Prepared by:

Chino Mines Company

Hurley, New Mexico

Completion Report

Interim Remedial Action

Osceolla, CG Bell, and Tenderfoot B Stockpiles

Hanover and Whitewater Creeks Investigation Unit

October 29, 2009

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1.0 INTRODUCTION

This completion report summarizes the reclamation of the Osceolla, CG Bell, and Tenderfoot B Stockpiles (the stockpiles) site within the Hanover and Whitewater Creeks Investigation Unit (HWCIU) under an Interim Remedial Action (IRA) pursuant to the Administrative Order on Consent (AOC) for Freeport-McMoRan Chino Mines Company (Chino). This work was performed in accordance with the IRA Work Plan (Chino, 2003). The stockpile locations are shown on Figure 1.

Chino removed stockpile material and hauled it to the West Stockpile near the Santa Rita Pit. The New Mexico Environment Department (NMED) granted a temporary permit modification to Chino to relocate and recycle the stockpile materials to the West Stockpile, consistent with the terms of Chino Discharge Permit 526 (DP-526). Material was removed to bedrock at all stockpile locations.

Following stockpile removal, the excavated surface was characterized according to the Work Plan (Chino, 2003). The excavated areas were then reclaimed with a vegetated soil cover, open shafts were closed and stormwater control was established. This report describes the removal and reclamation activities, and provides results of the post-removal sampling. A post-removal monitoring plan is also proposed for monitoring potential erosion, vegetation growth, and water quality.

This completion report is organized into the following sections:

- Section 2 states the purposes of the IRA.
- Section 3 contains the site description and a brief history.
- Section 4 describes the removal and reclamation activities.
- Section 5 recounts the monitoring activities during the removal period and the results of the post-removal sampling; laboratory data sheets are in Appendix A.
- Section 6 provides a post-reclamation monitoring plan for the site.
- Section 7 presents a summary.
- Section 8 contains references.

2.0 STATEMENT OF PURPOSE

This section discusses the objectives and scope of work of the IRA for the Osceolla, CG Bell, and Tenderfoot B Stockpiles. Stockpile removal at the site and surface reclamation met the objectives of the IRA and were consistent with the long-term objectives of the AOC.

2.1 Interim Remedial Action Objective and Long-Term Strategy

The primary objective of the IRA was to reduce potential mass-loading of metals and acidity from source materials to groundwater and surface water in accordance with New Mexico Water Quality Control Commission (WQCC) requirements under Regulation 1203. Removal of the stockpile material effectively reduced mass-loading from source materials and controlled potentially poor-quality surface-water discharges and groundwater seepage resulting from past mining activities at the site.

The remedial action implemented at the Osceolla, CG Bell, and Tenderfoot B Stockpiles is consistent with the following long-term remedial objectives:

- Preventing future releases to surface water, groundwater, and soil or sediment;
- Limiting direct exposure to waste materials;
- Achieving post-mining land use;
- Preventing erosion; and
- Ensuring physical stability and site safety.

This interim action is also consistent with the long-term strategy for closure/closeout and meets standards prescribed in the AOC agreement. Requirements under the New Mexico Mining Act and rules primarily pertain to returning the disturbed area to a post-mining beneficial use, such as wildlife habitat or grazing. Once vegetation matures on cover material and erosion is stabilized, the area will become a self-sustaining ecosystem for wildlife habitat and/or grazing.

2.2 Interim Remedial Action Scope of Work

The IRA was conducted in two phases. The first phase involved the development of the IRA Work Plan for removing the stockpiles (Chino, 2003). The IRA Work Plan was approved by NMED in a letter dated September 3, 2003. The second phase of the remedial action involved the excavation of the stockpiles based on the Work Plan.

3.0 BACKGROUND AND HISTORY

The Osceolla, CG Bell, and Tenderfoot B Stockpiles are approximately 1-½ miles northeast of Bayard, New Mexico (Figure 1). The sites lie on banks and steep hillsides above Whitewater Creek. Figure 2 shows the estimated stockpile extents and surrounding infrastructure prior to removal. The following sections describe the general hydrogeologic characteristics and historical operations of the sites.

3.1 Site Characteristics

The three stockpiles were located on steep slopes with thin soil and exposed bedrock. The underlying geology at the three stockpiles is predominately granodiorite stock with mineralized veins. The Osceolla and Tenderfoot B Stockpiles were located on hillslopes that drain toward Whitewater Creek. The CG Bell Stockpile was located in a tributary to Whitewater Creek that was blocked downstream of the stockpile by a road crossing.

The three stockpiles were previously sampled for the Phase 2 Comprehensive Groundwater Characterization Study (CGCS; Chino, 1998). All three stockpiles were determined to be potentially acid generating based on acid-base accounting (ABA) results. Synthetic Precipitation Leachate Procedure (SPLP) analysis of samples from the three stockpiles resulted in concentrations of sulfate, aluminum, cadmium, cobalt, manganese, lead, and zinc exceeding the NMWQCC standards. Based on this characterization, removal of stockpile materials and underlying colluviums was undertaken.

Prior to removal of the stockpiles, water likely infiltrated from the surface into the stockpile materials and colluvium during storms and snow melt. However, due to the naturally low permeability of the bedrock and relatively small areas covered by the stockpiles, it is unlikely that the infiltration had significant impact on the deep groundwater.

3.2 Historical Operations

The stockpile sites were owned by a number of companies over the years; the last operator was ASARCO prior to Chino acquiring the properties in the mid-1990s. The stockpiles are located on banks and hillsides of Whitewater Creek, between the former Groundhog Mine and Star Shaft. The Osceolla, CG Bell, and Tenderfoot B Stockpiles were located on small historical mining claims. These sites were mined in the 1800s and the early 1900s. All three claims were located on visible mineralogical veins and probably mined for lead and zinc. The veins were likely extensions of those mined at the Groundhog Mine just to the south.

The three stockpiles were mined by either underground or surface methods. Suspected shaft locations prior to removal are shown on Figure 2.

The Tenderfoot A Stockpile was located at the mouth of a tributary to Whitewater Creek several hundred feet east of the Tenderfoot B Stockpile. The Tenderfoot A Stockpile was removed during the construction of Dam 17 in 1999, and the materials were disposed of on the West Stockpile. The Tenderfoot B Stockpile is separate from the previously removed Tenderfoot A Stockpile.

4.0 STOCKPILE REMOVAL

The IRA for the Osceolla, CG Bell, and Tenderfoot B Stockpiles required removing all potentially acidic stockpile material, affected soil, and affected bedrock to the extent feasible. Any visible accumulations of waste rock in the vicinity of the stockpile footprints were also removed. This was followed by placing borrow soil where slopes were flatter than 3 Horizontal to 1 Vertical (3H:1V) for best retention, and seeding for revegetation. The activities required for the IRA are described below. Photographs of the sites prior to, during, and following excavation activities, including application and seeding of soil cover are provided in this completion report (Photos 1 through 27).

4.1 Pre-Excavation Preparation

Chino coordinated the excavation with the NMED through approved Work Plans and a temporary discharge permit authorization. Chino's internal Bluestake team coordinated with outside utility locating companies to clear the areas for excavation activities. Short, temporary access roads were built for removing stockpile material, particularly for the Tenderfoot B and CG Bell Stockpiles. Limited clearing and grubbing were needed for construction of the temporary access roads.

4.2 Infrastructure Relocation

Infrastructure was relocated at the Osceolla and CG Bell Stockpiles. At the Osceolla Stockpile, a groundwater monitoring well required lowering of the collar. The high-density polyethylene (HDPE) pipeline located along the railroad was moved out of the way. At the CG Bell Stockpile, the HDPE pipeline was removed during excavation of road fill and later a steel pipeline was installed on the clean road fill. No infrastructure at the Tenderfoot B Stockpile required relocation or disconnection during construction.

4.3 Stockpile Excavation

Excavation of stockpile materials began in early December 2003 and was completed in July 2004 by Chino Operations. The excavation area footprints for each stockpile are shown on Figures 3, 4, and 5. The stockpiles were removed by excavating to bedrock using bulldozers, front-end loaders, backhoes, and trucks to scrape, load, and haul. Stockpile material and any underlying colluvium were removed and weathered bedrock was scraped. In addition, material in the channel of Whitewater Creek adjacent to the railroad was removed from an overbank deposit. Visually impacted material, possibly related to historical upstream releases or a historical tin can operation, was removed to a surface that

was not visually impacted (Photos 9 and 10). Approximately 3,000, 4,000, and 3,000 cubic yards of material were removed from the Osceolla, CG Bell, and Tenderfoot B Stockpiles, respectively, based on truck counts during removal.

The excavated material was transported to the West Stockpile using haul trucks. Excavated material was placed on the West Stockpile, within a permitted area for leaching under DP-526.

4.4 Shaft Closure

Exposed mine openings were closed as required by the IRA Work Plan (Chino, 2003). Shaft locations identified at the CG Bell and Tenderfoot B Stockpiles (Figure 2) were previously mapped (Laskey, 1936). However, no shaft opening was found during excavation of the CG Bell Stockpile.

The shaft at the Tenderfoot B Stockpile was closed by Chino by filling the shaft with waste rock and mounding clean fill over the shaft opening to promote runoff. A berm was constructed on the uphill side of the mound to route runoff around the closed shaft. The closed Tenderfoot B shaft is shown in 2004 and in 2009 on Photos 24 and 25, respectively.

One shaft was discovered near the former Osceolla Stockpile in August 2008, and was closed by St. Cloud Mining Company (St. Cloud). The shaft surfaced on a road cut within the former footprint of the stockpile (Figure 3 and Photo 11) four years after removal activities were completed. St. Cloud determined with minimal excavation that the opening was narrow and small as shown in the photos. The opening was backfilled with clean material and compacted to eliminate safety hazards and to prevent surface water from entering the shaft. Photos of the closure activities were lost, but Chino has attached the St. Cloud daily work logs containing details of the backfilling (Appendix B).

4.5 Reclamation

Mine reclamation objectives require minimizing erosion associated with overland runoff and concentrated flows from high intensity storm events. The overall goal was to provide a stable surface that enhances vegetation growth and allows the establishment of a self-sustaining ecosystem. The completed project also protects surface water and groundwater and supports surface stabilization. A soil cover was placed on excavated surfaces that were flatter than 3H:1V and were not in use as access roads. The soil cover was seeded and surface-water controls established. Ultimately, revegetation of the sites will reduce erosion and enhance the post-mining uses.

4.5.1 Cover Placement

After excavation, a 1-foot-thick layer of soil was placed over areas excavated to bedrock as a growth medium for vegetation. Cover soil was excavated from borrow areas adjacent to the stockpiles (Figures 4 and 5). This work was completed in June and July 2004. Cover soil applied to the Osceolla Stockpile was excavated from the borrow area adjacent to the CG Bell Stockpile. The soil cover was generally composed of colluvium with tuff and granodiorite rock fragments up to several inches in diameter with a clayey sand matrix. The loose soil cover was scarified where possible to enhance seed germination. Soil covers were installed by Chino Operations.

Slopes underlying the Osceolla and CG Bell Stockpiles are locally steeper than approximately 3H:1V and are composed of competent bedrock. These slopes were left to form a natural rock outcrop, similar to rock exposures in the surrounding undisturbed terrain. The extent of soil cover for the Osceolla, CG Bell, and Tenderfoot B Stockpiles is shown on Figures 3, 4, and 5, respectively.

4.5.2 Revegetation

Native seeds were hand broadcasted on the soil cover and borrow area by Chino in July 2004. Seeds were applied at the rate specified in the IRA Work Plan. The seed mixture and application rate of the primary plant species used are listed in Table 1. The native vegetation will provide forage, seeds, and cover for reptiles, small mammals, and birds common to the area, which will also benefit from the increased insect populations that are likely to accompany vegetation growth. The shrubs, grasses, and forbs will provide forage and browse for larger native animals such as deer and javelina. Functions and attributes of the primary plant species are listed in Table 2.

4.5.3 Surface-Water Controls

The National Pollutant Discharge Elimination System requirement for temporary erosion-control measures was met using hay bales and berms where appropriate. At the Osceolla and Tenderfoot B Stockpiles, hay bales were placed at the toe of the stockpiles after removal and cover placement. These bales will remain in place until vegetation has matured.

The CG Bell Stockpile did not need temporary erosion control because the tributary in which it is located was blocked by road fill immediately downstream of the stockpile. The road fill was found to contain sulfides during excavation, and was removed and replaced

with clean road fill. Stormwater runoff collects behind the road fill after storm events and does not discharge to Whitewater Creek.

5.0 CONSTRUCTION PERIOD MONITORING

The engineering oversight and environmental monitoring performed during removal and reclamation activities are described in this section. The long-term monitoring plan is presented in Section 6.0.

5.1 Air Monitoring

The stockpile sites are located approximately ¼ mile from the nearest residents at the confluence of Hanover and Whitewater Creeks, and a topographic ridge separates the stockpile sites from the residents. The haul trucks that transported the stockpile material traveled on interior Chino roads; no public roads were used. The duration of the removal action was less than two months. The stockpile material was coarse grained and the potential for high dust generation during excavation was low. Therefore, monitoring and suppression of dust was not needed. Nonetheless, a water truck was available for dust control when windy conditions occurred.

5.2 Seepage Monitoring

Seepage monitoring consisted of daily inspections downhill from each stockpile during the removal period. No seepage was observed.

5.3 Engineering Oversight

The scope of the engineering oversight included supervising the excavation/reclamation process to make sure that the IRA and post-removal sampling met the guidelines in the Work Plan (Chino, 2003). A Chino geologist performed the field oversight of relocation of pipelines, excavation of stockpiles and borrow materials, shaft closure, soil cover placement, and control of surface water during construction.

5.4 Post-Removal Sampling

The purpose of post-removal sampling was to document the geochemical nature and distribution of the bedrock surface previously underlying the stockpiles. Mineralized veins and intrusive dikes at the three stockpiles are naturally mineralized, and removal to pre-determined standards was infeasible.

5.4.1 Geologic Mapping

After excavating the stockpile material, the geology of the exposed weathered bedrock surface was mapped by a Chino field geologist. Bedrock geology is shown on Figures 6, 7, and 8. Geologic units encountered during field mapping include:

Tertiary Quartz Monzonite (Tqm) – This unit is a post-mineralization dike occurring only at the CG Bell area (Figure 7). This unit tends to weather quickly into a friable topsoil.

Tertiary Granodiorite (Tgr) – This unit is differentiated on Figures 6, 7, and 8 as either biotized or quartz-sericite altered. The Tgr is mineralized in veins near the stockpiles, and is hard and resistant to weathering. In places, the Tgr is overprinted with leach-cap alteration.

Diorite Porphyry (Kep) – This unit is a propylitically altered diorite that occurs only at the CG Bell area.

Quaternary Alluvium (Qa) – This unit occurs as an overbank deposit in the Whitewater Creek channel adjacent to the slope of the Osceolla area (Figure 6).

5.4.2 Sample Collection and Laboratory Analysis

Stratified sampling was performed by Chino ELWD, with each strata being a visually identified surficial geologic unit within each of three areas. Sample locations are shown on Figures 6, 7, and 8. Twenty-eight samples were collected from the excavated bedrock surface. Samples types and analyses are summarized in Table 3.

Grab samples were crushed to a pulp by the Chino Assay Lab. The bulk of each sample was then sent to Freeport-McMoRan Copper & Gold Inc.'s Central Analytical Service Center in Safford Arizona for paste pH measurement and X-Ray Fluorescence (XRF) analysis of selected metals. XRF analysis was performed using a semi-quantitative, standardless program that does not calibrate for each element with calibration standards, but uses theoretical excitation values for each analyte to determine if the analyte is present, then quantifies the concentration using measured excitation intensities. This method is less accurate than calibration methods, but is useful as a screening tool to check for the variability of concentrations across the sites. An aliquot of selected samples was sent to SVL Analytical (SVL) in Kellogg, Idaho, for analysis of total metals by SW-846 Method 3050 to check the accuracy of the XRF analysis (split samples).

Following XRF analysis, the samples were returned to the Chino Assay Lab for compositing. An equal volume of aliquot from all grab samples within a stockpile area was

mixed to create a composite sample. The three composite samples were sent to SVL for analysis of:

- Paste pH: American Society of Agronomists Method 9,
- Acid Base Accounting (ABA): Modified Sobek,
- Synthetic Precipitation Leaching Procedure (SPLP): Method 1312, and
- Total Metals: SW-846 Method 3050.

5.4.3 Results of Laboratory Analysis

Results of the XRF analysis and paste pH are compiled in Table 4 with summary statistics for each stockpile area. Generally, XRF results show little variability in concentration within geologic units or stockpile areas, or between the different stockpile areas. Results of the total metals analysis for the three split samples (Osceolla-9, Bell-8, and TF-5) are listed in Table 5. The XRF overestimated metals concentrations with the exception of copper. Selenium was not detected in either the XRF or total metals results, and the XRF detection limit for cadmium was too high to be valuable for comparison, as the results were less than the method detection limit.

Results of ABA tests are listed in Table 6. In accordance with Price (1997), the following screening criteria are used to classify samples in terms of their acid-generation potential:

ARD Potential	Screening Criterion	Comments
Likely	Neutralizing Potential/Acid Potential (ANP/AGP) < 1	Likely ARD generating unless sulfide minerals are non-reactive
Possibly	1 < ANP/AGP < 2	Possibly ARD generating if ANP is insufficiently reactive or is depleted at a rate faster than sulfides
Low	2 < ANP/AGP < 4	Not potentially ARD generating unless sulfides are preferentially exposed or extremely reactive in combination with insufficiently reactive ANP
None	ANP/AGP > 4	Not acid generating

Notes:
ANP = acid-neutralization potential
AGP = acid-generation potential
ARD = acid-rock drainage

A fifth category follows an empirical rule of thumb: materials with sulfide sulfur contents less than 0.3 percent and a paste pH greater than 5.5 are generally considered non-acid-generating, regardless of their ratio of acid-neutralization potential (ANP) to acid-generation potential (AGP). The material classifications based on Price (1997) are listed on Table 6.

Based on ABA testing, the composite sample for the Osceolla area was classified as likely to generate acid (Table 6). The CG Bell and Tenderfoot B samples were classified as "not acid generating" and "low potential to generate acid," respectively. Note that for all three samples, the sulfide sulfur content was low (less than 0.2 percent). In fact, for the CG Bell and Tenderfoot B samples, the sulfide sulfur content was so low that acid generation through oxidation is unlikely. The low values for paste pH likely reflect past reactivity, which may have resulted in formation of oxidation products, such as jarosites, which contain stored acidity that is released when they dissolve. The only sample considered to be potentially acid generating due to future sulfide oxidation is the Osceolla composite, a much more naturally mineralized mine site than the other two sites.

Total metals analyses (Table 7) were conducted on composite samples to determine the nature of the exposed bedrock surface prior to cover material placement. SPLP testing (Table 8) was performed on composite samples to determine whether metal concentrations identified by total metals analysis have the potential to leach from the weathered bedrock.

All three composite samples leached elevated concentrations of manganese and zinc. Other metals were detected in the leachate, but not at elevated concentrations (Table 8).

6.0 POST-RECLAMATION MONITORING

This section presents the post-reclamation monitoring plan for former Osceolla, CG Bell, and Tenderfoot B Stockpiles. The plan includes erosion and vegetation monitoring of the soil covers. The sites will remain under the oversight of the Chino AOC at least until the Record of Decision for the HWCIU has been approved by NMED. Monitoring may then be included as part of the long-term closure actions for Chino under DP-1340. Surface-water monitoring is not proposed for these three facilities because the amount of runoff from these small areas would be impractical to capture and sample.

Vegetation and erosion will be monitored until a viable self-sustaining vegetated cover is established for grazing or wildlife habitat post-mining land use. The former Osceolla and CG Bell Stockpiles are in proximity to operational areas (access roads and active pipelines), and could be used again for operations, but will be monitored until that time as closed facilities.

The reclaimed areas will be monitored as follows: The revegetated soil cover and surface-water controls will be inspected, and repaired if necessary, quarterly for 1 year to determine the initial success of the seeding. The surface will be visually monitored for erosion while vegetation physically stabilizes the surface. Thereafter, vegetation will be monitored annually for 4 years. The vegetation survey will present the data in a format comparable to the Vegetation Success Standards and Success Monitoring Section of Appendix C in the Mining and Minerals Division revision 01-1 To Permit GR000RE, including canopy cover, shrub density, and plant diversity. Results of the vegetation survey will be submitted as part of the Groundhog Mine Site annual report, which contains the same monitoring information as required for these historic sites. Surface-water controls and erosion will be monitored quarterly until vegetation surveys demonstrate that the sites are stable and self sustaining. Chino performed the initial erosion and vegetation inspection in the third quarter of 2009 for all three sites while inspecting the Groundhog Mine Site for its quarterly monitoring requirements. This survey will be incorporated into the Groundhog Mine Site Annual Monitoring Report to be submitted October 31, 2009.

7.0 SUMMARY

The Osceolla, CG Bell, and Tenderfoot B Stockpiles were removed and reclaimed with a vegetated soil cover. The IRA was conducted in accordance with the NMED-approved Work Plan (Chino, 2003) from December 2003 to July 2004.

Stockpile material was excavated, removed, and placed on the West Stockpile near the Santa Rita Pit, where the material was recycled for copper recovery. Chino was permitted to relocate the stockpile materials to the West Stockpile under the terms of Chino's DP-526. Material was excavated to bedrock at all stockpile locations.

Following stockpile removal, the excavated surface was characterized according to the Work Plan. The site was then reclaimed with a vegetated soil cover, shafts associated with the Osceolla and Tenderfoot B Stockpiles were closed, and stormwater controls were established.

Results of characterization of the bedrock surface indicate that elevated concentrations of some metals would be expected due to the presence of naturally occurring mineralization; however, some residual acidity and metal concentrations may be present as a result of impacts from the stockpiles prior to removal.

Once vegetation is established, erosion and sedimentation will be reduced, and the land can be designated for a variety of uses. This remediation will ultimately lead to the improvement of surface water and groundwater resources in Whitewater Creek and conforms to the success criteria of the Closure/Closeout Plan for Chino.

8.0 REFERENCES

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TABLES

TABLE 1
SEED MIX USED FOR REVEGETATION

Species	Life Form	Duration [a]	Seasonality	Rate [b]
Blue flax (linum lewisii)	Forb	Per	NA	0.15
Blue grama (Bouteloua gracilis)	Grass	Per	Warm	0.25
Bottlebrush squirretail (Sitanion hystrix)	Grass	Per	Cool	1.25
Four-wing saltbush (Atriplex canescens)	Shrub	Per	Cool	1.5
Globe mallow (Sphaeralcea sp.)	Forb	Per	NA	0.1
Green sprangletop (Leptochloa dubia)	Grass	Per	Warm	1
Needle-and-thread (Stipa comata)	Grass	Per	Cool	ND
Sand dropseed (Sporobolus cryptandrus)	Grass	Per	Intermediate	ND
Side-oats grama (Bouteloua curtipendula)	Grass	Per	Warm	1.25
Streambank wheatgrass (Agropyron dastachyum v. riparium)	Grass	Per	Cool	1.5
Yellow sweet clover (Melilotus officinalis)	Forb	Ann	NA	0.15
Total PLS (lb/ac):				**7.45 to 10**

Notes: (a) = Per – Perennial; Ann – Annual
(b) = Rate is in pounds of pure live seed (PLS) per acre (lb/ac)
NA = Not applicable
ND = Not determined
PLS = Pure live seed

TABLE 2
FUNCTIONS AND ATTRIBUTES OF THE PRIMARY PLANT SPECIES

Species	Character	Attributes and Function
Blue flax (linum lewisii)	N, P, F	Persistent forb with a pretty blue flower
Blue grama (Bouteloua gracilis)	N, P, W, G	Sod and bunch grass providing ground cover and forage
Bottlebrush squirretail (Sitanion hystrix)	N, P, C, G	Persistent (moderately palatable) bunch grass providing ground cover
Fourwing saltbush (Atriplex canescens)	N, P, S	Mid-height to tall shrub providing browse and cover
Globe mallow (Sphaeralcea sp.)	N, P, F	Persistent mid-height forb providing browse
Green sprangletop (Leptochloa dubia)	N, P, W, G	Erect bunch grass; aggressive short-lived nurse plant with forage value
Needle-and-thread (Stipa comata)	N, P, C, G	Long-lived, tufted, perennial, good forage for livestock and wildlife
Sand Dropseed (Sporobolus cryptandrus)	N, P, W, G	Warm-season bunch grass providing erosion control of sandy soil
Side-oats grama (Bouteloua curtipendula)	N, P, W, G	Bunch grass providing ground cover and forage
Streambank wheatgrass (Agropyron dastachyum v. riparium)	N, P, C, G	Sod-forming grass providing ground cover and forage
Yellow sweet clover (Melilotus officinalis)	I, A/B, F	N-fixing forb providing forage and ground cover

Notes:
N = Native
I = Introduced
P = Perennial
A/B = Annual or biannual
W = Warm season
C = Cool season
G = Grass
S = Shrub
F = Forb

TABLE 3
POST-REMOVAL SAMPLE TYPES AND ANALYSES PERFORMED

Stockpile	No. of Samples	Sample Type	Sample Analysis				
			Paste pH	XRF	Modified Total Metals	ABA	SPLP
Osceolla	10	1 composite 9 grab	9	9	1	1	1
CG Bell	9	1 composite 8 grab	8	8	1	1	1
Tenderfoot B	12	1 composite 11 grab	11	11	1	1	1
Subtotals	31	---	28	28	3	3	3

Notes:

ABA = Acid-Base Accounting
SPLP = Synthetic Precipitation Leaching Procedure
XRF = X-ray fluorescence

TABLE 4
XRF RESULTS FOR GRAB SAMPLES

Sample ID	Geological Unit	Paste pH s.u.	Al mg/kg	Cd mg/kg	Co mg/kg	Cu mg/kg	Fe mg/kg	Mn mg/kg	Pb mg/kg	Se mg/kg	Zn mg/kg
Osceolla-1	Quaternary alluvium	5	86,268	ND	76.04	696	57,493	3,361	619	ND	1,350
Osceolla-2	Tertiary granodiorite - biotized	4	89,973	ND	67.51	1,486	57,563	2,718	628	ND	1,743
Osceolla-3	Quaternary alluvium	5	90,502	ND	82.43	1,446	60,221	2,192	541	ND	972
Osceolla-4	Tertiary granodiorite - biotized	4	23,022	ND	NA	248	243,402	335	4,382	ND	571
Osceolla-5	Tertiary granodiorite - biotized	4.5	109,026	ND	44.06	436	56,934	9,758	984	ND	4,451
Osceolla-6	Tertiary granodiorite - biotized	4	94,736	ND	46.90	173	49,660	2,927	188	ND	1,302
Osceolla-7	Tertiary granodiorite - biotized	4	107,967	ND	NA	433	49,240	4,507	252	ND	2,322
Osceolla-8	Tertiary granodiorite - biotized	5.5	107,438	ND	37.66	727	68,404	5,599	1,690	ND	1,575
Osceolla-9	Tertiary granodiorite - biotized	5	93,148	ND	40.51	188	52,247	4,221	320	ND	2,097
Count		9	9	9	7	9	9	9	9	9	9
Non-Detect Count		0	0	9	0	0	0	0	0	9	0
Non-Detect %		0	0	100	0	0	0	0	0	100	0
Maximum		5.5	109,026	0.00	82.43	1,486	243,402	9,758	4,382	0.00	4,451
Minimum		4	93,148	0.00	37.66	173	49,240	335	188	0.00	571
Mean		4.56	89,120	0.00	56.44	648	77,240	3,958	1,067	0.00	1,820
Median		4.50	101,087	0.00	46.90	436	57,493	3,361	619	0.00	1,575
Standard Deviation		0.58	26,255	0.00	18.41	504	62,586	2,644	1,325	0.00	1,123
Coefficient of Variation		0.13	0.29	0.00	0.33	1	1	1	1.24	0.00	1
Bell-1	Tertiary granodiorite - QSP	6	116,964	ND	NA	180	57,563	2,718	628	ND	1,743
Bell-2	Tertiary granodiorite - QSP	5	102,145	ND	31.98	176	60,221	2,192	541	ND	972
Bell-3	Tertiary granodiorite - leach-cap alteration	4	94,736	ND	54.01	139	243,402	335	4,382	ND	571
Bell-4	Tertiary granodiorite - leach-cap alteration	6	73,566	ND	NA	1,254	56,934	9,758	984	ND	4,451
Bell-5	Quartz monzonite	5	96,853	ND	56.14	716	49,660	2,927	188	ND	1,302
Bell-6	Tertiary granodiorite - biotized	4	99,499	ND	44.77	903	49,240	4,507	252	ND	2,322
Bell-7	Tertiary granodiorite - biotized	4.5	97,911	ND	41.22	516	68,404	5,599	1,690	ND	1,575
Bell-8	Tertiary granodiorite - leach-cap alteration	4	91,560	ND	45.48	340	52,247	4,221	320	ND	2,097
Count		8	8	8	6	8	8	8	8	8	8
Non-Detect Count		0	0	8	0	0	0	0	0	8	0
Non-Detect %		0	0	100	0	0	0	0	0	100	0
Maximum		6	116,964	0.00	56.14	1,254	243,402	9,758	4,382	0.00	4,451
Minimum		4	91,560	0.00	31.98	139	49,240	335	188	0.00	571
Mean		4.81	96,654	0.00	45.60	528	79,709	4,032	1,123	0.00	1,879
Median		4.75	97,382	0.00	45.12	428	57,248	3,574	584	0.00	1,659
Standard Deviation		0.84	12,042	0.00	8.80	403	66,437	2,816	1,405	0.00	1,185
Coefficient of Variation		0.18	0.12	0.00	0.19	1	1	1	1.25	0.00	1

TABLE 4
XRF RESULTS FOR GRAB SAMPLES

Sample ID	Geological Unit	Paste pH s.u.	Al mg/kg	Cd mg/kg	Co mg/kg	Cu mg/kg	Fe mg/kg	Mn mg/kg	Pb mg/kg	Se mg/kg	Zn mg/kg
TF-1	Tertiary granodiorite - biotized	5.5	136,547	ND	NA	613	81,833	1,394	938	ND	908
TF-2	Tertiary granodiorite - QSP	7	79,917	ND	72	339	65,467	1,588	1,003	ND	560
TF-3	Tertiary granodiorite - biotized	5.5	120,140	ND	NA	276	66,586	1,177	1,968	ND	745
TF-4	Tertiary granodiorite - leach-cap alteration	5	28,580	ND	90	1,078	189,546	297	2,896	ND	1,824
TF-5	Tertiary granodiorite - biotized	6	97,382	ND	62	381	53,786	4,383	449	ND	2,507
TF-6	Tertiary granodiorite - leach-cap alteration	4	101,616	ND	43	266	57,983	6,033	250	ND	1,358
TF-7	Tertiary granodiorite - biotized	5	102,675	ND	41	360	59,382	4,500	1,225	ND	1,293
TF-8	Tertiary granodiorite - biotized	4	96,853	ND	47	218	56,794	3,284	177	ND	1,141
TF-9	Tertiary granodiorite - leach-cap alteration	4.5	81,505	ND	97	332	65,467	4,275	661	ND	1,077
TF-10	Tertiary granodiorite - biotized	6	88,914	ND	76	89	50,009	5,661	124	ND	868
TF-11	Tertiary granodiorite - biotized	6	97,382	ND	39	169	49,380	2,842	312	ND	1,253
Count		11	11	11	9	11	11	11	11	11	11
Non-Detect Count		0	0	11	0	0	0	0	0	11	0
Non-Detect %		0	0	100	0	0	0	0	0	100	0
Maximum		7	136,547	0.00	97	1,078	189,546	6,033	2,896	0.00	2,507
Minimum		4	28,580	0.00	39	89	49,380	297	124	0.00	560
Mean		5.32	93,773	0.00	63	375	72,385	3,221	909	0.00	1,230
Median		5.00	97,382	0.00	62	332	59,382	3,284	661	0.00	1,141
Standard Deviation		0.93	27,051	0.00	22	269	39,926	1,919	860	0.00	544
Coefficient of Variation		0.17	0.29	0	0.35	1	1	1	0.95	0	0

Notes: All samples collected on 6/15/04
s.u. = Standard pH units
mg/kg = milligrams per kilogram
QSP = Quartz sericite alteration
ND = Not detected; concentration is less than the analytical detection limit
NA = Constituent not analyzed in this sample

TABLE 5
TOTAL METALS ANALYTICAL RESULTS
FOR SPLIT SAMPLES

Sample ID	Aluminum (mg/kg)	Cadmium (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Selenium (mg/kg)	Zinc (mg/kg)
Osceolla-9	15,300	1.5	9.08	121	23,900	313	2,220	<1.0	1360
Bell-8	11,900	0.36	7.13	231	27,600	107	1,580	<1.0	400
TF-5	13,900	3.79	8.82	294	20,700	509	2,550	<1.0	1270

Notes:
mg/kg = milligrams per kilogram
< = Concentration is less than the analytical detection limit

TABLE 6
ACID-BASE ACCOUNTING RESULTS FOR COMPOSITED SAMPLES

Sample ID	ABA Results					Sulfur				Material Classification
	Paste pH [a] s.u.	Net Neutralizing Potential $tCaCO_3/kt$	ANP/AGP	AGP $tCaCO_3/kt$	ANP $tCaCO_3/kt$	Unidentifiable %	Sulfide %	Sulfate %	Total %	
Osceolla Composite	4.92	-0.91	0.81	4.69	3.78	0.06	0.15	0.18	0.39	Likely to Generate Acid
CG Bell Composite	4.43	2.84	4.02	0.94	3.78	0.03	0.03	0.12	0.18	Not Acid Generating
Tenderfoot B Composite	6.32	2.59	3.76	0.94	3.53	0.02	0.03	0.07	0.12	Low Potential to Generate Acid

Notes: ABA = acid-base accounting
ANP = acid-neutralizing potential
AGP = acid-generating potential - calculated based on sulfide sulfur
s.u. = standard units
tCaCO3/kt = tons calcium carbonate per kiloton of sediment
< = concentration less than detection limit
a = Saturated Paste pH

TABLE 7
TOTAL METALS ANALYTICAL RESULTS
FOR COMPOSITED SAMPLES

Sample ID	Aluminum (mg/kg)	Cadmium (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Selenium (mg/kg)	Zinc (mg/kg)
Osceolla Composite	12,500	0.75	8.41	403	55,300	797	2,350	<1.0	945
CG Bell Composite	14,300	1.8	8.41	353	32,500	690	2,440	<1.0	742
Tenderfoot B Composite	13,500	1.29	5.7	218	39,800	423	1,590	<1.0	727

Notes:
mg/kg = milligrams per kilogram
< = Concentration is less than the analytical detection limit

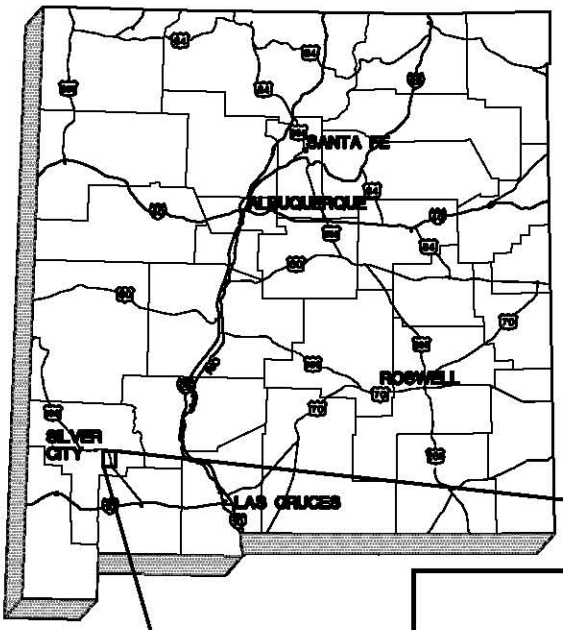
TABLE 8
SPLP RESULTS FOR COMPOSITED SAMPLES

Sample ID	Al (mg/L)	Cd (mg/L)	Co (mg/L)	Cu (mg/L)	Fe (mg/L)	Mn (mg/L)	Pb (mg/L)	Zn (mg/L)	TDS (mg/L)	SO_4 (mg/L)
Osceolla Composite	<0.02	0.0094	0.0223	0.189	<0.020	4.6	0.0067	1.9	184	123
CG Bell Composite	0.1	0.0125	0.0093	0.447	<0.020	2.69	0.0053	1.86	143	105
Tenderfoot B Composite	0.1	<0.002	<0.006	0.0124	0.197	0.888	0.008	0.0078	136	55.8

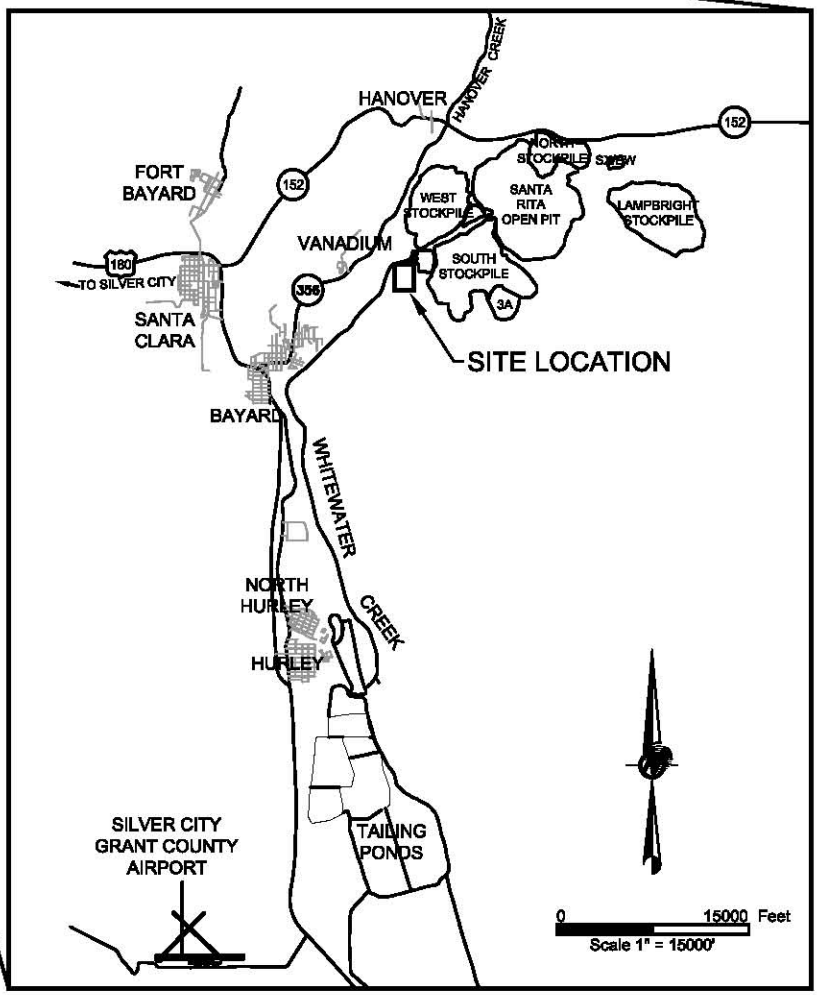
Notes:

mg/L = milligrams per liter
TDS = total dissolved solids
SO_4 = Sulfate

FIGURES



STATE OF NEW MEXICO
(NOT TO SCALE)



PROJECT

FREEPORT-McMoRAN COPPER & GOLD
CHINO MINES COMPANY

OSCEOLLA, CG BELL, AND TENDEFOOT B IRA
GRANT COUNTY, NEW MEXICO

TITLE

OSCEOLLA, CG BELL, AND TENDERFOOT B STOCKPILES SITE LOCATION

Golder Associates
Tucson, Arizona

PROJECT No. 073-92553-06			FILE No. 0739255306C004	
DESIGN	JP	10/02/09	SCALE AS SHOWN	REV. A
CADD	NIL	10/02/09	FIGURE 1	
CHECK	JP	10/02/09		
REVIEW	KRJ	10/13/09		

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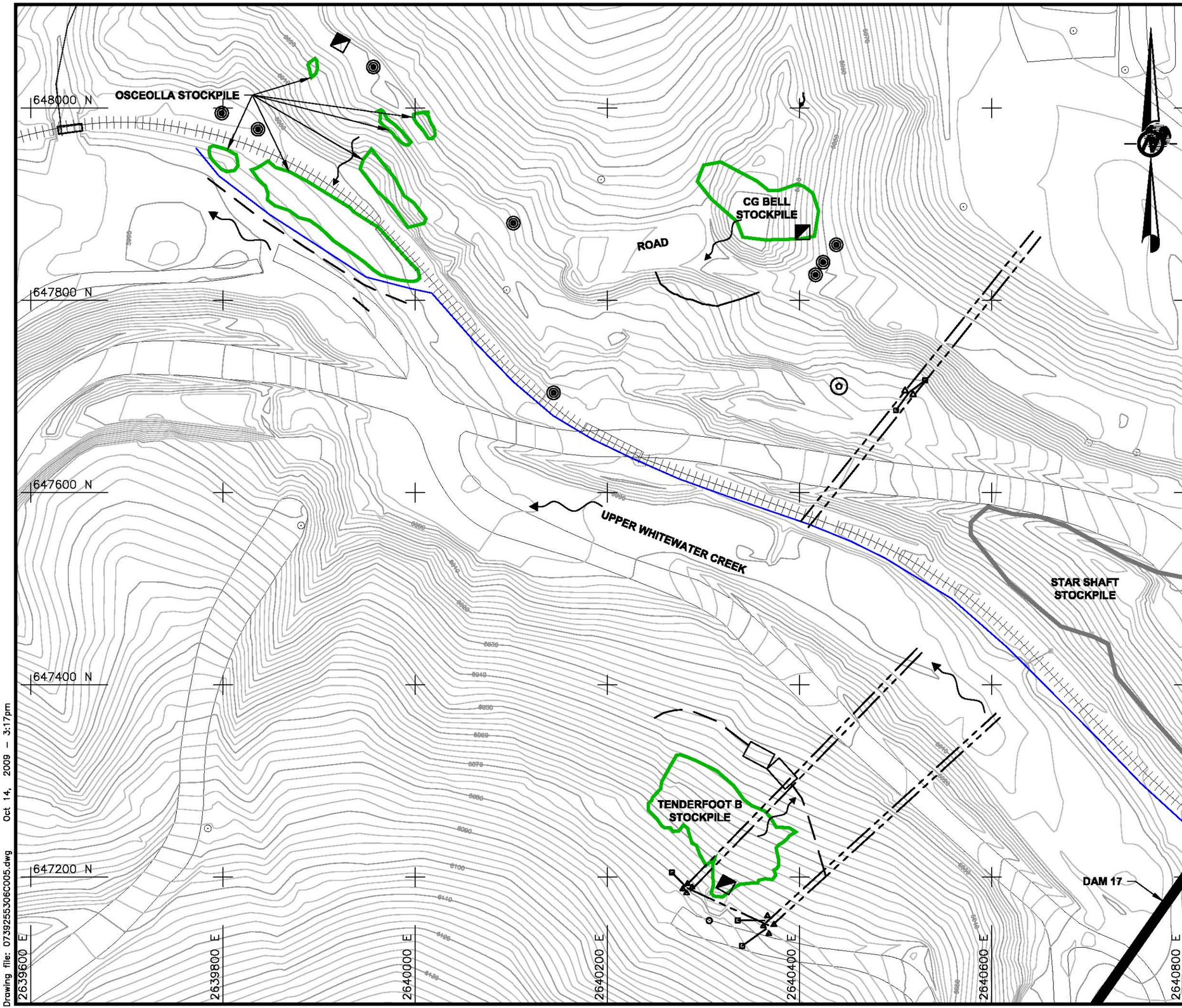

LEGEND

- LIMITS OF STOCKPILE
- MONITORING WELL
- HDPE PIPELINE
- RAILROAD
- SILT FENCE
- STRAW BALES
- POWER BOX
- POWER LINES
- POWER POLE
- GUY WIRES
- FORMER MINE SHAFT (APPROXIMATE)
- SURFACE–WATER FLOW DIRECTION

REFERENCES

1.) 2004 TOPOGRAPHY PROVIDED BY CHINO MINES COMPANY.

100 0 100

SCALE 1" to 100' FEET
CONTOUR INTERVAL = 2 FT

PROJECT

FMI Freeport-McMoRan Copper & Gold
CHINO MINES COMPANY

OSCEOLLA, CG BELL, AND TENDERFOOT B IRA
GRANT COUNTY, NEW MEXICO

TITLE

OSCEOLLA, CG BELL, AND TENDERFOOT B PRE-REMOVAL STOCKPILES AND INFRASTRUCTURE

Golder Associates
Tucson, Arizona

PROJECT No. 073–92553–06			FILE No. 0739255306C002	
DESIGN	JP	09/18/09	SCALE AS SHOWN	REV. A
CADD	NIL	09/23/09	FIGURE 2	
CHECK	JP	10/02/09		
REVIEW	KRJ	10/13/09		

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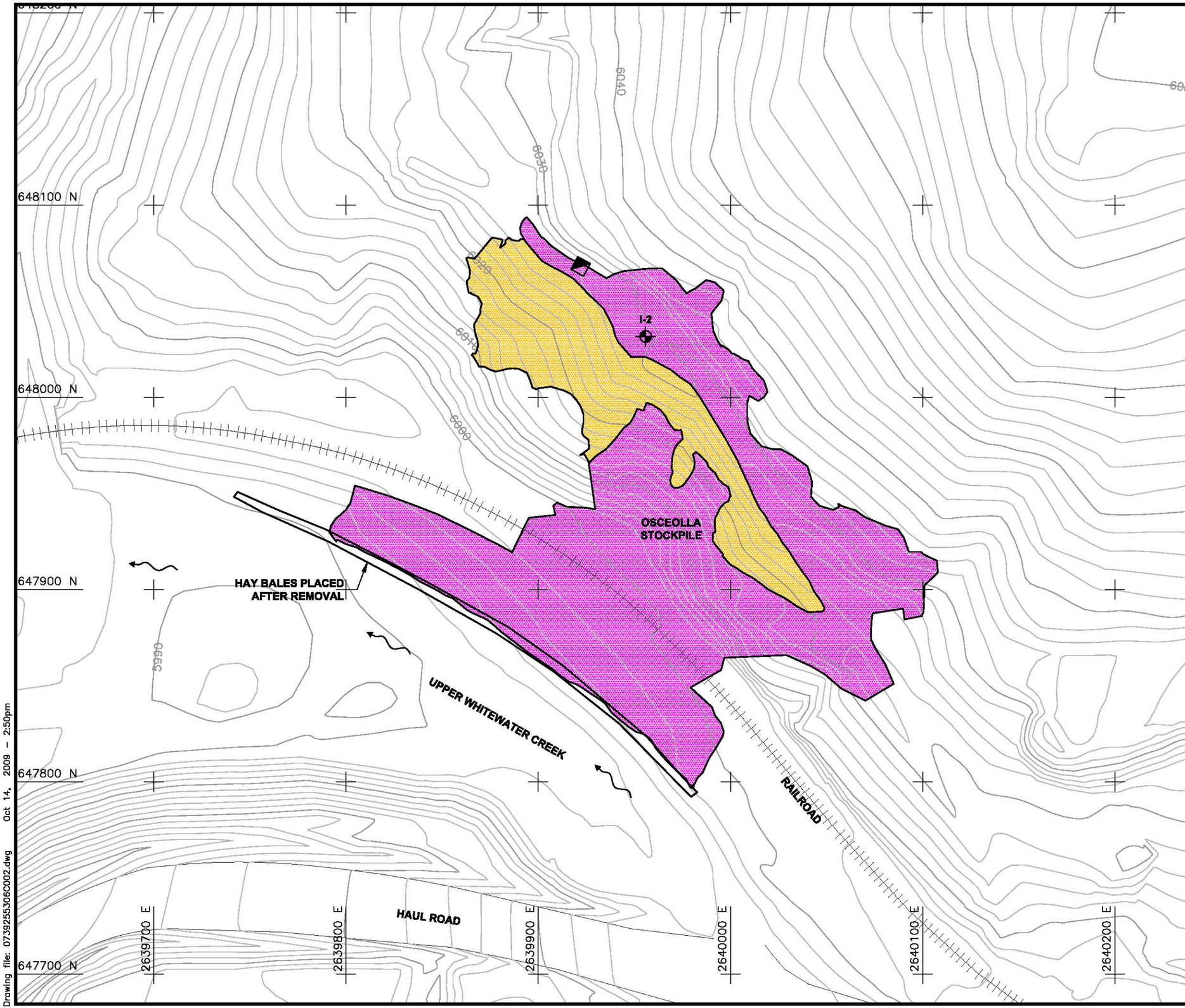

LEGEND

- AREA OF REMOVAL, CAPPED AND SEEDED
- AREA OF REMOVAL, NOT CAPPED OR SEEDED
- I-2 MONITOR WELL
- FORMER MINE SHAFT
- DIRECTION OF SURFACE WATER FLOW

REFERENCES

1.) 2004 TOPOGRAPHY PROVIDED BY CHINO MINES COMPANY.

50 0 50

SCALE 1" to 50' FEET

CONTOUR INTERVAL = 2 FT

PROJECT

FMI FREEPORT-McMoRAN COPPER & GOLD
CHINO MINES COMPANY

OSCEOLLA, CG BELL, AND TENDERFOOT B IRA
GRANT COUNTY, NEW MEXICO

TITLE

OSCEOLLA STOCKPILE POST-REMOVAL

Golder Associates
Tucson, Arizona

PROJECT No. 073-92553-06			FILE No. 0739255306C002	
DESIGN	JP	09/18/09	SCALE AS SHOWN	REV. A
CADD	NIL	09/23/09		
CHECK	JP	10/02/09	FIGURE 3	
REVIEW	KRJ	10/13/09		

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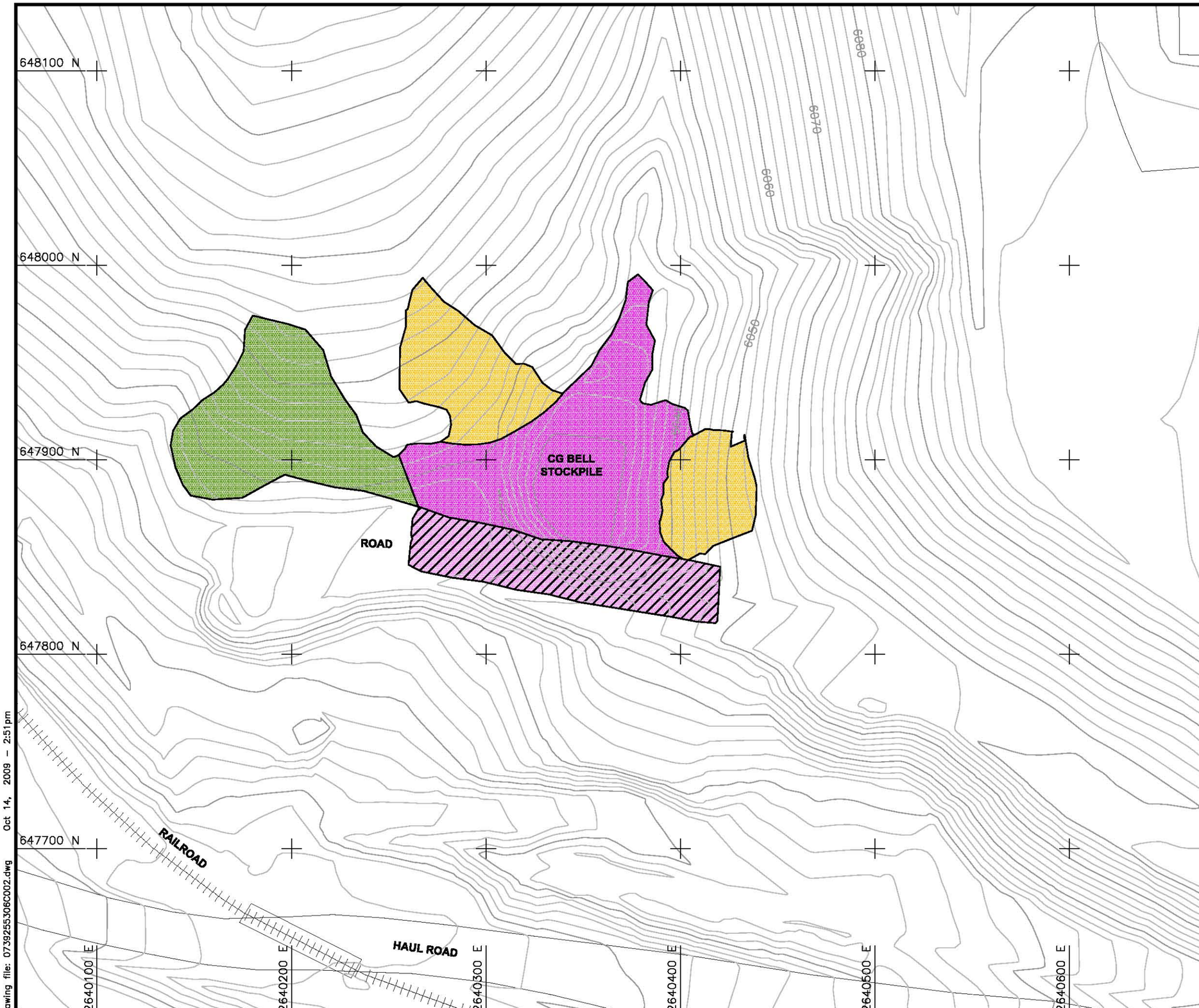

LEGEND

- AREA OF REMOVAL, CAPPED AND SEEDED
- AREA OF REMOVAL, NOT CAPPED OR SEEDED
- BORROW AREA
- AREA OF ROAD REMOVAL AND REPLACEMENT WITH CLEAN MATERIAL

REFERENCES

1.) 2004 TOPOGRAPHY PROVIDED BY CHINO MINES COMPANY.

50 0 50
SCALE 1" to 50' FEET
CONTOUR INTERVAL = 2 FT

PROJECT
FREEPORT-McMoRAN COPPER & GOLD
CHINO MINES COMPANY

OSCEOLLA, CG BELL, AND TENDERFOOT B IRA
GRANT COUNTY, NEW MEXICO

TITLE

CG BELL STOCKPILE POST-REMOVAL

Golder Associates
Tucson, Arizona

PROJECT No. 073-92553-06			FILE No. 0739255306C002	
DESIGN	JP	09/18/09	SCALE AS SHOWN	REV. A
CADD	NIL	09/23/09		
CHECK	JP	10/02/09	FIGURE 4	
REVIEW	KRJ	10/13/09		

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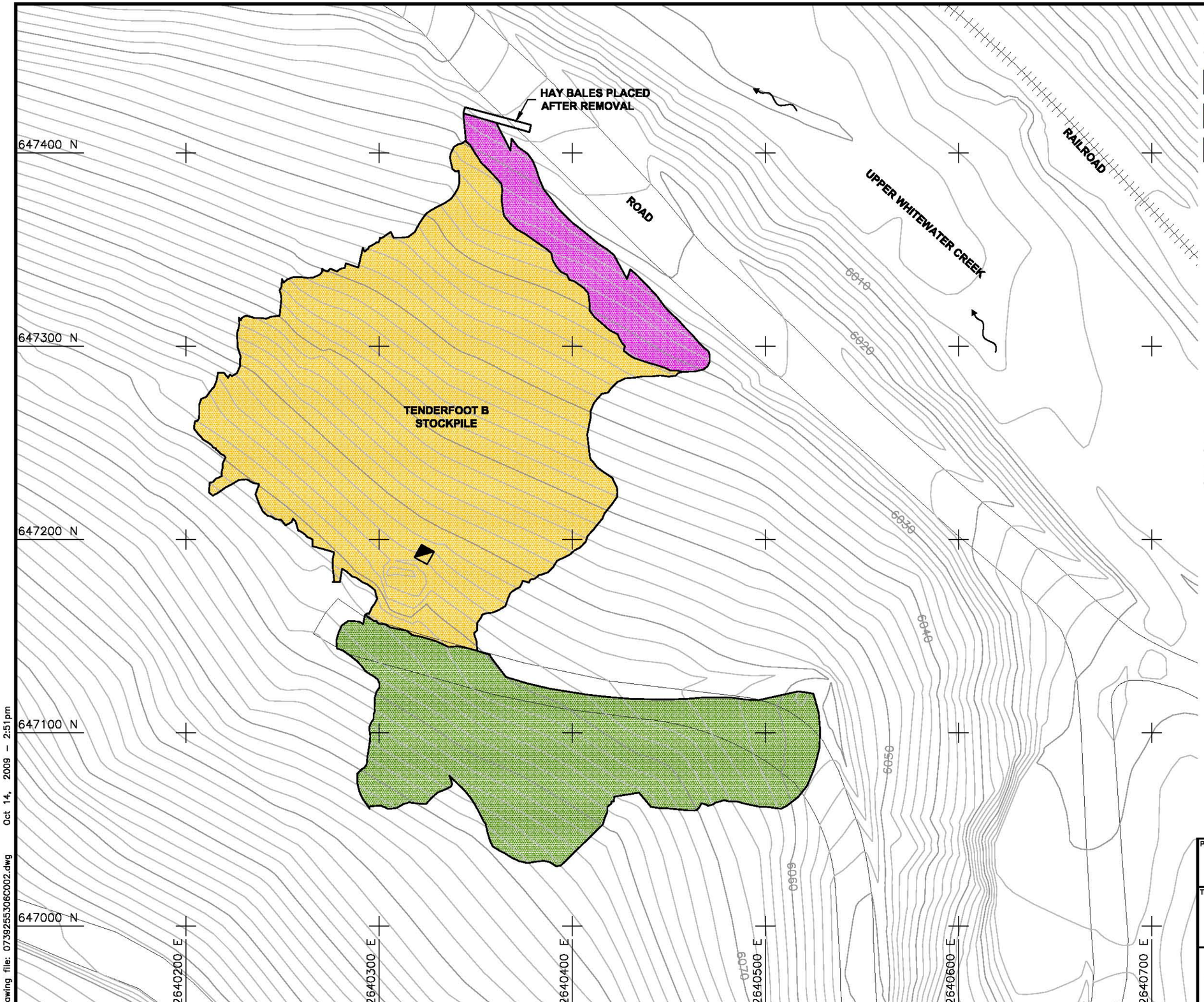


LEGEND

- AREA OF REMOVAL, CAPPED AND SEEDED
- AREA OF REMOVAL, NOT CAPPED OR SEEDED
- BORROW AREA
- FORMER MINE SHAFT
- DIRECTION OF SURFACE WATER FLOW

REFERENCES

1.) 2004 TOPOGRAPHY PROVIDED BY CHINO MINES COMPANY.

50 0 50

SCALE 1" to 50' FEET

CONTOUR INTERVAL = 2 FT

PROJECT

FMI Freeport-McMoRan Copper & Gold
CHINO MINES COMPANY

OSCEOLLA, CG BELL, AND TENDERFOOT B IRA
GRANT COUNTY, NEW MEXICO

TITLE

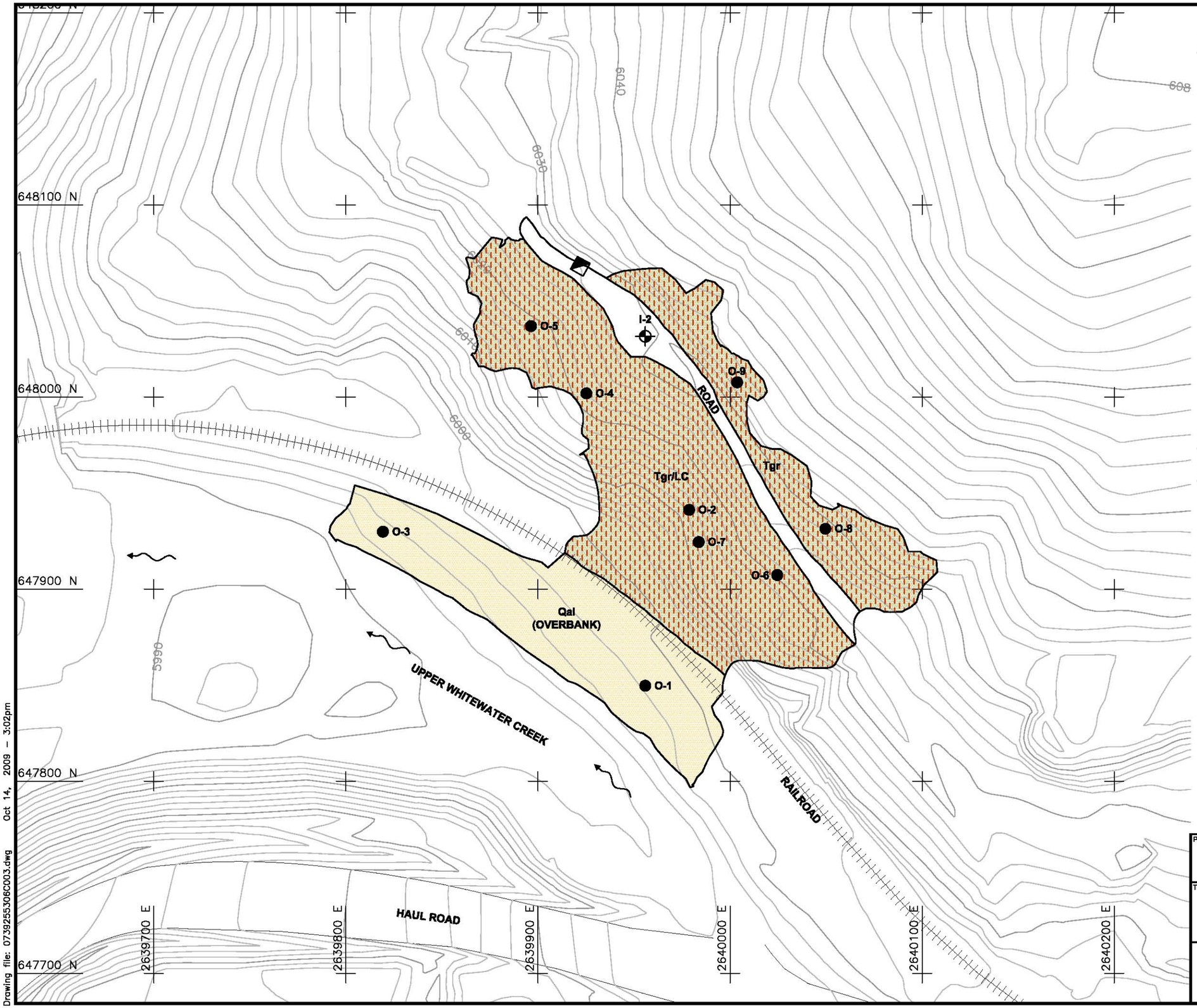
TENDERFOOT B STOCKPILE POST-REMOVAL

Golder Associates
Tucson, Arizona

PROJECT No. 073-92553-06			FILE No. 0739255306C002	
DESIGN	JP	09/18/09	SCALE AS SHOWN	REV. A
CADD	NIL	09/23/09		
CHECK	JP	10/02/09		
REVIEW	KRJ	10/13/09		

FIGURE 5

Drawing file: 0739255306C002.dwg Oct 14, 2009 - 2:51pm



LEGEND

Qal	QUATERNARY ALLUVIUM
Tgr	TERTIARY GRANODIORITE – BIOTIZED ALTERATION
LC	LEACH CAP ALTERATION OVERPRINT
O-1	BEDROCK SURFACE SAMPLE LOCATION
I-2	MONITOR WELL
	FORMER MINE SHAFT
	GEOLOGIC LIMIT (DASHED WHERE INTERPRETED)
	DIRECTION OF SURFACE WATER FLOW

REFERENCES

1.) 2004 TOPOGRAPHY PROVIDED BY CHINO MINES COMPANY.

50 0 50

SCALE 1" to 50' FEET
CONTOUR INTERVAL = 2 FT

PROJECT

FMI Freeport-McMoRan Copper & Gold
CHINO MINES COMPANY

OSCEOLLA, CG BELL, AND TENDERFOOT B IRA
GRANT COUNTY, NEW MEXICO

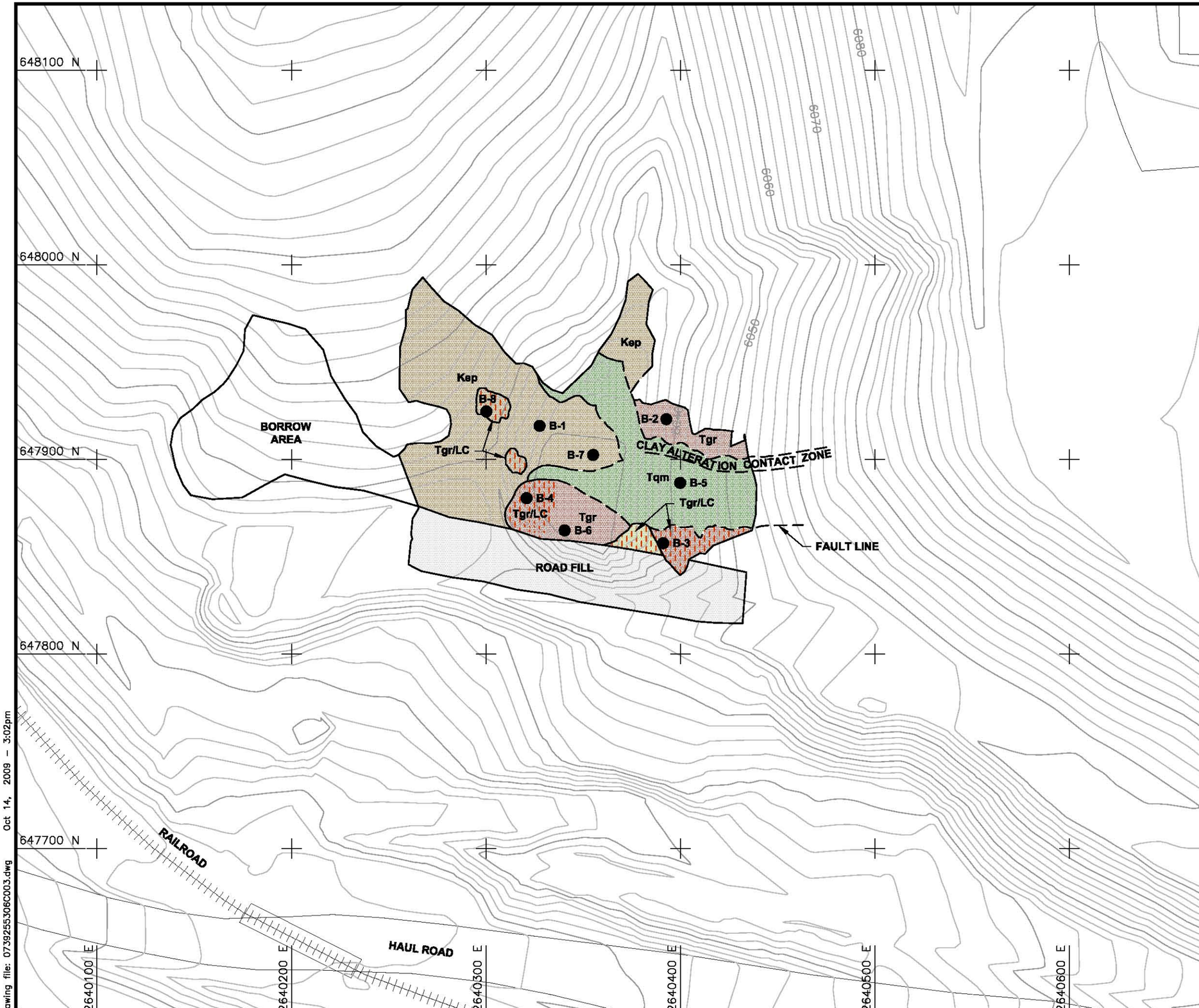
TITLE

OSCEOLLA STOCKPILE GEOLOGY AND SAMPLE LOCATIONS

Golder Associates
Tucson, Arizona

PROJECT No. 073-92553-06			FILE No. 0739255306C003	
DESIGN	JP	09/18/09	SCALE AS SHOWN	REV. A
CADD	NIL	09/23/09		
CHECK	JP	10/02/09	FIGURE 6	
REVIEW	KRJ	10/13/09		

Drawing file: 0739255306C003.dwg Oct 14, 2009 – 3:02pm



LEGEND

- FILL MATERIAL
- Tqm — QUARTZ MONZONITE
- Tgr — TERTIARY GRANODIORITE – QUARTZ SERICITE ALTERATION
- LC — LEACH CAP ALTERATION OVERPRINT
- Kep — DIORITE PORPHYRY
- B-1 — BEDROCK SURFACE SAMPLE LOCATION
- GEOLOGIC LIMIT (DASHED WHERE INTERPRETED)

REFERENCES

1.) 2004 TOPOGRAPHY PROVIDED BY CHINO MINES COMPANY.

50 0 50

SCALE 1" to 50' FEET

CONTOUR INTERVAL = 2 FT

PROJECT

FREEPORT-McMoRAN COPPER & GOLD — CHINO MINES COMPANY

OSCEOLLA, CG BELL, AND TENDERFOOT B IRA
GRANT COUNTY, NEW MEXICO

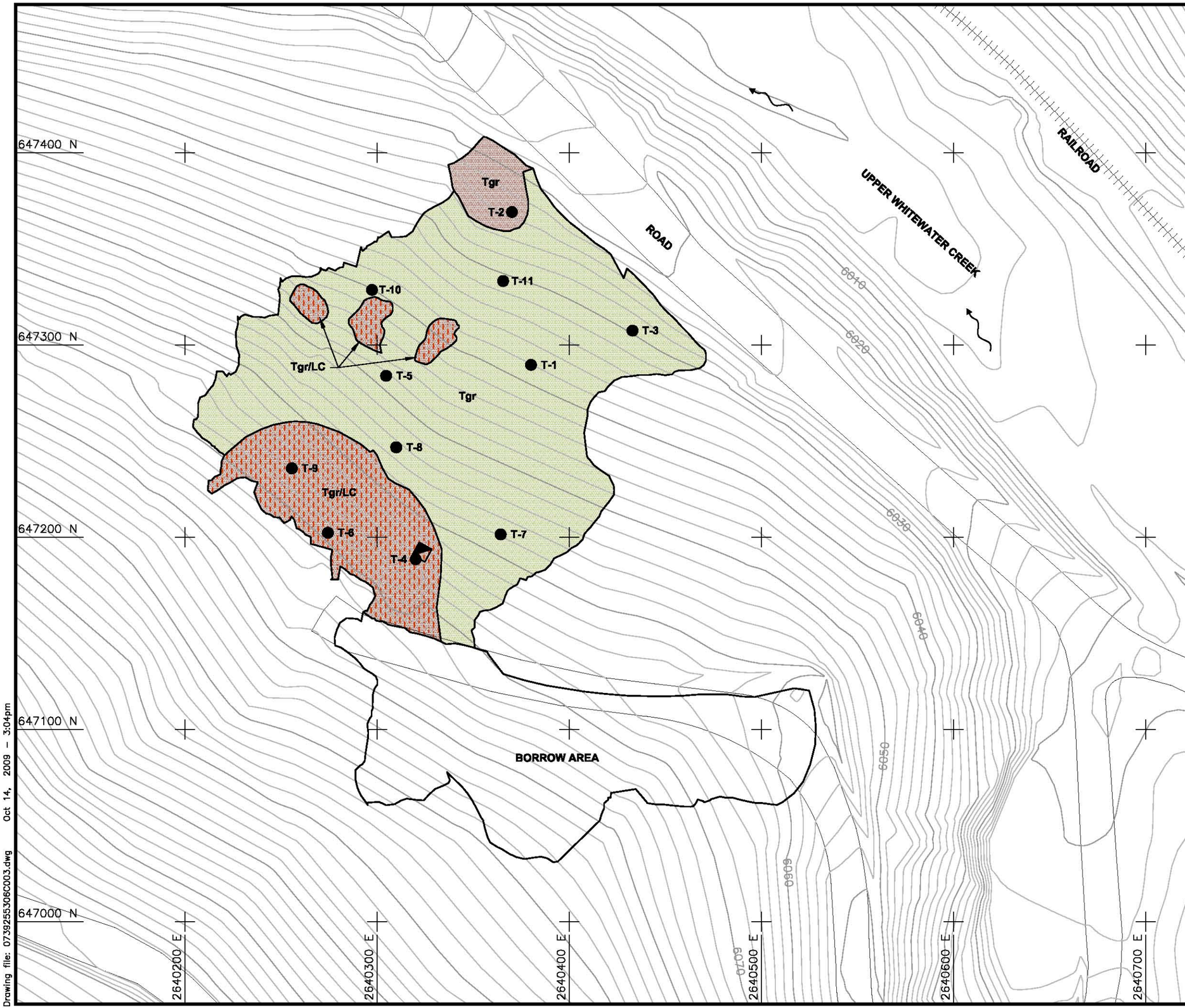
TITLE

CG BELL STOCKPILE GEOLOGY AND SAMPLE LOCATIONS

Golder Associates — Tucson, Arizona

PROJECT No. 073-92553-06			FILE No.	0739255306C003
DESIGN	JP	09/18/09	SCALE AS SHOWN	REV. A
CADD	NIL	09/23/09		
CHECK	JP	10/02/09	FIGURE 7	
REVIEW	KRJ	10/13/09		

Drawing file: 0739255306C003.dwg Oct 14, 2009 – 3:02pm



LEGEND

- Tgr — TERTIARY GRANODIORITE – BIOTIZED ALTERATION
- Tgr — TERTIARY GRANODIORITE – QUARTZ SERICITE ALTERATION
- LC — LEACH CAP ALTERATION OVERPRINT
- T-1 — BEDROCK SURFACE SAMPLE LOCATION
- FORMER MINE SHAFT
- GEOLOGIC LIMIT (DASHED WHERE INTERPRETED)
- DIRECTION OF SURFACE WATER FLOW

REFERENCES

1.) 2004 TOPOGRAPHY PROVIDED BY CHINO MINES COMPANY.

50 0 50

SCALE 1" to 50' FEET

CONTOUR INTERVAL = 2 FT

PROJECT

FMI Freeport-McMoRan Copper & Gold — Chino Mines Company

OSCEOLLA, CG BELL, AND TENDERFOOT B IRA GRANT COUNTY, NEW MEXICO

TITLE

TENDERFOOT B STOCKPILE GEOLOGY AND SAMPLE LOCATIONS

Golder Associates — Tucson, Arizona

PROJECT No. 073–92553–06			FILE No. 0739255306C003	
DESIGN	JP	09/18/09	SCALE AS SHOWN	REV. A
CADD	NIL	09/23/09		
CHECK	JP	10/02/09		
REVIEW	KRJ	10/13/09		

FIGURE 8

Drawing file: 0739255306C003.dwg Oct 14, 2009 – 3:04pm

PHOTOGRAPHS

PROJECT TITLE: Osceolla, CG Bell, and Tenderfoot B Stockpiles Removal	
PHOTO 1 Description: Osceolla Stockpile (2003) looking east along access road.	
PHOTO 2 Description: Osceolla (2009) Looking east along access road after stockpile removal.	

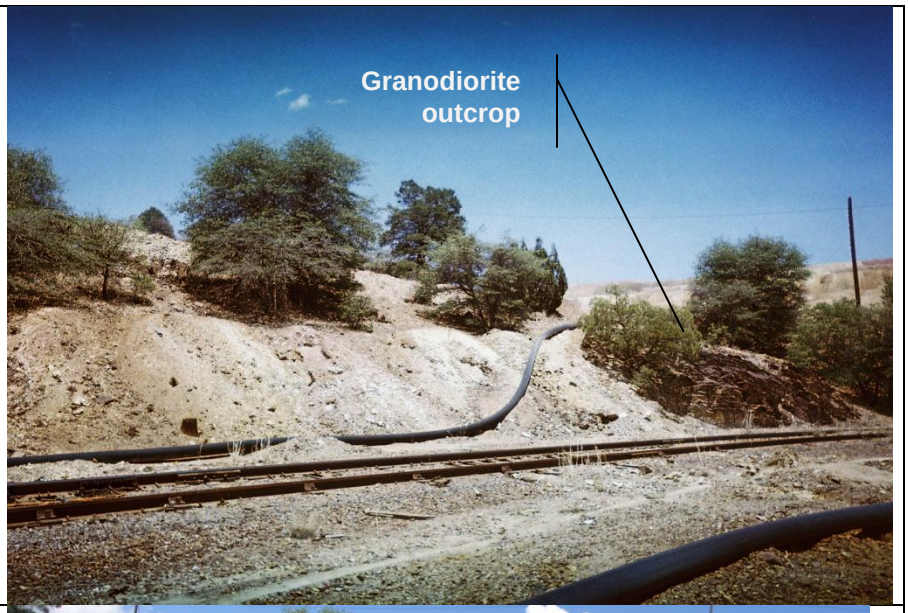
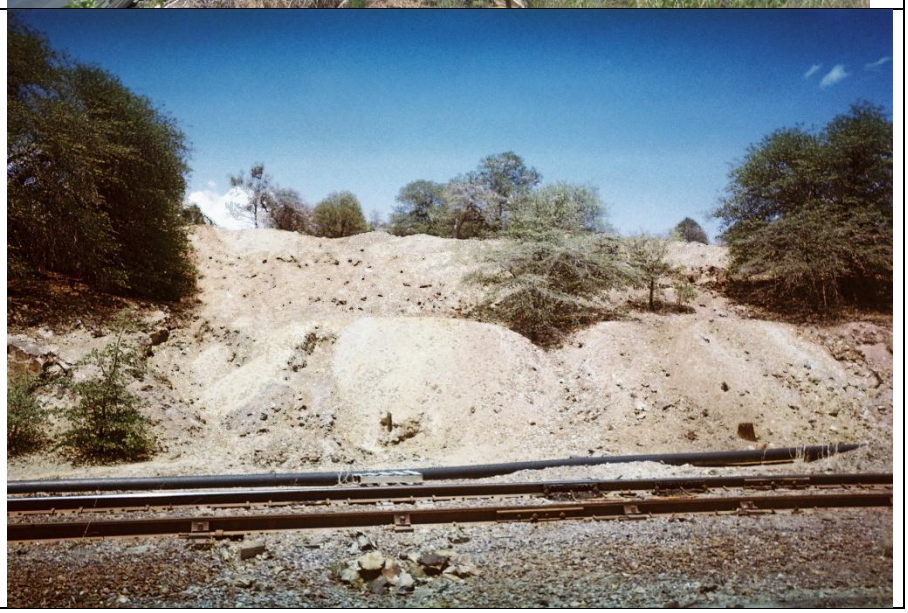
PHOTO 3 Description: Osceolla Stockpile (2003) looking northeast, stockpile on slope and adjacent to railway.	
PHOTO 4 Description: Osceolla (2009) looking northeast, vegetation growing in removal area adjacent to railroad. Pipeline and hay bales in foreground.	
PHOTO 5 Description: Osceolla Stockpile (2003) looking north.	

PHOTO 6 Description: Osceolla (2004) looking north after removal to bedrock.	
PHOTO 7 Description**:** Osceolla (2004) looking north, showing areas of soil cover (darker brown).	

PHOTO 8 Description: Osceolla (2009) looking north; limited vegetation establishment.	
PHOTO 9 Description: Osceolla Stockpile (2003), overbank deposit materials removal in Whitewater Creek.	

PHOTO 10 Description: Osceolla Stockpile (2003), overbank deposit after removal.	
PHOTO 11 Description: Osceolla Shaft (2008), shaft opening discovered in 2008.	

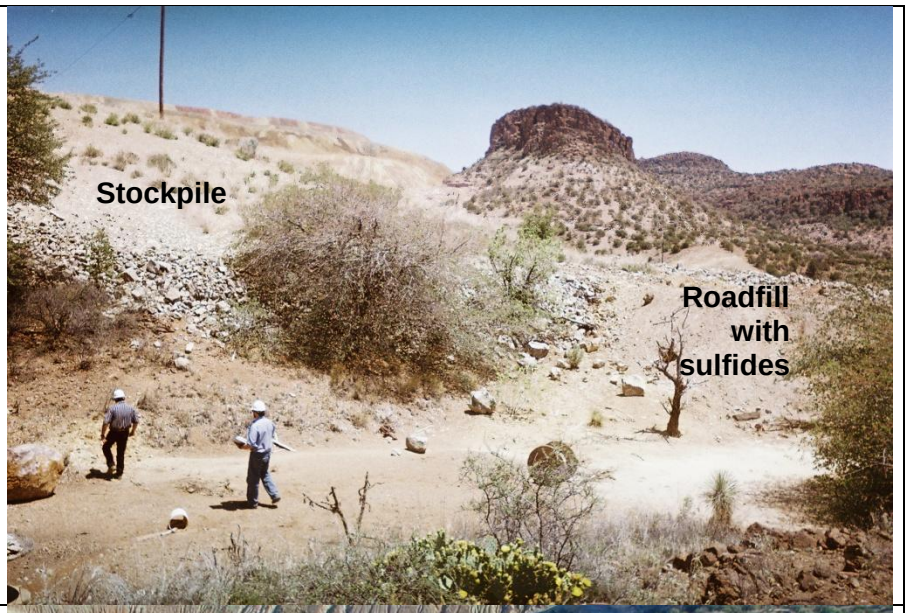
PHOTO 12 Description: CG Bell Stockpile (2003) looking southeast	
PHOTO 13 Description**:** CG Bell (2003) looking southeast during stockpile removal	

PHOTO 14 Description: CG Bell (2003), removal of pipeline road.	
PHOTO 15 Description: CG Bell (2003) looking west during stockpile removal.	
PHOTO 16 Description: CG Bell (2003), panorama from rebuilt pipeline road after stockpile removal.	

PHOTO 17 Description: CG Bell (2004) looking east, showing soil cover placement.	
PHOTO 18 Description: CG Bell (2009) looking east, showing limited vegetation establishment and soil development on bedrock slope.	
PHOTO 19 Description**:** CG Bell (2009) looking southwest. New pipeline constructed on clean road fill.	

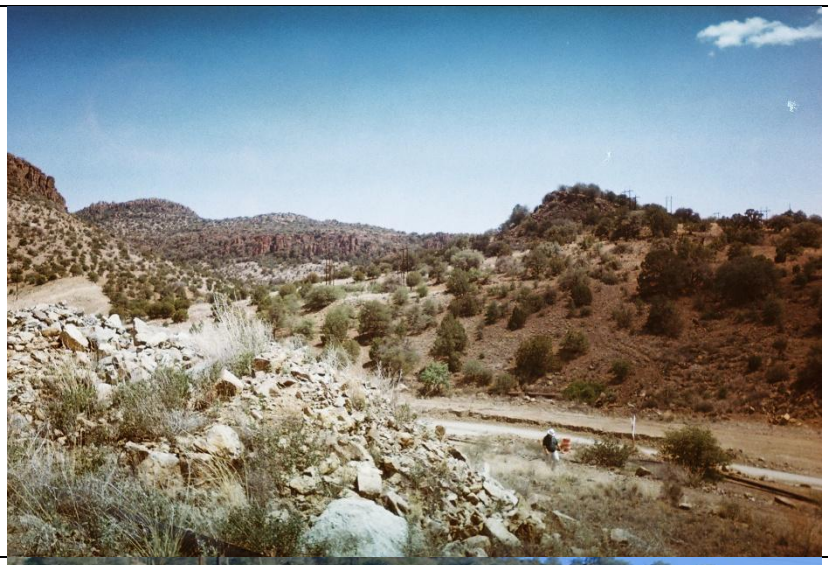
PHOTO 20 Description: Tenderfoot B (2003) looking southeast from Osceolla.	
PHOTO 21 Description: Tenderfoot B (2004) looking southwest during stockpile removal.	
PHOTO 22 Description: Tenderfoot B (2004) looking south, stockpile removed to bedrock.	

PHOTO 23 Description: Tenderfoot B (2004) looking southeast, showing application of soil cover.	
PHOTO 24 Description: Tenderfoot B (2004) looking west, showing closed shaft with mounded soil cover.	
PHOTO 25 Description**:** Tenderfoot B (2009) looking west. Vegetation established on mound over closed shaft.	

PHOTO 26 Description: Tenderfoot B (2009) looking south from Osceolla. Vegetation well established.	
PHOTO 27 Description: Tenderfoot B (2009), self-armoring channel formed on soil cover.	

APPENDIX A

ANALYTICAL DATA

APPENDIX A-1

SVL LABORATORY DATA

SVL ANALYTICAL, INC.
One Government Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83837-0929 ▪ Phone: (208)784-1258 ▪ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mine
PROJECT: WHITEWATER CR.
CLIENT SAMPLE ID: TENDERFOOT COMPOSITE
Sample Collected: 8/05/04 9:00
Sample Receipt : 8/11/04
Date of Report : 8/30/04

SVL JOB: 112598
SAMPLE: 404403
Matrix: ESOIL
Extraction: SPLP

Determination	Result	Units	Method	Analyzed
TDS	136	mg/L Ext	160.1	8/24/04
Sulfate, SO4	55.8	mg/L Ext	300.0	8/24/04
Aluminum	0.110	mg/L Ext	200.7	8/27/04
Cadmium	<0.0020	mg/L Ext	200.7	8/27/04
Cobalt	<0.0060	mg/L Ext	200.7	8/27/04
Copper	0.0124	mg/L Ext	200.7	8/27/04
Iron	0.197	mg/L Ext	200.7	8/27/04
Manganese	0.888	mg/L Ext	200.7	8/27/04
Lead	0.0080	mg/L Ext	200.7	8/27/04
Selenium	<0.010	mg/L Ext	200.7	8/27/04
Zinc	0.0078	mg/L Ext	200.7	8/27/04

NO TIME OR DATE ON SAMPLE

Reviewed By: [signature] Date 8/30/04
8/30/04 13:22

AZ: AZ0538 CA: NO. 2080 CO: 08/13/03 ID: ID00019 NV: ID-19-2004-19 TX: TX241-2002A WA: DOE NO. C074; DOH NO. 050

SVL ANALYTICAL, INC.
One Government Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83837-0929 ▪ Phone: (208)784-1258 ▪ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mine
PROJECT: WHITEWATER CR.
CLIENT SAMPLE ID: OSCEOLLA COMPOSITE
Sample Collected: 8/05/04 9:00
Sample Receipt : 8/11/04
Date of Report : 8/30/04

SVL JOB: 112598
SAMPLE: 404404
Matrix: ESOIL
Extraction: SPLP

Determination	Result	Units	Method	Analyzed
TDS	184	mg/L Ext	160.1	8/24/04
Sulfate, SO4	123	mg/L Ext	300.0	8/24/04
Aluminum	<0.020	mg/L Ext	200.7	8/27/04
Cadmium	0.0094	mg/L Ext	200.7	8/27/04
Cobalt	0.0223	mg/L Ext	200.7	8/27/04
Copper	0.189	mg/L Ext	200.7	8/27/04
Iron	<0.020	mg/L Ext	200.7	8/27/04
Manganese	4.60	mg/L Ext	200.7	8/27/04
Lead	0.0067	mg/L Ext	200.7	8/27/04
Selenium	<0.010	mg/L Ext	200.7	8/27/04
Zinc	1.90	mg/L Ext	200.7	8/27/04

NO TIME OR DATE ON SAMPLE

Reviewed By: _____ Date 8/30/04
8/30/04 13:22

AZ: AZ0538 CA: NO. 2080 CO: 08/13/03 ID: ID00019 NV: ID-19-2004-19 TX: TX241-2002A WA: DOE NO. C074; DOH NO. 050

SVL ANALYTICAL, INC.
One Government Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83837-0929 ▪ Phone: (208)784-1258 ▪ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mine
PROJECT: WHITEWATER CR.
CLIENT SAMPLE ID: BELL COMPOSITE
Sample Collected: 8/05/04 9:00
Sample Receipt : 8/11/04
Date of Report : 8/30/04

SVL JOB: 112598
SAMPLE: 404405
Matrix: ESOIL
Extraction: SPLP

Determination	Result	Units	Method	Analyzed
TDS	143	mg/L Ext	160.1	8/24/04
Sulfate, SO4	105	mg/L Ext	300.0	8/24/04
Aluminum	0.095	mg/L Ext	200.7	8/27/04
Cadmium	0.0125	mg/L Ext	200.7	8/27/04
Cobalt	0.0093	mg/L Ext	200.7	8/27/04
Copper	0.447	mg/L Ext	200.7	8/27/04
Iron	<0.020	mg/L Ext	200.7	8/27/04
Manganese	2.69	mg/L Ext	200.7	8/27/04
Lead	0.0053	mg/L Ext	200.7	8/27/04
Selenium	<0.010	mg/L Ext	200.7	8/27/04
Zinc	1.86	mg/L Ext	200.7	8/27/04

NO TIME OR DATE ON SAMPLE

Reviewed By: _____ Date 8/30/04
8/30/04 13:22

AZ: AZ0538 CA: NO. 2080 CO: 08/13/03 ID: ID00019 NV: ID-19-2004-19 TX: TX241-2002A WA: DOE NO. C074; DOH NO. 050

SVL ANALYTICAL, INC.

Quality Control Report
Part I Prep Blank and Laboratory Control Sample

Client :Phelps Dodge - Chino Mine SVL JOB No: 112598

Analyte	Method	Matrix	Units	Prep Blank	True—LCS	Found	LCS %R	Analysis Date
Aluminum	200.7	ESOIL	mg/L Ext	<0.020	1.00	0.999	99.9	8/27/04
Cadmium	200.7	ESOIL	mg/L Ext	<0.0020	1.00	0.925	92.5	8/27/04
Cobalt	200.7	ESOIL	mg/L Ext	<0.0060	1.00	0.942	94.2	8/27/04
Copper	200.7	ESOIL	mg/L Ext	<0.0030	1.00	0.965	96.5	8/27/04
Iron	200.7	ESOIL	mg/L Ext	<0.020	10.0	9.77	97.7	8/27/04
Manganese	200.7	ESOIL	mg/L Ext	<0.0020	1.00	0.982	98.2	8/27/04
Lead	200.7	ESOIL	mg/L Ext	<0.0050	1.00	0.954	95.4	8/27/04
Selenium	200.7	ESOIL	mg/L Ext	<0.010	1.00	0.887	88.7	8/27/04
Zinc	200.7	ESOIL	mg/L Ext	<0.0050	1.00	0.926	92.6	8/27/04
Sulfate, SO4	300.0	ESOIL	mg/L Ext	<0.30	10.0	9.80	98.0	8/24/04
TDS	160.1	ESOIL	mg/L Ext	<10	405	372	91.9	8/24/04

LEGEND:
LCS = Laboratory Control Sample LCS %R = LCS Percent Recovery N/A = Not Applicable

SVL ANALYTICAL, INC.

Quality Control Report
Part II Duplicate and Spike Analysis

Client :Phelps Dodge - Chino Mine SVL JOB No: 112598

Test	Method	Mtx	QC SAMPLE ID Units	Result	Duplicate or MSD Found	RPD%	Matrix Spike Result	SPK ADD	%R	Analysis Date
Al	200.7	E 1	mg/L Ex	0.110	0.129	15.9	1.23	1.00	112.0	8/27/04
Cd	200.7	E 1	mg/L Ex	<0.0020	<0.0020	UDL	0.984	1.00	98.4	8/27/04
Co	200.7	E 1	mg/L Ex	<0.0060	<0.0060	UDL	0.991	1.00	99.1	8/27/04
Cu	200.7	E 1	mg/L Ex	0.0124	0.0122	1.6	1.00	1.00	98.8	8/27/04
Fe	200.7	E 1	mg/L Ex	0.197	0.215	8.7	10.3	10.0	101.0	8/27/04
Mn	200.7	E 1	mg/L Ex	0.888	0.888	0.0	1.89	1.00	100.2	8/27/04
Pb	200.7	E 1	mg/L Ex	0.0080	0.0083	3.7	1.02	1.00	101.2	8/27/04
Se	200.7	E 1	mg/L Ex	<0.010	<0.010	UDL	0.993	1.00	99.3	8/27/04
Zn	200.7	E 1	mg/L Ex	0.0078	0.0081	3.8	1.00	1.00	99.2	8/27/04
SO4	300.0	E 1	mg/L Ex	55.8	55.5	0.5	81.4	25.0	102.4	8/24/04
TDS	160.1	E 1	mg/L Ex	136	128	6.1	N/A	N/A	N/A	8/24/04

LEGEND:

RPD% = (|SAM - DUP| /((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference required dilution.

RPD% = (|SPK - MSD| /((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC limits for MS recoveries apply only if the spike is at least 1/4 the concentration of the analyte in the sample.

Control limits for the RPD apply only if the concentration of the analyte in the sample is at least five times the reporting limit.

QC Sample 1: SVL SAM No.: 404403 Client Sample ID: TENDERFOOT COMPOSITE

112598

Chain of Custody Record

per Dave W. conversation with Chuck Pepe zm 8/13/04

COC No. Pam Pinson Historical Stockpiles

Project Name: Historical Stockpile Interim Action Sampling

Project Manager: Pam Pinson

Project Location: Whitewater Cr.

Sampler(s): Chuck Pepe-Ranney

Tot. ICP

Column 1: ~~XRF~~ Analysis for Al, Cd, Co, Cu, Fe, Mn, Pb, Se, and Zn

Same

Column 2: paste pH (1:1 solids to water ratio), total metals (Method 3050 digestion), ABA (Modified Sobek), and SPLP (Method 1312) Metals + TDS + SO4

Analytical Parameters

Chino Mines Company
ELWD.
P.O. Box 7
Hurley, N.M. 88043

Sample Date	time	Type Grab	Sample Identification (Field ID)	Matrix	No. of Containers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Chain of Custody Seal#
6.15.04	10:15		Bell - 8 (SVL)	Pulp	1	X																				* no date or
6.15.04	9:40		Osceolla - 9 (SVL)	Pulp	1	X																				Time on
6.15.04	11:10		TF - 5 (SVL)	Pulp	1	X																				Samples.
8.5.04	9:00		Terderfoot Composite	Pulp	1		X																			KCS 8-11-04
8.5.04	9:00		Osceolla Composite	Pulp	1		X																			
8.5.04	9:00		Bell Composite	Pulp	1		X																			

Special Instructions

Signatures	Date & Time
Relinquished by:	1:30? 8/5/04
Received by:	8-11-04 10:25
Relinquished by:	
Received for Laboratory by:	

Shipping Details

Method of Shipment: UPS

Lab Addresses: ATTN: Chris Myer
SVL
One Government Gulch
Kellogg, ID 83837-0929

Phone: 208-784-1258
Fax: 208-783-0891

Please sendelectronic reults to Pam Pinson at ppinson@phelpsdodge.com. Any questions, call Pam at 505.537.4213

08/30/2004 15:24 2087830891 SVL ANALYTICAL PAGE 06/09

SPLP Extraction Log

JOB#: 112598

SVL ANALYTICAL, INC.

Tot metals also being done

8/13/04

CASE #: SAS #: SDG #:

SVL#	M	ClientID	Fluid Type	mls Fluid	Sample Wt.	Tumble Ext. Time	Final pH
		pH 4 Buffer					6.99
		pH 7 Buffer					7.01
404403	ES	TENDERFOOT COMPOSITE	WESTERN	500 mls	25g	18 HR	6.62
404404	ES	OSCEOLLA COMPOSITE	FLUID	500 mls	25g	18 HR	5.51
404405	ES	BELL COMPOSITE		500 mls	25g	18 HR	5.09
405054	ES	EXTRACTION FLUID					5.00

Data Entry

Entered by _____ Date _____

Reviewed by _____ Date _____

Extraction Started By: GA Date/Time: 08/23/04 1230

Extraction Completed By: GA Date/Time: 08/24/04 0630

Client: Phelps Dodge - Chino Mine

Received: 8/11/04

v3.0

SVL ANALYTICAL, INC.
vernment Gulch - Kellogg, ID 83837-0929

SAMPLE RECEIPT CONFIRMATION

SVL JOB No: 112598
Received: 8/11/04
Expected Due date: 8/27/04

By	Received	Sample Comments
	8/11/04	NO TIME OR DATE ON SAMPLE
	8/11/04	NO TIME OR DATE ON SAMPLE
	8/11/04	NO TIME OR DATE ON SAMPLE
	8/13/04	

after job completion.
, then you will receive a letter requesting disposal options.

you have questions regarding the receipt of these samples. 8/13/04 11:51

08/30/2004 15:24 2087830891 SVL ANALYTICAL PAGE 09/09

TRANSMISSION VERIFICATION REPORT

TIME : 08/13/2004 13:46
NAME : SVL ANALYTICAL
FAX : 2087830891
TEL : 2087841258
SER.# : BROF3J496071

DATE,TIME 08/13 13:46
FAX NO./NAME 915055378012
DURATION 00:00:27
PAGE(S) 01
RESULT OK
MODE FINE
ECM

SVL ANALYTICAL, INC.
One Government Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83837-0929 ▪ Phone: (208)784-1258 ▪ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mine
PROJECT: WHITEWATER CR
CLIENT SAMPLE ID: BELL-8(SVL)
Sample Collected: 6/15/04 10:15
Sample Receipt : 8/13/04
Date of Report : 8/27/04 As Received Basis

SVL JOB: 112658
SAMPLE: 405070
% Solids: 0.0%
Matrix: SOIL

Determination	Result	Units	Method	Analyzed
Aluminum	11900	mg/kg	6010B	8/25/04
Cadmium	0.36	mg/kg	6010B	8/25/04
Cobalt	7.13	mg/kg	6010B	8/25/04
Copper	231	mg/kg	6010B	8/25/04
Iron	27600	mg/kg	6010B	8/25/04
Manganese	1580	mg/kg	6010B	8/25/04
Lead	107	mg/kg	6010B	8/25/04
Selenium	<1.0	mg/kg	6010B	8/25/04
Zinc	400	mg/kg	6010B	8/25/04

SAMPLE RECEIVED DRIED AND PULVERIZED

Reviewed By: _____ Date 8/27/04
8/27/04 13:05

AZ: AZ0538 CA: NO. 2080 CO: 08/13/03 ID: ID00019 NV: ID-19-2004-19 TX: TX241-2002A WA: DOE NO. C074; DOH NO. 050

SVL ANALYTICAL, INC.
One Government Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83837-0929 ▪ Phone: (208)784-1258 ▪ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mine
PROJECT: WHITEWATER CR
CLIENT SAMPLE ID: OSCEOLLA-9(SVL)
Sample Collected: 6/15/04 9:40
Sample Receipt : 8/13/04
Date of Report : 8/27/04 As Received Basis

SVL JOB: 112658
SAMPLE: 405071
% Solids: 0.0%
Matrix: SOIL

Determination	Result	Units	Method	Analyzed
Aluminum	15300	mg/kg	6010B	8/25/04
Cadmium	1.50	mg/kg	6010B	8/25/04
Cobalt	9.08	mg/kg	6010B	8/25/04
Copper	121	mg/kg	6010B	8/25/04
Iron	23900	mg/kg	6010B	8/25/04
Manganese	2220	mg/kg	6010B	8/25/04
Lead	313	mg/kg	6010B	8/25/04
Selenium	<1.0	mg/kg	6010B	8/25/04
Zinc	1360	mg/kg	6010B	8/25/04

SAMPLE RECEIVED DRIED AND PULVERIZED

Reviewed By: _____ Date 8/27/04
8/27/04 13:05

AZ: AZ0538 CA: NO. 2080 CO: 08/13/03 ID: ID00019 NV: ID-19-2004-19 TX: TX241-2002A WA: DOE NO. C074; DOH NO. 050

SVL ANALYTICAL, INC.
One Government Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83837-0929 ▪ Phone: (208)784-1258 ▪ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mine
PROJECT: WHITEWATER CR
CLIENT SAMPLE ID: TF-5(SVL)
Sample Collected: 6/15/04 11:10
Sample Receipt : 8/13/04
Date of Report : 8/27/04 As Received Basis

SVL JOB: 112658
SAMPLE: 405072
% Solids: 0.0%
Matrix: SOIL

Determination	Result	Units	Method	Analyzed
Aluminum	13900	mg/kg	6010B	8/25/04
Cadmium	3.79	mg/kg	6010B	8/25/04
Cobalt	8.82	mg/kg	6010B	8/25/04
Copper	294	mg/kg	6010B	8/25/04
Iron	20700	mg/kg	6010B	8/25/04
Manganese	2550	mg/kg	6010B	8/25/04
Lead	509	mg/kg	6010B	8/25/04
Selenium	<1.0	mg/kg	6010B	8/25/04
Zinc	1270	mg/kg	6010B	8/25/04

SAMPLE RECEIVED DRIED AND PULVERIZED

Reviewed By: _____ Date 8/27/04
8/27/04 13:06

AZ: AZ0538 CA: NO. 2080 CO: 08/13/03 ID: ID00019 NV: ID-19-2004-19 TX: TX241-2002A WA: DOE NO. C074; DOH NO. 050

SVL ANALYTICAL, INC.
One Government Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83837-0929 ▪ Phone: (208)784-1258 ▪ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mine
PROJECT: WHITEWATER CR
CLIENT SAMPLE ID: TENDERFOOT COMPOSITE
Sample Collected: 8/05/04 9:00
Sample Receipt : 8/13/04
Date of Report : 8/27/04 As Received Basis

SVL JOB: 112658
SAMPLE: 405073
% Solids: 0.0%
Matrix: SOIL

Determination	Result	Units	Method	Analyzed
ABP	2.59	TCaCO3/1000T	EPA600	8/18/04
Acid Generating	0.94	TCaCO3/1000T	EPA600	8/18/04
Acid Neut. Pot.	3.53	TCaCO3/1000T	EPA600	8/18/04
pH Paste	6.32		ASA M9	8/18/04
Non-Ext Sulfur,S	0.020	%	LECO	8/18/04
Pyritic Sulfur,S	0.030	%	LECO	8/18/04
Sulfate Sulfur,S	0.070	%	LECO	8/18/04
Total Sulfur, S	0.120	%	LECO	8/18/04
Aluminum	13500	mg/kg	6010B	8/25/04
Cadmium	1.29	mg/kg	6010B	8/25/04
Cobalt	5.70	mg/kg	6010B	8/25/04
Copper	218	mg/kg	6010B	8/25/04
Iron	39800	mg/kg	6010B	8/25/04
Manganese	1590	mg/kg	6010B	8/25/04
Lead	423	mg/kg	6010B	8/25/04
Selenium	<1.0	mg/kg	6010B	8/25/04
Zinc	727	mg/kg	6010B	8/25/04

SAMPLE RECEIVED DRIED AND PULVERIZED

Reviewed By: _____ Date 8/27/04
8/27/04 13:06

AZ: AZ0538 CA: NO. 2080 CO: 08/13/03 ID: ID00019 NV: ID-19-2004-19 TX: TX241-2002A WA: DOE NO. C074; DOH NO. 050

SVL ANALYTICAL, INC.
One Government Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83837-0929 ▪ Phone: (208)784-1258 ▪ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mine
PROJECT: WHITEWATER CR
CLIENT SAMPLE ID: OSCEOLLA COMPOSITE
Sample Collected: 8/05/04 9:00
Sample Receipt : 8/13/04
Date of Report : 8/27/04 As Received Basis

SVL JOB: 112658
SAMPLE: 405074
% Solids: 0.0%
Matrix: SOIL

Determination	Result	Units	Method	Analyzed
ABP	-0.91	TCaCO3/1000T	EPA600	8/18/04
Acid Generating	4.69	TCaCO3/1000T	EPA600	8/18/04
Acid Neut. Pot.	3.78	TCaCO3/1000T	EPA600	8/18/04
pH Paste	4.92		ASA M9	8/18/04
Non-Ext Sulfur,S	0.060	%	LECO	8/18/04
Pyritic Sulfur,S	0.150	%	LECO	8/18/04
Sulfate Sulfur,S	0.180	%	LECO	8/18/04
Total Sulfur, S	0.390	%	LECO	8/18/04
Aluminum	12500	mg/kg	6010B	8/25/04
Cadmium	0.75	mg/kg	6010B	8/25/04
Cobalt	8.41	mg/kg	6010B	8/25/04
Copper	403	mg/kg	6010B	8/25/04
Iron	55300	mg/kg	6010B	8/25/04
Manganese	2350	mg/kg	6010B	8/25/04
Lead	797	mg/kg	6010B	8/25/04
Selenium	<1.0	mg/kg	6010B	8/25/04
Zinc	945	mg/kg	6010B	8/25/04

SAMPLE RECEIVED DRIED AND PULVERIZED

Reviewed By: _____ Date 8/27/04
8/27/04 13:06

AZ: AZ0538 CA: NO. 2080 CO: 08/13/03 ID: ID00019 NV: ID-19-2004-19 TX: TX241-2002A WA: DOE NO. C074; DOH NO. 050

SVL ANALYTICAL, INC.
One Government Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83837-0929 ▪ Phone: (208)784-1258 ▪ Fax: (208)783-0897

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mine
PROJECT: WHITEWATER CR
CLIENT SAMPLE ID: BELL COMPOSITE
Sample Collected: 8/05/04 9:00
Sample Receipt : 8/13/04
Date of Report : 8/27/04 As Received Basis

SVL JOB: 112658
SAMPLE: 405075
% Solids: 0.0%
Matrix: SOIL

Determination	Result	Units	Method	Analyzed
ABP	2.84	TCaCO3/1000T	EPA600	8/18/04
Acid Generating	0.94	TCaCO3/1000T	EPA600	8/18/04
Acid Neut. Pot.	3.78	TCaCO3/1000T	EPA600	8/18/04
pH Paste	4.43		ASA M9	8/18/04
Non-Ext Sulfur,S	0.030	%	LECO	8/18/04
Pyritic Sulfur,S	0.030	%	LECO	8/18/04
Sulfate Sulfur,S	0.120	%	LECO	8/18/04
Total Sulfur, S	0.180	%	LECO	8/18/04
Aluminum	14300	mg/kg	6010B	8/25/04
Cadmium	1.80	mg/kg	6010B	8/25/04
Cobalt	8.41	mg/kg	6010B	8/25/04
Copper	353	mg/kg	6010B	8/25/04
Iron	32500	mg/kg	6010B	8/25/04
Manganese	2440	mg/kg	6010B	8/25/04
Lead	690	mg/kg	6010B	8/25/04
Selenium	<1.0	mg/kg	6010B	8/25/04
Zinc	742	mg/kg	6010B	8/25/04

SAMPLE RECEIVED DRIED AND PULVERIZED

Reviewed By: _____ Date 8/27/04
8/27/04 13:06

AZ: AZ0538 CA: NO. 2080 CO: 08/13/03 ID: ID00019 NV: ID-19-2004-19 TX: TX241-2002A WA: DOE NO. C074; DOH NO. 050

SVL ANALYTICAL, INC.

Quality Control Report
Part I Prep Blank and Laboratory Control Sample

Client :Phelps Dodge - Chino Mine SVL JOB No: 112658

Analyte	Method	Matrix	Units	Prep Blank	True—LCS	—Found	LCS %R	Analysis Date
Aluminum	6010B	SOIL	mg/kg	<2.0	100	100	100.0	8/25/04
Cadmium	6010B	SOIL	mg/kg	<0.20	100	90.1	90.1	8/25/04
Cobalt	6010B	SOIL	mg/kg	<0.60	100	92.8	92.8	8/25/04
Copper	6010B	SOIL	mg/kg	<0.30	100	98.0	98.0	8/25/04
Iron	6010B	SOIL	mg/kg	4.5	1000	962	96.2	8/25/04
Manganese	6010B	SOIL	mg/kg	<0.20	100	97.7	97.7	8/25/04
Lead	6010B	SOIL	mg/kg	<0.50	100	96.5	96.5	8/25/04
Selenium	6010B	SOIL	mg/kg	<1.0	100	83.9	83.9	8/25/04
Zinc	6010B	SOIL	mg/kg	<0.50	100	91.8	91.8	8/25/04
Acid Generating	EPA600	SOIL	TCaCO3/k	N/A	9.36	9.06	96.8	8/18/04
Acid Neut. Pot.	EPA600	SOIL	TCaCO3/k	N/A	52.0	50.1	96.3	8/18/04
pH Paste	ASA M9	SOIL		5.73	8.45	8.35	98.8	8/18/04
Non-Ext Sulfur,S	LECO	SOIL	%	<0.010	N/A		N/A	8/18/04
Pyritic Sulfur,S	LECO	SOIL	%	<0.010	N/A		N/A	8/18/04
Sulfate Sulfur,S	LECO	SOIL	%	<0.010	N/A		N/A	8/18/04
Total Sulfur, S	LECO	SOIL	%	<0.010	0.298	0.290	97.3	8/18/04

LEGEND:
LCS = Laboratory Control Sample LCS %R = LCS Percent Recovery N/A = Not Applicable

SVL ANALYTICAL, INC.

Quality Control Report
Part II Duplicate and Spike Analysis

Client :Phelps Dodge - Chino Mine SVL JOB No: 112658

Test	Method	Mtx	QC SAMPLE ID	Units	Result	Duplicate Found	or	MSD RPD%	Matrix Spike Result	SPK ADD	%R	Analysis Date
Al	6010B	S	1	mg/kg	13500	18400	M	3.9	17700	100	R >4S	8/25/04
Cd	6010B	S	1	mg/kg	1.29	95.6	M	3.1	92.7	100	91.4	8/25/04
Co	6010B	S	1	mg/kg	5.70	103	M	3.0	100	100	94.3	8/25/04
Cu	6010B	S	1	mg/kg	218	339	M	3.0	329	100	111.0	8/25/04
Fe	6010B	S	1	mg/kg	39800	44200	M	2.8	43000	1000	R >4S	8/25/04
Mn	6010B	S	1	mg/kg	1590	1780	M	4.6	1700	100	110.0	8/25/04
Pb	6010B	S	1	mg/kg	423	616	M	3.6	594	100	R >4S	8/25/04
Se	6010B	S	1	mg/kg	<1.0	87.4	M	1.3	86.3	100	86.3	8/25/04
Zn	6010B	S	1	mg/kg	727	890	M	3.4	860	100	R >4S	8/25/04
ABP	EPA600	S	1	TCaCO3/	2.59	2.84		9.2	N/A	N/A	N/A	8/18/04
AGP	EPA600	S	1	TCaCO3/	0.94	0.94		0.0	N/A	N/A	N/A	8/18/04
ANP	EPA600	S	1	TCaCO3/	3.53	3.78		6.8	N/A	N/A	N/A	8/18/04
S N-EX	LECO	S	1	%	0.020	0.020		0.0	N/A	N/A	N/A	8/18/04
S-PYR	LECO	S	1	%	0.030	0.030		0.0	N/A	N/A	N/A	8/18/04
S-SO4	LECO	S	1	%	0.070	0.070		0.0	N/A	N/A	N/A	8/18/04
S-TOT	LECO	S	1	%	0.120	0.120		0.0	N/A	N/A	N/A	8/18/04

LEGEND:
RPD% = (|SAM - DUP|/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference required dilution.
RPD% = (|SPK - MSD|/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.
SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added
QC limits for MS recoveries apply only if the spike is at least 1/4 the concentration of the analyte in the sample.
Control limits for the RPD apply only if the concentration of the analyte in the sample is at least five times the reporting limit.
QC Sample 1: SVL SAM No.: 405073 Client Sample ID: TENDERFOOT COMPOSITE

112658 ~~112598~~ pa

Chain of Custody Record

per Dave W. conversation with Chuck Pepe

COC No. Pam Pinson Historical Stockpiles

Project Name: Historical Stockpile Interim Action Sampling

Project Manager: Pam Pinson

Project Location: Whitewater Cr.

Sampler(s): Chuck Pepe-Ranney

Tot: ICP

Column 1: ~~XRF~~ Analysis for Al, Cd, Co, Cu, Fe, Mn, Pb, Se, and Zn

Same

Column 2: paste pH (1:1 solids to water ratio), total metals (Method 3050 digestion), ABA (Modified Sobek), and SPLP (Method 1312)

Metals + TDS + SO4

Analytical Parameters

Chino Mines Company
ELWD,
P.O. Box 7
Hurley, N.M. 88043

Sample Date	Type time	Type Grab	Sample Identification (Field ID)	Matrix	No. of Containers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Chain of Custody Seal#
6.15.04	10:15		Bell - 8 (SVL)	Pulp	1	X																				X no date or
6.15.04	9:40		Osceolla - 9 (SVL)	Pulp	1	X																				Time on
6.15.04	11:10		TF - 5 (SVL)	Pulp	1	X																				Samples.
8.5.04	9:00		Terderfoot Composite	Pulp	1		X																			KCS 8-11-04
8.5.04	9:00		Osceolla Composite	Pulp	1		X																			
8.5.04	9:00		Bell Composite	Pulp	1		X																			

Signatures	Date & Time
Relinquished by: Chris Pepe	1:30P 8/5/04
Received by: Kelli Sevy	8-11-04 10:25
Relinquished by:	
Received for Laboratory by:	

Shipping Details

Method of Shipment: UPS

Lab Addresses: ATTN: Chris Myer
SVL
One Government Gulch
Kellogg, ID 83837-0929

Phone: 208-784-1258
Fax: 208-783-0891

Special Instructions

Please sendelectronic reults to Pam Pinson at ppinson@phelpsdodge.com. Any questions, call Pam at 505.537.4213

08/27/2004 16:46 2087830891 SVL ANALYTICAL PAGE 09/10

SVL ANALYTICAL, INC.
ernment Gulch - Kellogg, ID 83837-0929

SAMPLE RECEIPT CONFIRMATION

SVL JOB No: 112658
Received: 8/13/04
Expected Due date: 8/27/04

By	Received	Sample Comments
PR	8/13/04	
PR	8/13/04	
PR	8/13/04	
PR	8/13/04	
PR	8/13/04	
PR	8/13/04	

ntainer temp not measured upon receipt.
' CODING INFORMATION

after job completion.
then you will receive a letter requesting disposal options.

you have questions regarding the receipt of these samples. 8/13/04 11:36

TRANSMISSION VERIFICATION REPORT

TIME : 08/13/2004 13:40
NAME : SVL ANALYTICAL
FAX : 2087830891
TEL : 2087841258
SER.# : BRDF3J496071

DATE,TIME	08/13 13:39
FAX NO./NAME	915055378012
DURATION	00:00:29
PAGE(S)	01
RESULT	OK
MODE	FINE ECM

APPENDIX A-2

XRF ANALYSIS DATASHEETS

2004- 7-29 14:52

SQX Calculation Result

Sample : 07-2253
Application : EZS001XNV
Flux: Cellulos

Model : Bulk
Ratio: 0.1284

Date analyzed : 2004- 7-26 08:06
Balance :
Matching library:
File : 07-2253

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	F	0.219	mass%	0.0654	F -KA	0.0280	0.1848
2	Na2O	0.0701	mass%	0.0051	Na-KA	0.2432	0.0593
3	MgO	2.10	mass%	0.0067	Mg-KA	14.5253	1.7773
4	Al2O3	25.8	mass%	0.0069	Al-KA	533.1269	21.8071
5	SiO2	53.7	mass%	0.0068	Si-KA	763.1931	45.3676
6	P2O5	0.188	mass%	0.0011	P -KA	5.3926	0.1592
7	SO3	0.265	mass%	0.0013	S -KA	6.2719	0.2237
8	Cl	0.0063	mass%	0.0015	Cl-KA	0.0750	0.0054
9	K2O	3.78	mass%	0.0020	K -KA	219.5041	3.1911
10	CaO	0.825	mass%	0.0011	Ca-KA	39.0695	0.6968
11	TiO2	0.593	mass%	0.0044	Ti-KA	4.5943	0.5013
12	V2O5	0.0857	mass%	0.0209	V -KB1	0.1967	0.0724
13	MnO	0.180	mass%	0.0019	Mn-KA	6.0689	0.1517
14	Fe2O3	11.7	mass%	0.0029	Fe-KA	543.6136	9.9215
15	NiO	0.0032	mass%	0.0011	Ni-KA	0.2188	0.0027
16	CuO	0.0767	mass%	0.0010	Cu-KA	6.9261	0.0648
17	ZnO	0.113	mass%	0.0009	Zn-KA	13.4754	0.0957
18	Ga2O3	0.0050	mass%	0.0009	Ga-KA	0.6282	0.0042
19	Rb2O	0.0212	mass%	0.0005	Rb-KA	8.7117	0.0179
20	SrO	0.0161	mass%	0.0005	Sr-KA	7.0027	0.0136
21	ZrO2	0.0176	mass%	0.0032	Zr-KB1	1.9330	0.0148
22	Nb2O5	0.0019	mass%	0.0006	Nb-KA	0.9630	0.0016
23	BaO	0.0993	mass%	0.0104	Ba-LA	0.3508	0.0840
24	PbO	0.101	mass%	0.0017	Pb-LA	9.0515	0.0851

2004- 7-26 10:01

SQX Calculation Result

Sample : 07-2254
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 09:23
Balance :
Matching library:
File : 07-2254

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	F	0.0853	mass%	0.0418	F -KA	0.0183	0.0676
2	Na2O	0.265	mass%	0.0061	Na-KA	0.7862	0.2102
3	MgO	1.40	mass%	0.0058	Mg-KA	10.0638	1.1064
4	Al2O3	15.1	mass%	0.0054	Al-KA	326.0722	11.9359
5	SiO2	65.7	mass%	0.0072	Si-KA	1035.4087	52.0251
6	P2O5	0.212	mass%	0.0012	P -KA	5.8688	0.1680
7	SO3	0.435	mass%	0.0014	S -KA	9.9428	0.3445
8	Cl	0.0038	mass%	0.0016	Cl-KA	0.0434	0.0030
9	K2O	2.88	mass%	0.0018	K -KA	160.3553	2.2818
10	CaO	3.29	mass%	0.0014	Ca-KA	150.2897	2.6082
11	TiO2	0.639	mass%	0.0038	Ti-KA	4.5033	0.5062
12	Cr2O3	0.0102	mass%	0.0024	Cr-KA	0.1998	0.0081
13	MnO	0.205	mass%	0.0201	Mn-KB1	1.2548	0.1625
14	Fe2O3	9.36	mass%	0.0018	Fe-KA	402.8007	7.4139
15	Co2O3	0.0101	mass%	0.0019	Co-KA	0.5932	0.0080
16	NiO	0.0036	mass%	0.0011	Ni-KA	0.2476	0.0029
17	CuO	0.0424	mass%	0.0010	Cu-KA	3.7842	0.0336
18	ZnO	0.0697	mass%	0.0009	Zn-KA	8.2090	0.0552
19	Ga2O3	0.0041	mass%	0.0009	Ga-KA	0.5144	0.0033
20	Rb2O	0.0138	mass%	0.0005	Rb-KA	5.6257	0.0109
21	SrO	0.0507	mass%	0.0005	Sr-KA	21.9517	0.0402
22	ZrO2	0.0224	mass%	0.0032	Zr-KB1	2.4435	0.0177
23	Nb2O5	0.0019	mass%	0.0006	Nb-KA	0.9357	0.0015
24	BaO	0.0938	mass%	0.0105	Ba-LA	0.3014	0.0743
25	WO3	0.0590	mass%	0.0038	W -LB1	2.0267	0.0468
26	PbO	0.108	mass%	0.0017	Pb-LA	9.6060	0.0852

2004- 7-26 10:40

SQX Calculation Result

Sample : 07-2255
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 10:02
Balance :
Matching library:
File : 07-2255

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	F	0.242	mass%	0.0579	F -KA	0.0325	0.1903
2	Na2O	0.0929	mass%	0.0050	Na-KA	0.3257	0.0731
3	MgO	1.50	mass%	0.0061	Mg-KA	10.8405	1.1825
4	Al2O3	22.7	mass%	0.0063	Al-KA	488.0193	17.8652
5	SiO2	59.6	mass%	0.0070	Si-KA	873.6872	46.9500
6	P2O5	0.174	mass%	0.0011	P -KA	4.7638	0.1368
7	SO3	0.762	mass%	0.0016	S -KA	17.2463	0.5998
8	Cl	0.0074	mass%	0.0016	Cl-KA	0.0834	0.0059
9	K2O	2.95	mass%	0.0018	K -KA	162.4224	2.3227
10	CaO	0.970	mass%	0.0011	Ca-KA	44.1806	0.7640
11	TiO2	0.625	mass%	0.0044	Ti-KA	4.6021	0.4918
12	V2O5	0.0745	mass%	0.0225	V -KB1	0.1623	0.0587
13	MnO	0.152	mass%	0.0019	Mn-KA	4.9236	0.1195
14	Fe2O3	9.52	mass%	0.0027	Fe-KA	425.0707	7.4952
15	NiO	0.0045	mass%	0.0011	Ni-KA	0.3117	0.0035
16	CuO	0.0345	mass%	0.0010	Cu-KA	3.1610	0.0272
17	ZnO	0.0927	mass%	0.0009	Zn-KA	11.1821	0.0730
18	Ga2O3	0.0068	mass%	0.0009	Ga-KA	0.8666	0.0053
19	Rb2O	0.0168	mass%	0.0005	Rb-KA	6.9909	0.0132
20	SrO	0.0272	mass%	0.0005	Sr-KA	11.9926	0.0214
21	Y2O3	0.0103	mass%	0.0028	Y -KB1	1.0986	0.0081
22	ZrO2	0.0183	mass%	0.0033	Zr-KB1	2.0255	0.0144
23	BaO	0.187	mass%	0.0111	Ba-LA	0.6281	0.1472
24	PbO	0.212	mass%	0.0017	Pb-LA	19.3801	0.1669

2004- 7-26 11:18

SQX Calculation Result

Sample : 07-2256
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 10:40
Balance :
Matching library:
File : 07-2256

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.0360	mass%	0.0040	Na-KA	0.1480	0.0288
2	MgO	0.334	mass%	0.0051	Mg-KA	2.0438	0.2668
3	Al2O3	5.40	mass%	0.0039	Al-KA	102.3524	4.3208
4	SiO2	64.2	mass%	0.0072	Si-KA	997.1736	51.3480
5	P2O5	0.345	mass%	0.0012	P -KA	9.5869	0.2759
6	SO3	0.586	mass%	0.0016	S -KA	13.4400	0.4685
7	Cl	0.0032	mass%	0.0016	Cl-KA	0.0370	0.0026
8	K2O	0.612	mass%	0.0011	K -KA	35.1100	0.4891
9	CaO	0.226	mass%	0.0009	Ca-KA	11.3768	0.1806
10	TiO2	0.176	mass%	0.0034	Ti-KA	1.4699	0.1409
11	Cr2O3	0.0107	mass%	0.0022	Cr-KA	0.2532	0.0086
12	MnO	0.0384	mass%	0.0018	Mn-KA	1.4516	0.0307
13	Fe2O3	27.1	mass%	0.0125	Fe-KB1	223.0189	21.6739
14	Co2O3	0.0127	mass%	0.0029	Co-KA	0.7525	0.0101
15	CuO	0.135	mass%	0.0012	Cu-KA	8.2566	0.1076
16	ZnO	0.227	mass%	0.0011	Zn-KA	18.1987	0.1812
17	Rb2O	0.0036	mass%	0.0007	Rb-KA	0.9700	0.0029
18	SrO	0.0309	mass%	0.0007	Sr-KA	8.6790	0.0247
19	ZrO2	0.0048	mass%	0.0003	Zr-KA	4.3160	0.0038
20	MoO3	0.0055	mass%	0.0008	Mo-KA	1.8365	0.0044
21	BaO	0.0449	mass%	0.0087	Ba-LA	0.1713	0.0359
22	WO3	0.113	mass%	0.0036	W -LA	2.7304	0.0900
23	PbO	0.312	mass%	0.0022	Pb-LA	18.5082	0.2492

2004- 7-26 11:57

SQX Calculation Result

Sample : 07-2257
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 11:19
Balance :
Matching library:
File : 07-2257

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	F	0.0998	mass%	0.0518	F -KA	0.0164	0.0804
2	Na2O	0.202	mass%	0.0055	Na-KA	0.7949	0.1627
3	MgO	3.15	mass%	0.0062	Mg-KA	23.1799	2.5394
4	Al2O3	18.4	mass%	0.0058	Al-KA	396.7413	14.8063
5	SiO2	58.3	mass%	0.0068	Si-KA	898.6268	46.9566
6	P2O5	0.274	mass%	0.0012	P -KA	7.8852	0.2207
7	SO3	0.107	mass%	0.0012	S -KA	2.5417	0.0860
8	K2O	4.04	mass%	0.0020	K -KA	232.1818	3.2489
9	CaO	5.70	mass%	0.0016	Ca-KA	259.1335	4.5892
10	TiO2	0.712	mass%	0.0034	Ti-KA	4.7792	0.5730
11	Cr2O3	0.0088	mass%	0.0023	Cr-KA	0.1629	0.0071
12	MnO	0.566	mass%	0.0159	Mn-KB1	3.3143	0.4554
13	Fe2O3	7.69	mass%	0.0026	Fe-KA	318.7973	6.1936
14	Co2O3	0.0087	mass%	0.0019	Co-KA	0.4885	0.0070
15	NiO	0.0033	mass%	0.0011	Ni-KA	0.2289	0.0027
16	CuO	0.0477	mass%	0.0010	Cu-KA	4.2792	0.0384
17	ZnO	0.312	mass%	0.0009	Zn-KA	36.8645	0.2512
18	Ga2O3	0.0031	mass%	0.0010	Ga-KA	0.3838	0.0025
19	Rb2O	0.0168	mass%	0.0005	Rb-KA	6.8714	0.0135
20	SrO	0.0805	mass%	0.0005	Sr-KA	34.9043	0.0648
21	ZrO2	0.0217	mass%	0.0032	Zr-KB1	2.3746	0.0174
22	BaO	0.153	mass%	0.0128	Ba-LA	0.4688	0.1233
23	WO3	0.0294	mass%	0.0026	W -LA	1.1345	0.0237
24	PbO	0.0484	mass%	0.0017	Pb-LA	4.3090	0.0390

2004- 7-26 12:36

SQX Calculation Result

Sample : 07-2258
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 11:57
Balance :
Matching library:
File : 07-2258

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.132	mass%	0.0052	Na-KA	0.4821	0.1065
2	MgO	3.18	mass%	0.0061	Mg-KA	23.3193	2.5591
3	Al2O3	19.2	mass%	0.0059	Al-KA	411.8297	15.4060
4	SiO2	57.7	mass%	0.0068	Si-KA	880.2573	46.3866
5	P2O5	0.272	mass%	0.0011	P -KA	7.8036	0.2186
6	SO3	0.502	mass%	0.0013	S -KA	11.9100	0.4038
7	Cl	0.0034	mass%	0.0015	Cl-KA	0.0404	0.0028
8	K2O	2.84	mass%	0.0017	K -KA	163.7062	2.2803
9	CaO	5.86	mass%	0.0016	Ca-KA	274.5147	4.7155
10	TiO2	0.782	mass%	0.0039	Ti-KA	5.3657	0.6287
11	V2O5	0.0241	mass%	0.0026	V -KA	0.3185	0.0194
12	Cr2O3	0.0085	mass%	0.0021	Cr-KA	0.1898	0.0068
13	MnO	0.779	mass%	0.0159	Mn-KB1	4.6308	0.6260
14	Fe2O3	8.29	mass%	0.0026	Fe-KA	348.3386	6.6662
15	Co2O3	0.0061	mass%	0.0019	Co-KA	0.3459	0.0049
16	NiO	0.0044	mass%	0.0011	Ni-KA	0.2988	0.0035
17	CuO	0.0333	mass%	0.0010	Cu-KA	2.9637	0.0268
18	ZnO	0.169	mass%	0.0009	Zn-KA	19.7717	0.1356
19	Ga2O3	0.0035	mass%	0.0010	Ga-KA	0.4305	0.0028
20	Rb2O	0.0132	mass%	0.0005	Rb-KA	5.4277	0.0106
21	SrO	0.0719	mass%	0.0005	Sr-KA	31.2402	0.0578
22	Y2O3	0.0078	mass%	0.0027	Y -KB1	0.8237	0.0063
23	ZrO2	0.0229	mass%	0.0031	Zr-KB1	2.5160	0.0184
24	BaO	0.116	mass%	0.0111	Ba-LA	0.3635	0.0934
25	PbO	0.0269	mass%	0.0017	Pb-LA	2.3941	0.0216

2004- 7-26 13:14

SQX Calculation Result

Sample : 07-2259
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 12:36
Balance :
Matching library:
File : 07-2259

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.216	mass%	0.0050	Na-KA	0.8061	0.1731
2	MgO	2.52	mass%	0.0062	Mg-KA	18.4723	2.0217
3	Al2O3	19.4	mass%	0.0059	Al-KA	420.0543	15.5668
4	SiO2	59.3	mass%	0.0068	Si-KA	903.9206	47.5115
5	P2O5	0.261	mass%	0.0011	P -KA	7.3917	0.2089
6	SO3	0.647	mass%	0.0014	S -KA	15.1494	0.5185
7	K2O	3.87	mass%	0.0020	K -KA	219.2236	3.1041
8	CaO	3.43	mass%	0.0014	Ca-KA	155.4972	2.7479
9	TiO2	0.678	mass%	0.0040	Ti-KA	4.7465	0.5436
10	Cr2O3	0.0081	mass%	0.0024	Cr-KA	0.1567	0.0065
11	MnO	0.581	mass%	0.0160	Mn-KB1	3.5298	0.4657
12	Fe2O3	8.49	mass%	0.0027	Fe-KA	364.0277	6.8071
13	Co2O3	0.0057	mass%	0.0019	Co-KA	0.3277	0.0045
14	NiO	0.0035	mass%	0.0011	Ni-KA	0.2388	0.0028
15	CuO	0.0451	mass%	0.0010	Cu-KA	4.0732	0.0361
16	ZnO	0.161	mass%	0.0009	Zn-KA	19.1917	0.1293
17	Ga2O3	0.0042	mass%	0.0009	Ga-KA	0.5240	0.0033
18	Rb2O	0.0185	mass%	0.0005	Rb-KA	7.6384	0.0149
19	SrO	0.0485	mass%	0.0005	Sr-KA	21.1818	0.0389
20	Y2O3	0.0068	mass%	0.0028	Y -KB1	0.7162	0.0054
21	ZrO2	0.0213	mass%	0.0032	Zr-KB1	2.3447	0.0171
22	BaO	0.136	mass%	0.0118	Ba-LA	0.4343	0.1091
23	WO3	0.0252	mass%	0.0024	W -LA	1.0404	0.0202
24	PbO	0.132	mass%	0.0016	Pb-LA	11.8777	0.1057

2004- 7-26 13:52

SQX Calculation Result

Sample : 07-2260
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 13:14
Balance :
Matching library:
File : 07-2260

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	1.68	mass%	0.0067	Na-KA	5.1078	1.3591
2	MgO	3.02	mass%	0.0061	Mg-KA	21.8920	2.4368
3	Al2O3	18.3	mass%	0.0059	Al-KA	391.5851	14.7955
4	SiO2	57.4	mass%	0.0068	Si-KA	879.8570	46.3428
5	P2O5	0.222	mass%	0.0011	P -KA	6.4217	0.1796
6	SO3	0.410	mass%	0.0012	S -KA	9.7912	0.3314
7	K2O	3.37	mass%	0.0019	K -KA	195.2920	2.7225
8	CaO	5.47	mass%	0.0016	Ca-KA	254.0546	4.4141
9	TiO2	0.887	mass%	0.0046	Ti-KA	6.0888	0.7158
10	V2O5	0.0907	mass%	0.0223	V -KB1	0.1827	0.0732
11	MnO	0.424	mass%	0.0020	Mn-KA	12.8477	0.3420
12	Fe2O3	8.12	mass%	0.0026	Fe-KA	340.6778	6.5518
13	Co2O3	0.0066	mass%	0.0019	Co-KA	0.3747	0.0053
14	CuO	0.0273	mass%	0.0010	Cu-KA	2.4613	0.0220
15	ZnO	0.142	mass%	0.0009	Zn-KA	16.9157	0.1148
16	Ga2O3	0.0045	mass%	0.0009	Ga-KA	0.5615	0.0036
17	Rb2O	0.0128	mass%	0.0005	Rb-KA	5.3427	0.0104
18	SrO	0.119	mass%	0.0005	Sr-KA	52.4984	0.0962
19	ZrO2	0.0251	mass%	0.0031	Zr-KB1	2.7962	0.0203
20	Nb2O5	0.0021	mass%	0.0006	Nb-KA	1.0765	0.0017
21	BaO	0.194	mass%	0.0117	Ba-LA	0.6061	0.1563
22	WO3	0.0306	mass%	0.0027	W -LA	1.0963	0.0247
23	PbO	0.0191	mass%	0.0016	Pb-LA	1.7281	0.0154

2004- 7-26 14:31

SQX Calculation Result

Sample : 07-2261
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 13:53
Balance :
Matching library:
File : 07-2261

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.228	mass%	0.0052	Na-KA	0.7937	0.1840
2	MgO	2.28	mass%	0.0059	Mg-KA	16.6097	1.8414
3	Al2O3	15.4	mass%	0.0054	Al-KA	333.7761	12.4414
4	SiO2	62.3	mass%	0.0069	Si-KA	987.1563	50.3019
5	P2O5	0.245	mass%	0.0011	P -KA	7.0004	0.1979
6	SO3	0.665	mass%	0.0014	S -KA	15.6804	0.5367
7	Cl	0.0030	mass%	0.0015	Cl-KA	0.0353	0.0024
8	K2O	3.00	mass%	0.0018	K -KA	172.0522	2.4244
9	CaO	4.76	mass%	0.0015	Ca-KA	221.5757	3.8438
10	TiO2	0.652	mass%	0.0034	Ti-KA	4.5574	0.5269
11	V2O5	0.0142	mass%	0.0025	V -KA	0.2086	0.0115
12	Cr2O3	0.0059	mass%	0.0015	Cr-KA	0.1782	0.0048
13	MnO	0.552	mass%	0.0161	Mn-KB1	3.3316	0.4459
14	Fe2O3	9.36	mass%	0.0027	Fe-KA	397.7933	7.5570
15	Co2O3	0.0136	mass%	0.0020	Co-KA	0.7815	0.0110
16	CuO	0.0415	mass%	0.0010	Cu-KA	3.6479	0.0335
17	ZnO	0.134	mass%	0.0009	Zn-KA	15.5865	0.1086
18	Ga2O3	0.0035	mass%	0.0009	Ga-KA	0.4308	0.0028
19	Rb2O	0.0133	mass%	0.0005	Rb-KA	5.3569	0.0108
20	SrO	0.0694	mass%	0.0005	Sr-KA	29.5354	0.0561
21	ZrO2	0.0219	mass%	0.0032	Zr-KB1	2.3522	0.0177
22	Nb2O5	0.0019	mass%	0.0006	Nb-KA	0.9276	0.0015
23	BaO	0.117	mass%	0.0107	Ba-LA	0.3729	0.0946
24	WO3	0.0698	mass%	0.0027	W -LA	2.4375	0.0564
25	PbO	0.0712	mass%	0.0017	Pb-LA	6.2454	0.0575

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SQX Calculation Result

Sample : 07-2262
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 14:31
Balance :
Matching library:
File : 07-2262

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	1.59	mass%	0.0069	Na-KA	4.8907	1.2923
2	MgO	2.67	mass%	0.0060	Mg-KA	19.6649	2.1681
3	Al2O3	16.8	mass%	0.0056	Al-KA	366.8515	13.6618
4	SiO2	59.6	mass%	0.0068	Si-KA	942.0482	48.4534
5	P2O5	0.225	mass%	0.0011	P -KA	6.5298	0.1825
6	SO3	0.0449	mass%	0.0011	S -KA	1.0797	0.0365
7	Cl	0.0039	mass%	0.0015	Cl-KA	0.0472	0.0032
8	K2O	2.75	mass%	0.0017	K -KA	161.0713	2.2375
9	CaO	7.46	mass%	0.0017	Ca-KA	351.7992	6.0599
10	TiO2	0.743	mass%	0.0033	Ti-KA	4.9771	0.6033
11	V2O5	0.0173	mass%	0.0027	V -KA	0.2384	0.0140
12	MnO	0.431	mass%	0.0019	Mn-KA	12.9271	0.3500
13	Fe2O3	7.15	mass%	0.0025	Fe-KA	298.0181	5.8087
14	Co2O3	0.0107	mass%	0.0018	Co-KA	0.6054	0.0087
15	CuO	0.0112	mass%	0.0010	Cu-KA	1.0347	0.0091
16	ZnO	0.108	mass%	0.0008	Zn-KA	13.1689	0.0881
17	Ga2O3	0.0040	mass%	0.0009	Ga-KA	0.5212	0.0033
18	Rb2O	0.0095	mass%	0.0005	Rb-KA	4.0699	0.0078
19	SrO	0.121	mass%	0.0005	Sr-KA	54.7670	0.0985
20	ZrO2	0.0253	mass%	0.0030	Zr-KB1	2.8875	0.0205
21	BaO	0.110	mass%	0.0109	Ba-LA	0.3358	0.0893
22	WO3	0.0518	mass%	0.0027	W -LA	1.8935	0.0421
23	PbO	0.0134	mass%	0.0016	Pb-LA	1.2394	0.0109

2004- 7-29 16:44

SQX Calculation Result

Sample : 07-2262B
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-29 16:06
Balance :
Matching library:
File : 07-2262B

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	F	0.0878	mass%	0.0469	F -KA	0.0147	0.0717
2	Na2O	1.58	mass%	0.0068	Na-KA	4.8694	1.2862
3	MgO	2.66	mass%	0.0060	Mg-KA	19.6763	2.1683
4	Al2O3	16.8	mass%	0.0056	Al-KA	367.9609	13.6947
5	SiO2	59.8	mass%	0.0067	Si-KA	949.1634	48.7838
6	P2O5	0.221	mass%	0.0011	P -KA	6.4539	0.1804
7	SO3	0.0394	mass%	0.0010	S -KA	0.9523	0.0322
8	Cl	0.0036	mass%	0.0015	Cl-KA	0.0428	0.0029
9	K2O	2.73	mass%	0.0017	K -KA	160.3128	2.2267
10	CaO	7.44	mass%	0.0017	Ca-KA	352.5581	6.0684
11	TiO2	0.735	mass%	0.0047	Ti-KA	4.9532	0.5998
12	MnO	0.426	mass%	0.0020	Mn-KA	12.8582	0.3476
13	Fe2O3	7.08	mass%	0.0017	Fe-KA	296.7324	5.7753
14	Co2O3	0.0074	mass%	0.0018	Co-KA	0.4243	0.0061
15	NiO	0.0031	mass%	0.0011	Ni-KA	0.2200	0.0025
16	CuO	0.0119	mass%	0.0009	Cu-KA	1.1094	0.0098
17	ZnO	0.110	mass%	0.0008	Zn-KA	13.4476	0.0896
18	Ga2O3	0.0031	mass%	0.0009	Ga-KA	0.3984	0.0025
19	Rb2O	0.0094	mass%	0.0005	Rb-KA	4.0581	0.0077
20	SrO	0.119	mass%	0.0005	Sr-KA	54.2800	0.0971
21	ZrO2	0.0232	mass%	0.0030	Zr-KB1	2.6785	0.0190
22	Nb2O5	0.0021	mass%	0.0005	Nb-KA	1.0997	0.0017
23	BaO	0.129	mass%	0.0114	Ba-LA	0.3947	0.1049
24	WO3	0.0326	mass%	0.0024	W -LA	1.3253	0.0266
25	PbO	0.0142	mass%	0.0016	Pb-LA	1.3280	0.0116

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SQX Calculation Result

Sample : 07-2263
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 15:10
Balance :
Matching library:
File : 07-2263

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.613	mass%	0.0062	Na-KA	1.8803	0.4892
2	MgO	2.18	mass%	0.0058	Mg-KA	16.1703	1.7418
3	Al2O3	18.4	mass%	0.0057	Al-KA	402.9100	14.6482
4	SiO2	62.8	mass%	0.0070	Si-KA	973.8315	50.0955
5	P2O5	0.167	mass%	0.0011	P -KA	4.6844	0.1335
6	SO3	0.175	mass%	0.0012	S -KA	4.0393	0.1393
7	Cl	0.0050	mass%	0.0016	Cl-KA	0.0572	0.0040
8	K2O	4.46	mass%	0.0021	K -KA	249.9745	3.5615
9	CaO	2.55	mass%	0.0014	Ca-KA	113.4239	2.0354
10	TiO2	0.720	mass%	0.0038	Ti-KA	5.0255	0.5742
11	Cr2O3	0.0099	mass%	0.0025	Cr-KA	0.1925	0.0079
12	MnO	0.367	mass%	0.0151	Mn-KB1	2.2520	0.2930
13	Fe2O3	7.06	mass%	0.0025	Fe-KA	305.9265	5.6290
14	Co2O3	0.0055	mass%	0.0018	Co-KA	0.3242	0.0044
15	NiO	0.0038	mass%	0.0011	Ni-KA	0.2779	0.0030
16	CuO	0.0212	mass%	0.0010	Cu-KA	2.0200	0.0169
17	ZnO	0.156	mass%	0.0008	Zn-KA	19.5378	0.1241
18	Ga2O3	0.0028	mass%	0.0009	Ga-KA	0.3711	0.0022
19	Rb2O	0.0220	mass%	0.0005	Rb-KA	9.6865	0.0175
20	SrO	0.0551	mass%	0.0005	Sr-KA	25.7352	0.0440
21	Y2O3	0.0095	mass%	0.0026	Y -KB1	1.0867	0.0076
22	ZrO2	0.0309	mass%	0.0031	Zr-KB1	3.6533	0.0246
23	BaO	0.156	mass%	0.0105	Ba-LA	0.4965	0.1245
24	WO3	0.0274	mass%	0.0025	W -LA	1.1191	0.0219
25	PbO	0.0336	mass%	0.0016	Pb-LA	3.2155	0.0268

2004- 7-26 20:56

SQX Calculation Result

Sample : 07-2264
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 20:18
Balance :
Matching library:
File : 07-2264

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	F	0.205	mass%	0.0645	F -KA	0.0276	0.1639
2	Na2O	0.0876	mass%	0.0044	Na-KA	0.4451	0.0700
3	MgO	3.23	mass%	0.0064	Mg-KA	23.6426	2.5769
4	Al2O3	22.1	mass%	0.0063	Al-KA	472.7483	17.6548
5	SiO2	57.9	mass%	0.0069	Si-KA	855.0560	46.2806
6	P2O5	0.202	mass%	0.0011	P -KA	5.6629	0.1616
7	SO3	0.128	mass%	0.0013	S -KA	2.9728	0.1026
8	K2O	4.37	mass%	0.0021	K -KA	245.5846	3.4899
9	CaO	1.04	mass%	0.0012	Ca-KA	46.7272	0.8292
10	TiO2	0.693	mass%	0.0037	Ti-KA	5.0555	0.5538
11	V2O5	0.0709	mass%	0.0219	V -KB1	0.1524	0.0567
12	MnO	1.23	mass%	0.0021	Mn-KA	39.3004	0.9786
13	Fe2O3	7.90	mass%	0.0025	Fe-KA	350.9279	6.3095
14	NiO	0.0040	mass%	0.0011	Ni-KA	0.2850	0.0032
15	CuO	0.0225	mass%	0.0010	Cu-KA	2.0785	0.0179
16	ZnO	0.405	mass%	0.0009	Zn-KA	49.3598	0.3237
17	Ga2O3	0.0044	mass%	0.0010	Ga-KA	0.5656	0.0035
18	Rb2O	0.0224	mass%	0.0005	Rb-KA	9.6209	0.0179
19	SrO	0.0123	mass%	0.0005	Sr-KA	5.4646	0.0098
20	Y2O3	0.0081	mass%	0.0027	Y -KB1	0.8718	0.0065
21	ZrO2	0.0250	mass%	0.0032	Zr-KB1	2.7991	0.0199
22	BaO	0.193	mass%	0.0114	Ba-LA	0.6402	0.1538
23	WO3	0.0134	mass%	0.0026	W -LA	0.5439	0.0107
24	Au2O	0.0064	mass%	0.0025	Au-LB1	0.4425	0.0051
25	PbO	0.108	mass%	0.0017	Pb-LA	9.8603	0.0862

2004- 7-26 21:34

SQX Calculation Result

Sample : 07-2265
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 20:56
Balance :
Matching library:
File : 07-2265

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	F	0.0542	mass%	0.0259	F -KA	0.0180	0.0433
2	Na2O	0.287	mass%	0.0056	Na-KA	1.0663	0.2292
3	MgO	3.32	mass%	0.0062	Mg-KA	24.3767	2.6544
4	Al2O3	19.3	mass%	0.0059	Al-KA	414.7884	15.4470
5	SiO2	59.2	mass%	0.0069	Si-KA	897.7646	47.2915
6	P2O5	0.250	mass%	0.0011	P -KA	7.0579	0.1995
7	SO3	0.225	mass%	0.0013	S -KA	5.2652	0.1801
8	K2O	2.65	mass%	0.0017	K -KA	151.0188	2.1169
9	CaO	5.07	mass%	0.0016	Ca-KA	236.2342	4.0513
10	TiO2	0.779	mass%	0.0038	Ti-KA	5.4006	0.6224
11	MnO	0.715	mass%	0.0020	Mn-KA	22.0749	0.5712
12	Fe2O3	7.57	mass%	0.0025	Fe-KA	324.3353	6.0489
13	Co2O3	0.0045	mass%	0.0018	Co-KA	0.2586	0.0036
14	NiO	0.0035	mass%	0.0011	Ni-KA	0.2447	0.0028
15	CuO	0.0220	mass%	0.0010	Cu-KA	2.0252	0.0176
16	ZnO	0.295	mass%	0.0009	Zn-KA	35.8234	0.2360
17	Ga2O3	0.0044	mass%	0.0009	Ga-KA	0.5705	0.0036
18	Rb2O	0.0125	mass%	0.0005	Rb-KA	5.2886	0.0100
19	SrO	0.0652	mass%	0.0005	Sr-KA	29.1376	0.0521
20	Y2O3	0.0066	mass%	0.0027	Y -KB1	0.7171	0.0053
21	ZrO2	0.0269	mass%	0.0031	Zr-KB1	3.0370	0.0215
22	BaO	0.0912	mass%	0.0108	Ba-LA	0.2883	0.0729
23	WO3	0.0163	mass%	0.0023	W -LA	0.7172	0.0131
24	PbO	0.0493	mass%	0.0016	Pb-LA	4.5217	0.0394

2004- 7-26 22:13

SQX Calculation Result

Sample : 07-2266
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 21:35
Balance :
Matching library:
File : 07-2266

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.258	mass%	0.0062	Na-KA	0.7956	0.2095
2	MgO	2.93	mass%	0.0060	Mg-KA	21.9592	2.3783
3	Al2O3	17.9	mass%	0.0057	Al-KA	393.6091	14.4902
4	SiO2	59.6	mass%	0.0068	Si-KA	939.5840	48.3879
5	P2O5	0.285	mass%	0.0011	P -KA	8.2701	0.2311
6	SO3	0.107	mass%	0.0011	S -KA	2.5578	0.0865
7	K2O	4.46	mass%	0.0021	K -KA	258.3562	3.6197
8	CaO	5.74	mass%	0.0017	Ca-KA	260.1096	4.6565
9	TiO2	0.701	mass%	0.0046	Ti-KA	4.6921	0.5686
10	Cr2O3	0.0095	mass%	0.0024	Cr-KA	0.1759	0.0077
11	MnO	0.631	mass%	0.0156	Mn-KB1	3.6961	0.5118
12	Fe2O3	6.99	mass%	0.0025	Fe-KA	289.9738	5.6703
13	Co2O3	0.0076	mass%	0.0018	Co-KA	0.4268	0.0062
14	NiO	0.0032	mass%	0.0012	Ni-KA	0.2038	0.0026
15	CuO	0.0174	mass%	0.0010	Cu-KA	1.5913	0.0141
16	ZnO	0.0657	mass%	0.0009	Zn-KA	7.9440	0.0533
17	Ga2O3	0.0042	mass%	0.0009	Ga-KA	0.5383	0.0034
18	Rb2O	0.0202	mass%	0.0005	Rb-KA	8.6060	0.0164
19	SrO	0.0565	mass%	0.0005	Sr-KA	25.5579	0.0458
20	Y2O3	0.0094	mass%	0.0026	Y -KB1	1.0383	0.0076
21	ZrO2	0.0192	mass%	0.0031	Zr-KB1	2.2074	0.0156
22	BaO	0.184	mass%	0.0125	Ba-LA	0.5616	0.1494
23	WO3	0.0242	mass%	0.0023	W -LA	1.0124	0.0197
24	PbO	0.0088	mass%	0.0016	Pb-LA	0.8148	0.0072

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SQX Calculation Result

Sample : 07-2267
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 22:13
Balance :
Matching library:
File : 07-2267

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.145	mass%	0.0063	Na-KA	0.4234	0.1208
2	MgO	1.17	mass%	0.0058	Mg-KA	8.0209	0.9770
3	Al2O3	13.9	mass%	0.0055	Al-KA	288.7955	11.5917
4	SiO2	57.6	mass%	0.0067	Si-KA	900.3133	47.8922
5	P2O5	0.293	mass%	0.0012	P -KA	8.6524	0.2440
6	SO3	2.52	mass%	0.0019	S -KA	61.1551	2.0951
7	Cl	0.0035	mass%	0.0015	Cl-KA	0.0419	0.0029
8	K2O	2.49	mass%	0.0017	K -KA	145.7596	2.0737
9	CaO	1.02	mass%	0.0011	Ca-KA	49.6555	0.8453
10	TiO2	0.477	mass%	0.0035	Ti-KA	3.7857	0.3970
11	Cr2O3	0.0097	mass%	0.0023	Cr-KA	0.2162	0.0081
12	MnO	0.168	mass%	0.0198	Mn-KB1	1.0784	0.1398
13	Fe2O3	19.2	mass%	0.0036	Fe-KA	847.5371	15.9314
14	CuO	0.157	mass%	0.0011	Cu-KA	11.5561	0.1305
15	ZnO	0.106	mass%	0.0010	Zn-KA	10.2384	0.0881
16	Rb2O	0.0123	mass%	0.0006	Rb-KA	3.9827	0.0103
17	SrO	0.0226	mass%	0.0006	Sr-KA	7.6277	0.0188
18	ZrO2	0.0115	mass%	0.0037	Zr-KB1	0.9620	0.0096
19	BaO	0.0717	mass%	0.0089	Ba-LA	0.2596	0.0596
20	WO3	0.0446	mass%	0.0031	W -LA	1.2999	0.0371
21	PbO	0.582	mass%	0.0019	Pb-LA	41.7238	0.4837
22	Bi2O3	0.0070	mass%	0.0022	Bi-LA	0.4822	0.0058

2004- 7-26 23:30

SQX Calculation Result

Sample : 07-2268
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 22:52
Balance :
Matching library:
File : 07-2268

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.763	mass%	0.0065	Na-KA	2.3195	0.6151
2	MgO	2.98	mass%	0.0060	Mg-KA	21.8778	2.4024
3	Al2O3	18.3	mass%	0.0058	Al-KA	396.2167	14.7950
4	SiO2	59.6	mass%	0.0069	Si-KA	918.5567	48.0657
5	P2O5	0.271	mass%	0.0012	P -KA	7.7439	0.2186
6	SO3	0.335	mass%	0.0013	S -KA	7.9017	0.2701
7	Cl	0.0029	mass%	0.0015	Cl-KA	0.0340	0.0023
8	K2O	3.62	mass%	0.0019	K -KA	207.5603	2.9218
9	CaO	4.11	mass%	0.0015	Ca-KA	189.1490	3.3153
10	TiO2	0.681	mass%	0.0044	Ti-KA	4.7676	0.5493
11	MnO	0.673	mass%	0.0020	Mn-KA	20.9181	0.5427
12	Fe2O3	8.05	mass%	0.0026	Fe-KA	346.4455	6.4902
13	Co2O3	0.0079	mass%	0.0019	Co-KA	0.4584	0.0064
14	NiO	0.0023	mass%	0.0008	Ni-KA	0.2141	0.0018
15	CuO	0.0896	mass%	0.0010	Cu-KA	8.2034	0.0723
16	ZnO	0.146	mass%	0.0009	Zn-KA	17.5909	0.1176
17	Ga2O3	0.0034	mass%	0.0009	Ga-KA	0.4302	0.0027
18	Rb2O	0.0163	mass%	0.0005	Rb-KA	6.8689	0.0132
19	SrO	0.0615	mass%	0.0005	Sr-KA	27.3622	0.0496
20	Y2O3	0.0093	mass%	0.0027	Y -KB1	1.0098	0.0075
21	ZrO2	0.0216	mass%	0.0031	Zr-KB1	2.4372	0.0175
22	BaO	0.130	mass%	0.0110	Ba-LA	0.4158	0.1051
23	WO3	0.0347	mass%	0.0024	W -LA	1.3960	0.0280
24	PbO	0.0519	mass%	0.0016	Pb-LA	4.7481	0.0419

2004- 7-27 00:08

SQX Calculation Result

Sample : 07-2269
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-26 23:30
Balance :
Matching library:
File : 07-2269

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	F	0.196	mass%	0.0510	F -KA	0.0254	0.1512
2	Na2O	0.914	mass%	0.0064	Na-KA	2.7428	0.7063
3	MgO	2.61	mass%	0.0062	Mg-KA	18.8551	2.0146
4	Al2O3	18.8	mass%	0.0059	Al-KA	400.9327	14.5559
5	SiO2	62.7	mass%	0.0071	Si-KA	938.5255	48.4538
6	P2O5	0.287	mass%	0.0012	P -KA	7.7675	0.2219
7	SO3	0.546	mass%	0.0014	S -KA	12.2027	0.4221
8	Cl	0.0038	mass%	0.0016	Cl-KA	0.0425	0.0030
9	K2O	3.31	mass%	0.0019	K -KA	179.4536	2.5557
10	CaO	2.94	mass%	0.0014	Ca-KA	129.8594	2.2745
11	TiO2	0.641	mass%	0.0047	Ti-KA	4.3936	0.4952
12	V2O5	0.0803	mass%	0.0225	V -KB1	0.1627	0.0620
13	MnO	0.263	mass%	0.0019	Mn-KA	8.1510	0.2035
14	Fe2O3	6.15	mass%	0.0024	Fe-KA	264.9836	4.7508
15	Co2O3	0.0063	mass%	0.0017	Co-KA	0.3712	0.0049
16	NiO	0.0034	mass%	0.0012	Ni-KA	0.2238	0.0026
17	CuO	0.113	mass%	0.0009	Cu-KA	10.9568	0.0873
18	ZnO	0.0997	mass%	0.0008	Zn-KA	12.7612	0.0770
19	Ga2O3	0.0039	mass%	0.0009	Ga-KA	0.5323	0.0030
20	Rb2O	0.0121	mass%	0.0005	Rb-KA	5.4415	0.0093
21	SrO	0.0728	mass%	0.0005	Sr-KA	34.7440	0.0562
22	ZrO2	0.0141	mass%	0.0030	Zr-KB1	1.7103	0.0109
23	BaO	0.115	mass%	0.0107	Ba-LA	0.3595	0.0890
24	WO3	0.0255	mass%	0.0023	W -LA	1.0847	0.0197
25	PbO	0.0242	mass%	0.0016	Pb-LA	2.3619	0.0187

2004- 7-27 00:47

SQX Calculation Result

Sample : 07-2270
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-27 00:08
Balance :
Matching library:
File : 07-2270

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	1.38	mass%	0.0064	Na-KA	4.2378	1.0801
2	MgO	2.67	mass%	0.0060	Mg-KA	19.5789	2.0833
3	Al2O3	18.5	mass%	0.0058	Al-KA	399.1279	14.4435
4	SiO2	63.0	mass%	0.0071	Si-KA	956.9016	49.1423
5	P2O5	0.268	mass%	0.0012	P -KA	7.3216	0.2088
6	SO3	0.902	mass%	0.0014	S -KA	20.3677	0.7033
7	Cl	0.0057	mass%	0.0016	Cl-KA	0.0634	0.0044
8	K2O	3.79	mass%	0.0020	K -KA	206.6798	2.9533
9	CaO	2.69	mass%	0.0014	Ca-KA	118.2795	2.0985
10	TiO2	0.623	mass%	0.0039	Ti-KA	4.2824	0.4859
11	MnO	0.279	mass%	0.0019	Mn-KA	8.7059	0.2175
12	Fe2O3	5.48	mass%	0.0023	Fe-KA	238.7189	4.2731
13	Co2O3	0.0058	mass%	0.0017	Co-KA	0.3450	0.0045
14	NiO	0.0034	mass%	0.0010	Ni-KA	0.2546	0.0026
15	CuO	0.0646	mass%	0.0009	Cu-KA	6.4594	0.0504
16	ZnO	0.0888	mass%	0.0008	Zn-KA	11.7311	0.0692
17	Ga2O3	0.0025	mass%	0.0009	Ga-KA	0.3487	0.0019
18	Rb2O	0.0143	mass%	0.0005	Rb-KA	6.7206	0.0112
19	SrO	0.0706	mass%	0.0005	Sr-KA	35.1278	0.0551
20	ZrO2	0.0148	mass%	0.0029	Zr-KB1	1.8691	0.0115
21	Nb2O5	0.0019	mass%	0.0005	Nb-KA	1.0812	0.0014
22	BaO	0.123	mass%	0.0111	Ba-LA	0.3867	0.0963
23	PbO	0.0068	mass%	0.0015	Pb-LA	0.6861	0.0053

2004- 7-27 01:25

SQX Calculation Result

Sample : 07-2271
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-27 00:47
Balance :
Matching library:
File : 07-2271

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	F	0.113	mass%	0.0560	F -KA	0.0152	0.0908
2	Na2O	1.97	mass%	0.0063	Na-KA	6.0797	1.5809
3	MgO	2.23	mass%	0.0059	Mg-KA	16.3263	1.7834
4	Al2O3	17.3	mass%	0.0057	Al-KA	376.4983	13.8486
5	SiO2	61.2	mass%	0.0069	Si-KA	955.3944	49.0054
6	P2O5	0.354	mass%	0.0012	P -KA	10.0469	0.2833
7	SO3	0.625	mass%	0.0014	S -KA	14.6542	0.5006
8	Cl	0.0051	mass%	0.0015	Cl-KA	0.0600	0.0041
9	K2O	4.72	mass%	0.0022	K -KA	266.4364	3.7817
10	CaO	3.35	mass%	0.0014	Ca-KA	148.6807	2.6829
11	TiO2	0.698	mass%	0.0039	Ti-KA	4.7939	0.5592
12	Cr2O3	0.0111	mass%	0.0024	Cr-KA	0.2121	0.0089
13	MnO	0.348	mass%	0.0147	Mn-KB1	2.1051	0.2787
14	Fe2O3	6.57	mass%	0.0024	Fe-KA	281.2492	5.2594
15	Co2O3	0.0064	mass%	0.0018	Co-KA	0.3760	0.0052
16	NiO	0.0051	mass%	0.0010	Ni-KA	0.3718	0.0041
17	CuO	0.0426	mass%	0.0010	Cu-KA	4.0748	0.0341
18	ZnO	0.0752	mass%	0.0008	Zn-KA	9.4969	0.0602
19	Ga2O3	0.0041	mass%	0.0009	Ga-KA	0.5467	0.0032
20	Rb2O	0.0172	mass%	0.0005	Rb-KA	7.6383	0.0138
21	SrO	0.127	mass%	0.0005	Sr-KA	60.0509	0.1021
22	Y2O3	0.0076	mass%	0.0026	Y -KB1	0.8645	0.0061
23	ZrO2	0.0176	mass%	0.0030	Zr-KB1	2.0875	0.0141
24	BaO	0.174	mass%	0.0120	Ba-LA	0.5440	0.1393
25	WO3	0.0209	mass%	0.0023	W -LA	0.8778	0.0167
26	PbO	0.0309	mass%	0.0016	Pb-LA	2.9796	0.0247

2004- 7-27 02:03

SQX Calculation Result

Sample : 07-2272
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-27 01:25
Balance :
Matching library:
File : 07-2272

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.838	mass%	0.0063	Na-KA	2.5241	0.6703
2	MgO	2.27	mass%	0.0059	Mg-KA	16.5191	1.8181
3	Al2O3	16.3	mass%	0.0055	Al-KA	352.3130	13.0544
4	SiO2	62.3	mass%	0.0070	Si-KA	973.6950	49.8266
5	P2O5	0.266	mass%	0.0011	P -KA	7.5131	0.2129
6	SO3	0.556	mass%	0.0014	S -KA	12.9536	0.4446
7	Cl	0.0052	mass%	0.0015	Cl-KA	0.0604	0.0042
8	K2O	3.56	mass%	0.0019	K -KA	200.8224	2.8437
9	CaO	3.88	mass%	0.0014	Ca-KA	176.3734	3.1011
10	TiO2	0.684	mass%	0.0042	Ti-KA	4.7555	0.5472
11	Cr2O3	0.0090	mass%	0.0024	Cr-KA	0.1740	0.0072
12	MnO	0.434	mass%	0.0157	Mn-KB1	2.6284	0.3469
13	Fe2O3	8.22	mass%	0.0026	Fe-KA	351.5981	6.5756
14	Co2O3	0.0107	mass%	0.0019	Co-KA	0.6187	0.0085
15	NiO	0.0041	mass%	0.0011	Ni-KA	0.2833	0.0033
16	CuO	0.0871	mass%	0.0010	Cu-KA	7.9237	0.0696
17	ZnO	0.168	mass%	0.0009	Zn-KA	20.1373	0.1342
18	Ga2O3	0.0032	mass%	0.0010	Ga-KA	0.4033	0.0025
19	Rb2O	0.0146	mass%	0.0005	Rb-KA	6.0625	0.0116
20	SrO	0.0708	mass%	0.0005	Sr-KA	31.2044	0.0566
21	ZrO2	0.0258	mass%	0.0031	Zr-KB1	2.8783	0.0207
22	Nb2O5	0.0018	mass%	0.0006	Nb-KA	0.9134	0.0014
23	BaO	0.125	mass%	0.0109	Ba-LA	0.3950	0.0997
24	WO3	0.0494	mass%	0.0025	W -LA	1.9785	0.0395
25	PbO	0.0667	mass%	0.0016	Pb-LA	6.0443	0.0533

2004- 7-29 17:22

SQX Calculation Result

Sample : 07-2272B
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-29 16:44
Balance :
Matching library:
File : 07-2272B

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.865	mass%	0.0064	Na-KA	2.6142	0.6935
2	MgO	2.28	mass%	0.0059	Mg-KA	16.6360	1.8293
3	Al2O3	16.4	mass%	0.0055	Al-KA	355.1098	13.1483
4	SiO2	62.4	mass%	0.0070	Si-KA	977.6249	50.0289
5	P2O5	0.263	mass%	0.0012	P -KA	7.4323	0.2107
6	SO3	0.542	mass%	0.0014	S -KA	12.6592	0.4345
7	Cl	0.0042	mass%	0.0016	Cl-KA	0.0488	0.0034
8	K2O	3.53	mass%	0.0019	K -KA	200.0202	2.8315
9	CaO	3.87	mass%	0.0014	Ca-KA	176.8067	3.1058
10	TiO2	0.666	mass%	0.0047	Ti-KA	4.6510	0.5345
11	MnO	0.454	mass%	0.0019	Mn-KA	14.1225	0.3646
12	Fe2O3	8.17	mass%	0.0026	Fe-KA	351.4436	6.5538
13	Co2O3	0.0112	mass%	0.0019	Co-KA	0.6534	0.0090
14	NiO	0.0047	mass%	0.0011	Ni-KA	0.3266	0.0038
15	CuO	0.0874	mass%	0.0010	Cu-KA	8.0084	0.0701
16	ZnO	0.166	mass%	0.0009	Zn-KA	20.0315	0.1331
17	Ga2O3	0.0036	mass%	0.0009	Ga-KA	0.4627	0.0029
18	Rb2O	0.0148	mass%	0.0005	Rb-KA	6.1914	0.0118
19	SrO	0.0717	mass%	0.0005	Sr-KA	31.8574	0.0575
20	Y2O3	0.0003	mass%	0.0000	Y -KA	2.0764	0.0003
21	ZrO2	0.0231	mass%	0.0031	Zr-KB1	2.5995	0.0186
22	Nb2O5	0.0017	mass%	0.0005	Nb-KA	1.0733	0.0013
23	BaO	0.109	mass%	0.0109	Ba-LA	0.3463	0.0873
24	WO3	0.0420	mass%	0.0023	W -LA	1.8131	0.0337
25	PbO	0.0629	mass%	0.0016	Pb-LA	5.7433	0.0504

2004- 7-29 11:27

SQX Calculation Result

Sample : 07-2273
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-29 10:49
Balance :
Matching library:
File : 07-2273

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	F	0.0640	mass%	0.0297	F -KA	0.0181	0.0507
2	Na2O	0.715	mass%	0.0066	Na-KA	2.1405	0.5674
3	MgO	1.84	mass%	0.0059	Mg-KA	13.2551	1.4572
4	Al2O3	17.0	mass%	0.0057	Al-KA	365.4104	13.4608
5	SiO2	62.0	mass%	0.0070	Si-KA	959.2403	49.1737
6	P2O5	0.214	mass%	0.0012	P -KA	5.9916	0.1697
7	SO3	1.53	mass%	0.0016	S -KA	35.3477	1.2131
8	Cl	0.0077	mass%	0.0017	Cl-KA	0.0876	0.0061
9	K2O	3.91	mass%	0.0020	K -KA	217.3474	3.0987
10	CaO	2.79	mass%	0.0014	Ca-KA	124.5132	2.2100
11	TiO2	0.675	mass%	0.0045	Ti-KA	4.7199	0.5357
12	Cr2O3	0.0122	mass%	0.0023	Cr-KA	0.2367	0.0097
13	MnO	0.351	mass%	0.0157	Mn-KB1	2.1409	0.2782
14	Fe2O3	8.23	mass%	0.0026	Fe-KA	354.5687	6.5300
15	Co2O3	0.0095	mass%	0.0019	Co-KA	0.5558	0.0075
16	NiO	0.0033	mass%	0.0011	Ni-KA	0.2354	0.0027
17	CuO	0.186	mass%	0.0010	Cu-KA	16.9775	0.1473
18	ZnO	0.217	mass%	0.0009	Zn-KA	26.0948	0.1718
19	Ga2O3	0.0034	mass%	0.0010	Ga-KA	0.4307	0.0027
20	Rb2O	0.0136	mass%	0.0005	Rb-KA	5.6641	0.0108
21	SrO	0.0579	mass%	0.0005	Sr-KA	25.4824	0.0459
22	ZrO2	0.0258	mass%	0.0032	Zr-KB1	2.8680	0.0204
23	Nb2O5	0.0018	mass%	0.0006	Nb-KA	0.9335	0.0014
24	BaO	0.0955	mass%	0.0102	Ba-LA	0.3042	0.0757
25	WO3	0.0471	mass%	0.0024	W -LA	1.9816	0.0374
26	PbO	0.0676	mass%	0.0017	Pb-LA	6.1251	0.0537

2004- 7-29 12:06

SQX Calculation Result

Sample : 07-2274
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-29 11:28
Balance :
Matching library:
File : 07-2274

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.781	mass%	0.0062	Na-KA	2.3572	0.6289
2	MgO	1.10	mass%	0.0057	Mg-KA	8.0407	0.8871
3	Al2O3	17.1	mass%	0.0056	Al-KA	375.8227	13.7589
4	SiO2	61.4	mass%	0.0069	Si-KA	968.5910	49.4632
5	P2O5	0.172	mass%	0.0011	P -KA	4.9093	0.1382
6	SO3	2.25	mass%	0.0017	S -KA	52.9759	1.8094
7	Cl	0.0083	mass%	0.0016	Cl-KA	0.0967	0.0067
8	K2O	4.54	mass%	0.0021	K -KA	255.7936	3.6574
9	CaO	2.45	mass%	0.0013	Ca-KA	109.2849	1.9694
10	TiO2	0.603	mass%	0.0044	Ti-KA	4.2478	0.4854
11	Cr2O3	0.0078	mass%	0.0024	Cr-KA	0.1525	0.0063
12	MnO	0.283	mass%	0.0157	Mn-KB1	1.7350	0.2275
13	Fe2O3	8.61	mass%	0.0026	Fe-KA	372.7520	6.9332
14	Co2O3	0.0116	mass%	0.0019	Co-KA	0.6822	0.0093
15	NiO	0.0039	mass%	0.0011	Ni-KA	0.2739	0.0031
16	CuO	0.181	mass%	0.0010	Cu-KA	16.4975	0.1454
17	ZnO	0.121	mass%	0.0009	Zn-KA	14.5530	0.0972
18	Ga2O3	0.0042	mass%	0.0009	Ga-KA	0.5264	0.0033
19	Rb2O	0.0155	mass%	0.0005	Rb-KA	6.4818	0.0125
20	SrO	0.0481	mass%	0.0005	Sr-KA	21.2632	0.0387
21	ZrO2	0.0433	mass%	0.0030	Zr-KB1	4.8421	0.0348
22	Nb2O5	0.0021	mass%	0.0006	Nb-KA	1.0785	0.0017
23	BaO	0.124	mass%	0.0107	Ba-LA	0.3981	0.0998
24	WO3	0.0489	mass%	0.0025	W -LA	1.9462	0.0393
25	PbO	0.0583	mass%	0.0016	Pb-LA	5.2968	0.0469

2004- 7-29 12:44

SQX Calculation Result

Sample : 07-2275
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-29 12:06
Balance :
Matching library:
File : 07-2275

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.132	mass%	0.0052	Na-KA	0.3701	0.1100
2	MgO	0.237	mass%	0.0051	Mg-KA	1.4033	0.1968
3	Al2O3	4.35	mass%	0.0037	Al-KA	80.3705	3.6202
4	SiO2	53.7	mass%	0.0067	Si-KA	834.1909	44.6687
5	P2O5	0.140	mass%	0.0011	P -KA	4.2053	0.1161
6	SO3	4.00	mass%	0.0021	S -KA	99.1872	3.3275
7	Cl	0.0029	mass%	0.0015	Cl-KA	0.0351	0.0024
8	K2O	1.37	mass%	0.0013	K -KA	83.1738	1.1429
9	CaO	0.127	mass%	0.0009	Ca-KA	6.6135	0.1054
10	TiO2	0.370	mass%	0.0033	Ti-KA	3.2162	0.3082
11	Cr2O3	0.0083	mass%	0.0022	Cr-KA	0.2037	0.0069
12	MnO	0.0433	mass%	0.0018	Mn-KA	1.6140	0.0360
13	Fe2O3	34.8	mass%	0.0134	Fe-KB1	277.2645	28.9370
14	CuO	0.0311	mass%	0.0014	Cu-KA	1.6932	0.0259
15	ZnO	0.0711	mass%	0.0012	Zn-KA	5.0619	0.0591
16	Rb2O	0.0072	mass%	0.0007	Rb-KA	1.6901	0.0060
17	SrO	0.0079	mass%	0.0007	Sr-KA	1.9565	0.0066
18	ZrO2	0.0172	mass%	0.0006	Zr-KA	5.8658	0.0143
19	WO3	0.121	mass%	0.0038	W -LA	2.6052	0.1008
20	PbO	0.472	mass%	0.0023	Pb-LA	24.8859	0.3924

2004- 7-29 13:23

SQX Calculation Result

Sample : 07-2276
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-29 12:44
Balance :
Matching library:
File : 07-2276

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	F	0.123	mass%	0.0804	F -KA	0.0140	0.0994
2	Na2O	0.0896	mass%	0.0045	Na-KA	0.4274	0.0724
3	MgO	3.20	mass%	0.0062	Mg-KA	23.6122	2.5859
4	Al2O3	20.6	mass%	0.0062	Al-KA	444.7394	16.6598
5	SiO2	59.4	mass%	0.0069	Si-KA	896.2739	48.0290
6	P2O5	0.217	mass%	0.0011	P -KA	6.1166	0.1750
7	SO3	0.265	mass%	0.0014	S -KA	6.1925	0.2144
8	Cl	0.0027	mass%	0.0016	Cl-KA	0.0319	0.0022
9	K2O	3.92	mass%	0.0020	K -KA	222.7519	3.1694
10	CaO	1.16	mass%	0.0011	Ca-KA	53.3428	0.9386
11	TiO2	0.692	mass%	0.0043	Ti-KA	5.1420	0.5597
12	MnO	1.26	mass%	0.0020	Mn-KA	41.1955	1.0156
13	Fe2O3	8.14	mass%	0.0026	Fe-KA	369.8528	6.5837
14	Co2O3	0.0062	mass%	0.0018	Co-KA	0.3715	0.0050
15	CuO	0.0546	mass%	0.0010	Cu-KA	5.1061	0.0442
16	ZnO	0.554	mass%	0.0009	Zn-KA	68.1114	0.4477
17	Ga2O3	0.0037	mass%	0.0010	Ga-KA	0.4840	0.0030
18	Rb2O	0.0219	mass%	0.0005	Rb-KA	9.3618	0.0177
19	SrO	0.0132	mass%	0.0005	Sr-KA	5.8436	0.0106
20	Y2O3	0.0070	mass%	0.0027	Y -KB1	0.7509	0.0056
21	ZrO2	0.0239	mass%	0.0032	Zr-KB1	2.6872	0.0194
22	BaO	0.0926	mass%	0.0106	Ba-LA	0.3135	0.0749
23	WO3	0.0262	mass%	0.0028	W -LA	0.9700	0.0211
24	Au2O	0.0052	mass%	0.0025	Au-LB1	0.3607	0.0042
25	PbO	0.106	mass%	0.0016	Pb-LA	9.7097	0.0858

2004- 7-29 14:01

SQX Calculation Result

Sample : 07-2277
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-29 13:23
Balance :
Matching library:
File : 07-2277

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	1.35	mass%	0.0068	Na-KA	4.1821	1.0978
2	MgO	3.00	mass%	0.0060	Mg-KA	22.2731	2.4384
3	Al2O3	17.9	mass%	0.0058	Al-KA	391.2461	14.5638
4	SiO2	59.5	mass%	0.0068	Si-KA	930.1123	48.3450
5	P2O5	0.280	mass%	0.0011	P -KA	8.0933	0.2274
6	SO3	0.152	mass%	0.0012	S -KA	3.6363	0.1236
7	K2O	4.40	mass%	0.0021	K -KA	254.1039	3.5750
8	CaO	4.60	mass%	0.0015	Ca-KA	209.1565	3.7363
9	TiO2	0.722	mass%	0.0043	Ti-KA	4.9559	0.5868
10	Cr2O3	0.0082	mass%	0.0023	Cr-KA	0.1561	0.0067
11	MnO	0.378	mass%	0.0150	Mn-KB1	2.2689	0.3069
12	Fe2O3	7.10	mass%	0.0024	Fe-KA	301.7760	5.7695
13	Co2O3	0.0066	mass%	0.0018	Co-KA	0.3789	0.0053
14	NiO	0.0026	mass%	0.0009	Ni-KA	0.2193	0.0022
15	CuO	0.0217	mass%	0.0009	Cu-KA	2.0311	0.0176
16	ZnO	0.162	mass%	0.0008	Zn-KA	20.0535	0.1317
17	Ga2O3	0.0038	mass%	0.0009	Ga-KA	0.5022	0.0031
18	Rb2O	0.0187	mass%	0.0005	Rb-KA	8.1033	0.0152
19	SrO	0.0794	mass%	0.0005	Sr-KA	36.5076	0.0645
20	Y2O3	0.0077	mass%	0.0026	Y -KB1	0.8571	0.0062
21	ZrO2	0.0242	mass%	0.0030	Zr-KB1	2.8145	0.0196
22	BaO	0.219	mass%	0.0122	Ba-LA	0.6859	0.1782
23	WO3	0.0272	mass%	0.0023	W -LA	1.1250	0.0221
24	PbO	0.0202	mass%	0.0016	Pb-LA	1.8984	0.0164

2004- 7-29 14:39

SQX Calculation Result

Sample : 07-2278
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-29 14:01
Balance :
Matching library:
File : 07-2278

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	1.35	mass%	0.0073	Na-KA	4.1535	1.0875
2	MgO	2.76	mass%	0.0063	Mg-KA	20.2931	2.2214
3	Al2O3	20.4	mass%	0.0061	Al-KA	440.8156	16.3870
4	SiO2	57.7	mass%	0.0068	Si-KA	873.5559	46.3606
5	P2O5	0.217	mass%	0.0011	P -KA	6.1921	0.1743
6	SO3	1.05	mass%	0.0014	S -KA	24.7174	0.8426
7	Cl	0.0036	mass%	0.0016	Cl-KA	0.0422	0.0029
8	K2O	2.97	mass%	0.0018	K -KA	170.0078	2.3900
9	CaO	4.50	mass%	0.0015	Ca-KA	209.3361	3.6181
10	TiO2	0.725	mass%	0.0045	Ti-KA	5.0773	0.5828
11	V2O5	0.0744	mass%	0.0225	V -KB1	0.1537	0.0598
12	MnO	0.582	mass%	0.0020	Mn-KA	18.1885	0.4673
13	Fe2O3	7.04	mass%	0.0024	Fe-KA	305.7424	5.6547
14	NiO	0.0042	mass%	0.0010	Ni-KA	0.3009	0.0033
15	CuO	0.0542	mass%	0.0010	Cu-KA	5.1404	0.0435
16	ZnO	0.289	mass%	0.0008	Zn-KA	36.0956	0.2320
17	Ga2O3	0.0030	mass%	0.0009	Ga-KA	0.3938	0.0024
18	Rb2O	0.0119	mass%	0.0005	Rb-KA	5.2042	0.0096
19	SrO	0.0681	mass%	0.0005	Sr-KA	31.4512	0.0548
20	Y2O3	0.0072	mass%	0.0027	Y -KB1	0.8062	0.0058
21	ZrO2	0.0238	mass%	0.0031	Zr-KB1	2.7803	0.0191
22	BaO	0.121	mass%	0.0111	Ba-LA	0.3860	0.0972
23	WO3	0.0144	mass%	0.0027	W -LA	0.5430	0.0116
24	PbO	0.0271	mass%	0.0016	Pb-LA	2.5599	0.0218

2004- 7-29 15:27

SQX Calculation Result

Sample : 07-2279
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-29 14:49
Balance :
Matching library:
File : 07-2279

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.210	mass%	0.0058	Na-KA	0.7412	0.1697
2	MgO	1.87	mass%	0.0061	Mg-KA	13.5683	1.5109
3	Al2O3	20.3	mass%	0.0060	Al-KA	438.0648	16.3647
4	SiO2	57.7	mass%	0.0068	Si-KA	875.5046	46.5955
5	P2O5	0.277	mass%	0.0011	P -KA	7.9241	0.2235
6	SO3	0.619	mass%	0.0015	S -KA	14.6351	0.5000
7	Cl	0.0032	mass%	0.0016	Cl-KA	0.0371	0.0026
8	K2O	3.91	mass%	0.0020	K -KA	223.4354	3.1566
9	CaO	3.11	mass%	0.0014	Ca-KA	142.5058	2.5113
10	TiO2	0.723	mass%	0.0042	Ti-KA	5.1497	0.5844
11	V2O5	0.0877	mass%	0.0219	V -KB1	0.1840	0.0709
12	MnO	0.723	mass%	0.0020	Mn-KA	22.4956	0.5837
13	Fe2O3	9.78	mass%	0.0027	Fe-KA	419.5771	7.9037
14	Co2O3	0.0053	mass%	0.0020	Co-KA	0.3035	0.0043
15	CuO	0.0910	mass%	0.0010	Cu-KA	7.9316	0.0735
16	ZnO	0.196	mass%	0.0009	Zn-KA	22.5435	0.1586
17	Ga2O3	0.0053	mass%	0.0010	Ga-KA	0.6376	0.0043
18	Rb2O	0.0187	mass%	0.0005	Rb-KA	7.3520	0.0151
19	SrO	0.0420	mass%	0.0005	Sr-KA	17.5056	0.0339
20	Y2O3	0.0096	mass%	0.0028	Y -KB1	0.9702	0.0078
21	ZrO2	0.0276	mass%	0.0033	Zr-KB1	2.8905	0.0223
22	BaO	0.146	mass%	0.0106	Ba-LA	0.4731	0.1178
23	WO3	0.0239	mass%	0.0028	W -LA	0.8256	0.0193
24	PbO	0.182	mass%	0.0017	Pb-LA	15.6924	0.1468

2004- 7-29 16:05

SQX Calculation Result

Sample : 07-2280
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-29 15:27
Balance :
Matching library:
File : 07-2280

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	Na2O	0.437	mass%	0.0061	Na-KA	1.5452	0.3529
2	MgO	2.83	mass%	0.0061	Mg-KA	20.8258	2.2792
3	Al2O3	17.6	mass%	0.0057	Al-KA	382.5755	14.1977
4	SiO2	59.4	mass%	0.0067	Si-KA	927.7058	47.9553
5	P2O5	0.261	mass%	0.0011	P -KA	7.5329	0.2109
6	SO3	0.215	mass%	0.0013	S -KA	5.1150	0.1733
7	Cl	0.0038	mass%	0.0015	Cl-KA	0.0452	0.0031
8	K2O	3.99	mass%	0.0020	K -KA	229.6130	3.2170
9	CaO	5.81	mass%	0.0017	Ca-KA	264.5094	4.6873
10	TiO2	0.755	mass%	0.0045	Ti-KA	5.0671	0.6094
11	Cr2O3	0.0092	mass%	0.0024	Cr-KA	0.1714	0.0074
12	MnO	0.545	mass%	0.0154	Mn-KB1	3.1926	0.4394
13	Fe2O3	7.47	mass%	0.0025	Fe-KA	309.8153	6.0273
14	Co2O3	0.0057	mass%	0.0019	Co-KA	0.3182	0.0046
15	NiO	0.0035	mass%	0.0011	Ni-KA	0.2409	0.0028
16	CuO	0.0235	mass%	0.0010	Cu-KA	2.1243	0.0190
17	ZnO	0.261	mass%	0.0009	Zn-KA	31.1409	0.2109
18	Ga2O3	0.0039	mass%	0.0010	Ga-KA	0.4895	0.0031
19	Rb2O	0.0161	mass%	0.0005	Rb-KA	6.6615	0.0130
20	SrO	0.0846	mass%	0.0005	Sr-KA	37.1753	0.0682
21	Y2O3	0.0081	mass%	0.0027	Y -KB1	0.8661	0.0065
22	ZrO2	0.0214	mass%	0.0031	Zr-KB1	2.3775	0.0173
23	BaO	0.146	mass%	0.0121	Ba-LA	0.4453	0.1175
24	WO3	0.0299	mass%	0.0024	W -LA	1.1892	0.0242
25	PbO	0.0345	mass%	0.0016	Pb-LA	3.1149	0.0279

2004- 7-29 18:01

SQX Calculation Result

Sample : 07-2280B
Application : EZS001XNV Model : Bulk

Date analyzed : 2004- 7-29 17:23
Balance :
Matching library:
File : 07-2280B

No.	Component	Result	Unit	Det.limit	El.line	Intensity	w/o normal
1	F	0.0615	mass%	0.0288	F -KA	0.0181	0.0499
2	Na2O	0.464	mass%	0.0062	Na-KA	1.6270	0.3766
3	MgO	2.82	mass%	0.0061	Mg-KA	20.9207	2.2904
4	Al2O3	17.5	mass%	0.0057	Al-KA	381.7161	14.1690
5	SiO2	59.5	mass%	0.0068	Si-KA	934.9188	48.2825
6	P2O5	0.259	mass%	0.0011	P -KA	7.4950	0.2098
7	SO3	0.216	mass%	0.0012	S -KA	5.1617	0.1749
8	K2O	3.97	mass%	0.0020	K -KA	229.8565	3.2195
9	CaO	5.82	mass%	0.0017	Ca-KA	266.2705	4.7157
10	TiO2	0.730	mass%	0.0047	Ti-KA	4.9214	0.5916
11	Cr2O3	0.0077	mass%	0.0024	Cr-KA	0.1436	0.0062
12	MnO	0.554	mass%	0.0156	Mn-KB1	3.2661	0.4491
13	Fe2O3	7.45	mass%	0.0026	Fe-KA	310.6915	6.0384
14	Co2O3	0.0092	mass%	0.0018	Co-KA	0.5180	0.0074
15	NiO	0.0033	mass%	0.0011	Ni-KA	0.2317	0.0027
16	CuO	0.0243	mass%	0.0010	Cu-KA	2.2066	0.0197
17	ZnO	0.258	mass%	0.0009	Zn-KA	30.9469	0.2093
18	Ga2O3	0.0028	mass%	0.0009	Ga-KA	0.3532	0.0023
19	Rb2O	0.0154	mass%	0.0005	Rb-KA	6.4500	0.0125
20	SrO	0.0843	mass%	0.0005	Sr-KA	37.3024	0.0684
21	ZrO2	0.0219	mass%	0.0031	Zr-KB1	2.4526	0.0178
22	Nb2O5	0.0019	mass%	0.0006	Nb-KA	0.9810	0.0015
23	BaO	0.148	mass%	0.0116	Ba-LA	0.4552	0.1201
24	WO3	0.0305	mass%	0.0025	W -LA	1.2003	0.0247
25	PbO	0.0338	mass%	0.0016	Pb-LA	3.0630	0.0274

APPENDIX B

DAILY WORK LOGS
ST. CLOUD MINING COMPANY

ST. CLOUD MINING COMPANY

Reclamation Operations Invoice

December 10 - 12, 2008

To: Freeport-McMoran Copper & Gold
210 Cortez Ave, Hurley, NM 88043
July 2008 **Project: OSCEOLLA ADIT**

USING GROUNDHOG P.O.

INVOICE NO.: One (1)
Service Agreement: CV 49959
PO #: OG027M

EQUIPMENT				PERSONNEL				
Equipment	Equipment Hours	Groundhog Rates	Equipment Subtotal	Name	Position	Personnel Hours	Groundhog Rates	Personnel Subtotal
Tractr/Trailer Truck	8.0	$125.00	$1,000.00	Sam Hayhurst	Foreman	12.50	$98.90	$1,236.25
Water Truck	0.0	$58.75	$0.00	Allison, Ray	Operator	14.00	$40.75	$570.50
Backhoe	0.0	$73.65	$0.00	Williams, David	Labor	7.00	$36.75	$257.25
Excavator	14.0	$94.85	$1,327.90	Foust, Ron	Truck Driver	8.00	$40.75	$326.00
Pick-up Trucks	16.0	$35.50	$568.00					
				Leake, Tracy	Superintendent	5.0	$98.90	$494.50
				Martinez, Tonie	Administrator	2.00	$46.75	$93.50
TOTALS	**38.0**		**$2,895.90**			**48.5**		**$2,978.00**

Subtotal Equipment + Personnel:	**$5,873.90**
FMI 10% Discount:	**$587.39**
Sub-Total:	**$5,286.51**
Gross Receipts Tax (Grant Co.) 6.0625%:	$320.49
Total:	**$5,607.00**

12/22/2008
DATE

St. Cloud Mining

ST. CLOUD MINING COMPANY

Reclamation Daily Operations Report
EQUIPMENT REPORT
PRINCESS * BULLFROG * SLATE

DATE: 12/10/2008

Equipment	Work Description (Be Detailed on Area)	Chino	Bullfrog	Slate	Hanover	HEZ	Ponds	[illegible]	Groundhog	Unbillable
D5 DOZER (490)	Level and rip Upper Hanover Creek area.				3					
D7 DOZER (534)	Push dump mat'L			10						
980G LOADER (535)	Load dump mat'L			10						
950H LOADER (RENTAL)										
320 EXCAVATOR	Excavate mine shaft @ Chino.	10								
725C HAUL TRUCK (556)										
MACK 531 (10 Wheeler)										
MACK 529 (10 Wheeler)	Haul dump mat'L			10			13.0			
WESTERN STAR-SEMI 517										
PETERBUILT-SEMI 317										
ATER TRUCK (2000g) 512	Haul water. Spray haul road.			10						
CONTRACTOR 10-WHEEL 1	Haul dump mat'L			10			12.0			
CONTRACTOR 10-WHEEL 2	Haul dump mat'L			10			12.0			
CONTRACTOR 10-WHEEL 3	Haul dump mat'L			10			11.0			
CONTRACTOR 10-WHEEL 4	Haul dump mat'L			10			11.0			
SERVICE TRUCK (REC565)	Fuel and grease equipment.			2						
SC511 Van	Crew transport.			2						
SC493 TRUCK (Power Stk)										
SC503 TRUCK	Supervisor transport.	7		2	1					
SC561 TRUCK										
SEEDER/PLANTER (SC326)										
Straw Mulch Blower (REC567)										
DISK TANDOM (SC328)										
		17.0	0.0	86.0	3.0	0.0	59.0	0.0	0.0	0.0

ST. CLOUD MINING COMPANY

Reclamation Daily Operations Report
PERSONNEL REPORT

Date: 12/10/2008

Name	Position	Work Description (Be Detailed on Area)	Princess	Bullfrog	Slate	Hanover	HKZ	Chino	[illegible]	Groundhog	Unbillable
Oldfield, Cody	Supervisor										
Hayhurst, Sam	Supervisor	Oversee Slate ops. Supervise shaft excavation.			2			8.5			
Bustamante Gabe	Oper/Labor										
Hardin, Clyde	Sr. Operator										
Reyes, Jose	Truck Driver	Haul dump mat'l. Haul water. Spray haul road.			10						
Ruebush, Randy	Oper/Driver	Push dump mat'l.			10						
Williams, David	Truck Driver	Labor @ Slate and Chino. Sweep highway.			3			7.0			
Catheart, Ernest	Operator										
Foust, Ron	Truck Driver										
Allison, Ray	Reclamation	Excavate collapsed shaft @ Chino.						10.0			
Hernandez, Omar	Reclamation	Load dump mat'l.			10						
Romero, Felix	Reclamation	Excavate dump mat'l.			10						
Lucero, Lonnie	Operator										
Montenegro, Robe	Reclamation										
Rodriguez, Frank	Reclamation										
Leake, Tracy	Supt. Recl										
Martinez, Tonie	Adm	T-Ordering material, calling vendors. Monthly Invoicing									
			0	0	45	0	0	25.5	0	0	0

ST. CLOUD MINING COMPANY

Reclamation Daily Operations Report

EQUIPMENT REPORT

PRINCESS * BULLFROG * SLATE

DATE: 12/12/2008

Equipment	Work Description (Be Detailed on Area)	Chino	Bullfrog	Slate	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Unbillable
D5 DOZER (490)										
D7 DOZER (534)	Push dump mat'l			10						
980G LOADER (535)	Load dump mat'l.			10						
950H LOADER (RENTAL)										
320 EXCAVATOR	Backfill shaft @ Chino.	4 c								
330 EXCAVATOR	Excavate dump mat'l.			10						
MACK 531 (10 Wheeler)										
MACK 529 (10 Wheeler)	Haul dump mat'l. Mobe D-5			10			11.0			
WESTERN STAR-SEMI 517										
FOWLER DUMP TRUCK	Haul dump mat'l.			10			13.0			
[illegible]TER TRUCK (2000g) 512	Spray haul road.			10						
CONTRACTOR 10-WHEEL 1	Haul dump mat'l.			10			12.0			
CONTRACTOR 10-WHEEL 2	Haul dump mat'l.			10			12.0			
CONTRACTOR 10-WHEEL 3	Haul dump mat'l.			10			12.0			
CONTRACTOR 10-WHEEL 4	Haul dumpp mat'l.			10			11.0			
SERVICE TRUCK (REC565)	Grease and fuel equipment.			2						
SC 511 VAN	Crew transport.			2						
SC493 TRUCK (Power Stk)	Crew transport.			2						
SC503 TRUCK	Supervisor transport.	4 c		~~10~~ 8						
[illegible]	[illegible]			6						

ST. CLOUD MINING COMPANY

Reclamation Daily Operations Report
PERSONNEL REPORT

Osceola Adit

Date: 12/12/2008

Name	Position	Work Description (Be Detailed on Area)	Princess	Bullfrog	Slate	Hanover	HLZ	[illegible]			Unbillable
Oldfield, Cody	Supervisor	Supervise Slate ops.			6			[illegible]			
Hayhurst, Sam	Supervisor	Assist in supervisin Slate ops.			2			4			
Bustamante Gabe	Oper/Labor	Haul tires.			6						
Hardin, Clyde	Sr. Operator										
Reyes, Jose	Truck Driver	Haul dump mat'l. Haul water. Spray haul road.			10.5						
Ruebush, Randy	Oper/Driver	off									
Williams, David	Truck Driver	Labor. Haul tires. Mobe D-5.			10.5						
Cathcart, Ernest	Operator										
Foust, Ron	Truck Driver										
Romero, Felix	Reclamation	Excavate dump mat'l. Load dump mat'l.			10						
Hernandez, Omar	Reclamation	Load dump mat'l.			6						
Allison, Ray	Reclamation	Push dump mat'l.			6			4			
Lucero, Lonnie	Operator										
Montenegro, Robe	Reclamation										
Rodriguez, Franki	Reclamation										
Leake, Tracy	Supt. Recl										
Martinez, Tonie	Adm	T-Ordering material, calling vendors, Monthly Invoicing									
			0	0	65	0	0	0	0	0	0

Ron morning 32 $125 hr