/06/14 23:37 | mss2 |

Soil Preparation

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------|--------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Air Dry at 34 Degrees C | USDA No. 1, 1972 | | | | | | | | 01/06/14 14:21 | mss2 |
| Digestion - Hot Plate | M3050B ICP | | | | | | | | 01/08/14 14:30 | cdb |
| Digestion - Hot Plate | M3050B ICP-MS | | | | | | | | 01/08/14 14:30 | cdb |
| Sieve-2000 um (2.0mm) | ASA No.9, 15-4.2.2 | | | | | | | | 01/08/14 10:21 | cdb |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: SED-5

ACZ Sample ID: **L16203-06**

Date Sampled: 12/16/13 07:45

Date Received: 12/27/13

Sample Matrix: *Sediment*

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|--------------------------------------|----------|--------|------|----|-------|-------|------|----------------|---------|
| Cyanide, total | M9012B - Automated Colorimetric | 40.4 | | UH | * | mg/Kg | 0.2 | 1 | 01/11/14 13:07 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 200 | 0.006 | B | * | % | 0.002 | 0.01 | 01/09/14 14:50 | bsu |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SED-6

ACZ Sample ID: **L16203-07**
Date Sampled: 12/16/13 08:15
Date Received: 12/27/13
Sample Matrix: *Sediment*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M9013 - Manual Distillation | | | | | | | | 01/10/14 15:40 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 01/08/14 14:03 | bsu |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|--------------|----------|--------|------|----|-------|------|-----|----------------|---------|
| Aluminum, total (3050) | M6020 ICP-MS | 10000 | 5850 | | * | mg/Kg | 10 | 50 | 01/14/14 0:45 | msh |
| Antimony, total (3050) | M6020 ICP-MS | 500 | 0.4 | B | * | mg/Kg | 0.2 | 1 | 01/10/14 22:27 | msh |
| Arsenic, total (3050) | M6020 ICP-MS | 500 | 32.9 | | | mg/Kg | 0.1 | 0.5 | 01/10/14 22:27 | msh |
| Barium, total (3050) | M6020 ICP-MS | 500 | 181 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:27 | msh |
| Boron, total (3050) | M6010B ICP | 100 | 2 | B | | mg/Kg | 1 | 5 | 01/09/14 23:08 | aeb |
| Cadmium, total (3050) | M6020 ICP-MS | 500 | 0.12 | B | | mg/Kg | 0.05 | 0.3 | 01/10/14 22:27 | msh |
| Calcium, total (3050) | M6010B ICP | 100 | 1180 | | | mg/Kg | 20 | 100 | 01/09/14 23:08 | aeb |
| Chromium, total (3050) | M6020 ICP-MS | 500 | 3.9 | | * | mg/Kg | 0.3 | 1 | 01/10/14 22:27 | msh |
| Copper, total (3050) | M6020 ICP-MS | 500 | 5.4 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:27 | msh |
| Iron, total (3050) | M6010B ICP | 100 | 13000 | | * | mg/Kg | 2 | 5 | 01/09/14 23:08 | aeb |
| Lead, total (3050) | M6020 ICP-MS | 500 | 5.97 | | * | mg/Kg | 0.05 | 0.3 | 01/10/14 22:27 | msh |
| Magnesium, total (3050) | M6010B ICP | 100 | 840 | | | mg/Kg | 20 | 100 | 01/09/14 23:08 | aeb |
| Manganese, total (3050) | M6020 ICP-MS | 10000 | 923 | | * | mg/Kg | 5 | 30 | 01/14/14 0:45 | msh |
| Mercury, total | M7471A CVAA | 311 | | U | | mg/Kg | 0.06 | 0.3 | 01/03/14 13:39 | mfm |
| Molybdenum, total (3050) | M6010B ICP | 100 | | U | | mg/Kg | 2 | 10 | 01/09/14 23:08 | aeb |
| Nickel, total (3050) | M6020 ICP-MS | 500 | 1.5 | B | | mg/Kg | 0.3 | 2 | 01/10/14 22:27 | msh |
| Potassium, total (3050) | M6010B ICP | 100 | 1360 | | | mg/Kg | 30 | 200 | 01/09/14 23:08 | aeb |
| Selenium, total (3050) | M6020 ICP-MS | 500 | 0.08 | B | | mg/Kg | 0.05 | 0.1 | 01/10/14 22:27 | msh |
| Silver, total (3050) | M6020 ICP-MS | 500 | 0.22 | | | mg/Kg | 0.03 | 0.1 | 01/10/14 22:27 | msh |
| Zinc, total (3050) | M6020 ICP-MS | 500 | 23 | | * | mg/Kg | 1 | 3 | 01/10/14 22:27 | msh |

Soil Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------|-------------------------|----------|--------|------|----|-------|-----|-----|---------------|---------|
| Solids, Percent | CLPSOW390, PART F, D-98 | 1 | 61.1 | | * | % | 0.1 | 0.5 | 01/07/14 1:00 | mss2 |

Soil Preparation

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------|--------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Air Dry at 34 Degrees C | USDA No. 1, 1972 | | | | | | | | 01/06/14 14:25 | mss2 |
| Digestion - Hot Plate | M3050B ICP-MS | | | | | | | | 01/08/14 14:45 | cdb |
| Digestion - Hot Plate | M3050B ICP | | | | | | | | 01/08/14 14:45 | cdb |
| Sieve-2000 um (2.0mm) | ASA No.9, 15-4.2.2 | | | | | | | | 01/08/14 10:25 | cdb |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: SED-6

ACZ Sample ID: **L16203-07**

Date Sampled: 12/16/13 08:15

Date Received: 12/27/13

Sample Matrix: *Sediment*

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|--------------------------------------|----------|--------|------|----|-------|-------|-------|----------------|---------|
| Cyanide, total | M9012B - Automated Colorimetric | 32.9 | | UH | * | mg/Kg | 0.2 | 0.8 | 01/11/14 13:10 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 130 | 0.010 | | * | % | 0.001 | 0.007 | 01/09/14 14:52 | bsu |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SED-7

ACZ Sample ID: **L16203-08**
Date Sampled: 12/16/13 10:25
Date Received: 12/27/13
Sample Matrix: *Sediment*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M9013 - Manual Distillation | | | | | | | | 01/10/14 15:50 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 01/08/14 14:21 | bsu |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|--------------|----------|--------|------|----|-------|------|-----|----------------|---------|
| Aluminum, total (3050) | M6020 ICP-MS | 10100 | 6780 | | * | mg/Kg | 10 | 50 | 01/14/14 0:48 | msh |
| Antimony, total (3050) | M6020 ICP-MS | 505 | 0.5 | B | * | mg/Kg | 0.2 | 1 | 01/10/14 22:30 | msh |
| Arsenic, total (3050) | M6020 ICP-MS | 505 | 8.3 | | | mg/Kg | 0.1 | 0.5 | 01/10/14 22:30 | msh |
| Barium, total (3050) | M6020 ICP-MS | 505 | 148 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:30 | msh |
| Boron, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 1 | 5 | 01/09/14 23:11 | aeb |
| Cadmium, total (3050) | M6020 ICP-MS | 505 | 0.12 | B | | mg/Kg | 0.05 | 0.3 | 01/10/14 22:30 | msh |
| Calcium, total (3050) | M6010B ICP | 101 | 1380 | | | mg/Kg | 20 | 100 | 01/09/14 23:11 | aeb |
| Chromium, total (3050) | M6020 ICP-MS | 505 | 1.5 | | * | mg/Kg | 0.3 | 1 | 01/10/14 22:30 | msh |
| Copper, total (3050) | M6020 ICP-MS | 505 | 4.7 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:30 | msh |
| Iron, total (3050) | M6010B ICP | 101 | 8920 | | * | mg/Kg | 2 | 5 | 01/09/14 23:11 | aeb |
| Lead, total (3050) | M6020 ICP-MS | 505 | 11.10 | | * | mg/Kg | 0.05 | 0.3 | 01/10/14 22:30 | msh |
| Magnesium, total (3050) | M6010B ICP | 101 | 980 | | | mg/Kg | 20 | 100 | 01/09/14 23:11 | aeb |
| Manganese, total (3050) | M6020 ICP-MS | 10100 | 661 | | * | mg/Kg | 5 | 30 | 01/14/14 0:48 | msh |
| Mercury, total | M7471A CVAA | 258 | | U | | mg/Kg | 0.05 | 0.3 | 01/03/14 13:41 | mfm |
| Molybdenum, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 2 | 10 | 01/09/14 23:11 | aeb |
| Nickel, total (3050) | M6020 ICP-MS | 505 | 1.7 | B | | mg/Kg | 0.3 | 2 | 01/10/14 22:30 | msh |
| Potassium, total (3050) | M6010B ICP | 101 | 2410 | | | mg/Kg | 30 | 200 | 01/09/14 23:11 | aeb |
| Selenium, total (3050) | M6020 ICP-MS | 505 | | U | | mg/Kg | 0.05 | 0.1 | 01/10/14 22:30 | msh |
| Silver, total (3050) | M6020 ICP-MS | 505 | 0.04 | B | | mg/Kg | 0.03 | 0.1 | 01/10/14 22:30 | msh |
| Zinc, total (3050) | M6020 ICP-MS | 505 | 25 | | * | mg/Kg | 1 | 3 | 01/10/14 22:30 | msh |

Soil Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------|-------------------------|----------|--------|------|----|-------|-----|-----|---------------|---------|
| Solids, Percent | CLPSOW390, PART F, D-98 | 1 | 74.3 | | * | % | 0.1 | 0.5 | 01/07/14 2:22 | mss2 |

Soil Preparation

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------|--------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Air Dry at 34 Degrees C | USDA No. 1, 1972 | | | | | | | | 01/06/14 14:29 | mss2 |
| Digestion - Hot Plate | M3050B ICP-MS | | | | | | | | 01/08/14 15:00 | cdb |
| Digestion - Hot Plate | M3050B ICP | | | | | | | | 01/08/14 15:00 | cdb |
| Sieve-2000 um (2.0mm) | ASA No.9, 15-4.2.2 | | | | | | | | 01/08/14 10:29 | cdb |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: SED-7

ACZ Sample ID: **L16203-08**

Date Sampled: 12/16/13 10:25

Date Received: 12/27/13

Sample Matrix: *Sediment*

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|--------------------------------------|----------|--------|------|----|-------|-------|-------|----------------|---------|
| Cyanide, total | M9012B - Automated Colorimetric | 27.2 | | UH | * | mg/Kg | 0.1 | 0.7 | 01/11/14 13:11 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 130 | 0.006 | B | * | % | 0.001 | 0.007 | 01/09/14 14:53 | bsu |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SED-8

ACZ Sample ID: **L16203-09**

Date Sampled: 12/05/13 14:00

Date Received: 12/27/13

Sample Matrix: *Sediment*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M9013 - Manual Distillation | | | | | | | | 01/10/14 16:00 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 01/08/14 14:40 | bsu |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|--------------|----------|--------|------|----|-------|------|-----|----------------|---------|
| Aluminum, total (3050) | M6020 ICP-MS | 10100 | 8300 | | * | mg/Kg | 10 | 50 | 01/14/14 0:52 | msh |
| Antimony, total (3050) | M6020 ICP-MS | 505 | 5.6 | | * | mg/Kg | 0.2 | 1 | 01/10/14 22:34 | msh |
| Arsenic, total (3050) | M6020 ICP-MS | 505 | 22.4 | | | mg/Kg | 0.1 | 0.5 | 01/10/14 22:34 | msh |
| Barium, total (3050) | M6020 ICP-MS | 505 | 179 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:34 | msh |
| Boron, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 1 | 5 | 01/09/14 23:18 | aeb |
| Cadmium, total (3050) | M6020 ICP-MS | 505 | 0.67 | | | mg/Kg | 0.05 | 0.3 | 01/10/14 22:34 | msh |
| Calcium, total (3050) | M6010B ICP | 101 | 2530 | | | mg/Kg | 20 | 100 | 01/09/14 23:18 | aeb |
| Chromium, total (3050) | M6020 ICP-MS | 505 | 9.6 | | * | mg/Kg | 0.3 | 1 | 01/10/14 22:34 | msh |
| Copper, total (3050) | M6020 ICP-MS | 505 | 9.1 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:34 | msh |
| Iron, total (3050) | M6010B ICP | 101 | 34600 | | * | mg/Kg | 2 | 5 | 01/09/14 23:18 | aeb |
| Lead, total (3050) | M6020 ICP-MS | 505 | 16.50 | | * | mg/Kg | 0.05 | 0.3 | 01/10/14 22:34 | msh |
| Magnesium, total (3050) | M6010B ICP | 101 | 1390 | | | mg/Kg | 20 | 100 | 01/09/14 23:18 | aeb |
| Manganese, total (3050) | M6020 ICP-MS | 10100 | 1030 | | * | mg/Kg | 5 | 30 | 01/14/14 0:52 | msh |
| Mercury, total | M7471A CVAA | 256 | 0.08 | B | * | mg/Kg | 0.05 | 0.3 | 12/31/13 10:53 | mfm |
| Molybdenum, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 2 | 10 | 01/09/14 23:18 | aeb |
| Nickel, total (3050) | M6020 ICP-MS | 505 | 3.9 | | | mg/Kg | 0.3 | 2 | 01/10/14 22:34 | msh |
| Potassium, total (3050) | M6010B ICP | 101 | 1550 | | | mg/Kg | 30 | 200 | 01/09/14 23:18 | aeb |
| Selenium, total (3050) | M6020 ICP-MS | 505 | 0.05 | B | | mg/Kg | 0.05 | 0.1 | 01/10/14 22:34 | msh |
| Silver, total (3050) | M6020 ICP-MS | 505 | 0.55 | | | mg/Kg | 0.03 | 0.1 | 01/10/14 22:34 | msh |
| Zinc, total (3050) | M6020 ICP-MS | 505 | 124 | | * | mg/Kg | 1 | 3 | 01/10/14 22:34 | msh |

Soil Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------|-------------------------|----------|--------|------|----|-------|-----|-----|---------------|---------|
| Solids, Percent | CLPSOW390, PART F, D-98 | 1 | 70.5 | | * | % | 0.1 | 0.5 | 01/07/14 3:45 | mss2 |

Soil Preparation

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------|--------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Air Dry at 34 Degrees C | USDA No. 1, 1972 | | | | | | | | 01/06/14 14:34 | mss2 |
| Digestion - Hot Plate | M3050B ICP | | | | | | | | 01/08/14 15:15 | cdb |
| Digestion - Hot Plate | M3050B ICP-MS | | | | | | | | 01/08/14 15:15 | cdb |
| Sieve-2000 um (2.0mm) | ASA No.9, 15-4.2.2 | | | | | | | | 01/08/14 10:34 | cdb |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: SED-8

ACZ Sample ID: **L16203-09**

Date Sampled: 12/05/13 14:00

Date Received: 12/27/13

Sample Matrix: *Sediment*

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|--------------------------------------|----------|--------|------|----|-------|-------|-------|----------------|---------|
| Cyanide, total | M9012B - Automated Colorimetric | 28.8 | | UH | * | mg/Kg | 0.1 | 0.7 | 01/11/14 13:12 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 140 | 0.021 | H | * | % | 0.001 | 0.007 | 01/09/14 14:54 | bsu |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SED-9

ACZ Sample ID: **L16203-10**
Date Sampled: 12/16/13 09:10
Date Received: 12/27/13
Sample Matrix: *Sediment*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M9013 - Manual Distillation | | | | | | | | 01/10/14 16:10 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 01/08/14 14:58 | bsu |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|--------------|----------|--------|------|----|-------|------|-----|----------------|---------|
| Aluminum, total (3050) | M6020 ICP-MS | 20200 | 11200 | | * | mg/Kg | 20 | 100 | 01/14/14 18:28 | msh |
| Antimony, total (3050) | M6020 ICP-MS | 505 | 0.9 | B | * | mg/Kg | 0.2 | 1 | 01/10/14 22:37 | msh |
| Arsenic, total (3050) | M6020 ICP-MS | 505 | 7.4 | | | mg/Kg | 0.1 | 0.5 | 01/10/14 22:37 | msh |
| Barium, total (3050) | M6020 ICP-MS | 505 | 129 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:37 | msh |
| Boron, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 1 | 5 | 01/09/14 23:21 | aeb |
| Cadmium, total (3050) | M6020 ICP-MS | 505 | 0.28 | B | | mg/Kg | 0.05 | 0.3 | 01/10/14 22:37 | msh |
| Calcium, total (3050) | M6010B ICP | 101 | 2180 | | | mg/Kg | 20 | 100 | 01/09/14 23:21 | aeb |
| Chromium, total (3050) | M6020 ICP-MS | 505 | 4.9 | | * | mg/Kg | 0.3 | 1 | 01/10/14 22:37 | msh |
| Copper, total (3050) | M6020 ICP-MS | 505 | 9.8 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:37 | msh |
| Iron, total (3050) | M6010B ICP | 101 | 14900 | | * | mg/Kg | 2 | 5 | 01/09/14 23:21 | aeb |
| Lead, total (3050) | M6020 ICP-MS | 505 | 9.99 | | * | mg/Kg | 0.05 | 0.3 | 01/10/14 22:37 | msh |
| Magnesium, total (3050) | M6010B ICP | 101 | 1120 | | | mg/Kg | 20 | 100 | 01/09/14 23:21 | aeb |
| Manganese, total (3050) | M6020 ICP-MS | 10100 | 440 | | * | mg/Kg | 5 | 30 | 01/14/14 0:55 | msh |
| Mercury, total | M7471A CVAA | 336 | | U | | mg/Kg | 0.07 | 0.3 | 01/03/14 13:44 | mfm |
| Molybdenum, total (3050) | M6010B ICP | 101 | | U | | mg/Kg | 2 | 10 | 01/09/14 23:21 | aeb |
| Nickel, total (3050) | M6020 ICP-MS | 505 | 2.5 | | | mg/Kg | 0.3 | 2 | 01/10/14 22:37 | msh |
| Potassium, total (3050) | M6010B ICP | 101 | 1470 | | | mg/Kg | 30 | 200 | 01/09/14 23:21 | aeb |
| Selenium, total (3050) | M6020 ICP-MS | 505 | 0.07 | B | | mg/Kg | 0.05 | 0.1 | 01/10/14 22:37 | msh |
| Silver, total (3050) | M6020 ICP-MS | 505 | 0.11 | | | mg/Kg | 0.03 | 0.1 | 01/10/14 22:37 | msh |
| Zinc, total (3050) | M6020 ICP-MS | 505 | 47 | | * | mg/Kg | 1 | 3 | 01/10/14 22:37 | msh |

Soil Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------|-------------------------|----------|--------|------|----|-------|-----|-----|---------------|---------|
| Solids, Percent | CLPSOW390, PART F, D-98 | 1 | 51.6 | | * | % | 0.1 | 0.5 | 01/07/14 5:07 | mss2 |

Soil Preparation

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------|--------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Air Dry at 34 Degrees C | USDA No. 1, 1972 | | | | | | | | 01/06/14 14:38 | mss2 |
| Digestion - Hot Plate | M3050B ICP-MS | | | | | | | | 01/08/14 15:30 | cdb |
| Digestion - Hot Plate | M3050B ICP | | | | | | | | 01/08/14 15:30 | cdb |
| Sieve-2000 um (2.0mm) | ASA No.9, 15-4.2.2 | | | | | | | | 01/08/14 10:38 | cdb |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: SED-9

ACZ Sample ID: **L16203-10**

Date Sampled: 12/16/13 09:10

Date Received: 12/27/13

Sample Matrix: *Sediment*

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|--------------------------------------|----------|--------|------|----|-------|-------|------|----------------|---------|
| Cyanide, total | M9012B - Automated Colorimetric | 44.6 | | UH | * | mg/Kg | 0.2 | 1 | 01/11/14 13:13 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 210 | 0.017 | | * | % | 0.002 | 0.01 | 01/09/14 14:55 | bsu |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: SED-2A

ACZ Sample ID: **L16203-11**
Date Sampled: 12/05/13 15:30
Date Received: 12/27/13
Sample Matrix: *Sediment*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|---------------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M9013 - Manual Distillation | | | | | | | | 01/10/14 16:20 | mpb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid Digestion | | | | | | | | 01/08/14 15:16 | bsu |

Metals Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|--------------------------|--------------|----------|--------|------|----|-------|------|-----|----------------|---------|
| Aluminum, total (3050) | M6020 ICP-MS | 51500 | 21100 | | * | mg/Kg | 50 | 300 | 01/14/14 18:32 | msh |
| Antimony, total (3050) | M6020 ICP-MS | 515 | 2.4 | | * | mg/Kg | 0.2 | 1 | 01/10/14 22:40 | msh |
| Arsenic, total (3050) | M6020 ICP-MS | 515 | 34.8 | | | mg/Kg | 0.1 | 0.5 | 01/10/14 22:40 | msh |
| Barium, total (3050) | M6020 ICP-MS | 515 | 178 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:40 | msh |
| Boron, total (3050) | M6010B ICP | 103 | 2 | B | | mg/Kg | 1 | 5 | 01/09/14 23:24 | aeb |
| Cadmium, total (3050) | M6020 ICP-MS | 515 | 1.61 | | | mg/Kg | 0.05 | 0.3 | 01/10/14 22:40 | msh |
| Calcium, total (3050) | M6010B ICP | 103 | 37000 | | | mg/Kg | 20 | 100 | 01/09/14 23:24 | aeb |
| Chromium, total (3050) | M6020 ICP-MS | 515 | 6.2 | | * | mg/Kg | 0.3 | 1 | 01/10/14 22:40 | msh |
| Copper, total (3050) | M6020 ICP-MS | 515 | 17.5 | | | mg/Kg | 0.3 | 1 | 01/10/14 22:40 | msh |
| Iron, total (3050) | M6010B ICP | 103 | 17800 | | * | mg/Kg | 2 | 5 | 01/09/14 23:24 | aeb |
| Lead, total (3050) | M6020 ICP-MS | 515 | 74.70 | | * | mg/Kg | 0.05 | 0.3 | 01/10/14 22:40 | msh |
| Magnesium, total (3050) | M6010B ICP | 103 | 2730 | | | mg/Kg | 20 | 100 | 01/09/14 23:24 | aeb |
| Manganese, total (3050) | M6020 ICP-MS | 20600 | 1620 | | * | mg/Kg | 10 | 50 | 01/14/14 0:59 | msh |
| Mercury, total | M7471A CVAA | 359 | | U | * | mg/Kg | 0.07 | 0.4 | 12/31/13 10:56 | mfm |
| Molybdenum, total (3050) | M6010B ICP | 103 | | U | | mg/Kg | 2 | 10 | 01/09/14 23:24 | aeb |
| Nickel, total (3050) | M6020 ICP-MS | 515 | 5.3 | | | mg/Kg | 0.3 | 2 | 01/10/14 22:40 | msh |
| Potassium, total (3050) | M6010B ICP | 103 | 2060 | | | mg/Kg | 30 | 200 | 01/09/14 23:24 | aeb |
| Selenium, total (3050) | M6020 ICP-MS | 515 | 0.16 | | | mg/Kg | 0.05 | 0.1 | 01/10/14 22:40 | msh |
| Silver, total (3050) | M6020 ICP-MS | 515 | 4.36 | | | mg/Kg | 0.03 | 0.1 | 01/10/14 22:40 | msh |
| Zinc, total (3050) | M6020 ICP-MS | 515 | 421 | | * | mg/Kg | 1 | 3 | 01/10/14 22:40 | msh |

Soil Analysis

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-----------------|-------------------------|----------|--------|------|----|-------|-----|-----|---------------|---------|
| Solids, Percent | CLPSOW390, PART F, D-98 | 1 | 50.0 | | * | % | 0.1 | 0.5 | 01/07/14 6:30 | mss2 |

Soil Preparation

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------------|--------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Air Dry at 34 Degrees C | USDA No. 1, 1972 | | | | | | | | 01/06/14 14:42 | mss2 |
| Digestion - Hot Plate | M3050B ICP-MS | | | | | | | | 01/08/14 15:45 | cdb |
| Digestion - Hot Plate | M3050B ICP | | | | | | | | 01/08/14 15:45 | cdb |
| Sieve-2000 um (2.0mm) | ASA No.9, 15-4.2.2 | | | | | | | | 01/08/14 10:42 | cdb |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: SED-2A

ACZ Sample ID: **L16203-11**

Date Sampled: 12/05/13 15:30

Date Received: 12/27/13

Sample Matrix: *Sediment*

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|-------------------|--------------------------------------|----------|--------|------|----|-------|-------|-------|----------------|---------|
| Cyanide, total | M9012B - Automated Colorimetric | 29.8 | | UH | * | mg/Kg | 0.1 | 0.7 | 01/11/14 13:14 | pjb |
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | 150 | 0.025 | H | * | % | 0.002 | 0.008 | 01/09/14 14:55 | bsu |



Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|--------------|--|--------------|--|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LCSWD</i> | Laboratory Control Sample - Water Duplicate |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFB</i> | Laboratory Fortified Blank |
| <i>CCB</i> | Continuing Calibration Blank | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>CCV</i> | Continuing Calibration Verification standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>ICB</i> | Initial Calibration Blank | <i>MS</i> | Matrix Spike |
| <i>ICV</i> | Initial Calibration Verification standard | <i>MSD</i> | Matrix Spike Duplicate |
| <i>ICSAB</i> | Inter-element Correction Standard - A plus B solutions | <i>PBS</i> | Prep Blank - Soil |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>PBW</i> | Prep Blank - Water |
| <i>LCSSD</i> | Laboratory Control Sample - Soil Duplicate | <i>PQV</i> | Practical Quantitation Verification standard |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>SDL</i> | Serial Dilution |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |
| Standard | Verifies the validity of the calibration. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L16203**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------------------------------------|----------|-------------------------|--------------------------------------|---|---|
| L16203-01 | WG357674 | Aluminum, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Antimony, total (3050) | M6020 ICP-MS | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Chromium, total (3050) | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357547 | Iron, total (3050) | M6010B ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Lead, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357674 | Manganese, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | N1 | See Case Narrative. |
| | WG357061 | Mercury, total | M7471A CVAA | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Zinc, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357621 | Cyanide, total | M9012B - Automated Colorimetric | H3 | Sample was received and analyzed past holding time. |
| | | | M9012B - Automated Colorimetric | Q6 | Sample was received above recommended temperature. |
| | | | M9012B - Automated Colorimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357526 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | H1 | Sample prep or analysis performed past holding time. See case narrative. |
| M365.1 - Auto Ascorbic Acid (digest) | | | RD | For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample. | |

Tahoe Resources, Inc.

ACZ Project ID: **L16203**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|---------------------------------|-------------------|--------------------------------------|---------------------------------|---|---|
| L16203-02 | WG357674 | Aluminum, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Antimony, total (3050) | M6020 ICP-MS | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Chromium, total (3050) | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357547 | Iron, total (3050) | M6010B ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Lead, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357735 | Manganese, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | N1 | See Case Narrative. |
| | WG357674 | Zinc, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357621 | Cyanide, total | M9012B - Automated Colorimetric | H1 | Sample prep or analysis performed past holding time. See case narrative. |
| | | | M9012B - Automated Colorimetric | Q6 | Sample was received above recommended temperature. |
| M9012B - Automated Colorimetric | | | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG357526 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | RD | For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample. | |

Tahoe Resources, Inc.

ACZ Project ID: **L16203**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|---------------------------------|-------------------|--------------------------------------|---------------------------------|---|---|
| L16203-03 | WG357674 | Aluminum, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Antimony, total (3050) | M6020 ICP-MS | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Chromium, total (3050) | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357547 | Iron, total (3050) | M6010B ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Lead, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357674 | Manganese, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | N1 | See Case Narrative. |
| | WG357553 | Zinc, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357621 | Cyanide, total | M9012B - Automated Colorimetric | H1 | Sample prep or analysis performed past holding time. See case narrative. |
| M9012B - Automated Colorimetric | | | Q6 | Sample was received above recommended temperature. | |
| M9012B - Automated Colorimetric | | | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). | |
| WG357526 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | RD | For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample. | |

Tahoe Resources, Inc.

ACZ Project ID: **L16203**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|-------------------------|--------------------------------------|------|---|
| L16203-04 | WG357674 | Aluminum, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Antimony, total (3050) | M6020 ICP-MS | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Chromium, total (3050) | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357547 | Iron, total (3050) | M6010B ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Lead, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357674 | Manganese, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | N1 | See Case Narrative. |
| | WG357553 | Zinc, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357621 | Cyanide, total | M9012B - Automated Colorimetric | H1 | Sample prep or analysis performed past holding time. See case narrative. |
| | | | M9012B - Automated Colorimetric | Q6 | Sample was received above recommended temperature. |
| | | | M9012B - Automated Colorimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357526 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | RD | For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample. |

Tahoe Resources, Inc.

ACZ Project ID: **L16203**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------|--------------------------------------|---------------------------------|---|---|
| L16203-05 | WG357674 | Aluminum, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Antimony, total (3050) | M6020 ICP-MS | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Chromium, total (3050) | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357547 | Iron, total (3050) | M6010B ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Lead, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357674 | Manganese, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | N1 | See Case Narrative. |
| | WG357553 | Zinc, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357621 | Cyanide, total | M9012B - Automated Colorimetric | H1 | Sample prep or analysis performed past holding time. See case narrative. |
| | | | M9012B - Automated Colorimetric | Q6 | Sample was received above recommended temperature. |
| | | | M9012B - Automated Colorimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG357526 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | RD | For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample. | |

Tahoe Resources, Inc.

ACZ Project ID: **L16203**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|-------------------------|--------------------------------------|------|---|
| L16203-06 | WG357674 | Aluminum, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Antimony, total (3050) | M6020 ICP-MS | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Chromium, total (3050) | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357547 | Iron, total (3050) | M6010B ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Lead, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357674 | Manganese, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | N1 | See Case Narrative. |
| | WG357553 | Zinc, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357621 | Cyanide, total | M9012B - Automated Colorimetric | H1 | Sample prep or analysis performed past holding time. See case narrative. |
| | | | M9012B - Automated Colorimetric | Q6 | Sample was received above recommended temperature. |
| | | | M9012B - Automated Colorimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357526 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | RD | For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample. |

Tahoe Resources, Inc.

ACZ Project ID: **L16203**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------|--------------------------------------|---------------------------------|---|---|
| L16203-07 | WG357674 | Aluminum, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Antimony, total (3050) | M6020 ICP-MS | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Chromium, total (3050) | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357547 | Iron, total (3050) | M6010B ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Lead, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357674 | Manganese, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | N1 | See Case Narrative. |
| | WG357553 | Zinc, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357621 | Cyanide, total | M9012B - Automated Colorimetric | H1 | Sample prep or analysis performed past holding time. See case narrative. |
| | | | M9012B - Automated Colorimetric | Q6 | Sample was received above recommended temperature. |
| | | | M9012B - Automated Colorimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG357526 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | RD | For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample. | |

Tahoe Resources, Inc.

ACZ Project ID: **L16203**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|-------------------|--------------------------------------|---------------------------------|---|---|
| L16203-08 | WG357674 | Aluminum, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Antimony, total (3050) | M6020 ICP-MS | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Chromium, total (3050) | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357547 | Iron, total (3050) | M6010B ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Lead, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357674 | Manganese, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | N1 | See Case Narrative. |
| | WG357553 | Zinc, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357621 | Cyanide, total | M9012B - Automated Colorimetric | H1 | Sample prep or analysis performed past holding time. See case narrative. |
| | | | M9012B - Automated Colorimetric | Q6 | Sample was received above recommended temperature. |
| | | | M9012B - Automated Colorimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| WG357526 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | RD | For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample. | |

Tahoe Resources, Inc.

ACZ Project ID: **L16203**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------------------------------------|----------|-------------------------|--------------------------------------|---|---|
| L16203-09 | WG357674 | Aluminum, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Antimony, total (3050) | M6020 ICP-MS | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Chromium, total (3050) | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357547 | Iron, total (3050) | M6010B ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Lead, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357674 | Manganese, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | N1 | See Case Narrative. |
| | WG357061 | Mercury, total | M7471A CVAA | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Zinc, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357621 | Cyanide, total | M9012B - Automated Colorimetric | H3 | Sample was received and analyzed past holding time. |
| | | | M9012B - Automated Colorimetric | Q6 | Sample was received above recommended temperature. |
| | | | M9012B - Automated Colorimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357526 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | H1 | Sample prep or analysis performed past holding time. See case narrative. |
| M365.1 - Auto Ascorbic Acid (digest) | | | RD | For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample. | |

Tahoe Resources, Inc.

ACZ Project ID: **L16203**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|-------------------------|--------------------------------------|------|---|
| L16203-10 | WG357735 | Aluminum, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Antimony, total (3050) | M6020 ICP-MS | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Chromium, total (3050) | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357547 | Iron, total (3050) | M6010B ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Lead, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357674 | Manganese, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | N1 | See Case Narrative. |
| | WG357553 | Zinc, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357621 | Cyanide, total | M9012B - Automated Colorimetric | H1 | Sample prep or analysis performed past holding time. See case narrative. |
| | | | M9012B - Automated Colorimetric | Q6 | Sample was received above recommended temperature. |
| | | | M9012B - Automated Colorimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357526 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | RD | For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample. |

Tahoe Resources, Inc.

ACZ Project ID: **L16203**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|--------------------------------------|----------|-------------------------|--------------------------------------|---|---|
| L16203-11 | WG357735 | Aluminum, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Antimony, total (3050) | M6020 ICP-MS | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | Chromium, total (3050) | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357547 | Iron, total (3050) | M6010B ICP | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Lead, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357674 | Manganese, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | N1 | See Case Narrative. |
| | WG357061 | Mercury, total | M7471A CVAA | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | WG357553 | Zinc, total (3050) | M6020 ICP-MS | M3 | The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M6020 ICP-MS | ZB | The ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 100 times the MDL. |
| | WG357621 | Cyanide, total | M9012B - Automated Colorimetric | H3 | Sample was received and analyzed past holding time. |
| | | | M9012B - Automated Colorimetric | Q6 | Sample was received above recommended temperature. |
| | | | M9012B - Automated Colorimetric | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| | WG357526 | Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) | H1 | Sample prep or analysis performed past holding time. See case narrative. |
| M365.1 - Auto Ascorbic Acid (digest) | | | RD | For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample. | |

Tahoe Resources, Inc.

ACZ Project ID: **L16203**

Soil Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|-----------------|-------------------------|
| Solids, Percent | CLPSOW390, PART F, D-98 |
|-----------------|-------------------------|

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

| | |
|-------------------|--------------------------------------|
| Phosphorus, total | M365.1 - Auto Ascorbic Acid (digest) |
|-------------------|--------------------------------------|

Tahoe Resources, Inc.
 Escobal

ACZ Project ID: L16203
 Date Received: 12/27/2013 10:01
 Received By: mtb
 Date Printed: 12/30/2013

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | X | | |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? | | X | |

Samples/Containers

| | YES | NO | NA |
|---|-----|----|----|
| 8) Are all containers intact and with no leaks? L16203-01 Container B1421141 (SJ INORG): This container was received broken but the contents were salvageable. L16203-03 Container B1421143 (SJ INORG): This container was received broken but the contents were salvageable. L16203-08 Container B1421148 (SJ INORG): This container was received broken but the contents were salvageable. L16203-09 Container B1421149 (SJ INORG): This container was received broken but the contents were salvageable. | | X | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | | | X |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? | X | | |

Chain of Custody Related Remarks

Client Contact Remarks

Sample SED-4A did not have a sample date or time on the chain of custody or the container. The sample date is assumed to be 16DEC13. Four containers were received broken but the contents should be salvageable.

Shipping Containers

Tahoe Resources, Inc.
Escobal

ACZ Project ID: L16203
Date Received: 12/27/2013 10:01
Received By: mtb
Date Printed: 12/30/2013

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| NA18918 | 7.4 | 12 | N/A |

Was ice present in the shipment container(s)?

No - Wet or gel ice was not present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.



Laboratories, Inc. L16203

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: Mberganza@santofael.com.gt

Address: Boulevard Los Proceres 18 calle 24-692-10
Zona Empresarial, zona Pradera, TOME IV of 1400
Telephone: (502) 5951 5248

Copy of Report to:

Name: Charlie Muerhoff
Company: Tahoe Resources Inc.

E-mail: cmuerhoff@tahoeresourcesinc.com
Telephone:

Invoice to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: Mberganza@santofael.com.gt

Address:
Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring? Yes No

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: Fernanda Barrios Sampler's site information State: Zip code Time Zone

Check box if observe Daylight Savings Time

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: Water Quality

PO#: Escobal

Reporting state for compliance testing:

Check box if samples include NRC licensed material?

Table with columns: SAMPLE IDENTIFICATION, DATE:TIME, Matrix, # of Containers, SED, and analysis results.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Chain of custody # 1/2 : Present results with CC # 2/2.

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns: RELINQUISHED BY, DATE:TIME, RECEIVED BY, DATE:TIME. Includes signatures and dates.

Vertical text: Chain of Custody # 16203

Guatemala December 24th, 2013

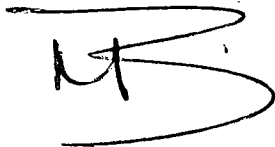
QUARANTINE STATEMENT

To whom it might concern:

Minera San Rafael, S.A is sending a case of sediment samples, which require quarantine and documentation due to organic content. These samples will be analyzed by ACZ Laboratories Inc. in Steamboat Springs, Colorado, USA.

If you have any questions, please contact Miguel Berganza at Minera San Rafael, S.A. (502-5951-5248) or Sue Webber at ACZ Laboratories (970-879-6590).

Best regards,

A handwritten signature in black ink, consisting of a stylized 'M' and 'B' connected together, with a horizontal line above and below the letters.

Miguel Berganza
Environment Department
Proyecto Escobal, S. A.



United States Department of Agriculture
 Animal and Plant Health Inspection Service
 4700 River Road
 Riverdale, MD 20737

Permit to Receive Soil
 Regulated by 7 CFR 330

This permit was generated electronically via the ePermits system.

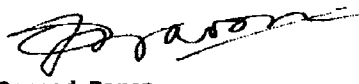
| | | | |
|---------------------------|-----------------------------|----------------------------|-----------------|
| PERMITTEE NAME: | Ms. Audrey J Stover | PERMIT NUMBER: | P330-13-00153 |
| COMPANY: | ACZ Laboratories, Inc. | APPLICATION NUMBER: | P525-130418-001 |
| RECEIVING ADDRESS: | 2773 Downhill Drive | DATE ISSUED: | 05/22/2013 |
| | Steamboat Springs, CO 80487 | | |
| MAILING ADDRESS: | 2773 Downhill Drive | | |
| | Steamboat Springs, CO 80487 | | |
| PHONE: | (970) 879-6590 Ext. 515 | EXPIRES: | 05/22/2016 |
| FAX: | (815) 301-3857 | | |

PORTS OF ARRIVAL/PLANT INSPECTION STATIONS: AK, Anchorage; AL, Huntsville; AL, Mobile; AZ, Douglas; AZ, Lukeville; AZ, Naco; AZ, Nogales; AZ, Phoenix; AZ, San Luis; AZ, Tucson; CA, Calexico; CA, Fresno; CA, Hawthorne; CA, Hawthorne; CA, Long Beach; CA, Oakland; CA, Ontario; CA, Otay Mesa; CA, Port Hueneme; CA, Sacramento; CA, San Diego; CA, San Francisco; CA, San Jose; CA, San Ysidro; CA, Tecate; CO, Denver; CT, Hartford; CT, New Haven; DE, Dover; DE, Wilmington; FL, Ft. Lauderdale; FL, Ft. Myers; FL, Ft. Pierce; FL, Jacksonville; FL, Key West; FL, Miami; FL, Orlando; FL, Pensacola; FL, Port Canaveral; FL, Port Everglades; FL, Sanford; FL, Tampa; FL, West Palm Beach; GA, Atlanta; GA, Savannah; GU, Agana; HI, Hilo; HI, Honolulu; HI, Kahului; HI, Kailua-Kona; HI, Lihue; ID, Eastport; IL, Chicago; IN, Indianapolis; KY, Louisville; MA, South Boston; MD, Baltimore; MD, Beltsville; ME, Bangor; ME, Calais; ME, Houlton; ME, Portland; MI, Detroit; MI, Port Huron; MI, Romulus; MI, Sault Saint Marie; MN, Duluth; MN, Grand Portage; MN, International Falls; MN, Minneapolis; MO, Kansas City; MO, St. Louis; MP, Commonwealth of the Northern Mariana Islands; MS, Gulfport; MS, Port Bienville; MT, Raymond; MT, Roosville; MT, Sweetgrass; NC, Raleigh; NC, Wilmington; ND, Dunseith; ND, Pembina; ND, Portal; NJ, Linden; NJ, Newark; NM, Albuquerque; NM, Columbus; NM, SantaTeresa; NV, Las Vegas; NY, Albany; NY, Alexandria Bay; NY, Brooklyn; NY, Buffalo; NY, Champlain, Rouses Point; NY, Jamaica; NY, Jamaica; NY, Newburgh; OH, Ashtabula; OH, Cincinnati; OH, Cleveland; OH, Columbus; OH, Toledo; OH, Wilmington; OK, Oklahoma City; OR, Portland; PA, Allentown; PA, Harrisburg; PA, Philadelphia; PA, Pittsburgh; PA, Scranton; PR, Aguadilla; PR, Carolina; PR, Fajardo; PR, Mayaguez; PR, Ponce; RI, Warwick/Providence; SC, Charleston; TN, Memphis; TN, Nashville; TX, Austin; TX, Brownsville; TX, Corpus Christi; TX, Dallas; TX, Del Rio; TX, Eagle Pass; TX, El Paso; TX, Fabens; TX, Falcon; TX, Fort Hancock; TX, Galveston; TX, Hidalgo; TX, Humble; TX, Laredo; TX, Los Indios; TX, Pharr; TX, Port Arthur; TX, Presidio; TX, Progreso; TX, Rio Grande City; TX, Roma; TX, San Antonio; TX, Victoria; UT, Salt Lake City; VA, Dulles; VA, Norfolk; VI, St. Croix; VI, St. Thomas; VT, Berlin; WA, Blaine; WA, Oroville; WA, Port Angeles; WA, SeaTac; WA, Sumas; WI, Green Bay; WI, Milwaukee

HAND CARRY: No

Under the conditions specified, this permit authorizes the following:
Quantity of Soil per Shipment and Treatment
 Over 3 lbs - Your facility **MUST** be inspected and approved to receive this soil

SPECIAL INSTRUCTIONS TO INSPECTORS
 See permit conditions below

| | |
|--|------------------------|
| Permit Number P330-13-00153 | |
| THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EPERMITTS.  Osmond Baron | DATE 05/22/2013 |

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to \$250,000 (7 U.S.C.s 7734(b)) or punishable by a fine of not more than \$10,000, or imprisonment of not more than 5 years, or both (18 U.S.C.s 1001)

INSTRUCTIONS TO DHS CBP INSPECTORS FOR IMPORTED SOIL SHIPMENTS ROUTED TO RECEIVING FACILITY:

For hand carry of soil, an official of CBP Agricultural Programs and Trade Liaison (APTL) would have been notified to document and facilitate the entry of the soil (See hand carry conditions below if stipulated). Otherwise:

1. Validate the permit in ePermits using the CBP search feature by logging on to:
<https://epermits.aphis.usda.gov/epermits>
2. Confirm that the shipment is being routed directly to a USDA APHIS PPQ Inspected Facility authorized to receive soil by logging on to: <https://web01.aphis.usda.gov/PPQ/AuthSoilLabs.nsf/web?openform>
3. Confirm that the imported shipment has a valid USDA PPQ Form 550 Black/White label.
4. Confirm that the carrier of the shipment imported under this USDA PPQ 525 permit is commercially bonded.
5. For questions or concerns, contact the USDA APHIS PPQ Permit Unit in Riverdale, MD, at 866-524-5421 and ask to speak with a compliance officer.

PERMIT GUIDANCE

Receipt or use of foreign isolates or samples from countries under sanctions requires specific permission from the U.S. Department of Treasury (see <http://www.ustras.gov/offices/enforcement/ofac/sanctions> for current country/regional listings) for current country listings.

This permit does not authorize importation, interstate movement, possession, and/or use of strains of genetically engineered regulated organisms (created by the use of recombinant DNA technology).

If an animal pathogen is identified in your shipment, to ensure appropriate safeguarding, please refer to http://www.aphis.usda.gov/import_export/animals/animal_import/animal_imports_anproducts.sh

tml.

If a human pathogen is identified, please see the CDC Etiologic Agent Import Permit Program at <http://www.cdc.gov/od/eaipp/>

This permit does not fulfill the requirements of other federal or state regulatory authorities. As appropriate, please contact the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the U.S. Food and Drug Administration, the Centers for Disease Control and Prevention, the APHIS Veterinary Services unit, or your State's Department of Agriculture to ensure proper permitting.

If you are considering renewal of this permit, an application should be submitted at least 90 days prior to the expiration date of this permit to ensure continued coverage. Permits requiring containment facilities may take a longer period of time to process.

Approved Sterilization Methods:

All soil residues must be dry-heated, incinerated, hydroclaved or autoclaved.


DRY HEAT Treatment: use one of the following schedules:

- 110- 120.5 degrees C (230-249 F) for 16 hours
- 121-154 degrees C (250-309 F) for 2 hours
- 154.4 - 192.5 degrees C (310-379 F) for 30 minutes
- 193-220 degrees C (380-429 F) for 4 minutes
- 221-232 degrees C (430-450) for 2 minutes

Time starts when the entire sample reaches the required temperature, and a suitable temperature probe must be used for verification.

INCINERATION: With the exception of metal and glass containers, all regulated and associated material must be reduced completely to ash at the end of the incineration cycle.

Permit Number P330-13-0015:

| | |
|---|--|
| <p>THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EPERIMITS.</p>  <p>Osmond Baron</p> | <p>DATE</p> <p>05/22/2013</p> |
|---|--|

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to \$250,000 (7 U.S.C. s 7734(b)) or punishable by a fine of not more than \$10,000, or imprisonment of not more than 5 years, or both (18 U.S.C. s 1001)

AUTOCLAVE soil and other material using the following conditions:

- a. Soil must be autoclaved at 121 degrees Centigrade (250 degrees Fahrenheit) for a minimum of 30 minutes at 15 psi.
- b. Autoclave tape or other indicators must be placed on each bag or sharps container prior to treatment. The autoclave tape or other indicator on each container must be checked to verify color change before disposal.
- c. The autoclave log must be completed by each user for each autoclave cycle. All parameters must be noted as listed on the log for each autoclave load.
- d. If the autoclave does not attain the minimum time and/or temperature or the autoclave tape does not change color, a notation must be made in the comment section of the autoclave log. The load must then be re-autoclaved after placing new tape on the material. If minimum time and temperature is not attained on the second cycle, users must contact the person responsible for maintaining the unit to initiate repairs. Waste must then be treated at an alternate autoclave facility that is approved by USDA.
- e. Thermometers on the autoclave must be calibrated annually, and a written record must be maintained. This must be done by an authorized autoclave service company during routine servicing.
- f. Every 6 months, you should use a commercially available test indicator kit that uses bacterial spores *Bacillus stearothermophilus* that are rendered unviable at 250 degrees F or 121 degrees C. For the test, ampules of *B. stearothermophilus* are autoclaved along with a load of waste. Upon completion of the cycle, the ampules are incubated for 48 hours and then observed for any sign of growth, which indicates insufficient sterilization.


HYDROCLAVE: Soil must be hydroclaved at 121oC/250oF for a minimum of 30 minutes or 132oC for 15 minutes.

PERMIT CONDITIONS

This permit authorizes the importation of soil from all foreign sources (except countries with sanctions or embargoes by U.S. State Department), and interstate/ domestic movement of soil from Hawaii, the contiguous U.S., the continental U.S., and all U.S. territories only for chemical/ physical analysis in a controlled laboratory environment at the named facility on the permit.

1. This permit is issued only for the named permit holder at the address(s) identified on this permit. This permit cannot be transferred or assigned.
2. The permit holder verifies United States residency by initialing and accepting these permit conditions. If you are not a United States resident, it is unlawful for you to initial or accept these permit conditions because a USDA 525 soil Permit can only be issued to United States residents.
3. The permit holder is solely responsible for ensuring compliance with all statutory requirements and specifically listed permit conditions. Failure to comply with the terms and conditions of this permit is cause for the following: (a) cancellation of this permit, (b) cancellation of other permits issued to the permit holder, (c) seizure and/or destruction of regulated organisms, (d) denial of future permit applications by this permit holder, (e) liability for civil penalties, and (f) criminal prosecution under provisions in the Plant Protection Act.
4. Any alteration, forgery, unauthorized use of this permit and/or associated Federal Forms are subject to civil and criminal penalties including fines and imprisonment.
5. This permit must not be used for the movement or use of plant pathogens listed in the Public Health Security and Bioterrorism Preparedness and Response Act of 2002. If any organism listed as a Select Agent is identified from materials associated with this research, the permit holder is required to notify APHIS, Agricultural Select Agent Program (ASAP) within one business day by phone at 301-851-3300, and within seven (7) days submit APHIS/CDC Form 4 (Report of Identification of a Select Agent or Toxin in a Clinical or Diagnostic Laboratory) to APHIS, ASAP; 4700 River Rd, Unit 2, Riverdale, MD 20737 (see instructions at: http://www.aphis.usda.gov/programs/ag_selectagent/index.shtml). Failure to comply with this requirement is a violation of the Agricultural Bioterrorism Protection Act of 2002.


Permit Number P330-13-00153

| | |
|---|-------------------------------|
| <p>THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EPERMITS.</p>  <p>Osmond Baron</p> | <p>DATE</p> <p>05/22/2013</p> |
|---|-------------------------------|

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to \$250,000 (7 U.S.C. § 7734(b)) or punishable by a fine of not more than \$10,000, or imprisonment of not more than 5 years, or both (18 U.S.C. § 1001)

6. If a regulated organism is received in this shipment, the permit holder must take all prudent measures to contain the organism(s) and notify the permit unit within one business day by calling 866-524-5421 or by e-mail to pest.permits@aphis.usda.gov. The permit holder must immediately notify the permit unit of the destruction of regulated organisms received under this permit, as above. Similarly, the permit holder must immediately notify the permit unit if facilities are destroyed or decommissioned for any reason.
7. You as the permit holder are responsible for maintaining a valid permit for as long as the soil is in your possession. APHIS does not issue extensions or renewals of existing permits. The permit holder must submit a new permit application at least three months prior to the expiration of this permit, and obtain a new permit to continue uninterrupted authorization for the soil approved under this permit.
8. If an accidental release into the environment occurs, notification must be made within one business day to APHIS, PPQ, 4700 River Rd., unit 133; Riverdale, MD 20737; 866-524-5421. A written report of the incident must be submitted identifying: (a) the name of the permit holder (responsible person), (b) the permit number, (c) the country or State of origin of the soil, (d) the nature of the release, and (e) measures already taken to contain, reduce or limit the effects of the accidentally released soil. Any plans prepared to contain, reduce or limit the effects of the accidentally released soil may be submitted as developed.
9. Without prior notice and during reasonable hours, authorized PPQ and/or State regulatory officials shall be allowed to inspect the conditions associated with the regulated soil authorized under this permit.
10. The permit holder must maintain an official permanent work assignment at the address identified on this permit. If the permit holder ceases assignment/affiliation at the address identified on this permit, or personnel circumstances change in any way, then a compliance officer must be notified at the PPQ permit unit immediately (that is, within one business day) by either (a) email to pest.permits@aphis.usda.gov, (b) fax to 301-734-4300 or 8700/5392, or (c) conventional mail to USDA PPQ Permit Unit, 4700 River Road, Riverdale, MD 20737. Should the permit holder depart from the organization/facility, the permit holder must either (a) request cancellation of this permit and comply with all permit-specific termination conditions, (b) apply for and receive a permit to move the soil to a new facility, or (c) relinquish control of the regulated soil to a qualified individual who obtained a permit for the continued use of this regulated soil prior to this permit holder's departure.
11. A copy of this permit must accompany all shipments authorized under this permit.
12. CBP-AI and PPQ have the authority to order and approve treatment, re-exportation or destruction of a shipment, a portion of a shipment or any other material associated with the shipment (i.e. pallets, packaging, and means of conveyance). If an official of CBP-AI or PPQ determines that the shipment requires treatment as a condition of entry, is contaminated with a quarantine plant pest or pests, is commingled with prohibited plant material or the required documentation is incomplete or missing, then that official may order and approve treatment, re-exportation or destruction of a shipment, a portion of a shipment or any other material associated with the shipment (i.e. pallets, packaging, means of conveyance).
13. All solid wood packing material (SWPM) accompanying the shipment must be in compliance with ISPM 15 treatment regulations and IPPC stamp requirements and enforcement. Noncompliant shipments will be treated, re-exported or destroyed at the consignee's expense.
14. All costs and arrangements for safeguarding and transportation of the cargo are the responsibility of the importer, broker or other parties associated with the shipment.
15. All operations must be consistent with information submitted in association with the above listed APHIS-PPQ inspected facility and subject to the conditions below.
16. Soil must be shipped in a securely closed, watertight container (primary container, test tube, vial, etc.) which must be enclosed in a second, durable watertight container (secondary container).
17. The shipment must be free from foreign matter or debris, plants and plant parts including noxious weeds and infestations by other macroorganisms such as insects, Cyst nematode nematodes, mollusks and acari. Authorized material found to be commingled with unauthorized material will be subject to the same action (i.e. re-export, destruction) as unauthorized material.
18. The imported article can be released without treatment at the port of entry to the permittee's address listed on the permit or label or to an authorized user only if the final destination is an approved facility listed at <https://web01.aphis.usda.gov/PPQ/AuthSoilLabs.nsf/web?openform>.

Permit Number P330-13-00153

| | |
|--|-------------------------------|
| <p>THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EPERMITS.</p>  <p>Osmond Baron</p> | <p>DATE</p> <p>05/22/2013</p> |
|--|-------------------------------|

WARNING: Any alteration, forgery, or unauthorized use of this Federal Form is subject to civil penalties of up to \$250,000 (7 U.S.C.s 7734(b)) or punishable by a fine of not more than \$10,000, or imprisonment of not more than 5 years, or both (18 U.S.C.s 1001)

19. The soil must not be used in field research or release into the environment before sterilization.

The soil must not be used for isolation or culture of organisms, or for extracting and concentrating organisms from the soil.

The soil must not be used as a growing medium.

20. Further distribution of soil is not allowed without prior approval from Federal officials [State Plant Health Director or designee] (or from Federal officials with State concurrence): Access the website at <http://www.aphis.usda.gov/ppq/sphd/> for a list of State Plant Health Offices. Access the website at <http://nationalplantboard.org/member/index.html> for a list of State Plant Regulatory Officials.

21. While in storage, all soil must be kept locked (e.g. in freezer, cabinet) in the approved lab with access limited to authorized personnel or they will be in a restricted access building that requires a key card entry and access is restricted to authorized personnel only; or it must be in locked room restricted to authorized personnel only.

22. The soil must be handled as quarantined material until sterilized. This will include keeping the soil enclosed in containers when not in use and labeling all containers and/or storage areas: "Quarantine Soil- Sterilize Before Disposal"

23. All packing material, media, substrate, and shipping containers must be sterilized or destroyed as approved and prescribed by the permit conditions after removing the soil.

24. All unconsumed soil, containers and effluent must be autoclaved, incinerated or properly sterilized by the permittee at the conclusion of the project as approved and prescribed by the permit conditions.

25. Any water residues (effluent) from the processing of soil samples must be treated by an approved sterilization procedure such as hydroclave or autoclave.

26. All soil residues must be dry-heated, incinerated, hydroclaved or autoclaved.

Dry Heat Treatment: use one of the following schedules:

- 110- 120.5 degrees C (230-249 F) for 16 hours
- 121-154 degrees C (250-309 F) for 2 hours
- 154.4 - 192.5 degrees C (310-379 F) for 30 minutes
- 193-220 degrees C (380-429 F) for 4 minutes
- 221-232 degrees C (430-450) for 2 minutes

Time starts when the entire sample reaches the required temperature, and a suitable temperature probe must be used for verification.


27. Incineration: With the exception of metal and glass containers, all regulated and associated material must be reduced completely to ash at the end of the incineration cycle.

28. Equipment and supplies used to conduct operations or that have contacted the soil must be decontaminated using one of the following methods:

- (a) Material can be soaked in a fresh bleach solution of 10 percent (1:10) for at least 30 minutes. (1:10 is a convention that means 1 in 10 or 1 part 9 parts = 10 parts total, which is a 10 percent solution)
- (b) Material can be soaked in 70 percent ethanol
- (c) Flamed with ethanol
- (d) Treated with quaternary ammonium compounds.

Note also that autoclaving, hydroclave, incineration, and dry heat sterilization are also acceptable sterilization/decontamination methods.


Permit Number P330-13-00153

| | |
|---|--|
| <p>THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EPERMITS.</p>  <p>Osmond Baron</p> | <p>DATE</p> <p>05/22/2013</p> |
|---|--|

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to \$250,000 (7 U.S.C.s 7734(b)) or punishable by a fine of not more than \$10,000, or imprisonment of not more than 5 years, or both (18 U.S.C.s 1001)

29. You must attach a PPQ Form 550 Black/White label to the exterior of each shipment being imported under this permit. If you are e-authenticated, you are instructed to request labels using the My shipment/my label option within ePermits at least 7 days in advance. Labels also may be requested by email at: BlackWhiteGreenYellow.labelrequest@aphis.usda.gov. All email requests must come from the permit holder or their authorized contact, if requested by an authorized contact the permit holder must be copied on all requests. You must specify PPQ Form 550 Black/White labels, the specific port(s) of entry and number of labels for each port when requesting labels. The requested labels will be sent to you through a bonded carrier.
30. Underlying packaging/wrapping must carry the address, billing, and any other information required to direct the shipment to its final destination (i.e., the permit holder's address; Please note: USDA APHIS does not defray any additional shipping costs incurred for transiting the shipment through an inspection station as the initial US destination).

END OF PERMIT CONDITIONS

| | |
|---|--------------------------------------|
| Permit Number P330-13-00153 | |
| <p>THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EPERMITS.</p>  <p>Osmond Baron</p> | <p>DATE</p> <p>05/22/2013</p> |

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to \$250,000 (7 U.S.C.s 7734(b)) or punishable by a fine of not more than \$10,000, or imprisonment of not more than 5 years, or both (18 U.S.C.s 1001)

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control numbers for this information collection are 0579-0054, 0088, 0129, 0198, 0238, 0257, 0306, 0310. The time required to complete this information collection is estimated to average 1.25 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

FORM APPROVED
OMB NUMBER 0579-0054
0088-0129 0198-0238 0257-0306 0310

| | |
|---|---|
| <p align="center">UNITED STATES DEPARTMENT OF AGRICULTURE ANIMAL AND PLANT HEALTH INSPECTION SERVICE PLANT PROTECTION AND QUARANTINE</p> | <p align="center">COMPLIANCE AGREEMENT</p> |
| <p>1. NAME AND MAILING ADDRESS OF PERSON OR FIRM</p> <p>Audrey J. Stover ACZ Laboratories 2773 Downhill Drive Steamboat Springs, CO 80487 Ph: 970-879-6590 Ext. 515 Fax: 815-301-3857 Email: audreys@acz.com</p> | <p>2. LOCATION</p> <p>Same</p> |

3. REGULATED ARTICLE(S)

Non-sterilized Foreign soil; or Foreign & Regulated Domestic soil; or Domestic soil (HI and/or U.S. territories) - ANALYSIS

4. APPLICABLE FEDERAL QUARANTINE(S) OR REGULATIONS

7 CFR Part 330 and 7 CFR 301

5. I/WE AGREE TO THE FOLLOWING:

I. Transfer and Noncompliance

A. This agreement may be immediately cancelled or revoked for noncompliance.

B. This compliance agreement is non-transferable.

C. Any person who knowingly violates the Plant Protection Act (PPA) (7 U.S.C. 7701 et seq.) and/or the Animal Health Protection Act (AHPA) (7 U.S.C. 8301 et seq.) may be criminally prosecuted and found guilty of a misdemeanor which can result in penalties, a one-year prison term or both. Additionally, any person violating the PPA and/or the AHPA may be assessed civil penalties of up to \$250,000 per violation or twice the gross gain or gross loss for any violation that results in the person deriving pecuniary gain or causing pecuniary loss to another, whichever is greater.

II. Procedures, protocols and limitations established in 'General Stipulations' (attached).

| | | |
|--|---|---|
| <p>6. SIGNATURE</p> <p><i>Audrey J. Stover</i></p> | <p>7. TITLE</p> <p>President/CEO</p> | <p>8. DATE SIGNED</p> <p>4-30-13</p> |
| <p>The affixing of the signatures below will validate this agreement which shall remain in effect until cancelled, but may be revised as necessary or revoked for noncompliance.</p> | | <p>9. AGREEMENT NO.</p> <p>SP-13 169</p> <p>10. DATE OF AGREEMENT</p> |

| | |
|--|---|
| <p>11. PPQ/CBP OFFICIAL (NAME AND TITLE)</p> <p>Patrick McPherran State Plant Health Director</p> | <p>12. ADDRESS</p> <p>USDA APHIS PPQ 3950 N. Lewiston St. Suite 104 Aurora, CO 80011</p> |
| <p>13. SIGNATURE</p> <p><i>Patrick McPherran</i></p> | |

| | |
|--|---|
| <p>14. U.S. GOVERNMENT/STATE AGENCY OFFICIAL (NAME AND TITLE)</p> <p>Mitch Yergert Director, Division of Plant Industry</p> | <p>15. ADDRESS</p> <p>Colorado Department of Agriculture 700 Kipling Suite 4000 Lakewood, CO 80215</p> |
| <p>16. SIGNATURE</p> <p><i>Mitch Yergert</i></p> | |

PPQ FORM 619 (MAY 2007) Previous editions are obsolete

11.7 Informes Originales de los Resultados Analíticos Obtenidos del Efluente en los meses de Noviembre 2013 a Enero 2014.



REG 016 Resultados de Análisis

Muestra: 1 muestra de agua compuesta (según información del cliente)

Alicuota 1: 04:00 horas

Alicuota 2: 07:00 horas

Alicuota 3: 10:00 horas

Alicuota 4: 13:00 horas

Análisis solicitado por: Ing. Miguel Berganza

Dirección: Km. 97.5 carretera Mataquesuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa

Procedencia de la muestra: Proyecto Escobal

Fecha de muestreo: 071113

Fecha de ingreso de muestra: 081113

Fecha de análisis: 081113-201113

Fecha del informe: 201113

Identificación de la muestra: WW9

Correlativo Ecosistemas: 2866

Acuerdo Gubernativo 236-2006 (excepto cianuros)

Límites Máximos Permisibles Entes
Generadores Nuevos
Acuerdo 236-2006

| PARAMETRO | DIMENSIONAL | LIMITE DE DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
|--|-------------|---------------------|-----------|--|----------------------------|
| pH (Laboratorio) | unidades | 1 | 7.93 | SMWW 4500H-B | 6 a 9 |
| * Aceites y Grasas | mg/L | 5 | N.D. | EPA 1664 | 10 |
| Materia Flotante | --- | --- | ausente | Visual | ausente |
| Demanda Bioquímica de Oxígeno DBO ₅ | mg/L | 10 | < 10 | Oxitop-Merck Análogo SMWW 5210D | ver nota |
| * Demanda Química de Oxígeno DQO | mg/L | 25 | < 25 | Reflujo Cerrado, Merck, análogo SMWW 5220D | no especificado |
| Relación DBO ₅ /DQO | --- | --- | ----- | --- | --- |
| Relación DQO/DBO ₅ | --- | --- | ----- | --- | --- |
| * Sólidos Suspendidos | mg/L | 10 | < 10 | SMWW 2540D | 100 |
| * Sólidos Sedimentables | ml/L | 0.1 | < 0.1 | SMWW 2540F | no especificado |
| Nitrógeno Total | mg/L | 1 | 5.6 | Digestión alcalina persulfato colorimétrico HACH | 20 |
| Fósforo Total | mg/L | 0.05 | N.D. | Spectroquant Merck Análogo EPA 365.2+3, SMWW 4500-P E, ISO 6978/1, DIN EN 1189 D11 | 10 |
| * Arsénico As | mg/L | 0.002 | 0.003 | UNICAM AN40177_E10/03C | 0.1 |
| * Cadmio Cd | mg/L | 0.02 | N.D. | SMWW 3111B | 0.1 |
| * Cobre Cu | mg/L | 0.03 | N.D. | SMWW 3111B | 3 |
| Cromo Hexavalente Cr(VI) | mg/L | 0.05 | N.D. | Colorimétrico Merck, análogo SMWW 3500-Cr-D | 0.1 |
| * Mercurio Hg | mg/L | 0.004 | N.D. | UNICAM AN40181_E10/03C | 0.01 |
| * Níquel Ni | mg/L | 0.05 | N.D. | SMWW 3111B | 2 |

| | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|-----------------------|-----------------------------|------------------------|-----------|--|---|
| PARAMETRO | DIMENSIONAL | LIMITE DE DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Plomo Pb | mg/L | 0.05 | N.D. | SMWW 3111B | 0.4 |
| * Zinc Zn | mg/L | 0.01 | N.D. | SMWW 3111B | 10 |
| Color Aparente | UC HZ equiv. Unid. Pt-Co | 1 | 7 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | 500 |
| Color Real | UC HZ equiv. Unid. Pt-Co | 1 | < 1 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | |
| ** Coliformes Fecales | NMP/100mL | 2 | 4.5 | NMP | < 1 x 10 ⁴ |

Notas:

Captación de muestras: La muestra fue captada por personal ajeno a Ecosistemas.

Transporte y preservación de la muestra: Refrigeración. pH < 2 en muestra para análisis de metales y Aceites y Grasas

Metodología: Espectrofotométricos / Standard Methods for water and wastewater APHA, AWWA, 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977. EPA 1664

N.D. No detectable. Debajo del límite de detección.

NMP: Número mas probable

El valor DQO/DBO₅ y DBO₅/DQO no se ha determinado porque el resultado se encuentra abajo de nuestros límites de detección.

Respecto a la DBO el acuerdo 236-2006 la relaciona como "carga" junto al caudal y como meta de cumplimiento

un valor de DBO de 200 mg/L (ver Acuerdo Artículo 21).

Los resultados obtenidos corresponden únicamente a la muestra recibida por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

** Análisis acreditado COGUANOR NTG/ISO/IEC 17025:2005 según OGA LE 006-04*

*** Análisis referido.*



Ing. Fernando Fuentes
Gerente Técnico

LUIS FERNANDO FUENTES MÉNDEZ
INGENIERO QUIMICO
COLEGIADO No. 876

REG 016 Resultados de Análisis

Muestra: 1 muestra de agua simple
 Análisis solicitado por: Ing. Miguel Berganza
 Dirección: Km. 97.5 carretera Mataquescuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa
 Procedencia de la muestra: Proyecto Escobal
 Fecha de muestreo: 071113
 Fecha de ingreso de muestra: 081113
 Fecha de análisis: 081113-201113
 Fecha del informe: 201113

Identificación de la muestra: WW10

Correlativo Ecosistemas: 2867

| Acuerdo Gubernativo 236-2006 (excepto cianuros) | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|---|-------------|------------------------|-----------|---|---|
| PARAMETRO | DIMENSIONAL | LIMITE DE DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Potencial de Hidrogeno pH (Laboratorio) | unidades | 1 | 6.97 | SMWW 4500H-B | 6 a 9 |
| * Aceites y Grasas | mg/L | 5 | N.D. | EPA 1664 | 10 |
| Materia Flotante | --- | --- | ausente | Visual | ausente |
| Demanda Bioquímica de Oxígeno DBO ₅ | mg/L | 10 | < 10 | Oxitop-Merck Análogo SMWW 5210D | ver nota |
| * Demanda Química de Oxígeno DQO | mg/L | 25 | < 25 | Reflujo Cerrado, Merck, análogo SMWW 5220D | no especificado |
| Relación DBO ₅ /DQO | --- | --- | ----- | --- | --- |
| Relación DQO/DBO ₅ | --- | --- | ----- | --- | --- |
| * Sólidos Suspendidos | mg/L | 10 | < 10 | SMWW 2540D | 100 |
| * Sólidos Sedimentables | m/L | 0.1 | < 0.1 | SMWW 2540F | no especificado |
| Nitrógeno Total | mg/L | 1 | N.D. | Digestión alcalina persulfato colorimétrico HACH | 20 |
| Fósforo Total | mg/L | 0.05 | N.D. | Spectroquant Merck Análogo EPA 365.2+3, SMWW 4500-P E, ISO 6978/1, DIN EN 1189 D11 | 10 |
| * Arsénico As | mg/L | 0.002 | N.D. | UNICAM AN40177_E10/03C | 0.1 |
| * Cadmio Cd | mg/L | 0.02 | N.D. | SMWW 3111B | 0.1 |
| * Cobre Cu | mg/L | 0.03 | N.D. | SMWW 3111B | 3 |
| Cromo Hexavalente Cr(VI) | mg/L | 0.05 | N.D. | Colorimétrico Merck, análogo SMWW 3500- Cr-D | 0.1 |
| * Mercurio Hg | mg/L | 0.004 | N.D. | UNICAM AN40181_E10/03C | 0.01 |
| * Niquel Ni | mg/L | 0.05 | N.D. | SMWW 3111B | 2 |

| | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|-----------------------|-----------------------------|------------------------|-----------|--|---|
| PARAMETRO | DIMENSIONAL | LIMITE DE DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Plomo Pb | mg/L | 0.05 | N.D. | SMWW 3111B | 0.4 |
| * Zinc Zn | mg/L | 0.01 | N.D. | SMWW 3111B | 10 |
| Color Aparente | UC HZ equiv. Unid. Pt-Co | 1 | < 1 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | 500 |
| Color Real | UC HZ equiv. Unid. Pt-Co | 1 | < 1 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | |
| ** Coliformes Fecales | NMP/100mL | 2 | < 2 | NMP | < 1 x 10 ⁴ |

Notas:

Captación de muestras: La muestra fue captada por personal ajeno a Ecosistemas.

Transporte y preservación de la muestra: Refrigeración. pH < 2 en muestra para análisis de metales y Aceites y Grasas

Metodología: Espectrofotométricos / Standard Methods for water and wastewater APHA, AWWA, 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977. EPA 1664

N.D. No detectable. Debajo del límite de detección.

NMP: Número mas probable

El valor DQO/DBO₅ y DBO₅/DQO no se ha determinado porque el resultado se encuentra abajo de nuestros límites de detección.

Respecto a la DBO el acuerdo 236-2006 la relaciona como "carga" junto al caudal y como meta de cumplimiento un valor de DBO de 200 mg/L (ver Acuerdo Artículo 21).

Los resultados obtenidos corresponden únicamente a la muestra recibida por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

** Análisis acreditado COGUANOR NTG/ISO/IEC 17025:2005 según OGA LE 006-04*

*** Análisis referido.*



Ing. Fernando Fuentes
Gerente Técnico

LUIS FERNANDO FUENTES MÉNDEZ
INGENIERO QUIMICO
COLEGIADO No. 876

November 20, 2013

Report to:

Miguel Berganza

Tahoe Resources, Inc.

Km 8.6 carrtera Antigua a El Salvador

Centro corporativo Muxbal

Torre Oeste.Apto 503y504 Guatemala, GT

Bill to:

Miguel Berganza

Tahoe Resources, Inc.

5310 Kietzke Lane

Suite 200

Reno, NV 89511

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L15517

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on November 13, 2013. This project has been assigned to ACZ's project number, L15517. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L15517. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

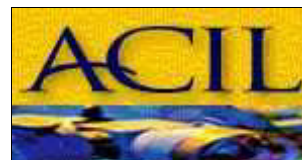
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after December 20, 2013. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and approved this report.



Tahoe Resources, Inc.Project ID: Escobal
Sample ID: WW9ACZ Sample ID: **L15517-01**
Date Sampled: 11/07/13 13:00
Date Received: 11/13/13
Sample Matrix: Waste Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 11/18/13 17:24 | mpb |

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|---------------------------------------|----------|--------|------|----|-------|-------|------|----------------|---------|
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 11/19/13 14:42 | mpb |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: WW10

ACZ Sample ID: **L15517-02**

Date Sampled: 11/07/13 10:00

Date Received: 11/13/13

Sample Matrix: *Surface Water*

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 11/18/13 17:31 | mpb |

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|---------------------------------------|----------|--------|------|----|-------|-------|------|----------------|---------|
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 11/19/13 15:08 | mpb |



Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|--------------|--|--------------|--|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LCSWD</i> | Laboratory Control Sample - Water Duplicate |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFB</i> | Laboratory Fortified Blank |
| <i>CCB</i> | Continuing Calibration Blank | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>CCV</i> | Continuing Calibration Verification standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>ICB</i> | Initial Calibration Blank | <i>MS</i> | Matrix Spike |
| <i>ICV</i> | Initial Calibration Verification standard | <i>MSD</i> | Matrix Spike Duplicate |
| <i>ICSAB</i> | Inter-element Correction Standard - A plus B solutions | <i>PBS</i> | Prep Blank - Soil |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>PBW</i> | Prep Blank - Water |
| <i>LCSSD</i> | Laboratory Control Sample - Soil Duplicate | <i>PQV</i> | Practical Quantitation Verification standard |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>SDL</i> | Serial Dilution |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |
| Standard | Verifies the validity of the calibration. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L15517**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|----------------|--|------|---|
| L15517-01 | WG355114 | Cyanide, total | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| L15517-02 | WG355114 | Cyanide, total | M335.4 - Colorimetric w/ distillation | Q6 | Sample was received above recommended temperature. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |

Tahoe Resources, Inc.

ACZ Project ID: **L15517**

No certification qualifiers associated with this analysis

Tahoe Resources, Inc.
 Escobal

ACZ Project ID: L15517
 Date Received: 11/13/2013 09:59
 Received By: mtb
 Date Printed: 11/13/2013

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | | | X |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? | | X | |

Samples/Containers

| | YES | NO | NA |
|--|-----|----|----|
| 8) Are all containers intact and with no leaks? | X | | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | | | X |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? | X | | |

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| 3505 | 11.5 | 13 | N/A |

Was ice present in the shipment container(s)?

Yes - Gel ice was present in the shipment container(s) but was thawed by receipt at ACZ.

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

REG 016 Resultados de Análisis

Muestra: 1 muestra de agua compuesta (según información del cliente)

Alicuota 1: 03:00 horas

Alicuota 2: 06:00 horas

Alicuota 3: 09:00 horas

Alicuota 4: 12:00 horas

Análisis solicitado por: Ing. Miguel Berganza

Dirección: Km. 97.5 carretera Mataquesuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa

Procedencia de la muestra: Proyecto Escobal

Fecha de muestreo: 171213

Fecha de ingreso de muestra: 181213

Fecha de análisis: 181213-090114

Fecha del informe: 090114

Identificación de la muestra: WW9

Correlativo Ecosistemas: 3353

| Acuerdo Gubernativo 236-2006 (excepto cianuros) | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|---|-------------|-----------|-----------|---|---|
| PARAMETRO | DIMENSIONAL | DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Potencial de Hidrogeno pH (Laboratorio) | unidades | 1 | 7.63 | SMWW 4500H-B | 6 a 9 |
| * Aceites y Grasas | mg/L | 5 | N.D. | EPA 1664 | 10 |
| Materia Flotante | --- | --- | ausente | Visual | ausente |
| Demanda Bioquímica de Oxígeno DBO ₅ | mg/L | 10 | < 10 | Oxitop-Merck Análogo SMWW 5210D | ver nota |
| * Demanda Química de Oxígeno DQO | mg/L | 25 | < 25 | Reflujo Cerrado, Merck, análogo SMWW 5220D | no especificado |
| Relación DBO ₅ /DQO | --- | --- | ---- | --- | --- |
| Relación DQO/DBO ₅ | --- | --- | ---- | --- | --- |
| * Sólidos Suspendidos | mg/L | 10 | < 10 | SMWW 2540D | 100 |
| * Sólidos Sedimentables | ml/L | 0.1 | < 0.1 | SMWW 2540F | no especificado |
| Nitrógeno Total | mg/L | 1 | 6.9 | Digestión alcalina persulfato colorimétrico HACH | 20 |
| Fósforo Total | mg/L | 0.05 | 0.07 | Spectroquant Merck Análogo EPA 365.2+3, SMWW 4500-P E, ISO 6978/1, DIN EN 1189 D11 | 10 |
| * Arsénico As | mg/L | 0.002 | 0.003 | UNICAM AN40177_E10/03C | 0.1 |
| * Cadmio Cd | mg/L | 0.02 | N.D. | SMWW 3111B | 0.1 |
| * Cobre Cu | mg/L | 0.03 | N.D. | SMWW 3111B | 3 |
| Cromo Hexavalente Cr(VI) | mg/L | 0.05 | N.D. | Colorimétrico Merck, análogo SMWW 3500- Cr-D | 0.1 |
| * Mercurio Hg | mg/L | 0.004 | N.D. | UNICAM AN40181_E10/03C | 0.01 |
| * Níquel Ni | mg/L | 0.05 | N.D. | SMWW 3111B | 2 |

| | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|-----------------------|-----------------------------|------------------------|-----------|--|---|
| PARAMETRO | DIMENSIONAL | LIMITE DE DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Plomo Pb | mg/L | 0.05 | N.D. | SMWW 3111B | 0.4 |
| * Zinc Zn | mg/L | 0.01 | N.D. | SMWW 3111B | 10 |
| Color Aparente | UC HZ equiv. Unid. Pt-Co | 1 | 17 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | no especificado |
| Color Real | UC HZ equiv. Unid. Pt-Co | 1 | < 1 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | 500 |
| ** Coliformes Fecales | NMP/100mL | 2 | 49 | NMP | < 1 x 10 ⁴ |

Notas:

Captación de muestras: La muestra fue captada por personal ajeno a Ecosistemas. Es una muestra compuesta.

Transporte y preservación de la muestra: Refrigeración. pH < 2 en muestra para análisis de metales y Aceites y Grasas

Metodología: Espectrofotométricos / Standard Methods for water and wastewater APHA, AWWA, 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977. EPA 1664

N.D. No detectable. Debajo del límite de detección.

NMP: Número mas probable

El valor DQO/DBO₅ y DBO₅/DQO no se ha determinado porque el resultado se encuentra abajo de nuestros límites de detección.

Respecto a la DBO el acuerdo 236-2006 la relaciona como "carga" junto al caudal y como meta de cumplimiento un valor de DBO de 200 mg/L (ver Acuerdo Artículo 21).

Los resultados obtenidos corresponden únicamente a la muestra recibida por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

** Análisis acreditado COGUANOR NTG/ISO/IEC 17025:2005 según OGA LE 006-04*

*** Análisis referido.*

Comparación de descarga según información del cliente.



Ing. Fernando Fuentes
Gerente Técnico

LUIS FERNANDO FUENTES MÉNDEZ
INGENIERO QUIMICO
COLEGIADO No. 876

REG 016 Resultados de Análisis

Muestra: 1 muestra de agua simple
 Análisis solicitado por: Ing. Miguel Berganza
 Dirección: Km. 97.5 carretera Mataquescuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa
 Procedencia de la muestra: Proyecto Escobal
 Fecha de muestreo: 171213
 Fecha de ingreso de muestra: 181213
 Fecha de análisis: 181213-090114
 Fecha del informe: 090114

Identificación de la muestra: WW10

Correlativo Ecosistemas: 3354

| Acuerdo Gubernativo 236-2006 (excepto cianuros) | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|---|-------------|------------------------|-----------|---|---|
| PARAMETRO | DIMENSIONAL | LIMITE DE DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Potencial de Hidrogeno pH (Laboratorio) | unidades | 1 | 8.03 | SMWW 4500H-B | 6 a 9 |
| * Aceites y Grasas | mg/L | 5 | N.D. | EPA 1664 | 10 |
| Materia Flotante | --- | --- | ausente | Visual | ausente |
| Demanda Bioquímica de Oxígeno DBO ₅ | mg/L | 10 | < 10 | Oxitop-Merck Análogo SMWW 5210D | ver nota |
| * Demanda Química de Oxígeno DQO | mg/L | 25 | < 25 | Reflujo Cerrado, Merck, análogo SMWW 5220D | no especificado |
| Relación DBO ₅ /DQO | --- | --- | ----- | --- | --- |
| Relación DQO/DBO ₅ | --- | --- | ----- | --- | --- |
| * Sólidos Suspendidos | mg/L | 10 | < 10 | SMWW 2540D | 100 |
| * Sólidos Sedimentables | ml/L | 0.1 | < 0.1 | SMWW 2540F | no especificado |
| Nitrógeno Total | mg/L | 1 | N.D. | Digestión alcalina persulfato colorimétrico HACH | 20 |
| Fósforo Total | mg/L | 0.05 | N.D. | Spectroquant Merck Análogo EPA 365.2+3, SMWW 4500-P E, ISO 6978/1, DIN EN 1189 D11 | 10 |
| * Arsénico As | mg/L | 0.002 | N.D. | UNICAM AN40177_E10/03C | 0.1 |
| * Cadmio Cd | mg/L | 0.02 | N.D. | SMWW 3111B | 0.1 |
| * Cobre Cu | mg/L | 0.03 | N.D. | SMWW 3111B | 3 |
| Cromo Hexavalente Cr(VI) | mg/L | 0.05 | N.D. | Colorimétrico Merck, análogo SMWW 3500- Cr-D | 0.1 |
| * Mercurio Hg | mg/L | 0.004 | N.D. | UNICAM AN40181_E10/03C | 0.01 |
| * Niquel Ni | mg/L | 0.05 | N.D. | SMWW 3111B | 2 |

| | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|-----------------------|-----------------------------|------------------------|-----------|--|---|
| PARAMETRO | DIMENSIONAL | LIMITE DE DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Plomo Pb | mg/L | 0.05 | N.D. | SMWW 3111B | 0.4 |
| * Zinc Zn | mg/L | 0.01 | N.D. | SMWW 3111B | 10 |
| Color Aparente | UC HZ equiv. Unid. Pt-Co | 1 | < 1 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | 500 |
| Color Real | UC HZ equiv. Unid. Pt-Co | 1 | < 1 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | |
| ** Coliformes Fecales | NMP/100mL | 2 | < 2 | NMP | < 1 x 10 ⁴ |

Notas:

Captación de muestras: La muestra fue captada por personal ajeno a Ecosistemas.

Transporte y preservación de la muestra: Refrigeración. pH < 2 en muestra para análisis de metales y Aceites y Grasas

Metodología: Espectrofotométricos / Standard Methods for water and wastewater APHA, AWWA, 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977. EPA 1664

N.D. No detectable. Debajo del límite de detección.

NMP: Número mas probable

Respecto a la DBO el acuerdo 236-2006 la relaciona como "carga" junto al caudal y como meta de cumplimiento un valor de DBO de 200 mg/L (ver Acuerdo Artículo 21).

Los resultados obtenidos corresponden únicamente a la muestra recibida por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

** Análisis acreditado COGUANOR NTG/ISO/IEC 17025:2005 según OGA LE 006-04*

*** Análisis referido.*

Comparación de descarga según información del cliente.



Ing. Fernando Fuentes
Gerente Técnico

LUIS FERNANDO FUENTES MÉNDEZ
INGENIERO QUIMICO
COLEGIADO No. 876

January 08, 2014

Report to:

Miguel Berganza

Tahoe Resources, Inc.

Km 8.6 carrtera Antigua a El Salvador

Centro corporativo Muxbal

Torre Oeste.Apto 503y504 Guatemala, GT

Bill to:

Miguel Berganza

Tahoe Resources, Inc.

5310 Kietzke Lane

Suite 200

Reno, NV 89511

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L16121

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 19, 2013. This project has been assigned to ACZ's project number, L16121. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L16121. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

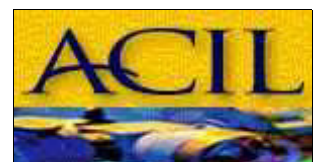
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after February 07, 2014. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and approved this report.



Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: WW9

ACZ Sample ID: **L16121-05**
Date Sampled: 12/17/13 12:00
Date Received: 12/19/13
Sample Matrix: Waste Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/26/13 14:03 | tcd |

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|---------------------------------------|----------|--------|------|----|-------|-------|------|----------------|---------|
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/28/13 15:47 | pjb |

Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: WW10

ACZ Sample ID: **L16121-06**
Date Sampled: 12/17/13 10:30
Date Received: 12/19/13
Sample Matrix: Surface Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 12/26/13 14:04 | tcd |

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|---------------------------------------|----------|--------|------|----|-------|-------|------|----------------|---------|
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 12/28/13 15:49 | pjb |



Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|--------------|--|--------------|--|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LCSWD</i> | Laboratory Control Sample - Water Duplicate |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFB</i> | Laboratory Fortified Blank |
| <i>CCB</i> | Continuing Calibration Blank | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>CCV</i> | Continuing Calibration Verification standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>ICB</i> | Initial Calibration Blank | <i>MS</i> | Matrix Spike |
| <i>ICV</i> | Initial Calibration Verification standard | <i>MSD</i> | Matrix Spike Duplicate |
| <i>ICSAB</i> | Inter-element Correction Standard - A plus B solutions | <i>PBS</i> | Prep Blank - Soil |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>PBW</i> | Prep Blank - Water |
| <i>LCSSD</i> | Laboratory Control Sample - Soil Duplicate | <i>PQV</i> | Practical Quantitation Verification standard |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>SDL</i> | Serial Dilution |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |
| Standard | Verifies the validity of the calibration. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.
 Escobal

ACZ Project ID: L16121
 Date Received: 12/19/2013 12:08
 Received By: mtb
 Date Printed: 12/20/2013

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | | | X |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? | | X | |

Samples/Containers

| | YES | NO | NA |
|--|-----|----|----|
| 8) Are all containers intact and with no leaks? | X | | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | X | | |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? | | X | |

Some parameters were received past hold time.

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| 3405 | 14.1 | 11 | N/A |

Was ice present in the shipment container(s)?
 Yes - Gel ice was present in the shipment container(s) but was thawed by receipt at ACZ.
 Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.



Laboratories, Inc.

116121

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: mberganza@sanrafael.com.gt

Address: Boulevard los Próceres B calle 24-69 z. 10
Zona Empresarial, Zona Pradera, Torre N of 1406
Telephone: (502) 5951 5248

Copy of Report to:

Name: Charlie Mwerhoff
Company: Tahoe Resources Inc.

E-mail: cimerhoff@tahoeresourcesinc.com
Telephone:

Invoice to:

Name: Miguel Berganza
Company: Tahoe Resources Inc.
E-mail: MBERGANZA@SANRAFAEL.COM.GT

Address:
Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring? Yes No

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: Susana Arcoche Sampler's site information State: Zip code Time Zone

Check box if observe Daylight Savings Time

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: Water Quality
PO#: Escobal
Reporting state for compliance testing:
Check box if samples include NRC licensed material?

Table with columns: # of Containers, SW, total CW, and multiple empty columns for analysis results.

Table with columns: SAMPLE IDENTIFICATION, DATE:TIME, Matrix, and analysis results.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns: RELINQUISHED BY, DATE:TIME, RECEIVED BY, DATE:TIME. Includes signatures and dates.

REG 016 Resultados de Análisis

Muestra: 1 muestra de agua compuesta (según información del cliente)

Alicuota 1: 04:10 horas

Alicuota 2: 07:10 horas

Alicuota 3: 10:10 horas

Alicuota 4: 13:10 horas

Análisis solicitado por: Ing. Miguel Berganza

Dirección: Km. 97.5 carretera Mataquesuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa

Procedencia de la muestra: Proyecto Escobal

Fecha de muestreo: 270114

Fecha de ingreso de muestra: 270114

Fecha de análisis: 280114-070214

Fecha del informe: 070214

Identificación de la muestra: WW9

Correlativo Ecosistemas: 326

| Acuerdo Gubernativo 236-2006 (excepto cianuros) | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|---|-------------|-----------|-----------|---|---|
| PARAMETRO | DIMENSIONAL | DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Potencial de Hidrogeno pH (Laboratorio) | unidades | 1 | 7.38 | SMWW 4500H-B | 6 a 9 |
| * Aceites y Grasas | mg/L | 5 | N.D. | EPA 1664 | 10 |
| Materia Flotante | --- | --- | ausente | Visual | ausente |
| Demanda Bioquímica de Oxígeno DBO ₅ | mg/L | 10 | < 10 | Oxitop-Merck Análogo SMWW 5210D | ver nota |
| * Demanda Química de Oxígeno DQO | mg/L | 25 | < 25 | Reflujo Cerrado, Merck, análogo SMWW 5220D | no especificado |
| Relación DBO ₅ /DQO | --- | --- | ---- | --- | --- |
| Relación DQO/DBO ₅ | --- | --- | ---- | --- | --- |
| * Sólidos Suspendidos | mg/L | 10 | < 10 | SMWW 2540D | 100 |
| * Sólidos Sedimentables | ml/L | 0.1 | < 0.1 | SMWW 2540F | no especificado |
| Nitrógeno Total | mg/L | 1 | 12.5 | Digestión alcalina persulfato colorimétrico HACH | 20 |
| Fósforo Total | mg/L | 0.05 | N.D. | Spectroquant Merck Análogo EPA 365.2+3, SMWW 4500-P E, ISO 6978/1, DIN EN 1189 D11 | 10 |
| * Arsénico As | mg/L | 0.002 | 0.007 | UNICAM AN40177_E10/03C | 0.1 |
| * Cadmio Cd | mg/L | 0.02 | N.D. | SMWW 3111B | 0.1 |
| * Cobre Cu | mg/L | 0.03 | N.D. | SMWW 3111B | 3 |
| Cromo Hexavalente Cr(VI) | mg/L | 0.05 | N.D. | Colorimétrico Merck, análogo SMWW 3500- Cr-D | 0.1 |
| * Mercurio Hg | mg/L | 0.004 | N.D. | UNICAM AN40181_E10/03C | 0.01 |
| * Níquel Ni | mg/L | 0.05 | N.D. | SMWW 3111B | 2 |

| | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|-----------------------|-----------------------------|------------------------|-----------|--|---|
| PARAMETRO | DIMENSIONAL | LIMITE DE DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Plomo Pb | mg/L | 0.05 | N.D. | SMWW 3111B | 0.4 |
| * Zinc Zn | mg/L | 0.01 | N.D. | SMWW 3111B | 10 |
| Color Aparente | UC HZ equiv. Unid. Pt-Co | 1 | 11 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | no especificado |
| Color Real | UC HZ equiv. Unid. Pt-Co | 1 | < 1 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | 500 |
| ** Coliformes Fecales | NMP/100mL | 2 | 49 | NMP | < 1 x 10 ⁴ |

Notas:

Captación de muestras: La muestra fue captada por personal ajeno a Ecosistemas.

Transporte y preservación de la muestra: Refrigeración. pH < 2 en muestra para análisis de metales y Aceites y Grasas

Metodología: Espectrofotométricos / Standard Methods for water and wastewater APHA, AWWA, 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977. EPA 1664

N.D. No detectable. Debajo del limite de detección.

NMP: Número mas probable

El valor DQO/DBO₅ y DBO₅/DQO no se ha determinado porque el resultado se encuentra abajo de nuestros límites de detección.

Respecto a la DBO el acuerdo 236-2006 la relaciona como "carga" junto al caudal y como meta de cumplimiento un valor de DBO de 200 mg/L (ver Acuerdo Artículo 21).

Los resultados obtenidos corresponden únicamente a la muestra recibida por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

** Análisis acreditado COGUANOR NTG/ISO/IEC 17025:2005 según OGA LE 006-04*

*** Análisis referido.*

Comparación de descarga según información del cliente.



Ing. Fernando Fuentes
Gerente Técnico

LUIS FERNANDO FUENTES MÉNDEZ
INGENIERO QUIMICO
COLEGIADO No. 876

REG 016 Resultados de Análisis

Muestra: 1 muestra de agua simple
Análisis solicitado por: Ing. Miguel Berganza
Dirección: Km. 97.5 carretera Mataquesuintla, Aldea Sabana Redonda, San Rafael Las Flores, Santa Rosa
Procedencia de la muestra: Proyecto Escobal
Fecha de muestreo: 270114
Fecha de ingreso de muestra: 270114
Fecha de análisis: 280114-070214
Fecha del informe: 070214

Identificación de la muestra: WW10

Correlativo Ecosistemas: 329

| Acuerdo Gubernativo 236-2006 (excepto cianuros) | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|---|-------------|------------------------|-----------|---|---|
| PARAMETRO | DIMENSIONAL | LIMITE DE DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Potencial de Hidrogeno pH (Laboratorio) | unidades | 1 | 6.42 | SMWW 4500H-B | 6 a 9 |
| * Aceites y Grasas | mg/L | 5 | N.D. | EPA 1664 | 10 |
| Materia Flotante | --- | --- | ausente | Visual | ausente |
| Demanda Bioquímica de Oxígeno DBO ₅ | mg/L | 10 | < 10 | Oxitop-Merck Análogo SMWW 5210D | ver nota |
| * Demanda Química de Oxígeno DQO | mg/L | 25 | < 25 | Reflujo Cerrado, Merck, análogo SMWW 5220D | no especificado |
| Relación DBO ₅ /DQO | --- | --- | ----- | --- | --- |
| Relación DQO/DBO ₅ | --- | --- | ----- | --- | --- |
| * Sólidos Suspendidos | mg/L | 10 | < 10 | SMWW 2540D | 100 |
| * Sólidos Sedimentables | ml/L | 0.1 | < 0.1 | SMWW 2540F | no especificado |
| Nitrógeno Total | mg/L | 1 | N.D. | Digestión alcalina persulfato colorimétrico HACH | 20 |
| Fósforo Total | mg/L | 0.05 | N.D. | Spectroquant Merck Análogo EPA 365.2+3, SMWW 4500-P E, ISO 6978/1, DIN EN 1189 D11 | 10 |
| * Arsénico As | mg/L | 0.002 | N.D. | UNICAM AN40177_E10/03C | 0.1 |
| * Cadmio Cd | mg/L | 0.02 | N.D. | SMWW 3111B | 0.1 |
| * Cobre Cu | mg/L | 0.03 | N.D. | SMWW 3111B | 3 |
| Cromo Hexavalente Cr(VI) | mg/L | 0.05 | N.D. | Colorimétrico Merck, análogo SMWW 3500- Cr-D | 0.1 |
| * Mercurio Hg | mg/L | 0.004 | N.D. | UNICAM AN40181_E10/03C | 0.01 |
| * Niquel Ni | mg/L | 0.05 | N.D. | SMWW 3111B | 2 |

| | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|-----------------------|-----------------------------|------------------------|-----------|--|---|
| PARAMETRO | DIMENSIONAL | LIMITE DE DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Plomo Pb | mg/L | 0.05 | N.D. | SMWW 3111B | 0.4 |
| * Zinc Zn | mg/L | 0.01 | N.D. | SMWW 3111B | 10 |
| Color Aparente | UC HZ equiv. Unid. Pt-Co | 1 | < 1 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | 500 |
| Color Real | UC HZ equiv. Unid. Pt-Co | 1 | < 1 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | |
| ** Coliformes Fecales | NMP/100mL | 2 | < 2 | NMP | < 1 x 10 ⁴ |

Notas:

Captación de muestras: La muestra fue captada por personal ajeno a Ecosistemas.

Transporte y preservación de la muestra: Refrigeración. pH < 2 en muestra para análisis de metales y Aceites y Grasas

Metodología: Espectrofotométricos / Standard Methods for water and wastewater APHA, AWWA, 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977. EPA 1664

N.D. No detectable. Debajo del límite de detección.

NMP: Número mas probable

El valor DQO/DBO₅ y DBO₅/DQO no se ha determinado porque el resultado se encuentra abajo de nuestros límites de detección.

Respecto a la DBO el acuerdo 236-2006 la relaciona como "carga" junto al caudal y como meta de cumplimiento un valor de DBO de 200 mg/L (ver Acuerdo Artículo 21).

Los resultados obtenidos corresponden únicamente a la muestra recibida por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

** Análisis acreditado COGUANOR NTG/ISO/IEC 17025:2005 según OGA LE 006-04*

*** Análisis referido.*

Comparación de descarga según información del cliente.



Ing. Fernando Fuentes
Gerente Técnico

LUIS FERNANDO FUENTES MÉNDEZ
INGENIERO QUIMICO
COLEGIADO No. 876

REG 016 Resultados de Análisis

Muestra: 1 muestra de agua simple
Análisis solicitado por: Ing. Miguel Berganza
Dirección: Km. 97.5 carretera Mataquescuintla, Aldea Sabana Redonda, San Rafael Las Flores. Santa Rosa
Procedencia de la muestra: Proyecto Escobal
Fecha de muestreo: 270114
Fecha de ingreso de muestra: 270114
Fecha de análisis: 280114-070214
Fecha del informe: 070214

Identificación de la muestra: WW11
Correlativo Ecosistemas: 327

| Acuerdo Gubernativo 236-2006 (excepto cianuros) | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|---|-------------|------------------------|-----------|---|---|
| PARAMETRO | DIMENSIONAL | LIMITE DE DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Potencial de Hidrogeno pH (Laboratorio) | unidades | 1 | 7.40 | SMWW 4500H-B | 6 a 9 |
| * Aceites y Grasas | mg/L | 5 | N.D. | EPA 1664 | 10 |
| Materia Flotante | --- | --- | ausente | Visual | ausente |
| Demanda Bioquímica de Oxígeno DBO ₅ | mg/L | 10 | < 10 | Oxitop-Merck Análogo SMWW 5210D | ver nota |
| * Demanda Química de Oxígeno DQO | mg/L | 25 | < 25 | Reflujo Cerrado, Merck, análogo SMWW 5220D | no especificado |
| Relación DBO ₅ /DQO | --- | --- | ---- | --- | --- |
| Relación DQO/DBO ₅ | --- | --- | ---- | --- | --- |
| * Sólidos Suspendidos | mg/L | 10 | < 10 | SMWW 2540D | 100 |
| * Sólidos Sedimentables | m/L | 0.1 | < 0.1 | SMWW 2540F | no especificado |
| Nitrógeno Total | mg/L | 1 | 11.4 | Digestión alcalina persulfato colorimétrico HACH | 20 |
| Fósforo Total | mg/L | 0.05 | N.D. | Spectroquant Merck Análogo EPA 365.2+3, SMWW 4500-P E, ISO 6978/1, DIN EN 1189 D11 | 10 |
| * Arsénico As | mg/L | 0.002 | 0.006 | UNICAM AN40177_E10/03C | 0.1 |
| * Cadmio Cd | mg/L | 0.02 | N.D. | SMWW 3111B | 0.1 |
| * Cobre Cu | mg/L | 0.03 | N.D. | SMWW 3111B | 3 |
| Cromo Hexavalente Cr(VI) | mg/L | 0.05 | N.D. | Colorimétrico Merck, análogo SMWW 3500- Cr-D | 0.1 |
| * Mercurio Hg | mg/L | 0.004 | N.D. | UNICAM AN40181_E10/03C | 0.01 |
| * Níquel Ni | mg/L | 0.05 | N.D. | SMWW 3111B | 2 |

| | | | | | Límites Máximos Permisibles Entes Generadores Nuevos Acuerdo 236-2006 |
|-----------------------|-----------------------------|------------------------|-----------|--|---|
| PARAMETRO | DIMENSIONAL | LIMITE DE DETECCION | RESULTADO | METODOLOGIA | descarga a cuerpo receptor |
| * Plomo Pb | mg/L | 0.05 | N.D. | SMWW 3111B | 0.4 |
| * Zinc Zn | mg/L | 0.01 | N.D. | SMWW 3111B | 10 |
| Color Aparente | UC HZ equiv. Unid. Pt-Co | 1 | 11 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | 500 |
| Color Real | UC HZ equiv. Unid. Pt-Co | 1 | < 1 | Colorimétrico Merck, análogo APHA 2120B, DIN 53409 | |
| ** Coliformes Fecales | NMP/100mL | 2 | < 2 | NMP | < 1 x 10 ⁴ |

Notas:

Captación de muestras: La muestra fue captada por personal ajeno a Ecosistemas.

Transporte y preservación de la muestra: Refrigeración. pH < 2 en muestra para análisis de metales y Aceites y Grasas

Metodología: Espectrofotométricos / Standard Methods for water and wastewater APHA, AWWA, 22 edic.

Organic Reagents for Trace Analysis. J.Fries/H. Getrost. E. Merck Darmstadt. 1977. EPA 1664

N.D. No detectable. Debajo del límite de detección.

NMP: Número mas probable

El valor DQO/DBO₅ y DBO₅/DQO no se ha determinado porque el resultado se encuentra abajo de nuestros límites de detección.

Respecto a la DBO el acuerdo 236-2006 la relaciona como "carga" junto al caudal y como meta de cumplimiento un valor de DBO de 200 mg/L (ver Acuerdo Artículo 21).

Los resultados obtenidos corresponden únicamente a la muestra recibida por el personal de Ecosistemas Proyectos Ambientales.

Se prohíbe la reproducción total o parcial de este informe sin la autorización escrita de Ecosistemas Proyectos Ambientales.

* Análisis acreditado COGUANOR NTG/ISO/IEC 17025:2005 según OGA LE 006-04

** Análisis referido.

Comparación de descarga según información del cliente.



Ing. Fernando Fuentes
Gerente Técnico

LUIS FERNANDO FUENTES MÉNDEZ
INGENIERO QUÍMICO
COLEGIADO No. 876

February 10, 2014

Report to:

Miguel Berganza
Tahoe Resources, Inc.
Boulevard Los Proceres 18 c. 24-69 zona 10
Centro
Corporativo Zona Pradera, Torre 4 Of. 1408 Guatemala

Bill to:

Miguel Berganza
Tahoe Resources, Inc.
Boulevard Los Proceres 18 c. 24-69 zona 10
Centro
Corporativo Zona Pradera, Torre 4 Of. 1408 Guatemala

cc: Charlie Muerhoff

Project ID: Escobal

ACZ Project ID: L16669

Miguel Berganza:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on February 03, 2014. This project has been assigned to ACZ's project number, L16669. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L16669. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

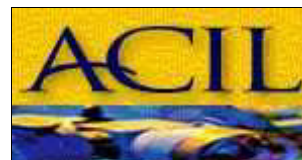
This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after March 12, 2014. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and approved this report.



Tahoe Resources, Inc.

Project ID: Escobal
Sample ID: WW10

ACZ Sample ID: **L16669-05**
Date Sampled: 01/22/14 11:00
Date Received: 02/03/14
Sample Matrix: Surface Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 02/04/14 10:00 | bsu |

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|---------------------------------------|----------|--------|------|----|-------|-------|------|----------------|---------|
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 02/04/14 19:48 | mss2 |

Tahoe Resources, Inc.

Project ID: Escobal

Sample ID: WW9

ACZ Sample ID: **L16669-06**

Date Sampled: 01/27/14 13:10

Date Received: 02/03/14

Sample Matrix: Waste Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 02/07/14 11:55 | mpb |

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|---------------------------------------|----------|--------|------|----|-------|-------|------|----------------|---------|
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 02/07/14 19:06 | pjb |

Tahoe Resources, Inc.

Project ID: Escobal
 Sample ID: WW11

ACZ Sample ID: **L16669-08**
 Date Sampled: 01/27/14 13:30
 Date Received: 02/03/14
 Sample Matrix: Waste Water

Inorganic Prep

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|------------------------------|----------|--------|------|----|-------|-----|-----|----------------|---------|
| Cyanide, total | M335.4 - Manual Distillation | | | | | | | | 02/07/14 12:14 | mpb |

Wet Chemistry

| Parameter | EPA Method | Dilution | Result | Qual | XQ | Units | MDL | PQL | Date | Analyst |
|----------------|---------------------------------------|----------|--------|------|----|-------|-------|------|----------------|---------|
| Cyanide, total | M335.4 - Colorimetric w/ distillation | 0.5 | | U | * | mg/L | 0.003 | 0.01 | 02/07/14 19:08 | pjb |



Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|--------------|--|--------------|--|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LCSWD</i> | Laboratory Control Sample - Water Duplicate |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFB</i> | Laboratory Fortified Blank |
| <i>CCB</i> | Continuing Calibration Blank | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>CCV</i> | Continuing Calibration Verification standard | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>ICB</i> | Initial Calibration Blank | <i>MS</i> | Matrix Spike |
| <i>ICV</i> | Initial Calibration Verification standard | <i>MSD</i> | Matrix Spike Duplicate |
| <i>ICSAB</i> | Inter-element Correction Standard - A plus B solutions | <i>PBS</i> | Prep Blank - Soil |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>PBW</i> | Prep Blank - Water |
| <i>LCSSD</i> | Laboratory Control Sample - Soil Duplicate | <i>PQV</i> | Practical Quantitation Verification standard |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>SDL</i> | Serial Dilution |

QC Sample Type Explanations

| | |
|-------------------------|---|
| Blanks | Verifies that there is no or minimal contamination in the prep method or calibration procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |
| Standard | Verifies the validity of the calibration. |

ACZ Qualifiers (Qual)

| | |
|---|---|
| B | Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| L | Target analyte response was below the laboratory defined negative threshold. |
| U | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Tahoe Resources, Inc.

ACZ Project ID: **L16669**

| ACZ ID | WORKNUM | PARAMETER | METHOD | QUAL | DESCRIPTION |
|-----------|----------|----------------|--|------|---|
| L16669-01 | WG358841 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| L16669-02 | WG358841 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| L16669-03 | WG358841 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| L16669-04 | WG358841 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| L16669-05 | WG358841 | Cyanide, total | M335.4 - Colorimetric w/ distillation | M2 | Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable. |
| | | | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| L16669-06 | WG359037 | Cyanide, total | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| L16669-07 | WG359037 | Cyanide, total | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |
| L16669-08 | WG359037 | Cyanide, total | M335.4 - Colorimetric w/ distillation | RA | Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL). |

Tahoe Resources, Inc.

ACZ Project ID: **L16669**

No certification qualifiers associated with this analysis

Tahoe Resources, Inc.
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ACZ Project ID: L16669
 Date Received: 02/03/2014 10:00
 Received By: mtb
 Date Printed: 2/3/2014

Receipt Verification

| | YES | NO | NA |
|---|-----|----|----|
| 1) Is a foreign soil permit included for applicable samples? | | | X |
| 2) Is the Chain of Custody or other directive shipping papers present? | X | | |
| 3) Does this project require special handling procedures such as CLP protocol? | | | X |
| 4) Are any samples NRC licensable material? | | | X |
| 5) If samples are received past hold time, proceed with requested short hold time analyses? | X | | |
| 6) Is the Chain of Custody complete and accurate? | X | | |
| 7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? | | X | |

Samples/Containers

| | YES | NO | NA |
|--|-----|----|----|
| 8) Are all containers intact and with no leaks? | X | | |
| 9) Are all labels on containers and are they intact and legible? | X | | |
| 10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? | X | | |
| 11) For preserved bottle types, was the pH checked and within limits? | | | X |
| 12) Is there sufficient sample volume to perform all requested work? | X | | |
| 13) Is the custody seal intact on all containers? | | | X |
| 14) Are samples that require zero headspace acceptable? | | | X |
| 15) Are all sample containers appropriate for analytical requirements? | X | | |
| 16) Is there an Hg-1631 trip blank present? | | | X |
| 17) Is there a VOA trip blank present? | | | X |
| 18) Were all samples received within hold time? | | X | |

Some parameters were received past hold time.

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

| Cooler Id | Temp (°C) | Rad (µR/Hr) | Custody Seal Intact? |
|-----------|-----------|-------------|----------------------|
| 4071 | 2.8 | 13 | N/A |

Was ice present in the shipment container(s)?
 Yes - Gel ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

