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The Department of Communications, Energy and Natural Resources

Feasibility Study for Management and Remediation of the Avoca Mining Site - Volume 1

December 2008

Investigative Reports:

- Data Report
- Conceptual Site Model
- Human Health Risk Assessment
- Ecological Risk Assessment

Report

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Feasibility Study for Management and Remediation of the Avoca Mining Site - Volume 1

December 2008

Report

Investigative Reports

Introduction

The Minister for Communications, Energy and Natural Resources has contracted with Camp Dresser & McKee (Ireland) Limited (CDM) to conduct a feasibility study for the management and remediation of the Avoca Mining Area. During the conduct of the feasibility study, CDM also performed various site investigations. This document provides the collected data and subsequent evaluations resulting from the site investigations. This Investigative Reports document contains four separate reports in two volumes:

- Site Investigations Data Report (in volume 1) – this report provides the procedures used in the field and the data resulting from the sample collection and site investigations
- Conceptual Site Model Report (in volume 2) – this report is an evaluation of the geochemical and hydrological processes occurring at the Site
- Human Health Risk Assessment (in volume 2) – this report is an evaluation of human health risks associated with exposure to mine related contaminants at the Site
- Ecological Risk Assessment (in volume 2) – this report is an evaluation of any adverse effects to ecological receptors associated with the mine related contaminants at the Site

These reports are Phase 2 reports that were completed using site-specific information collected during the field investigations. Preliminary Phase 1 reports were also prepared before the site investigations using existing data. The Phase 1 reports were part of the planning process to collect focused and appropriate site-specific data during the field investigations. The reports contained in this document use the information provided in the preliminary Phase 1 reports. The preliminary Phase 1 report for the Conceptual Site Model Report is provided in this Investigative Reports document as the last report (Phase 1 – CSM in volume 2). In addition, the Phase 2 Ecological Risk Assessment Report (volume 2) contains the Phase 1 preliminary report as an introduction. The Phase 1 Human Health Risk Assessment Report is summarized in the Phase 2 Report (volume 2).

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The Department of Communications, Energy and Natural Resources

Feasibility Study for Management and Remediation of the Avoca Mining Site

Site Investigations Data Report

October 2008

Data Report

Contents

Section 1 Introduction

Section 2 Surface Water Investigations

2.1 Avoca River 2-1
2.1.1 Flow Measurement 2-1
2.1.2 Water Quality Measurements 2-2
2.2 Bank Samples 2-3
2.3 Adits, Seeps, Discharges, Springs, and Pit Lakes 2-4
2.4 Tracer Test 2-5

Section 3 Sediment Investigations

3.1 Sample Collection 3-1

Section 4 Groundwater Investigations

4.1 Wells 4-1
4.1.1 Existing Wells 4-1
4.1.2 New Wells 4-2
4.2 Groundwater Data 4-3
4.3 Groundwater Gradients 4-4

Section 5 Spoils and Soils Investigations

5.1 Subsurface Spoils 5-1
5.2 Surface Spoils 5-3
5.3 Subsurface Spoils EMP Analysis 5-4
5.4 Surface Soils 5-4
5.5 XRF Analyses (GSI) 5-5

Section 6 Ecological Investigations

6.1 Plant Bioaccumulation 6-1
6.2 Upper Trophic Predators (Bats) Evaluation 6-2
6.3 Land Use and Habitat Evaluation 6-2
6.4 Macroinvertebrate Evaluation 6-3

Section 7 Miscellaneous Investigations

7.1 Industrial Archaeology 7-1
7.2 Lidar Survey 7-2
7.3 Public Participation 7-4

Figures

1-1 Study Area Map
2-1 Transect Locations
2-2a Sampling Locations in Upper Avoca
2-2b Sampling Locations through Mining Area
2-2c Sampling Locations near Shelton Abbey
2-2d Sampling Locations near Arklow Town
2-3a GSI Sampling Locations – Along Mining Area
2-3b GSI Sampling Locations – Near Avoca Village
2-3c GSI River Sampling Locations – Shelton Abbey
2-4a River Bank Samples (Upper Section of Mining Area)
2-4b River Bank Samples (Lower Section of Mining Area)
2-4c River Bank Samples (Avoca Village)
2-4d River Bank Samples (Shelton Abbey)
2-5a Adits, Seeps etc – East Avoca Area
2-5b Adits, Seeps etc – River and West Avoca Area
2-6a GSI Adit and Discharge Sample Locations near Mt Platt
2-6b GSI Adit and Discharge Sample Locations near River
2-6c GSI Adit and Discharge Sample Locations – Shelton Abbey
3-1a CDM Sediment Sampling Locations – Mining Area
3-1b CDM Sediment Sampling Locations – Shelton Abbey
3-2a GSI Sediment Locations through Mining Area
3-2b GSI Sediment Locations near Shelton Abbey
4-1a Homeowner Well Locations
4-1b New Monitoring Wells and Co. Wicklow Well Locations
4-1c Shelton Abbey Monitoring Well Location
5-1a Location of Borings and Test Pits (Connary)
5-1b Location of Borings and Test Pits (Cronebane/Mt. Platt)
5-1c Location of Borings and Test Pits (East Avoca/Tigroney)
5-1d Location of Borings and Test Pits (Avoca West)
5-1e Location of Borings and Test Pits (Shelton Abbey)
5-2a Location of Surface Spoils – Connary
5-2b Location of Surface Spoils – Cronebane/Mt. Platt
5-2c Location of Surface Spoils – East Avoca/Tigroney
5-2d Location of Surface Spoils – Avoca West
5-3a Location of Surface Soils (South of Cronebane)
5-3b Location of Surface Soils (Paddy's Field)
5-3c Location of Surface Soils (North of Cronebane)
5-3d Location of Surface Soils (West Avoca)

5-4a GSI XRF Locations at Cronebane/Mt. Platt
5-4b GSI XRF Locations at East Avoca/Tigroney
5-4c GSI XRF Locations at East Avoca near Whitesbridge
5-4d GSI XRF Locations near Emergency Tailings
5-4e GSI XRF Locations at West Avoca
5-4f GSI XRF Locations at Shelton Abbey
6-1 Locations of Vegetation Samples

Tables

2-1a Measured Flows: Avoca River and Tributaries
2-1b Avoca River Gage Elevations
2-2 Analytical Data: Avoca River and Tributaries
2-3 GSI Analytical Data: Avoca River and Tributaries
2-4 Analytical Data: Avoca River Bank Samples
2-5 Measured Flows: Adits
2-6a Analytical Data: Adits, Seeps, and Pit Lakes
2-6b Field Parameters: Adits and Pit Lakes
2-7 Iron Speciation: Adits, Seeps, and Pit Lakes
2-8a GSI Flow Measurements: Adits and Seeps
2-8b GSI Analytical Data: Adits and Seeps
2-9 Measured Flows: Chloride Tracer Results
3-1 Analytical Data: Sediments
3-2 GSI Analytical Data: Sediments
4-1 Groundwater Wells: Completion Information
4-2a Metals Analytical Data: Groundwater Wells
4-2b General Water Quality Analytical Data: Groundwater Wells
4-3 Calculated Groundwater Gradients
5-1 Borehole Summary
5-2a Metals Analytical Data: Boreholes
5-2b Acid Base Accounting Analytical Data: Boreholes
5-2c Geotechnical Results: Boreholes
5-3 Test Pits Summary
5-4a Metals Data: Test Pits
5-4b Acid Base Accounting Data: Test Pits
5-4c Geotechnical Results: Test Pits
5-5a Metals Data: Surface Spoils
5-5b Acid Base Accounting Analytical Data: Surface Spoils
5-5c Metals in <250 Micron Fraction
5-5d Spoils: Bioavailable Arsenic and Lead

5-5e CDM XRF Results: Spoils - CDM Instrument
5-5f CDM XRF Results: Spoils - GSI Instrument
5-6 Metals Analytical Data: Surface Soils
5-7 GSI XRF Results
6-1 Metals Analytical Results: Vegetation
6-2 Avoca River Screening Level BMI Survey (April 3-5, 2007)
6-3 Avoca River Screening Level BMI Survey (April 3-5, 2007)
6-4 Avoca River Screening Level BMI Survey (April 3-5, 2007)
6-5 Avoca River Screening Level BMI Survey (April 3-5, 2007)

Appendices

A Flow Measurement Data
B County Wicklow Staff Gauge Measurements and Well Data Logger Graphs
C Borehole Logs and Completion Diagrams
D Geotechnical Data
E Test Pit Logs
F Report of the August 2007 Field Geotechnical Investigations
G Report on Sites of Industrial Archaeology Importance

Section 1
Introduction

The Avoca mining region, located in County Wicklow, Ireland (Site), was the focus of a Site investigation conducted from July 2007 through February 2008, with supplemental data collected at other times by Geological Survey of Ireland (GSI) and County Wicklow. For the investigation, the Site included the Avoca River and associated tributaries from upstream of the Meeting of the Waters to Arklow Bay, the mining regions located to the east and west of the river, and the Shelton Abbey Tailings Impoundment (see Figure 1-1). Mining activities were conducted in the region from the 1700s until the late 1900s. Contaminated media include surface water, river sediments, groundwater, surface soils, mining spoils, and tailings. This investigation was designed to provide data for the determination of the extent of contamination, the severity of contaminants, and to provide information to address data gaps at the Site. The presence of spoil heaps, tailings facilities, and adit drainages were well documented prior to investigation; however, their influence on surrounding surface waters, soils, sediments, and groundwater was not well described. The field investigations were designed to provide information regarding interactions of surface water and groundwater, impacts of spoils on surrounding surface soils, and influence of drainages on surface water features (i.e., mass balance and loading). Collection of these data provide required information for development of remedial options to be implemented at the Site and allows the development of an assessment of risk to human health and the environment.

Methods of investigation included surface water flow measurements and sampling; sediment sampling; surface spoils and soils sampling; subsurface investigation of spoils, alluvial fill, and tailings by drilling; and groundwater sampling. Additionally, biological assessments were conducted using habitat assessments. Key areas of investigation for surface soils, spoils, and discharges included the Connary mining region, Cronebane Pit and Mt. Platt, East Avoca/Tigroney West region, West Avoca mining region including the North Lode Pit area, the emergency tailings facility, and the Shelton Abbey tailings impoundment. The Avoca River was investigated using a series of transect, bank, and sediment sampling locations. Results of the various investigations are provided in the following sections. Evaluations are provided in the attached separate reports (Conceptual Site Model, Human Health Risk Assessment, and Ecological Risk Assessment). This document includes the following sections:

- Section 1 – Introduction
- Section 2 – Surface Water Investigations
- Section 3 – Sediments Investigations
- Section 4 - Groundwater Investigations
- Section 5 – Spoils and Soils Investigations
- Section 6 – Ecological Investigations

Section 2
Surface Water Investigations

Surface water investigations were performed to achieve two main objectives: 1) to collect and analyze surface water samples for metals, and 2) to measure flows. The results of these investigations were used to complete the following:

- Perform mass loading calculations to evaluate amounts of diffuse metal contributions to the Avoca River
- Evaluate water quality compared to various ecological and human health criteria and standards
- Evaluate changes in concentrations during high and low flows
- Evaluate metal contributions from various point sources (adits, seeps, etc.)
- Evaluate various remedial treatment options

Each of these evaluations is presented in separate reports attached to this Data Report. Field characterization was conducted during anticipated lower flow (July/August 2007) and higher flow (February 2008) periods for the Avoca River. Selected samples were also collected during low flow from selected adits and groundwater monitoring wells (November). Additional data used for analysis and evaluation were provided by GSI for samples collected in November 2006 and June 2007.

2.1 Avoca River and Tributaries

2.1.1 Flow Measurement

Field investigation of the Avoca River and tributaries included flow measurements, measurement of field water quality parameters, and sample collection for laboratory analyses. Flow measurements along the Avoca River utilized an electromagnetic velocity meter and were obtained at the following six transects ("T" from upstream to downstream):

- Downstream of the Meetings of the Waters and upstream of Whitesbridge (T1)
- Downstream of the Deep Adit discharge point to Avoca River (T2)
- Across from the abandoned "coal yard" (T5)
- Downstream of the abandoned coal yard (T3)
- Downstream of Avoca Bridge (T4)

The locations of these transects are shown on Figure 2-1. Two transects (T1 and T5) were relocated and additional flow data (tracer test) were collected for use in flow calculations (see Section 2.4). Approximately 15 flow measurements (consisting of depth and velocity data) were collected at each transect at equally-spaced intervals.

Flow measurement results are presented in Table 2-1a, and field data are included in Appendix A.

Flow measurements were also collected at the following tributaries: Vale View, Sulphur Brook, Unknown Tributary, and Red Road Stream. Flow measurements were collected using either the electromagnetic flow meter or flume, and are presented in Table 2-1a. These locations are shown in Figures 2-2a and 2-2b.

To provide additional data for flow, the staff gauge at the upstream end of the County Wicklow Yard was monitored by CDM and County Wicklow personnel. The staff gauge consisted of a steel measuring plate fastened to a cement block (remaining from the tailings pipeline) with meters, tenths of meters, and millimeters indicated to identify the height of the water column from the river bed. Water level measurements from the County Wicklow gauge are included in Table 2-1b and Appendix B. A request has been submitted to County Wicklow and Environmental Protection Agency (EPA) to install a permanent staff gauge to monitor future flow in the Avoca River.

2.1.2 Water Quality Measurements

Numerous samples were collected of surface waters from the Avoca River and tributaries to the Avoca River. The sample locations are provided in the following figures.

- Figure 2-2a: Sampling Locations in Upper Avoca
- Figure 2-2b: Sampling Locations through Mining Area
- Figure 2-2c: Sampling Locations near Shelton Abbey
- Figure 2-2d: Sampling Locations near Arklow Town

Field water quality parameters were measured at transects, tributaries, and at locations upstream and downstream of the Aughrim River outlet, downstream of the fertilizer plant, downstream of the landfill below the fertilizer plant, Arklow Bridge, and downstream of the Arklow wastewater discharge (both banks). Field analysis of water quality included monitoring for the field parameters pH, specific conductance, temperature, dissolved oxygen, and oxidation-reduction potential (ORP or Eh) utilizing a multiparameter water quality instrument.

Flow weighted, composited samples and/or discrete grab samples for laboratory analyses were collected across the Avoca River within the primary field investigation areas at the following locations:

- Transects 1 through 5
- Upstream of Shelton Abbey tailings impoundment
- Downstream of Shelton Abbey tailings impoundment

A flow weighted composite sample was composed of multiple samples collected across the river and composited by the relative amount of flow at each location. A composite

sample was collected at T2 for comparison to the grab sample at T2. Grab samples were collected at all other locations in a high flow and well mixed location in the river. All samples were analyzed for field parameters, a full suite of dissolved and total metals (using ICP-MS), nutrients (soluble reactive phosphate [orthophosphate]), total phosphorus, total organic carbon, total Kjeldahl nitrogen, total organic nitrogen, ammonia, nitrite, nitrate, anions (sulfate, alkalinity, and chloride), and general parameters (acidity, total dissolved solids, and total suspended solids). Results of the analyses are presented in Table 2-2. Samples for dissolved analyses were filtered through a 0.45 micron membrane filter in the field.

Additional samples for the full suite of parameters including total and dissolved metals, nutrients, and anions were also collected at the following locations:

- Upstream and downstream of the Aughrim River outlet
- Ballinacleish Bridge (upstream of Meetings of the Waters)
- Lion's Bridge (upstream of Meetings of the Waters)
- Arklow Bridge
- Downstream of the fertilizer plant
- Downstream of the landfill below the fertilizer plant
- Left and right banks in Arklow
- Vale View Stream
- Sulphur Brook
- Unknown Tributary
- Red Road Stream

Laboratory results are provided in Table 2-2. In all, approximately 24 samples were collected from 21 locations on the Avoca River and tributaries and sent to the analytical laboratories for chemical analyses. Samples were collected at T5 and Red Road multiple times. The GSI provided additional surface water data from samples collected in November 2006 and June 2007. Locations of GSI samples are indicated on Figures 2-3a (upper Avoca mining region), 2-3b (Avoca River from Whitesbridge to Avoca Bridge), and 2-3c (Shelton Abbey area). GSI analytical laboratory results are provided in Table 2-3.

2.2 Bank Samples

Additional sampling locations on the Avoca River included bank sampling locations where field parameters and grab samples were collected. The bank samples were collected to provide supplemental data to the data from the transects, and to identify areas of the river that are likely receiving diffuse flows from groundwater seeps. In addition to field parameters, selected samples were also analyzed for metals. Measurements of field parameters along the banks were taken at routine intervals where access was available, as well as at locations where the river was noticeably impacted by discharges. Field measurement data for the bank samples are included in Table 2-4. A total of 21 bank locations were identified for measurement of field parameters in the upper mining area (across from Paddy Hogan's field to just

downstream of the emergency tailings pond). Locations are provided in Figures 2-4a and 2-4b. Three additional bank locations were measured between Transects 3 and 4, upstream of the village of Avoca (Figure 2-4c). Ten bank locations were measured along the Shelton Abbey tailings impoundment (Figure 2-4d). Locations of bank measurements were modified based on the actual, real-time field results of pH/conductivity and field observations. For example, if no change was observed in the field parameters at subsequent locations and there were no observable discharges to the river, the distance between measurement stations was increased. Sampling locations were also limited by access.

Based on the results of the field parameters, grab samples were collected and analyzed for dissolved metals at 24 of the bank monitoring locations. Results are presented in Table 2-4.

2.3 Adits, Seeps, Discharges, Springs, and Pit Lakes

Field investigation of the adits, seeps, discharges, springs, and pit lakes in the vicinity of the Avoca River included flow measurements, field water quality parameter measurements, and sample collection. Locations that were investigated are identified in Figures 2-5a (East Avoca Area) and 2-5b (West Avoca Area), and listed in Tables 2-5 (flow data), 2-6a (laboratory results), and 2-6b (field parameters). Point sources of contamination to the Avoca River include the Deep and Road Adits, which contributed approximately 35 L/sec combined discharge to the Avoca River according to measurements collected during the July/August 2007 field program. Additional adits identified in the Avoca mining region that were investigated include the following:

- Kilmacoo Adit
- Madam Butler's Adit
- Intermediate Adit
- Cronebane Shallow Adit
- Cronebane Intermediate Adit
- Ballygahan Adit
- Spa Adit

Flow and field parameters were measured and samples collected for the full suite of parameters (see Tables 2-5, 2-6a, and 2-6b) at each of these locations.

Other discharges that were located during field activities (seeps and springs) were also measured and sampled (see locations on Figures 2.5a and 2.5b). These included seeps emanating from spoil heaps and pit walls. If possible, flow measurements were collected using flumes or buckets. Seeps and springs that were identified and sampled include the following:

- Drew's Discharge
- Cronebane Seeps
- Radio Tower Spring

- Paddy's Spring
- Valve Box Seep
- Mt. Platt Seep East
- Mt. Platt Seep West
- Mulcahy Ditch

Pit lakes that were investigated included the Cronebane Pit Lake, East Avoca Pit Lake, and the Shelton Abbey Base Pond.

Field water quality parameters were measured at each discharge location and pit lakes. Samples for the full suite of chemical analyses including metals, nutrients, and anions were collected at each identified location. Results of flow measurements at discharges, field parameters, and laboratory analyses are included in Tables 2-5 (flow), 2-6a (laboratory results), and 2-6b (field parameters).

Iron speciation of water from adits and seeps was performed using a field portable spectrophotometer at selected locations. Specifically, a HACH portable colorimeter (Model DR/890) was used to measure concentrations of ferrous and ferric iron. Iron speciation (Fe^{+3}/Fe^{+2}) is a more accurate and direct measure of the oxidation-reduction potential (ORP) in comparison to a redox probe on the field instrument. Locations and results where iron speciation was performed are included in Table 2-7. As shown in most cases, the iron in solution is all ferrous (Fe^{2+}) iron.

The GSI provided supplemental flow and metals data for November 2006 and June 2007. The data are provided in Tables 2-8a and 2-8b. Locations of the GSI samples are identified in Figures 2-6a, 2-6b, and 2-6c.

2.4 Tracer Test

A tracer study was conducted in the Avoca River for the purpose of providing information to more accurately determine flow volumes in the Avoca River. The tracer study was designed to provide an assessment of significant flow gains and losses along the study reach (dilution due to tributaries and diffuse flow). This information could then be used to determine the mass balance of metals in the Avoca mining region and provide insight into studies of solute fate and transport within the system.

For the study, an approximately 2 km river segment was selected for monitoring; the segment included the area from upstream of Whitesbridge to downgradient below the adit confluences (from T1 to T3, see Figure 2-1). The slug addition site was a region of the river where flow was turbulent due to a narrow channel (to facilitate rapid mixing). Salt (sodium chloride) was added to the river in solution at an approximate concentration of 1 kg/1 gal at the slug site. A total of approximately 60 kg salt was added during the first addition, and approximately 100 kg was added during the second addition. The location of the first addition is shown on Figure 2-1 as "Tracer Test 1 Dump Site." The location of the second addition is shown as "Tracer Test 2 Dump Site." Flow measurement and continuous monitoring of electroconductivity was

performed downgradient at Transects 1, 2, 3, and 5 (4 was downgradient of 5). The test was conducted twice, on two separate days. Transects 1 and 5, as well as the slug addition location, were relocated on the second day to provide a larger distance between locations of the slug input and the monitoring points. This was done to encourage better mixing and distribution of the salt prior to its reaching the transects. The locations used during the second test are shown in Figure 2-1 and are labelled Transect 1A, Transect 5A, and Tracer Test 2 Dump Site.

Results from transect flow measurements are provided in Table 2-1a, while results from the tracer test are provided in Table 2-9. In general, there was good overall agreement between flows measured at the transects and the results of the tracer test in relation to magnitude and relative spatial changes. Between Transects 1 and 2, the river appears to increase in magnitude, likely due to inputs from Vale View Stream and adit discharges. However, between Transects 2 and 3, the river appears to decrease in magnitude, likely due to seepage to the subsurface. Between Transects 3 and 4, the river displays little net change. This indicates that the river is likely losing volume to the subsurface, as the amount of inflows (Red Road Stream, Unknown Tributary, and Sulphur Brook) should cause an increase in magnitude. Overall, the Avoca River appears to lose water in its course through the upper mining region. These results are discussed in detail in the attached Conceptual Site Model Report.

Section 3
Sediment Investigations

Sediment collection and metals analysis were performed for sediments within the Avoca River. The results of these investigations were used to complete the following:

- Evaluate stream sediment quality compared to various ecological and human health criteria
- Evaluate the potential for dissolution of metals to surface water
- Evaluate the impact on metals concentrations in sediments from various point and diffuse sources
- Evaluate various remedial treatment options

Each of these evaluations have been prepared and submitted as separate reports (attached). This Data Report provides the locations, methods, and results of the sediment sampling activities. Field collection of sediment samples was conducted subsequent to collection of surface water samples described in Section 2.

3.1 Sample Collection

Sediment samples were collected at the following locations:

- Transects 1- 4
- Deep Adit Confluence with Avoca River
- Road Adit Confluence with Avoca River
- Aughrim River at Golf Course
- Shelton Abbey tailings impoundment (four samples total)

Locations of sediment sample collection are shown in Figures 3-1a (Mining Area) and 3-1b (Shelton Abbey). Generally, sediments were collected on the downstream side of a sampling location to avoid disturbing the sample site and potentially corrupting the sample. After sample collection, the sediments were sieved to remove the larger fractions. Three Hubbard plastic sieves or equivalent with U.S. mesh sizes of 5, 10, and 35 were used to sort the sediment into fractions. The sieves were shaken aggressively, and sediment clumps were worked through the sieves by hand (wearing nitrile gloves). The sediment that passed through the number 35 sieve (less than approximately 2 mm) was sent to the laboratory for total metals analysis, while the other sediment fractions were discarded. Sediment samples were analyzed for total metals only. The metals were analyzed after the sediments were digested using nitric acid/hydrogen peroxide. Laboratory results of sediment analyses are included in Table 3-1.

The GSI provided supplemental sediment data; locations of sediment collection are shown in Figures 3-2a and 3-2b, and results are provided in Table 3-2.

Section 4
Groundwater Investigations

Groundwater investigations were performed for the following purposes:

- Describe subsurface materials.
- Determine groundwater gradients and flow directions.
- Collect and analyze groundwater samples to determine groundwater chemistry and potential contribution to the Avoca River.

The results of these investigations were used to complete the following evaluations:

- Refine the conceptual hydrogeological model of the Avoca mine site
- Evaluate groundwater quality compared to various ecological and human health criteria and standards
- Evaluate the potential metal mass loadings contributed by groundwater
- Determine hydraulic interactions between the alluvial aquifer and the Avoca River
- Determine possible sources of groundwater contamination
- Determine appropriate water collection and treatment alternatives and predict metal concentrations in the Avoca River for various remedial alternatives

These evaluations are submitted with the attached Conceptual Site Model Report. Groundwater investigations were completed using private wells as allowed by owners, and existing and new monitoring wells.

4.1 Wells

The groundwater investigation included field water quality measurements, water level measurements, and sample collection for analyses of general water quality parameters and metals. The investigation targeted gaps in the understanding of groundwater hydraulics along the Avoca River and potential diffuse groundwater discharges to the river.

4.1.1 Existing Wells

Existing private wells were used for groundwater monitoring activities as much as possible. Figure 4-1a shows the locations of private wells that were sampled with permission from the owner. The Holy Well is actually a pipe with flowing water. Cosgrove's well is spring-fed and was sampled from a tap. Homeowner wells were selected that would mostly likely be contaminated as a result of mining activities (i.e., those downgradient of Mt. Platt/ Cronebane pit, East Avoca pit, East Avoca, and West

Tigroney areas). On the west side of the river, select existing wells associated with the Ballymurtagh landfill were also integrated into site monitoring activities. General information concerning wells (depth, use, depth to water, etc.) is included in Table 4-1. The full suite of chemical parameters was analyzed for each well sampled and results are provided in Tables 4-2a and 4-2b.

4.1.2 New Wells

Six new alluvial wells along the Avoca River were constructed at four locations:

- Two wells on the east side of the Avoca River near the Deep Adit, screened to different depths
- One well on Paddy Hogan's field north of the Deep Adit
- Two wells in the emergency tailings pond, screened to different depths
- One well at the base of the Shelton Abbey tailings

Drilling was conducted using a shell auger or rotary rig. "Undisturbed" samples were collected with the shell auger or split spoon samplers. Wells were completed with 50 or 100 mm PVC riser and screen materials, with a screened interval of approximately 3 m and a 0.5 mm slot size (and appropriate filter pack). After completion, the wells were developed by airlifting prior to groundwater sampling. Well completion information is included in Table 4-1, and locations of the new wells are included in Figure 4-1b. The monitoring wells were installed in boreholes used for investigation of subsurface soils, spoils, and tailings, as described in Section 5. All drilling logs and completion diagrams are provided in Appendix C.

The alluvial monitoring wells were installed to test the physical characteristics and groundwater quality beneath suspected diffuse source areas (Deep Adit spoil, Emergency Tailings, and Shelton Abbey Tailings) and to monitor the hydraulic influence of the Avoca River on the potential source areas.

The results of the surface flow sampling and loading analysis indicated specific locations where polluted diffuse flow was entering the Avoca River and therefore, where alluvial wells should be located. Nested wells were installed at the Emergency Tailings impoundment and on the East bank south of the Deep Adit. The nested wells consist of one well screened in the shallow overburden (to approximately 7 to 12 meters below ground level) and one well screened at the base of the alluvial aquifer (to approximately 20 to 25 meters below ground level). The deep wells were initially targeted to be constructed to monitor the top of bedrock, but following review of subsurface samples collected during drilling, it was found that the shallow and deep subsoil samples were visually very different, the shallow samples being of a distinctly brown/orange coloration, and the deep samples being distinctly grey. Initial screening of field parameters suggested the pH and conductivity of shallow and deep samples

would be different, hinting at a potentially significant change in hydrochemical characteristics with depth. At both of the nested well locations, subsoil samples suggested the presence of fine silt/clay layers or lenses between the shallow and deep alluvium.

While drilling proceeded to within the first few meters of bedrock (to verify depth to bedrock and top of bedrock characteristics), the decision was made to set the deep well screens to the base of the alluvium rather than in bedrock. The shallow alluvial wells therefore represent groundwater flow at the water table while the deeper wells represent groundwater flow at the base of the alluvial aquifer.

One well in the upper mining region was installed in Paddy Hogan's field north of the Deep Adit to monitor shallow groundwater quality at the margin of the alluvial aquifer between the East Avoca/Tigroney mining region and the river. Any contaminants discharging from the bedrock would, in theory, be observed in this well, and therefore provide important information on the northern extent of groundwater contamination from East Avoca.

One additional shallow alluvial monitoring well was completed at the Shelton Abbey Tailings Impoundment. The well is located at the base of the berm of the impoundment (see Figure 4-1c) and provides information regarding the water quality that likely discharges directly to the Avoca River from this potential contaminant source.

4.2 Groundwater Data

Each existing or newly-completed well had water level measurements taken and was sampled and analyzed for metals and general water quality. Both water quality and water level measurements obtained from the new wells aid in providing an independent measurement of metals loading to the Avoca River.

Prior to sampling, monitoring wells or unused private wells were purged a minimum of three screened interval volumes and until water quality field parameters reached stable conditions (<10 percent difference in subsequent specific conductivity measurements, and <0.1 su difference for pH). Wells that were frequently used by private residences or businesses were allowed to flow for 5 minutes, and one set of field parameters was measured prior to sampling. Field analysis of water quality included monitoring for the following field parameters: pH, specific conductance, temperature, dissolved oxygen, and oxidation-reduction potential. Water level measurements were collected before and after purging. Samples for the full suite of parameters were collected at each well. Results of sampling are included in Tables 4-2a and 4-2b.

Water levels in the new wells and two additional County Wicklow wells associated with the Ballymurtagh landfill were measured each time the new wells were sampled. On November 15 and 16, 2007, dedicated automatic data loggers were installed in the new monitoring wells. A summary of the data obtained from the automatic loggers is

provided in Table 4-3, and the complete data logs (in the form of graphs) are provided in Appendix B.

4.3 Groundwater Gradients

Water level data gathered from the wells (Table 4-3) were important for determination of groundwater gradients in the vicinity of the river. Gradients were calculated using water level data from the wells in combination with elevation of the Avoca River at a point perpendicular to the location of the well. The "perpendicular" location was determined to be along the groundwater flow path between the well and the river (i.e., perpendicular to groundwater elevation contours). Elevation of the surface water was computed using data from the gauge installed at the Wicklow County yard (Table 2-1b) and the Lidar topographic maps of the region. River gradients were calculated using the topographic maps and the fluctuation in measured water height at the gauge was used to calculate the elevation of the river at the point corresponding to each well. Calculated groundwater gradients are provided in Table 4-3.

Section 5
Spoils and Soils Investigations

Spoils and soils investigations were performed to achieve two main objectives: 1) to collect and analyze mine spoils and surface soils samples for metals, acid-base potentials, and bioavailability; and 2) to evaluate the geotechnical properties of spoils. The results of these investigations were used to complete the following evaluations:

- Determine the metal concentrations and reactivity of spoils material relative to remedial option evaluations
- Determine acid generating potential
- Determine the amount of arsenic and lead that is bioavailable in the human gut
- Evaluate geotechnical parameters to provide information for remedial options
- Determine the level of contamination within surface soils in fields near spoil piles
- Evaluate various remedial treatment options

Each of these evaluations has been completed and is provided in separate reports (attached).

5.1 Subsurface Spoils

Field investigations of spoil pile subsurface materials included drilling of boreholes, test pit excavation, sampling of surface materials, and laboratory analyses.

Drilling activities included the drilling of 10 boreholes through spoils to characterize the materials. Boreholes were drilled at the following locations:

- Cronebane/Mt. Platt – Two boreholes, through thickest section of Mt. Platt
- East Avoca/Tigroney – Six boreholes, one through spoils southwest of Cronebane Pit, one through Paddy Hogan's field (completed as a monitoring well), two through spoils northeast of the Deep Adit ("orebin" area), and two through the spoils southeast of the Deep Adit (completed as monitoring wells)
- West Avoca – Three boreholes, two through emergency tailings pond near the Avoca River (completed as monitoring wells) and one through spoils in the backfilled North Lode pit
- Shelton Abbey – Two boreholes, one through spoils in the tailings pond, and one at the base of the berm embankment (completed as a monitoring well)

Boreholes were completed through the spoil material to drill rig refusal or to the alluvial material (Deep Adit and Emergency Tailings areas). Depths of completion are

indicated in Table 5-1 and locations are provided in Figures 5-1a to 5-1e. The most critical data gap concerning the many waste piles was the potential for the waste material to generate acid and mobilize metals during precipitation events. Thus, samples were collected and analyzed for metals and acid-base analysis. Additional samples were collected for geotechnical parameters including moisture content, plasticity indices, and grain size distribution. Drilling was conducted using a shell auger, with split spoon sampling at the depths defined in Table 5-1. In general, samples were collected within the primary material type and at intervals where the primary grain size changed within the spoils.

Laboratory analyses for metals were completed using ICP-MS following digestion using nitric acid and hydrogen peroxide. Analyses for acid-base accounting included the use of the Net Acid Generation (NAG) test procedure (Environmental Geochemistry International Pty Ltd., "Net Acid Generation (NAG) Test Procedures." February, 2002). This procedure provides an indication of the potential for acid generation by a soil or sample. The procedure is conducted by reacting the sample with hydrogen peroxide until the reaction is complete, adding water, and measuring the pH of the resulting solution, followed by titration using sodium hydroxide. The NAG value is a function of the volume and concentration of the sodium hydroxide used in titration, the weight of the sample reacted, and the pH of the reacted sample.

Analyses were also conducted for the forms of sulfur including total sulfur, pyretic sulfur, sulfate sulfur, and organic sulfur. Organic sulfur is calculated based on total sulfur and the amounts of pyritic and sulfate sulfur. In addition to NAG potential and forms of sulfur, the neutralization potential was also measured. An acid-base potential is calculated (in terms of tons of $CaCO_3$ per kiloton of material) by using the total sulfur and NAG values and subtracting the neutralization potential.

Results of laboratory analyses are included in Tables 5-2a (metals) and 5-2b (acid-base analysis, including NAG and forms of sulfur). For geotechnical analyses, samples were collected at each borehole for analysis of unit weight, moisture content, and plasticity, indices, and grain size distribution. These samples were collected using split spoon sampling. Fifteen samples were analyzed at the geotechnical laboratory. Results of geotechnical analyses are included in Table 5-2c and Appendix D.

In addition to drilling, test pits were excavated to a depth between 1 and 2 m in various spoils piles. The locations of test pits include the following:

- Connary – four test pits
- Cronebane/Mt. Platt – two test pits
- East Avoca/Tigroney – four test pits
- West Avoca – three test pits
- Shelton Abbey Tailings Impoundment – five test pits

Test pits were excavated at the locations shown in Figures 5-1a to 5-1e; depths and descriptions are provided in Table 5-3. Test pit logs are provided in Appendix E. Thirty samples for metals and ten samples for acid-base analysis were collected from the various test pits. Laboratory results are provided in Tables 5-4a and 5-4b. Eight samples were collected from the test pits for geotechnical analyses including moisture content, liquid limit, plastic limit, plasticity index, and grain size analysis. An additional nine samples were collected for moisture content and grain size analysis only. Results from geotechnical analyses are provided in Table 5-4c, Appendix D (laboratory data), and Appendix F (written report).

5.2 Surface Spoils

Metal concentrations in the surface materials on discrete waste piles were determined using the field XRF, and a subset of the sample sites were selected for laboratory analysis of metals and acid-base accounting. Sample locations were based on a regular grid pattern developed for the spoils piles. Samples were collected at the grid points from the upper 5 cm. Figures 5-2a to 5-2f provide the locations of spoil pile surface sample locations. Surface spoil laboratory analyses were conducted for the following number of samples:

- Figure 5-2a, Connary – 18 samples
- Figure 5-2b, Mt. Platte/Cronebane – 21 samples
- Figure 5-2c, East Avoca/Tigroney – 19 samples
- Figure 5-2d, West Avoca – 33 samples

Based on the onsite, real time XRF results, the sampling grid and approach was altered as necessary. Analyses of the wastes were performed by placing the XRF analyzer directly on the in-place waste material. This allowed for a very rapid determination of variability of the waste materials. XRF analyses were performed in the field using portable Niton XRF instruments. The instruments were of two types:

- Niton model XLi 700 Series with Americium 241 radioactive source (CDM provided)

- Niton model XL3 600 with Mo K-alpha x-ray tube source (GSI provided)

Results of XRF analyses are provided in Tables 5-5e and 5-5f. Samples were selected for laboratory analyses of metals and the acid-base account procedures described above. A total of 98 samples were submitted for laboratory analysis of metals and 32 for acid-base accounting, including NAG testing (as discussed in Section 5.1). Results are presented in Tables 5-5a and 5-5b.

In addition, 31 samples were selected for analysis of the bioavailability of arsenic and lead in the human gut. Samples were analyzed by the University of Colorado using an *in vitro* method (www.colorado.edu/geolsci/legs/invitro1.html). Results are provided in Tables 5-5c and 5-5d. Table 5-5c provides the total metal analyses on the <250

micron fraction (the size fraction that sticks to a child's hands). Table 5-5d provides the results of the *in vitro* test for arsenic and lead.

5.3 Spoils EMP Analysis

A subset of samples from surface and subsurface spoils were analyzed by CDM using the electron microprobe (EMP) at the University of Colorado. EMP provides analysis of primary constituents on a per-grain investigation, allowing for determination of mineral types, origins, and previous reactions. Results of the analysis are included in Appendix A of the Conceptual Site Model Report (attached). Generally, EMP analysis indicated that the materials derived from the Cronebane Pit and now comprising Mt. Platt contains a mixture of primary sulfide minerals and secondary phases. Materials at depth within the spoils are less oxidized than surficial materials. In the Connary spoils piles, the materials are more uniform, likely due to the age and shallower depth of the material. Tailings at the Site (e.g., Shelton Abbey and Emergency Tailings Pond) were found to be less oxidized than the spoils. Another significant finding was that copper and zinc were abundant within the primary minerals (chalcopyrite and sphalerite) but much less abundant in the secondary oxyhydroxides and hydroxysulfates. Lead and arsenic were present in high concentrations in both the primary minerals and in the secondary phases.

The conversion of the primary phases to secondary phases is due to oxidation, either within the ore body itself (such as for the Cronebane ore) or, more commonly, within the shallower more oxygenated zones on the mine waste. Due to the concentrations of minerals and chemistry of the pore water, arsenic and lead are removed from the pore water, while copper and zinc stay in solution, where they are eventually transported to the Avoca River. The formation of arsenic-bearing plumbojarosite explains the low mobility and bioavailability of lead and arsenic within the mine wastes, despite the high concentrations within the waste materials themselves.

5.4 Surface Soils

Field investigation of surface soils consisted of the collection of samples in agricultural fields used for livestock grazing near spoils piles. A 20cm x 20cm square section of grass was removed to a depth of 5cm. The soil was collected by shaking the sample to remove the soil from the roots. Surface soils were typically collected on two transects radiating outward from spoils piles. Sampling locations were spaced at geometric increasing distances (0, 20, 40, 80, etc. m). Seven fields were sampled, including:

- South Mt. Platt/Cronebane (one G. Murphy field - Figure 5-3a) – 7 samples
- Paddy's Field (one P. Hogan field - Figure 5-3b) – 3 samples
- North Mt. Platt/Cronebane (one I. Fitzpatrick field and two Kavanagh fields - Figure 5-3c) – 16 samples
- West Avoca (two T. Merrigan fields - Figure 5-3d) –14 samples

A total of 41 samples were sent to the laboratory for metals analysis. Laboratory results for surface soils are provided in Table 5-6.

5.5 XRF Analyses (GSI)

The GSI collected supplemental XRF data at various spoils piles. Locations of samples are indicated in Figures 5-4a (Cronebane/Mt. Platt), 5-4b (West Avoca), and 5-4c (Shelton Abbey). Metal concentrations for sample locations are provided in Table 5-7.

Section 6
Ecological Investigations

Ecological investigations were performed to achieve three main objectives: 1) to measure metal bioaccumulation in plants, 2) to perform an upper trophic predators (bat) evaluation, and 3) to perform a land use and habitat evaluation. In addition, a macroinvertebrate evaluation was conducted in the Avoca River in April 2007 as part of the preliminary evaluation. The results of these investigations were used to complete the following:

- Document impact on the macroinvertebrate community as indicators of contamination
- Document vegetation, land use, habitat, and animal assemblages in the Avoca Site area
- Document diversity of bats within the Avoca Site area
- Evaluate affects of contamination on local ecological receptors
- Identify areas of concern to human health and the environment

The land use evaluation consisted of: 1) aerial photography and 2) ground confirmation. The upper trophic predator (bat) evaluation consisted of: 1) an assessment of data collected from the previous field investigations and 2) discussion with local experts. Samples for bioaccumulation of metals in plants were collected in the fields surrounding the spoils piles in the East and West Avoca areas.

6.1 Plant Bioaccumulation

The primary goal of this task was to identify potential impacts to livestock in areas with exposure to elevated levels of metals. One of the main areas of concern was the agricultural area near Connary, where sheep graze in fields located near spoils piles. During the field investigation, plants were collected in the grazing lands at the locations indicated on Figure 6-1.

For the samples, the section of the plant that was above the ground surface, and thus available for consumption by livestock, was removed, placed in a plastic zip-top bag, and sent to the laboratory (unwashed) for metals analysis. Nine plant samples were collected during the field investigation. Laboratory results and plant type are presented in Table 6-1.

An evaluation of the potential for uptake due to plant and soil ingestion is provided in the Ecological Risk Assessment Report (attached). Generally, the data indicate that risk to animals is low based on bioaccumulation factors. However, based on soil concentrations, risk may be higher due to potential for ingestion of soils contaminated with heavy metals. The greatest areas of potential risk are spoils piles.

6.2 Upper Trophic Predators (Bat) Evaluation

A bat survey was conducted to examine the potential impacts of compromised habitat on the bat population of the region. This is an important evaluation due to its examination of an upper trophic predator that has the potential to be affected by bioaccumulation of toxic metals. The survey is summarized below, but described in full in the Ecological Risk Assessment Report.

The bat survey included evaluation of data collected during previous surveys. Based on these surveys, six species have been observed or recorded at or near the Avoca River mining region. However, it is unlikely that the bats are adversely affected by mining contamination. This can be assumed due to a lack of insects with flying adult life stages (and aquatic larval stages) occurring in areas of highest contamination (according to the benthic macroinvertebrate study). Areas where these insects occur are located outside of the primary impact areas, such as downgradient of the Avoca/Aughrim River confluence, where contamination in the river sediments is substantially lower.

6.3 Land Use and Habitat Evaluation

A land use and habitat evaluation was conducted throughout the Avoca River valley. The land use/habitat assessment was performed according to The Heritage Council's Draft methodology. A Lidar survey and aerial photography were used to aid in the classifications of vegetation types; a ground survey was used to confirm vegetation and conduct the fauna survey. The following is a summary of the land use evaluation report and habitat survey; the full report is included in the Ecological Risk Assessment Report (attached).

The study area includes a large area of mixed woodland along the river valley. Around the mine area are pine and pine/birch woodland. There are also pine and larch woodland on both sides of the river. The steep slopes of the Tigroney Hill and the Mottee Stone and a large area in West Avoca are covered in heather/gorse heathland. Agricultural land is mainly for grazing. Spoil heaps are covered scarcely or not at all by mine wastes.

Many of the vascular plant species occurred in more than one habitat. This is an illustration of how the process of colonization of disturbed land relies on the surrounding flora to provide 'volunteer' plants. *Erica* and *Ulex*, species belonging to the heathland vegetation, successfully establish themselves in the pine woods of the mine sites and in scrub vegetation. *Pinus* can invade the oak wood, and likewise *Quercus* is a common component of the pine woods (Fay 1996).

During the fauna survey, only two species were observed; however, an additional 24 species have been recorded as living in the area. These species include mammals, birds, and fish. An additional eight species are expected to occur within the region based on geographic ranges and habitat preferences.

6.4 Macroinvertebrate Evaluation

During April 3-5, 2007, a screening level benthic macroinvertebrate survey was conducted within the Avoca River watershed. The method employed for this survey was timed (30 second) kick net sampling using a 500 um D-frame kick net. The preferred habitat for this sampling was riffle, followed by shallow run where riffles were not present. Three replicates (center channel, near left bank, near right bank) were collected, and data were evaluated both independently and pooled. Metrics included the following:

- Total number of organisms
- Total number of mayflies (Ephemeroptera)
- Total number of caddisflies (Trichoptera)
- Total number of worms (oligochaetes)
- Total number of beetles (Coleoptera)
- Total number of dipterans (flies and midges)
- Total number of leeches
- Total number of ostracods
- Total number of snails (gastropods)

Most useful among these metrics are the first four, based on the assumption that greater numbers of organisms, mayflies, and caddisflies are generally a positive finding and greater numbers of worms (as well as dipterans, snails, etc.) signify a negative finding (indicative of some form of stress). These assumptions are not without uncertainty, given the fact that some mayfly and caddisfly taxa are known to be tolerant of various forms of pollution, including metals contamination and nutrient enrichment. However, the underlying general assumptions are sufficiently valid for a screening level assessment based on rapid field identification to the order level (e.g., Ephemeroptera, Trichoptera, Diptera, etc.).

Tables 6-2 through 6-5 present the raw data (numbers of each type of organisms) for each replicate, the total number of organisms based on combined replicates (Table 6-2), total number of mayflies based on combined replicates (Table 6-3), total number of caddisflies based on combined replicates (Table 6-4), and total number of worms based on combined replicates (Table 6-5). These four metrics and/or groups of organisms (total number of organisms, mayflies, caddisflies, and worms) represent the most useful metrics and most abundant types of benthic macroinvertebrates collected during the April 2007 surveys. Data for other taxa collected are also included on Tables 6-2 through 6-5, including aquatic beetles, dipterans, leeches, ostracods, and snails.

Each of these data tables are also associated with a graph showing the combined (all replicates) totals for the key metric associated with each table, on an upstream to downstream (left to right) format. On each of these graphs, the leftmost station (downstream of Meeting of the Waters) and the Aughrim River station can be considered reference or at least minimally impacted stations. The other stations, from downstream of Whitesbridge to downstream of the former fertilizer plant, are

considered impacted or potentially impacted stations (primarily by mining-related contaminants).

Section 7
Miscellaneous Investigations

7.1 Industrial Archaeology

Industrial-scale mining began at Avoca in the early 18th Century and continued intermittently until the mines were closed in 1982, by which time some 12 Mt of ore had been extracted, much of it through open-cast mining. A considerable legacy of this long period of mining activity remains around Avoca in the form of heritage features and industrial archaeology sites. Consideration of this important legacy in the overall context of the remediation options developed for the Avoca Mining Area was very important. To assist with interpretation of the industrial archaeology, Seán Harrington Architects (SHA) updated and reinterpreted their previous work for the Avoca Mining Heritage Trust evaluating the environment in and around the Avoca Mining Area. Their report, *Report on Sites of Industrial Archaeology Importance* (SHA 2007) is provided in Appendix G.

The industrial archaeology sites consist of two general types of features:

- Buildings and structures (chimneys, ore bins, etc.)
- Mining landscape features (spoil piles, open pits, etc.)

In summary, the visible important buildings/structures identified by SHA follow:

- The Williams Engine House
- The Tigroney Ore Bins
- The Baronet's (or Farmer's) Engine House
- The Chimney to the former Waggon Engine House at Connary
- The Tramway Engine House Chimney at Ballygahan
- The Twin Shafts Engine House
- The Hodgson's Tramway Arch
- The Ballygahan Engine House Chimney
- The Mines Office in West Avoca

The visible mining landscape features identified by SHA follow:

- The Open Cast (open pit) Mines at Cronebane, East and West Avoca
- Adits, Shafts, and Underground Mines (many features are not visible)
- Mount Platt (only mentioned by SHA and not identified specifically)

The condition of many of these features was addressed in detail in the *Health & Safety Audit Avoca Mining Site* prepared by GWP Consultants (GWP 2008). SHA provided descriptions and photography of the features and evaluated the significance of the various features. SHA concluded that "There are serious issues regarding pollution, destabilisation, and general health and safety hazards on the Site." SHA specifically recommends that Williams Engine House, the Ore Bins at Tigroney West, Baronet's

(Farmer's) Engine House, and Twin Shaft Engine House be repaired and made safe and accessible to the public. The "serious health and safety hazards" of the open pit mines also need to be addressed.

Wicklow County Council's most recent Development Plan (*Wicklow County Development Plan 2004-2010*) contains a chapter on Heritage and Landscape Conservation (Chapter 10). The Council's heritage objectives are guided by the following principles:

- Avoid negative impacts upon heritage
- Promote enhancement of heritage as a key principle to every development
- Ensure that all developments include adequate provisions regarding mitigation of impact upon heritage

Specifically, the Development Plan maintains a Record of Protected Structures. Protected Structures at the Site include:

- Ballymurtagh (old mining office, Tramway Arch, Western Whim Engine House, Twin Shafts Engine House and Chimney, Tramway Engine House Chimney, Ballygahan Engine House, spoils heaps and associated disturbed ground, etc.)
- Connary (Waggon Shaft Engine House, spoils heaps and associated disturbed ground)
- Cronebane (Cronebane and East Avoca open pits, volcanogenic massive sulphide mineralisation and host rock sequences)
- Tigroney West (Williams Engine House and Chimney, Baronet Engine House and Chimney, spoil heaps and associated disturbed ground, etc.)

Wicklow County Policy HL47 states that "The Council will have regard to structures, sites, and objects which are part of the county's industrial heritage, in particular features which relate to former mining and/or transport activities."

7.2 Lidar Survey

At the request of GSI, CDM sought quotations from experienced airborne survey firms to undertake a Lidar (Laser Imaging Detection and Ranging) survey of the Avoca Mining Area (some 6 km^2 in total, including the Shelton Abbey tailings facility) at an early stage in the project.

Three quotations were received, and Precision Terrain Surveys (PTS), part of the NPA Group from Kent, England were selected to undertake the airborne survey, which took place on 24 July 2007. The survey measurements are recorded with 0.15 m r.m.s.

accuracy (contour interval) and approximately 0.5 m horizontal accuracy with an average point density over the project area of greater than 1 point per square metre.

The data were then processed to a regular 1 m grid interval and, using the last laser returns (i.e., closest to the ground level), the data are filtered to remove tall surface cover (trees, buildings, bushes etc.). DSM & DTM Data were supplied in an ASCII x,y,z format in 1 km Irish Grid tiles and the digital data were provided with a viewer so measurements can be taken without the need for other software.

In October 2007, to ground-truth the Lidar survey, GWP Consultants undertook a check of the levels obtained by this survey by a limited terrestrial survey, using GPS. The Lidar survey provided a grid of points at a 1 m spacing (north south and east west). The ground level in between was deduced by interpolation. The exact level of features with sharp changes in level, such as ditches, walls etc. cannot be obtained, because they seldom lie exactly on the grid. The GPS survey, however, may obtain exact levels (to within 25 mm) and positions of such points.

Accuracy of Lidar surveys in areas of thick vegetation is reduced because of the obscuring of the ground from the air. PTS use an algorithm that removes the effects of tree cover, computing the ground level from such points on the ground as may be seen. A comparison was made between the two surveys by subtracting the interpolated Lidar levels from the GWP surveyed point levels. A summary of the results are shown in the Table below. Results are provided for both all points and with incompatible points excluded.

Excluded points were as follows:

- Tops of gauge boards;
- Tops or bottoms of walls and chimneys;
- Bridges (including the Tramway arch);
- River, stream and pond levels;
- Bases of ditches and ponds (where water filled in July) ;
- Pipe and adit inverts; and
- Levels on new excavations and spoil tips in Shelton Abbey lagoon pheasant hatchery

Differences Between GWP GPS Survey and Lidar Survey

	All points	Excluding incompatible points
Mean	0.023	-0.004
Standard deviation	0.620	0.206
Range including all points		
Minimum	-4.682	-1.076
Maximum	6.695	1.125
Range including 90% of points		
lower 95% percentile	-0.531	-0.335
upper 95% percentile	0.443	0.308
Range including 75% of points		
lower 87.5% percentile	-0.249	-0.199
upper 87.5% percentile	0.185	0.167
No. of points	1871	1733

If the match were perfect, then the difference should be zero in all cases. For the reasons noted above, this will not be the case. However, the mean difference should be about zero, as can be seen to be the case, even with the incompatible points included.

GWP concluded that the Lidar survey has given an adequately accurate model of the ground surface. When comparing similar points, the mean difference is 4 mm, which is insignificant. Seventy-five (75) percent of the points are within 0.2 m and 90 percent within 0.33 m. Whilst a few points are up to 1 m out, this is to be expected, as the 1 m grid of Lidar points will necessarily miss crests and troughs of sharp ridges, valleys and scarps which can be picked up by terrestrial surveying of point locations.

The Lidar survey was used by CDM and GWP over the duration of the Feasibility Study, principally to generate cross-sections, to calculate the volumes of waste at Avoca and to prepare 3-dimensional imagery of the remediation sites.

7.3 Public Participation

7.3.1 Introduction

The views and concerns of people from the local communities around Avoca and local interest groups are considered to be important inputs to the project. Many residents and their families have worked in or for the mines in the past. Some have become involved in efforts to preserve the mines for heritage purposes or restore the river for angling purposes. Others have no connection with the mines but are concerned with quality of life issues in the area. In general, there was a high level of interest in the project from local people. Groups who use the Avoca valley for fishing and boating were also very interested in the outcomes of the project.

Stakeholder engagement took the form of two major public meetings, one before the major fieldwork investigations in July 2007, and another before the completion of the draft Feasibility Study in April 2008. Both meetings were held in the function room of the Woodenbridge Hotel. In addition to these meetings, a webpage with information on the project was maintained on the GSI's website for the duration of the project,

while a dedicated phone line was established to allow local people to make enquiries about the project.

Both public meetings were extensively publicized in the local press, on local radio, on the GSI's website and by posters in shops and public buildings around the Avoca area. Additionally, for the second meeting, invitations were issued to those attendees of the first meeting who provided their contact details in an attendance book. Sean O'Riordain of Heneghan PR was retained by CDM to assist with publicity and organisation of the first meeting.

Attendance at both meetings was very good, with approximately 80 present at the first meeting and approximately 100 present at the second. Many attendees came to both meetings, and those present comprised a good cross section of local people, elected representatives and members of environmental, community, recreation and heritage groups. Many young people with an interest in the project were present and participated.

7.3.2 First Public Meeting – July 2007

The purpose of the first meeting was to explain the objectives of the project, and to elaborate in particular on the extensive fieldwork planned for the weeks following the meeting. The potential remediation options available for the Avoca Mining Area were discussed in a presentation to the attendees, using examples from other mine remediation projects undertaken around the world to demonstrate the various options available.

Feedback and input was invited from the attendees by dividing the attendance into smaller groups of around 10 people, each facilitated by representatives from the GSI, the Department of Communications, Energy & Natural Resources, Wicklow County Council or CDM. Each group was asked the same questions about what they value about the Avoca valley and in particular the Avoca Mining Area, and what changes are required to ensure that these values are preserved and enhanced. The answers and discussions from the groups were compiled and summarised at the end of the meeting. This formed part of the record of the first public meeting.

Overall, the key issues and questions raised at this first meeting concerned site safety, the environment, heritage and cost. These issues were confirmed by the project team as being integral to the development of options for the Avoca Mining Area. There were a range of views expressed some of which were conflicting. All views were recorded and have been posted on the website. The views are also summarised in the Table below.

Contact details were provided to the attendance to ensure an open line of communication between the project team and the local community over the remainder of the project, particularly when the project team would be present around various parts of Avoca undertaking fieldwork in the month subsequent to the meeting. The presentations were made available on the GSI website.

A separate meeting was also held between the GSI Project Manager and Eastern Regional Fisheries Board (ERFB) representatives, who have been involved in various initiatives over the years to restore the Avoca River for fishing purposes, and have collected much data on the river. During the course of the project, the EPA was updated by GSI and Eastern River Basin District consultants were kept informed of progress by CDM.

7.3.3 Second Public Meeting – April 2008

The second public meeting was held at a point when CDM had almost completed in draft their Feasibility Study of the Avoca Mining Area. Before final decisions were made on the remediation options, feedback from the local communities around Avoca was sought. The format of the meeting was similar to the first meeting, without the break-out groups. The attendees were shown a presentation concerning the findings of the study, and in particular, the results of the extensive fieldwork, and the remediation options being recommended for the Avoca Mining Area were discussed.

Questions from the attendees were answered by representatives from the GSI, the Department of Communications, Energy & Natural Resources, Wicklow County Council or CDM. Generally the response to the presentation was positive, although some attendees felt that individual issues such as heritage were not being given adequate attention in the remediation options. The overall core objectives of the feasibility study, i.e., public safety, protection of human health and the environment, were reiterated as being the drivers behind the various options proposed for remediation. Written comment on the proposals was encouraged.

Separate meetings were also held between the GSI Project Manager and representatives of the Mining Heritage Trust of Ireland (MHTI) and the ERFB while submissions were received from:

- Celtic copper Heritage
- ERFB
- Mining Heritage Trust of Ireland
- Nick Coy
- SPC Developments
- Vale of Avoca Development Association Ltd.

Information, views, and concerns of the local community and interest groups were used and considered throughout the Feasibility Study.

Responses from Participants at the First Public Meeting

What do you like about Avoca mine site and what are the main uses?	***What is your vision for the area in 20 years?***
• Fishing and tourism potential (water pollution) • Canoeing / sea scouts • Tourism potential –international genealogy dimension • Wildlife / nature corridor, wildness of the site / flora & fauna • Beauty / tranquillity / scenery / view • Quality of life / environment –mining is a bad thing • Location • History (oral) Heritage / Buildings • Educational value • No traffic • Amenity / recreation • Cross on hill • Distinctive colour – ochre • Wildness of site • Don't like site / dislike mines / Mine office is ugly • Eyesore • Dangerous • Open to abuse – dumping • Illegal encampments • Site not managed • Want public to have greater access to the site • Joyriding • Quad bikes • Going underground • Hill walking / lots of places • Equestrian	• Better recreational use • Tourism • Fishing –clean river / River quality restored / Angling tourism • Sports, adventure sports • Museum / Interactive interpretative centre / Mine office should be a centre / Themed heritage park or centre • Preserve the buildings and heritage • Landscape pits and piles • Preserve the ecological diversity • Develop as a nature attraction • Amenity • Rock climbing • Employment • Re-open railway station • Need more access • Make site safe without loss of buildings / heritage

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Fig 1-1 Study Area Map

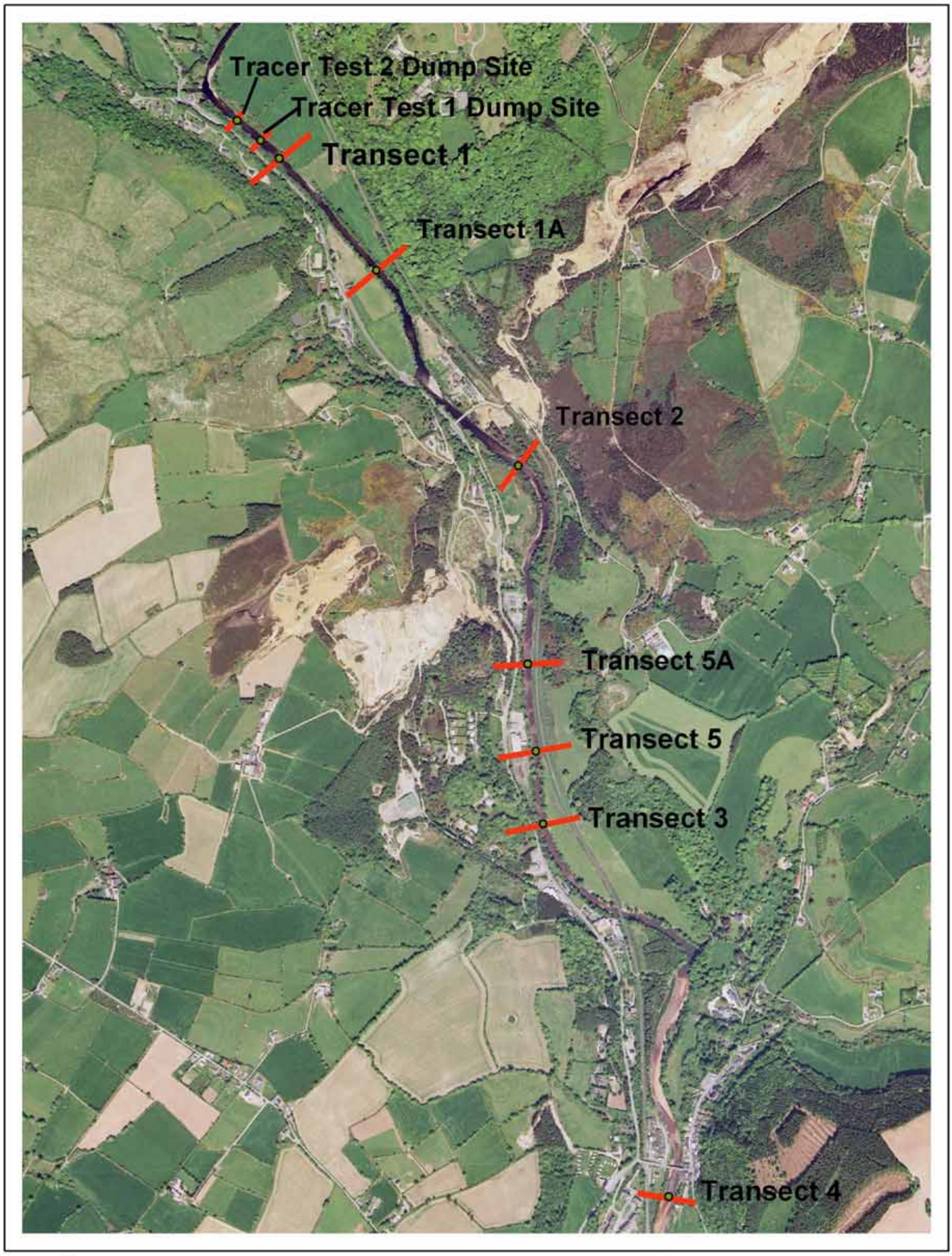


Fig 2-1 Transect Locations

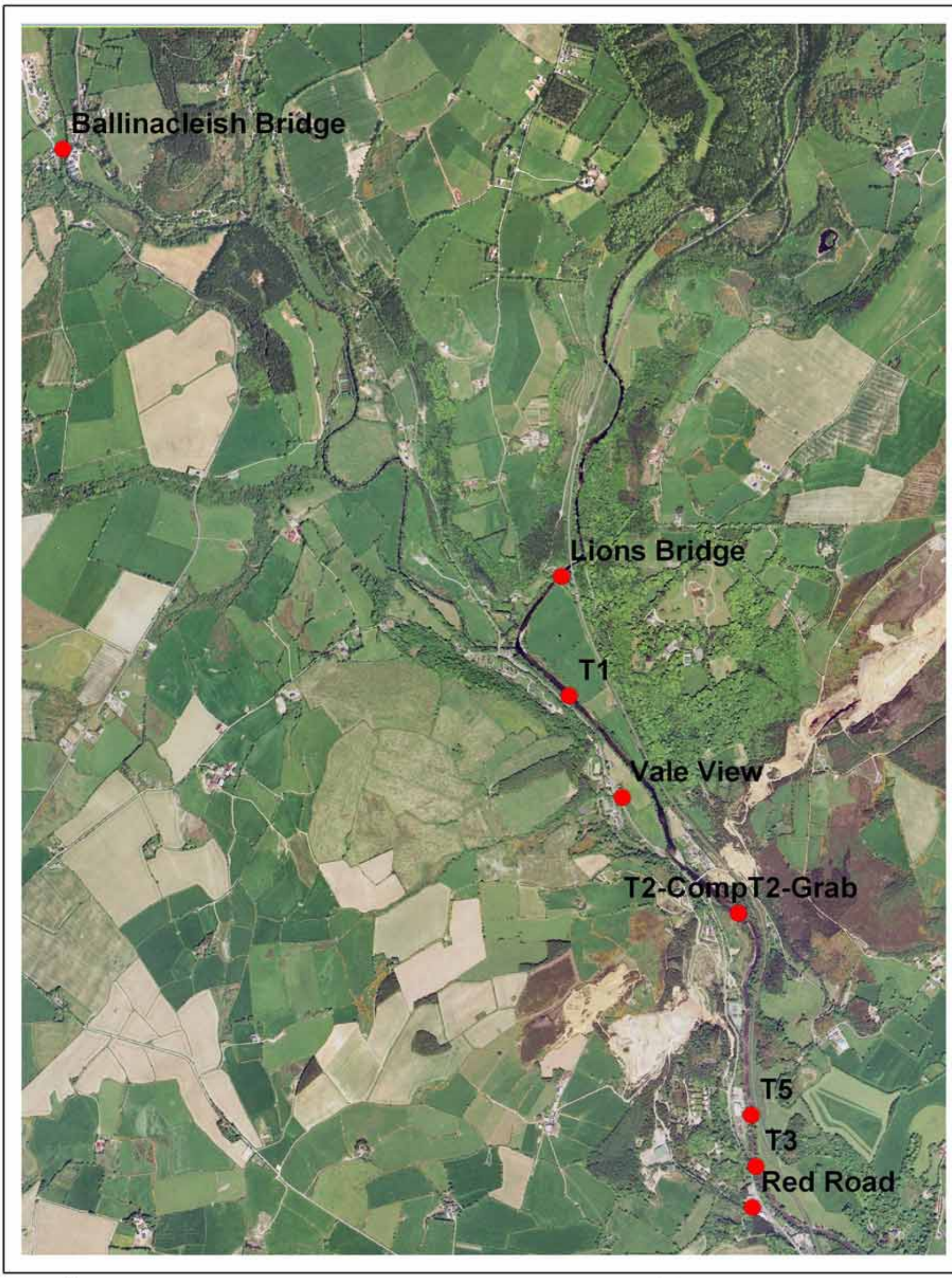


Fig 2-2a Sampling Locations in Upper Avoca

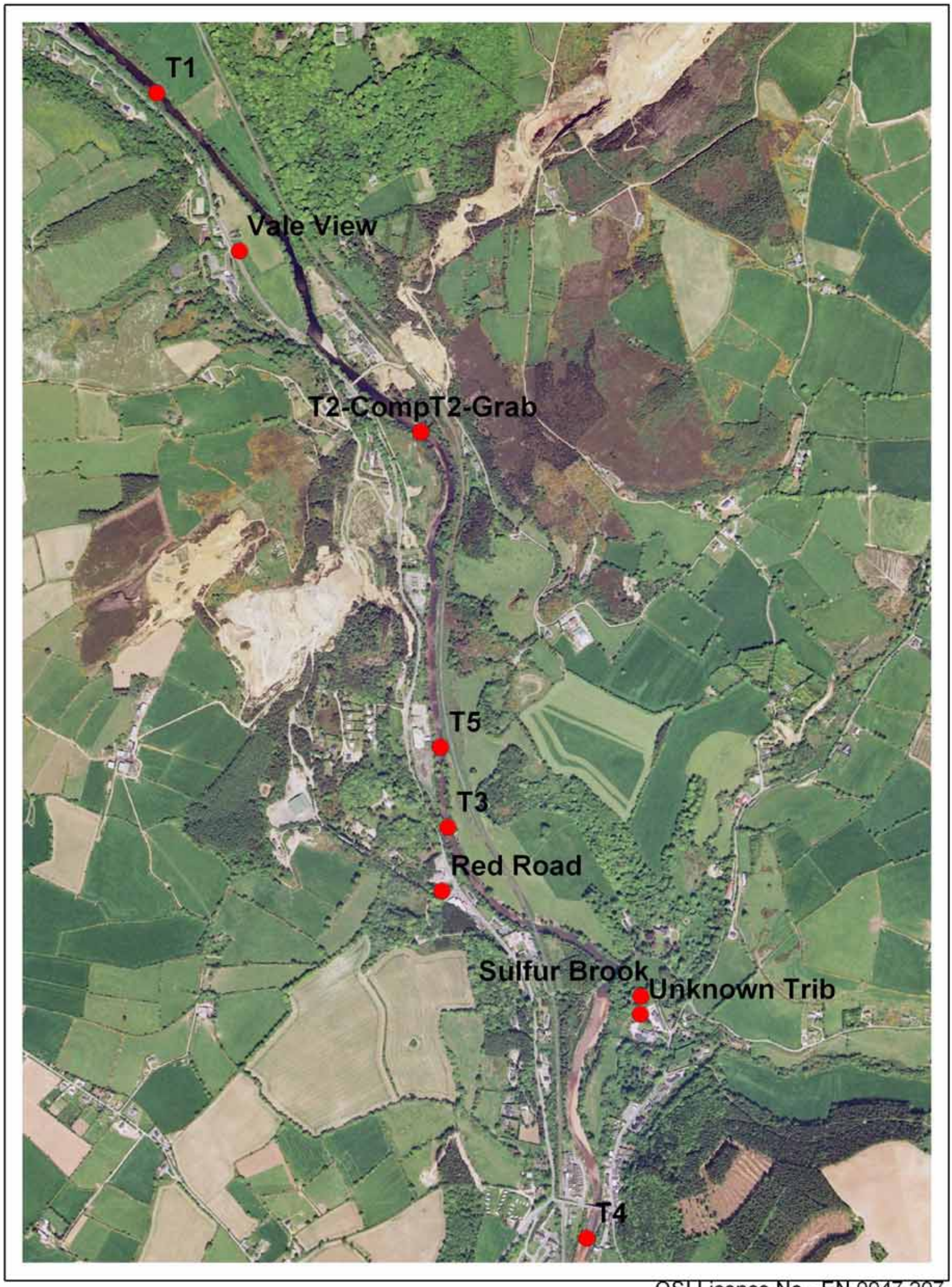
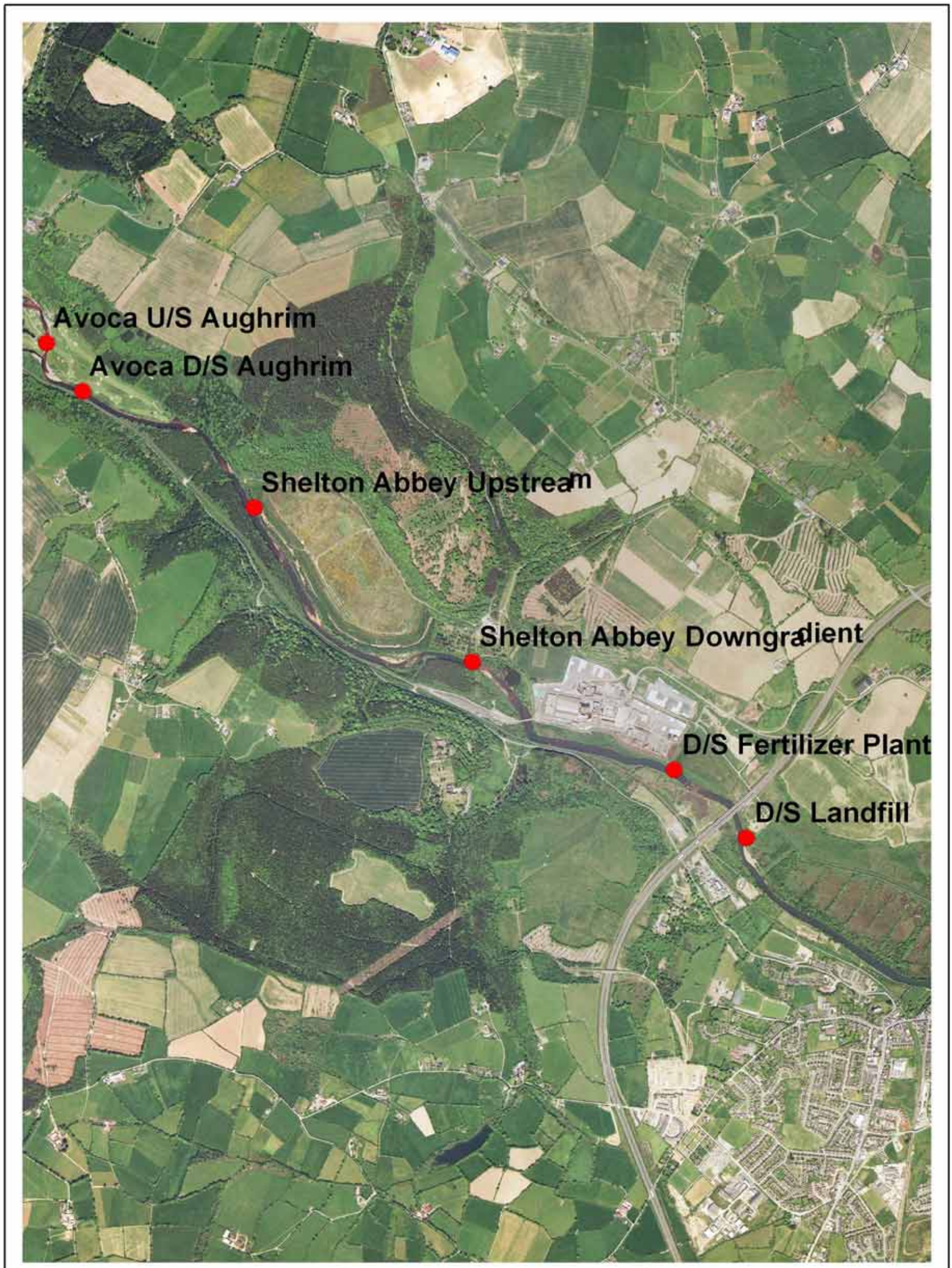


Fig 2-2b Sampling Locations through Mining Area



OSI Licence No - EN 0047 207

N

0 337.5 675 1,350 2,025
Meters

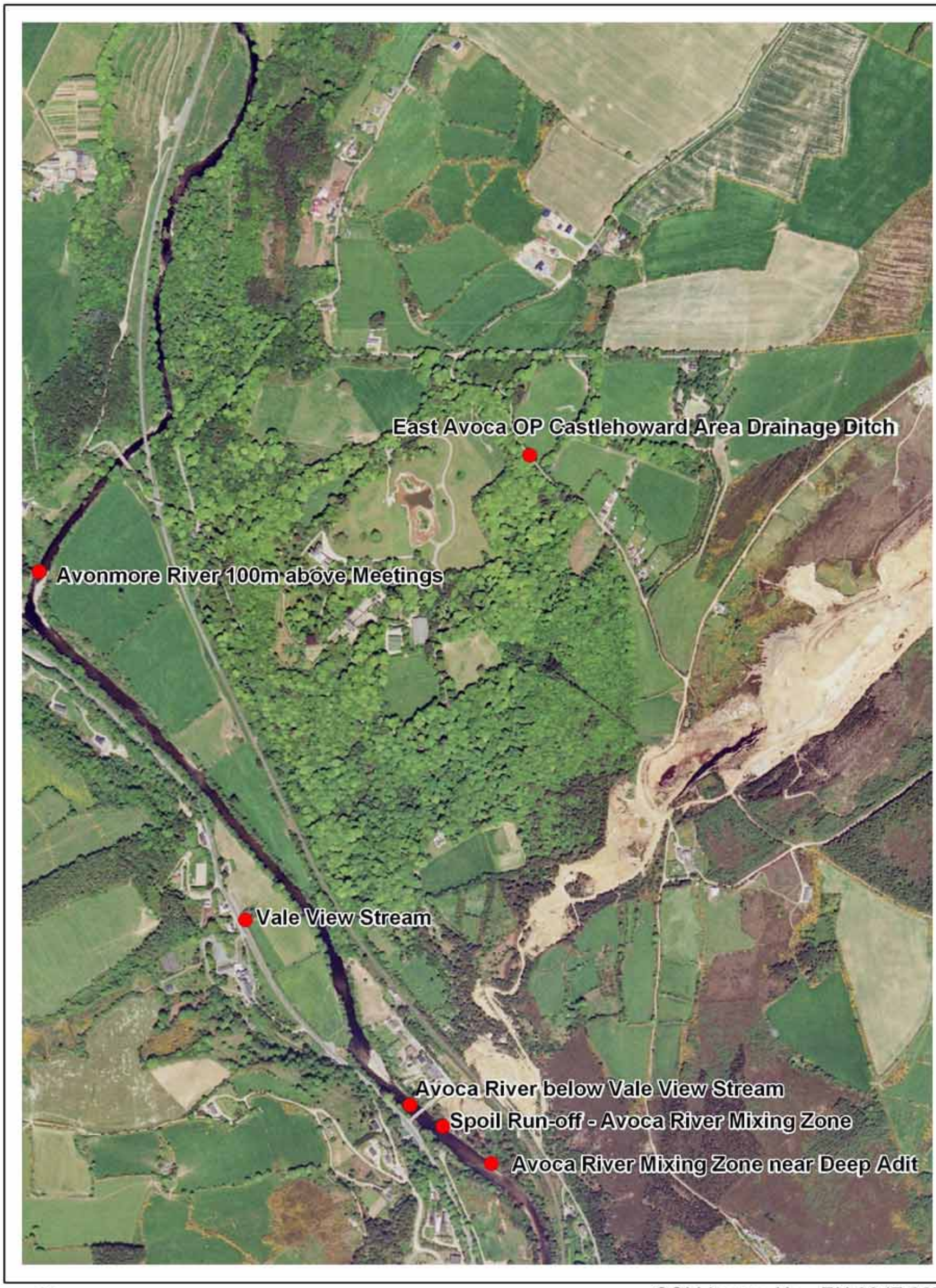
Fig 2-2c Sampling Locations near Shelton Abbey

OSI Licence No - EN 0047 207

N

0 335 670 1,340 2,010 Meters

Fig 2-2d Sampling Locations near Arklow Town



N

OSI Licence No - EN 0047 207

0 165 330 660 990 Meters

Fig 2-3a GSI Sampling Locations - Along Mining Area

Fig 2-3b GSI Sampling Locations - Near Avoca Village

OSI Licence No - EN 0047 207

N

0 170 340 680 1,020
Meters

Fig 2-3c GSI River Sampling Locations- Shelton Abbey

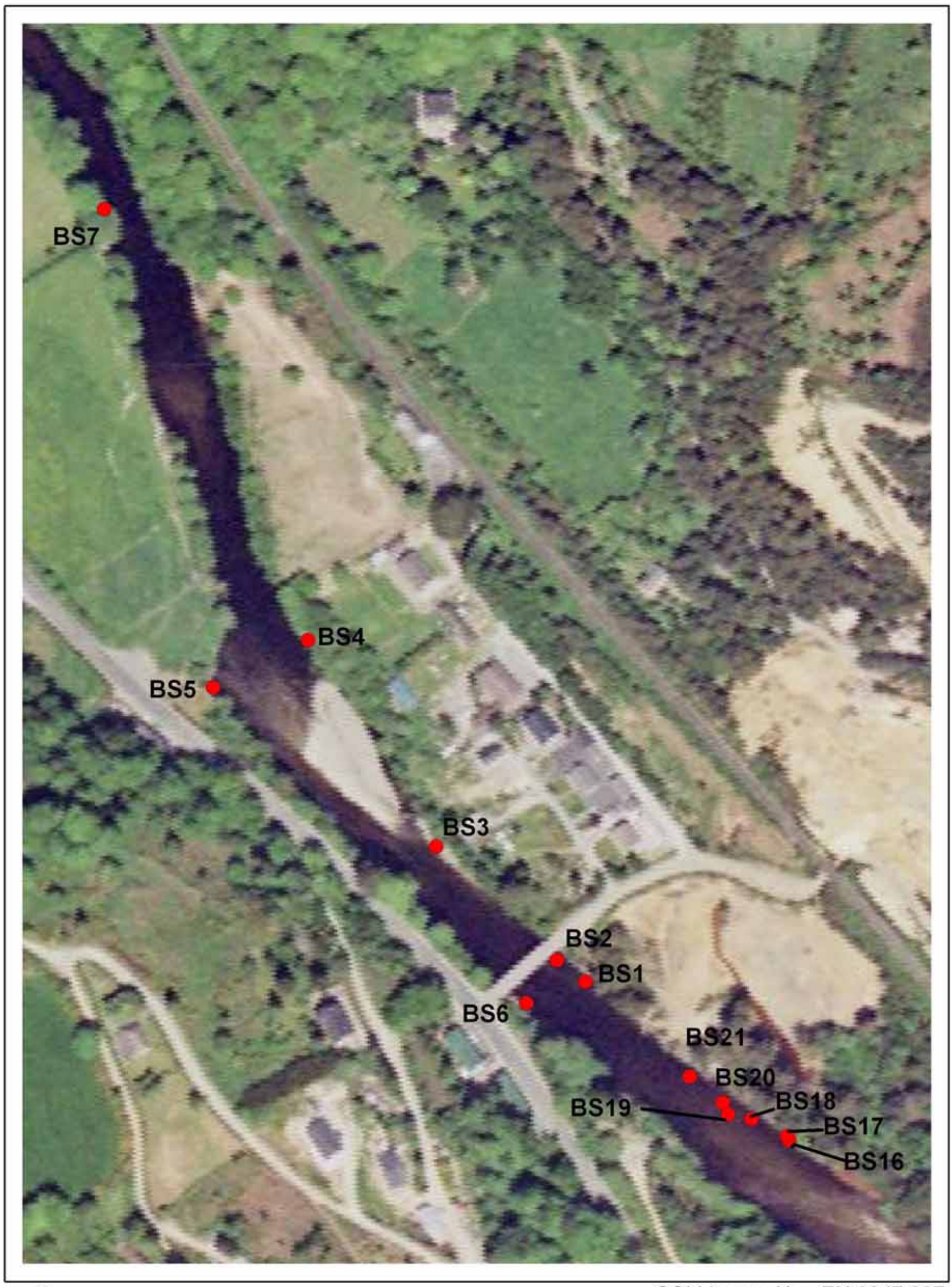


Fig 2-4a River Bank Samples (Upper Section of Mining Area)

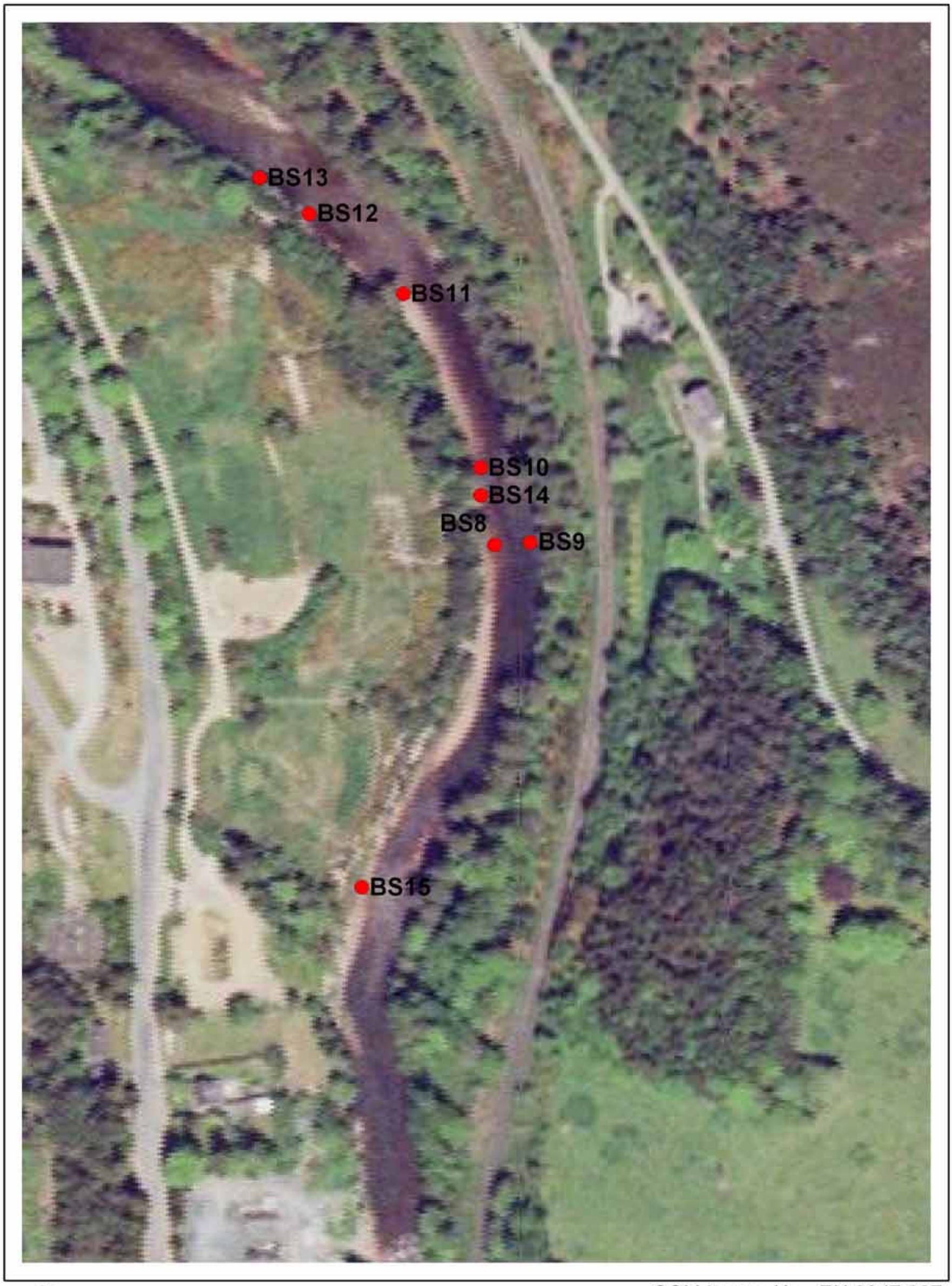
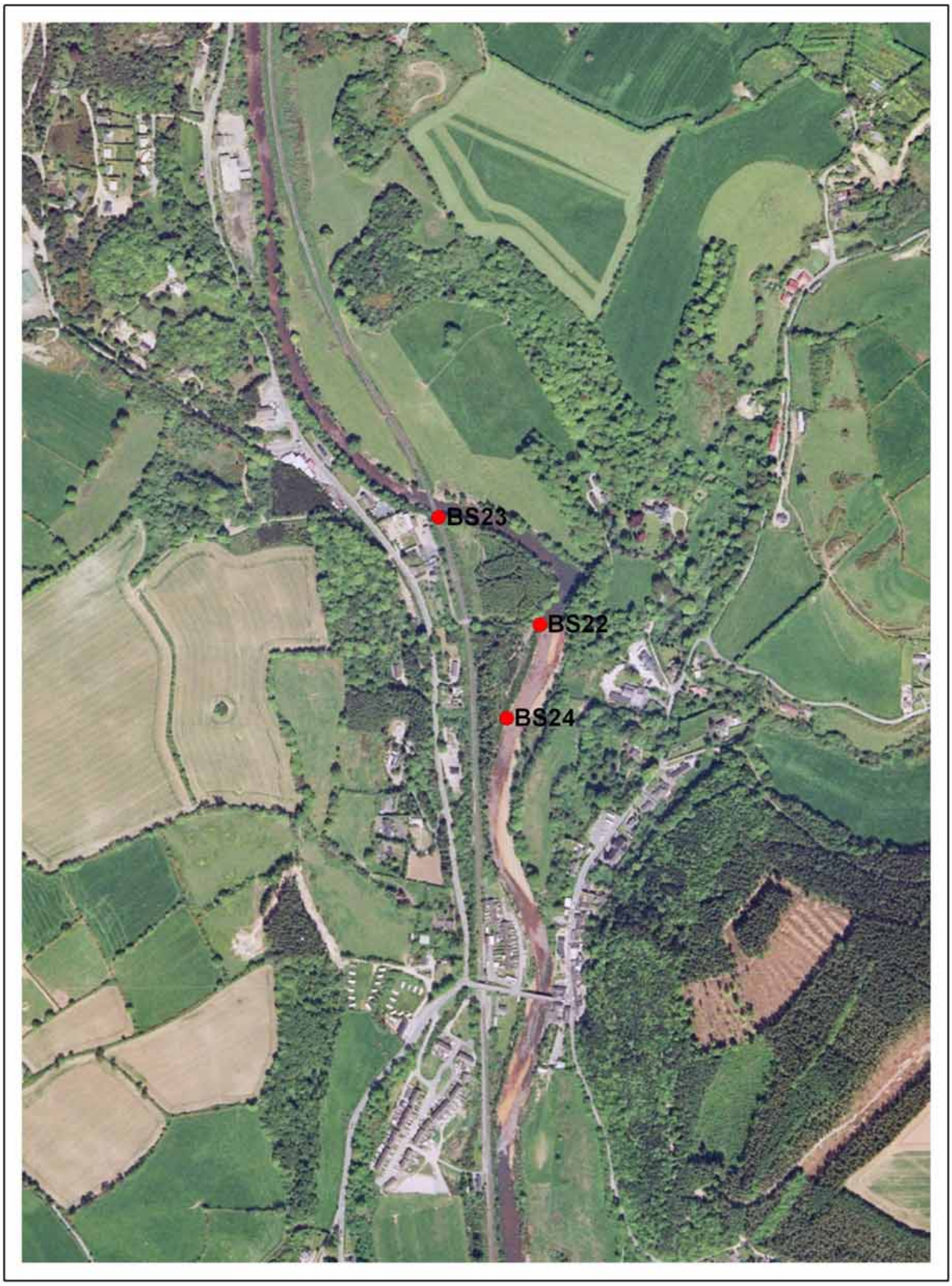


Fig 2-4b River Bank Samples (Lower Section of Mining Area)



OSI Licence No - EN 0047 207

N

0 100 200 400 600
Meters

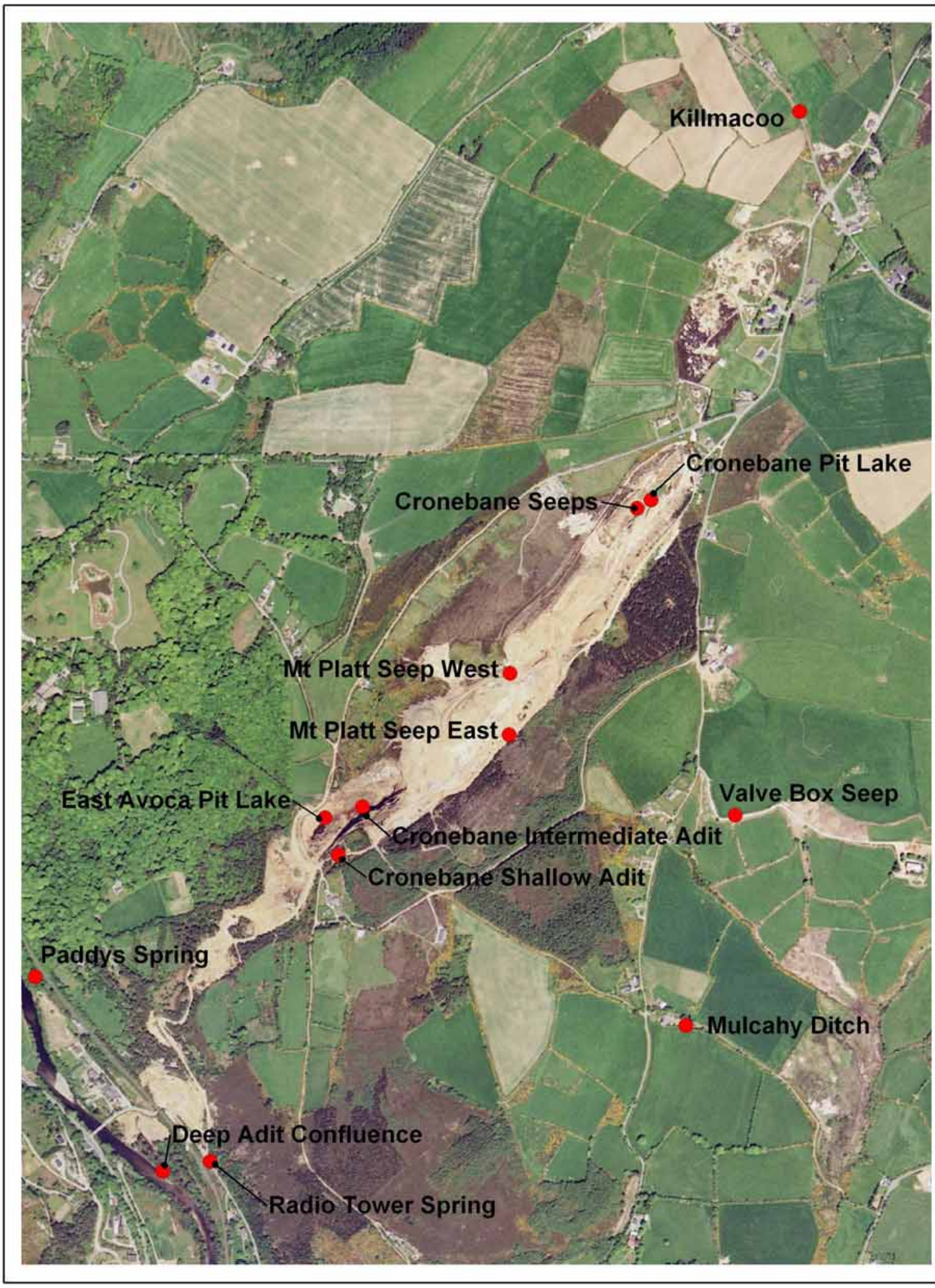
Fig 2-4c River Bank Samples (Avoca Village)

OSI Licence No - EN 0047 207

N

0 100 200 400 600
Meters

Fig 2-4d River Bank Samples (Shelton Abbey)

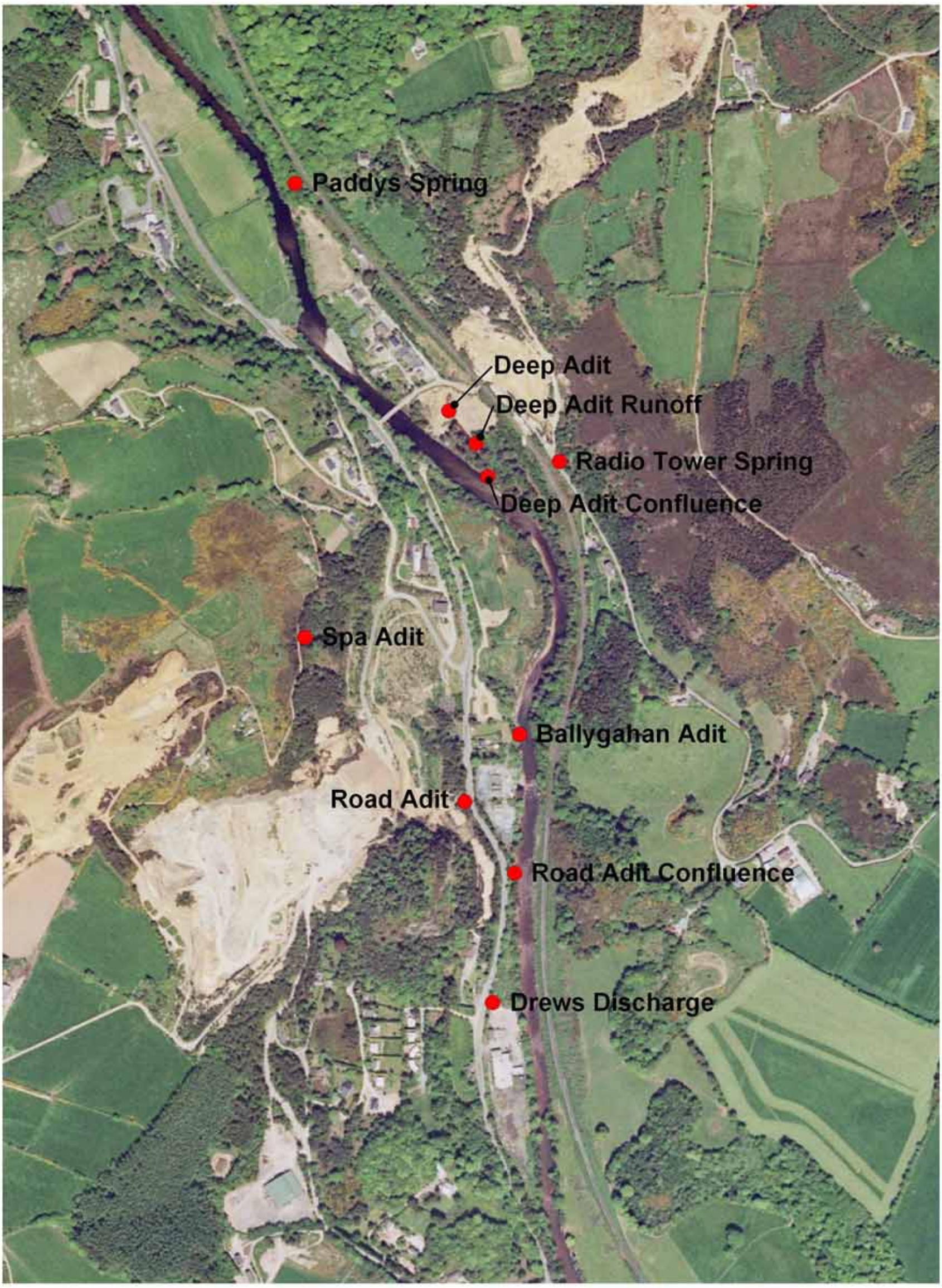


OSI Licence No - EN 0047 207

N

0 190 380 760 1,140 Meters

Fig 2-5a Adits, Seeps, etc - East Avoca Area



OSI Licence No - EN 0047 207

N

0 100 200 400 600 Meters

Fig 2-5b Adits, Seeps etc - River and West Avoca Area

N

OSI Licence No - EN 0047 207

0 165 330 660 990 Meters

Fig 2-6a GSI Adit and Discharge Sample Locations near Mt Platt

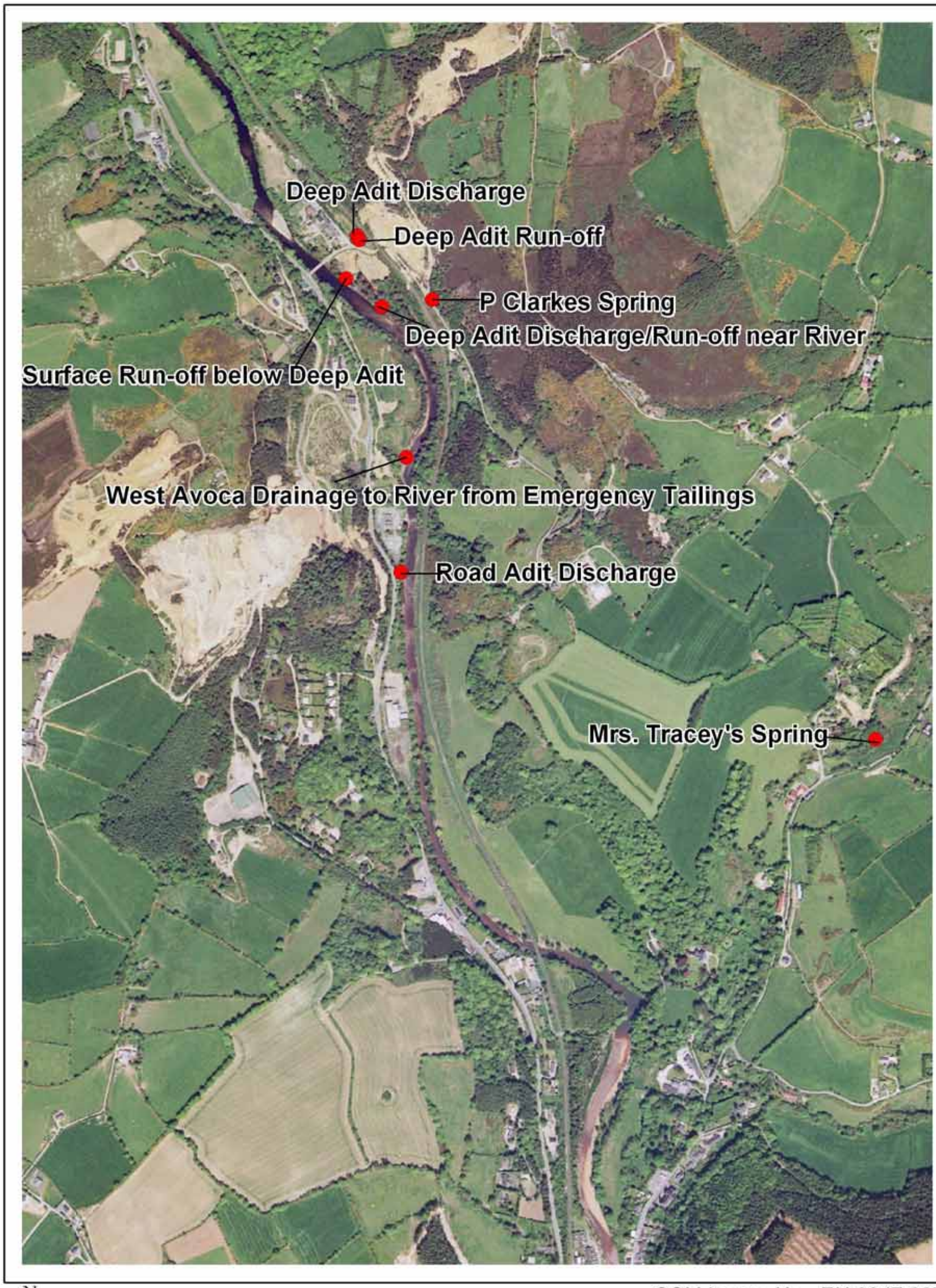


Fig 2-6b GSI Adit and Discharge Sample Locations near River

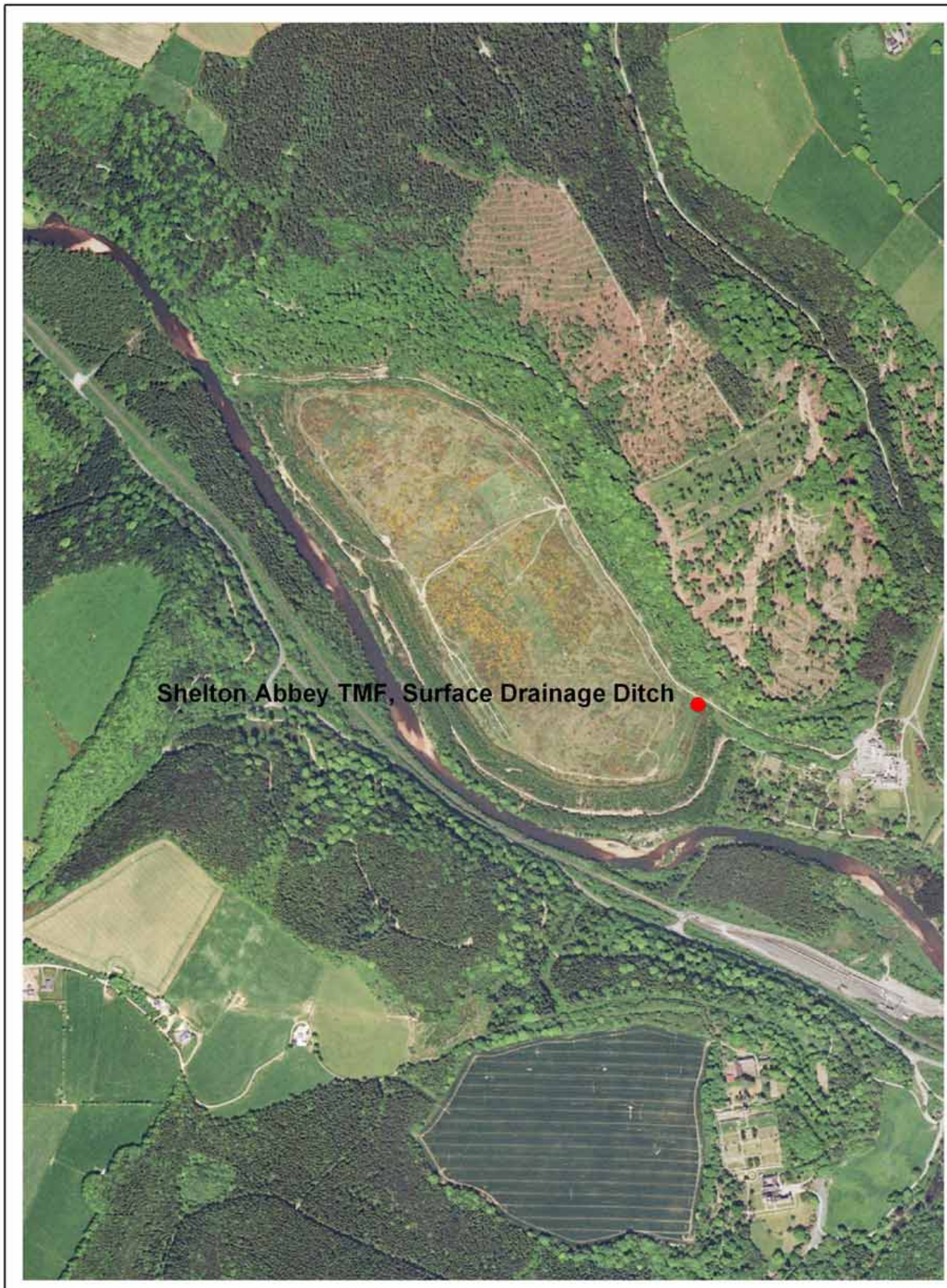


Fig 2-6c GSI Adit and Discharge Sample Locations- Shelton Abbey

Fig 3-1a CDM Sediment Sampling Locations - Mining Area

OSI Licence No - EN 0047 207

N

0 85 170 340 510

Meters

Fig 3-1b CDM Sediment Sampling Locations - Shelton Abbey

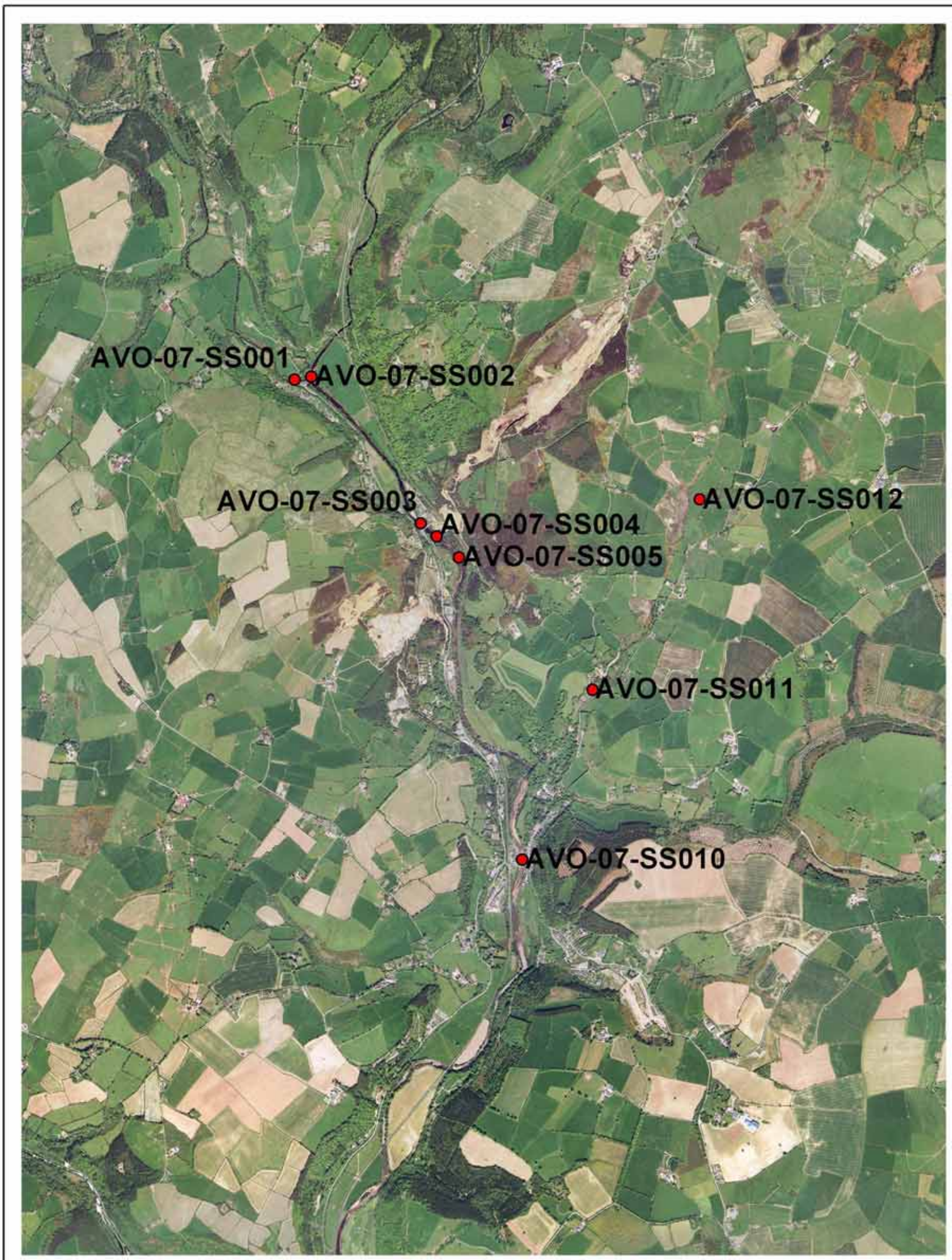
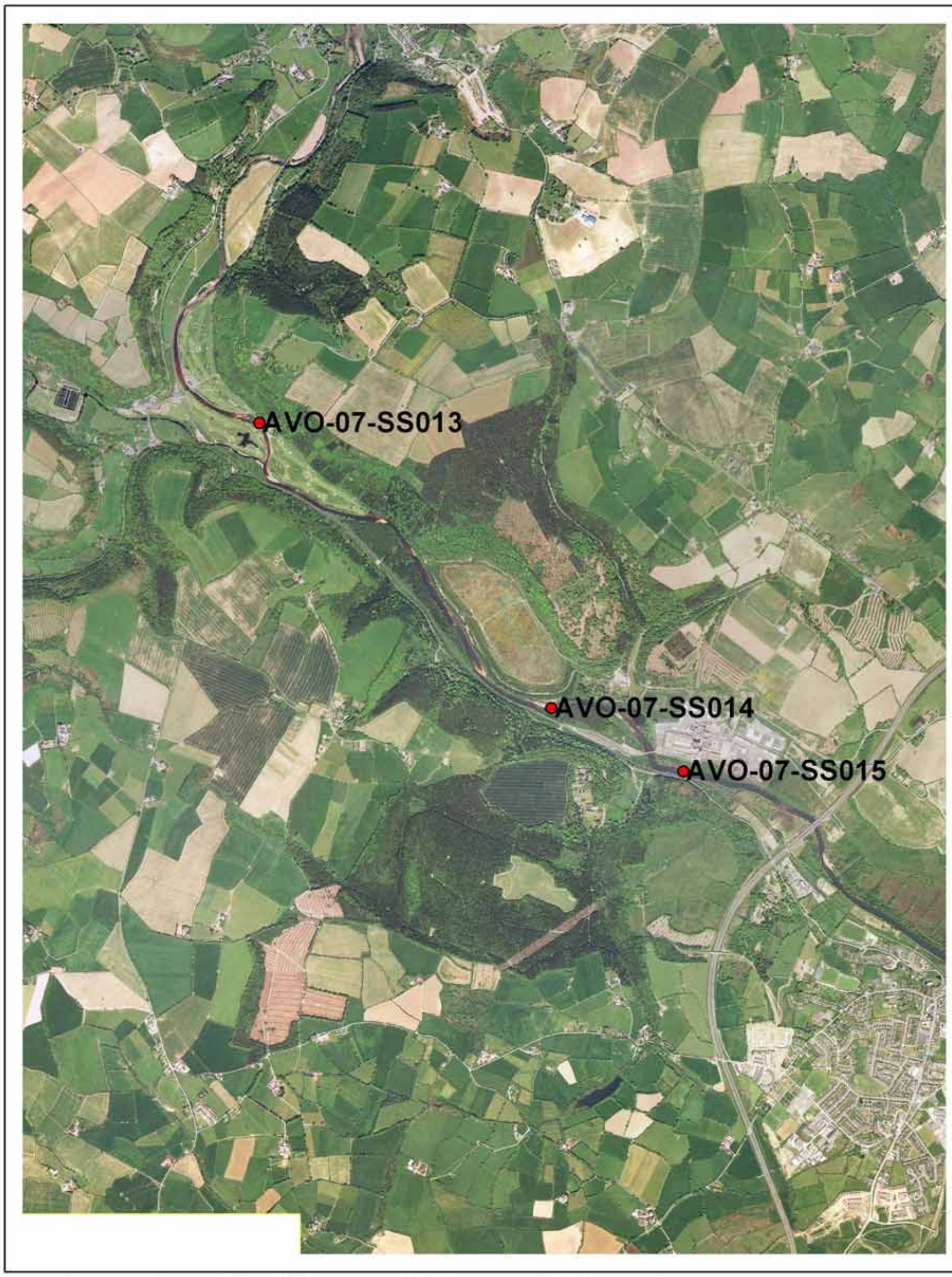


Fig 3-2a GSI Sediment Locations through Mining Area

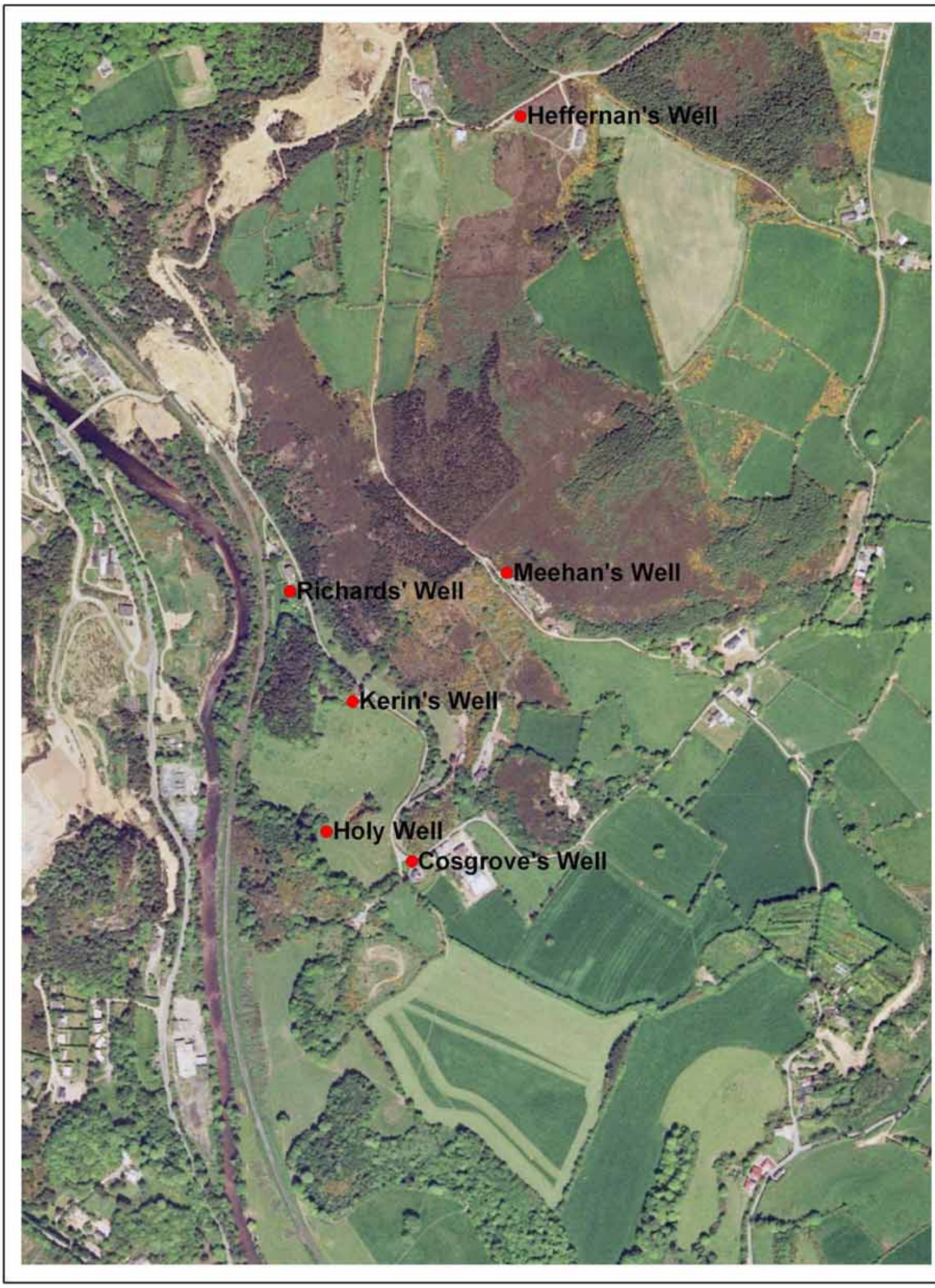


N

0 425 850 1,700 2,550
Meters

OSI Licence No - EN 0047 207

Fig 3-2b GSI Sediment Locations near Shelton Abbey



OSI Licence No - EN 0047 207

N

0 100 200 400 600 Meters

Fig 4-1a Homeowner Well Locations

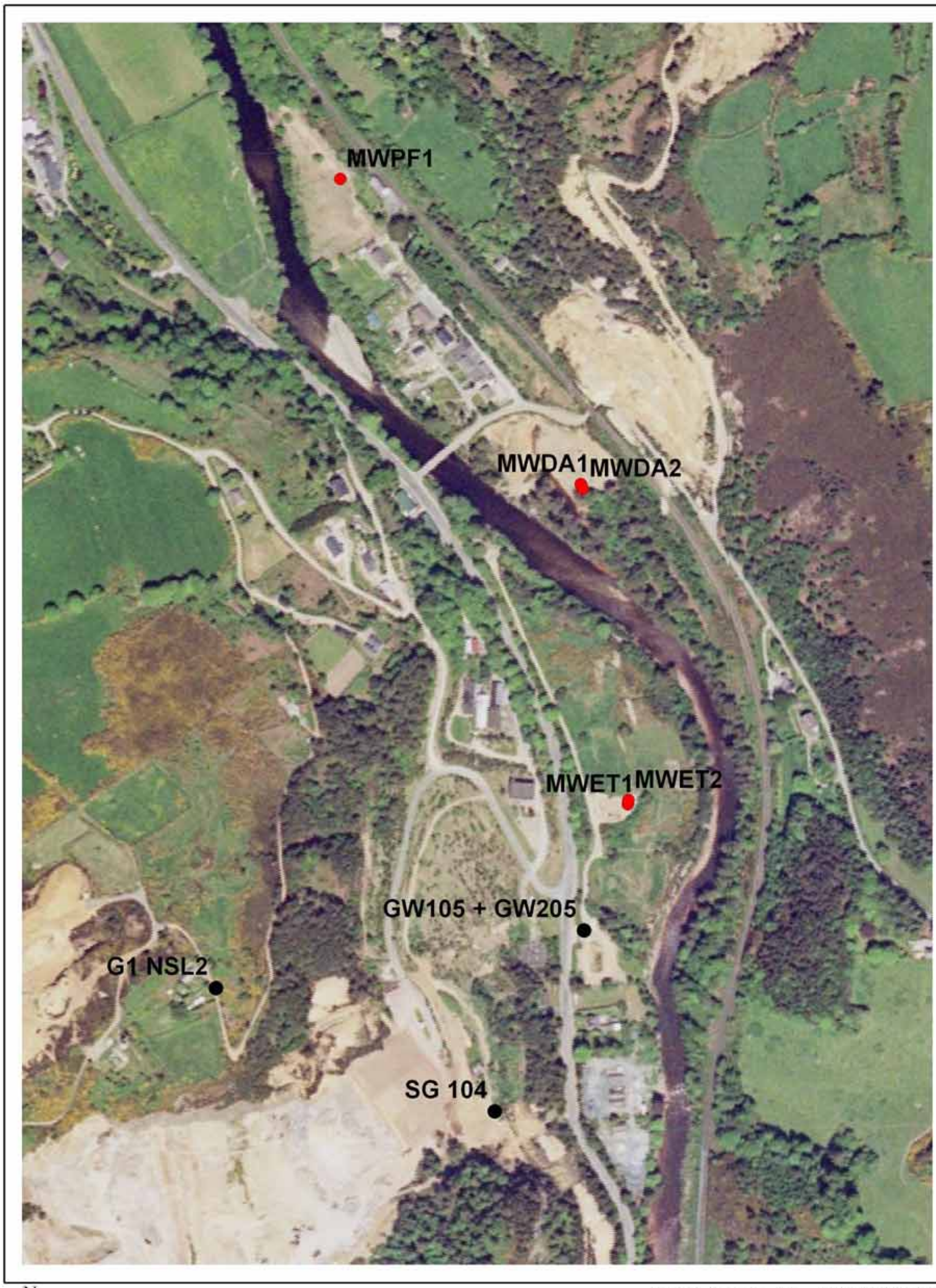
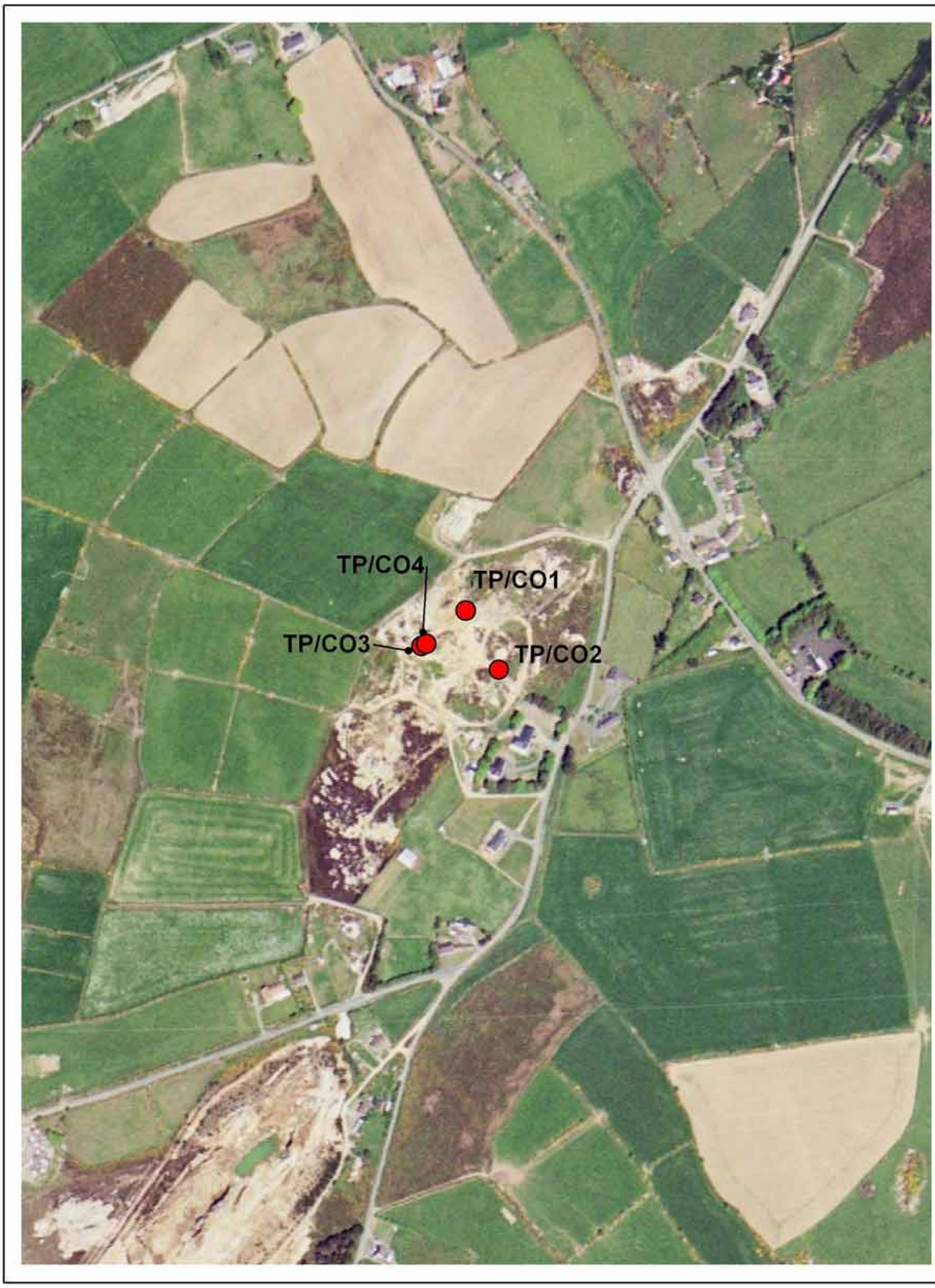


Fig 4-1b New Monitoring Wells and Co. Wicklow Well Locations

Fig 4-1c Shelton Abbey Monitoring Well Location

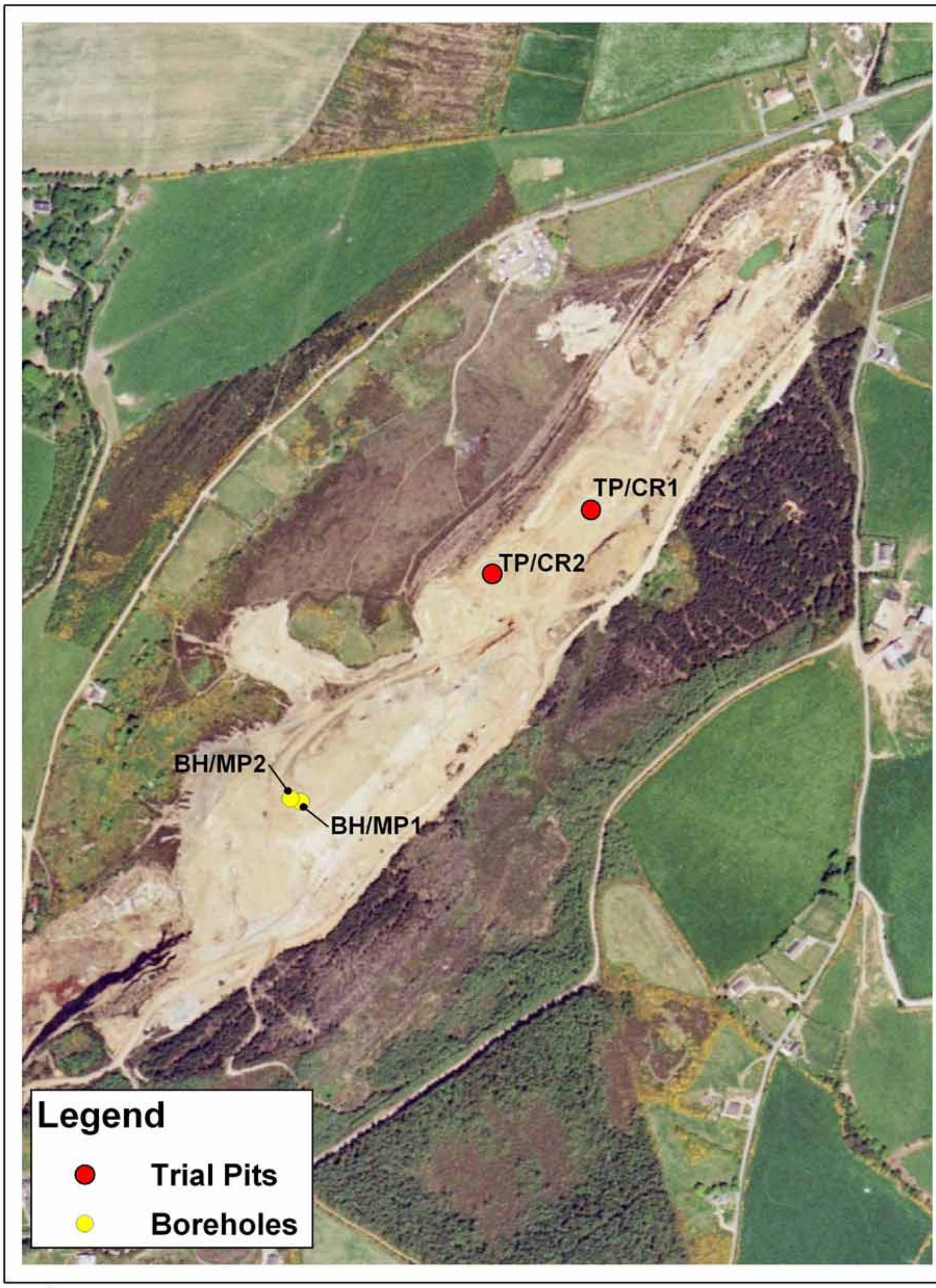


OSI Licence No - EN 0047 207

N

0 65 130 260 390
Meters

Fig 5-1a Location of Test Pits (Connary)



OSI Licence No - EN 0047 207

N

0 65 130 260 390 Meters

Fig 5-1b Location of Borings and Test Pits (Cronebane/Mt. Platt)

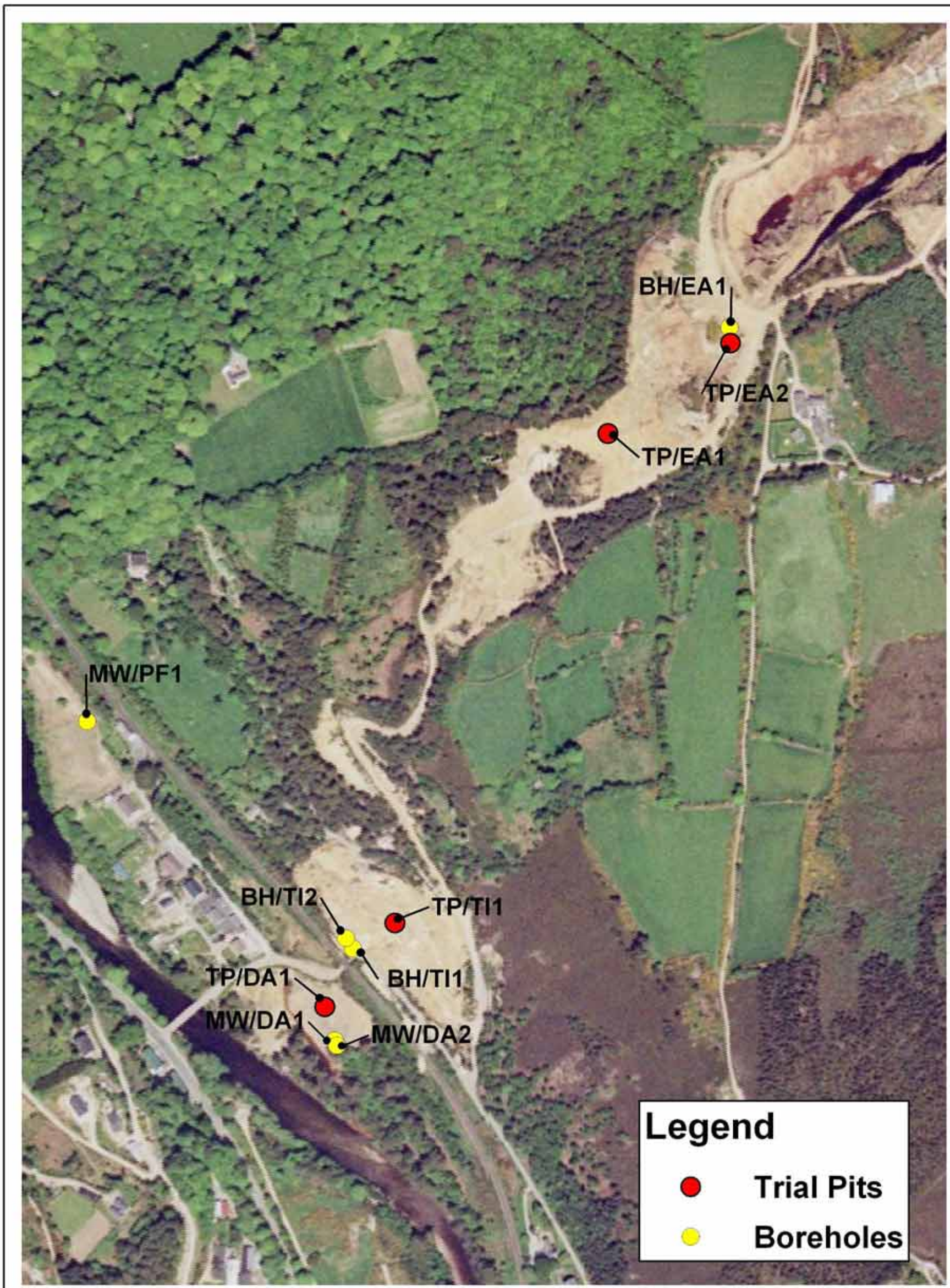
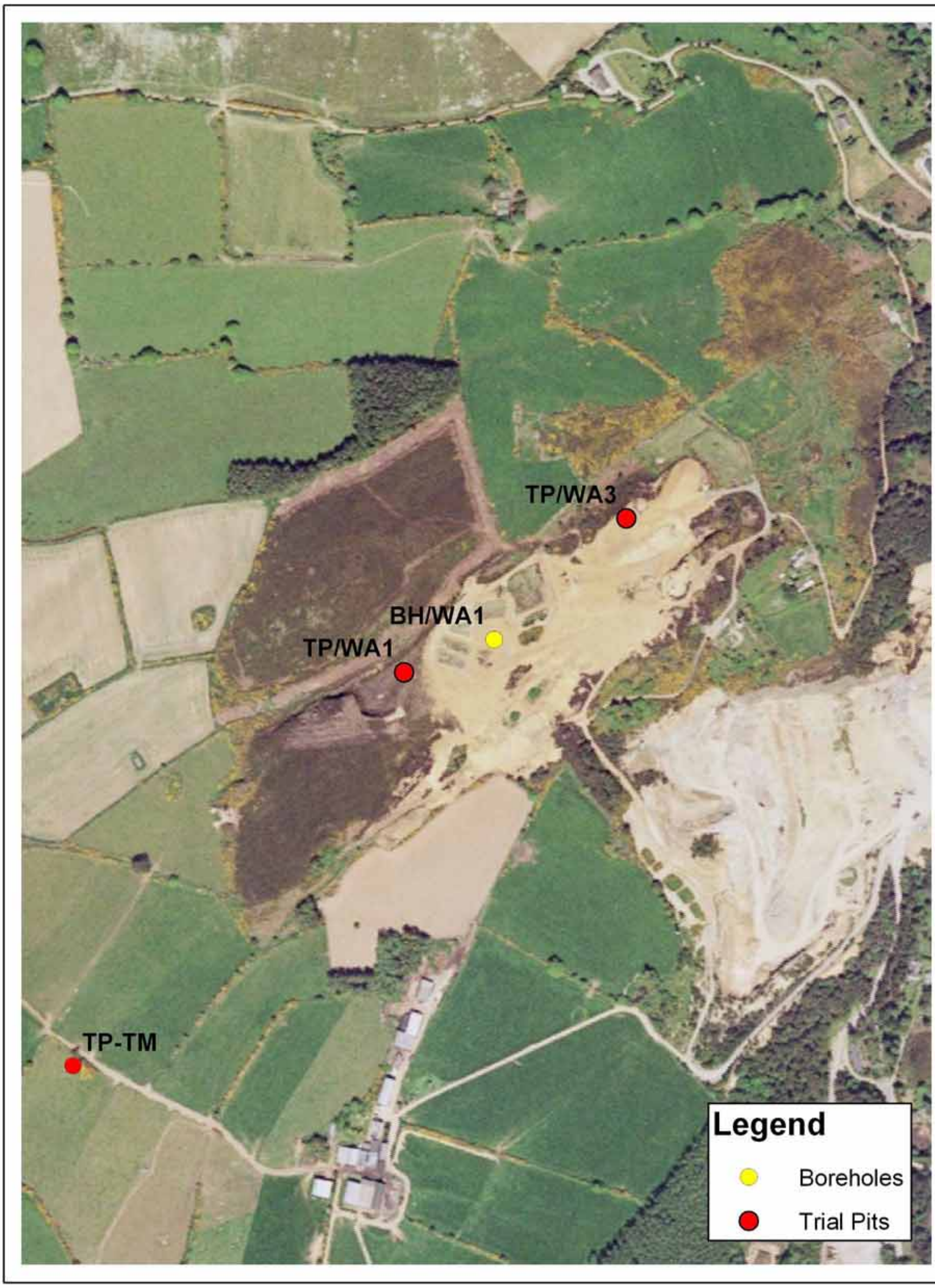


Fig 5-1c Location of Borings and Test Pits (East Avoca/Tigroney)

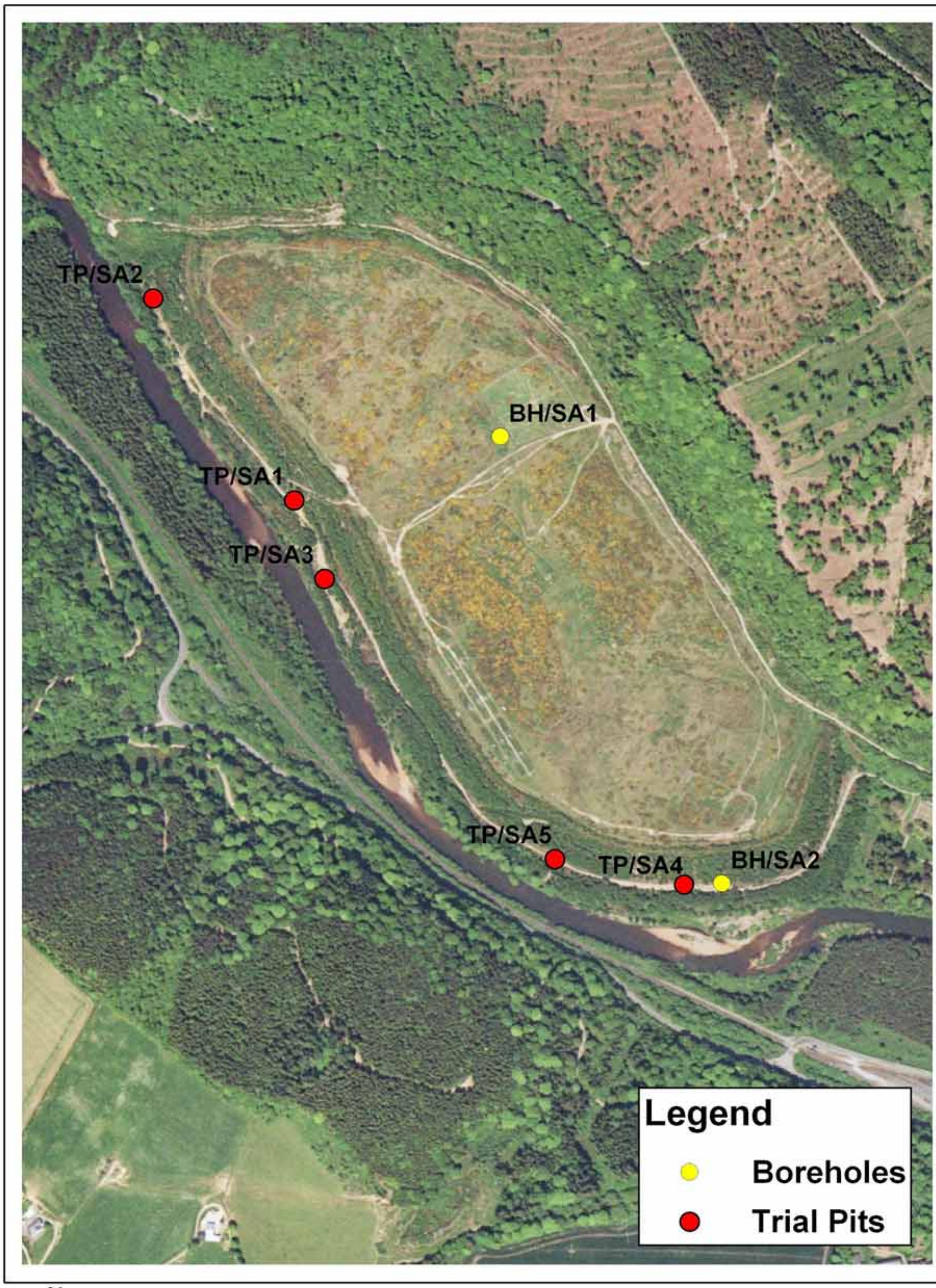


OSI Licence No - EN 0047 207

N

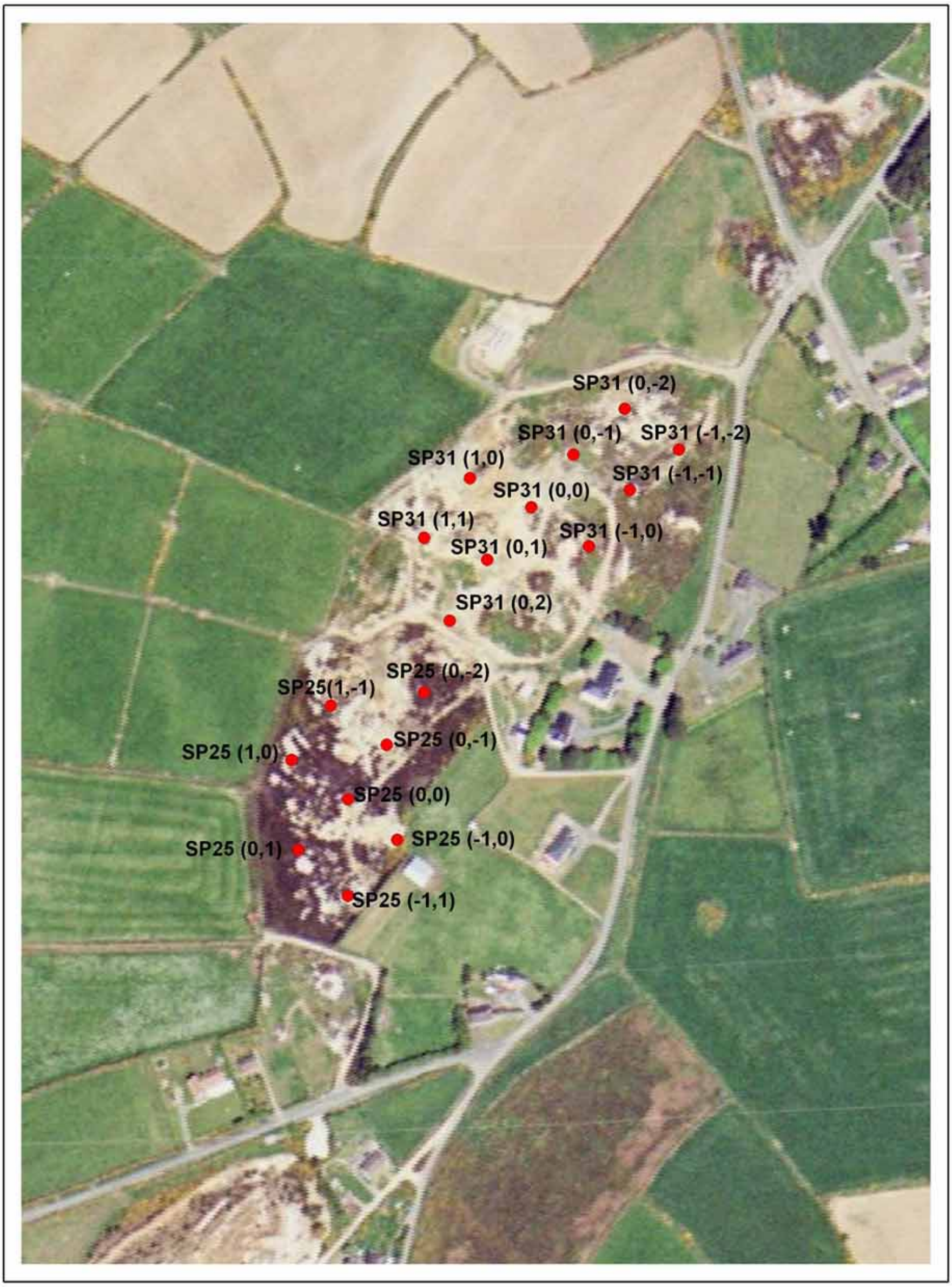
0 85 170 340 510 Meters

Fig 5-1d Location of Borings and Test Pits (Avoca West)



OSI Licence No - EN 0047 207

Fig 5-1e Location of Borings and Test Pits (Shelton Abbey)

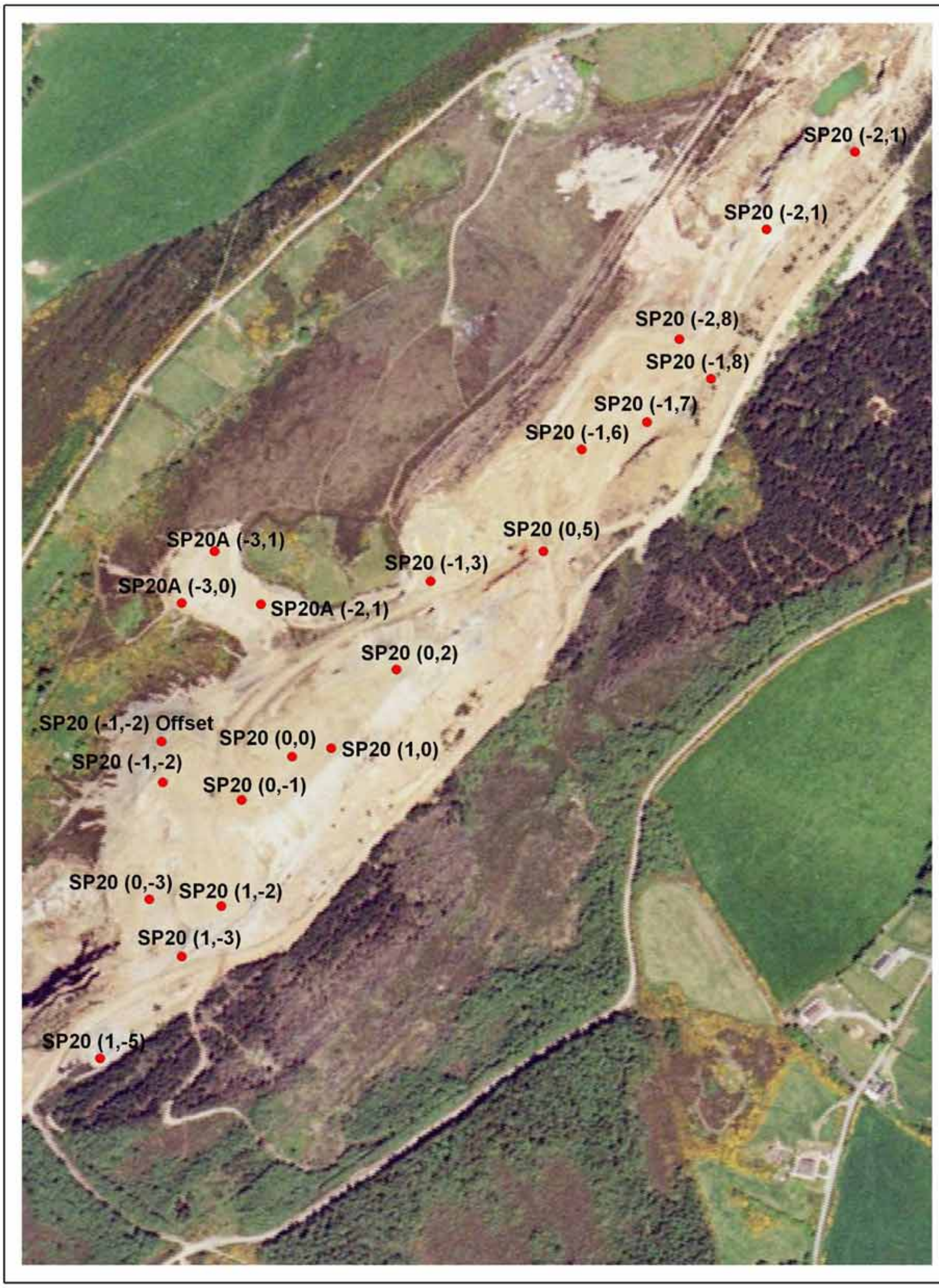


N

OSI Licence No - EN 0047 207

0 50 100 200 300 Meters

Fig 5-2a Location of Surface Spoils - Connary

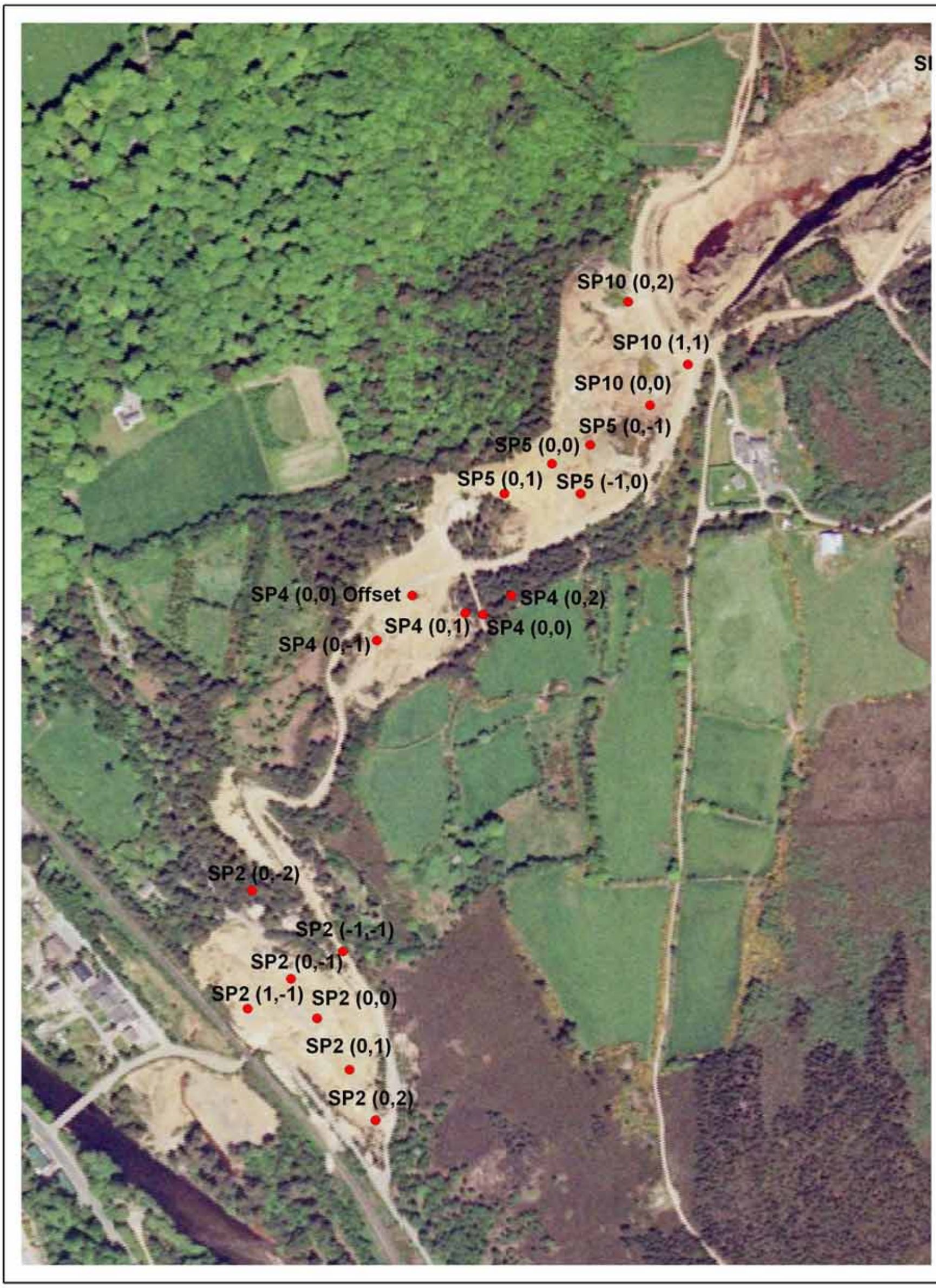


N

OSI Licence No - EN 0047 207

0 62.5 125 250 375 Meters

Fig 5-2b Location of Surface Spoils - Cronebane/Mt. Platt

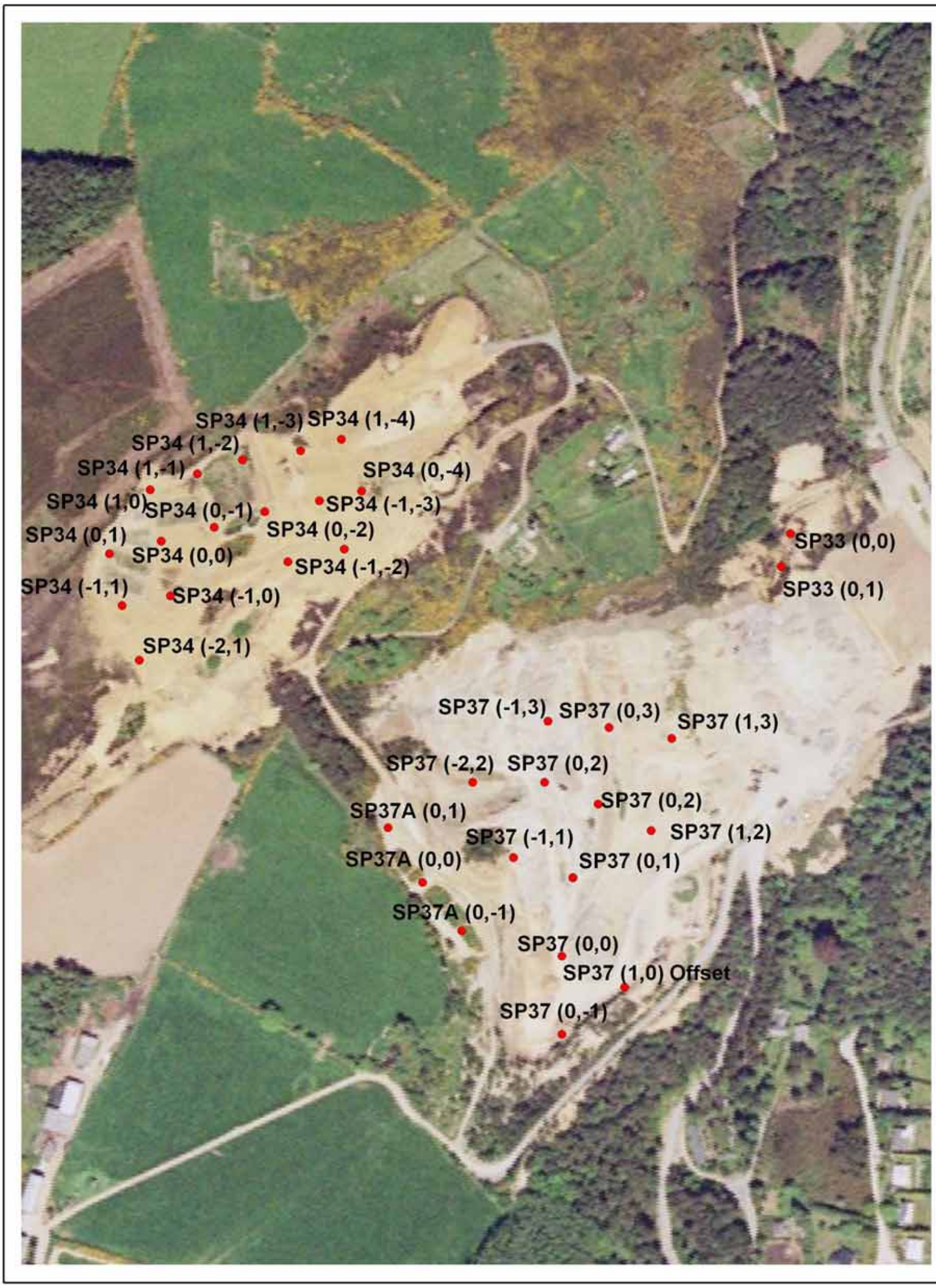


N

OSI Licence No - EN 0047 207

0 62.5 125 250 375 Meters

Fig 5-2c Location of Surface Spoils - East Avoca/Tigroney

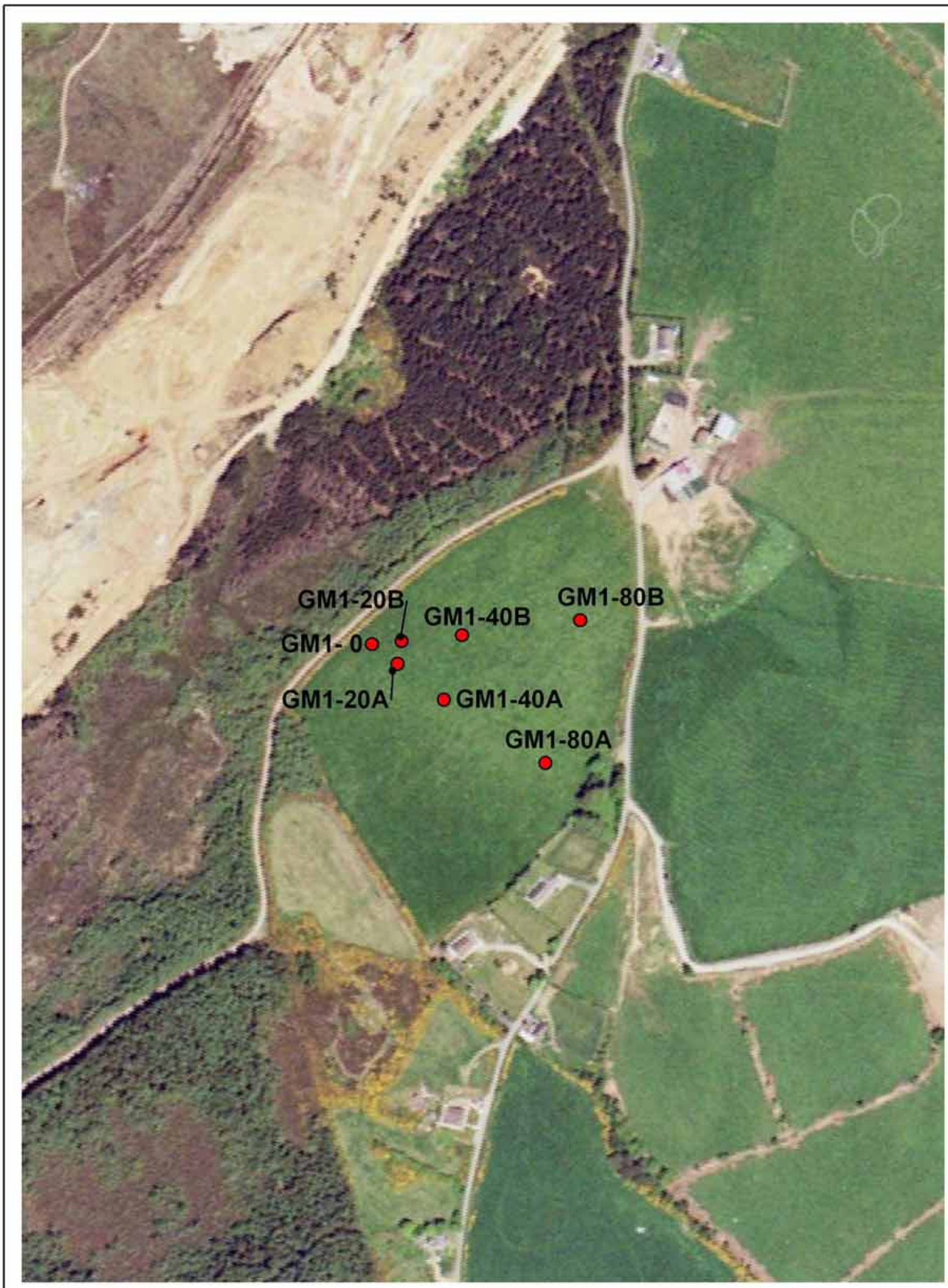


OSI Licence No - EN 0047 207

N

0 50 100 200 300 Meters

Fig 5-2d Location of Surface Spoils -Avoca West

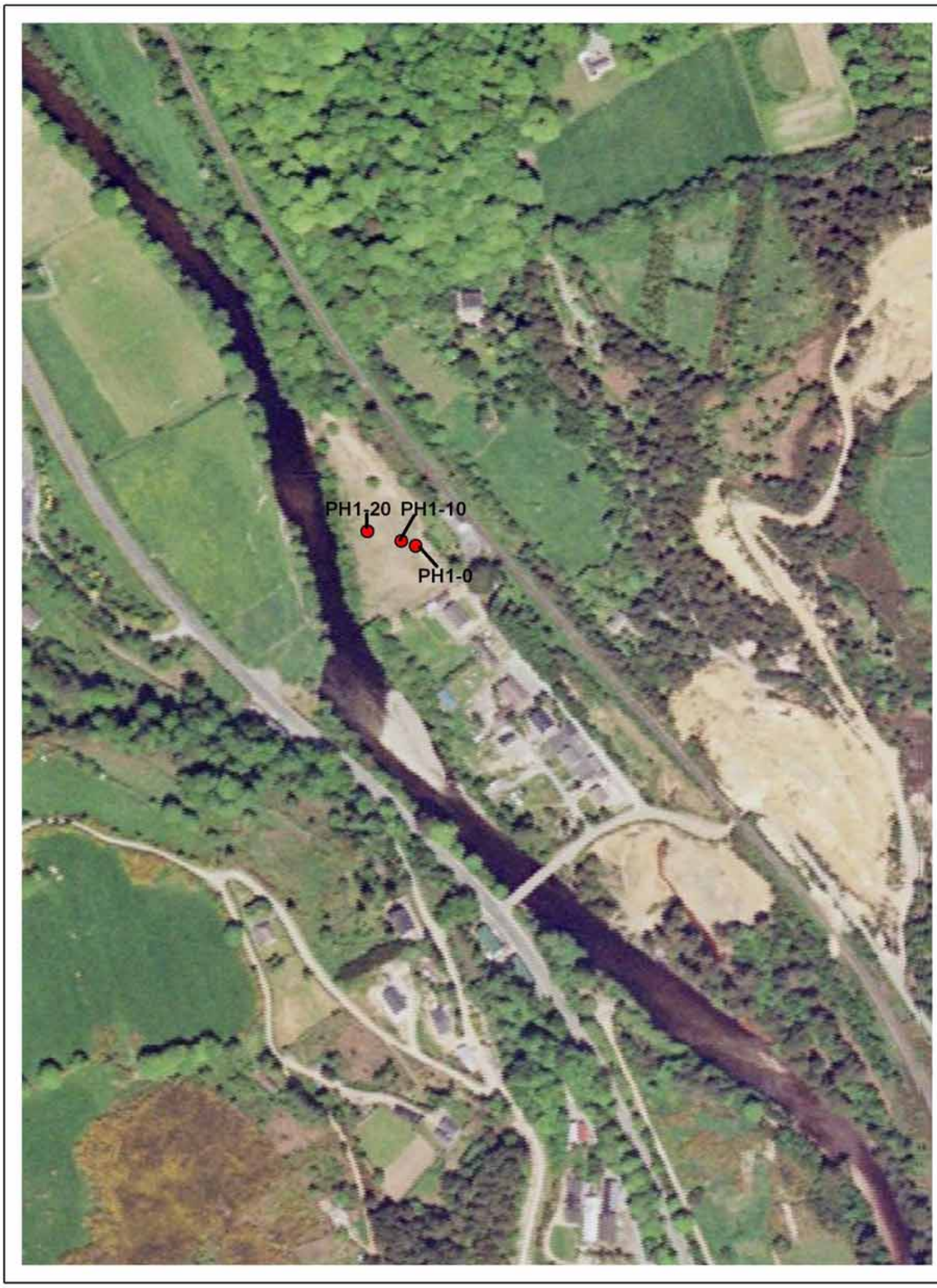


OSI Licence No - EN 0047 207

N

0 50 100 200 300 Meters

Fig 5-3a Location of Surface Soils (South of Cronebane)

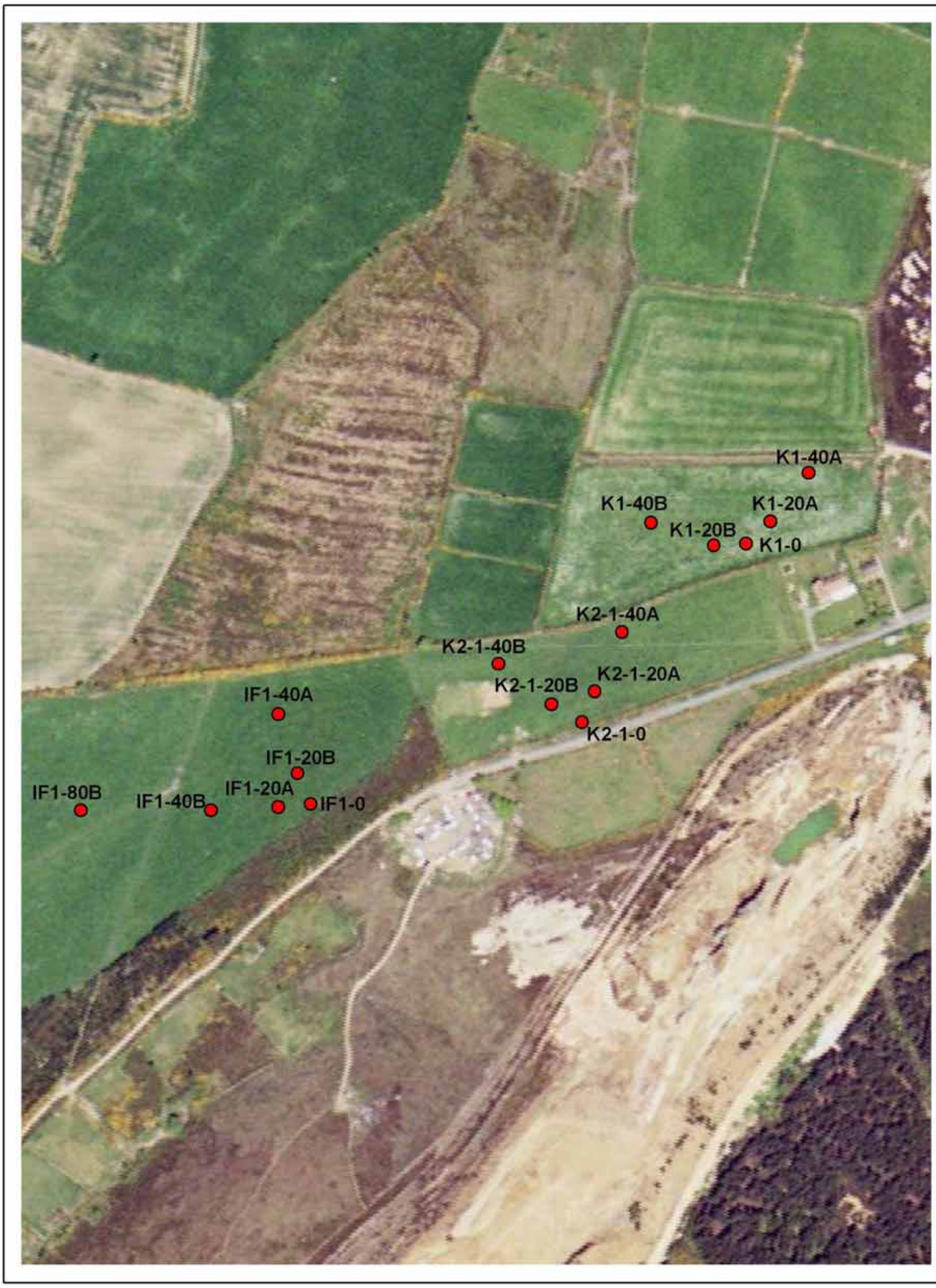


OSI Licence No - EN 0047 207

N

0 45 90 180 270
Meters

Fig 5-3b Location of Surface Soils (Paddy's Field)

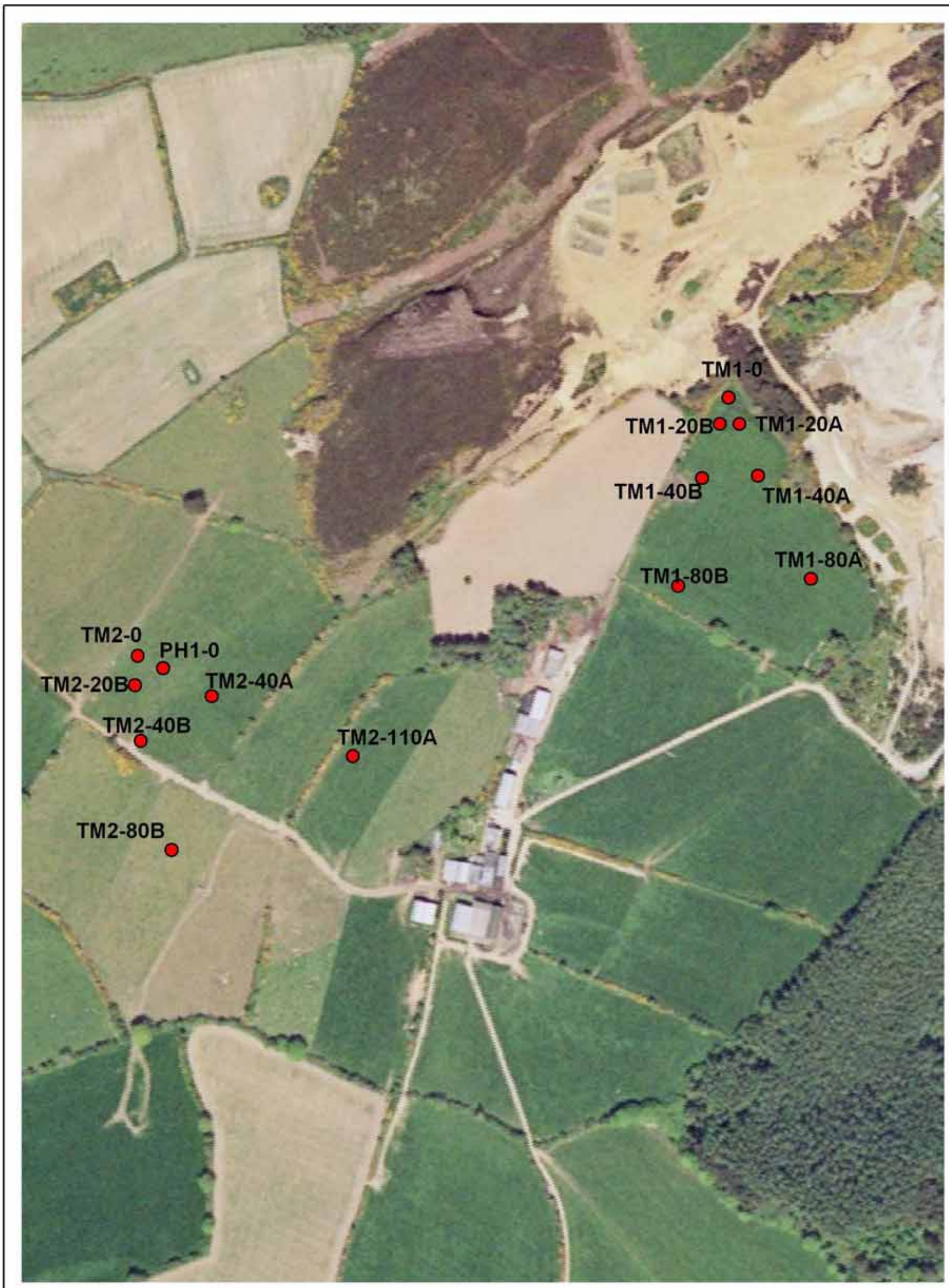


OSI Licence No - EN 0047 207

N

0 50 100 200 300 Meters

Fig 5-3c Location of Surface Soils (North Of Cronebane)

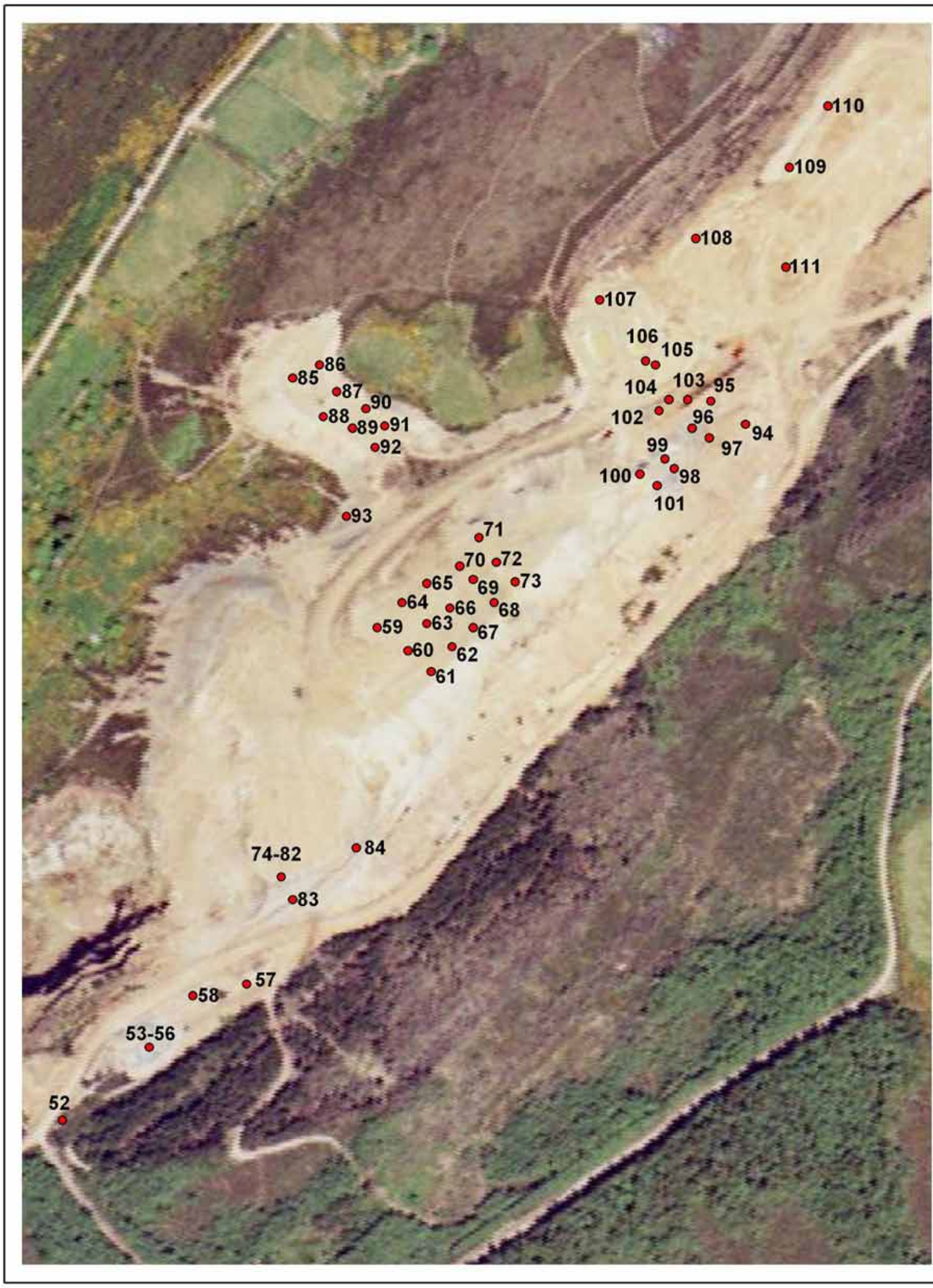


N

OSI Licence No - EN 0047 207

0 50 100 200 300 Meters

Fig 5-3d Location of Surface Soils (West Avoca)



OSI Licence No - EN 0047 207

N

0 35 70 140 210 Meters

Fig 5-4a GSI XRF Locations at Cronebane/Mt. Platt

OSI Licence No - EN 0047 207

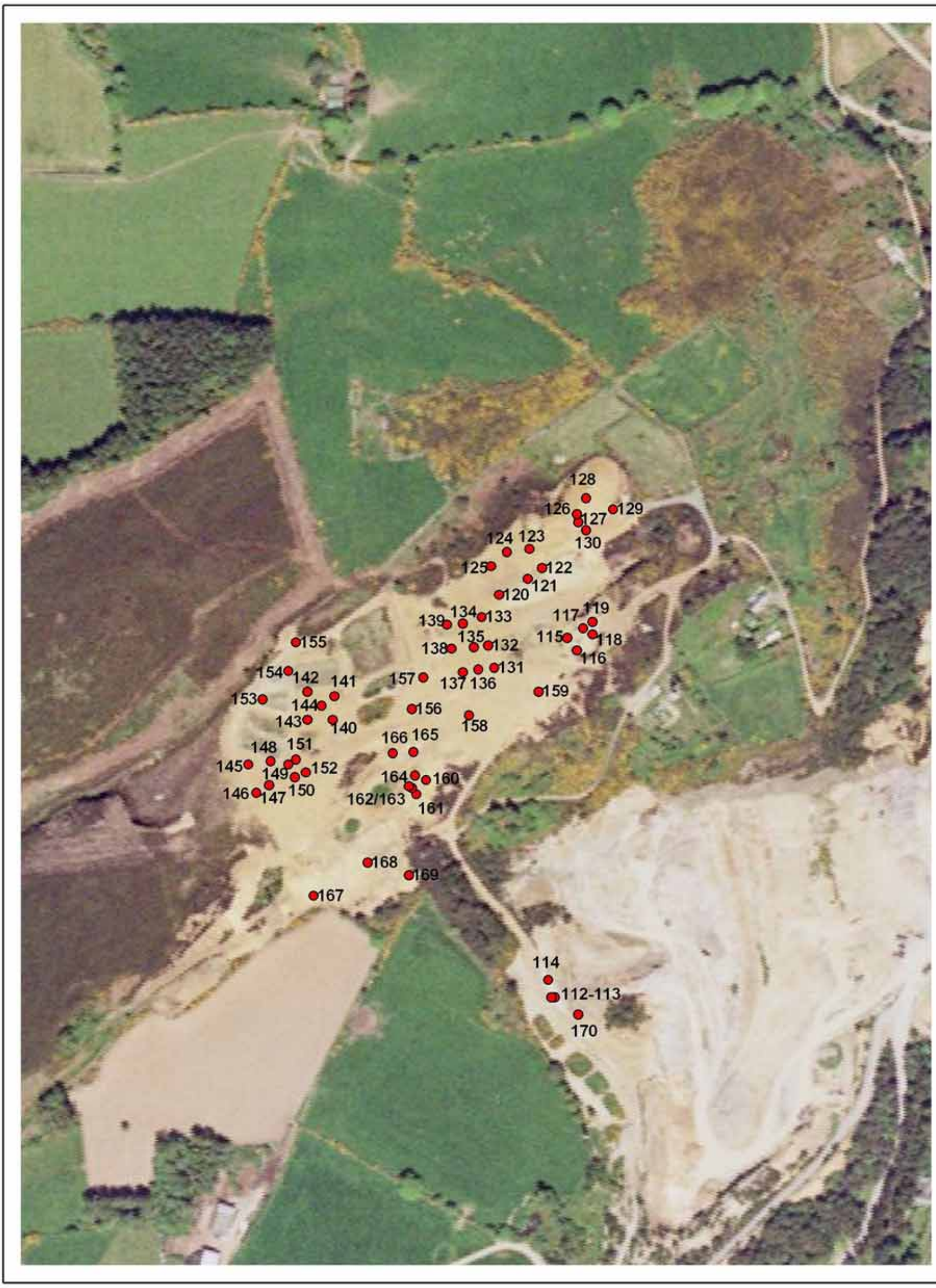
N

0 35 70 140 210 Meters

Fig 5-4b GSI XRF Locations at East Avoca/Tigroney

Fig 5-4c GSI XRF Locations at East Avoca near White's bridge

Fig 5-4d GSI XRF Locations near Emergency Tailings

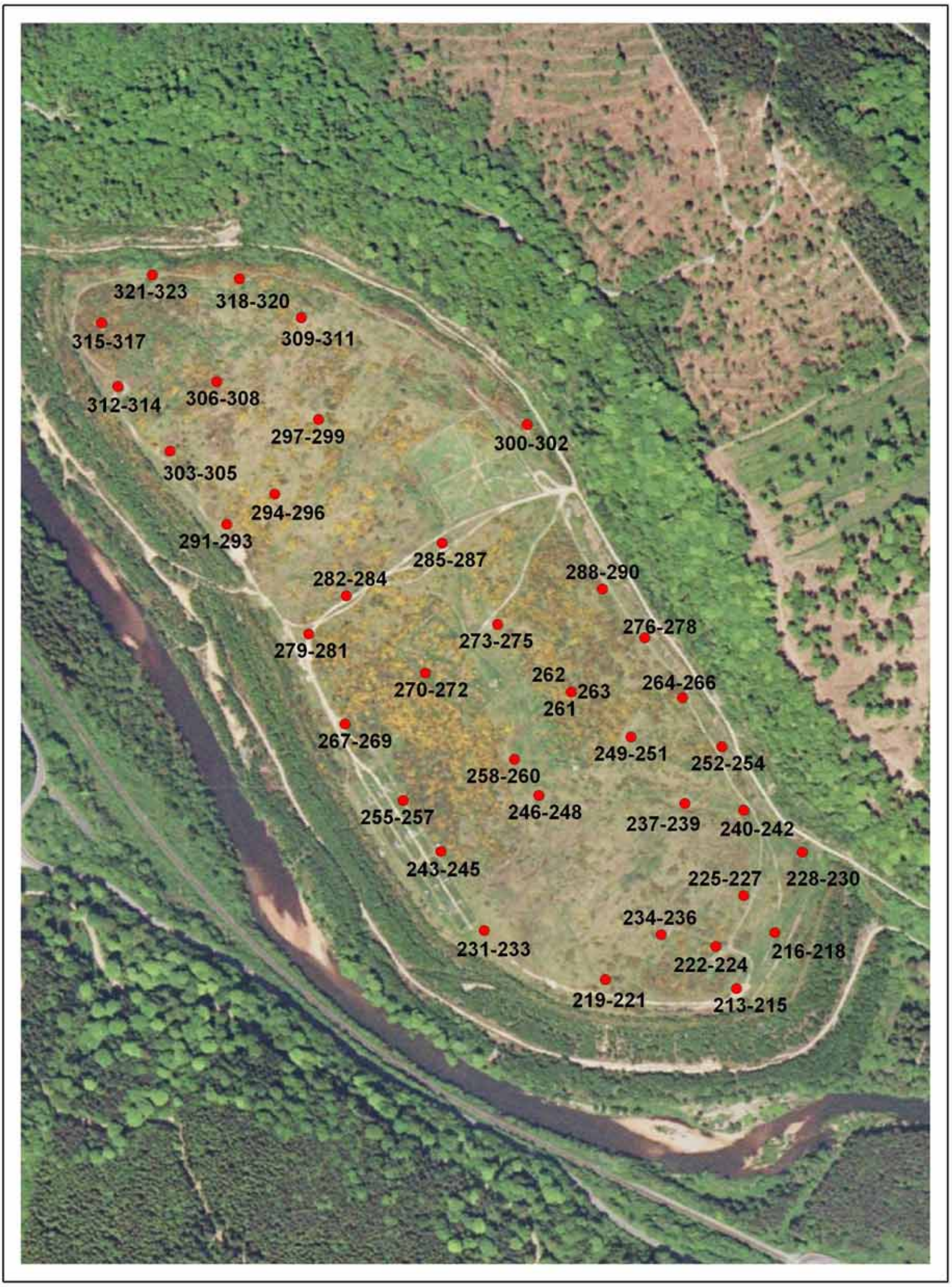


N

OSI Licence No - EN 0047 207

0 50 100 200 300 Meters

Fig 5-4e GSI XRF Locations at West Avoca



N

OSI Licence No - EN 0047 207

0 85 170 340 510 Meters

Fig 5-4f GSI XRF Locations at Shelton Abbey

Fig 6-1 Locations of Vegetation Samples

Table 2-1a. Measured Flows: Avoca River and Tributaries

Transects	7/30/2007		7/31/2007	
	Flow (m3/s)	% Change	Flow (m3/s)	% Change
1	5.86			
2	6.95	18.8%	5.83	
5			5.01	-14.2%
3	5.73	-17.6%		
4	5.87	2.5%		

Tributaries	7/30/2007 Flow (m3/s)	
Red Road	0.020	*between T3 and T4*
UnknownTrib (Avoca Handweavers)	0.119	*between T3 and T4*
ValeView	0.021	*between T1 and T2*
Sulfur Brook	0.115	*between T3 and T4*

Table 2-1b. Avoca River Gage Elevations

Date	Measured Gage Height	Water Elevation at Gage
	m	m
30/07/2007	0.597	24.119
31/07/2007	0.573	24.095
27/09/2007	0.52	24.042
18/12/2007	0.623	24.145
20/12/2007	0.601	24.123
21/12/2007	0.588	24.11
02/01/2008	0.65	24.172
03/01/2008	0.635	24.157
10/01/2008	1.7	25.222
11/01/2008	1.2	24.722
14/01/2008	1.3	24.822
16/01/2008	1.05	24.572
17/01/2008	1.2	24.722
18/01/2008	1.25	24.772
23/01/2008	1.05	24.572
25/01/2008	1.02	24.542

Gage elevation: 23.522

Note: Data only included for dates with corresponding field measurements

Table 2-2. Analytical Data: Avoca River and Tributaries

Metals	Date	X	Y	Dissolved Aluminium Low Level		Total Aluminium Low Level		Dissolved Antimony Low Level		Total Antimony Low Level		Dissolved Arsenic Low Level		Total Arsenic Low Level		Dissolved Barium Low Level		Total Barium Low Level		Dissolved Cadmium Low Level	
Sample I.D.				ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
T1	30/07/2007 13:10	319239	182805	100.00		165.00		1.00	U	1.00	U	1.00	U	1.00	U	7.00		35.00		0.40	U
T2-Comp	30/07/2007 15:30	319119	182914	197.00		423.00		1.00	U	1.00	U	1.00	U	1.00	U	7.00		40.00		0.40	U
T2-Grab	30/07/2007 16:10	319119	182914	164.00		801.00		1.00	U	1.00	U	1.00	U	1.00	U	54.00		29.00		2.50	
T3	30/07/2007 17:00	319992	180907	210.00		574.00		1.00	U	1.00	U	1.00	U	1.00	U	31.00		37.00		0.70	
T4	30/07/2007 19:00	320350	179844	313.00		487.00		1.00	U	1.00	U	1.00	U	1.00	U	11.00		37.00		0.80	
T5	31/07/2007 18:15	319972	181114	208.00		1146.00		1.00	U	1.00	U	1.00	U	1.00		6.00		37.00		0.60	
T5	21/02/2008 10:30	319972	181114	2.00	U	60.00		1.00	U	50.00	U	1.00	U	50.00	U	2.00		50.00	U	0.40	U
Vale View	31/07/2007 10:15	319453	182396	13.00		119.00		1.00	U	1.00	U	1.00	U	1.00		12.00		39.00		0.40	U
Sulfur Brook	31/07/2007 11:45	320491	180470	2.00		160.00		1.00	U	1.00	U	1.00		1.00	U	1.00	U	35.00		0.40	U
Unknown Trib	31/07/2007 12:25	320489	180423	15.00		89.00		1.00	U	1.00	U	1.00	U	1.00	U	4.00		31.00		0.40	U
Ballinacleish Bridge	02/08/2007 09:39	317197	185010	71.00		145.00		1.00	U	1.00	U	1.00	U	1.00		9.00		32.00		0.40	U
Avoca U/S Aughrim	02/08/2007 10:00	319790	176823	69.00		446.00		1.00	U	1.00	U	1.00	U	1.00	U	7.00		36.00		0.60	
Shelton Abbey Upstream	02/08/2007 10:27	320838	175991	119.00		3095.00		1.00	U	1.00	U	1.00	U	1.00		38.00		42.00		0.40	U
Avoca D/S Aughrim	02/08/2007 10:40	319972	176579	110.00		395.00		1.00	U	1.00	U	1.00	U	1.00	U	7.00		36.00		0.60	
D/S Fertilizer Plant	02/08/2007 12:25	322956	174669	91.00		363.00		1.00	U	1.00	U	1.00	U	1.00	U	10.00		33.00		0.50	
D/S Landfill	02/08/2007 13:10	323322	174325	62.00		323.00		1.00	U	1.00	U	1.00	U	1.00	U	7.00		34.00		0.40	U
Shelton Abbey Downgradient	02/08/2007 14:22	321939	175213	133.00		3717.00		1.00	U	2.00		1.00	U	1.00		37.00		35.00		0.50	
Arklow Bridge	02/08/2007 16:20	324700	324700	124.00		315.00		1.00	U	1.00	U	1.00		1.00	U	41.00		37.00		0.50	
Lions Bridge	02/08/2007 18:28	319207	183287	59.00		190.00		1.00	U	1.00	U	1.00	U	1.00	U	7.00		34.00		0.40	U
Arklow LB	03/08/2007 08:05	325409	172990	59.00		361.00		1.00	U	1.00	U	6.00		6.00		7.00		32.00		0.40	U
Arklow RB	03/08/2007 12:19	325392	172919	101.00		311.00		1.00	U	1.00	U	4.00		4.00		7.00		39.00		0.40	U
Red Road	31/07/2007 14:20	319977	180742	2.00	U	152.00		1.00	U	1.00		1.00		1.00		1.00	U	41.00		0.40	U
Red Road	14/11/2007 16:30	319977	180742	118400.00				1.00				1.00	U			11.00				13.10	
Red Road	19/02/2008 14:43	319977	180742	2.00	U	50.00	U	1.00	U	60.00		1.00	U	50.00	U	23.00		50.00	U	0.40	

General Chemistry Parameters	Date	X	Y	Acidity		Ammonia		Chloride		Nitrate		Nitrite		Phosphorus (React)		Sulphate		Suspended Solids		Total Organic Carbon	
Sample I.D.				mg CaCO3/l		mg/l as N		mg/l		mg/l as N		mg/l as N		mg/l as P		mg/l		mg/l		mg/l	
T1	30/07/2007 13:10	319239	182805	2.00		0.30	U	8.00		1.05		0.01		0.01	U	5.00		10.00	U	5.00	
T2-Comp	30/07/2007 15:30	319119	182914	4.00		0.03		8.00		0.98		0.01		0.01		9.00		10.00	U	4.70	
T2-Grab	30/07/2007 16:10	319119	182914	6.00		0.06		8.00		0.96		0.01	U	0.01	U	23.00		10.00	U	1.00	
T3	30/07/2007 17:00	319992	180907	3.00		0.05		8.00		0.99		0.01	U	0.01	U	12.00		10.00	U	4.50	
T4	30/07/2007 19:00	320350	179844	2.00		0.04		10.00		0.85		0.01		0.01	U	14.00		10.00	U	4.50	
T5	31/07/2007 18:15	319972	181114	4.00		0.05		9.00		0.99		0.01	U	0.01		31.00		10.00	U	3.60	
T5	21/02/2008 10:30	319972	181114	4.00		0.16		10.00		1.46		0.02		0.01	U	24.00		10.00	U	1.90	
Vale View	31/07/2007 10:15	319453	182396	2.00		0.02		13.00		0.37	U	0.02		0.01		16.00		10.00	U	2.30	
Sulfur Brook	31/07/2007 11:45	320491	180470	5.00		0.01		15.00		5.49		0.01	U	0.01		14.00		15.00		0.80	
Unknown Trib	31/07/2007 12:25	320489	180423	2.00		0.02		16.00		1.95		0.01	U	0.03		9.00		11.00		1.20	
Ballinacleish Bridge	02/08/2007 09:39	317197	185010	2.00		0.30	U	16.00		1.68		0.01	U	0.01	U	8.00		10.00	U	2.00	
Avoca U/S Aughrim	02/08/2007 10:00	319790	176823	3.00		0.30	U	9.00		0.37	U	0.04		0.01	U	16.00		10.00	U	3.30	
Shelton Abbey Upstream	02/08/2007 10:27	320838	175991	2.00		0.30	U	11.00		2.13		0.01		0.01	U	14.00		10.00	U	2.70	
Avoca D/S Aughrim	02/08/2007 10:40	319972	176579	2.00		0.30	U	10.00		2.69		0.01		0.01	U	13.00		10.00		5.40	
D/S Fertilizer Plant	02/08/2007 12:25	322956	174669	3.00		0.30	U	15.00		1.09		0.04		0.01	U	18.00		10.00		2.50	
D/S Landfill	02/08/2007 13:10	323322	174325	2.00		0.30	U	10.00		4.09		0.01		0.01	U	16.00		10.00	U	2.70	
Shelton Abbey Downgradient	02/08/2007 14:22	321939	175213	2.00		1.30		11.00		2.11		0.01		0.01	U	15.00		10.00	U	2.50	
Arklow Bridge	02/08/2007 16:20	324700	324700	2.00		0.30	U	11.00		2.42		0.01		0.01	U	15.00		10.00	U	2.80	
Lions Bridge	02/08/2007 18:28	319207	183287	2.00		0.30	U	9.00		2.21		0.01		0.01	U	5.00		10.00	U	5.00	
Arklow LB	03/08/2007 08:05	325409	172990	4.00		0.30	U	2441.00		2.26		0.01		0.01	U	344.00		11.00		1.80	
Arklow RB	03/08/2007 12:19	325392	172919	3.00		0.30	U	1231.00		2.33		0.01		0.01	U	212.00		10.00	U	2.30	
Red Road	31/07/2007 14:20	319977	180742	3.00		0.04		13.00		4.99		0.01	U	0.01	U	29.00		10.00	U	0.50	
Red Road	14/11/2007 16:30	319977	180742	4.00		0.03		14.00		6.05		0.01		0.01	U	13.00		10.00	U	0.90	
Red Road	19/02/2008 14:43	319977	180742	3.00		0.06		18.00		15.35		0.01	U	0.01	U	97.00		10.00	U	0.80	U

Notes: U = below detection limit; U/S = up stream; D/S = down stream; LB = left bank (looking downstream); RB = right bank (looking downstream)

Table 2-2. Analytical Data: Avoca River and Tributaries

Metals		Total Cadmium Low Level		Dissolved Calcium Low Level		Total Calcium Low Level		Dissolved Chromium Low Level		Total Chromium Low Level		Dissolved Cobalt Low Level		Total Cobalt Low Level		Dissolved Copper Low Level		Total Copper Low Level		Dissolved Iron Low Level		Total Iron Low Level	
Sample I.D.	Date	ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
T1	30/07/2007 13:10	1.00	U	4621.00		26720.00		1.00	U	5.00		1.00	U	1.00	U	8.00		37.00		99.00		521.00	
T2-Comp	30/07/2007 15:30	1.00	U	4700.00		25790.00		1.00	U	3.00		1.00	U	1.00	U	12.00		43.00		162.00		589.00	
T2-Grab	30/07/2007 16:10	2.00		5241.00		22920.00		1.00	U	3.00		2.00		2.00		21.00		53.00		610.00		410.00	
T3	30/07/2007 17:00	1.00	U	5143.00		26250.00		1.00	U	3.00		1.00		1.00		16.00		51.00		302.00		960.00	
T4	30/07/2007 19:00	1.00	U	5498.00		30040.00		1.00	U	4.00		1.00		1.00		15.00		55.00		250.00		1028.00	
T5	31/07/2007 18:15	1.00	U	5487.00		27510.00		1.00	U	6.00		2.00		2.00		24.00		52.00		403.00		1073.00	
T5	21/02/2008 10:30	50.00	U	2466.00		9220.00		1.00	U	50.00	U	1.00	U	50.00	U	5.00		50.00	U	2.00	U	50.00	U
Vale View	31/07/2007 10:15	1.00	U	17990.00		42040.00		1.00	U	6.00		1.00	U	1.00	U	2.00		38.00		7.00		445.00	
Sulfur Brook	31/07/2007 11:45	1.00	U	120.00	U	28350.00		1.00		3.00		1.00	U	1.00	U	1.00	U	63.00		2.00	U	330.00	
Unknown Trib	31/07/2007 12:25	1.00	U	10330.00		30270.00		1.00	U	6.00		1.00	U	1.00	U	1.00		40.00		31.00		465.00	
Ballinacleish Bridge	02/08/2007 09:39	1.00	U	4593.00		21880.00		1.00	U	3.00		1.00	U	1.00	U	1.00	U	31.00		15.00		405.00	
Avoca U/S Aughrim	02/08/2007 10:00	1.00	U	9339.00		27750.00		1.00	U	6.00		1.00		1.00		10.00		48.00		65.00		789.00	
Shelton Abbey Upstream	02/08/2007 10:27	1.00	U	6724.00		29100.00		1.00	U	5.00		1.00	U	1.00	U	8.00		53.00		125.00		780.00	
Avoca D/S Aughrim	02/08/2007 10:40	1.00	U	7159.00		28220.00		1.00	U	6.00		1.00		1.00	U	9.00		47.00		110.00		699.00	
D/S Fertilizer Plant	02/08/2007 12:25	1.00	U	8550.00		26120.00		1.00	U	3.00		1.00	U	1.00	U	11.00		43.00		84.00		670.00	
D/S Landfill	02/08/2007 13:10	1.00	U	7820.00		26570.00		1.00	U	2.00		1.00	U	1.00	U	7.00		38.00		58.00		610.00	
Shelton Abbey Downgradient	02/08/2007 14:22	1.00	U	7433.00		28610.00		1.00	U	3.00		1.00		1.00	U	10.00		45.00		154.00		776.00	
Arklow Bridge	02/08/2007 16:20	1.00	U	7925.00		30800.00		1.00	U	4.00		1.00		1.00	U	7.00		47.00		137.00		707.00	
Lions Bridge	02/08/2007 18:28	1.00	U	8162.00		24750.00		1.00	U	3.00		1.00	U	1.00	U	4.00		45.00		72.00		477.00	
Arklow LB	03/08/2007 08:05	1.00	U	61460.00		74200.00		1.00	U	5.00		1.00	U	1.00		2.00		35.00		19.00		677.00	
Arklow RB	03/08/2007 12:19	1.00	U	38360.00		58170.00		1.00	U	4.00		1.00		1.00	U	2.00		43.00		17.00		627.00	
Red Road	31/07/2007 14:20	1.00	U	120.00	U	32240.00		1.00		6.00		1.00	U	2.00		1.00	U	43.00		2.00	U	623.00	
Red Road	14/11/2007 16:30			3699.00				1.00	U			20.00				31950.00				951.00			
Red Road	19/02/2008 14:43	50.00	U	10470.00		12880.00		1.00	U	50.00	U	1.00	U	50.00	U	25.00		70.00		2.00	U	50.00	U

General Chemistry Parameters		Total Organic Nitrogen		Total Alkalinity		Total Dissolved Solids (180°C)		Total Kjeldahl Nitrogen		Total Phosphorus		Sodium		Sodium Unfiltered		Potassium		Potassium Unfiltered	
Sample I.D.	Date	mg/l as N		mgCaCO3/l		mg/l		mg/l as N		mg P/l		mg/l		mg/l		mg/l		mg/l	
T1	30/07/2007 13:10	1.05		10.00	U	162.00		1.70		0.01		6.00		5.50		0.60		0.60	
T2-Comp	30/07/2007 15:30	0.98		10.00	U	20.00		0.50		0.01		6.00		5.50		0.60		0.70	
T2-Grab	30/07/2007 16:10	0.97		10.00	U	356.00		0.50	U	0.02		6.00		6.00		0.70		0.70	
T3	30/07/2007 17:00	1.00		10.00	U	242.00		0.50	U	0.01		6.50		6.50		0.70		0.70	
T4	30/07/2007 19:00	0.87		10.00	U	78.00		0.50	U	0.03		6.50		6.00		0.80		0.80	
T5	31/07/2007 18:15	1.00		10.00	U	66.00		0.50	U	0.02		6.00		6.00		0.70		0.70	
T5	21/02/2008 10:30	1.48		10.00	U	20.00		0.50	U	0.01	U	8.40				0.70			
Vale View	31/07/2007 10:15	0.37	U	26.00		326.00		0.50	U	0.02		7.00		6.00		1.90		2.00	
Sulfur Brook	31/07/2007 11:45	5.50		22.00		126.00		0.50	U	0.02		10.00		10.00		2.20		2.20	
Unknown Trib	31/07/2007 12:25	1.96		17.00		114.00		0.50	U	0.05		10.00		10.00		1.80		1.90	
Ballinacleish Bridge	02/08/2007 09:39	1.68		10.00	U	70.00		0.50	U	0.03		5.50		5.20		0.50		0.50	
Avoca U/S Aughrim	02/08/2007 10:00	0.37	U	10.00	U	34.00		0.50	U	0.01	U	7.00		6.00		0.80		0.90	
Shelton Abbey Upstream	02/08/2007 10:27	2.14		10.00		86.00		0.50	U	0.02		7.00		7.00		0.90		0.90	
Avoca D/S Aughrim	02/08/2007 10:40	2.70		10.00		42.00		0.90		0.02		7.00		6.50		0.90		0.90	
D/S Fertilizer Plant	02/08/2007 12:25	1.13		10.00		62.00		0.50	U	0.01		7.00		7.50		0.90		1.00	
D/S Landfill	02/08/2007 13:10	4.10		12.00		76.00		0.50	U	0.02		7.00		7.00		0.90		1.00	
Shelton Abbey Downgradient	02/08/2007 14:22	2.12		10.00		58.00		0.50	U	0.02		7.00		7.00		0.90		0.90	
Arklow Bridge	02/08/2007 16:20	2.43		10.00	U	62.00		0.50	U	0.02		8.00		7.50		1.00		1.00	
Lions Bridge	02/08/2007 18:28	2.22		10.00	U	150.00		0.50	U	0.02		6.50		6.00		0.70		0.80	
Arklow LB	03/08/2007 08:05	2.27		30.00		4710.00		0.50	U	0.04		1450.00		1550.00		56.00		59.00	
Arklow RB	03/08/2007 12:19	2.34		23.00		2784.00		0.50	U	0.05		750.00		800.00		34.00		35.00	
Red Road	31/07/2007 14:20	5.00		18.00		118.00		0.50	U	0.01		9.00		9.00		2.50		2.50	
Red Road	14/11/2007 16:30	6.06		14.00		100.00		0.50	U	0.01		10.00				3.80			
Red Road	19/02/2008 14:43	15.36		12.00		140.00		0.80		0.01	U	9.10				2.20			

Table 2-2. Analytical Data: Avoca River and Tributaries

Metals		Dissolved Lead Low Level		Total Lead Low Level		Dissolved Magnesium Low Level		Total Magnesium Low Level		Dissolved Manganese Low Level		Total Manganese Low Level		Dissolved Mercury Low Level		Total Mercury		Dissolved Nickel Low Level		Total Nickel Low Level		Total Phosphorous Low Level	
Sample I.D.	Date	ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		mg/l		ug/l		ug/l		ug/l	
T1	30/07/2007 13:10	3.00		4.00		1679.00		4822.00		9.00		11.00		0.05	U	0.05	U	2.00		7.00		391.00	
T2-Comp	30/07/2007 15:30	4.00		8.00		2077.00		4949.00		35.00		35.00		0.05	U	0.05	U	2.00		7.00		442.00	
T2-Grab	30/07/2007 16:10	5.00		14.00		3603.00		5625.00		103.00		85.00		0.05	U	0.05	U	3.00		6.00		371.00	
T3	30/07/2007 17:00	6.00		12.00		2509.00		5448.00		76.00		74.00		0.05	U	0.05	U	1.00		6.00		440.00	
T4	30/07/2007 19:00	5.00		10.00		2724.00		6146.00		76.00		68.00		0.05	U	0.05	U	1.00		6.00		434.00	
T5	31/07/2007 18:15	7.00		15.00		2816.00		5715.00		97.00		91.00		0.05	U	0.05	U	1.00		7.00		441.00	
T5	21/02/2008 10:30	1.00	U	50.00	U	1607.00		3770.00		76.00		170.00		0.05	U	0.05	U	1.00	U	50.00	U		
Vale View	31/07/2007 10:15	1.00	U	4.00		3880.00		6864.00		8.00		13.00		0.05	U	0.05	U	1.00		6.00		397.00	
Sulfur Brook	31/07/2007 11:45	1.00	U	10.00		100.00	U	7634.00		1.00	U	42.00		0.05	U	0.05	U	1.00	U	5.00		390.00	
Unknown Trib	31/07/2007 12:25	1.00	U	2.00		6007.00		8178.00		15.00		10.00		0.05	U	0.05	U	2.00		6.00		410.00	
Ballinacleish Bridge	02/08/2007 09:39	3.00		5.00		1648.00		4025.00		14.00		13.00		0.05	U	0.05	U	1.00		6.00		376.00	
Avoca U/S Aughrim	02/08/2007 10:00	1.00		7.00		3573.00		6010.00		78.00		75.00		0.05	U	0.05	U	1.00		7.00		421.00	
Shelton Abbey Upstream	02/08/2007 10:27	2.00		8.00		3160.00		6153.00		50.00		56.00		0.05	U	0.05	U	1.00		7.00		402.00	
Avoca D/S Aughrim	02/08/2007 10:40	2.00		6.00		3254.00		6039.00		54.00		50.00		0.05	U	0.05	U	2.00		6.00		390.00	
D/S Fertilizer Plant	02/08/2007 12:25	1.00		5.00		3730.00		6026.00		156.00		133.00		0.05	U	0.05	U	1.00		6.00		491.00	
D/S Landfill	02/08/2007 13:10	1.00		4.00		3432.00		6049.00		101.00		74.00		0.05	U	0.05	U	2.00		6.00		384.00	
Shelton Abbey Downgradient	02/08/2007 14:22	2.00		14.00		3383.00		6498.00		82.00		64.00		0.05	U	0.05	U	2.00		6.00		400.00	
Arklow Bridge	02/08/2007 16:20	2.00		4.00		3521.00		6828.00		93.00		25.00		0.05	U	0.05	U	2.00		6.00		374.00	
Lions Bridge	02/08/2007 18:28	2.00		5.00		2664.00		4658.00		8.00		13.00		0.05	U	0.05	U	1.00	U	8.00		446.00	
Arklow LB	03/08/2007 08:05	1.00	U	10.00		170400.00		163000.00		93.00		89.00		0.05	U	0.05	U	2.00		5.00		516.00	
Arklow RB	03/08/2007 12:19	1.00		6.00		99810.00		92250.00		93.00		87.00		0.05	U	0.05	U	2.00		7.00		381.00	
Red Road	31/07/2007 14:20	1.00	U	17.00		100.00	U	9477.00		1.00	U	317.00		0.05	U	0.05	U	1.00	U	8.00		376.00	
Red Road	14/11/2007 16:30	630.00				9142.00				5480.00				0.05	U			5.00					
Red Road	19/02/2008 14:43	1.00	U	50.00	U	7119.00		6080.00		48.00		50.00		0.05	U	0.05	U	4.00		50.00	U		

Metals		Dissolved Selenium Low Level		Total Selenium Low Level		Dissolved Silver Low Level		Total Silver Low Level		Dissolved Thallium Low Level		Total Thallium Low Level		Dissolved Tin Low Level		Total Tin Low Level		Dissolved Titanium Low Level		Total Titanium Low Level		Dissolved Uranium Low Level	
Sample I.D.	Date	ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
T1	30/07/2007 13:10	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	2.00		1.00		3.00		1.00	U
T2-Comp	30/07/2007 15:30	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	1.00		1.00		4.00		1.00	U
T2-Grab	30/07/2007 16:10	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	2.00		1.00	U	4.00		1.00	U
T3	30/07/2007 17:00	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	2.00		1.00	U	5.00		1.00	U
T4	30/07/2007 19:00	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	2.00		1.00	U	5.00		1.00	U
T5	31/07/2007 18:15	1.00		1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	2.00		1.00	U	5.00		1.00	U
T5	21/02/2008 10:30	1.00	U	50.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00	U
Vale View	31/07/2007 10:15	1.00	U	2.00		2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	3.00		1.00	U	3.00		1.00	U
Sulfur Brook	31/07/2007 11:45	2.00		1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	1.00		1.00	U	4.00		1.00	U
Unknown Trib	31/07/2007 12:25	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	2.00		1.00		3.00		1.00	U
Ballinacleish Bridge	02/08/2007 09:39	1.00		1.00		2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	1.00		1.00	U	4.00		1.00	U
Avoca U/S Aughrim	02/08/2007 10:00	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	2.00		1.00	U	4.00		1.00	U
Shelton Abbey Upstream	02/08/2007 10:27	1.00		1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	2.00		1.00	U	6.00		1.00	U
Avoca D/S Aughrim	02/08/2007 10:40	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	2.00		1.00	U	4.00		1.00	U
D/S Fertilizer Plant	02/08/2007 12:25	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	1.00		1.00	U	4.00		1.00	U
D/S Landfill	02/08/2007 13:10	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	1.00		1.00	U	4.00		1.00	U
Shelton Abbey Downgradient	02/08/2007 14:22	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	3.00		1.00	U	4.00		1.00	U
Arklow Bridge	02/08/2007 16:20	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	1.00		1.00	U	4.00		1.00	U
Lions Bridge	02/08/2007 18:28	1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	2.00		1.00	U	4.00		1.00	U
Arklow LB	03/08/2007 08:05	17.00		15.00		2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	2.00		1.00	U	5.00		1.00	U
Arklow RB	03/08/2007 12:19	11.00		8.00		2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	3.00		1.00	U	4.00		1.00	U
Red Road	31/07/2007 14:20	3.00		2.00		2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	3.00		1.00	U	4.00		1.00	U
Red Road	14/11/2007 16:30	2.00				2.00	U			1.00	U			1.00	U			2.00				1.00	
Red Road	19/02/2008 14:43	1.00	U	50.00	U	2.00	U	2.00	U	1.00	U	1.00	U	1.00	U	1.00	U	3.00		2.00		1.00	U

Metals		Total Uranium Low Level		Dissolved Vanadium Low Level		Total Vanadium Low Level		Dissolved Zinc Low Level		Total Zinc Low Level	
Sample I.D.	Date	ug/l		ug/l		ug/l		ug/l		ug/l	
T1	30/07/2007 13:10	4.00		2.00		1.00	U	29.00		93.00	
T2-Comp	30/07/2007 15:30	4.00		1.00	U	1.00	U	143.00		208.00	
T2-Grab	30/07/2007 16:10	3.00		1.00		1.00	U	770.00		741.00	
T3	30/07/2007 17:00	4.00		1.00	U	1.00		224.00		300.00	
T4	30/07/2007 19:00	5.00		1.00	U	2.00		239.00		245.00	
T5	31/07/2007 18:15	4.00		1.00	U	1.00	U	267.00		302.00	
T5	21/02/2008 10:30	1.00	U	1.00	U	50.00	U	150.00			
Vale View	31/07/2007 10:15	4.00		1.00	U	1.00	U	3.00		409.00	
Sulfur Brook	31/07/2007 11:45	3.00		1.00	U	2.00		190.00		165.00	
Unknown Trib	31/07/2007 12:25	4.00		1.00	U	1.00	U	1.00	U	82.00	
Ballinacleish Bridge	02/08/2007 09:39	3.00		2.00		1.00	U	13.00		73.00	
Avoca U/S Aughrim	02/08/2007 10:00	4.00		1.00	U	1.00		219.00		257.00	
Shelton Abbey Upstream	02/08/2007 10:27	4.00		1.00	U	2.00		136.00		201.00	
Avoca D/S Aughrim	02/08/2007 10:40	4.00		1.00	U	1.00	U	131.00		277.00	
D/S Fertilizer Plant	02/08/2007 12:25	3.00		1.00		1.00	U	148.00		169.00	
D/S Landfill	02/08/2007 13:10	3.00		3.00		3.00		135.00		195.00	
Shelton Abbey Downgradient	02/08/2007 14:22	4.00		1.00	U	3.00		146.00		167.00	
Arklow Bridge	02/08/2007 16:20	4.00		1.00	U	1.00		152.00		177.00	
Lions Bridge	02/08/2007 18:28	4.00		1.00		1.00	U	26.00		108.00	
Arklow LB	03/08/2007 08:05	4.00		1.00	U	1.00	U	103.00		167.00	
Arklow RB	03/08/2007 12:19	4.00		1.00	U	1.00	U	104.00		222.00	
Red Road	31/07/2007 14:20	4.00		1.00	U	1.00	U	206.00		272.00	
Red Road	14/11/2007 16:30			1.00	U			5026.00			
Red Road	19/02/2008 14:43	1.00	U	1.00	U	50.00	U	107.00			

Table 2-3. GSI Analytical Data: Avoca River and Tributaries

ID1	ID	Date	Site description	Easting	Northing	pH	Electrical Conductivity	TDS	Temperature	Dissolved Oxygen	Tot_filter	Flow_ls	Alkalinity	Acidity	BOD	K
						su	mS	ppt	°C	mg/L						
1	AVO-06-W001	20-11-2006	Vale View Stream	319433	182424	6.86	0.15	0.07	8.20	0.00	1.00	0.00	0.00	8.00	1000.00	2600.00
	AVO-07-W001	14-06-2007	Vale View Stream	319434	182427	6.63	0.14	0.07	12.40	11.30	1.00		0.00	6.00		1800.00
	AVO-07-W002	14-06-2007	Avoca River below Vale View stream	319743	182079	6.88	0.06	0.03	15.10	11.80	1.00		0.00	6.40		1100.00
5	AVO-06-W006	20-11-2006	Avoca River mixing zone near Deep Adit discharge	319896	181969	5.05	0.05	0.02	9.00	0.00	1.00	0.00	0.00	16.80	1000.00	700.00
	AVO-07-W006	13-06-2007	Avoca River mixing zone near Deep Adit discharge	319896	181969	3.75	0.38	0.19	16.40	10.00	5.00		0.00	115.00		1200.00
6	AVO-06-W007	20-11-2006	Avoca River mixing zone near Road Adit	319939	181426	4.30	1.10	0.55	10.00	0.00	1.00	0.00	0.00	300.00	11000.00	4400.00
	AVO-07-W007	13-06-2007	Avoca River mixing zone near Road Adit	319939	181426	5.29	0.15	0.07	16.40	10.00	1.00		0.00	25.00		1700.00
8	AVO-06-W009	22-11-2006	Avonmore River 100m above Meetings	319048	183083	6.73	0.04	0.02	7.60	0.00	1.00	0.00	0.00	8.40	2000.00	700.00
	AVO-07-W009	14-06-2007	Avonmore River 100m above Meetings	319047	183082	7.00	0.05	0.02	15.20	12.25	1.00		0.00	4.40		1000.00
9	AVO-06-W010	20-11-2006	Red Road stream	320021	180761	6.86	0.15	0.07	9.00	0.00	1.00	0.00	0.00	18.40	1000.00	2500.00
	AVO-07-W010	14-06-2007	Red Road stream	320021	180761	6.43	0.10	0.05	12.20	12.55	1.00		0.00	6.40		3300.00
10	AVO-06-W011	22-11-2006	Avoca River above Sulphur Brook	320397	180484	6.71	0.05	0.02	7.50	0.00	1.00	0.00	0.00	10.40	1000.00	700.00
	AVO-07-W011	14-06-2007	Avoca River above Sulphur Brook	320397	180484	6.08	0.08	0.04	15.40	11.50	6.00		0.00	4.00		1300.00
11	AVO-06-W012	22-11-2006	Sulphur Brook near discharge to Avoca River	320429	180434	7.05	0.14	0.07	9.10	0.00	1.00	0.00	0.00	9.00	1000.00	2100.00
	AVO-07-W012	14-06-2007	Sulphur Brook near discharge to Avoca River	320429	180434	6.56	0.15	0.07	12.10	11.95	1.00		0.00	8.00		2300.00
12	AVO-06-W013	22-11-2006	Sulphur Brook midway	320806	181049	6.64	0.20	0.10	9.50	0.00	1.00	0.00	0.00	11.20	1000.00	2400.00
	AVO-07-W013	14-06-2007	Sulphur Brook midway	320806	181049	5.88	0.15	0.07	12.00	13.15	1.00		0.00	6.80		2400.00
14	AVO-06-W016	20-11-2006	Avoca River just above Avoca bridge	320368	179933	6.25	0.02	0.01	7.30	0.00	1.00	0.00	10.40	9.20	1000.00	600.00
	AVO-07-W016	14-06-2007	Avoca River just above Avoca bridge	320372	179932	6.38	0.09	0.04	15.30	11.10	5.00		0.00	5.20		1200.00
15	AVO-06-W018	22-11-2006	Avoca River at Shelton Abbey TMF	321597	175216	6.70	0.04	0.02	7.60	0.00	1.00	0.00	0.00	9.00	3000.00	900.00
	AVO-07-W018	13-06-2007	Avoca River at Shelton Abbey TMF	321619	175227	6.15	0.10	0.05	17.00	10.09	4.00		0.00	12.00		1100.00
16	AVO-06-W019	22-11-2006	Avoca River below Shelton Abbey TMF	321588	175248	3.65	1.70	0.85	10.50	0.00	1.00	0.00	0.00	294.00	5000.00	5600.00
18	AVO-06-W021	20-11-2006	Avoca River just below Emergency TMF	319943	181662	5.97	0.04	0.02	8.10	0.00	1.00	0.00	9.20	8.40	1000.00	600.00
19	AVO-06-W022	20-11-2006	Spoil run-off - Avoca River mixing zone	319805	182039	5.71	0.04	0.02	8.80	0.00	1.00	0.00	0.00	7.20	1000.00	600.00
	AVO-07-W022	14-06-2007	Spoil run-off - Avoca River mixing zone	319805	182039	6.21	0.07	0.03	15.20	11.02	6.00		0.00	10.40		1100.00
21	AVO-06-W025	22-11-2006	East Avoca OP - Castlehoward area drainage ditch	319968	183300	6.05	0.11	0.06	9.10	0.00	1.00	0.00	0.00	9.20	3000.00	3100.00
26	AVO-06-W032	27-11-2006	Avoca River, Shelton Abbey TMF downstream	321711	175266	6.75	0.02	0.01	9.10	0.00	4.00	0.00	0.00	7.60	3000.00	1000.00

Notes: U = below detection limit

Table 2-3. GSI Analytical Data: Avoca River and Tributaries

ID	Date	Na	TSS	Ortho-phosphate	Sulphate	TDS	COD	Dissolved Aluminium		Total Aluminium		Dissolved Antimony		Total Antimony		Dissolved Arsenic		Total Arsenic		Dissolved Barium		Total Barium	
				mg/L	ug/L	ug/L	ug/L	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
AVO-06-W001	20-11-2006	7000.00	5000.00	50.00	17000.00	89000.00	7500.00	11.00		71.00		4.00		0.50	U	0.50	U	0.50	U	12.00		13.00	
AVO-07-W001	14-06-2007	7500.00	5000.00	15.00	28000.00	63000.00		1635.00		7524.00		0.50	U	0.50	U	0.50	U	0.50	U	9.00		67.00	
AVO-07-W002	14-06-2007	7500.00	5000.00	15.00	10000.00	36000.00		110.00		1082.00		0.50	U	0.50	U	0.50	U	0.50	U	6.00		56.00	
AVO-06-W006	20-11-2006	6000.00	5000.00	15.00	24000.00	52000.00	7500.00	972.00		2167.00		1.00		0.50	U	0.50	U	0.50	U	10.00		7.00	
AVO-07-W006	13-06-2007	8000.00	33000.00	90.00	133000.00	264000.00		17380.00		17840.00		0.50	U	0.50	U	0.50	U	1.00		5.00		67.00	
AVO-06-W007	20-11-2006	13500.00	5000.00	15.00	618000.00	696000.00	7500.00	8982.00		8015.00		0.50	U	0.50	U	0.50	U	0.50	U	12.00		12.00	
AVO-07-W007	13-06-2007	9500.00	24000.00	15.00	105000.00	174000.00		4705.00		4363.00		0.50	U	0.50	U	0.50	U	1.00		7.00		59.00	
AVO-06-W009	22-11-2006	6500.00	5000.00	40.00	11000.00	37000.00	7500.00	102.00		151.00		2.00		0.50	U	1.00		1.00		5.00		5.00	
AVO-07-W009	14-06-2007	8000.00	5000.00	15.00	9000.00	32000.00		1.00	U	781.00		0.50	U	0.50	U	0.50	U	2.00		1.00		55.00	
AVO-06-W010	20-11-2006	10000.00	5000.00	15.00	24000.00	178000.00	7500.00	98.00		205.00		0.50	U	0.50	U	0.50	U	0.50	U	17.00		17.00	
AVO-07-W010	14-06-2007	9500.00	13000.00	15.00	44000.00	85000.00		63.00		1518.00		0.50	U	1.00		0.50	U	2.00		17.00		87.00	
AVO-06-W011	22-11-2006	6000.00	5000.00	15.00	13000.00	39000.00	7500.00	207.00		537.00		0.50	U	0.50	U	0.50	U	2.00		6.00		6.00	
AVO-07-W011	14-06-2007	8500.00	5000.00	15.00	23000.00	47000.00		129.00		1353.00		0.50	U	0.50	U	0.50	U	0.50	U	15.00		52.00	
AVO-06-W012	22-11-2006	10500.00	5000.00	110.00	8000.00	76000.00	7500.00	33.00		94.00		0.50	U	0.50	U	0.50	U	1.00		7.00		7.00	
AVO-07-W012	14-06-2007	10000.00	5000.00	15.00	13000.00	62000.00		2037.00		1268.00		0.50	U	0.50	U	0.50	U	2.00		8.00		61.00	
AVO-06-W013	22-11-2006	10000.00	5000.00	15.00	12000.00	82000.00	7500.00	62.00		545.00		0.50	U	0.50	U	0.50	U	1.00		12.00		12.00	
AVO-07-W013	14-06-2007	10000.00	5000.00	15.00	16000.00	60000.00		716.00		1853.00		0.50	U	0.50	U	0.50	U	0.50	U	15.00		63.00	
AVO-06-W016	20-11-2006	5000.00	5000.00	630.00	44000.00	57000.00	15000.00	205.00		364.00		0.50	U	0.50	U	0.50	U	0.50	U	8.00		9.00	
AVO-07-W016	14-06-2007	7500.00	5000.00	15.00	24000.00	53000.00		8535.00		1393.00		0.50	U	0.50	U	0.50	U	0.50	U	6.00		53.00	
AVO-06-W018	22-11-2006	7000.00	5000.00	15.00	11000.00	55000.00	7500.00	173.00		2296.00		0.50	U	0.50	U	0.50	U	1.00		6.00		6.00	
AVO-07-W018	13-06-2007	8500.00	5000.00	15.00	23000.00	50000.00		31.00		1093.00		0.50	U	0.50	U	0.50	U	0.50	U	5.00		63.00	
AVO-06-W019	22-11-2006	11500.00	5000.00	30.00	1062000.00	961000.00	7500.00	24970.00		20180.00		0.50	U	0.50	U	0.50	U	0.50	U	11.00		11.00	
AVO-06-W021	20-11-2006	5000.00	5000.00	15.00	10000.00	35000.00	17000.00	268.00		417.00		0.50	U	0.50	U	0.50	U	0.50	U	9.00		8.00	
AVO-06-W022	20-11-2006	5000.00	5000.00	15.00	8000.00	133000.00	20000.00	214.00		312.00		10.00		0.50	U	0.50	U	0.50	U	7.00		7.00	
AVO-07-W022	14-06-2007	8000.00	5000.00	15.00	23000.00	52000.00		1927.00		2170.00		0.50	U	0.50	U	0.50	U	2.00		6.00		62.00	
AVO-06-W025	22-11-2006	8500.00	11000.00	15.00	11000.00	61000.00	7500.00	79.00		235.00		0.50	U	0.50	U	0.50	U	0.50	U	13.00		13.00	
AVO-06-W032	27-11-2006	4500.00	5000.00	15.00	6000.00	30000.00	22000.00	130.00		5415.00		0.50	U	7.00		0.50	U	4.00		6.00		16.00	

Notes: U = below detection limit

Table 2-3. GSI Analytical Data: Avoca River and Tributaries

ID	Date	Dissolved Cadmium		Total Cadmium		Dissolved Calcium	Total Calcium	Dissolved Chromium		Total Chromium	Dissolved Copper		Total Copper		Dissolved Iron		Total Iron	Dissolved Lead		Total Lead	Dissolved Magnesium
		ug/L		ug/L		ug/L	ug/L	ug/L		ug/L	ug/L		ug/L		ug/L		ug/L	ug/L		ug/L	ug/L
AVO-06-W001	20-11-2006	0.50	U	0.50	U	17310.00	15940.00	2.00		3.00	8.00		5.00		33.00		149.00	0.50	U	2.00	3753.00
AVO-07-W001	14-06-2007	0.20	U	0.50	U	14670.00	41290.00	0.50	U	3.00	0.50	U	115.00		7.00		550.00	0.50	U	3.00	4533.00
AVO-07-W002	14-06-2007	0.20	U	0.50	U	3467.00	30840.00	0.50	U	12.00	8.00		97.00		14.00		510.00	0.50	U	5.00	1821.00
AVO-06-W006	20-11-2006	3.00		3.00		3850.00	3727.00	3.00		5.00	40.00		41.00		76.00		1194.00	25.00		40.00	3121.00
AVO-07-W006	13-06-2007	24.00		22.00		4489.00	30680.00	0.50	U	5.00	298.00		323.00		321.00		1842.00	239.00		237.00	19250.00
AVO-06-W007	20-11-2006	5.00		5.00		61640.00	58430.00	2.00		19.00	184.00		169.00		27060.00		16600.00	143.00		152.00	62890.00
AVO-07-W007	13-06-2007	2.30		2.00		16640.00	35590.00	0.50	U	5.00	69.00		89.00		75.00		7812.00	15.00		29.00	10720.00
AVO-06-W009	22-11-2006	0.50	U	0.50	U	3797.00	3774.00	0.50	U	3.00	0.50	U	0.50	U	86.00		199.00	2.00		4.00	1733.00
AVO-07-W009	14-06-2007	0.20	U	0.50	U	1143.00	32290.00	0.50	U	3.00	0.50	U	124.00		1.00	U	392.00	0.50	U	3.00	507.00
AVO-06-W010	20-11-2006	0.50	U	0.50	U	14130.00	14340.00	3.00		14.00	23.00		25.00		67.00		470.00	0.50	U	7.00	6912.00
AVO-07-W010	14-06-2007	1.60		2.00		11640.00	41870.00	0.50	U	7.00	7.00		170.00		20.00		2193.00	0.50	U	22.00	8633.00
AVO-06-W011	22-11-2006	0.50	U	0.50	U	4548.00	4170.00	0.50	U	28.00	6.00		11.00		221.00		662.00	3.00		6.00	2273.00
AVO-07-W011	14-06-2007	1.70		1.00		10480.00	24870.00	0.50	U	4.00	16.00		58.00		156.00		1205.00	2.00		12.00	3130.00
AVO-06-W012	22-11-2006	0.50	U	0.50	U	10680.00	9740.00	0.50	U	0.50	U	9.00	18.00		1.00	U	42.00	2.00		4.00	5523.00
AVO-07-W012	14-06-2007	0.20	U	0.50	U	11770.00	27590.00	0.50	U	6.00	8.00		36.00		1.00	U	578.00	0.50	U	7.00	6525.00
AVO-06-W013	22-11-2006	0.50	U	0.50	U	11170.00	11200.00	0.50	U	24.00	34.00		64.00		1.00	U	179.00	10.00		26.00	5048.00
AVO-07-W013	14-06-2007	1.20		1.00		10780.00	29070.00	0.50	U	4.00	46.00		81.00		1.00	U	393.00	8.00		17.00	6112.00
AVO-06-W016	20-11-2006	0.50	U	0.50	U	4308.00	4184.00	3.00		2.00	17.00		6.00		246.00		421.00	5.00		15.00	1903.00
AVO-07-W016	14-06-2007	0.90		1.00		4824.00	21510.00	0.50	U	5.00	11.00		55.00		127.00		1189.00	0.50	U	11.00	3132.00
AVO-06-W018	22-11-2006	0.50	U	0.50	U	5640.00	6043.00	0.50	U	0.50	U	0.50	U	9.00	126.00		319.00	2.00		3.00	2789.00
AVO-07-W018	13-06-2007	0.20	U	0.50	U	5863.00	23840.00	0.50	U	5.00	5.00		38.00		3.00		818.00	0.50	U	6.00	3375.00
AVO-06-W019	22-11-2006	4.00		3.00		274600.00	264100.00	0.50	U	122.00	227.00		244.00		3102.00		3559.00	15.00		14.00	65020.00
AVO-06-W021	20-11-2006	0.50	U	0.50	U	4081.00	3938.00	3.00		14.00	34.00		27.00		146.00		294.00	5.00		8.00	1792.00
AVO-06-W022	20-11-2006	0.50	U	0.50	U	3950.00	3742.00	3.00		37.00	19.00		29.00		138.00		380.00	6.00		11.00	1645.00
AVO-07-W022	14-06-2007	1.70		2.00		4015.00	30090.00	0.50	U	4.00	42.00		187.00		5.00		1031.00	0.50	U	9.00	2929.00
AVO-06-W025	22-11-2006	0.50	U	0.50	U	8140.00	7989.00	0.50	U	1.00	0.50	U	3.00		1.00	U	34.00	0.50	U	2.00	3987.00
AVO-06-W032	27-11-2006	0.50	U	0.50	U	4537.00	5405.00	0.50	U	4.00	6.00		9.00		80.00		3113.00	2.00		35.00	1928.00

Notes: U = below detection limit

Table 2-3. GSI Analytical Data: Avoca River and Tributaries

ID	Date	Total Magnesium		Dissolved Manganese		Total Manganese		Dissolved Mercury		Total Mercury		Dissolved Molybdenum		Total Molybdenum		Dissolved Nickel		Total Nickel		Dissolved Selenium		Total Selenium		Dissolved Tin		Total Tin
		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L
AVO-06-W001	20-11-2006	3470.00		4.00		19.00		0.03	U	25.00	U	0.50	U	0.50	U	3.00		7.00		0.50	U	0.50	U	0.50	U	0.50
AVO-07-W001	14-06-2007	7916.00		2.00		37.00		0.03	U	25.00	U	0.50	U	0.50	U	0.50	U	3.00		0.50	U	1.00		0.50	U	2.00
AVO-07-W002	14-06-2007	5233.00		5.00		32.00		0.03	U	25.00	U	0.50	U	2.00		1.00		6.00		0.50	U	0.50	U	0.50	U	2.00
AVO-06-W006	20-11-2006	2934.00		117.00		144.00		0.03	U	25.00	U	0.50	U	0.50	U	3.00		32.00		0.50	U	0.50	U	0.50	U	0.50
AVO-07-W006	13-06-2007	22820.00		798.00		802.00		0.03	U	25.00	U	0.50	U	0.50	U	9.00		14.00		1.00		3.00		0.50	U	2.00
AVO-06-W007	20-11-2006	57720.00		5925.00		5663.00		0.03	U	25.00	U	0.50	U	2.00		37.00		37.00		0.50	U	0.50	U	0.50	U	0.50
AVO-07-W007	13-06-2007	13290.00		787.00		762.00		0.03	U	25.00	U	0.50	U	0.50	U	5.00		9.00		0.50	U	2.00		0.50	U	1.00
AVO-06-W009	22-11-2006	1756.00		6.00		13.00		0.03	U	25.00	U	0.50	U	0.50	U	2.00		4.00		1.00		1.00		10.00		6.00
AVO-07-W009	14-06-2007	5245.00		0.50	U	15.00		0.03	U	25.00	U	0.50	U	0.50	U	0.50	U	2.00		0.50	U	3.00		0.50	U	3.00
AVO-06-W010	20-11-2006	6425.00		290.00		291.00		0.03	U	25.00	U	0.50	U	3.00		4.00		9.00		0.50	U	0.50	U	0.50	U	3.00
AVO-07-W010	14-06-2007	12160.00		625.00		634.00		0.03	U	25.00	U	0.50	U	0.50	U	4.00		28.00		2.00		2.00		0.50	U	9.00
AVO-06-W011	22-11-2006	2114.00		63.00		59.00		0.05		25.00	U	0.50	U	4.00		0.50	U	4.00		0.50	U	1.00		10.00		0.50
AVO-07-W011	14-06-2007	5870.00		130.00		144.00		0.03	U	25.00	U	0.50	U	0.50	U	5.00		6.00		0.50	U	0.50	U	0.50	U	2.00
AVO-06-W012	22-11-2006	5339.00		16.00		17.00		0.08		25.00	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	10.00		0.50
AVO-07-W012	14-06-2007	8513.00		23.00		37.00		0.03	U	25.00	U	0.50	U	0.50	U	0.50	U	9.00		0.50	U	3.00		0.50	U	3.00
AVO-06-W013	22-11-2006	5186.00		44.00		51.00		0.03	U	25.00	U	0.50	U	2.00		0.50	U	3.00		0.50	U	1.00		9.00		0.50
AVO-07-W013	14-06-2007	8457.00		79.00		87.00		0.03	U	25.00	U	0.50	U	0.50	U	2.00		7.00		0.50	U	0.50	U	0.50	U	2.00
AVO-06-W016	20-11-2006	1834.00		57.00		60.00		0.03	U	25.00	U	0.50	U	0.50	U	3.00		2.00		0.50	U	0.50	U	0.50	U	0.50
AVO-07-W016	14-06-2007	5546.00		143.00		141.00		0.03	U	25.00	U	0.50	U	0.50	U	3.00		5.00		2.00		0.50	U	0.50	U	2.00
AVO-06-W018	22-11-2006	2876.00		48.00		54.00		0.03	U	25.00	U	0.50	U	0.50	U	2.00		2.00		2.00		0.50	U	9.00		0.50
AVO-07-W018	13-06-2007	6274.00		140.00		159.00		0.03	U	25.00	U	0.50	U	0.50	U	3.00		5.00		1.00		1.00		0.50	U	3.00
AVO-06-W019	22-11-2006	64810.00		15840.00		15540.00		0.29		25.00	U	0.50	U	13.00		124.00		160.00		0.50	U	0.50	U	9.00		0.50
AVO-06-W021	20-11-2006	1680.00		54.00		57.00		0.08		25.00	U	0.50	U	2.00		4.00		6.00		0.50	U	0.50	U	0.50	U	0.50
AVO-06-W022	20-11-2006	1570.00		26.00		38.00		0.03	U	25.00	U	0.50	U	6.00		2.00		5.00		0.50	U	0.50	U	0.50	U	0.50
AVO-07-W022	14-06-2007	6049.00		133.00		145.00		0.03	U	25.00	U	0.50	U	0.50	U	2.00		8.00		2.00		3.00		0.50	U	2.00
AVO-06-W025	22-11-2006	4146.00		18.00		19.00		0.03	U	25.00	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	2.00		9.00		0.50
AVO-06-W032	27-11-2006	2291.00		2.00		272.00		0.03	U	25.00	U	0.50	U	0.50	U	1.00		5.00		0.50	U	2.00		0.50	U	0.50

Notes: U = below detection limit

Table 2-3. GSI Analytical Data: Avoca River and Tributaries

ID	Date		Dissolved Uranium		Total Uranium		Dissolved Vanadium		Total Vanadium		Dissolved Zinc		Total Zinc	
			ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
AVO-06-W001	20-11-2006	U	0.50	U	0.50	U	0.50	U	0.50	U	30.00		47.00	
AVO-07-W001	14-06-2007		0.50	U	4.00		0.50	U	0.50	U	14.00		121.00	
AVO-07-W002	14-06-2007		0.50	U	4.00		0.50	U	0.50	U	64.00		162.00	
AVO-06-W006	20-11-2006	U	0.50	U	0.50	U	0.50	U	0.50	U	909.00		997.00	
AVO-07-W006	13-06-2007		2.00		7.00		0.50	U	1.00		9167.00		8306.00	
AVO-06-W007	20-11-2006	U	2.00		1.00		0.50	U	0.50	U	5904.00		6361.00	
AVO-07-W007	13-06-2007		0.50	U	4.00		0.50	U	0.50	U	1159.00		1053.00	
AVO-06-W009	22-11-2006		0.50	U	0.50	U	0.50	U	0.50	U	66.00		58.00	
AVO-07-W009	14-06-2007		0.50	U	4.00		0.50	U	0.50	U	16.00		139.00	
AVO-06-W010	20-11-2006		0.50	U	0.50	U	0.50	U	0.50	U	209.00		232.00	
AVO-07-W010	14-06-2007		0.50	U	4.00		0.50	U	0.50	U	479.00		769.00	
AVO-06-W011	22-11-2006	U	0.50	U	0.50	U	1.00		1.00		182.00		179.00	
AVO-07-W011	14-06-2007		0.50	U	4.00		0.50	U	0.50	U	399.00		480.00	
AVO-06-W012	22-11-2006	U	0.50	U	0.50	U	0.50	U	0.50	U	68.00		74.00	
AVO-07-W012	14-06-2007		0.50	U	3.00		0.50	U	0.50	U	88.00		167.00	
AVO-06-W013	22-11-2006	U	0.50	U	0.50	U	0.50	U	0.50	U	149.00		166.00	
AVO-07-W013	14-06-2007		0.50	U	4.00		0.50	U	0.50	U	315.00		347.00	
AVO-06-W016	20-11-2006	U	0.50	U	0.50	U	0.50	U	4.00		145.00		208.00	
AVO-07-W016	14-06-2007		0.50	U	3.00		0.50	U	0.50	U	378.00		457.00	
AVO-06-W018	22-11-2006	U	0.50	U	0.50	U	0.50	U	0.50	U	121.00		135.00	
AVO-07-W018	13-06-2007		0.50	U	4.00		0.50	U	0.50	U	221.00		284.00	
AVO-06-W019	22-11-2006	U	1.00		1.00		0.50	U	0.50	U	2268.00		2186.00	
AVO-06-W021	20-11-2006	U	0.50	U	0.50	U	0.50	U	0.50	U	102.00		126.00	
AVO-06-W022	20-11-2006	U	0.50	U	0.50	U	0.50	U	0.50	U	104.00		131.00	
AVO-07-W022	14-06-2007		0.50	U	3.00		0.50	U	0.50	U	532.00		575.00	
AVO-06-W025	22-11-2006	U	0.50	U	0.50	U	0.50	U	0.50	U	63.00		64.00	
AVO-06-W032	27-11-2006	U	0.50	U	0.50	U	0.50	U	3.00		49.00		101.00	

Notes: U = below detection limit

Table 2-4. Analytical Data: Avoca River Bank Samples

Field Parameters and Metals	Date	Description	X	Y	pH	Temperature	ORP	Eh-SHE	Conductivity at 25 ºC	Copper		Zinc		Dissolved Mercury Low Level		Dissolved Aluminium Low Level		Dissolved Antimony Low Level		Dissolved Arsenic Low Level	
Sample I.D.					su	ºC	mV	mV	uS/cm	ug/L		ug/L		ug/l		ug/l		ug/l		ug/l	
CDM-BS1	30/07/2007	East Bank Avoca near Whites Bridge	319783	182057	6.14	13.79	168.00	378.21	77.00	17.00		80.00		0.05	U	230.00		1.00	U	1.00	U
CDM-BS2	31/07/2007	South of Whites Bridge	319771	182066	6.34	13.91	166.00	376.09	76.00	8.00		56.00		0.05	U	312.00		1.00	U	1.00	U
CDM-BS3	01/08/2007	75m N of Whites Bridge - E Bank	319720	182114	6.58	13.84	155.00	365.16	72.00	16.00		59.00		0.05	U	234.00		1.00	U	1.00	
CDM-BS4	02/08/2007	N. of Whites Bridge, 30m N of Island	319666	182201	6.74	13.87	126.00	336.13	71.00	4.00		22.00		0.05	U	3050.00		1.00	U	1.00	
CDM-BS5	03/08/2007	E. Bank directly across from BS4	319658	182150	6.82	13.66	144.00	354.34	72.00	1.00	U	20.00		0.05	U	87.00		1.00	U	1.00	U
CDM-BS6	04/08/2007	W. Bank under Whites Bridge	319745	182065	7.05	13.99	109.00	319.01	72.00												
CDM-BS7	05/08/2007	S. end of St. Patrick's Football Field - W. Bank	319580	182383	7.58	14.46	95.00	304.54	71.00	11.00		23.00		0.05	U	4225.00		1.00	U	1.00	U
CDM-BS8	06/08/2007	E. Bank W. of RR and S. of Whites Bridge (flowing water)	319991	181796	6.90	5.46	88.00	306.54	86.00	14.00		341.00		0.05	U	284.00		1.00	U	1.00	U
CDM-BS9	07/08/2007	W. Bank directly across from BS8 (stagnant water)	319986	181814	5.67	14.72	236.00	445.28	126.00	65.00		300.00		0.05	U	150.00		1.00	U	1.00	U
CDM-BS10	08/08/2007	50m N. of BS-9	319986	181824	5.61	14.73	219.00	428.27	106.00	90.00		375.00		0.05	U	272.00		1.00	U	1.00	U
CDM-BS11	09/08/2007	E. Bank	319958	181887	5.34	14.67	244.00	453.33	127.00	66.00		413.00		0.05	U	319.00		1.00	U	1.00	U
CDM-BS12	10/08/2007	E. Bank	319924	181916	5.95	14.74	220.00	429.26	89.00	83.00		482.00		0.05	U	3356.00		1.00	U	1.00	U
CDM-BS13	11/08/2007	E. Bank - Near T2 S. of Whites Bridge	319906	181929	6.56	14.80	171.00	380.20	74.00	8.00		61.00		0.05	U	146.00		1.00	U	1.00	U
CDM-BS14	12/08/2007	W. Bank, S. of BS9	319945	181674	6.57	14.95	145.00	354.05	79.00	49.00		274.00		0.05	U	121.00		1.00	U	1.00	U
CDM-BS15	13/08/2007	W. Bank - Beside black pipe	319943	181672	6.59	14.96	140.00	349.04	82.00	24.00		141.00		0.05	U	280.00		1.00	U	1.00	U
CDM-BS16	14/08/2007	E. Bank - 15m N. of Deep Adit Discharge	319869	181990	5.38	15.10	262.00	470.90	121.00	71.00		1423.00		0.05	U	1715.00		1.00	U	1.00	U
CDM-BS17	15/08/2007	E. Bank - 30m N. of Deep Adit Discharge	319868	181992	5.12	14.98	298.00	507.02	142.00	68.00		1315.00		0.05	U	1570.00		1.00	U	1.00	U
CDM-BS18	16/08/2007		319853	181999	5.52	15.11	281.00	489.89	106.00												
CDM-BS19	17/08/2007	Upstream of BS18	319843	182001	5.19	15.06	310.00	518.94	156.00												
CDM-BS20	18/08/2007		319841	182006	5.35	15.04	291.00	499.96	131.00												
CDM-BS21	19/08/2007		319827	182017	5.93	15.04	237.00	445.96	93.00												
CDM-BS22	20/08/2007		320372	180472	6.41	14.85	129.00	338.15	89.00	15.00		231.00		0.05	U	197.00		1.00	U	1.00	U
CDM-BS23	21/08/2007	Down-gradient at RR Bridge	320223	180630	6.48	14.71	128.00	337.29	90.00	17.00		246.00		0.05	U	4448.00		1.00	U	1.00	U
CDM-BS24	22/08/2007	100m downstream from trib. Nr Avoca	320323	180334	6.42	14.72	137.00	346.28	92.00												
CDM-BS25	23/08/2007	Avoca E. Bank - above Shelton Abbey	320764	176114	6.56	13.52	112.00	322.48	118.00	7.00		123.00		0.05	U	115.00		1.00	U	1.00	U
CDM-BS26	24/08/2007	Tributary up-gradient of SA Tailings	320772	176121	6.63	12.16	117.00	328.84	177.00	2.00		1.00	U	0.05	U	32.00		1.00	U	1.00	U
CDM-BS26B	25/08/2007	E. Bank - 50m down-gradient from BS25	320838	175991	6.78	13.74	92.60	302.86	118.00												
CDM-BS27	26/08/2007	Small pond on E. Bank below tailings	320996	175758	4.04	12.58	357.30	568.72	602.00	108.00		831.00		0.05	U	8176.00		1.00	U	1.00	U
CDM-BS28	27/08/2007		321059	175585	6.71	12.24	106.00	317.76	118.00	7.00		133.00		0.05	U	125.00		1.00	U	1.00	U
CDM-BS29	28/08/2007	River adjacent to BS27	321005	175733	6.57	13.86	117.10	327.24	117.00												
CDM-BS30	29/08/2007		321145	175469	6.78	15.38	96.00	304.62	117.00	9.00		119.00		0.05	U	6293.00		1.00	U	1.00	U
CDM-BS31	30/08/2007		321600	175224	6.79	14.82	102.00	311.18	123.00	10.00		134.00		0.05	U	141.00		1.00	U	1.00	U
CDM-BS32	31/08/2007	Duck Pond	321548	175237	6.31	19.07	34.00	238.93	279.00												
CDM-BS33	01/09/2007	E. Bank - Down-gradient of SA Tailings (adjacent to detention facility)	321939	175213	6.86	14.22	90.90	300.68	121.00												
Field Blank		FB												0.05	U	113.00		1.00	U	1.00	U
Bank Sample Pipe		bs Pipe												0.05	U	41.00		1.00	U	1.00	U

Notes: U = below detection limit

Table 2-4. Analytical Data: Avoca River Bank Samples

Field Parameters and Metals	Date	Dissolved Barium Low Level	Dissolved Cadmium Low Level	Dissolved Calcium Low Level	Dissolved Chromium Low Level	Dissolved Cobalt Low Level	Dissolved Copper Low Level	Dissolved Iron Low Level	Dissolved Lead Low Level	Dissolved Magnesium Low Level	Dissolved Manganese Low Level	Dissolved Nickel Low Level	Dissolved Selenium Low Level	Dissolved Silver Low Level	Dissolved Thallium Low Level
Sample I.D.		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
CDM-BS1	30/07/2007	7.00	0.40 U	4542.00	1.00 U	1.00 U	17.00	112.00	4.00	1917.00	28.00	2.00	1.00 U	2.00 U	1.00 U
CDM-BS2	31/07/2007	6.00	0.40 U	4436.00	1.00 U	1.00 U	8.00	102.00	4.00	1792.00	17.00	2.00	1.00 U	2.00 U	1.00 U
CDM-BS3	01/08/2007	6.00	0.40 U	4376.00	1.00 U	1.00 U	16.00	85.00	4.00	1788.00	26.00	1.00	2.00	2.00 U	1.00 U
CDM-BS4	02/08/2007	6.00	0.40 U	4322.00	1.00 U	1.00 U	4.00	154.00	3.00	1748.00	13.00	1.00	2.00	2.00 U	1.00 U
CDM-BS5	03/08/2007	6.00	0.40 U	4313.00	1.00 U	1.00 U	1.00 U	76.00	3.00	1804.00	9.00	1.00	1.00 U	2.00 U	1.00 U
CDM-BS6	04/08/2007														
CDM-BS7	05/08/2007	8.00	0.40 U	4973.00	1.00 U	1.00 U	11.00	183.00	5.00	1873.00	24.00	2.00	1.00 U	2.00 U	1.00 U
CDM-BS8	06/08/2007	7.00	0.40 U	4305.00	1.00 U	1.00	14.00	95.00	4.00	2289.00	45.00	1.00	2.00	2.00 U	1.00 U
CDM-BS9	07/08/2007	6.00	0.80	5787.00	1.00 U	3.00	65.00	141.00	3.00	2946.00	170.00	3.00	1.00 U	2.00 U	1.00 U
CDM-BS10	08/08/2007	9.00	1.00	4831.00	1.00 U	5.00	90.00	187.00	3.00	3086.00	205.00	3.00	1.00 U	2.00 U	1.00 U
CDM-BS11	09/08/2007	8.00	1.20	5348.00	1.00 U	6.00	66.00	225.00	3.00	3170.00	252.00	4.00	1.00 U	2.00 U	1.00 U
CDM-BS12	10/08/2007	8.00	1.40	5168.00	1.00 U	5.00	83.00	111.00	3.00	3021.00	232.00	4.00	1.00 U	2.00 U	1.00 U
CDM-BS13	11/08/2007	6.00	0.40 U	4901.00	1.00 U	1.00 U	8.00	87.00	5.00	1785.00	22.00	1.00	1.00 U	2.00 U	1.00 U
CDM-BS14	12/08/2007	7.00	0.60	5612.00	1.00 U	4.00	49.00	394.00	4.00	2975.00	202.00	3.00	1.00 U	2.00 U	1.00 U
CDM-BS15	13/08/2007	7.00	0.40 U	4755.00	1.00 U	1.00	24.00	187.00	4.00	2143.00	55.00	2.00	1.00 U	2.00 U	1.00 U
CDM-BS16	14/08/2007	39.00	4.10	11590.00	1.00 U	4.00	71.00	151.00	15.00	4475.00	159.00	2.00	1.00 U	2.00 U	1.00 U
CDM-BS17	15/08/2007	7.00	4.00	4638.00	1.00 U	4.00	68.00	97.00	11.00	4035.00	151.00	3.00	1.00 U	2.00 U	1.00 U
CDM-BS18	16/08/2007														
CDM-BS19	17/08/2007														
CDM-BS20	18/08/2007														
CDM-BS21	19/08/2007														
CDM-BS22	20/08/2007	6.00	0.60	4778.00	1.00 U	1.00	15.00	216.00	5.00	2471.00	77.00	3.00	1.00	2.00 U	1.00 U
CDM-BS23	21/08/2007	7.00	0.40 U	5073.00	1.00	1.00	17.00	363.00	5.00	2586.00	84.00	1.00	1.00	2.00 U	1.00 U
CDM-BS24	22/08/2007														
CDM-BS25	23/08/2007	6.00	0.40 U	6775.00	1.00 U	1.00 U	7.00	117.00	2.00	3112.00	47.00	2.00	1.00 U	2.00 U	1.00 U
CDM-BS26	24/08/2007	2.00	0.40 U	6518.00	1.00 U	1.00 U	2.00	2.00 U	1.00 U	4643.00	4.00	1.00 U	1.00 U	2.00 U	1.00 U
CDM-BS26B	25/08/2007														
CDM-BS27	26/08/2007	22.00	1.50	6324.00	1.00 U	22.00	108.00	8069.00	29.00	8360.00	1429.00	18.00	1.00 U	2.00 U	1.00 U
CDM-BS28	27/08/2007	7.00	0.40 U	6912.00	1.00 U	1.00 U	7.00	128.00	2.00	3165.00	55.00	2.00	1.00	2.00 U	1.00 U
CDM-BS29	28/08/2007														
CDM-BS30	29/08/2007	7.00	0.40 U	7487.00	1.00 U	1.00 U	9.00	199.00	2.00	3171.00	60.00	2.00	1.00 U	2.00 U	1.00 U
CDM-BS31	30/08/2007	8.00	0.40 U	7072.00	1.00 U	1.00	10.00	109.00	2.00	3385.00	97.00	2.00	2.00	2.00 U	1.00 U
CDM-BS32	31/08/2007														
CDM-BS33	01/09/2007														
Field Blank		2.00	0.40 U	1693.00	2.00	1.00 U	12.00	11.00	5.00	100.00 U	5.00	1.00	1.00 U	2.00 U	1.00 U
Bank Sample Pipe		17.00	0.40 U	13030.00	1.00 U	1.00 U	16.00	2.00 U	1.00	2739.00	46.00	3.00	1.00 U	2.00 U	1.00 U

Notes: U = below detection limit

Table 2-4. Analytical Data: Avoca River Bank Samples

Field Parameters and Metals	Date	Dissolved Tin Low Level		Dissolved Titanium Low Level		Dissolved Uranium Low Level		Dissolved Vanadium Low Level		Dissolved Zinc Low Level	
Sample I.D.		ug/l		ug/l		ug/l		ug/l		ug/l	
CDM-BS1	30/07/2007	1.00	U	1.00	U	1.00	U	1.00	U	80.00	
CDM-BS2	31/07/2007	1.00	U	1.00	U	1.00	U	2.00		56.00	
CDM-BS3	01/08/2007	1.00	U	1.00	U	1.00	U	1.00	U	59.00	
CDM-BS4	02/08/2007	1.00	U	1.00		1.00	U	2.00		22.00	
CDM-BS5	03/08/2007	1.00	U	1.00	U	1.00	U	2.00		20.00	
CDM-BS6	04/08/2007										
CDM-BS7	05/08/2007	1.00	U	1.00		1.00	U	1.00	U	23.00	
CDM-BS8	06/08/2007	1.00	U	1.00	U	1.00	U	1.00	U	341.00	
CDM-BS9	07/08/2007	1.00	U	1.00	U	1.00	U	1.00	U	300.00	
CDM-BS10	08/08/2007	1.00	U	1.00		1.00	U	1.00	U	375.00	
CDM-BS11	09/08/2007	1.00	U	1.00	U	1.00	U	1.00	U	413.00	
CDM-BS12	10/08/2007	1.00	U	1.00		1.00	U	1.00	U	482.00	
CDM-BS13	11/08/2007	1.00	U	1.00	U	1.00	U	1.00	U	61.00	
CDM-BS14	12/08/2007	1.00	U	1.00	U	1.00	U	1.00		274.00	
CDM-BS15	13/08/2007	1.00	U	1.00		1.00	U	1.00	U	141.00	
CDM-BS16	14/08/2007	1.00	U	1.00	U	1.00	U	1.00	U	1423.00	
CDM-BS17	15/08/2007	1.00	U	1.00	U	1.00	U	1.00		1315.00	
CDM-BS18	16/08/2007										
CDM-BS19	17/08/2007										
CDM-BS20	18/08/2007										
CDM-BS21	19/08/2007										
CDM-BS22	20/08/2007	1.00	U	1.00	U	1.00	U	1.00	U	231.00	
CDM-BS23	21/08/2007	1.00	U	2.00		1.00	U	1.00	U	246.00	
CDM-BS24	22/08/2007										
CDM-BS25	23/08/2007	1.00	U	1.00	U	1.00	U	1.00	U	123.00	
CDM-BS26	24/08/2007	1.00	U	1.00	U	1.00	U	1.00	U	1.00	U
CDM-BS26B	25/08/2007										
CDM-BS27	26/08/2007	1.00	U	1.00	U	1.00	U	1.00	U	831.00	
CDM-BS28	27/08/2007	1.00	U	1.00	U	1.00	U	1.00	U	133.00	
CDM-BS29	28/08/2007										
CDM-BS30	29/08/2007	1.00	U	2.00		1.00	U	1.00	U	119.00	
CDM-BS31	30/08/2007	1.00	U	1.00	U	1.00	U	1.00	U	134.00	
CDM-BS32	31/08/2007										
CDM-BS33	01/09/2007										
Field Blank		1.00		1.00	U	1.00	U	1.00	U	9.00	
Bank Sample Pipe		1.00	U	1.00	U	1.00	U	1.00	U	34.00	

Notes: U = below detection limit

Table 2-5. Measured Flows: Adits

Location	Date	Time	Flow	Flow	Notes
			gpm	lps	
Kilmacoo Adit	**31/07/2007**	10:13	5.96	0.3748	
Cronebane Shallow	**31/07/2007**	14:05	3.36	0.2108	
Intermediate Adit	**31/07/2007**	15:45	134.67	8.4620	Approximately 20% of the flow was passing under and around the flume. Reported flow was corrected by dividing by 0.8
Ballygahan	**31/07/2007**	-	1.00	0.0628	Coming out of pipe in back of yard with sinkhole. Flow could not be measured, but was easily 1 gpm
Spa Adit	**31/07/2007**	20:05	4.73	0.2973	4 minutes to fill a 5L bottle
Wood Adit	**31/07/2007**	-	-	-	No flow
Deep Adit	**31/07/2007**	14:55	254.20	15.9725	Calculated from measurements of 90 degree V-notch weir collected by CDM.
Road Adit	**01/08/2007**	-	305.55	19.1990	Calculated by County Wicklow from stage measurements at weir

Table 2-6a. Analytical Data: Adits, Seeps, and Pit Lakes

Metals	Date	X	Y	Dissolved Aluminium Low Level		Total Aluminium Low Level		Dissolved Antimony Low Level		Total Antimony Low Level		Dissolved Arsenic Low Level		Total Arsenic Low Level		Dissolved Barium Low Level		Total Barium Low Level		Dissolved Cadmium Low Level		Total Cadmium Low Level		Dissolved Calcium Low Level	
Sample I.D.				ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
Drews Discharge	04/08/2007 15:59	319902	181231	20.00		159.00		1.00		1.00		1.00	U	1.00		17.00		38.00		15.00		14.00		37530.00	
Cronebane Seeps	31/07/2007 09:00	320903	183384	18390.00		14600.00		1.00	U	1.00	U	1.00	U	1.00	U	12.00		37.00		23.30		16.00		4476.00	
Kilmacoo	31/07/2007 10:13	321249	184228	4017.00		3103.00		1.00	U	1.00	U	1.00		1.00	U	37.00		60.00		11.00		10.00		8200.00	
Cronebane Pit Lake	31/07/2007 11:33	320933	183402	13780.00		11410.00		1.00	U	1.00	U	1.00		1.00		11.00		37.00		15.50		13.00		3895.00	
Cronebane Pit Lake	14/11/2007 12:30	320933	183402	118500.00				1.00	U			1.00	U			11.00				14.10				3694.00	
Cronebane Shallow Adit	31/07/2007 14:05	320268	182646	36700.00		271000.00		1.00		1.00	U	34.00		6.00		24.00		23.00		289.30		248.00		11830.00	
Cronebane Shallow Adit	14/11/2007 13:30	320268	182646	344900.00				1.00	U			9.00				10.00				332.60				14170.00	
Cronebane Small Seep	31/07/2007 09:10	320903	183384	34660.00				1.00	U			4.00				7.00				69.40				4580.00	
Cronebane Intermediate Adit	31/07/2007 15:45	320320	182749	71360.00		52800.00		1.00	U	1.00	U	10.00		1.00		11.00		34.00		127.00		107.00		8687.00	
Road Adit Confluence	31/07/2007 16:15	319933	181414	984.00		15820.00		1.00	U	1.00	U	3.00		2.00		25.00		39.00		0.40	U	10.00		219100.00	
Road Adit	31/07/2007 16:00	319910	181413	20930.00				1.00	U			6.00				17.00				12.30				227600.00	
Road Adit	21/02/2008 11:05	319910	181413	28520.00		18750.00		1.00	U	50.00	U	1.00	U	50.00	U	18.00		50.00	U	10.90		50.00	U	176500.00	
Ballygahan Adit	31/07/2007 20:53	319940	181610	99110.00		80430.00		1.00	U	1.00	U	22.00		1.00	U	15.00		31.00		51.00		44.00		118500.00	
Spa Adit	31/07/2007 20:05	319637	181747	21730.00		164800.00		1.00	U	1.00	U	1.00	U	1.00	U	7.00		30.00		54.80		48.00		16860.00	
East Avoca Pit Lake	02/08/2007 17:19	320240	182726	6752.00		53070.00		1.00	U	1.00	U	6.00		1.00	U	11.00		34.00		125.90		106.00		8488.00	
Radio Tower Spring	02/08/2007 17:38	319996	181995	10.00		107.00		1.00	U	1.00	U	1.00	U	1.00	U	11.00		37.00		0.40	U	1.00	U	2017.00	
Paddys Spring	31/07/2007	319623	182388	56.00				1.00	U			1.00	U			4.00				0.40	U			7377.00	
Valve Box Seep	04/08/2007	321112	182731	69.00				1.00	U			1.00	U			27.00				0.80				14390.00	
Mt Platt Seep East	04/08/2007	320631	182902	1032000.00				1.00	U			1.00				66.00				518.50				15680.00	
Mt Platt Seep West	04/08/2007	320633	183033	313600.00				2.00				154.00				113.00				367.60				3331.00	
Mulcahy Ditch	04/08/2007	321007	182284	1188.00				1.00	U			1.00	U			25.00				1.10				5763.00	
Deep Adit	31/07/2007 15:20	319840	182067	102600.00				1.00	U			2.00				7.00				115.60				10770.00	
Deep Adit	14/11/2007 15:30	319842	182061	84020.00				1.00	U			1.00	U			7.00				91.40				8913.00	
Deep Adit	19/02/2008 16:45	319842	182061	131800.00		80860.00		1.00	U	50.00	U	1.00	U	50.00	U	7.00		50.00	U	142.70		120.00		10270.00	
Deep Adit Confluence	31/07/2007 15:30	319895	181974	9.00		76570.00		1.00	U	1.00	U	1.00		1.00		63.00		29.00		0.40	U	99.00		8188.00	
Shelton Abbey Base Pond	15/11/2007 12:15	321616	175253	158.00				1.00	U			1.00	U			40.00				0.50				10450.00	

General Chemistry Parameters	Date	X	Y	Acidity		Ammonia		Chloride		Nitrate		Nitrite		Phosphorus (React)		Sulphate		Suspended Solids		Total Organic Carbon		Total Organic Nitrogen		Total Alkalinity	
Sample I.D.				mg CaCO3/l		mg/l as N		mg/l		mg/l as N		mg/l as N		mg/l as P		mg/l		mg/l		mg/l		mg/l as N		mgCaCO3/l	
Drews Discharge	04/08/2007 15:59	319902	181231	17.00		3.70		20.00		0.93		0.04		0.01	U	192.00		10.00	U	5.70		0.97		18.00	
Cronebane Seeps	31/07/2007 09:00	320903	183384	185.00		0.08		8.00		0.37	U	0.01		0.01	U	228.00		10.00	U	0.30	U	0.37	U	10.00	U
Kilmacoo	31/07/2007 10:13	321249	184228	49.00		0.03		15.00		0.60		0.02		0.01	U	63.00		10.00	U	0.30	U	0.62		10.00	U
Cronebane Pit Lake	31/07/2007 11:33	320933	183402	141.00		0.11		7.00		0.37	U	0.04		0.01		167.00		12.00		0.30	U	0.37	U	10.00	U
Cronebane Pit Lake	14/11/2007 12:30	320933	183402	128.00		0.31		7.00		0.54		0.01	U	0.01	U	160.00		10.00	U	0.80		0.55		10.00	U
Cronebane Shallow Adit	31/07/2007 14:05	320268	182646	2825.00		0.78		12.00		1.83		0.01		0.07		3215.00		19.00		2.60		1.84		10.00	U
Cronebane Shallow Adit	14/11/2007 13:30	320268	182646	2395.00		0.54		11.00		0.37	U	0.02		0.03		3691.00		16.00		6.80		0.37	U	10.00	U
Cronebane Small Seep	31/07/2007 09:10	320903	183384																						
Cronebane Intermediate Adit	31/07/2007 15:45	320320	182749	670.00		0.33		12.00		0.43		0.01		0.21		799.00		10.00	U	0.50		0.44		10.00	U
Road Adit Confluence	31/07/2007 16:15	319933	181414	630.00		6.59		40.00		0.37	U	0.02		0.02		1539.00		10.00	U	1.20		0.37	U	10.00	U
Road Adit	31/07/2007 16:00	319910	181413																						
Road Adit	21/02/2008 11:05	319910	181413	535.00		7.09		2171.00		0.37	U	0.01	U	0.01	U	2171.00		10.00	U	1.60		0.37	U	10.00	U
Ballygahan Adit	31/07/2007 20:53	319940	181610	985.00		9.04		49.00		0.89		0.01	U	0.03		2072.00		10.00	U	2.30		0.90		10.00	U
Spa Adit	31/07/2007 20:05	319637	181747	1690.00		1.22		10.00		0.37	U	0.01		0.03		2044.00		10.00	U	2.90		0.37	U	10.00	U
East Avoca Pit Lake	02/08/2007 17:19	320240	182726	635.00		0.30	U	12.00		1.21		0.01		0.01	U	796.00		10.00	U	0.40		1.22		10.00	U
Radio Tower Spring	02/08/2007 17:38	319996	181995	6.00		0.30	U	13.00		1.16		0.01		0.01	U	4.00		10.00	U	0.30	U	1.17		10.00	U
Paddys Spring	31/07/2007	319623	182388																						
Valve Box Seep	04/08/2007	321112	182731																						
Mt Platt Seep East	04/08/2007	320631	182902																						
Mt Platt Seep West	04/08/2007	320633	183033																						
Mulcahy Ditch	04/08/2007	321007	182284																						
Deep Adit	31/07/2007 15:20	319840	182067																						
Deep Adit	14/11/2007 15:30	319842	182061	715.00		0.27		12.00		0.37	U	0.01		0.01	U	963.00		10.00	U	1.20		0.37	U	10.00	U
Deep Adit	19/02/2008 16:45	319842	182061	930.00		0.28		13.00		0.37	U	0.01	U	0.01		1047.00		10.00	U	0.90		0.37	U	10.00	U
Deep Adit Confluence	31/07/2007 15:30	319895	181974	820.00		0.33		13.00		0.37	U	0.03		0.02		1362.00		10.00		0.40		0.37	U	10.00	U
Shelton Abbey Base Pond	15/11/2007 12:15	321616	175253	272.00		0.63		15.00		0.37	U	0.01		0.01	U	930.00		10.00	U	2.20		0.37	U	10.00	U

Notes: U = below detection limit

Table 2-6a. Analytical Data: Adits, Seeps, and Pit Lakes

Metals		Total Calcium Low Level	Dissolved Chromium Low Level	Total Chromium Low Level	Dissolved Cobalt Low Level	Total Cobalt Low Level	Dissolved Copper Low Level	Total Copper Low Level	Dissolved Iron Low Level	Total Iron Low Level	Dissolved Lead Low Level	Total Lead Low Level	Dissolved Magnesium Low Level	Total Magnesium Low Level
Sample I.D.	**Date**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**
Drews Discharge	04/08/2007 15:59	50410.00	1.00 U	2.00	45.00	43.00	26.00	52.00	35.00	417.00	1.00 U	3.00	24610.00	26030.00
Cronebane Seeps	31/07/2007 09:00	23960.00	5.00	3.00	38.00	34.00	5212.00	4988.00	2639.00	2577.00	1065.00	901.00	13120.00	15850.00
Kilmacoo	31/07/2007 10:13	26200.00	1.00 U	3.00	7.00	6.00	311.00	290.00	461.00	696.00	2176.00	1944.00	4996.00	7629.00
Cronebane Pit Lake	31/07/2007 11:33	24150.00	1.00 U	4.00	27.00	22.00	4188.00	3435.00	2492.00	2532.00	475.00	416.00	8972.00	11530.00
Cronebane Pit Lake	14/11/2007 12:30		1.00 U		23.00		32760.00		1145.00		742.00		10220.00	
Cronebane Shallow Adit	31/07/2007 14:05	27070.00	13.00	14.00	295.00	250.00	8921.00	8809.00	22640.00	130600.00	1334.00	1110.00	189400.00	179400.00
Cronebane Shallow Adit	14/11/2007 13:30		5.00		335.00		9218.00		193000.00		1301.00		241000.00	
Cronebane Small Seep	31/07/2007 09:10		1.00 U		94.00		14800.00		23240.00		1339.00		24060.00	
Cronebane Intermediate Adit	31/07/2007 15:45	27030.00	2.00	4.00	101.00	84.00	3198.00	2569.00	10770.00	28150.00	1352.00	1109.00	57180.00	54180.00
Road Adit Confluence	31/07/2007 16:15	224300.00	9.00	3.00	1.00 U	129.00	2.00	311.00	30.00	111500.00	1.00	270.00	133400.00	126600.00
Road Adit	31/07/2007 16:00		1.00 U		134.00		268.00		150700.00		308.00		143300.00	
Road Adit	21/02/2008 11:05	142400.00	1.00 U	50.00 U	137.00	130.00	309.00	50.00 U	85390.00	77110.00	366.00	240.00	131300.00	108400.00
Ballygahan Adit	31/07/2007 20:53	127500.00	3.00	5.00	200.00	178.00	5237.00	5266.00	10800.00	32640.00	237.00	191.00	210400.00	191800.00
Spa Adit	31/07/2007 20:05	33860.00	6.00	8.00	299.00	257.00	8390.00	8212.00	15420.00	104500.00	102.00	88.00	148100.00	132500.00
East Avoca Pit Lake	02/08/2007 17:19	28680.00	1.00	4.00	92.00	84.00	2822.00	2531.00	9536.00	28730.00	1226.00	1101.00	53550.00	54670.00
Radio Tower Spring	02/08/2007 17:38	19320.00	1.00 U	3.00	1.00 U	1.00 U	46.00	65.00	2.00 U	323.00	1.00 U	2.00	2409.00	
Paddys Spring	31/07/2007		1.00 U		1.00		14.00		16.00		1.00 U		3733.00	
Valve Box Seep	04/08/2007		1.00 U		1.00 U		12.00		2.00 U		8.00		4288.00	
Mt Platt Seep East	04/08/2007		102.00		495.00		88760.00		722600.00		9.00		305900.00	
Mt Platt Seep West	04/08/2007		28.00		172.00		39510.00		348400.00		98.00		118900.00	
Mulcahy Ditch	04/08/2007		1.00 U		1.00 U		28.00		2.00 U		4.00		2848.00	
Deep Adit	31/07/2007 15:20		1.00 U		113.00		845.00		72340.00		1717.00		87470.00	
Deep Adit	14/11/2007 15:30		1.00 U		105.00		1133.00		49220.00		1339.00		77460.00	
Deep Adit	19/02/2008 16:45	11050.00	1.00 U	50.00 U	117.00	100.00	1380.00	1320.00	21080.00	17490.00	2247.00	1540.00	93680.00	74720.00
Deep Adit Confluence	31/07/2007 15:30	29230.00	1.00 U	9.00	9.00	108.00	1.00 U	830.00	293.00	17300.00	1.00 U	1534.00	81610.00	84190.00
Shelton Abbey Base Pond	15/11/2007 12:15		1.00 U		3.00		16.00		508.00		28.00		4170.00	

General Chemistry Parameters		Total Dissolved Solids (180°C)	Total Kjeldahl Nitrogen	Total Phosphorus	Sodium	Sodium Unfiltered	Potassium	Potassium Unfiltered
Sample I.D.	**Date**	**mg/l**	**mg/l as N**	**mg P/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**
Drews Discharge	04/08/2007 15:59	464.00	4.60	0.09	19.00	19.50	5.40	5.40
Cronebane Seeps	31/07/2007 09:00	274.00	0.50 U	0.02	5.00	4.90	0.60	0.60
Kilmacoo	31/07/2007 10:13	216.00	0.50 U	0.05	9.00	8.00	3.00	3.00
Cronebane Pit Lake	31/07/2007 11:33	536.00	0.50 U	0.01	4.40	4.40	0.60	0.60
Cronebane Pit Lake	14/11/2007 12:30	260.00	0.50 U	0.01 U	5.00		0.90	
Cronebane Shallow Adit	31/07/2007 14:05	4550.00	0.50 U	0.13	6.50	6.00	0.60	0.60
Cronebane Shallow Adit	14/11/2007 13:30	6260.00	0.70	0.01 U	7.00		0.70	
Cronebane Small Seep	31/07/2007 09:10				-	-	-	-
Cronebane Intermediate Adit	31/07/2007 15:45	1706.00	0.50 U	0.02	8.00	7.50	3.00	3.10
Road Adit Confluence	31/07/2007 16:15	2434.00	10.20	0.01 U	27.50	26.00	11.90	12.00
Road Adit	31/07/2007 16:00				-	-	-	-
Road Adit	21/02/2008 11:05	2140.00	12.30	0.01 U	28.70		12.10	
Ballygahan Adit	31/07/2007 20:53	3268.00	13.00	0.03	33.50	36.00	14.00	15.00
Spa Adit	31/07/2007 20:05	698.00	1.30	0.02	6.00	6.00	0.70	0.70
East Avoca Pit Lake	02/08/2007 17:19	1196.00	0.50 U	0.10	8.00	7.50	3.00	3.00
Radio Tower Spring	02/08/2007 17:38	84.00	0.50 U	0.01	8.50	8.00	3.20	3.20
Paddys Spring	31/07/2007				-	-	-	-
Valve Box Seep	04/08/2007				-	-	-	-
Mt Platt Seep East	04/08/2007				-	-	-	-
Mt Platt Seep West	04/08/2007				-	-	-	-
Mulcahy Ditch	04/08/2007				-	-	-	-
Deep Adit	31/07/2007 15:20				-	-	-	-
Deep Adit	14/11/2007 15:30	1600.00	0.50 U	0.01 U	8.50		2.20	
Deep Adit	19/02/2008 16:45	2140.00	0.50 U	0.01 U	8.30		1.10	
Deep Adit Confluence	31/07/2007 15:30	1770.00	0.50 U	0.01 U	8.00	8.00	2.10	2.20
Shelton Abbey Base Pond	15/11/2007 12:15	1440.00	0.90	0.03	10.50		4.50	

Table 2-6a. Analytical Data: Adits, Seeps, and Pit Lakes

Metals		Dissolved Manganese Low Level		Total Manganese Low Level		Dissolved Mercury Low Level		Total Mercury		Dissolved Nickel Low Level		Total Nickel Low Level		Total Phosphorous Low Level		Dissolved Selenium Low Level		Total Selenium Low Level		Dissolved Silver Low Level		Total Silver Low Level		Dissolved Thallium Low Level		Total Thallium Low Level	
Sample I.D.	Date	ug/l		ug/l		ug/l		mg/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
Drews Discharge	04/08/2007 15:59	1501.00		1357.00		0.05	U	0.05	U	39.00		38.00		410.00		1.00	U	1.00	U	2.00	U	2.00	U	1.00		1.00	
Cronebane Seeps	31/07/2007 09:00	875.00		753.00		0.05	U	0.05	U	5.00		8.00		394.00		1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U
Kilmacoo	31/07/2007 10:13	347.00		309.00		0.05	U	0.05	U	8.00		11.00		470.00		2.00		1.00	U	2.00	U	2.00	U	1.00		1.00	U
Cronebane Pit Lake	31/07/2007 11:33	558.00		494.00		0.05	U	0.05	U	4.00		6.00		427.00		1.00	U	1.00		2.00	U	2.00	U	1.00	U	1.00	U
Cronebane Pit Lake	14/11/2007 12:30	5650.00				0.05	U			5.00						1.00	U			2.00	U			1.00	U		
Cronebane Shallow Adit	31/07/2007 14:05	9375.00		7440.00		0.05	U	0.05	U	155.00		129.00		412.00		3.00		2.00		2.00	U	2.00	U	3.00		2.00	
Cronebane Shallow Adit	14/11/2007 13:30	14920.00				0.05	U			167.00						1.00	U			2.00	U			4.00			
Cronebane Small Seep	31/07/2007 09:10	1670.00				0.05	U			6.00						2.00				2.00	U			1.00			
Cronebane Intermediate Adit	31/07/2007 15:45	3132.00		2568.00		0.05	U	0.05	U	53.00		48.00		371.00		2.00		1.00	U	2.00	U	2.00	U	4.00		3.00	
Road Adit Confluence	31/07/2007 16:15	42.00		11040.00		0.05	U	0.05	U	7.00		62.00		348.00		1.00	U	3.00		2.00	U	2.00	U	1.00	U	2.00	
Road Adit	31/07/2007 16:00	13240.00				0.05	U			61.00						3.00				2.00	U			2.00			
Road Adit	21/02/2008 11:05	11730.00		9740.00		0.05	U	0.05	U	58.00		50.00	U			1.00		180.00		2.00	U	2.00	U	2.00		1.00	U
Ballygahan Adit	31/07/2007 20:53	17050.00		13670.00		0.05	U	0.05	U	92.00		86.00		428.00		5.00		3.00		2.00	U	2.00	U	5.00		4.00	
Spa Adit	31/07/2007 20:05	10410.00		8596.00		0.05	U	0.05	U	89.00		82.00		398.00		1.00	U	1.00	U	2.00	U	2.00	U	2.00		2.00	
East Avoca Pit Lake	02/08/2007 17:19	2905.00		2571.00		0.05	U	0.05	U	51.00		46.00		411.00		3.00		1.00	U	2.00	U	2.00	U	4.00		3.00	
Radio Tower Spring	02/08/2007 17:38	32.00				0.05	U	0.05	U	4.00						1.00	U			2.00	U			1.00	U		
Paddys Spring	31/07/2007	69.00				0.05	U			2.00						1.00	U			2.00	U			1.00	U		
Valve Box Seep	04/08/2007	7.00				0.05	U			2.00						1.00	U			2.00	U			1.00	U		
Mt Platt Seep East	04/08/2007	14860.00				0.05	U			329.00						3.00				2.00	U			1.00	U		
Mt Platt Seep West	04/08/2007	4568.00				0.05	U			114.00						1.00	U			2.00	U			1.00			
Mulcahy Ditch	04/08/2007	35.00				0.05	U			1.00	U					1.00				2.00	U			1.00	U		
Deep Adit	31/07/2007 15:20	4100.00				0.05	U			39.00						1.00	U			2.00	U			2.00			
Deep Adit	14/11/2007 15:30	4280.00				0.05	U			39.00						1.00	U			2.00	U			2.00			
Deep Adit	19/02/2008 16:45	4358.00		3350.00		0.05	U	0.05	U	39.00		50.00	U			1.00	U	110.00		2.00	U	2.00	U	2.00		1.00	U
Deep Adit Confluence	31/07/2007 15:30	961.00		3573.00		0.05	U	0.05	U	42.00		88.00		394.00		1.00	U	2.00		2.00	U	2.00	U	1.00	U	2.00	
Shelton Abbey Base Pond	15/11/2007 12:15	184.00				0.05	U			2.00						1.00	U			2.00	U			1.00	U		

Metals		Dissolved Tin Low Level		Total Tin Low Level		Dissolved Titanium Low Level		Total Titanium Low Level		Dissolved Uranium Low Level		Total Uranium Low Level		Dissolved Vanadium Low Level		Total Vanadium Low Level		Dissolved Zinc Low Level		Total Zinc Low Level	
Sample I.D.	Date	ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
Drews Discharge	04/08/2007 15:59	1.00	U	2.00		1.00	U	5.00		1.00	U	3.00		1.00	U	1.00		5046.00		4518.00	
Cronebane Seeps	31/07/2007 09:00	1.00	U	1.00		2.00		5.00		2.00		6.00		1.00	U	1.00	U	6610.00		5728.00	
Kilmacoo	31/07/2007 10:13	1.00	U	1.00		1.00		5.00		1.00	U	4.00		1.00	U	1.00		2655.00		2339.00	
Cronebane Pit Lake	31/07/2007 11:33	1.00	U	2.00		2.00		5.00		2.00		5.00		1.00	U	1.00		5213.00		4390.00	
Cronebane Pit Lake	14/11/2007 12:30	1.00	U			1.00	U			2.00				1.00	U			5015.00			
Cronebane Shallow Adit	31/07/2007 14:05	1.00	U	1.00	U	6.00		7.00		32.00		31.00		1.00	U	2.00		85900.00		76380.00	
Cronebane Shallow Adit	14/11/2007 13:30	1.00	U			4.00				39.00				3.00				110200.00			
Cronebane Small Seep	31/07/2007 09:10	1.00	U			3.00				6.00				1.00				19640.00			
Cronebane Intermediate Adit	31/07/2007 15:45	1.00	U	1.00		3.00		6.00		10.00		12.00		3.00		1.00	U	33030.00		28800.00	
Road Adit Confluence	31/07/2007 16:15	1.00	U	1.00	U	4.00		6.00		3.00		7.00		1.00	U	1.00	U	10600.00		9480.00	
Road Adit	31/07/2007 16:00	1.00	U			3.00				3.00				1.00	U			10950.00			
Road Adit	21/02/2008 11:05	1.00	U	1.00	U	4.00		4.00		4.00		4.00		1.00	U	250.00		11060.00			
Ballygahan Adit	31/07/2007 20:53	1.00	U	1.00	U	4.00		6.00		11.00		13.00		1.00	U	1.00	U	21680.00		19210.00	
Spa Adit	31/07/2007 20:05	1.00	U	1.00		6.00		8.00		11.00		13.00		1.00	U	1.00	U	14300.00		13710.00	
East Avoca Pit Lake	02/08/2007 17:19	1.00	U	1.00		4.00		6.00		9.00		12.00		1.00	U	1.00	U	31810.00		28450.00	
Radio Tower Spring	02/08/2007 17:38	1.00	U			1.00	U			1.00	U			1.00	U			117.00			
Paddys Spring	31/07/2007	1.00	U			1.00	U			1.00	U			1.00	U			71.00			
Valve Box Seep	04/08/2007	1.00	U			1.00	U			1.00	U			1.00	U			115.00			
Mt Platt Seep East	04/08/2007	1.00	U			11.00				61.00				2.00				132900.00			
Mt Platt Seep West	04/08/2007	1.00	U			9.00				25.00				1.00	U			113300.00			
Mulcahy Ditch	04/08/2007	1.00	U			1.00				1.00	U			1.00	U			192.00			
Deep Adit	31/07/2007 15:20	1.00	U			6.00				10.00				2.00				47620.00			
Deep Adit	14/11/2007 15:30	1.00	U			4.00				9.00				1.00	U			48630.00			
Deep Adit	19/02/2008 16:45	1.00	U	1.00	U	7.00		6.00		12.00		11.00		1.00	U	180.00		48860.00			
Deep Adit Confluence	31/07/2007 15:30	1.00	U	1.00		10.00		7.00		1.00	U	12.00		2.00		1.00		43090.00		39290.00	
Shelton Abbey Base Pond	15/11/2007 12:15	1.00	U			1.00	U			1.00	U			1.00	U			177.00			

Table 2-6b. Field Parameters: Adits and Pit Lakes

Sample ID	Date	X	Y	pH	Temperature	ORP	Conductivity at 25 ºC	Dissolved Oxygen
				su	ºC	mV	µS/cm	mg/L
Cronebane Pit Lake	31/7/07 1133			3.62	17.24	510.7	551	-
Cronebane Pit Lake	14/11/07 1230	320933	183402	3.33	8.08	525	592	-
Cronebane Small Seep	31/7/07			2.98	20.29	532	1276	-
Cronebane Seeps	31/7/07			3.55	15.59	489	680	-
Cronebane Intermediate Adit	31/7/07 1545			4.31	10.49	419	1093	-
Cronebane Shallow Adit	31/7/07 1405			3.92	10.45	502	2805	-
Cronebane Shallow Adit	14/11/07 1330	320268	182646	3.13	10.34	440.9	4277	-
Deep Adit	14/11/07 1530	319842	182061	3.55	11.18	447.9	1555	-
Deep Adit Weir	31/7/07 1455			3.55	11.22	416	1321	2.9
Deep Adit Confluence	31/7/07 1530			3.47	12.76	403.7	1397	8.57
Road Adit Flume	31/7/07 1600			4.08	12.87	309	2067	3.8
Kilmacoo Adit	31/7/07 1013			4.62	9.84	451	211	-
Radio Tower Spring	31/7/07 1916			5.4	13.8	249.5	95	-
Paddy's Spring	31/7/07 1938			5.93	13.07	232.9	118	-
Spa Adit	31/7/07 2005			3.5	11.38	528	2244	-
Ballygahan Adit	31/7/07 2053			3.8	13.44	399.7	2445	-
Shelton Abbey	1/8/2007 1027			6.62	15.03	94	107	-
East Avoca Pit Lake	1/8/07 1719			3.41	15.49	445	1280	-
Valve Box Seep	4/8/07 1729			5.82	13.57	130	144	-

Table 2-7. Iron Speciation: Adits, Seeps, and Pit Lakes

Sample ID	Date	Ferrous Iron	Total Iron
		mg/L	mg/L
Ballygahan Adit	31/07/2007	112	116/117
Deep Adit Confluence	31/07/2007	61	61
Cronebane Intermediate Adit	31/07/2007	88/88	90
Spa Adit	31/07/2007	154	153/154
East Avoca Pit Lake	02/08/2007	130	128
Killmacoo	31/07/2007	0.49	0.5
Cronebane Shallow Adit	31/07/2007	312	322
Deep Adit at Weir	04/08/2007	75	95
Road Adit	31/07/2007	156	156
Deep Adit Runoff	08/05/2007	40	39
Mt. Platt Seep West	04/08/2007	620	632

Note: two values indicate duplicate sample

Table 2-8a. GSI Flow Measurements: Adits and Seeps

ID1	ID	Site Description	Site Code	Easting	Northing	Date	Flow (L/sec)
218	AVO-06-W003	Deep Adit surface run-off	Waste run-off / ponding	319841	182130	15/02/2007	3.68
219	AVO-06-W004	Deep Adit discharge	Adit/Shaft discharge	319846	182121	15/02/2007	24.10
	AVO-07-W004	Deep Adit discharge		319846	182121	13/06/2007	13.70
220	AVO-06-W008	Road adit discharge	Adit/Shaft discharge	319854	181512	15/02/2007	26.30
	AVO-07-W008b	Road adit discharge		319854	181512	13/06/2007	13.40
221	AVO-06-W015	Sroughmore - Connary adit drainage	Adit/Shaft discharge	321236	184271	15/02/2007	0.71
222	AVO-06-W024	Cronebane Shallow Adit discharge	Adit/Shaft discharge	320273	182641	15/02/2007	0.38
	AVO-07-W024	Cronebane Shallow Adit discharge		320273	182641	13/06/2007	0.10
223	AVO-06-W035	Surface run-off below Deep Adit near river	Waste run-off / ponding	319819	182041	15/02/2007	0.29

Table 2-8b. GSI Analytical Data: Adits and Seeps

ID1	ID	Date	Site description	Site Code	Easting	Northing	pH	Electrical Conductivity	TDS	Temperature	DO	Tot_filter	Flow_ls	Alkalinity
							su	mS	ppt	°C	mg/L			
2	AVO-06-W003	20/11/2006	Deep Adit run-off	Waste run-off / ponding	319841	182130	2.66	1.48	0.74	7.00	0.00	1.00	0.00	0.00
218	AVO-06-W003	15/02/2007	Deep Adit surface run-off	Waste run-off / ponding	319841	182130	3.18	0.58	0.29	8.50	0.00	1.00	3.68	0.00
3	AVO-06-W004	20/11/2006	Deep Adit discharge	Adit/Shaft discharge	319846	182121	3.30	1.68	0.84	10.30	0.00	1.00	0.00	0.00
219	AVO-06-W004	15/02/2007	Deep Adit discharge	Adit/Shaft discharge	319846	182121	3.33	1.86	0.93	10.40	0.00	1.00	24.10	0.00
	AVO-07-W004	13/06/2007	Deep Adit discharge		319846	182121	3.06	1.76	0.88	11.20	0.59	1.00	13.70	0.00
4	AVO-06-W005	20/11/2006	Deep Adit discharge/runoff near river	Adit/Shaft discharge	319893	181982	3.12	1.67	0.84	11.10	0.00	1.00	0.00	0.00
	AVO-07-W005	13/06/2007	Deep Adit discharge/runoff near river		319893	181983	3.03	1.77	0.88	5.30	9.30	1.00		0.00
7	AVO-06-W008	20/11/2006	Road Adit discharge	Adit/Shaft discharge	319932	181432	3.74	2.48	1.24	12.10	0.00	1.00	0.00	0.00
220	AVO-06-W008	15/02/2007	Road adit discharge	Adit/Shaft discharge	319854	181512	3.93	2.32	1.16	11.90	0.00	1.00	26.30	0.00
	AVO-07-W008b	13/06/2007	Road adit discharge		319854	181512	3.80	2.44	1.22	12.80	3.94	1.00	13.40	0.00
13	AVO-06-W015	22/11/2006	Sroughmore, Connary adit	Adit/Shaft discharge	321236	184271	3.66	0.24	0.12	9.50	0.00	1.00	0.00	0.00
221	AVO-06-W015	15/02/2007	Sroughmore - Connary adit drainage	Adit/Shaft discharge	321236	184271	3.74	0.26	0.13	9.10	0.00	1.00	0.71	0.00
20	AVO-06-W024	22/11/2006	Cronebane Shallow Adit discharge	Adit/Shaft discharge	320273	182641	2.59	3.22	1.64	9.50	0.00	1.00	0.00	0.00
222	AVO-06-W024	15/02/2007	Cronebane Shallow Adit discharge	Adit/Shaft discharge	320273	182641	3.87	1.96	0.98	9.80	0.00	1.00	0.38	0.00
	AVO-07-W024	13/06/2007	Cronebane Shallow Adit discharge		320273	182641	2.60	4.56	2.28	11.00	1.24	1.00	0.10	0.00
24	AVO-06-W029	22/11/2006	Mrs Tracey's Spring	Spring	320914	181086	6.30	0.16	0.08	9.90	0.00	1.00	0.00	0.00
	AVO-07-W029	14/06/2007	Mrs Tracey's Spring		320914	181086	6.34	0.17	0.08	10.90	12.22	1.00		0.00
25	AVO-06-W030	20/11/2006	P Clarke's Spring	Spring	319997	181997	5.54	0.04	0.02	10.00	0.00	1.00	0.00	0.00
22	AVO-06-W026	22/11/2006	Run-off, NE end of Mount Platt	Waste run-off / ponding	320718	183075	2.36	2.03	1.01	5.50	0.00	1.00	0.00	0.00
23	AVO-06-W027	22/11/2006	Run-off from SW-Central part Mount Platt	Waste run-off / ponding	320636	183032	2.19	3.76	1.92	5.80	0.00	1.00	0.00	0.00
17	AVO-06-W020	20/11/2006	West Avoca Drainage to river from Emergency TMF?	Tailings seepage	319943	181670	4.33	0.58	0.03	8.00	0.00	1.00	0.00	0.00
27	AVO-06-W033	27/11/2006	Shelton Abbey TMF, surface drainage ditch	Tailings run-off	321682	175499	5.91	0.04	0.02	8.50	0.00	8.00	0.00	0.00
223	AVO-06-W035	15/02/2007	Surface run-off below Deep Adit near river	Waste run-off / ponding	319819	182041	2.17	1.10	0.55	8.60	0.00	1.00	0.29	0.00

Notes: U = below detection limit

Table 2-8b. GSI Analytical Data: Adits and Seeps

ID	Date	Acidity	BOD	K	Na	TSS	Orthophosphate	Sulphate	TDS	COD	Dissolved Aluminium		Total Aluminium		Dissolved Antimony		Total Antimony		Dissolved Arsenic		Total Arsenic		Dissolved Barium	
							mg/L	mg/L	mg/L	mg/L	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
AVO-06-W003	20/11/2006	466.00	1000.00	1200.00	5000.00	5000.00	15.00	710000.00	692000.00	7500.00	43290.00		40800.00		2.00		0.50	U	0.50	U	1.00		8.00	
AVO-06-W003	15/02/2007	135.00	2000.00	700.00	14500.00	5000.00	15.00	156000.00	381000.00	35000.00	11520.00		9062.00		1.00		0.50		0.50		2.00		7.00	
AVO-06-W004	20/11/2006	934.00	6000.00	1800.00	8500.00	5000.00	15.00	1161000.00	961000.00	7500.00	98810.00		91050.00		2.00		9.00		0.50	U	0.50	U	8.00	
AVO-06-W004	15/02/2007	960.00	4000.00	1700.00	7500.00	5000.00	15.00	1205000.00	857000.00	56000.00	110200.00		87890.00		0.50		0.50		0.50		0.50		8.00	
AVO-07-W004	13/06/2007	910.00		2000.00	9000.00	5000.00	15.00	1111000.00	907000.00		97670.00		85450.00		0.50	U	0.50	U	0.50	U	0.50	U	6.00	
AVO-06-W005	20/11/2006	900.00	8000.00	1800.00	11000.00	5000.00	15.00	1153000.00	989000.00	7500.00	98200.00		88990.00		1.00		1.00		0.50	U	0.50	U	7.00	
AVO-07-W005	13/06/2007	855.00		2000.00	8500.00	5000.00	15.00	1111000.00	869000.00		89120.00		83250.00		0.50	U	0.50	U	0.50	U	0.50	U	6.00	
AVO-06-W008	20/11/2006	972.00	11000.00	10400.00	31500.00	5000.00	130.00	1580000.00	1280000.00	30000.00	23840.00		21330.00		0.50	U	0.50	U	3.00		3.00		19.00	
AVO-06-W008	15/02/2007	772.00	8000.00	10400.00	22000.00	5000.00	15.00	1401000.00	1070000.00	42000.00	20450.00		16080.00		0.50		0.50		1.00		2.00		18.00	
AVO-07-W008b	13/06/2007	540.00		11400.00	27000.00	5000.00	15.00	1652000.00	1110000.00		17600.00		17720.00		0.50	U	0.50	U	3.00		2.00		15.00	
AVO-06-W015	22/11/2006	45.20	1000.00	2600.00	9500.00	5000.00	15.00	63000.00	119000.00	7500.00	4121.00		3900.00		0.50	U	0.50	U	0.50	U	2.00		41.00	
AVO-06-W015	15/02/2007	38.00	2000.00	2600.00	11500.00	5000.00	15.00	65000.00	129000.00	7500.00	3408.00		2868.00		0.50		0.50		0.50		0.50		39.00	
AVO-06-W024	22/11/2006	316.00	1000.00	400.00	8000.00	13000.00	70.00	2767000.00	1530000.00	7500.00	373700.00		279000.00		0.50	U	0.50	U	15.00		13.00		6.00	
AVO-06-W024	15/02/2007	2400.00	1000.00	400.00	7000.00	5000.00	60.00	3510000.00	1750000.00	188000.00	352500.00		269500.00		0.50		0.50		18.00		14.00		8.00	
AVO-07-W024	13/06/2007	3400.00		700.00	6500.00	5000.00	50.00	4901000.00	2010000.00		407700.00		371800.00		0.50	U	0.50	U	5.00		3.00		9.00	
AVO-06-W029	22/11/2006	16.80	1000.00	1000.00	11500.00	5000.00	15.00	10000.00	94000.00	7500.00	48.00		529.00		10.00		5.00		0.50	U	0.50	U	0.50	U
AVO-07-W029	14/06/2007	10.00		800.00	10000.00	5000.00	15.00	10000.00	73000.00		2290.00		655.00		0.50	U	0.50	U	0.50	U	0.50	U	1.00	
AVO-06-W030	20/11/2006	9.60	1000.00	2800.00	8000.00	5000.00	15.00	5000.00	44000.00	7500.00	3.00		39.00		2.00		0.50	U	0.50	U	0.50	U	11.00	
AVO-06-W026	22/11/2006	348.00	1000.00	100.00	3500.00	5000.00	50.00	880000.00	930000.00	7500.00	66520.00		66570.00		1.00		0.50	U	45.00		57.00		3.00	
AVO-06-W027	22/11/2006	556.00	1000.00	100.00	4500.00	16000.00	350.00	2606000.00	1600000.00	7500.00	262500.00		238800.00		2.00		0.50	U	234.00		271.00		5.00	
AVO-06-W020	20/11/2006	63.20	1000.00	800.00	4000.00	5000.00	15.00	271000.00	350000.00	7500.00	8626.00		7789.00		0.50	U	0.50	U	0.50	U	0.50	U	24.00	
AVO-06-W033	27/11/2006	12.40	5000.00	3000.00	3500.00	5000.00	60.00	1500.00	27000.00	35000.00	77.00		97.00		0.50	U	0.50	U	2.00		2.00		0.50	U
AVO-06-W035	15/02/2007	316.00	1000.00	200.00	10000.00	5000.00	15.00	404000.00	520000.00	7500.00	16370.00		13150.00		0.50		0.50		0.50		1.00		5.00	

J = below detection limit

Table 2-8b. GSI Analytical Data: Adits and Seeps

ID	Date	Total Barium		Dissolved Cadmium		Total Cadmium		Dissolved Calcium		Total Calcium		Dissolved Chromium		Total Chromium		Dissolved Copper		Total Copper		Dissolved Iron		Total Iron		Dissolved Lead		Total Lead	
		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
AVO-06-W003	20/11/2006	9.00		34.00		37.00		25450.00		24370.00		5.00		19.00		8638.00		8266.00		19510.00		19330.00		394.00		394.00	
AVO-06-W003	15/02/2007	37.00		8.70		8.00		7141.00		27970.00		0.50		5.00		3126.00		2300.00		1134.00		1460.00		338.00		287.00	
AVO-06-W004	20/11/2006	7.00		140.00		148.00		10400.00		9954.00		1.00		109.00		1553.00		1471.00		25020.00		22370.00		2125.00		2113.00	
AVO-06-W004	15/02/2007	29.00		170.80		139.00		10870.00		25110.00		0.50		4.00		1829.00		1416.00		24750.00		19360.00		1892.00		1483.00	
AVO-07-W004	13/06/2007	51.00		123.10		105.00		11380.00		28110.00		0.50	U	3.00		1359.00		1154.00		19200.00		20230.00		1434.00		1272.00	
AVO-06-W005	20/11/2006	8.00		137.00		150.00		10320.00		9293.00		2.00		5.00		1563.00		1457.00		23840.00		21840.00		2009.00		2021.00	
AVO-07-W005	13/06/2007	50.00		117.00		102.00		9942.00		30590.00		0.50	U	5.00		1306.00		1188.00		18060.00		18800.00		1334.00		1227.00	
AVO-06-W008	20/11/2006	19.00		12.00		11.00		165600.00		155800.00		1.00		0.50	U	384.00		364.00		162100.00		159600.00		407.00		372.00	
AVO-06-W008	15/02/2007	37.00		13.90		11.00		180900.00		158200.00		0.50		2.00		361.00		301.00		131500.00		102300.00		384.00		305.00	
AVO-07-W008b	13/06/2007	60.00		11.20		12.00		208300.00		221700.00		0.50	U	4.00		230.00		234.00		101300.00		96200.00		289.00		278.00	
AVO-06-W015	22/11/2006	41.00		11.00		12.00		8871.00		9381.00		0.50	U	1.00		255.00		287.00		367.00		546.00		1685.00		1705.00	
AVO-06-W015	15/02/2007	58.00		13.40		10.00		9558.00		25630.00		0.50		5.00		273.00		227.00		328.00		742.00		2054.00		1552.00	
AVO-06-W024	22/11/2006	6.00		257.00		242.00		8916.00		8316.00		8.00		19.00		10510.00		10520.00		127500.00		128400.00		997.00		975.00	
AVO-06-W024	15/02/2007	25.00		304.80		251.00		11740.00		24600.00		15.00		14.00		13860.00		10720.00		193800.00		146900.00		1105.00		835.00	
AVO-07-W024	13/06/2007	46.00		349.60		317.00		14040.00		35370.00		10.00		14.00		9136.00		8361.00		164600.00		151800.00		1299.00		1197.00	
AVO-06-W029	22/11/2006	0.50	U	0.50	U	0.50	U	16530.00		17840.00		0.50	U	5.00		0.50	U	8.00		1.00	U	78.00		0.50	U	0.50	U
AVO-07-W029	14/06/2007	50.00		0.20	U	0.50		14360.00		31350.00		0.50	U	5.00		0.50	U	19.00		5.00		390.00		0.50	U	3.00	
AVO-06-W030	20/11/2006	11.00		0.50	U	0.50	U	1102.00		1195.00		3.00		3.00		22.00		12.00		12.00		237.00		0.50	U	3.00	
AVO-06-W026	22/11/2006	3.00		71.00		73.00		772.00		730.00		6.00		8.00		6644.00		7072.00		97060.00		104300.00		345.00		471.00	
AVO-06-W027	22/11/2006	5.00		283.00		280.00		1691.00		1967.00		17.00		234.00		29610.00		30830.00		286800.00		303600.00		72.00		433.00	
AVO-06-W020	20/11/2006	27.00		5.00		4.00		68300.00		67870.00		2.00		39.00		1662.00		1578.00		144.00		464.00		24.00		28.00	
AVO-06-W033	27/11/2006	2.00		0.50	U	0.50	U	3095.00		2777.00		0.50	U	0.50	U	6.00		0.50	U	131.00		584.00		0.50	U	2.00	
AVO-06-W035	15/02/2007	29.00		5.30		5.00		6575.00		21680.00		3.00		8.00		6084.00		4725.00		40990.00		32770.00		114.00		92.00	

J = below detection limit

Table 2-8b. GSI Analytical Data: Adits and Seeps

ID	Date	Dissolved Magnesium		Total Magnesium		Dissolved Manganese		Total Manganese		Dissolved Mercury		Total Mercury		Dissolved Molybdenum		Total Molybdenum		Dissolved Nickel		Total Nickel		Dissolved Selenium		Total Selenium	
		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
AVO-06-W003	20/11/2006	55390.00		53790.00		2533.00		2495.00		0.03	U	25.00	U	0.50	U	3.00		16.00		36.00		0.50	U	2.00	
AVO-06-W003	15/02/2007	12650.00		12920.00		732.00		571.00		0.03		25.00		0.50		0.50		6.00		20.00		0.50		0.50	
AVO-06-W004	20/11/2006	96670.00		91020.00		4307.00		4216.00		0.03	U	25.00	U	0.50	U	16.00		47.00		70.00		0.50	U	1.00	
AVO-06-W004	15/02/2007	113700.00		91790.00		4462.00		3464.00		0.03		25.00		0.50		0.50		50.00		48.00		0.50		0.50	
AVO-07-W004	13/06/2007	104700.00		93150.00		4271.00		3734.00		0.03	U	25.00	U	0.50	U	0.50	U	42.00		40.00		0.50	U	1.00	
AVO-06-W005	20/11/2006	96480.00		89270.00		4295.00		4167.00		0.03	U	25.00	U	0.50	U	0.50	U	46.00		44.00		0.50	U	1.00	
AVO-07-W005	13/06/2007	94770.00		91740.00		3895.00		3713.00		0.03	U	25.00	U	0.50	U	0.50	U	41.00		41.00		0.50	U	0.50	U
AVO-06-W008	20/11/2006	168300.00		158900.00		15300.00		15080.00		0.03	U	90.00		0.50	U	0.50	U	86.00		88.00		3.00		3.00	
AVO-06-W008	15/02/2007	146700.00		117400.00		11990.00		9404.00		0.03		90.00		0.50		0.50		72.00		62.00		2.00		3.00	
AVO-07-W008b	13/06/2007	130700.00		127900.00		10550.00		10140.00		0.03	U	50.00		0.50	U	0.50	U	52.00		59.00		4.00		1.00	
AVO-06-W015	22/11/2006	4819.00		5038.00		305.00		319.00		0.03	U	25.00	U	0.50	U	0.50	U	5.00		7.00		0.50	U	1.00	
AVO-06-W015	15/02/2007	6166.00		7361.00		402.00		309.00		0.03		25.00		0.50		0.50		11.00		19.00		0.50		0.50	
AVO-06-W024	22/11/2006	158200.00		155100.00		6929.00		6680.00		0.38		120.00		0.50	U	0.50	U	120.00		120.00		2.00		1.00	
AVO-06-W024	15/02/2007	225600.00		175500.00		8798.00		6611.00		0.03		50.00		0.50		0.50		160.00		129.00		0.50		0.50	
AVO-07-W024	13/06/2007	261800.00		238500.00		10640.00		9841.00		0.03	U	90.00		0.50	U	0.50	U	174.00		163.00		0.50	U	0.50	U
AVO-06-W029	22/11/2006	5334.00		5853.00		0.50	U	6.00		0.03	U	25.00	U	0.50	U	0.50	U	1.00		5.00		1.00		0.50	U
AVO-07-W029	14/06/2007	5424.00		7682.00		9.00		13.00		0.03	U	25.00	U	0.50	U	0.50	U	1.00		6.00		0.50	U	0.50	U
AVO-06-W030	20/11/2006	1831.00		1823.00		2.00		8.00		0.06		25.00	U	0.50	U	0.50	U	2.00		9.00		0.50	U	0.50	U
AVO-06-W026	22/11/2006	34270.00		35170.00		734.00		746.00		0.14		120.00		0.50	U	0.50	U	54.00		57.00		3.00		0.50	U
AVO-06-W027	22/11/2006	80410.00		82270.00		3325.00		3349.00		0.19		230.00		0.50	U	32.00		88.00		139.00		2.00		2.00	
AVO-06-W020	20/11/2006	14210.00		13510.00		1966.00		1876.00		0.03	U	25.00	U	0.50	U	5.00		27.00		39.00		0.50	U	0.50	U
AVO-06-W033	27/11/2006	1397.00		1310.00		4.00		166.00		0.05		25.00	U	0.50	U	0.50	U	2.00		2.00		0.50	U	0.50	U
AVO-06-W035	15/02/2007	20160.00		18580.00		580.00		459.00		0.03		25.00		0.50		0.50		8.00		18.00		0.50		0.50	

J = below detection limit

Table 2-8b. GSI Analytical Data: Adits and Seeps

ID	Date	Dissolved Tin		Total Tin		Dissolved Uranium		Total Uranium		Dissolved Vanadium		Total Vanadium		Dissolved Zinc		Total Zinc	
		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
AVO-06-W003	20/11/2006	0.50	U	0.50	U	3.00		3.00		0.50	U	0.50	U	9589.00		10570.00	
AVO-06-W003	15/02/2007	0.50		2.00		0.50		4.00		0.50		0.50		2956.00		2182.00	
AVO-06-W004	20/11/2006	0.50	U	0.50	U	11.00		12.00		0.50	U	1.00		45690.00		49310.00	
AVO-06-W004	15/02/2007	0.50		0.50		13.00		14.00		0.50		0.50		51530.00		37950.00	
AVO-07-W004	13/06/2007	0.50	U	2.00		9.00		11.00		0.50	U	0.50	U	48070.00		39130.00	
AVO-06-W005	20/11/2006	0.50	U	0.50	U	12.00		12.00		0.50	U	0.50	U	45190.00		48870.00	
AVO-07-W005	13/06/2007	0.50	U	2.00		9.00		11.00		0.50	U	1.00		44500.00		38710.00	
AVO-06-W008	20/11/2006	0.50	U	0.50	U	4.00		5.00		0.50	U	0.50	U	13320.00		15880.00	
AVO-06-W008	15/02/2007	0.50		0.50		4.00		7.00		0.50		0.50		11710.00		8716.00	
AVO-07-W008b	13/06/2007	0.50	U	2.00		3.00		7.00		0.50	U	0.50	U	10370.00		9374.00	
AVO-06-W015	22/11/2006	9.00		0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	2927.00		2969.00	
AVO-06-W015	15/02/2007	0.50		5.00		0.50		4.00		0.50		0.50		3160.00		2286.00	
AVO-06-W024	22/11/2006	7.00		0.50	U	23.00		22.00		0.50	U	0.50	U	74040.00		71250.00	
AVO-06-W024	15/02/2007	0.50		0.50		34.00		29.00		0.50		0.50		84840.00		62010.00	
AVO-07-W024	13/06/2007	0.50	U	3.00		38.00		39.00		0.50	U	0.50	U	110500.00		102400.00	
AVO-06-W029	22/11/2006	11.00		0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	26.00		37.00	
AVO-07-W029	14/06/2007	0.50	U	2.00		0.50	U	3.00		0.50	U	0.50	U	18.00		116.00	
AVO-06-W030	20/11/2006	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	2.00		67.00		82.00	
AVO-06-W026	22/11/2006	10.00		0.50	U	11.00		11.00		2.00		2.00		14270.00		14170.00	
AVO-06-W027	22/11/2006	9.00		0.50	U	19.00		20.00		0.50	U	0.50	U	80980.00		80990.00	
AVO-06-W020	20/11/2006	0.50	U	30.00		0.50	U	0.50	U	0.50	U	1.00		1277.00		1491.00	
AVO-06-W033	27/11/2006	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	16.00		32.00	
AVO-06-W035	15/02/2007	0.50		2.00		0.50		4.00		0.50		0.50		1818.00		1454.00	

J = below detection limit

Table 2-9. Measured Flows: Chloride Tracer Results

Transects	8/2/2007		8/3/2007	
	Flow (m3/s)	% Change	Flow (m3/s)	% Change
1			4.08	
2	7.67		4.33	6.0%
5	6.27	-18.3%	2.44*	-43.8%*
3	4.75	-24.2%	4.05	66.2%
4				

* Flow for Transect 5 on 8/3/07 unreliable due to probe malfunction

Table 3-1. Analytical Data: Sediments

SAMPLE NO.	Aluminium		Antimony		Arsenic		Barium		Bismuth		Cadmium		Calcium		Chromium		Cobalt		Copper		Iron		Lead		Magnesium		Manganese		Mercury		Molybdenum
	%		ppm		ppm		ppm		ppm		ppm		%		ppm		ppm		ppm		%		ppm		%		ppm		ppm		ppm
Transect 1	2.25		0.20	U	27.79		59.85		0.30		1.84		0.21		29.02		20.20		34.91		3.67		259.31		0.60		5016.33		0.08		0.99
Transect 2	2.50		0.20	U	30.25		40.34		0.35		0.98		0.18		30.59		17.92		133.60		4.28		229.33		0.58		8069.74		0.02	U	0.94
Transect 3	2.47		0.20	U	27.53		53.96		0.35		0.52		0.09		33.87		15.70		85.61		4.34		144.06		0.71		2286.07		0.02	U	0.86
Transect 4	2.23		0.20	U	38.21		49.85		0.97		0.90		0.09		30.68		17.82		225.97		4.24		152.62		0.70		2507.41		0.02	U	1.14
Deep Adit -Sed	0.92		1.06		97.09		15.03		1.84		0.30		0.04	U	9.68		3.67		160.69		27.16		704.21		0.29		407.52		0.16		2.00
Road Adit - Sed	0.49		1.68		481.25		4.57		0.08	U	0.17		0.04	U	8.00	U	1.77		503.46		42.13		267.20		0.08		77.53		0.12		1.28
Aughrim at Golf Course	2.40		0.20	U	21.58		70.55		0.29		0.26		0.08		24.43		18.23		21.83		3.70		21.36		0.64		2065.98		0.02	U	0.57
SA/T1-1	2.78		0.20	U	30.82		58.70		0.68		0.20		0.07		29.41		15.42		78.13		4.41		82.62		0.77		1974.61		0.02	U	1.03
SA/T1-2	2.81		0.20	U	31.66		60.45		1.20		0.31		0.07		30.71		18.70		73.54		4.45		93.50		0.75		2055.21		0.02	U	1.14
SA/T2-1	2.72		0.20	U	28.85		58.65		1.07		0.70		0.08		29.89		17.63		68.88		4.31		76.41		0.78		1953.87		0.02	U	0.99
SA/T2-2	2.65		0.20	U	27.73		53.67		0.64		0.39		0.06		29.13		18.35		70.00		4.28		69.06		0.78		1716.67		0.02	U	0.94

Notes: U = below detection limit; ppm = mg/kg; SA = Shelton Abbey
Deep Adit = sediments in Avoca River at Deep Adit discharge point
Road Adit = Sediments in Avoca River at Road Adit discharge point

Table 3-1. Analytical Data: Sediments

SAMPLE NO.	Nickel		Phosphorus		Selenium		Silver		Sodium		Sulphur		Thorium		Tin		Titanium		Uranium		Vanadium		Zinc	
	ppm		%		ppm		ppm		%		%		ppm		ppm		ppm		ppm		ppm		ppm	
Transect 1	23.84		0.05		1.28		1.05		0.04	U	0.07		8.02		0.87		262.85		1.78		26.27		267.95	
Transect 2	20.79		0.05		0.80	U	0.20		0.04	U	0.09		6.66		1.49		263.75		3.84		24.63		238.17	
Transect 3	23.12		0.04		0.80	U	0.10		0.05		0.08		6.02		0.80	U	236.62		1.41		25.79		192.98	
Transect 4	24.00		0.04		0.80	U	0.17		0.05		0.12		5.65		0.80	U	207.97		1.32		24.98		244.03	
Deep Adit -Sed	7.86		0.02		0.80	U	0.35		0.04	U	2.60		3.96		0.80	U	79.65		0.62		13.47		141.63	
Road Adit - Sed	3.62		0.01		0.80	U	0.04	U	0.04	U	2.81		2.00		0.80	U	45.05		0.49		8.00	U	201.68	
Aughrim at Golf Course	21.95		0.03		0.80	U	0.04	U	0.06		0.09		6.21		0.80	U	291.46		1.89		28.81		102.86	
SA/T1-1	24.49		0.04		0.80	U	0.04		0.07		0.09		6.72		0.80	U	247.98		1.85		28.75		138.30	
SA/T1-2	25.78		0.04		0.80	U	0.06		0.07		0.03		6.67		0.80	U	233.69		1.60		29.78		154.17	
SA/T2-1	25.83		0.03		0.80	U	0.11		0.06		0.09		7.41		0.80	U	249.28		1.58		30.21		200.91	
SA/T2-2	25.81		0.04		0.80	U	0.05		0.06		0.06		6.65		0.80	U	216.70		1.51		27.50		160.78	

Notes: U = below detection lim
Deep Adit = sediments in Avoc
Road Adit = Sediments in Avo

Table 3-2. GSI Analytical Data: Sediments

SAMPLE_ID	Date/Time	Mine	Site	Livestock access	Field/Lab	Fraction	Easting	Northing	Reading No	Type	Duration	Units	Sequence	SAMPLE	Antimony	Arsenic	Barium
AVO-07-SS001	12/12/2007 12:33	Avoca	Meetings Avonmore river	Yes	Lab	<150um	318931	183004	3111	BULK	360.85	ppm	Final	AVO-07-SS001	0.00	33.78	0.00
AVO-07-SS002	12/12/2007 12:44	Avoca	Avonmore, up/s of mettings	No	Lab	<150um	319037	183023	3117	BULK	361.18	ppm	Final	AVO-07-SS002	0.00	34.58	0.00
AVO-07-SS003	12/12/2007 12:58	Avoca	Whitesbridge up/s	No	Lab	<150um	319729	182095	3116	BULK	360.65	ppm	Final	AVO-07-SS003	0.00	57.85	0.00
AVO-07-SS004	12/12/2007 13:11	Avoca	Whitesbridge d/s	No	Lab	<150um	319831	182012	3120	BULK	360.53	ppm	Final	AVO-07-SS004	74.61	47.70	859.88
AVO-07-SS005	12/12/2007 13:22	Avoca	Deep adit	No	Lab	<150um	319971	181881	3123	BULK	360.97	ppm	Final	AVO-07-SS005	0.00	52.98	0.00
AVO-07-SS010	12/12/2007 13:31	Avoca	Avoca village	No	Lab	<150um	320370	179968	3126	BULK	360.33	ppm	Final	AVO-07-SS010	0.00	73.08	0.00
AVO-07-SS011	12/12/2007 13:45	Avoca	Sulphur brook	No	Lab	<150um	320817	181043	3129	BULK	360.64	ppm	Final	AVO-07-SS011	0.00	100.73	0.00
AVO-07-SS012	12/12/2007 13:53	Avoca	up/s sulphur brook	Yes	Lab	<150um	321492	182245	3132	BULK	361.01	ppm	Final	AVO-07-SS012	0.00	32.96	0.00
AVO-07-SS013	12/12/2007 14:01	Avoca	Woodenbridge	No	Lab	<150um	319738	177006	3135	BULK	360.79	ppm	Final	AVO-07-SS013	0.00	60.20	0.00
AVO-07-SS014	12/12/2007 14:10	Avoca	Shelton Abbey	No	Lab	<150um	321585	175199	3138	BULK	360.35	ppm	Final	AVO-07-SS014	0.00	47.34	0.00
AVO-07-SS015	12/12/2007 14:18	Avoca	Avoca River Park	No	Lab	<150um	322421	174799	3141	BULK	361.01	ppm	Final	AVO-07-SS015	0.00	52.50	0.00
GLD-07-SS001	6/1/2007	Glendalough	Ballinafunshoge Avonbeg River d/s site	No	Lab	<150 um	308441	192337	1902	BULK	360.86	ppm	Final	GLD-07-SS001	0.00	49.25	0.00
GLD-07-SS002	6/1/2007	Glendalough	Ballinafunshoge Avonbeg River 2km d/s mine	No	Lab	<150 um	309778	191185	1914	BULK	360.93	ppm	Final	GLD-07-SS002	0.00	68.35	0.00
GLD-07-SS005	6/1/2007	Glendalough	Ballinafunshoge Avonbeg River 1km d/s mine	Yes	Lab	<150 um	309054	191676	1880	BULK	361.03	ppm	Final	GLD-07-SS005	0.00	55.30	0.00
GLD-07-SS012	6/1/2007	Glendalough	Laragh	No	Lab	<150 um	314138	195973	1884	BULK	360.09	ppm	Final	GLD-07-SS012	0.00	168.62	0.00
GLD-07-SS016	6/1/2007	Glendalough	Laragh	No	Lab	<150 um	311801	197253	1896	BULK	360.50	ppm	Final	GLD-07-SS016	147.03	321.01	756.19
GLD-07-SS020	6/1/2007	Glendalough	Laragh	No	Lab	<150 um	312667	196674	1875	BULK	360.40	ppm	Final	GLD-07-SS020	0.00	306.59	0.00
GLD-07-SS027	6/1/2007	Glendalough	Ballinafunshoge Avonbeg River 3km d/s mine	No	Lab	<150 um	310512	190779	1917	BULK	361.05	ppm	Final	GLD-07-SS027	0.00	35.48	0.00

Table 3-2. GSI Analytical Data: Sediments

SAMPLE_ID	Date/Time	Bismuth	Cadmium	Calcium	Chloride	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Phosphorus	Potassium	Rubidium	Scandium	Selenium	Silver	Strontium
AVO-07-SS001	12/12/2007 12:33	0.00	0.00	4119.25	0.00	0.00	0.00	34.49	43592.41	594.43	5397.07	0.00	0.00	0.00	21359.39	110.37	0.00	0.00	0.00	15.25
AVO-07-SS002	12/12/2007 12:44	0.00	0.00	4220.30	0.00	0.00	0.00	60.78	51670.48	640.37	6958.58	0.00	0.00	0.00	21885.44	112.62	0.00	0.00	0.00	23.67
AVO-07-SS003	12/12/2007 12:58	0.00	0.00	2874.20	0.00	0.00	0.00	354.62	45812.43	573.47	6798.72	0.00	68.09	0.00	19517.49	96.32	0.00	0.00	0.00	0.00
AVO-07-SS004	12/12/2007 13:11	0.00	0.00	1192.61	0.00	0.00	0.00	442.84	297720.06	180.58	1716.65	0.00	0.00	0.00	12962.95	80.59	0.00	0.00	0.00	0.00
AVO-07-SS005	12/12/2007 13:22	0.00	0.00	1902.84	0.00	0.00	0.00	279.92	69155.66	313.67	2283.19	0.00	0.00	0.00	18912.71	99.60	0.00	0.00	0.00	0.00
AVO-07-SS010	12/12/2007 13:31	0.00	0.00	3564.08	0.00	0.00	0.00	381.02	67300.58	546.39	4932.93	0.00	0.00	0.00	16674.14	93.68	0.00	0.00	0.00	0.00
AVO-07-SS011	12/12/2007 13:45	0.00	0.00	2426.23	0.00	106.21	0.00	2183.01	43564.52	1813.85	2190.83	0.00	0.00	0.00	20749.31	118.87	0.00	0.00	0.00	0.00
AVO-07-SS012	12/12/2007 13:53	0.00	0.00	2483.81	0.00	0.00	0.00	57.31	40475.72	134.36	1968.67	0.00	0.00	0.00	21676.64	116.21	0.00	0.00	0.00	0.00
AVO-07-SS013	12/12/2007 14:01	0.00	0.00	1842.15	0.00	0.00	0.00	256.60	76628.48	411.50	3664.79	0.00	0.00	0.00	21439.79	119.58	0.00	0.00	0.00	0.00
AVO-07-SS014	12/12/2007 14:10	0.00	0.00	2803.94	0.00	0.00	0.00	224.40	58782.01	257.48	3861.07	0.00	57.93	0.00	21088.86	106.45	0.00	0.00	0.00	0.00
AVO-07-SS015	12/12/2007 14:18	0.00	0.00	3444.94	0.00	0.00	0.00	177.10	61103.39	239.41	3067.61	0.00	0.00	0.00	21852.29	117.04	0.00	0.00	0.00	17.94
GLD-07-SS001	6/1/2007	0.00	0.00	3992.99	0.00	0.00	0.00	30.91	36807.15	1226.01	2013.42	0.00	0.00	0.00	23805.52	136.94	0.00	0.00	0.00	32.34
GLD-07-SS002	6/1/2007	0.00	0.00	3789.50	0.00	0.00	0.00	27.91	33325.30	622.92	2234.40	0.00	0.00	0.00	18591.54	119.54	0.00	0.00	0.00	30.41
GLD-07-SS005	6/1/2007	0.00	0.00	4071.06	0.00	0.00	0.00	27.61	29635.27	861.79	2106.55	0.00	0.00	0.00	21720.97	122.72	0.00	0.00	0.00	28.88
GLD-07-SS012	6/1/2007	0.00	0.00	3202.38	0.00	0.00	0.00	115.93	85335.79	7214.93	10251.44	0.00	0.00	0.00	18525.03	124.16	0.00	0.00	0.00	53.75
GLD-07-SS016	6/1/2007	0.00	152.84	4306.47	0.00	0.00	0.00	452.37	54243.75	11811.86	3492.23	0.00	0.00	0.00	20854.26	160.60	0.00	0.00	31.03	128.84
GLD-07-SS020	6/1/2007	0.00	58.56	4469.49	0.00	0.00	0.00	306.51	63464.36	9535.83	11202.51	0.00	0.00	0.00	18832.18	129.74	0.00	0.00	0.00	76.38
GLD-07-SS027	6/1/2007	0.00	0.00	4367.95	2535.88	0.00	0.00	0.00	24131.02	494.09	1137.17	0.00	0.00	0.00	18342.28	109.06	0.00	0.00	0.00	26.23

Table 3-2. GSI Analytical Data: Sediments

SAMPLE_ID	Date/Time	Sulphur	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc
AVO-07-SS001	12/12/2007 12:33	0.00	0.00	0.00	0.00	4692.42	0.00	0.00	0.00	433.29
AVO-07-SS002	12/12/2007 12:44	0.00	0.00	0.00	0.00	4902.19	0.00	0.00	0.00	754.89
AVO-07-SS003	12/12/2007 12:58	0.00	0.00	0.00	0.00	4822.54	0.00	0.00	0.00	354.60
AVO-07-SS004	12/12/2007 13:11	0.00	0.00	34.82	0.00	3468.31	0.00	0.00	0.00	267.30
AVO-07-SS005	12/12/2007 13:22	0.00	0.00	0.00	0.00	4321.81	0.00	0.00	0.00	150.57
AVO-07-SS010	12/12/2007 13:31	0.00	0.00	0.00	0.00	3954.14	0.00	0.00	0.00	587.43
AVO-07-SS011	12/12/2007 13:45	0.00	0.00	54.56	0.00	3815.66	0.00	0.00	0.00	877.80
AVO-07-SS012	12/12/2007 13:53	0.00	0.00	27.13	0.00	4801.91	0.00	0.00	0.00	193.13
AVO-07-SS013	12/12/2007 14:01	0.00	0.00	0.00	0.00	4253.31	0.00	0.00	0.00	572.62
AVO-07-SS014	12/12/2007 14:10	0.00	0.00	0.00	0.00	4421.58	0.00	0.00	0.00	784.10
AVO-07-SS015	12/12/2007 14:18	0.00	0.00	0.00	0.00	4277.06	0.00	0.00	165.02	611.39
GLD-07-SS001	6/1/2007	0.00	0.00	0.00	0.00	5209.42	0.00	0.00	0.00	475.17
GLD-07-SS002	6/1/2007	0.00	0.00	32.44	0.00	4017.93	0.00	0.00	0.00	115.13
GLD-07-SS005	6/1/2007	0.00	0.00	37.42	0.00	4339.58	0.00	0.00	0.00	261.02
GLD-07-SS012	6/1/2007	0.00	0.00	0.00	0.00	3642.35	0.00	0.00	0.00	2920.13
GLD-07-SS016	6/1/2007	8983.04	0.00	0.00	68.44	3653.25	0.00	0.00	0.00	38181.79
GLD-07-SS020	6/1/2007	0.00	0.00	0.00	59.61	3082.95	0.00	0.00	0.00	15236.90
GLD-07-SS027	6/1/2007	0.00	0.00	0.00	0.00	3290.27	0.00	0.00	0.00	193.64

Table 4-1. Groundwater Wells: Completion Information

Well ID	Depth (m)	Screen Interval (m)	Top of Casing Elevation (m)	Ground Surface Elevation (m)	Water Level (depth m)	Notes
New Wells						
PF1	10	4.7 - 7.7	31.49	30.792		
DA1	12	9.0 - 12	32.79	32.186		
DA2	24.9	21.9 - 24.9	32.62	31.886		
ET1	10.9	7.8 -10.6	33.385	32.795		
ET2	21	17 - 20	33.365	32.795		
SA2	12.6	8.0 - 11	10.17	9.893		
Existing Wells						
G1/05	31	25.0 - 31	30.99	30.164		
G2/05	10	4.0 - 10	30.77	30.127		
Heffernans	27.8				7.83	
Meehans	30.4				9.815	
Richards	13.3				3.62	
Kerins	39.6					Sampled from tap.
Holy Well						Sampled from yellow pipe.
Cosgroves						Sampled from tap. Spring, not a well.
SG104	26.8				25.579	
G1NSL2	21.984				9.222	

Note: Depths from Ground level

* Not surveyed, determined based on GPS readings and LIDAR survey

Table 4-2a. Metals Analytical Data: Groundwater Wells

Sample I.D.	Date	X	Y	Dissolved Mercury Low Level		Total Mercury		Dissolved Aluminium Low Level		Total Aluminium Low Level		Dissolved Antimony Low Level		Total Antimony Low Level		Dissolved Arsenic Low Level		Total Arsenic Low Level		Dissolved Barium Low Level		Total Barium Low Level		Dissolved Cadmium Low Level	
				ug/l		mg/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
Heffernans Well	**03/08/2007 1332**	320402	182508	-		1.40		0.05	U	24.00		83.00		1.00	U	1.00	U	1.00	U	1.00	U	6.00		31.00	
Cosgrove's Well	**04/08/2007 1500**	320244	181424	0.05	U	0.05	U	2.00		95.00		1.00	U	1.00	U	1.00	U	1.00	U	5.00		27.00		0.40	U
G1NSL2	**03/08/2007 1925**	319575	181625	0.05	U	0.05	U	2154.00		2142.00		1.00	U	1.00	U	1.00	U	1.00	U	21.00		47.00		2.30	
GW1/05	**03/08/2007 1025**	319880	181673	0.05	U	0.05	U	86040.00		62440.00		1.00	U	1.00	U	1.00	U	1.00	U	6.00		27.00		38.30	
GW1/05	**16/11/2007 1220**			0.05	U			73130.00				1.00	U			1.00	U			5.00				31.10	
GW1/05	**19/02/2008 1515**	319880	181673	0.05	U	0.05	U	107100.00		75680.00		1.00	U	50.00	U	1.00	U	50.00	U	8.00		50.00	U	35.40	
GW2/05	**16/11/2007 1145**			0.05	U			57080.00				1.00	U			1.00	U			3.00				25.00	
GW2/05	**19/02/2008 1545**	319880	181673	0.05	U	0.05	U	75990.00		56160.00		1.00	U	50.00	U	1.00	U	50.00	U	10.00		50.00	U	24.90	
GW2/05	**3/8/2007 1215**	319880	181673	0.05	U	0.05	U	48450.00		38300.00		1.00	U	1.00	U	1.00	U	1.00	U	3.00		24.00		20.70	
Holy Well	**04/08/2007 1530**	320120	181468	0.05	U	0.05	U	8.00		1186.00		1.00	U	1.00		1.00	U	1.00	U	41.00		26.00		0.40	U
Kerins Well	**21/02/2008 1330**	320158	181657	0.05	U	0.05	U	12.00		50.00	U	1.00	U	50.00	U	1.00	U	50.00	U	8.00		50.00	U	0.40	U
Kerins Well	**3/8/2007 1220**	320158	181657	0.05	U	0.05	U	2147.00		1014.00		1.00		1.00	U	1.00	U	1.00	U	8.00		35.00		1.10	
Kerins Well-D	**03/08/2007 1914**	320158	181657	0.05	U	0.05	U	66.00		122.00		1.00	U	1.00	U	1.00	U	1.00	U	8.00		33.00		0.40	U
Meehan's Well	**04/08/2007 1305**	320382	181844	0.05	U	0.05	U	80.00		115.00		1.00	U	1.00	U	1.00	U	1.00	U	19.00		46.00		0.50	
MWDA1	**15/11/07 1600**	319877	182043	0.05	U			66460.00				1.00	U			1.00	U			12.00				48.60	
MWDA1	**20/02/2008 1330**	319877	182043	0.05	U	0.05	U	325400.00		213800.00		1.00	U	50.00	U	1.00	U	260.00		9.00		50.00	U	156.70	
MWDA2	**15/11/07 1620**	319879	182039	0.05	U			76200.00				1.00	U			1.00	U			17.00				58.90	
MWDA2	**20/02/2008 1400**	319879	182039	0.05	U	0.05	U	102500.00		75390.00		1.00	U	50.00	U	1.00	U	50.00	U	10.00		50.00	U	63.20	
MWET1	**15/11/07 1500**	319916	181778	0.05	U			125500.00				1.00	U			1.00	U			22.00				4.20	
MWET1	**19/02/2008 1320**	319916	181778	0.05	U	0.05	U	154800.00		96020.00		1.00	U	50.00	U	1.00	U	150.00		5.00		50.00	U	34.80	
MWET2	**15/11/07 1430**	319917	181781	0.05	U			103.00				1.00	U			1.00	U			41.00				0.50	
MWET2	**20/02/2008 1600**	319917	181781	0.05	U	0.05	U	392.00		1660.00		1.00	U	70.00		1.00	U	70.00		28.00		50.00	U	5.40	
MWPF1	**16/11/2007 1045**	319678	182296	0.05	U			154.00				1.00	U			1.00	U			34.00				0.70	
MWPF1	**20/02/2008 1220**	319678	182296	0.05	U	0.05	U	2.00	U	50.00	U	1.00	U	50.00	U	1.00	U	50.00	U	19.00		50.00	U	0.70	
MWSA2	**15/11/07 1200**	321566	175292	0.05	U			57750.00				1.00	U			27.00				16.00				4.40	
MWSA2	**20/02/2008 1100**	321566	175292	0.05	U	0.05	U	44300.00		65510.00		1.00	U	50.00		1.00	U	50.00	U	14.00		50.00	U	3.90	
Richards Well	**03/08/2007 1809**	320067	181817	0.05	U	0.05	U	5.00		177.00		1.00	U	1.00	U	1.00		1.00	U	4.00		25.00		0.40	U
SG104	**03/08/2007 1500**	319806	181523	0.05	U	-		1300000.00		-		1.00	U	-		1.00		-		15.00		-		294.30	
SG104	**21/02/2008 1230**	319806	181523	0.05	U	0.05	U	1506000.00		965500.00		1.00	U	60.00		1.00	U	1090.00		16.00		50.00	U	313.70	

Notes: U = below detection limit; DA = Deep Adit; PF = Paddy Hogan's Field; ET = Emergency Tailings; SA = Shelton Abbey

Kerin's Well-D = Duplicate

Kerin's Well data from 3/8/2007 1220: sampling equipment was not properly decontaminated, Kerin's Well-D was collected after proper decontamination\

Table 4-2a. Metals Analytical Data: Groundwater Wells

Sample I.D.	Date	Total Cadmium Low Level		Dissolved Calcium Low Level		Total Calcium Low Level		Dissolved Chromium Low Level		Total Chromium Low Level		Dissolved Cobalt Low Level		Total Cobalt Low Level		Dissolved Copper Low Level		Total Copper Low Level		Dissolved Iron Low Level		Total Iron Low Level		Dissolved Lead Low Level		Total Lead Low Level		Dissolved Magnesium Low Level	
		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
Heffernans Well	**03/08/2007 1332**	0.40	U	1660.00		18950.00		1.00	U	4.00		1.00	U	1.00	U	7.00		31.00		2.00	U	296.00		1.00	U	1.00		2308.00	
Cosgrove's Well	**04/08/2007 1500**	1.00	U	10770.00		27230.00		1.00	U	3.00		1.00	U	1.00	U	17.00		43.00		2.00	U	331.00		1.00	U	2.00		7681.00	
G1NSL2	**03/08/2007 1925**	1.00		9637.00		28470.00		1.00	U	4.00		13.00		11.00		598.00		602.00		31.00		1058.00		6.00		10.00		13140.00	
GW1/05	**03/08/2007 1025**	30.00		141100.00		141200.00		2.00		2.00		135.00		116.00		9664.00		8028.00		731.00		452.00		2.00		4.00		114500.00	
GW1/05	**16/11/2007 1220**			110900.00				1.00	U			130.00				10010.00				186.00				1.00	U			94130.00	
GW1/05	**19/02/2008 1515**	50.00	U	164200.00		144200.00		2.00		50.00	U	140.00		120.00		9880.00		9330.00		182.00		50.00	U	4.00		50.00	U	112700.00	
GW2/05	**16/11/2007 1145**			97590.00				1.00	U			97.00				8736.00				156.00				1.00	U			72140.00	
GW2/05	**19/02/2008 1545**	50.00	U	145600.00		134500.00		1.00	U	50.00	U	101.00		90.00		7083.00		7010.00		46.00		50.00	U	1.00		50.00	U	81830.00	
GW2/05	**3/8/2007 1215**	18.00		117200.00		117800.00		1.00	U	2.00		78.00		67.00		6047.00		5336.00		92.00		630.00		1.00	U	3.00		61960.00	
Holy Well	**04/08/2007 1530**	1.00	U	11400.00		27030.00		1.00	U	4.00		1.00	U	1.00	U	2.00		27.00		2.00	U	324.00		1.00	U	1.00		7585.00	
Kerins Well	**21/02/2008 1330**	50.00	U	2008.00		3910.00		1.00	U	50.00	U	1.00	U	50.00	U	56.00		150.00		15.00		50.00	U	1.00	U	50.00	U	2896.00	
Kerins Well	**3/8/2007 1220**	1.00	U	5792.00		22700.00		1.00	U	4.00		4.00		1.00	U	326.00		81.00		2.00	U	400.00		1.00	U	2.00		5677.00	
Kerins Well-D	**03/08/2007 1914**	1.00	U	2385.00		20290.00		1.00	U	3.00		1.00	U	1.00	U	52.00		78.00		2.00	U	371.00		1.00	U	3.00		2835.00	
Meehan's Well	**04/08/2007 1305**	1.00	U	3244.00		23480.00		1.00	U	4.00		1.00	U	1.00	U	31.00		63.00		2.00	U	413.00		1.00	U	3.00		3193.00	
MWDA1	**15/11/07 1600**			12620.00				7.00				79.00				8821.00				16090.00				231.00				67430.00	
MWDA1	**20/02/2008 1330**	140.00		19530.00		18620.00		44.00		50.00	U	220.00		190.00		19630.00		18030.00		56330.00		49980.00		88.00		160.00		242000.00	
MWDA2	**15/11/07 1620**			39220.00				1.00	U			169.00				7746.00				38690.00				203.00				109500.00	
MWDA2	**20/02/2008 1400**	60.00		28970.00		29030.00		1.00	U	50.00	U	132.00		130.00		6250.00		6520.00		6080.00		5480.00		91.00		60.00		106300.00	
MWET1	**15/11/07 1500**			103800.00				1.00	U			125.00				358.00				87260.00				1.00				60980.00	
MWET1	**19/02/2008 1320**	50.00	U	140800.00		109400.00		3.00		50.00	U	207.00		180.00		9556.00		8370.00		47130.00		38380.00		11.00		50.00	U	116700.00	
MWET2	**15/11/07 1430**			9533.00				1.00	U			2.00				15.00				477.00				29.00				3920.00	
MWET2	**20/02/2008 1600**	50.00	U	531300.00		426200.00		1.00	U	50.00	U	178.00		140.00		26.00		50.00	U	1808.00		1020.00		75.00		50.00	U	303900.00	
MWPF1	**16/11/2007 1045**			14340.00				1.00	U			1.00	U			95.00				64.00				1.00	U			2887.00	
MWPF1	**20/02/2008 1220**	50.00	U	14360.00		17430.00		1.00	U	50.00	U	1.00		50.00	U	56.00		60.00		2.00	U	50.00	U	1.00	U	50.00	U	2644.00	
MWSA2	**15/11/07 1200**			323800.00				1.00	U			160.00				158.00				65310.00				1.00	U			85020.00	
MWSA2	**20/02/2008 1100**	50.00	U	356000.00		340200.00		1.00		50.00	U	135.00		130.00		206.00		150.00		8022.00		7830.00		21.00		50.00	U	81300.00	
Richards Well	**03/08/2007 1809**	1.00	U	10480.00		24630.00		1.00	U	4.00		1.00	U	1.00	U	2.00		27.00		2.00	U	502.00		1.00	U	3.00		2979.00	
SG104	**03/08/2007 1500**	-		243100.00		-		370.00		-		1087.00		-		85460.00		-		136000.00		-		107.00		-		1216000.00	
SG104	**21/02/2008 1230**	590.00		249500.00		195200.00		207.00		170.00		1083.00		1150.00		128300.00		160700.00		73410.00		72770.00		116.00		620.00		1143000.00	

Notes: U = below detection limit; DA = Deep Ad

Kerin's Well-D = Duplicate

Kerin's Well data from 3/8/2007 1220: sampling

Table 4-2a. Metals Analytical Data: Groundwater Wells

Sample I.D.	Date	Total Magnesium Low Level		Dissolved Manganese Low Level		Total Manganese Low Level		Dissolved Nickel Low Level		Total Nickel Low Level		Total Phosphorous Low Level		Dissolved Selenium Low Level		Total Selenium Low Level		Dissolved Silver Low Level		Total Silver Low Level		Dissolved Thallium Low Level		Total Thallium Low Level	
		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
Heffernans Well	**03/08/2007 1332**	4733.00		2.00		6.00		1.00	U	5.00		413.00		1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U
Cosgrove's Well	**04/08/2007 1500**	9883.00		1.00		7.00		1.00	U	5.00		447.00		1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U
G1NSL2	**03/08/2007 1925**	15700.00		544.00		464.00		5.00		8.00		389.00		1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U
GW1/05	**03/08/2007 1025**	97580.00		6593.00		5537.00		68.00		58.00		404.00		1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U
GW1/05	**16/11/2007 1220**			6704.00				63.00						2.00				2.00	U			1.00	U		
GW1/05	**19/02/2008 1515**	101900.00		7068.00		5930.00		73.00		80.00				1.00	U	50.00	U	2.00	U	2.00	U	1.00	U	1.00	U
GW2/05	**16/11/2007 1145**			5507.00				51.00						2.00				2.00	U			1.00	U		
GW2/05	**19/02/2008 1545**	76890.00		5127.00		4440.00		51.00		70.00				1.00	U	140.00		2.00	U	2.00	U	1.00	U	1.00	U
GW2/05	**3/8/2007 1215**	59150.00		3904.00		3354.00		42.00		41.00		399.00		1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U
Holy Well	**04/08/2007 1530**	9848.00		6.00		8.00		1.00	U	4.00		527.00		1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U
Kerins Well	**21/02/2008 1330**	2470.00		80.00		70.00		4.00		50.00	U			1.00	U	70.00		2.00	U	2.00	U	1.00	U	1.00	U
Kerins Well	**3/8/2007 1220**	5630.00		199.00		23.00		2.00		7.00		501.00		1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U
Kerins Well-D	**03/08/2007 1914**	5323.00		23.00		25.00		1.00		8.00		425.00		1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U
Meehan's Well	**04/08/2007 1305**	5893.00		6.00		8.00		1.00	U	8.00		426.00		1.00	U	1.00	U	2.00	U	2.00	U	1.00	U	1.00	U
MWDA1	**15/11/07 1600**			5427.00				60.00						1.00	U			2.00	U			1.00	U		
MWDA1	**20/02/2008 1330**	200100.00		18620.00		15070.00		145.00		130.00				1.00	U	60.00		2.00	U	2.00	U	1.00	U	1.00	U
MWDA2	**15/11/07 1620**			13810.00				109.00						1.00	U			2.00	U			1.00	U		
MWDA2	**20/02/2008 1400**	99860.00		9506.00		8370.00		89.00		110.00				1.00	U	50.00	U	2.00	U	2.00	U	2.00		1.00	U
MWET1	**15/11/07 1500**			9920.00				143.00						3.00				2.00	U			1.00	U		
MWET1	**19/02/2008 1320**	93800.00		10350.00		7810.00		100.00		80.00				1.00	U	140.00		2.00	U	2.00	U	3.00		2.00	
MWET2	**15/11/07 1430**			157.00				2.00						1.00	U			2.00	U			1.00	U		
MWET2	**20/02/2008 1600**	234100.00		46080.00		36600.00		36.00		50.00	U			1.00	U	50.00	U	2.00	U	2.00	U	1.00	U	1.00	U
MWPF1	**16/11/2007 1045**			67.00				1.00						2.00				2.00	U			1.00	U		
MWPF1	**20/02/2008 1220**	2950.00		77.00		80.00		2.00		50.00	U			1.00	U	80.00		2.00	U	2.00	U	1.00	U	1.00	U
MWSA2	**15/11/07 1200**			23890.00				138.00						2.00				2.00	U			1.00	U		
MWSA2	**20/02/2008 1100**	80070.00		18520.00		17380.00		117.00		130.00				1.00	U	50.00	U	2.00	U	2.00	U	1.00	U	1.00	U
Richards Well	**03/08/2007 1809**	5095.00		35.00		20.00		1.00	U	5.00		508.00		3.00		1.00	U	2.00	U	2.00	U	1.00	U	1.00	U
SG104	**03/08/2007 1500**	-		51310.00		-		575.00		-		-		1.00	U	-		2.00	U	-		1.00	U	-	
SG104	**21/02/2008 1230**	792200.00		50810.00		45560.00		503.00		580.00				9.00		80.00		2.00	U	2.00	U	1.00	U	1.00	U

Notes: U = below detection limit; DA = Deep Ad

Kerin's Well-D = Duplicate

Kerin's Well data from 3/8/2007 1220: sampling

Table 4-2a. Metals Analytical Data: Groundwater Wells

Sample I.D.	Date	Dissolved Tin Low Level		Total Tin Low Level		Dissolved Titanium Low Level		Total Titanium Low Level		Dissolved Uranium Low Level		Total Uranium Low Level		Dissolved Vanadium Low Level		Total Vanadium Low Level		Dissolved Zinc Low Level		Total Zinc Low Level	
		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
Heffernans Well	**03/08/2007 1332**	1.00	U	1.00		1.00	U	4.00		1.00	U	3.00		1.00	U	2.00		35.00		81.00	
Cosgrove's Well	**04/08/2007 1500**	1.00	U	2.00		1.00		3.00		1.00	U	3.00		1.00	U	1.00	U	10.00		91.00	
G1NSL2	**03/08/2007 1925**	1.00	U	2.00		1.00	U	21.00		1.00	U	4.00		1.00	U	4.00		746.00		533.00	
GW1/05	**03/08/2007 1025**	1.00	U	3.00		4.00		6.00		5.00		7.00		1.00	U	1.00		12190.00		9855.00	
GW1/05	**16/11/2007 1220**	1.00	U			3.00				5.00				1.00	U			13830.00			
GW1/05	**19/02/2008 1515**	5.00		1.00	U	4.00		5.00		6.00		5.00		1.00	U	280.00		12710.00			
GW2/05	**16/11/2007 1145**	1.00	U			4.00				5.00						1.00	U	10450.00			
GW2/05	**19/02/2008 1545**	1.00	U	3.00		3.00		3.00		4.00		4.00		1.00	U	220.00		8601.00			
GW2/05	**3/8/2007 1215**	1.00	U	4.00		3.00		8.00		4.00		6.00		1.00	U	1.00	U	6651.00		5863.00	
Holy Well	**04/08/2007 1530**	1.00	U	1.00		2.00		4.00		1.00	U	3.00		1.00	U	1.00	U	22.00		47.00	
Kerins Well	**21/02/2008 1330**	1.00	U	1.00	U	3.00		4.00		1.00	U	1.00	U	1.00	U	50.00	U	65.00			
Kerins Well	**3/8/2007 1220**	1.00	U	2.00		1.00	U	3.00		1.00	U	4.00		1.00	U	2.00		403.00		117.00	
Kerins Well-D	**03/08/2007 1914**	1.00	U	1.00		1.00	U	3.00		1.00	U	3.00		1.00	U	1.00	U	70.00		113.00	
Meehan's Well	**04/08/2007 1305**	1.00	U	1.00		1.00	U	4.00		1.00	U	4.00		1.00	U	1.00	U	68.00		108.00	
MWDA1	**15/11/07 1600**	1.00	U			6.00				4.00				2.00				21990.00			
MWDA1	**20/02/2008 1330**	1.00	U	1.00	U	11.00		14.00		15.00		12.00		1.00	U	510.00		59960.00			
MWDA2	**15/11/07 1620**	1.00	U			3.00				6.00				1.00	U			42120.00			
MWDA2	**20/02/2008 1400**	1.00	U	1.00	U	4.00		6.00		7.00		7.00		1.00	U	240.00		27300.00			
MWET1	**15/11/07 1500**	1.00	U			1.00				2.00				1.00	U			15240.00			
MWET1	**19/02/2008 1320**	1.00	U	1.00	U	7.00		6.00		10.00		8.00		1.00	U	1000.00	U	12310.00			
MWET2	**15/11/07 1430**	1.00	U			1.00	U			1.00	U			1.00	U			161.00			
MWET2	**20/02/2008 1600**	1.00	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00	U	490.00		4899.00			
MWPF1	**16/11/2007 1045**	1.00	U			1.00	U			1.00	U			1.00	U			95.00			
MWPF1	**20/02/2008 1220**	1.00	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00	U	50.00	U	85.00			
MWSA2	**15/11/07 1200**	1.00	U			3.00				5.00				1.00	U			4475.00			
MWSA2	**20/02/2008 1100**	1.00	U	1.00	U	2.00		4.00		3.00		3.00		1.00	U	230.00		3680.00			
Richards Well	**03/08/2007 1809**	1.00	U	1.00		1.00	U	5.00		1.00	U	2.00		1.00	U	2.00		206.00		234.00	
SG104	**03/08/2007 1500**	1.00	U	-		9.00		-		93.00		-		1.00	U	-		137700.00		-	
SG104	**21/02/2008 1230**	1.00	U	1.00	U	10.00		11.00		101.00		84.00		1.00	U	2590.00		136800.00			

Notes: U = below detection limit; DA = Deep Ad

Kerin's Well-D = Duplicate

Kerin's Well data from 3/8/2007 1220: sampling

Table 4-2b. General Water Quality Analytical Data: Groundwater Wells

Sample I.D.	Date	X	Y	Acidity		Ammonia		Chloride		Nitrate		Nitrite		Phosphorus (React)		Sulphate		Suspended Solids		T.O.C.		TON		Total Alkalinity		Total Dissolved Solids (180°C)	
				mgCaCO3/l		mg/l as N		mg/l		mg/l as N		mg/l as N		mg/l as P		mg/l		mg/l		mg/l		mg/l as N		mgCaCO3/l		mg/l	
Heffernans Well	**03/08/2007 1332**	320402	182508	11.00		0.30	U	11.00		1.78		0.01	U	0.01		5.00		10.00	U	1.60		1.78		10.00	U	18.00	
Meehan's Well	**04/08/2007 1305**	320382	181844	6.00		0.30	U	36.00		4.14		0.01	U	0.01	U	10.00		10.00	U	1.50		4.14		10.00	U	94.00	
Richards Well	**03/08/2007 1809**	320067	181817	4.00		0.30	U	17.00		0.37	U	0.01		0.02		2.00		10.00	U	2.90		0.37	U	44.00		82.00	
Kerins Well	**3/8/2007 1220**	320158	181657	8.00		0.30	U	18.00		2.75		0.01	U	0.01	U	8.00		10.00	U	0.30	U	2.75		10.00	U	46.00	
Kerins Well-D	**03/08/2007 1914**	320158	181657	6.00		0.30	U	18.00		2.44		0.01		0.01	U	6.00		10.00	U	0.30	U	2.45		10.00	U	124.00	
Kerins Well	**21/02/2008 1330**	320158	181657	5.00		0.07		19.00		1.99		0.01	U	0.01		8.00		10.00	U	4.20		2.00		10.00	U	80.00	
Holy Well	**04/08/2007 1530**	320120	181468	4.00		0.40		15.00		6.90		0.12		0.10		14.00		10.00	U	2.80		7.01		27.00		198.00	
Cosgrove's Well	**04/08/2007 1500**	320244	181424	21.00		0.40		19.00		7.60		0.01	U	0.01		25.00		10.00	U	1.70		7.60		23.00		144.00	
GW1/05	**03/08/2007 1025**	319880	181673	525.00		0.30	U	14.00		1.66		0.01	U	0.01	U	1121.00		10.00	U	1.50		1.67		10.00	U	1712.00	
GW1/05	**16/11/2007 1220**			535.00		0.04		15.00		1.47		0.01	U	0.01	U	855.00		10.00	U	1.80		1.47		10.00	U	1720.00	
GW1/05	**19/02/2008 1515**	319880	181673	565.00		0.06		15.00		1.31		0.01	U	0.01		1254.00		10.00	U	1.90		1.31		10.00	U	1920.00	
GW2/05	**3/8/2007 1215**	319880	181673	306.00		0.30	U	18.00		0.37	U	0.01		0.06		753.00		11.00		1.40		0.37	U	10.00	U	1688.00	
GW2/05	**16/11/2007 1145**			345.00		0.06		15.00		1.36		0.01		0.02		21.00		1514.00		2.90		1.38		10.00	U	1420.00	
GW2/05	**19/02/2008 1545**	319880	181673	455.00		0.11		19.00		1.19		0.01		0.01	U	942.00		347.00		3.60		1.20		10.00	U	1440.00	
G1NSL2	**03/08/2007 1925**	319575	181625	22.00		0.30	U	14.00		0.57		0.01	U	0.01	U	85.00		10.00		2.60		0.57		10.00	U	158.00	
SG104	**03/08/2007 1500**	319806	181523	9325.00		2.70		13.00		2.32		0.01		0.01	U	12673.00		27.00		8.60		2.33		10.00	U	23292.00	
SG104	**21/02/2008 1230**	319806	181523	8050.00		3.26		16.00		0.37	U	0.01		0.08		5863.00		143.00		7.70		0.37	U	10.00	U	25820.00	
MWPF1	**16/11/2007 1045**	319678	182296	18.00		0.04		16.00		2.60		0.01	U	0.03		33.00		38.00		1.20		2.61		10.00		180.00	
MWPF1	**20/02/2008 1220**	319678	182296	6.00		0.02		15.00		4.13		0.01	U	0.02		36.00		20.00		0.80	U	4.13		10.00	U	100.00	
MWDA1	**15/11/07 1600**	319877	182043	525.00		0.11		14.00		7.73		0.02		0.01		784.00		44.00		1.10		7.75		10.00	U	2600.00	
MWDA1	**20/02/2008 1330**	319877	182043	1785.00		0.63		13.00		0.37	U	0.01	U	0.01		2060.00		10.00	U	1.10		0.37	U	10.00	U	4160.00	
MWDA2	**15/11/07 1620**	319879	182039	660.00		0.10		48.00		0.37	U	0.02		0.01		1240.00		21.00		0.80	U	0.37	U	10.00	U	220.00	
MWDA2	**20/02/2008 1400**	319879	182039	760.00		0.09		15.00		0.37	U	0.01	U	0.01	U	1060.00		10.00	U	1.30		0.37	U	10.00	U	1480.00	
MWET1	**15/11/07 1500**	319916	181778	955.00		0.65		17.00		0.37	U	0.01		0.02		1636.00		54.00		5.50		0.37	U	10.00	U	1400.00	
MWET1	**19/02/2008 1320**	319916	181778	945.00		0.60		24.00		0.37	U	0.03		0.01		1426.00		10.00	U	3.10		0.37	U	10.00	U	2300.00	
MWET2	**15/11/07 1430**	319917	181781	8.00		0.05		21.00		1.63		0.01	U	0.02		26.00		28.00		2.10		1.63		18.00		160.00	
MWET2	**20/02/2008 1600**	319917	181781	90.00		0.15		13.00		0.37	U	0.01	U	0.01	U	2515.00		23.00		3.00		0.37	U	10.00	U	3500.00	
MWSA2	**15/11/07 1200**	321566	175292	525.00		1.57		17.00		0.37	U	0.01		0.01	U	1658.00		163.00		3.00		0.37	U	10.00	U	2700.00	
MWSA2	**20/02/2008 1100**	321566	175292	350.00		1.36		19.00		0.37	U	0.01	U	0.01	U	1551.00		10.00	U	1.50		0.37	U	10.00	U	2340.00	

Notes: U = below detection limit; DA = Deep Adit; PF = Paddy Hogan's Field; ET = Emergency Tailings; SA = Shelton Abbey

Kerin's Well-D = Duplicate

Table 4-2b. General Water Quality Analytical Data: Groundwater Wells

Sample I.D.	Date	Total Kjeldahl Nitrogen		Total Phosphorus		Sodium		Sodium Unfiltered		Potassium		Potassium Unfiltered	
		mg/l as N		mg P/l		mg/l		mg/l		mg/l		mg/l	
Heffernans Well	**03/08/2007 1332**	0.50	U	0.01	U	0.05	U	9.00		9.00		1.40	
Meehan's Well	**04/08/2007 1305**	0.50	U	0.01	U	11.50		12.00		4.30		4.20	
Richards Well	**03/08/2007 1809**	0.50	U	0.14		14.50		15.00		6.10		6.20	
Kerins Well	**3/8/2007 1220**	0.50	U	0.01	U	11.50		11.50		3.00		3.00	
Kerins Well-D	**03/08/2007 1914**	0.50	U	0.01	U	12.00		12.00		3.00		3.00	
Kerins Well	**21/02/2008 1330**	0.50	U	0.01	U	11.70				2.00			
Holy Well	**04/08/2007 1530**	0.90		0.11		13.50		14.00		2.80		2.70	
Cosgrove's Well	**04/08/2007 1500**	0.50	U	0.01	U	12.00		12.50		2.50		2.40	
GW1/05	**03/08/2007 1025**	0.50	U	0.01		12.00		11.50		2.20		2.20	
GW1/05	**16/11/2007 1220**	0.90		0.01	U	11.50		0.00		2.40		0.00	
GW1/05	**19/02/2008 1515**	0.50		0.01		13.40				2.10			
GW2/05	**3/8/2007 1215**	0.50	U	0.01		12.00		12.00		2.40		2.50	
GW2/05	**16/11/2007 1145**	0.50	U	0.56		11.50		0.00		2.50		0.00	
GW2/05	**19/02/2008 1545**	0.50	U	0.70		16.60				2.20			
G1NSL2	**03/08/2007 1925**	0.60		0.03		8.50		8.50		2.90		2.90	
SG104	**03/08/2007 1500**	3.60		0.01		-		-		-		-	
SG104	**21/02/2008 1230**	3.60		0.01		7.10				0.20	U		
MWPF1	**16/11/2007 1045**	1.70		0.03		9.50		0.00		1.20		0.00	
MWPF1	**20/02/2008 1220**	0.50	U	0.01		10.10				0.80			
MWDA1	**15/11/07 1600**	0.50	U	0.02		8.50		0.00		0.80		0.00	
MWDA1	**20/02/2008 1330**	0.70		0.01		10.40				0.30			
MWDA2	**15/11/07 1620**	0.50	U	0.10		14.50		0.00		4.70		0.00	
MWDA2	**20/02/2008 1400**	0.50	U	0.01	U	13.40				2.80			
MWET1	**15/11/07 1500**	0.80		0.04		14.00		0.00		2.20		0.00	
MWET1	**19/02/2008 1320**	1.60		0.02		16.30				1.60			
MWET2	**15/11/07 1430**	0.50	U	0.02		11.00		0.00		0.90		0.00	
MWET2	**20/02/2008 1600**	0.50	U	0.01	U	26.50				12.30			
MWSA2	**15/11/07 1200**	0.90		0.22		11.00		0.00		8.00		0.00	
MWSA2	**20/02/2008 1100**	1.40		0.09		12.50				7.40			

Notes: U = below detection limit; DA = Deep Ac

Kerin's Well-D = Duplicate

Table 4-3. Calculated Groundwater Gradients

Well ID	Date	Water level depth (m)	Water Level Elevation (m)
PF1	9/27/2007	4.62	26.871
DA1	9/27/2007	6.2	26.589
DA2	9/27/2007	6.345	26.27
ET1	9/27/2007	7.26	26.125
ET2	9/27/2007	7.1	26.265
SA2	9/27/2007	8.72	1.445
G1/05	9/27/2007	5.12	25.869
G2/05	9/27/2007	5.23	25.541
PF1	11/15/2007	4.62	26.871
DA1	11/15/2007	6.13	26.659
DA2	11/15/2007	6.29	26.325
ET1	11/15/2007	7.32	26.065
ET2	11/15/2007	7.18	26.185
SA2	11/15/2007	8.72	1.445
G1/05	11/15/2007	5.37	25.619
G2/05	11/15/2007	5.2	25.571

Water Elevation at Perpendicular Stream Point (m)
26.042
26.042
26.042
25.20368
25.20368
1.5
24.75
24.75
26.162
26.162
26.162
25.32368
25.32368
1.5
24.87
24.87

Well	Distance to Perpendicular Stream Point (m)
PF1	37
DA1	38
DA2	38
ET1	82
ET2	82
SA2	
G1/05	66
G2/05	66

Well ID	Date	Gradient
PF1	9/27/2007	0.022405
DA1	9/27/2007	0.014395
DA2	9/27/2007	0.006
ET1	9/27/2007	0.011236
ET2	9/27/2007	0.012943
SA2	9/27/2007	
G1/05	9/27/2007	0.016955
G2/05	9/27/2007	0.011985
PF1	11/15/2007	0.019162
DA1	11/15/2007	0.013079
DA2	11/15/2007	0.004289
ET1	11/15/2007	0.00904
ET2	11/15/2007	0.010504
SA2	11/15/2007	
G1/05	11/15/2007	0.011348
G2/05	11/15/2007	0.010621

Table 5-1. Borehole Summary

Location ID	Location	Total Depth m	# Samples	Notes
MP1	Mt. Platt	9.6	2	Refusal at 9.6 m, abandoned
MP2	Mt. Platt	17	2	Refusal at 17 m, abandoned
EA1	East Avoca	12	5	Refusal at 12 m, abandoned
TI1	Tigroney West	3	0	Refusal at 3 m, abandoned, water at 2.4 m, sample mixed with TI2#1
TI2	Tigroney West	7	2	Refusal at 7 m, abandoned
DA1	Deep Adit Spoils	12	4	Monitoring well installed, water at 6.13 m
DA2	Deep Adit Spoils	24.9	0	Monitoring well installed, water at 6.29 m, samples mixed with DA1
WA1	West Avoca	5.9	2	Refusal at 5.9 m, abandoned
ET1	Emergency Tailings	10.9	3	Monitoring well installed, water at 7.32 m
ET2	Emergency Tailings	25.8	0	Monitoring well installed, water at 7.18 m
PF1	Paddy Hogan's Field	10	2	Monitoring well installed, water at 3.6 m
SA1	Shelton Abbey	20	2	Refusal at 20 m, abandoned
SA2	Shelton Abbey	12.23	1	Monitoring well installed, water at 8.41 m

Table 5-2a. Metals Analytical Data: Boreholes

Sample ID	Depth	X	Y	Aluminum		Antimony		Arsenic	Barium	Bismuth	Calcium		Cadmium	Chromium		Cobalt	Copper	Iron	Lead
Units	(m)			%		ppm		ppm	ppm	ppm	%		ppm	ppm		ppm	ppm	%	ppm
BH/DA1/1.2	1.2	319877	182043	1.86		0.20	U	35.31	20.45	0.45	0.04	U	0.12	29.75		4.66	148.16	6.07	27.86
BH/DA1/16.3	16.3	319877	182043	2.67		0.20	U	18.27	54.38	0.32	0.08		0.14	28.61		4.43	55.53	4.13	23.61
BH/DA1/19.3	19.3	319877	182043	2.79		0.20	U	33.70	46.06	0.55	0.04	U	0.30	37.40		13.83	136.28	5.45	63.47
BH/DA1/7.5	7.5	319877	182043	1.27		0.20	U	41.90	17.64	0.47	0.06		0.14	18.71		2.75	166.48	6.54	42.77
BH/EA1/1-1.5	1-1.5	320199	182611	3.02		1.18		226.43	16.93	39.03	0.04	U	0.42	8.00	U	5.03	1317.35	10.77	1512.49
BH/EA1/2-2.5	2-2.5	320199	182611	2.55		3.48		494.33	90.17	77.04	0.04	U	0.66	14.81		2.68	2136.98	12.21	4570.33
BH/EA1/4-4.5	4-4.5	320199	182611	1.85		1.07		227.19	18.10	39.97	0.04	U	0.18	8.00	U	1.82	1294.18	10.19	777.74
BH/EA1/6-6.5	6-6.5	320199	182611	2.02		1.70		276.11	7.32	16.66	0.04	U	0.27	8.00	U	3.17	978.19	10.36	1556.41
BH/EA1/8-8.5	8-8.5	320199	182611	2.21		1.71		345.18	14.70	44.60	0.04	U	0.43	8.00	U	2.28	1182.06	10.07	1784.38
BH/ET1/1.6	1.6	319916	181778	2.91		0.20	U	59.82	31.31	3.19	0.04	U	0.23	29.66		13.75	253.66	5.64	57.09
BH/ET1/2	2	319916	181778	2.46		0.55		119.74	8.76	63.76	0.05		0.09	8.00	U	2.15	859.24	5.17	605.25
BH/ET1/7.5	7.5	319916	181778	2.50		0.20	U	57.75	24.32	5.58	0.04	U	1.25	29.37		10.40	754.36	5.76	245.14
BH/MP1/4	4	320515	182910	0.79		6.24		734.20	69.27	9.18	0.04		0.19	8.00	U	0.65	367.12	5.85	3039.91
BH/MP1/8	8	320515	182910	1.24		1.32		230.51	54.86	3.97	0.04	U	0.53	8.66		2.61	329.18	4.19	1104.95
BH/MP2/12	12	320505	182913	0.85		2.27		429.44	59.72	6.68	0.04	U	0.51	8.00	U	0.81	498.00	5.28	1961.93
BH/MP2/16	16	320505	182913	1.08		2.70		486.35	81.84	11.68	0.04	U	0.69	8.00	U	1.37	496.06	4.97	2365.69
BH/PF1/6.8	6.8	319678	182296	2.25		0.20	U	25.70	36.17	0.31	0.04	U	0.16	23.19		13.64	114.64	3.75	15.30
BH/PF1/8.5	8.5	319678	182296	2.61		0.68		24.69	30.21	0.42	0.04	U	0.20	29.58		37.20	90.49	5.47	17.39
BH/SA2/2.5	2.5	321566	175292	1.21		1.16		26.34	277.47	11.87	18.43		0.90	14.81		3.89	204.17	2.80	201.92
BH/SAI/17.5	17.5	321261	175834	5.08		1.14		197.17	13.19	51.46	0.08		10.71	11.50		27.08	1371.94	11.20	3651.06
BH/SAI/3-3.5	3-3.5	321261	175834	2.18		0.78		119.65	3.57	40.90	0.05		0.43	23.67		15.08	542.99	6.41	320.90
BH/TI2/2-2.5	2-2.5	319889	182131	1.99		20.15		2361.93	17.26	39.22	0.04	U	15.71	8.00	U	26.01	9002.80	21.79	16881.90
BH/TI2/4-4.5	4-4.5	319889	182131	2.23		0.54		82.98	29.66	1.79	0.04	U	0.32	11.26		1.79	443.43	7.04	540.73
BH/WA1/2.55	2.55	319273	181572	5.23		0.55		126.96	6.46	72.42	0.04	U	1.06	24.74		22.84	280.73	10.61	669.02
BH/WA1/4.55	4.55	319273	181572	4.15		1.42		528.24	15.66	86.45	0.04	U	0.68	17.09		19.48	345.35	12.27	816.18

Notes: ppm = mg/kg; U = below detection limit; DA = Deep Adit; EA = East Avoca; ET = Emergency Tailings; MP = Mt. Platt; PF = Paddy Hogan's Field; SA = Shelton Abbey; TI = Tigroney West; WA = West Av

Table 5-2a. Metals Analytical Data: Boreholes

Sample ID	Depth	Magnesium		Manganese		Mercury		Molybdenum		Nickel		Phosphorus		Selenium		Silver		Sodium		Sulfur		Thorium		Tin	
Units	(m)	%		ppm		ppm		ppm		ppm		%		ppm		ppm		%		%		ppm		ppm	
BH/DA1/1.2	1.2	0.69		1257.78		0.02	U	1.43		13.22		0.04		0.80	U	0.11		0.04	U	0.19		6.06		0.80	U
BH/DA1/16.3	16.3	0.77		1739.95		0.02	U	0.76		14.36		0.03		0.80	U	0.26		0.07		0.11		5.57		0.80	U
BH/DA1/19.3	19.3	0.91		1246.84		0.02	U	1.81		29.56		0.05		0.80	U	0.20		0.04	U	0.15		9.12		0.80	U
BH/DA1/7.5	7.5	0.43		806.13		0.02	U	1.26		9.68		0.04		0.80	U	0.10		0.04	U	0.23		4.68		0.80	U
BH/EA1/1-1.5	1-1.5	0.89		593.36		0.63		33.36		4.86		0.02		1.08		5.39		0.04	U	0.59		7.89		2.67	
BH/EA1/2-2.5	2-2.5	0.80		307.19		1.94		43.64		13.78		0.04		1.70		12.44		0.04	U	0.62		12.20		2.56	
BH/EA1/4-4.5	4-4.5	0.39		284.48		0.23		24.78		5.41		0.01		1.28		2.90		0.04	U	0.34		6.88		1.94	
BH/EA1/6-6.5	6-6.5	0.58		377.23		0.91		41.17		2.39		0.01		1.37		4.28		0.04	U	0.51		8.78		1.39	
BH/EA1/8-8.5	8-8.5	0.54		370.31		1.08		44.12		4.75		0.02		1.29		6.47		0.04	U	0.37		8.70		1.89	
BH/ET1/1.6	1.6	1.34		1046.81		0.02	U	3.42		26.03		0.05		1.15		0.43		0.04	U	0.52		7.00		0.80	U
BH/ET1/2	2	1.68		745.24		0.06		22.52		1.40		0.01		0.80	U	1.65		0.04	U	0.40		6.30		2.09	
BH/ET1/7.5	7.5	0.93		1324.87		0.02	U	3.19		21.72		0.03		0.80	U	0.75		0.04	U	0.84		6.51		0.80	U
BH/MP1/4	4	0.20		61.72		3.20		16.71		2.88		0.04		0.86		7.40		0.04	U	0.48		13.36		1.32	
BH/MP1/8	8	0.42		169.38		0.41		9.57		4.79		0.03		0.80	U	1.73		0.04	U	0.76		9.42		0.80	U
BH/MP2/12	12	0.19		55.74		1.03		10.49		2.14		0.03		0.99		3.08		0.04	U	0.48		11.37		0.80	U
BH/MP2/16	16	0.34		112.95		1.44		16.54		1.76		0.03		0.80		7.31		0.04	U	0.61		11.09		0.80	U
BH/PF1/6.8	6.8	0.65		1400.12		0.02	U	0.76		22.53		0.04		0.80	U	0.12		0.04	U	0.05		7.48		0.80	U
BH/PF1/8.5	8.5	1.00		2485.63		0.15		0.97		25.39		0.04		0.80	U	0.10		0.04	U	0.03		5.66		0.80	U
BH/SA2/2.5	2.5	0.69		375.72		0.60		11.04		12.33		0.17		5.41		6.29		0.04	U	12.11		8.39		1.01	
BH/SAI/17.5	17.5	3.26		1434.74		0.32		44.41		5.03		0.00		0.80	U	3.81		0.04	U	3.07		9.58		2.60	
BH/SAI/3-3.5	3-3.5	1.15		702.27		0.02	U	19.51		4.30		0.01		0.80	U	0.79		0.04	U	1.48		5.91		1.46	
BH/TI2/2-2.5	2-2.5	1.31		255.32		6.77		60.31		9.95		0.04		1.86		26.15		0.04	U	18.43		9.00		6.53	
BH/TI2/4-4.5	4-4.5	0.93		281.72		0.23		10.98		5.84		0.02		0.80	U	0.78		0.04	U	0.63		8.20		0.85	
BH/WA1/2.55	2.55	3.14		1521.97		0.04		39.86		3.71		0.00	U	0.80	U	1.69		0.04	U	1.69		10.51		2.62	
BH/WA1/4.55	4.55	2.42		1266.69		0.27		57.90		6.58		0.01		2.33		2.44		0.04	U	1.97		10.38		4.10	

Table 5-2a. Metals Analytical Data: Boreholes

Sample ID	Depth	Titanium		Uranium		Vanadium		Zinc
Units	(m)	ppm		ppm		ppm		ppm
BH/DA1/1.2	1.2	124.54		0.82		21.65		94.04
BH/DA1/16.3	16.3	147.55		1.07		26.72		84.88
BH/DA1/19.3	19.3	177.55		1.81		29.33		183.61
BH/DA1/7.5	7.5	91.65		0.74		17.04		94.43
BH/EA1/1-1.5	1-1.5	130.48		1.40		9.09		275.58
BH/EA1/2-2.5	2-2.5	129.12		2.73		11.96		366.31
BH/EA1/4-4.5	4-4.5	79.63		1.09		8.00	U	132.17
BH/EA1/6-6.5	6-6.5	76.58		1.38		8.00	U	212.53
BH/EA1/8-8.5	8-8.5	99.47		2.02		8.00	U	256.90
BH/ET1/1.6	1.6	181.78		1.43		39.59		144.59
BH/ET1/2	2	76.75		1.59		8.00	U	112.92
BH/ET1/7.5	7.5	159.51		1.35		23.15		484.31
BH/MP1/4	4	84.01		1.60		8.00	U	82.43
BH/MP1/8	8	117.16		1.43		8.63		211.17
BH/MP2/12	12	43.54		1.53		8.00	U	182.36
BH/MP2/16	16	54.49		1.58		8.00	U	270.15
BH/PF1/6.8	6.8	68.28		2.01		21.86		76.29
BH/PF1/8.5	8.5	43.51		1.63		22.12		79.56
BH/SA2/2.5	2.5	50.45		7.76		8.00	U	104.01
BH/SAI/17.5	17.5	117.23		3.75		8.00	U	2141.30
BH/SAI/3-3.5	3-3.5	64.25		1.47		8.00	U	260.08
BH/TI2/2-2.5	2-2.5	118.55		5.32		23.20		6100.10
BH/TI2/4-4.5	4-4.5	202.40		2.01		21.73		258.45
BH/WA1/2.55	2.55	146.39		2.75		8.00	U	437.22
BH/WA1/4.55	4.55	148.61		2.94		8.00	U	790.98

Table 5-2b. Acid Base Accounting Analytical Data: Boreholes

SAMPLE NO.	Depth	X	Y	Acid Generation Potential (calc on Sulphur Total)	Acid Neutralization Potential (calc)	Acid-Base Potential (calc on Sulphur Total)	Net Acid Generation Procedure	Neutralization Potential as CaCO3	Sulphur Organic Residual	Sulphur Pyritic Sulfide	Sulphur Sulphate	Sulphur Total	Total Sulphur minus Sulphate
Units	m			t CaCO3/Kt	t CaCO3/Kt	t CaCO3/Kt	Kg H2SO4/t	%	%	%	%	%	%
BH/DA1/1.2	1.2	**319877**	**182043**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH/DA1/7.5	7.5	**319877**	**182043**	10.00	0.00	-10.00	7.00	0.00	0.11	0.06	0.14	0.31	0.17
BH/DA1/16.3	16.3	**319877**	**182043**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH/DA1/19.3	19.3	**319877**	**182043**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH/EA1/1-1.5	1-1.5	**320199**	**182611**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH/EA1/2-2.5	2-2.5	**320199**	**182611**	65.00	0.00	-65.00	38.00	0.00	0.82	0.90	0.37	2.09	1.72
BH/EA1/4-4.5	4-4.5	**320199**	**182611**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH/EA1/6-6.5	6-6.5	**320199**	**182611**	17.00	0.00	-17.00	11.00	0.00	0.30	0.03	0.21	0.54	0.33
BH/EA1/8-8.5	8-8.5	**320199**	**182611**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH/ET1/1.6	1.6	**319916**	**181778**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH/ET1/2	2	**319916**	**181778**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH/ET1/7.5	7.5	**319916**	**181778**	39.00	0.00	-39.00	38.00	0.00	0.28	0.79	0.19	1.26	1.07
BH/MP1/4	4	**320515**	**182910**	12.00	0.00	-12.00	5.00	0.00	0.23	0.00	0.14	0.38	0.24
BH/MP1/8	8	**320515**	**182910**	29.00	0.00	-29.00	25.00	0.00	0.26	0.49	0.18	0.93	0.75
BH/MP2/12	12	**320505**	**182913**	14.00	0.00	-14.00	7.00	0.00	0.17	0.00	0.28	0.45	0.17
BH/MP2/16	16	**320505**	**182913**	18.00	0.00	-18.00	12.00	0.00	0.29	0.13	0.14	0.56	0.42
BH/PF1/6.8	6.8	**319678**	**182296**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH/PF1/8.5	8.5	**319678**	**182296**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH/SA2/2.5	2.5	**321566**	**175292**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH/SAI/3-3.5	3-3.5	**321261**	**175834**	43.00	1.00	-42.00	45.00	0.10	0.38	0.88	0.11	1.37	1.26
BH/SAI/17.5	17.5	**321261**	**175834**	100.00	8.00	-92.00	67.00	0.80	0.21	2.68	0.31	3.20	2.89
BH/TI2/2-2.5	2-2.5	**319889**	**182131**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH/TI2/4-4.5	4-4.5	**319889**	**182131**	15.00	0.00	-15.00	10.00	0.00	0.24	0.02	0.21	0.47	0.26
BH/WA1/2.55	2.55	**319273**	**181572**	47.00	5.00	-42.00	43.00	0.50	0.14	1.15	0.21	1.50	1.29
BH/WA1/4.55	4.55	**319273**	**181572**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: NA=Not analyzed

Table 5-2c. Geotechnical Results: Boreholes

Location	Depth	Sample Type	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	<425 um	Preparation	Description	Unified Soil Classification System
	m		%	%	%		%			
BH DA1	7.4		11.8	29	19	10	45		light brown slightly sandy gravelly clay	
BH DA1	7.5	SB	9.1					WS/H	brown clayey/silty very gravelly sand	
BH EA1	2.5	SB	17.5					WS/H	mottled light grey brown slightly sandy gravelly silt/clay	
BH EA1	4.5	SB	9.8					WS/H	reddish brown clayey/silt very sandy gravel	
BH EA1	6.5	SB	9.9					WS/H	reddish brown clayey/silt very sandy gravel	
BH ET1	10.6		10.5	29	19	10	43	WS/H	grey brown sandy slightly gravelly clay	
BH MP1	0-3		12.8	37	26	11	37	WS/H	orange brown slightly sandy gravelly silt	
BH MP1&MP2	2.0 & 10.0	SB	13					WS/H	orange brown slightly sandy gravelly silt/clay	
BH MP1&MP2	6.0 & 14.0	SB	13.3					WS/H	reddish brown slightly sandy gravelly silt/clay	
BH SA1	17.5		35.7	45	NP	0	100	WS/H	grey slightly sandy silt	
BH SA1	3.0-3.55	SB	11.4					WS/H	grey sandy silt/clay	
BH T11 & 12	2		24.5	41	30	11	29		orange brown (with pockets of grey clay) slightly sandy slightly gravelly silt	
BH T12	4.0-4.5	SB	14.4					WS/H	reddish brown slightly sandy gravelly silt/clay	
BH WA1	2.55	SB	42.6	44	29	15	100	WS/H	grey slightly sandy silt	M I
BH WA1	44.0&4.55		31.2	40	NP	0	73	WS/H	orange brown (with pockets of grey silt) slightly sandy slightly gravelly silt	

Notes: SB = bulk sample; NP = not plastic; <425 um = clay fraction; WS = wet seive; H = hydrometer

Table 5-3. Test Pits Summary

Location ID	Location	Total Depth mm	Excavation Effort	# Samples	Water Encountered
CO1	Connary	1700	M	3	No
CO2	Connary	1600	M	0	No
CO3	Connary	1500	E/M	1	No
CO4	Connary	1500	E	2	No
CR1	Cronebane	1500	M	3	No
CR2	Cronebane	1500	M	3	No
EA1	East Avoca	1500	M	2	No
EA2	East Avoca	1500	M/D	2	Yes
TI1	Tigroney West	1500	E	1	No
DA1	Deep Adit	1500	M/D	2	No
WA1	West Avoca North Lode	1500	E	1	Yes
WA2	West Avoca North Lode	1500	M	2	No
WA3	West Avoca Wheatly	1400	M/D	1	No
ET1	Emergency Tailings	1800	E	2	No
SA1	Shelton Abbey	1600	E/M	1	No
SA2	Shelton Abbey	1700	E/M/D	1	No
SA3	Shelton Abbey	1900	E/M/D	0	No
SA4	Shelton Abbey	1600	M	0	No
SA5	Shelton Abbey	1500	M	1	No

Notes: E = easy; M = moderate; D = difficult

Table 5-4a. Metals Data: Test Pits

Sample ID	Depth	CDM ID	X	Y	Aluminum		Antimony		Arsenic		Barium		Bismuth		Calcium		Cadmium		Chromium		Cobalt		Copper		Iron	
	m				%		ppm		ppm		ppm		ppm		%		ppm		ppm		ppm		ppm		%	
TP1	0.15-0.46	TP/CO1/0.15-0.46	321137	183925	1.15		14.75		1428.08		283.73		112.26		0.04	U	0.49		8.00	U	0.47		2397.06		13.27	
TP2	0.9-1.1	TP/CO1/0.9-1.1	321137	183925	1.00		4.58		1462.28		271.09		13.31		0.04	U	0.29		8.62		1.03		257.49		8.20	
TP3	1.2-1.5	TP/CO1/1.2-1.5	321137	183925	1.39		4.79		740.09		465.34		26.53		0.04	U	0.46		11.19		1.61		236.39		7.93	
TP4	0.9-1.35	TP/CO3/0.9-1.35	321096	183892	0.66		0.55		112.90		16.70		1.33		0.04	U	0.13		8.00	U	0.40	U	104.02		3.52	
TP5	0.3-0.6	TP/CO4/0.3-0.6	321100	183894	1.27		6.30		650.89		1522.51		4.51		0.04	U	0.36		8.13		0.89		356.27		7.51	
TP6	0.9-1.2	TP/CO4/0.9-1.2	321100	183894	1.32		15.34		1616.18		518.83		32.57		0.04	U	1.41		10.44		1.19		1076.00		8.40	
TP7	0.3-0.6	TP/CR1/0.3-0.6	320785	183183	1.37		2.83		732.40		9.22		131.18		0.04	U	0.39		8.00	U	1.75		1206.87		14.49	
TP8	0.75-0.9	TP/CR1/0.75-0.9	320785	183183	1.74		2.34		488.44		9.61		55.34		0.04	U	0.35		8.00	U	1.46		1265.50		14.68	
TP9	1.2-1.5	TP/CR1/1.2-1.5	320785	183183	1.50		1.39		301.67		6.07		10.39		0.04	U	1.84		8.00	U	3.28		823.44		8.88	
TP10	0.2-0.4	TP/CR2/0.2-0.4	320693	183123	1.22		2.25		357.53		12.12		10.03		0.04	U	0.22		8.00	U	0.61		624.41		9.86	
TP11	0.6-0.76	TP/CR2/0.6-0.76	320693	183123	2.18		6.66		894.75		90.55		59.75		0.04	U	1.08		8.00	U	1.19		996.86		9.07	
TP12	1.2-1.4	TP/CR2/1.2-1.4	320693	183123	1.05		1.34		355.44		8.24		7.28		0.04	U	0.13		8.00	U	0.70		401.46		7.82	
TP13	0.3-0.6	TP/DA1/0.3-0.6	319869	182070	5.10		18.94		1424.28		7.89		69.61		0.04	U	66.30		8.00	U	38.60		11334.49		27.92	
TP14	0.9-1.5	TP/DA1/0.9-1.5	319869	182070	1.62		2.93		546.20		27.83		22.49		0.04	U	5.93		17.71		10.16		2794.99		19.06	
TP15	0.3-0.6	TP/EA1/0.3-0.6	320095	182528	2.31		3.95		888.48		13.07		152.10		0.04	U	2.52		8.00	U	12.32		4292.45		21.82	
TP16	1.05-1.35	TP/EA1/1.05-1.35	320095	182528	2.60		4.25		935.03		14.59		168.70		0.04	U	2.37		8.00	U	13.96		4585.59		21.84	
TP17	0.3-0.6	TP/EA2/0.3-0.6	320193	182600	2.65		1.39		300.86		11.88		15.68		0.04	U	0.26		8.00	U	1.20		631.32		9.77	
TP18	1.05-1.35	TP/EA2/1.05-1.35	320193	182600	1.27		2.46		403.98		10.69		20.42		0.04	U	0.34		8.00	U	1.50		1007.86		11.60	
TP19	0.3-0.6	TP/ET1/0.3-0.6	319900	181774	0.09		48.81		1562.03		2.00	U	282.00		0.04	U	9.83		8.00	U	219.68		3850.23		51.04	
TP20	0.6-1.5	TP/ET1/0.6-1.5	319900	181774	2.36		0.68		299.77		5.69		61.59		0.04	U	0.19		8.00	U	2.04		991.33		6.24	
TP21	0.8-1.0	TP/SA1/0.8-1.0	321021	175780	2.78		0.64		198.21		10.62		50.09		0.04	U	0.26		8.00	U	10.84		657.45		8.07	
TP22	1.2-1.4	TP/SA2/1.2-1.4	320842	176036	2.19		0.20	U	162.21		26.73		2.32		0.04	U	0.05		28.45		7.20		66.88		6.22	
TP23	1.4-1.5	TP/SA5/1.4-1.5	321351	175326	2.07		0.33		100.84		37.42		36.88		3.18		0.15		11.81		3.86		203.46		4.84	
TP24	1.05-1.35	TP/TI1/1.05-1.35	319925	182137	2.77		28.03		1648.48		4.77		72.60		0.04	U	17.58		8.00	U	41.12		11026.30		33.28	
TP25	0.3-0.6	TP/WA1/0.3-0.6	319195	181535	2.55		0.22		102.55		2.00	U	46.52		0.04	U	0.06		8.00	U	1.76		110.88		6.05	
TP26	0.3-0.6	TP/WA2/0.3-0.6	321305	181528	3.51		2.49		1575.33		18.87		260.83		0.04	U	0.46		8.00	U	53.36		1658.23		33.90	
TP27	1.05-1.35	TP/WA2/1.05-1.35	321305	181528	3.36		2.37		1393.88		17.38		301.67		0.04	U	0.33		8.00	U	50.85		1170.67		32.11	
TP28	0.9-1.2	TP/WA3/0.9-1.2	319396	181674	0.83		7.65		3205.53		29.21		129.77		0.04	U	0.25		8.00	U	1.34		570.86		21.29	
TP29	1	TP-TM2-1			3.14		2.34		64.97		55.19		0.93		0.04	U	0.07		8.00	U	0.40	U	10.23		1.14	
TP30	2	TP-TM2-2			3.31		2.49		80.18		68.66		1.22		0.04	U	0.09		8.00	U	0.40	U	11.66		1.19	

Notes: U = below detection limit; ppm = mg/kg; CO = Connary; CR = Cronebane Pit; DA = Deep Adit; EA = East Avoca; SA = Shelton Abbey; TI = Tigroney West; WA = West Avoca; TM = Tom Merrigan

Table 5-4a. Metals Data: Test Pits

Sample ID	Depth	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Selenium	Silver	Sodium	Sulfur	Thorium	Tin	Titanium
	m	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	%	%	ppm	ppm	ppm
TP1	**0.15-0.46**	35008.28	0.61	228.96	6.34	118.86	1.12	0.03	3.02	24.74	0.06	2.33	7.38	3.57	52.00
TP2	**0.9-1.1**	3205.89	0.43	142.97	0.86	13.05	3.31	0.10	2.19	3.18	0.04 U	0.47	10.32	0.80 U	106.65
TP3	**1.2-1.5**	3747.57	0.77	162.18	3.57	14.95	5.99	0.09	1.41	12.21	0.04 U	0.59	11.85	1.55	129.83
TP4	**0.9-1.35**	802.03	0.13	59.67	0.25	6.30	1.03	0.01	0.91	1.43	0.04 U	0.19	13.58	0.80 U	40.00 U
TP5	**0.3-0.6**	16965.30	0.70	199.91	3.68	22.30	3.96	0.11	1.16	23.77	0.05	1.58	10.65	0.80 U	40.00 U
TP6	**0.9-1.2**	21614.63	0.83	233.71	6.59	47.70	4.54	0.11	2.59	29.51	0.05	1.43	9.11	0.80 U	92.57
TP7	**0.3-0.6**	1471.94	0.25	141.08	0.65	44.00	4.23	0.02	1.48	2.55	0.04 U	0.50	8.66	1.80	94.68
TP8	**0.75-0.9**	1659.36	0.50	284.23	0.90	39.52	1.90	0.02	1.24	4.22	0.04 U	0.76	8.24	2.45	84.63
TP9	**1.2-1.5**	2110.12	0.66	411.99	0.53	27.09	0.97	0.00	1.10	2.53	0.04 U	3.15	7.40	0.80 U	40.00 U
TP10	**0.2-0.4**	1730.27	0.42	211.17	1.64	33.67	1.76	0.01	2.32	5.00	0.04 U	0.42	8.82	0.80 U	68.77
TP11	**0.6-0.76**	9520.65	1.76	269.11	5.84	41.91	1.14	0.07	2.10	20.15	0.04 U	1.53	15.34	3.28	58.66
TP12	**1.2-1.4**	942.19	0.32	160.46	0.95	38.55	2.18	0.02	1.68	3.67	0.04 U	0.37	7.17	0.80 U	63.18
TP13	**0.3-0.6**	12092.28	5.70	882.14	2.81	72.17	3.71	0.03	1.91	21.13	0.04 U	25.23	10.65	12.48	66.36
TP14	**0.9-1.5**	3433.68	1.09	749.77	0.92	18.11	6.10	0.06	0.80 U	6.44	0.04 U	5.24	4.81	1.83	156.64
TP15	**0.3-0.6**	9298.56	1.86	426.62	2.08	85.03	2.36	0.02	3.89	17.67	0.04 U	4.81	8.39	6.15	119.38
TP16	**1.05-1.35**	9871.59	2.02	451.83	2.38	91.22	2.53	0.03	3.86	19.92	0.04 U	5.21	9.39	7.48	131.11
TP17	**0.3-0.6**	2073.78	1.02	694.67	0.54	24.21	2.37	0.02	1.07	3.38	0.04 U	0.38	9.22	1.65	99.58
TP18	**1.05-1.35**	869.72	0.25	138.99	0.79	68.57	3.05	0.03	3.83	2.99	0.04 U	0.28	8.81	1.60	97.33
TP19	**0.3-0.6**	2649.13	0.07	54.83	0.83	101.00	3.96	0.00 U	5.92	9.67	0.04 U	49.75	4.93	8.66	40.00 U
TP20	**0.6-1.5**	634.16	1.66	818.64	0.21	21.15	0.80 U	0.01	0.80 U	1.77	0.04 U	0.43	5.33	1.85	69.64
TP21	**0.8-1.0**	448.11	1.93	991.19	0.07	21.31	3.27	0.01	0.80 U	1.44	0.04 U	2.08	5.70	1.14	74.50
TP22	**1.2-1.4**	38.86	0.84	1180.37	0.02 U	1.54	21.63	0.04	0.80 U	0.04 U	0.04 U	0.25	5.33	0.80 U	94.84
TP23	**1.4-1.5**	425.98	1.19	855.33	0.14	14.21	9.43	0.04	0.80 U	1.46	0.04 U	2.33	4.73	0.80 U	85.60
TP24	**1.05-1.35**	12249.59	2.45	445.96	2.88	96.25	6.32	0.05	1.31	20.22	0.04 U	33.20	6.20	8.77	40.00 U
TP25	**0.3-0.6**	188.25	1.61	948.01	0.02 U	30.43	1.25	0.00 U	1.17	0.33	0.04 U	0.19	5.44	0.93	72.63
TP26	**0.3-0.6**	2324.68	1.59	922.92	1.08	85.73	1.90	0.01	5.94	5.73	0.04 U	10.83	8.34	9.08	139.96
TP27	**1.05-1.35**	1471.07	1.47	835.56	0.74	116.01	2.05	0.01	6.78	5.11	0.04 U	10.34	8.58	8.89	153.69
TP28	**0.9-1.2**	1474.30	0.04 U	132.65	0.94	98.63	2.34	0.04	8.07	4.94	0.04 U	1.49	6.87	7.64	142.53
TP29	**1**	539.12	3.00	193.91	2.77	5.98	1.70	0.03	0.80 U	1.44	0.04 U	0.17	20.91	1.53	55.92
TP30	**2**	459.33	3.12	195.34	3.04	10.13	1.85	0.02	0.80 U	1.31	0.04 U	0.16	18.67	1.47	54.44

Notes: U = below detection lim

Table 5-4a. Metals Data: Test Pits

Sample ID	Depth	Uranium		Vanadium		Zinc	
	m	ppm		ppm		ppm	
TP1	**0.15-0.46**	2.10		8.00	U	305.10	
TP2	**0.9-1.1**	1.47		18.53		103.95	
TP3	**1.2-1.5**	1.91		16.43		177.70	
TP4	**0.9-1.35**	2.75		8.00	U	65.42	
TP5	**0.3-0.6**	2.57		14.69		391.67	
TP6	**0.9-1.2**	2.32		18.80		679.39	
TP7	**0.3-0.6**	1.25		8.54		173.21	
TP8	**0.75-0.9**	1.21		8.00	U	167.83	
TP9	**1.2-1.5**	1.63		8.00	U	662.81	
TP10	**0.2-0.4**	1.48		8.00	U	152.52	
TP11	**0.6-0.76**	4.02		8.24		476.95	
TP12	**1.2-1.4**	1.24		8.00	U	81.32	
TP13	**0.3-0.6**	5.63		8.00	U	7403.96	
TP14	**0.9-1.5**	1.59		22.73		1636.89	
TP15	**0.3-0.6**	2.25		12.33		936.80	
TP16	**1.05-1.35**	2.80		12.09		947.04	
TP17	**0.3-0.6**	1.57		8.00	U	218.94	
TP18	**1.05-1.35**	1.43		8.00	U	143.66	
TP19	**0.3-0.6**	1.17		8.00	U	3446.16	
TP20	**0.6-1.5**	1.45		8.00	U	132.99	
TP21	**0.8-1.0**	1.59		8.00	U	168.81	
TP22	**1.2-1.4**	1.11		24.08		69.05	
TP23	**1.4-1.5**	1.63		12.59		77.17	
TP24	**1.05-1.35**	5.47		8.00	U	5129.68	
TP25	**0.3-0.6**	1.36		8.00	U	77.78	
TP26	**0.3-0.6**	2.80		16.96		245.28	
TP27	**1.05-1.35**	3.01		14.33		166.72	
TP28	**0.9-1.2**	1.17		17.09		43.99	
TP29	**1**	9.26		14.72		105.77	
TP30	**2**	8.27		12.32		100.25	

Notes: U = below detection lin

Table 5-4b. Acid Base Accounting Data: Test Pits

New Sample ID	CDM ID	Depth	X	Y	Acid Generation Potential (calc on Sulphur Total)	Acid Neutralization Potential (calc)	Acid-Base Potential (calc on Sulphur Total)	Net Acid Generation Procedure	Neutralization Potential as CaCO3	Sulphur Organic Residual	Sulphur Pyritic Sulfide	Sulphur Sulphate	Sulphur Total	Total Sulphur minus Sulphate
		m			t CaCO3/Kt	t CaCO3/Kt	t CaCO3/Kt	Kg H2SO4/t	%	%	%	%	%	%
TP1	TP/CO1/0.15-0.46	0.15-0.46	321137	183925	15.00	0.00	-15.00	7.00	0.00	0.15	0.00	0.33	0.47	0.14
TP2	TP/CO1/0.9-1.1	0.9-1.1	321137	183925	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP3	TP/CO1/1.2-1.5	1.2-1.5	321137	183925	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP4	TP/CO3/0.9-1.35	0.9-1.35	321096	183892	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP5	TP/CO4/0.3-0.6	0.3-0.6	321100	183894	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP6	TP/CO4/0.9-1.2	0.9-1.2	321100	183894	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP7	TP/CR1/0.3-0.6	0.3-0.6	320785	183183	15.00	0.00	-15.00	9.00	0.00	0.20	0.03	0.25	0.48	0.23
TP8	TP/CR1/0.75-0.9	0.75-0.9	320785	183183	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP9	TP/CR1/1.2-1.5	1.2-1.5	320785	183183	148.00	0.00	-148.00	79.00	0.00	1.33	1.19	2.22	4.74	2.52
TP10	TP/CR2/0.2-0.4	0.2-0.4	320693	183123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP11	TP/CR2/0.6-0.76	0.6-0.76	320693	183123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP12	TP/CR2/1.2-1.4	1.2-1.4	320693	183123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP13	TP/DA1/0.3-0.6	0.3-0.6	319869	182070	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP14	TP/DA1/0.9-1.5	0.9-1.5	319869	182070	245.00	0.00	-245.00	67.00	0.00	3.15	3.47	1.23	7.85	6.62
TP15	TP/EA1/0.3-0.6	0.3-0.6	320095	182528	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP16	TP/EA1/1.05-1.35	1.05-1.35	320095	182528	171.00	0.00	-171.00	52.00	0.00	2.95	1.60	0.92	5.47	4.55
TP17	TP/EA2/0.3-0.6	0.3-0.6	320193	182600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP18	TP/EA2/1.05-1.35	1.05-1.35	320193	182600	8.00	0.00	-8.00	5.00	0.00	0.14	0.00	0.12	0.25	0.13
TP19	TP/ET1/0.3-0.6	0.3-0.6	319900	181774	1360.00	0.00	-1360.00	117.00	0.00	17.20	21.30	4.85	43.40	38.50
TP20	TP/ET1/0.6-1.5	0.6-1.5	319900	181774	27.00	0.00	-27.00	42.00	0.00	0.21	0.46	0.19	0.86	0.67
TP21	TP/SA1/0.8-1.0	0.8-1.0	321021	175780	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP22	TP/SA2/1.2-1.4	1.2-1.4	320842	176036	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP23	TP/SA5/1.4-1.5	1.4-1.5	321351	175326	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP24	TP/TI1/1.05-1.35	1.05-1.35	319925	182137	922.00	0.00	-922.00	95.00	0.00	11.70	15.00	2.91	29.50	26.60
TP25	TP/WA1/0.3-0.6	0.3-0.6	319195	181535	3.00	1.00	-2.00	5.00	0.10	0.04	0.02	0.05	0.11	0.06
TP26	TP/WA2/0.3-0.6	0.3-0.6	321305	181528	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP27	TP/WA2/1.05-1.35	1.05-1.35	321305	181528	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP28	TP/WA3/0.9-1.2	0.9-1.2	319396	181674	38.00	0.00	-38.00	27.00	0.00	0.22	0.00	0.98	1.20	0.22
TP29	TP-TM2-1	1			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP30	TP-TM2-2	2			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not analyzed

Table 5-4c. Geotechnical Results: Test Pits

Location	Depth	Sample Type	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	<425 um	Preparation	Description	Unified Soil Classification System
	m		%	%	%		%			
TP CO1	0.9-1.1	SB	39.1	71	38	33	47	WS/H	Reddish brown slightly sandy gravelly silt	M V
TP CO4	0.9-1.2	SB	30.7	75	40	35	53	WS/H	Mottled light grey brown slightly sandy slightly gravelly silt	M V
TP CR1	0.75-0.90	SB	7.7					WS	orange brown slightly sandy gravelly silt/clay	
TP CR1	0.3-0.6	SB	9.1					WS	reddish brown slightly sandy gravelly silt/clay	
TP CR1	1.2-1.5	SB	6.9					WS/H	yellowish brown clayey/silt very sandy gravel	
TP CR2	0.2-0.4	SB	10.6					WS/H	yellowish brown clayey/silt very sandy gravel	
TP CR2	1.2-1.4	SB	13.3					WS/H	reddish brown clayey/silt very sandy gravel	
TP DA1	0.3-0.6	SB	9	43	27	16	41	WS/H	light brown slightly sandy gravelly silt	
TP DA1	0.9-1.5	SB	16.6					WS	reddish brown clayey/silt very sandy gravel	
TP EA1	0.3-0.6	SB	14.1					WS/H	yellowish brown slightly sandy slightly gravelly silt/clay	
TP EA1	1.05-1.35	SB	14.8					WS/H	yellowish brown slightly sandy slightly gravelly silt/clay	
TP EA2	0.3-0.6	SB	10.6	42	28	14	26	WS	brown silty very sandy gravel	M I
TP EA2	1.05-1.35	SB	14.5	45	31	14	27	WS/H	reddish brown silty very sandy gravel	M I
TP SA2	1.2-1.4	SB	6.2					WS	brown slightly clayey/silt very sandy gravel	
TP WA2	0.3-0.6	SB	21	45	32	13	48	WS/H	Reddish brown slightly sandy gravelly silt	M I
TP WA2	1.05-1.35	SB	20	46	31	15	40	WS/H	yellowish brown slightly sandy gravelly silt	M I
TP WA3	0.9-1.2	SB	30.7	72	40	32	34	WS/H	brown slightly sandy gravelly silt	M V

Notes: SB = bulk sample; <425 um = clay fraction; WS = wet seive; H = hydrometer

Table 5-5a. Metals Data: Surface Spoils

Sample ID	CDM ID	X	Y	Aluminum		Antimony		Arsenic		Barium		Bismuth		Calcium		Cadmium		Chromium		Cobalt		Copper		Iron		Lead		Magnesium	
				%		ppm		ppm		ppm		ppm		%		ppm		ppm		ppm		ppm		%		ppm		%	
SP1	SP10 (0,0)	320182	182582	1.73		2.47		569.07		17.04		101.67		0.04	U	0.25		8.00	U	1.57		1407.03		12.47		1734.17		0.44	
SP2	SP10 (0,2)	320166	182658	2.39		0.89		146.81		46.26		29.69		0.35		0.53		13.33		5.92		671.66		6.47		580.03		0.76	
SP3	SP10 (1,1)	320210	182612	3.34		1.13		224.79		5.15		56.51		0.04	U	0.19		8.00	U	2.48		2338.77		11.03		3283.23		1.29	
SP4	SP2 (0,0)	319937	182131	2.77		12.49		1275.62		21.34		100.41		0.04	U	3.20		8.00	U	8.54		11116.12		15.10		22685.54		2.61	
SP5	SP2 (0,1)	319961	182093	2.28		3.82		761.14		24.78		43.99		0.28		0.58		8.00	U	3.38		1239.50		13.82		7463.59		1.93	
SP6	SP2 (0,-1)	319918	182160	2.16		5.66		1018.67		30.96		56.50		0.04	U	0.61		8.00	U	2.26		2103.61		20.12		8461.84		1.86	
SP7	SP2 (0,2)	319980	182056	1.46		0.87		215.76		70.97		6.09		0.21		0.33		11.03		3.95		465.82		5.05		1090.76		0.84	
SP8	SP2 (0,-2)	319889	182225	3.59		9.82		1143.23		37.23		58.79		0.04	U	3.46		8.00	U	2.00		2073.10		12.69		13758.08		3.53	
SP9	SP2 (1,1)	319929	682111	2.63		12.88		1069.45		21.50		87.09		0.04	U	0.42		8.00	U	0.47		1966.27		17.52		45287.96		2.82	
SP10	SP2 (1,-1)	319886	182138	0.86		44.01		2892.66		20.85		171.96		0.04	U	6.30		8.00	U	3.26		3446.17		12.44		74876.99		0.68	
SP11	SP2 (-1,-1)	319956	182180	1.90		1.83		292.67		22.20		27.70		0.04	U	0.60		8.00	U	3.11		747.56		7.51		1830.14		1.13	
SP12	SP20 (0,0)	320540	182926	0.88		3.82		508.37		103.24		16.43		0.04	U	0.65		8.00	U	1.16		553.20		5.65		2733.73		0.29	
SP13	SP20 (0,-1)	320503	182894	1.24		3.50		513.96		76.08		26.23		0.04	U	0.48		8.00	U	1.82		567.63		6.26		2957.89		0.56	
SP14	SP20 (0,2)	320617	182990	0.65		3.09		658.48		116.73		5.64		0.04	U	1.21		8.00	U	1.48		564.26		2.85		6373.00		0.09	
SP15	SP20 (0,-2)	320465	1828601	1.96		3.98		648.92		69.16		20.27		0.04	U	0.42		8.00	U	1.74		521.26		6.25		3586.90		1.71	
SP16	SP20 (0,-3)	320435	182821	1.23		2.58		483.91		135.63		9.70		0.04	U	0.30		8.00	U	0.40	U	348.99		3.90		3517.18		0.61	
SP17	SP20 (0,5)	320725	183077	1.44		4.40		1045.87		112.11		65.22		0.04	U	0.52		8.00	U	2.15		848.52		9.26		6019.80		0.88	
SP18	SP20 (0.5,2)	310553	183010	1.09		5.44		807.98		89.52		26.67		0.04	U	0.74		8.00	U	2.28		719.43		6.61		6926.57		0.53	
SP19	SP20 (1,0)	320555	182057	2.07		2.38		574.11		33.21		36.12		0.04	U	0.20		37.58		3.68		763.80		12.70		5418.61		1.49	
SP20	SP20 (1,0.5)	320569	182932	0.72		4.41		546.90		96.99		28.37		0.04	U	0.80		8.00	U	1.08		595.79		7.13		2129.42		0.20	
SP21	SP20 (1,-2)	320488	182816	1.63		3.29		714.53		100.81		34.01		0.04	U	0.67		8.00	U	0.96		672.64		6.06		5373.64		1.00	
SP22	SP20 (-1,-2)	320445	182907	0.79		2.31		399.83		106.86		7.68		0.04	U	0.26		8.00	U	0.63		238.42		2.40		5047.34		0.19	
SP23	SP20 (-1,-2) Offset	320444	182937	0.59		2.75		413.97		343.15		37.16		0.04	U	0.52		8.00	U	0.80		476.67		1.69		6334.06		0.13	
SP24	SP20 (-1,3)	320642	183055	0.86		3.56		631.41		97.39		26.32		0.04	U	0.55		8.00	U	2.23		755.38		5.90		5033.99		0.39	
SP25	SP20 (1,-3)	320459	182779	1.00		2.94		439.43		134.96		7.20		0.04	U	0.41		8.00	U	0.40	U	295.73		3.14		3748.70		0.45	
SP26	SP20 (1,-5)	320399	182704	2.46		4.11		263.25		189.65		3.92		0.04	U	0.50		8.00	U	0.68		1092.95		3.75		24265.95		1.74	
SP27	SP20 (-1,6)	320753	183152	1.96		3.96		746.52		24.76		82.79		0.04	U	0.39		8.00	U	2.69		1337.36		14.56		4225.52		1.18	
SP28	SP20 (-1,7)	320801	183172	1.74		4.39		500.51		62.99		28.05		0.04	U	0.67		17.18		3.64		1238.94		11.33		3131.42		1.01	
SP29	SP20 (-1,8)	320848	183204	0.41		7.45		704.87		90.70		0.44		0.04	U	0.21		8.00	U	0.59		149.74		2.62		3477.92		0.07	
SP30	SP20 (-2,10)	320889	183314	1.97		5.78		705.28		60.39		50.19		0.04	U	0.74		8.00	U	1.66		899.84		10.72		7021.79		1.34	
SP31	SP20 (-2,12)	320954	183371	0.78		1.29		339.97		29.20		0.84		0.04	U	0.55		8.00	U	1.20		297.13		3.49		1506.15		0.09	
SP32	SP20 (-2,8)	320825	183233	1.08		3.91		645.38		133.62		15.97		0.04	U	0.76		8.00	U	1.20		452.86		3.88		4958.05		0.56	
SP33	SP20A (-2,1)	320517	183038	1.14		1.39		561.59		62.72		12.70		0.04	U	0.13		8.00	U	0.40		467.88		5.52		3788.40		0.36	
SP34	SP20A (-3,0)	320459	183039	0.81		2.78		461.11		82.95		22.69		0.04	U	0.26		8.00	U	0.80		429.42		5.68		3797.35		0.34	
SP35	SP20A (-3,1)	320483	183077	1.09		1.56		393.33		76.35		18.45		0.04	U	0.45		8.00	U	1.12		392.74		3.57		3241.13		0.33	
SP36	SP25 (0,0)	321041	183737	2.58		10.59		961.01		295.72		37.75		0.04	U	0.93		8.00	U	0.75		1154.89		7.55		25148.96		2.52	
SP37	SP25 (0,1)	321012	183707	1.43		5.14		517.71		265.23		42.62		0.04	U	0.37		8.00	U	0.78		671.01		3.84		7330.07		0.76	
SP38	SP25 (0,-1)	321064	183769	1.05		26.63		1309.10		434.51		230.01		0.04	U	0.71		8.00	U	0.86		6426.28		9.08		56523.26		0.25	
SP39	SP25 (0,-2)	321086	183800	1.17		37.16		3508.99		164.36		124.26		0.04	U	1.57		8.00	U	0.78		7077.84		11.15		78441.27		0.35	
SP40	SP25 (1,0)	321008	183760	1.44		19.80		917.25		211.01		34.59		0.04	U	0.88		8.00	U	0.55		1099.42		3.97		22030.85		0.82	
SP41	SP25 (-1,0)	321070	183713	2.30		6.76		870.19		178.64		107.97		0.04	U	0.63		8.00	U	1.24		2184.75		9.75		23894.57		1.39	
SP42	SP25 (-1,1)	321041	183680	1.28		2.36		484.39		85.61		83.60		0.04	U	0.31		8.00	U	0.40	U	4586.99		5.43		27960.40		0.25	
SP43	SP25(1,-1)	321031	183792	2.33		8.88		544.44		329.74		97.35		0.04	U	0.45		8.00	U	0.67		2168.87		8.93		20004.92		1.37	
SP44	SP31 (0,0)	321149	183909	2.20		0.75		73.17		535.33		2.62		0.11		0.13		8.00	U	0.40		120.64		2.11		1757.75		1.23	
SP45	SP31 (0,1)	321123	183878	1.39		23.29		1930.91		1384.18		41.85		0.04	U	1.48		8.00	U	0.40	U	1667.78		7.50		33045.18		0.69	
SP46	SP31 (0,-1)	321174	183940	1.17		9.65		939.61		191.46		18.81		0.04	U	0.48		8.00	U	1.37		1087.92		8.70		12920.21		0.54	

Notes: U = below detection limit

Table 5-5a. Metals Data: Surface Spoils

Sample ID	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Selenium	Silver	Sodium	Sulfur	Thorium	Tin	Titanium	Uranium	Vanadium	Zinc
	ppm	ppm	ppm	ppm	%	ppm	ppm	%	%	ppm	ppm	ppm	ppm	ppm	ppm
SP1	253.34	0.70	34.96	3.30	0.02	1.62	4.01	0.04 U	0.30	8.66	1.72	83.28	1.17	8.00 U	156.60
SP2	845.16	0.50	15.59	8.16	0.08	0.99	1.52	0.04 U	0.09	7.16	0.80 U	168.57	1.44	22.96	213.89
SP3	968.50	0.39	52.41	1.42	0.00	0.80 U	5.75	0.04 U	0.61	7.57	1.52	85.28	1.27	8.00 U	188.87
SP4	396.74	6.53	133.63	1.69	0.03	1.35	44.62	0.04 U	9.36	10.14	5.60	40.00 U	2.66	8.00 U	1748.51
SP5	455.20	2.13	55.62	5.11	0.03	1.16	12.74	0.04 U	1.44	9.23	2.60	81.33	1.94	9.36	345.87
SP6	399.95	1.21	93.34	6.51	0.03	1.13	15.50	0.05	2.18	9.89	12.44	100.22	2.25	11.25	399.27
SP7	311.61	0.23	11.79	11.44	0.07	0.80 U	1.67	0.04 U	0.28	6.69	0.80 U	849.29	1.12	26.28	181.36
SP8	471.27	3.90	105.14	3.04	0.08	2.11	22.38	0.04	2.07	14.14	6.08	133.24	4.80	14.36	1603.34
SP9	454.64	10.48	99.74	1.01	0.04	1.82	27.33	0.04 U	4.67	8.94	10.77	56.95	2.61	8.00 U	1091.20
SP10	97.60	20.87	185.61	1.58	0.09	6.17	34.03	0.04 U	4.28	11.82	13.75	75.99	4.18	8.00 U	2627.94
SP11	336.47	0.51	21.82	3.85	0.04	0.80 U	3.19	0.04 U	0.33	7.63	0.96	169.36	1.48	14.90	294.73
SP12	36.38	1.74	20.37	0.94	0.03	1.51	7.18	0.04 U	0.48	10.40	0.80 U	40.00 U	1.60	8.00 U	230.12
SP13	81.66	1.80	18.45	1.35	0.04	1.59	6.68	0.04 U	0.47	12.07	0.80 U	52.17	2.22	8.00 U	141.09
SP14	20.00	2.29	14.89	1.00	0.04	0.93	12.28	0.04 U	0.45	11.37	0.80 U	40.00 U	2.05	8.00 U	348.74
SP15	191.08	2.17	24.68	2.65	0.04	1.35	7.63	0.04 U	0.37	11.68	0.80 U	56.00	2.20	10.34	132.39
SP16	53.78	1.13	17.32	1.42	0.07	1.16	5.59	0.04 U	0.26	13.27	0.80 U	40.39	2.86	8.00 U	155.80
SP17	198.18	3.39	34.53	4.46	0.05	2.90	13.22	0.04 U	0.58	11.13	0.80 U	134.58	2.21	15.54	261.08
SP18	113.84	3.51	42.12	2.59	0.05	1.53	15.09	0.04 U	0.60	10.96	0.80 U	67.22	1.94	12.01	246.45
SP19	416.81	1.33	42.61	8.72	0.04	0.86	10.28	0.04 U	0.93	11.27	3.44	208.67	1.84	15.06	204.46
SP20	36.19	1.21	24.29	0.80 U	0.02	1.53	5.20	0.04 U	0.33	9.15	0.80 U	41.65	1.35	10.19	306.68
SP21	123.92	4.03	27.30	1.03	0.05	1.65	15.15	0.04 U	0.40	15.08	0.80 U	50.87	2.54	8.00 U	272.98
SP22	38.32	1.55	10.62	1.00	0.12	0.80 U	4.85	0.04 U	0.21	17.31	0.80 U	40.00 U	3.68	8.00 U	99.37
SP23	28.47	1.72	29.58	0.82	0.06	1.60	11.11	0.04 U	0.47	15.89	0.80 U	42.74	4.33	8.00 U	140.69
SP24	95.44	1.83	33.46	2.17	0.06	1.17	12.59	0.04	0.84	10.65	0.80 U	40.00 U	2.39	8.00 U	148.66
SP25	42.80	1.46	14.70	0.80 U	0.07	0.80 U	8.09	0.04 U	0.22	13.43	0.80 U	40.00 U	2.89	8.00 U	194.51
SP26	59.21	17.48	18.10	1.48	0.18	3.94	19.05	0.04 U	1.25	26.24	0.80 U	40.00 U	12.82	10.19	253.82
SP27	286.61	1.54	53.82	4.57	0.04	2.50	9.21	0.04 U	0.74	10.29	2.34	95.18	1.79	9.30	199.96
SP28	352.42	2.63	38.76	11.52	0.03	1.16	8.58	0.04 U	0.79	8.85	4.53	102.09	1.65	8.00 U	376.47
SP29	23.90	1.37	13.24	1.82	0.09	0.80 U	2.35	0.04 U	0.06	16.02	1.01	75.50	2.37	8.00 U	47.29
SP30	288.51	2.75	49.97	3.81	0.04	0.82	11.25	0.04 U	0.85	15.42	5.25	83.70	2.57	8.00 U	247.99
SP31	32.26	0.57	2.14	0.80 U	0.03	0.80 U	1.35	0.04 U	0.13	14.61	0.80 U	40.00 U	1.62	8.00 U	168.15
SP32	51.98	4.49	21.26	0.80 U	0.07	2.96	13.17	0.04 U	0.36	14.28	0.80 U	40.00 U	3.04	8.00 U	273.86
SP33	73.28	0.72	16.72	2.00	0.06	0.80 U	4.46	0.04 U	0.47	12.18	0.80 U	44.18	2.06	8.00 U	137.61
SP34	74.42	0.95	21.55	1.09	0.06	1.28	5.20	0.04 U	0.37	11.95	0.80 U	40.00 U	2.29	8.00 U	120.87
SP35	64.89	1.08	17.81	1.27	0.04	0.80 U	4.85	0.04 U	0.27	12.80	0.80 U	45.50	2.14	8.00 U	163.05
SP36	432.33	5.68	35.90	2.18	0.09	0.80 U	32.37	0.04 U	1.74	17.89	0.80 U	42.41	4.88	14.09	693.34
SP37	180.60	1.25	46.75	1.98	0.06	1.09	20.78	0.04 U	0.54	10.90	0.95	45.97	3.00	11.41	214.75
SP38	89.22	16.68	80.39	1.58	0.02	2.04	50.01	0.04 U	3.31	11.52	3.47	44.39	3.74	8.00 U	705.51
SP39	85.07	16.30	72.51	2.36	0.04	1.87	82.56	0.04 U	4.17	9.34	3.10	46.91	3.54	8.00 U	1313.43
SP40	179.66	2.55	24.81	1.93	0.06	0.80 U	43.65	0.04 U	1.16	16.80	0.80 U	40.00 U	3.53	8.00 U	678.04
SP41	443.44	6.14	107.74	2.43	0.04	1.95	26.56	0.04 U	1.74	13.30	3.04	73.11	3.44	8.00 U	478.00
SP42	103.68	3.51	50.41	1.11	0.02	1.79	26.13	0.04 U	1.52	9.29	6.07	40.00 U	2.50	8.00 U	308.80
SP43	412.75	4.41	73.24	2.19	0.04	1.21	27.13	0.04	1.68	12.67	4.34	56.72	3.66	8.00 U	374.15
SP44	286.59	0.36	3.80	5.47	0.12	0.80 U	2.50	0.04 U	0.19	29.48	0.80 U	40.00 U	1.45	8.00 U	86.69
SP45	184.30	9.60	50.39	0.80 U	0.13	1.02	35.84	0.04 U	2.10	12.53	0.80 U	66.38	3.17	8.76	883.05
SP46	177.34	2.27	32.11	4.25	0.49	1.56	23.11	0.04 U	0.87	8.00	1.36	59.96	1.53	14.28	236.32

Notes: U = below detection limit

Table 5-5a. Metals Data: Surface Spoils

Sample ID	CDM ID	X	Y	Aluminum		Antimony		Arsenic		Barium		Bismuth		Calcium		Cadmium		Chromium		Cobalt		Copper		Iron		Lead		Magnesium	
				%		ppm		ppm		ppm		ppm		%		ppm		ppm		ppm		ppm		%		ppm		%	
SP47	**SP31 (0,2)**	321101	183842	1.60		39.42		2707.65		612.70		77.18		0.04	U	1.20		8.00	U	0.53		2957.42		9.96		41353.36		0.95	
SP48	**SP31 (0,-2)**	321204	183967	4.21		5.90		833.96		145.71		3.31		0.04	U	0.25		8.00	U	0.40	U	1446.63		7.92		26557.45		4.05	
SP49	**SP31 (1,0)**	321113	183926	1.45		7.64		871.57		668.61		32.55		0.04	U	0.29		8.00	U	0.70		1207.27		7.61		11123.03		0.74	
SP50	**SP31 (-1,0)**	321183	183886	1.74		2.39		604.68		80.39		5.46		0.04	U	0.27		8.00	U	0.61		595.59		6.61		6289.46		0.58	
SP51	**SP31 (1,1)**	321086	183891	1.54		22.03		1580.21		382.46		21.52		0.04	U	1.14		8.00	U	0.40	U	1439.14		6.03		25421.33		1.02	
SP52	**SP31 (-1,-1)**	321207	183919	0.38		5.99		97.47		60.41		0.08	U	0.26		0.57		8.00	U	0.93		81.20		0.98		1112.44		0.30	
SP53	**SP31 (-1,-2)**	321236	183943	1.78		4.72		607.56		197.65		0.08	U	0.04	U	0.16		8.00	U	0.40	U	307.02		4.66		7698.72		1.35	
SP54	**SP33 (0,0)**	319664	181577	1.35		19.93		2506.33		17.79		136.75		0.04	U	1.32		8.00	U	0.57		2822.48		20.22		28363.13		0.87	
SP55	**SP33 (0,1)**	319658	181556	1.60		2.49		807.16		17.32		88.85		0.04	U	0.23		8.00	U	1.96		1076.16		17.26		4594.33		0.80	
SP56	**SP34 (0,0)**	319262	181572	2.36		2.17		1527.28		27.93		198.69		0.04	U	0.10		8.00	U	2.77		730.69		21.32		1234.02		0.87	
SP57	**SP34 (0,1)**	319229	181564	3.90		1.10		682.70		54.07		83.89		0.04	U	0.14		45.08		7.96		590.17		15.12		1138.29		2.95	
SP58	**SP34 (0,-1)**	319296	181581	2.35		4.75		1667.73		34.18		158.01		0.04	U	0.20		8.00	U	1.72		572.25		21.67		1605.14		1.09	
SP59	**SP34 (0,-2)**	319328	181591	5.51		0.31		148.42		92.40		12.91		0.04	U	0.09		90.21		14.99		360.89		11.07		393.56		4.62	
SP60	**SP34 (0,-3)**	319363	181598	1.95		2.61		1364.35		43.23		145.77		0.04	U	0.05		8.00	U	0.97		452.55		26.10		1134.11		0.74	
SP61	**SP34 (0,-3)**	320763	281607	1.74		3.29		1411.67		40.44		154.86		0.04	U	0.15		8.00	U	1.50		484.03		26.60		945.10		0.61	
SP62	**SP34 (0,-4)**	319390	181604	2.22		3.27		1472.95		44.70		151.26		0.04	U	0.12		8.00	U	1.32		493.39		29.92		1018.47		0.92	
SP63	**SP34 (1,0)**	319255	181605	2.07		0.70		410.80		14.08		62.48		0.04	U	0.04	U	8.00	U	0.86		173.11		9.22		682.32		1.06	
SP64	**SP34 (-1,0)**	319268	181537	2.84		0.90		525.89		13.27		102.39		0.04	U	0.07		8.81		2.12		258.99		12.41		645.10		1.38	
SP65	**SP34 (-1,1)**	319237	181531	2.30		2.29		1461.82		33.67		232.53		0.04	U	0.04	U	8.00	U	1.83		704.12		21.61		1812.83		0.77	
SP66	**SP34 (1,-1)**	319285	181615	2.90		5.34		1086.56		25.54		127.32		0.04	U	0.04	U	9.19		1.90		340.51		14.70		2135.89		1.64	
SP67	**SP34 (1,-2)**	319314	181624	1.34		5.23		1562.84		53.72		121.11		0.04	U	0.30		8.00	U	2.51		503.71		16.30		1655.39		0.40	
SP68	**SP34 (-1,-2)**	319343	181559	2.41		6.79		2090.75		36.67		238.38		0.04	U	0.24		8.00	U	2.06		699.12		28.23		2434.70		0.94	
SP69	**SP34 (1,-3)**	319351	181630	0.79		19.64		3902.96		31.51		289.32		0.04	U	0.38		8.00	U	0.69		722.49		25.34		2827.29		0.16	
SP70	**SP34 (-1,-3)**	319379	181567	2.15		2.81		1327.22		60.86		156.30		0.04	U	0.04		8.00	U	1.32		575.39		30.80		1205.85		0.84	
SP71	**SP34 (1,-4)**	319377	181637	1.76		4.34		1797.81		18.24		158.64		0.04	U	0.13		8.00	U	1.85		928.61		26.18		1308.49		0.47	
SP72	**SP34 (-2,1)**	319248	181496	2.21		2.30		1284.73		18.66		242.07		0.04	U	0.09		8.00	U	2.00		628.74		18.53		2078.74		0.87	
SP73	**SP37 (0,0)**	319518	181307	2.23		0.39		84.98		48.03		3.03		0.60		0.18		18.76		11.02		83.59		4.05		926.15		0.62	
SP74	**SP37 (0,1)**	319525	181357	2.15		0.20	U	38.56		87.18		1.38		2.86		0.64		30.74		16.24		54.72		3.66		121.22		0.59	
SP75	**SP37 (0,1)**	319525	181357	1.49		0.20	U	22.11		86.72		0.98		2.31		1.18		22.21		11.41		50.52		2.80		122.62		0.44	
SP76	**SP37 (0,-1)**	319518	181257	2.72		0.20	U	67.46		73.77		0.59		0.45		0.24		36.53		17.64		57.11		4.42		106.77		0.61	
SP77	**SP37 (0,2)**	319541	181404	1.30		0.20	U	15.87		83.18		0.50		0.85		1.35		18.01		9.03		27.01		2.03		53.26		0.27	
SP78	**SP37 (0,3)**	319548	181453	1.62		0.20	U	12.69		99.26		0.30		0.41		1.31		21.90		9.86		33.83		2.32		60.66		0.30	
SP79	**SP37 (1,0) Offset**	319558	181287	4.55		1.37		103.69		88.57		8.91		0.78		0.37		70.29		14.54		380.25		8.32		467.00		3.85	
SP80	**SP37 (1,1)**	320962	281350	1.23		0.20	U	13.68		87.91		0.08	U	0.92		1.32		17.96		8.45		28.48		2.00		48.39		0.26	
SP81	**SP37 (-1,1)**	319487	181370	2.99		0.95		370.07		50.98		43.63		0.09		0.16		13.62		4.68		501.80		9.20		1987.96		2.51	
SP82	**SP37 (1,2)**	319575	181387	1.48		0.20	U	19.55		84.96		0.30		0.83		1.36		24.88		9.70		28.51		2.25		43.50		0.31	
SP83	**SP37 (-1,2)**	319507	181418	1.77		0.51		22.50		101.44		0.41		0.51		1.43		29.29		11.08		38.91		2.64		50.35		0.35	
SP84	**SP37 (1,3)**	319588	181446	1.51		0.20	U	15.17		74.73		0.17		0.37		1.11		24.55		9.39		20.49		2.21		32.82		0.26	
SP85	**SP37 (-1,3)**	319509	181457	1.86		0.20	U	16.37		70.46		0.25		1.11		0.72		27.40		13.00		22.73		2.77		22.79		0.53	
SP86	**SP37 (-2,2)**	319461	181418	2.32		0.20		29.88		92.42		0.31		1.38		1.00		35.36		15.51		36.97		3.99		64.23		0.43	
SP87	**SP37A (0,0)**	319429	181354	4.74		0.89		279.02		37.86		18.94		0.04	U	0.04	U	8.00	U	0.40	U	277.73		8.59		2201.89		4.46	
SP88	**SP37A (0,1)**	319407	181389	3.49		8.35		1262.10		79.87		258.90		0.04	U	0.77		8.00	U	1.18		2588.49		11.26		22837.80		3.05	
SP89	**SP37A (0,-1)**	319454	181323	2.98		4.04		684.78		54.53		119.22		0.04	U	0.45		8.00	U	2.56		1697.08		9.56		12001.72		2.73	
SP90	**SP4 (0,0)**	320059	182428	1.84		1.20		329.12		27.09		31.36		0.04	U	0.13		12.58		2.26		795.95		9.03		2261.28		0.89	
SP91	**SP4 (0,0) Offset**	320007	182442	2.26		4.62		941.68		48.19		105.79		0.04	U	0.48		8.18		1.63		1694.32		13.80		21752.88		1.34	
SP92	**SP4 (0,1)**	320046	182429	2.59		1.60		349.55		23.19		109.60		0.04	U	0.35		8.00	U	1.94		1763.00		12.82		5915.25		1.51	
SP93	**SP4 (0,-1)**	319981	182409	2.63		1.48		498.60		93.23		102.47		0.04	U	0.23		13.31		3.46		1517.06		13.63		5998.09		1.22	

Notes: U = below detection limit

Table 5-5a. Metals Data: Surface Spoils

Sample ID	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Selenium	Silver	Sodium	Sulfur	Thorium	Tin	Titanium	Uranium	Vanadium	Zinc
	ppm	ppm	ppm	ppm	%	ppm	ppm	%	%	ppm	ppm	ppm	ppm	ppm	ppm
SP47	223.63	16.08	80.77	2.46	0.09	2.79	54.51	0.05	2.43	12.36	2.16	55.47	3.68	8.00 U	782.02
SP48	860.79	6.61	52.77	2.54	0.08	0.80 U	26.37	0.04 U	1.57	12.74	0.80 U	72.62	4.35	9.50	483.01
SP49	205.71	1.16	55.85	3.96	0.07	1.60	16.65	0.04 U	0.89	10.52	0.80 U	49.76	2.01	8.43	192.23
SP50	155.36	0.74	34.16	1.08	0.03	0.80 U	6.72	0.04 U	0.59	8.82	0.80 U	42.85	1.87	8.00 U	169.12
SP51	264.37	7.30	31.23	3.63	0.07	2.79	38.13	0.04 U	1.46	12.27	0.80 U	62.67	3.23	8.10	882.86
SP52	114.30	0.79	5.05	4.04	0.10	0.80 U	4.22	0.04 U	0.20	2.74	0.80 U	40.00 U	0.63	8.00 U	125.09
SP53	264.45	4.80	20.22	0.80 U	0.14	0.80 U	8.94	0.04 U	0.19	22.62	0.80 U	40.00 U	4.67	8.00 U	119.75
SP54	237.24	8.20	132.02	1.76	0.06	2.10	55.35	0.04 U	1.99	8.41	13.83	84.61	2.24	9.55	733.03
SP55	252.08	1.36	46.54	3.23	0.06	1.62	9.87	0.04 U	0.80	7.53	6.25	114.70	1.56	19.16	141.43
SP56	457.44	0.61	59.73	4.63	0.02	3.31	3.25	0.04 U	1.04	10.28	5.47	140.13	2.08	15.81	84.99
SP57	647.61	0.58	27.05	16.84	0.07	2.22	2.29	0.04 U	0.70	8.75	3.76	598.42	2.29	85.04	233.69
SP58	522.54	0.58	78.01	2.99	0.03	4.42	3.80	0.04 U	1.07	13.16	8.36	175.95	2.69	14.29	91.33
SP59	894.73	0.31	5.90	31.10	0.13	1.15	0.90	0.04 U	0.60	5.59	2.05	778.65	2.07	179.87	281.96
SP60	434.73	0.57	75.92	2.73	0.01	3.68	3.37	0.04 U	1.62	11.91	6.25	140.65	2.56	15.03	69.75
SP61	340.70	0.35	83.64	3.10	0.02	4.04	2.81	0.04 U	1.59	14.76	0.80 U	146.13	3.20	18.78	65.96
SP62	599.93	0.46	81.74	2.98	0.02	4.18	3.62	0.04 U	1.77	15.49	0.80 U	167.21	3.47	15.32	125.94
SP63	633.63	0.23	30.00	1.24	0.00 U	0.80 U	1.56	0.04 U	0.56	6.73	2.85	76.94	1.35	8.00 U	78.06
SP64	809.29	0.33	40.38	2.66	0.01	1.26	1.53	0.04 U	0.42	9.17	3.13	103.41	1.74	8.00 U	92.19
SP65	408.42	0.95	73.93	4.69	0.01	4.67	4.37	0.04 U	1.29	11.96	2.98	135.88	2.60	15.01	91.83
SP66	742.37	0.78	54.59	4.03	0.03	2.89	4.15	0.04 U	0.82	10.22	5.84	136.69	2.04	11.89	108.97
SP67	246.73	0.78	55.78	3.46	0.42	3.18	3.65	0.04 U	0.95	6.17	10.11	115.04	1.18	11.32	85.08
SP68	559.80	0.62	119.24	3.26	0.02	5.95	6.27	0.04 U	1.65	14.01	1.02	179.77	2.91	18.06	115.35
SP69	89.33	1.14	188.31	1.86	0.04	9.76	9.63	0.04 U	0.93	16.55	26.67	226.88	2.62	8.96	75.20
SP70	530.51	0.65	79.97	3.56	0.01	4.02	3.08	0.04 U	2.20	12.31	3.48	149.70	2.66	20.64	82.30
SP71	264.20	0.80	76.95	3.69	0.02	3.90	3.03	0.04 U	0.76	13.53	9.79	173.20	2.12	12.67	77.49
SP72	499.76	1.07	71.67	3.12	0.02	5.31	4.99	0.04 U	0.93	11.01	2.58	125.12	2.22	13.52	89.94
SP73	908.80	0.97	3.94	17.75	0.07	0.96	1.01	0.04 U	0.06	8.61	0.94	72.77	2.32	22.42	110.68
SP74	1638.59	0.27	1.97	36.89	0.08	0.80 U	0.04	0.04 U	0.04	6.14	0.80 U	98.90	1.48	34.81	121.00
SP75	1420.90	0.18	3.50	33.34	0.10	0.80 U	0.13	0.04 U	0.06	4.14	0.80 U	65.37	1.61	30.35	129.31
SP76	1777.39	0.16	1.20	30.21	0.12	0.80 U	0.04 U	0.04 U	0.07	7.14	0.80 U	159.04	1.78	42.89	122.62
SP77	1331.32	0.17	1.80	25.00	0.12	1.30	0.04 U	0.04 U	0.08	3.26	0.80 U	74.07	2.85	28.58	102.82
SP78	1446.88	0.08	1.72	27.37	0.11	1.13	0.10	0.04 U	0.03	3.46	0.80 U	81.47	2.47	32.02	111.51
SP79	1093.17	0.23	5.33	31.33	0.07	0.80 U	1.09	0.04 U	0.22	6.29	5.38	498.12	2.28	106.98	239.03
SP80	1264.62	0.04	1.40	25.96	0.12	1.82	0.04 U	0.04 U	0.05	2.96	0.80 U	52.60	3.15	27.76	96.79
SP81	904.63	0.91	21.11	12.79	0.05	1.81	4.24	0.04 U	0.66	9.90	0.80 U	147.32	1.89	17.28	199.81
SP82	1371.56	0.06	1.50	29.19	0.11	0.89	0.28	0.04 U	0.08	2.93	2.89	75.59	3.61	38.17	103.39
SP83	1875.79	0.09	2.14	34.70	0.14	0.80 U	2.04	0.04 U	0.07	3.00	3.71	109.82	1.87	37.41	140.44
SP84	1332.62	0.03	1.82	27.19	0.09	0.80 U	0.24	0.04 U	0.03	2.72	2.90	77.66	2.24	37.79	99.75
SP85	1282.04	0.02 U	0.96	34.97	0.05	0.80 U	0.30	0.04 U	-0.01	4.39	2.77	171.08	0.91	33.45	82.72
SP86	1550.07	0.10	2.03	41.25	0.06	0.80 U	0.36	0.04 U	0.03	4.85	3.19	87.59	1.31	43.31	114.68
SP87	1100.30	0.50	9.15	1.74	0.06	1.05	2.19	0.04 U	0.38	16.54	1.75	93.64	3.22	8.00 U	189.13
SP88	477.48	3.52	119.24	2.55	0.03	3.56	37.43	0.04 U	2.25	15.93	2.52	154.74	5.32	15.00	444.08
SP89	429.81	4.86	57.61	4.84	0.04	2.37	18.64	0.04 U	1.68	11.50	1.95	135.76	3.09	16.51	308.99
SP90	315.35	0.26	21.53	4.26	0.03	0.80 U	3.61	0.04 U	0.43	6.93	4.39	259.44	1.42	20.69	129.47
SP91	356.79	3.76	56.04	3.17	0.03	1.93	31.38	0.04 U	2.05	9.46	24.59	173.46	2.36	14.17	415.29
SP92	562.52	0.33	43.93	2.32	0.03	1.39	12.38	0.06	1.05	8.82	8.93	145.68	1.79	10.09	241.37
SP93	632.79	0.76	42.60	6.25	0.03	1.35	11.17	0.04 U	0.89	8.26	7.02	223.30	1.84	18.94	211.63

Notes: U = below detection limit

Table 5-5a. Metals Data: Surface Spoils

Sample ID	CDM ID	X	Y	Aluminum		Antimony		Arsenic		Barium		Bismuth		Calcium		Cadmium		Chromium		Cobalt		Copper		Iron		Lead		Magnesium	
				%		ppm		ppm		ppm		ppm		%		ppm		ppm		ppm		ppm		%		ppm		%	
SP94	**SP4 (0,2)**	320080	182442	0.14		0.91		8.14		10.06		1.70		0.07		0.31		8.00	U	0.58		73.95		0.38		111.81		0.10	
SP95	**SP5 (0,0)**	320110	182539	1.75		3.23		885.77		14.69		140.55		0.04	U	0.24		8.00	U	1.71		1809.89		16.97		7974.05		1.09	
SP96	**SP5 (0,1)**	320075	182517	1.74		3.22		721.80		14.51		134.88		0.04	U	0.24		8.00	U	1.48		1480.37		16.35		7399.07		1.22	
SP97	**SP5 (0,-1)**	320138	182553	3.46		0.99		172.52		6.18		52.62		0.04	U	0.43		8.00	U	4.01		2911.85		10.62		1311.83		1.37	
SP98	**SP5 (-1,0)**	320131	182517	1.90		2.72		640.07		22.66		104.91		0.04	U	0.34		8.00	U	1.66		1420.47		15.05		6002.89		1.16	

Notes: U = below detection limit

Table 5-5a. Metals Data: Surface Spoils

Sample ID	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Selenium	Silver	Sodium	Sulfur	Thorium	Tin	Titanium	Uranium	Vanadium	Zinc
	ppm	ppm	ppm	ppm	%	ppm	ppm	%	%	ppm	ppm	ppm	ppm	ppm	ppm
SP94	44.67	0.24	1.31	1.85	0.05	0.80 U	1.01	0.05	0.23	0.40	4.25	40.00 U	0.40	8.00 U	49.01
SP95	340.52	1.63	88.34	1.60	0.01	3.06	16.39	0.04 U	1.19	8.02	4.15	90.93	1.49	8.00 U	155.49
SP96	311.92	1.29	84.65	2.08	0.02	2.44	15.97	0.04 U	1.14	8.10	4.51	94.84	1.73	8.00 U	152.83
SP97	1043.33	0.17	43.75	0.80 U	0.01	0.80 U	3.18	0.04 U	0.61	7.38	1.66	93.60	1.44	8.00 U	273.56
SP98	311.42	1.24	62.34	3.11	0.03	1.35	11.59	0.04 U	1.02	9.23	3.02	127.56	1.88	8.53	195.55

Notes: U = below detection limit

Table 5-5b. Acid Base Accounting Analytical Data: Surface Spoils

New Sample ID	CDM ID	X	Y	Acid Generation Potential (calc on Sulphur Total)	Acid Neutralization Potential (calc)	Acid-Base Potential (calc on Sulphur Total)	Net Acid Generation Procedure	Neutralization Potential as CaCO3	Sulphur Organic Residual	Sulphur Pyritic Sulfide	Sulphur Sulphate	Sulphur Total	Total Sulphur minus Sulphate
				t CaCO3/Kt	t CaCO3/Kt	t CaCO3/Kt	Kg H2SO4/t	%	%	%	%	%	%
SP1	SP10 (0,0)	320182	182582	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP2	SP10 (0,2)	320166	182658	4.00	4.00	0.00	0.00	0.40	0.10	0.01	0.03	0.14	0.11
SP3	SP10 (1,1)	320210	182612	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP4	SP2 (0,0)	319937	182131	322.00	0.00	-322.00	84.00	0.00	3.66	4.26	2.36	10.30	7.92
SP5	SP2 (0,1)	319961	182093	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP6	SP2 (0,-1)	319918	182160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP7	SP2 (0,2)	319980	182056	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP8	SP2 (0,-2)	319889	182225	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP9	SP2 (1,1)	319929	682111	185.00	0.00	-185.00	11.00	0.00	3.76	0.87	1.28	5.91	4.63
SP10	SP2 (1,-1)	319886	182138	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP11	SP2 (-1,-1)	319956	182180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP12	SP20 (0,0)	320540	182926	17.00	0.00	-17.00	5.00	0.00	0.22	0.06	0.25	0.53	0.28
SP13	SP20 (0,-1)	320503	182894	17.00	0.00	-17.00	8.00	0.00	0.17	0.06	0.31	0.54	0.23
SP14	SP20 (0,2)	320617	182990	19.00	0.00	-19.00	3.00	0.00	0.39	0.07	0.15	0.61	0.46
SP15	SP20 (0,-2)	320465	1828601	15.00	0.00	-15.00	5.00	0.00	0.22	0.07	0.20	0.49	0.29
SP16	SP20 (0,-3)	320435	182821	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP17	SP20 (0,5)	320725	183077	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP18	SP20 (0.5,2)	310553	183010	22.00	0.00	-22.00	6.00	0.00	0.38	0.09	0.24	0.71	0.47
SP19	SP20 (1,0)	320555	182057	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP20	SP20 (1,0.5)	320569	182932	15.00	0.00	-15.00	7.00	0.00	0.24	0.04	0.20	0.48	0.28
SP21	SP20 (1,-2)	320488	182816	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP22	SP20 (-1,-2)	320445	182907	8.00	0.00	-8.00	4.00	0.00	0.14	0.03	0.08	0.25	0.17
SP23	SP20 (-1,-2) Offset	320444	182937	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP24	SP20 (-1,3)	320642	183055	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP25	SP20 (1,-3)	320459	182779	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP26	SP20 (1,-5)	320399	182704	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP27	SP20 (-1,6)	320753	183152	27.00	0.00	-27.00	11.00	0.00	0.44	0.16	0.26	0.86	0.60
SP28	SP20 (-1,7)	320801	183172	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP29	SP20 (-1,8)	320848	183204	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP30	SP20 (-2,10)	320889	183314	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP31	SP20 (-2,12)	320954	183371	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP32	SP20 (-2,8)	320825	183233	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP33	SP20A (-2,1)	320517	183038	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP34	SP20A (-3,0)	320459	183039	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP35	SP20A (-3,1)	320483	183077	10.00	0.00	-10.00	4.00	0.00	0.17	0.02	0.12	0.31	0.19
SP36	SP25 (0,0)	321041	183737	64.00	0.00	-64.00	6.00	0.00	1.23	0.34	0.47	2.04	1.57
SP37	SP25 (0,1)	321012	183707	14.00	0.00	-14.00	0.00	0.00	0.30	0.00	0.16	0.46	0.30
SP38	SP25 (0,-1)	321064	183769	113.00	0.00	-113.00	4.00	0.00	2.06	0.31	1.26	3.63	2.37
SP39	SP25 (0,-2)	321086	183800	106.00	0.00	-106.00	6.00	0.00	1.86	0.38	1.14	3.38	2.24
SP40	SP25 (1,0)	321008	183760	42.00	0.00	-42.00	6.00	0.00	0.88	0.08	0.37	1.33	0.96
SP41	SP25 (-1,0)	321070	183713	82.00	0.00	-82.00	8.00	0.00	1.92	0.22	0.48	2.62	2.14
SP42	SP25 (-1,1)	321041	183680	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP43	SP25(1,-1)	321031	183792	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP44	SP31 (0,0)	321149	183909	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP45	SP31 (0,1)	321123	183878	81.00	0.00	-81.00	8.00	0.00	1.68	0.19	0.73	2.60	1.87
SP46	SP31 (0,-1)	321174	183940	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP47	SP31 (0,2)	321101	183842	83.00	0.00	-83.00	5.00	0.00	1.93	0.07	0.65	2.65	2.00
SP48	SP31 (0,-2)	321204	183967	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP49	SP31 (1,0)	321113	183926	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP50	SP31 (-1,0)	321183	183886	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP51	SP31 (1,1)	321086	183891	47.00	0.00	-47.00	5.00	0.00	0.99	0.17	0.33	1.49	1.16
SP52	SP31 (-1,-1)	321207	183919	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 5-5b. Acid Base Accounting Analytical Data: Surface Spoils

New Sample ID	CDM ID	X	Y	Acid Generation Potential (calc on Sulphur Total)	Acid Neutralization Potential (calc)	Acid-Base Potential (calc on Sulphur Total)	Net Acid Generation Procedure	Neutralization Potential as CaCO3	Sulphur Organic Residual	Sulphur Pyritic Sulfide	Sulphur Sulphate	Sulphur Total	Total Sulphur minus Sulphate
				t CaCO3/Kt	t CaCO3/Kt	t CaCO3/Kt	Kg H2SO4/t	%	%	%	%	%	%
SP53	SP31 (-1,-2)	321236	183943	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP54	SP33 (0,0)	319664	181577	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP55	SP33 (0,1)	319658	181556	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP56	SP34 (0,0)	319262	181572	40.00	0.00	-40.00	17.00	0.00	0.53	0.20	0.56	1.29	0.73
SP57	SP34 (0,1)	319229	181564	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP58	SP34 (0,-1)	319296	181581	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP59	SP34 (0,-2)	319328	181591	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP60	SP34 (0,-3)	319363	181598	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP61	SP34 (0,-3)	320763	281607	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP62	SP34 (0,-4)	319390	181604	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP63	SP34 (1,0)	319255	181605	11.00	0.00	-11.00	10.00	0.00	0.08	0.08	0.19	0.35	0.16
SP64	SP34 (-1,0)	319268	181537	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP65	SP34 (-1,1)	319237	181531	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP66	SP34 (1,-1)	319285	181615	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP67	SP34 (1,-2)	319314	181624	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP68	SP34 (-1,-2)	319343	181559	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP69	SP34 (1,-3)	319351	181630	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP70	SP34 (-1,-3)	319379	181567	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP71	SP34 (1,-4)	319377	181637	25.00	0.00	-25.00	10.00	0.00	0.42	0.06	0.32	0.80	0.48
SP72	SP34 (-2,1)	319248	181496	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP73	SP37 (0,0)	319518	181307	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP74	SP37 (0,1)	319525	181357	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP75	SP37 (0,1)	319525	181357	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP76	SP37 (0,-1)	319518	181257	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP77	SP37 (0,2)	319541	181404	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP78	SP37 (0,3)	319548	181453	2.00	9.00	7.00	0.00	0.90	0.04	0.01	0.01	0.06	0.05
SP79	SP37 (1,0) Offset	319558	181287	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP80	SP37 (1,1)	320962	281350	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP81	SP37 (-1,1)	319487	181370	26.00	0.00	-26.00	8.00	0.00	0.42	0.11	0.31	0.84	0.53
SP82	SP37 (1,2)	319575	181387	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP83	SP37 (-1,2)	319507	181418	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP84	SP37 (1,3)	319588	181446	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP85	SP37 (-1,3)	319509	181457	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP86	SP37 (-2,2)	319461	181418	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP87	SP37A (0,0)	319429	181354	18.00	0.00	-18.00	10.00	0.00	0.13	0.06	0.37	0.56	0.19
SP88	SP37A (0,1)	319407	181389	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP89	SP37A (0,-1)	319454	181323	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP90	SP4 (0,0)	320059	182428	18.00	0.00	-18.00	8.00	0.00	0.31	0.06	0.21	0.58	0.37
SP91	SP4 (0,0) Offset	320007	182442	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP92	SP4 (0,1)	320046	182429	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP93	SP4 (0,-1)	319981	182409	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP94	SP4 (0,2)	320080	182442	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP95	SP5 (0,0)	320110	182539	43.00	0.00	-43.00	16.00	0.00	0.71	0.16	0.52	1.39	0.87
SP96	SP5 (0,1)	320075	182517	43.00	0.00	-43.00	13.00	0.00	0.74	0.18	0.46	1.38	0.92
SP97	SP5 (0,-1)	320138	182553	68.00	0.00	-68.00	38.00	0.00	0.75	0.75	0.68	2.18	1.50
SP98	SP5 (-1,0)	320131	182517	37.00	0.00	-37.00	10.00	0.00	0.59	0.14	0.46	1.19	0.73

Table 5-5c. Metals in <250 Micron Fraction

Sample ID	Al	Sb	As	Ba	Bi	Cd	Cr	Co	Cu	Pb	Mg	Mn	Mo	Ni*	P	Se	Ag	Sr	Th	Sn	Ti	U	V	Zn
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
SP20 (-1,-2) <250 um	11,205,475	2,346	461,902	131,382	7,863	141	3,951	DL	230,359	5,397,076	2,559,193	38,287	8,141	764	1,215,066	DL	7,287	16,066	18,842	740	53,755	4,031	6,213	112,854
SP20 (0,2) <250 um	9,099,652	2,533	653,996	111,753	8,034	1,094	2,090	DL	482,424	5,523,848	1,179,182	17,362	14,439	560	401,484	1,485	13,076	4,939	11,371	847	39,831	2,066	3,737	400,948
SP25 (0,1) <250 um	13,525,223	10,350	625,219	208,405	41,670	297	3,715	220	728,399	7,896,351	8,275,514	165,700	44,562	1,893	618,331	2,228	27,339	9,154	12,146	4,045	50,982	3,009	11,100	210,736
SP34 (1,0) <250 um	16,513,055	DL	159,945	6,550	29,250	DL	3,319	784	83,230	289,392	10,780,453	554,612	14,078	99	40,704	DL	694	642	5,475	1,511	71,234	1,179	2,430	67,546
SP20A (-3,1) <250 um	13,267,963	1,605	407,304	78,912	19,232	265	2,266	DL	403,223	3,404,644	3,646,895	71,282	16,224	638	386,621	1,879	6,172	7,494	12,303	1,423	62,286	2,269	3,290	175,416
SP37 (-1,1) <250 um	27,192,194	833	418,011	57,337	47,491	309	19,761	4,949	535,791	2,452,470	25,092,876	886,312	19,318	13,241	662,309	2,830	6,063	9,155	10,758	2,054	194,159	2,553	24,327	219,537
SP2 (0,0) <250 um	23,298,606	10,932	1,053,109	16,562	78,805	3,610	2,354	7,618	16,436,024	17,170,325	27,915,696	393,772	105,609	1,136	269,212	2,122	38,756	3,802	8,297	7,670	39,439	2,925	4,159	1,615,843
SP4 (0,0) <250 um	15,082,574	1,460	427,236	18,116	40,233	98	11,545	1,723	833,509	2,657,083	8,917,624	251,083	25,640	4,165	361,220	1,688	5,179	3,284	8,265	2,532	250,720	1,667	19,924	152,495
SP4 (0,0) <250 um DUP	13,946,544	1,907	414,241	19,152	40,922	62	11,736	1,763	824,451	2,595,898	8,424,731	252,035	26,889	4,196	349,085	1,122	4,811	3,119	8,197	2,946	240,494	1,627	20,391	130,617
SP25 (-1,0) <250 um	21,994,573	8,043	975,154	128,577	132,612	525	2,220	717	2,935,197	29,192,732	16,405,177	456,420	91,413	1,598	411,335	3,044	41,123	6,903	12,425	4,679	76,916	4,239	8,047	499,401
SP5 (-1,0) <250 um	15,078,676	3,531	706,483	21,243	116,872	232	4,676	945	1,371,082	7,331,026	11,111,196	259,218	63,529	2,075	302,953	2,875	14,672	5,106	9,045	4,709	133,583	2,077	11,588	194,172
SP2 (1,1) <250 um	22,439,711	10,102	1,122,461	22,846	98,171	410	1,340	184	2,110,003	49,540,694	27,114,031	417,884	76,053	266	475,378	2,344	51,255	7,059	9,558	10,755	57,955	3,811	5,082	1,043,380
SP20 (1,0.5) <250 um	8,570,505	5,228	581,588	90,864	31,763	731	8,463	170	530,332	2,877,101	2,958,037	48,983	24,633	1,209	366,597	2,368	5,826	6,191	12,077	1,792	65,171	1,997	10,520	330,399
SP20 (0.5, 2) <250 um	12,600,861	6,307	800,936	104,479	32,529	509	7,656	576	755,007	8,061,220	5,422,866	95,340	43,596	3,074	471,806	2,553	17,089	10,032	13,073	1,622	90,033	2,665	12,183	233,469
SP5 (0,0) <250 um	15,499,798	2,839	1,035,074	14,329	167,870	143	4,651	768	1,753,658	9,815,539	11,506,969	301,988	88,465	1,979	201,227	4,149	20,475	2,584	8,193	4,337	102,421	2,144	9,919	156,593
SP20 (0,0) <250 um	9,331,904	5,853	538,538	110,879	19,711	892	6,411	276	508,779	3,301,832	3,385,007	40,521	20,918	1,288	419,542	1,799	6,480	7,457	13,046	1,901	52,289	2,393	7,561	324,281
SP25 (1,0) <250 um	15,019,804	37,778	1,452,032	211,205	51,525	1,087	2,141	197	1,636,162	35,527,421	11,254,733	217,077	34,606	1,627	804,920	3,146	46,175	16,245	19,191	2,125	45,107	4,869	11,463	947,928
SP 25 (1,0) <250 um DUP	15,483,290	36,276	1,477,618	213,391	52,643	1,205	2,259	209	1,697,145	35,452,574	10,935,741	223,360	35,986	1,848	851,550	2,701	47,030	16,169	18,621	2,204	43,961	4,624	11,676	989,572
SP34 (1,-4) <250 um	15,581,776	5,232	1,611,334	27,555	142,335	134	6,259	1,582	654,123	1,764,060	4,069,639	272,089	68,536	2,697	274,691	4,889	5,277	2,589	15,672	5,459	194,062	3,006	15,574	70,974
SP31 (1,1) <250 um	15,897,730	31,078	2,007,579	302,357	26,639	1,500	7,203	640	1,631,385	35,590,883	11,275,337	252,768	36,561	3,141	871,611	1,749	45,712	10,954	15,496	2,288	84,186	4,112	13,416	1,127,414
SP25 (0,0) <250 um	24,784,108	12,593	1,189,387	278,484	49,334	922	2,335	175	1,341,756	28,755,373	23,106,132	404,168	34,382	1,467	1,009,689	1,628	50,725	20,893	20,604	2,648	36,423	6,138	15,392	840,373
SP31 (0,1) <250 um	14,460,052	36,109	2,169,503	988,538	47,774	2,143	5,423	419	1,793,791	41,434,927	8,540,436	202,886	54,712	2,403	1,242,522	1,384	46,691	23,843	11,873	3,143	75,072	4,149	12,773	1,067,996
NIST 2711	21,861,920	1,277	94,128	204,279	2,037	38,104	24,231	7,899	105,051	1,087,838	7,930,610	519,535	DL	16,936	771,147	DL	3,974	49,040	12,288	1,085	700,168	1,310	50,381	326,166
SP25 (0,-1) <250 um	7,855,150	24,379	1,038,131	172,936	191,228	449	1,152	230	5,844,043	55,523,413	1,679,503	69,742	69,396	770	143,060	3,004	56,064	4,449	8,050	4,215	35,378	2,953	3,347	550,775
SP25 (0,-1) <250 um DUP	7,265,069	29,801	1,035,669	183,340	198,108	508	1,094	261	5,909,910	58,418,353	1,700,476	68,521	70,784	782	132,720	3,239	57,250	4,596	7,878	6,263	34,924	2,958	3,374	565,040
SP5 (0,-1) <250 um	35,118,814	1,498	336,143	8,071	83,385	280	1,902	2,537	3,219,879	2,648,849	15,274,376	1,293,771	71,669	995	126,375	1,504	5,950	1,239	8,997	4,927	116,425	2,046	5,529	220,229
SP20 (0,-1) <250 um	12,287,564	4,107	487,966	82,924	22,403	295	4,791	359	502,318	3,151,451	3,936,181	72,304	19,636	1,336	449,328	1,731	5,260	8,880	11,511	1,889	61,772	2,427	7,039	168,575
SP5 (0,1) <250 um	16,412,797	3,655	789,058	14,441	179,561	156	4,576	722	1,524,563	9,322,856	12,588,618	292,209	88,297	1,984	276,674	3,973	20,278	2,747	10,337	6,484	120,025	2,474	10,528	155,497
SP20 (0,-2) <250 um	26,026,231	4,514	676,688	89,558	23,094	257	6,883	555	540,724	4,773,881	18,900,934	188,591	24,457	3,228	527,879	1,865	9,580	12,177	14,984	2,154	79,149	3,410	12,915	161,932
SP37 (0,3) <250 um	17,571,263	DL	14,791	109,775	362	1,496	32,396	9,513	33,989	58,578	2,794,731	1,620,507	1,842	31,289	1,188,131	DL	DL	21,673	4,219	616	132,935	2,983	46,140	121,683
SP31 (0,2) <250 um	12,595,252	52,330	2,560,136	342,848	62,366	875	2,896	182	2,837,133	37,514,033	8,142,899	177,204	70,395	1,320	861,423	4,047	48,263	10,402	10,233	4,282	58,322	3,407	6,619	579,227
SP37A (0,0) <250 um	42,117,836	1,377	346,106	41,973	25,953	DL	5,228	708	360,921	2,203,550	40,208,324	1,164,739	11,854	2,752	618,073	2,362	3,616	3,917	19,094	2,521	113,996	3,758	6,630	184,822
SP25 (0,-2) <250 um	8,483,112	61,399	2,525,361	143,415	91,080	1,498	2,542	314	5,543,026	56,021,770	2,265,815	69,428	51,660	1,408	432,567	3,513	47,123	5,934	8,500	4,512	43,596	3,334	7,507	1,023,104
SP10 (0,2) <250 um	21,039,682	751	130,121	44,948	22,130	229	18,257	4,799	526,930	548,547	6,809,338	897,927	13,157	9,141	776,430	DL	1,663	12,826	6,704	1,812	213,428	1,489	26,889	189,885
SP34 (0,0) <250 um	21,493,969	2,689	1,424,211	31,204	191,002	DL	10,583	2,588	582,299	1,250,503	9,762,771	458,727	56,983	3,856	263,494	5,594	4,107	3,241	10,912	4,564	164,360	2,561	21,621	77,764
SP20 (-1,-2) <2 mm	9,361,803	2,799	371,091	123,915	8,227	152	3,425	DL	208,665	5,209,655	2,004,604	34,498	10,566	572	1,124,636	1,300	4,848	14,242	19,963	1,039	44,110	4,232	6,167	105,688
SP20 (0,2) <2 mm	8,822,043	2,587	635,710	113,660	8,454	631	2,270	DL	468,568	6,010,245	1,030,491	16,511	16,047	469	427,742	1,822	10,558	4,746	12,375	1,139	35,694	2,172	4,057	254,288
SP25 (0,1) <2 mm	9,833,587	9,478	459,107	144,093	39,042	152	2,716	DL	578,555	6,226,526	6,106,110	127,448	42,365	1,190	444,297	2,673	16,662	6,130	10,010	3,575	41,575	2,500	9,028	162,121
SP34 (1,0) <2 mm	16,461,665	524	351,550	11,329	44,680	DL	3,345	791	150,105	445,932	10,289,273	554,411	24,777	295	62,588	1,686	1,296	878	6,384	2,491	74,301	1,318	4,629	69,896
SP20A (-3,1) <2 mm	12,272,848	1,851	362,727	61,196	21,237	113	1,593	DL	371,228	2,863,456	3,240,222	72,043	17,826	444	325,718	1,933	4,436	5,688	11,722	1,581	54,131	2,003	2,982	124,461
SP20A (-3,1) <2 mm DUP	10,327,163	1,945	456,640	57,327	22,671	383	1,676	DL	408,806	3,390,795	2,835,146	59,933	19,880	401	327,478	DL	4,841	5,607	11,596	1,547	47,575	1,931	3,348	197,313
SP37 (-1,1) <2 mm	25,535,900	1,920	469,364	51,294	41,956	249	16,461	5,343	412,458	2,286,791	23,423,308	861,501	20,265	13,471	609,727	2,384	4,098	10,629	10,002	2,372	177,486	2,272	23,642	172,866
SP2 (0,0) <2 mm	21,591,303	10,219	1,175,702	17,931	92,844	2,619	1,699	4,666	9,890,909	19,858,462	24,862,177	353,112	110,137	1,991	332,741	3,007	36,449	4,127	9,442	8,063	31,350	2,974	4,903	1,337,787
SP4 (0,0) <2 mm	14,028,337	1,333	315,691	14,902	27,872	DL	14,420	2,076	609,358	2,138,270	7,929,474	276,249	17,162	5,128	329,023	1,192	2,943	2,372	6,617	2,259	231,435	1,242	21,995	117,676
SP25 (-1,0) <2 mm	19,041,987	8,287	914,562	98,596	310,519	443	2,401	759	2,611,984	25,618,153	14,593,016	407,680	99,425	1,979	331,920	2,965	40,869	5,575	10,582	4,951	65,483	3,370	7,854	410,815
SP5 (-1,0) <2 mm	14,930,456	3,726	652,359	16,059	109,644	149	3,584	1,178	1,290,522	5,301,337	10,473,306	282,304	61,943	1,444	244,870	3,322	10,392	3,547	7,667	4,378	103,209	1,637	10,166	175,406
NIST 2711	21,911,328	1,322	99,359	204,603	2,212	41,082	23,055	8,330	109,535	1,113,191	8,629,344	516,042	DL	17,710	815,628	1,846	4,334	51,241	12,057	1,095	678,184	1,290	49,756	330,969
SP2 (1,1) <2 mm	21,585,548	11,316	1,177,821	21,738	88,988	436	1,571	412	1,993,914	44,252,610	26,190,000	366,768	89,063	564	572,872	2,431	49,336	7,537	8,961	10,562	54,394	3,415	6,286	1,017,653
SP20 (1,0.5) <2 mm	6,763,275	4,747	528,077	54,190	32,306	468	7,877	219	529,891	2,491,557	2,300,123	42,610	23,448	746	326,206	2,063	4,176	5,415	9,153	1,729	47,044	1,643	10,893	226,211
SP20 (0.5, 2) <2 mm	11,793,001	6,232	750,746	90,351	29,931	527	6,519	703	676,846	6,995,142	5,835,679	112,101	39,653	2,467	442,453	2,081	14,313	8,994	11,140	1,851	83,360	2,190	11,950	240,557
SP5 (0,0) <2 mm	14,499,720	3,609	897,718	11,658	147,581	DL	4,513	815	1,652,945	7,931,501	10,262,931	282,596	74,862	1,075	224,942	3,870	15,488	2,095	7,134	5,155	94,429	1,669	9,448	129,610
SP5 (0,0) <2 mm DUP	14,433,517	3,180	973,618	12,706	163,213	118	3,421	802	1,530,248	7,997,720	10,738,118	273,957	83,040	1,241	205,835	3,735	16,971	2,421	7,722	5,121	98,056	1,875	9,152	130,309
SP20 (0,0) <2 mm	7,651,385	9,088	589,941	89,459	19,085	663	5,720	327	522,676	2,964,340	2,875,050	34,702	32,383	746	373,435	3,074	7,125	7,012	10,465	1,729	47,349	1,810	7,555	218,032
SP25 (1,0) <2 mm	10,528,419	32,079	980,362	171,278	38,485	1,196	1,354	189	1,115,924	24,146,044	8,315,799	164,807	25,447	1,034	666,102	3,136	46,685	14,484	13,924	1,892	32,380	3,025	7,986	767,746
SP34 (1,-4) <2 mm	14,613,210	5,426	2,039,175	20,001	146,923	117	5,151	1,581	924,083	2,174,156	3,574,135	229,869	72,705	1,754	236,281	5,977	4,300	1,912	11,917	5,451	175,884	2,044	14,577	86,318
SP31 (1,1) <2 mm	11,999,322	35,718	1,530,229	211,514	20,135	1,125	5,541	678	1,199,246	23,452,967	9,658,690	216,114	28,702	2,455	609,429	1,871	38,079	8,989	12,209	1,836	67,042	2,999	11,237	790,550
SP25 (0,0) <2 mm	21,735,002	9,442	928,352	261,423	37,231	525	2,288	214	1,042,107	22,903,596	23,163,911	388,216	30,868	1,251	910,967	1,150	45,938	20,603	16,247	2,361	30,223	4,565	14,473	573,797
SP31 (0,1) <2 mm	12,543,631	34,025	2,199,445	939,533	45,003	3,086	3,706	442	1,745,137	35,931,284	8,146,236	187,237	52,001	1,691	1,162,686	DL	59,291	21,929	10,046	3,070	57,460	3,964	10,512	1,182,731

SP25 (0,-1) <2 mm	6,977,092	27,413	1,020,204	190,615	185,152	536	940	326	5,800,395	52,717,155	1,561,911	62,243	71,172	495	124,882	3,476	40,367	3,333	7,285	3,727	30,624	2,655	3,270	504,568
SP5 (0,-1) <2 mm	30,616,608	946	232,791	5,636	53,386	121	1,068	2,268	2,629,467	1,782,406	14,483,833	1,171,192	50,703	512	80,221	1,210	3,749	700	6,319	3,940	95,628	1,416	4,636	192,750
SP20 (0,-1) <2 mm	10,382,296	3,663	451,280	58,332	20,940	156	3,809	408	488,814	2,532,793	3,844,639	67,060	18,394	875	356,601	2,326	5,124	7,412	9,285	1,598	51,925	1,867	6,404	125,619
SP5 (0,1) <2 mm	14,571,093	3,854	745,029	11,978	151,107	DL	3,414	778	1,333,100	7,889,438	11,781,022	270,013	78,641	1,262	235,913	3,163	16,225	2,735	7,885	5,709	104,313	1,880	9,618	129,851
SP5 (0,1) <2 mm DUP	13,643,918	3,320	714,802	9,652	143,506	DL	3,081	1,158	1,301,116	6,864,441	10,827,216	260,584	78,303	1,499	203,907	4,723	14,389	1,944	7,447	5,386	90,694	1,793	8,541	125,674
SP20 (0,-2) <2 mm	22,274,308	4,050	686,817	94,846	24,772	109	5,429	621	589,806	4,408,716	18,673,328	167,652	25,835	2,545	451,043	3,156	8,221	11,410	12,481	2,473	70,991	2,848	12,325	130,187
SP37 (0,3) <2 mm	13,867,799	DL	12,976	83,106	230	1,168	25,769	8,443	26,736	61,344	2,676,788	1,314,219	DL	26,545	950,130	DL	DL	18,045	3,311	404	113,445	2,274	36,818	102,466
SP31 (0,2) <2 mm	12,264,674	55,230	2,530,370	346,554	76,487	1,149	1,830	312	2,896,793	38,483,982	8,876,660	176,178	59,584	981	708,312	3,025	49,459	10,326	9,438	4,475	48,628	3,106	5,745	642,641
SP37A (0,0) <2 mm	39,409,013	1,099	265,261	35,673	15,854	DL	3,500	605	245,483	1,930,056	41,025,350	1,152,283	8,736	1,733	527,514	2,380	2,278	3,400	13,662	1,911	89,228	2,940	4,869	162,937
SP25 (0,-2) <2 mm	7,536,033	46,122	2,049,171	119,874	81,465	1,590	1,899	420	4,937,742	48,499,666	2,066,714	60,135	51,550	1,029	355,412	3,055	35,946	5,027	7,169	4,027	38,097	2,806	6,449	932,449
SP10 (0,2) <2 mm	20,333,103	874	141,460	39,650	25,768	178	16,196	4,599	644,646	615,744	7,571,517	666,366	13,796	8,707	671,181	1,990	1,943	11,662	6,217	1,889	189,871	1,351	25,097	164,985
SP34 (0,0) <2 mm	19,979,086	2,545	1,484,876	25,039	180,436	DL	8,239	2,302	689,820	1,045,055	8,702,864	405,481	65,947	3,000	215,232	5,572	3,364	2,514	9,145	4,541	131,709	2,018	17,965	71,010
NIST 2711	20,502,758	1,099	94,374	194,599	2,129	38,955	22,648	7,852	106,580	1,073,056	8,059,705	499,338	DL	16,995	734,660	1,281	4,107	50,697	10,647	811	618,413	1,144	47,134	320,904

Table 5-5d. Spoils: Bioavailable Arsenic and Lead

Sample	Arsenic in <250um Bulk Soil	Bioavailable Arsenic	Lead in <250um Bulk Soil	Bioavailable Lead
	µg/kg	mg/kg	µg/kg	mg/kg
SP20 (-1,-2)	461,902	1.40	5,397,076	7.29
SP20 (0,2)	653,996	0.18	5,523,848	33.57
SP25 (0,1)	625,219	3.73	7,896,351	224.52
SP34 (1,0)	159,945	0.44	289,392	1.26
SP20A (-3,1)	407,304	0.51	3,404,644	12.15
SP37 (-1,1)	418,011	3.61	2,452,470	13.13
SP2 (0,0)	1,053,109	17.57	17,170,325	134.06
SP4 (0,0)	427,236	1.14	2,657,083	35.50
SP25 (-1,0)	975,154	-0.20	29,192,732	265.51
SP5 (-1,0)	706,483	0.41	7,331,026	81.97
SP2 (1,1)	1,122,461	0.05	49,540,694	189.62
SP20 (1,0.5)	581,588	0.34	2,877,101	7.08
SP20 (0.5, 2)	800,936	0.81	8,061,220	53.10
SP5 (0,0)	1,035,074	1.88	9,815,539	54.35
SP20 (0,0)	538,538	0.80	3,301,832	12.53
SP25 (1,0)	1,452,032	1.96	35,527,421	1281.09
SP34 (1,-4)	1,611,334	2.96	1,764,060	38.01
SP31 (1,1)	2,007,579	2.39	35,590,883	1131.15
SP25 (0,0)	1,189,387	0.56	28,755,373	191.34
SP31 (0,1)	2,169,503	3.47	41,434,927	1504.50
SP25 (0,-1)	1,038,131	4.45	55,523,413	3662.74
SP5 (0,-1)	336,143	0.91	2,648,849	36.75
SP20 (0,-1)	487,966	-0.88	3,151,451	5.39
SP5 (0,1)	789,058	0.01	9,322,856	98.77
SP20 (0,-2)	676,688	-0.05	4,773,881	36.79
SP37 (0,3)	14,791	1.12	58,578	4.90
SP31 (0,2)	2,560,136	3.03	37,514,033	223.01
SP37A (0,0)	346,106	0.09	2,203,550	0.96
SP25 (0,-2)	2,525,361	3.84	56,021,770	1779.55
SP10 (0,2)	130,121	0.38	548,547	20.97
SP34 (0,0)	1,424,211	0.14	1,250,503	10.80

Table 5-5e. CDM XRF Results: Spoils - CDM Instrument

Reading No	Time	SAMPLE	Instrument	Qualifier	Flags	Antimony		1.5 * Error	Antimony Error	Arsenic		1.5 * Error	Arsenic Error	Barium		1.5 * Error	Barium Error	Cadmium		1.5 * Error	Cadmium Error	Cesium		1.5 * Error	Cesium Error
189	8/7/2007 8:20	NIST-HIGH	CDM			34.08			18.03	426.18			42.12	403.46			17.87	-14.33	U	17.28	11.52	49.71			8.1
190	8/7/2007 12:16	SP10 (0,0)	CDM			-1.18	U	32.22	21.48	238.69			28.35	31.79			9.41	-15.68	U	21.42	14.28	-0.9	U	12.12	8.08
191	8/7/2007 12:32	SP10 (0,2)	CDM			-15.33	U	26.16	17.44	58.61			17.72	95.94			10.62	-20.01	U	17.97	11.98	-1.74	U	10.08	6.72
192	8/7/2007 12:55	SP10 (1,1)	CDM			-10.8	U	39.015	26.01	234.77			41.65	96.84			14.48	-37.71	U	25.155	16.77	-12.87	U	14.16	9.44
193	8/7/2007 12:55	SP10 (1,1)	CDM	R		113.93			199.13	145.02			284.71	144.91			114.66	-90.75	U	155.85	103.9	-42.8	U	92.97	61.98
194	8/7/2007 13:22	SP10 (-1,-1)	CDM			-1.65	U	34.245	22.83	170.08			33.34	7.68			8.75	-43.93	U	21.45	14.3	-2.7	U	12.75	8.5
195	8/7/2007 16:11	SP2 (0,1)	CDM			30.79			19.56	94.43			25.75	85.68			10.85	-33.58	U	18.375	12.25	9.26			7.52
196	8/7/2007 16:34	SP2 (0,-1)	CDM			29.22			27.71	486.79			61.68	67.16			13.08	-38.57	U	25.005	16.67	14.44			10.48
197	8/7/2007 16:43	SP2 (0,-2)	CDM			112.57			28.99	685.8			72.79	238.14			19.41	-39.82	U	24.66	16.44	23.29			11.1
198	8/7/2007 17:48	SP2 (-1,-1)	CDM			-20.88	U	23.985	15.99	103.91			21.21	85.63			9.84	-25.33	U	16.545	11.03	-1.48	U	9.33	6.22
205	8/9/2007 8:20	NIST-STANDARD	CDM			33.83			18.83	452.42			45.41	487.79			19.81	-4.86	U	18.27	12.18	62.19			8.75
206	8/9/2007 8:28		CDM			10.92			16.84	66.11			22.57	558.79			19.64	5.93			11.61	19.9			7.17
208	8/10/2007 8:40	NIST-STANDARD	CDM			13.42			17.99	476.62			44.6	469.63			19.14	4.41			12.15	66.42			8.62
209	8/10/2007 13:18	GM-4OB	CDM			-28	U	19.32	12.88	28.17			12.38	36.53			7.01	-11.03	U	14.445	9.63	-0.54	U	7.665	5.11
160	8/6/2007 12:27	MT SP20 (0,0)	CDM			21.89			20.31	215.88			34.67	1040.58			29.37	-14.34	U	19.815	13.21	40.99			9.53
161	8/6/2007 12:37	MT SP20 (0,2)	CDM			34.14			18.19	245			37.25	668.71			22.34	-21.45	U	17.34	11.56	24.29			7.94
162	8/6/2007 12:46	MT SP20 (0,1)	CDM			53.93			21.46	214.43			30.93	2148.22			41.95	-28.18	U	19.695	13.13	69.48			11.09
163	8/6/2007 12:56	MT SP20 (1,1.5)	CDM			37.13			17.57	234.74			36.16	739.7			22.76	-20.24	U	16.725	11.15	23.41			7.64
164	8/6/2007 13:03	MT SP20 (1,0.5)	CDM			-1.87	U	26.295	17.53	213.2			26.61	205.75			13.22	-27.36	U	17.13	11.42	8.61			7.17
165	8/6/2007 13:10	MT SP20 (1,-0.5)	CDM			32.82			19.58	195.51			27.79	595.88			22.3	-31.4	U	18.42	12.28	15.72			8.24
166	8/6/2007 13:23	MT SP20 (-0.5,2)	CDM			62.49			19.53	268.38			43.98	548.66			21.05	-25.16	U	17.865	11.91	22.27			8.14
167	8/6/2007 13:30	MT SP20 (0.5,2)	CDM			26.58			23.17	310.54			43.96	941.72			31	-4.7	U	22.965	15.31	39.22			10.38
168	8/6/2007 13:36	MT SP20 (0,3)	CDM			-19.41	U	20.88	13.92	105.23			20.89	47.75			7.55	-22.54	U	14.49	9.66	5.91			5.68
169	8/6/2007 13:41	MT SP20 (0,4)	CDM			133.71			25.78	666.61			49.94	1319.17			35.98	-37.71	U	21.255	14.17	44.97			11.13
170	8/6/2007 15:38	MTSP20 (-1,4)	CDM			46.15			22.15	291.42			42.62	739.98			26.02	-7.03	U	21.105	14.07	27.56			9.39
171	8/6/2007 15:45	MTSP20 (-1,5)	CDM			8.65			25	256.2			39.72	214			17.44	-18.24	U	24.63	16.42	1.38			9.55
172	8/6/2007 15:48	MTSP20 (-1,6)	CDM	R		23.59			341.72	755.92			659.78	228.8			247.71	-182.19	U	206.115	137.41	-44.33	U	162.81	108.54
173	8/6/2007 15:51	MTSP20 (-1,6)	CDM	R		26.19			29.17	255.33			57.41	138.06			18.42	-46.03	U	26.37	17.58	13.02			11.4
174	8/6/2007 15:56	MTSP20 (-1,6B)	CDM			48.4			21.2	343.17			40.58	140.87			13.17	-36.64	U	19.08	12.72	-2.3	U	11.58	7.72
175	8/6/2007 16:02	MTSP20 (-2,7)	CDM			28.15			21.29	253.91			37.5	302.72			17.67	-34.18	U	19.815	13.21	13.23			8.51
176	8/6/2007 16:08	MTSP20 (-2,8)	CDM			365.19			20.48	233.95			27.75	234.41			12.52	-38	U	13.41	8.94	20.85			6.85
177	8/6/2007 16:20	MTSP20 (-2,9)	CDM			59.82			15.55	361.19			32.78	125.07			10.24	-38.64	U	13.875	9.25	14.18			6.13
178	8/6/2007 16:31	MTSP20 (-2,11)	CDM			28.67			21.57	146.05			31.94	542.44			23.07	-25.18	U	20.715	13.81	12.36			8.85
179	8/6/2007 16:38	MTSP20 (-2,12)	CDM			-20.29	U	23.625	15.75	139.59			23.59	149.82			11.74	-39.46	U	15.795	10.53	7.62			6.54
180	8/6/2007 16:46	MTSP20 (-2,13)	CDM			-13.64	U	21.96	14.64	99.12			21.13	131.38			10.44	-27.86	U	15	10	9.45			6.05
181	8/6/2007 17:17	MTSP20 (-1,2)	CDM			1.46			21.27	181.55			29.04	176.74			14.56	-7.97	U	21.57	14.38	2.16			8.25
182	8/6/2007 17:23	MTSP20 (-1,1)	CDM			12.4			22.49	236.09			29.82	155.65			14.73	-26.47	U	21.765	14.51	-1.97	U	12.735	8.49
183	8/6/2007 17:27	MTSP20 (-1,1)	CDM			32.92			21.83	237.27			28.55	225.32			15.91	-23.02	U	20.895	13.93	-0.87	U	12.36	8.24
184	8/6/2007 17:34	MTSP20A (-3,1)	CDM			13.29			17.02	190.69			30.53	494.87			19.08	-35.18	U	16.29	10.86	13.35			7.22
185	8/6/2007 17:45	MTSP20A (-3,0)	CDM			20.58			19.74	250.89			38.48	896.65			27.01	-13.05	U	19.29	12.86	33.99			8.96
186	8/6/2007 18:05	MTSP20 (0,-2)	CDM			34.63			18.88	245.84			32.88	269.89			15.47	-35.28	U	17.49	11.66	8.71			7.44
187	8/6/2007 18:12	MTSP20 (1,-2)	CDM			25.09			19.37	310.08			36.9	373.89			18.22	-38.58	U	18.075	12.05	16.72			8.01
210	8/13/2007 10:22		CDM		304.32	0.05			0	0.88			0	0.02			0	3.45			0	0.02			0
211	8/13/2007 10:29	NIST-HIGH	CDM			10.78			16.2	5.88			11.16	22.01			7.02	-48.27	U	50.745	33.83	436.63			17.25
212	8/13/2007 14:53	WR1	CDM			-2.95	U	14.745	9.83	7.35			6.74	19.72			4.73	-130.72	U	31.08	20.72	482.92			15.21
213	8/13/2007 15:12	SP37A (0,0)	CDM	R		-21.13	U	94.905	63.27	-26.41	U	56.82	37.88	44.12			31.77	11.45			140.47	36.53			30.74
214	8/13/2007 15:16	SP37A (0,0)	CDM			3			19.45	-7.01	U	17.835	11.89	68.25			10.48	-81.39	U	61.215	40.81	66.13			10.33
215	8/13/2007 15:35	SP37A (0,1)	CDM			-10.41	U	29.955	19.97	2.06			14.22	121.44			13.23	-61.22	U	64.71	43.14	409.14			20.61
216	8/13/2007 15:53	SP37A (0,-1)	CDM	R		-0.77	U	60.075	40.05	-23.15	U	40.47	26.98	114			23.82	-105.03	U	126.195	84.13	853.39			49.34
217	8/13/2007 15:56	SP37A (0,-1)	CDM			-1.23	U	38.505	25.67	7.14			18.12	117.94			15.56	12.35			55.02	832.87			31.82
218	8/13/2007 16:58	SP37 (0,0)	CDM			-2.68	U	35.985	23.99	-16.54	U	21.465	14.31	23.42			10.45	6.87			51.21	308.41			19.49
219	8/13/2007 17:13	SP37 (0,1)	CDM			1.83			14.23	12.33			9.36	10.24			5.72	-107.89	U	44.49	29.66	61.87			8.64
220	8/13/2007 17:24	SP37 (0,2)	CDM			23.74			16.39	-7.93	U	13.95	9.3	17.06			6.72	-2.15	U	50.535	33.69	132.2			10.81
221	8/13/2007 17:29	SP37 (0,2)	CDM			9.07			18.87	-5.44	U	16.695	11.13	15.25			7.8	-13.76	U	59.28	39.52	146.94			12.61
222	8/13/2007 17:45	SP37 (0,3)	CDM			22.21			16.92	6.65			9.92	24.46			7.29	-13.15	U	52.065	34.71	175.54			11.87
223	8/13/2007 17:59	SP37 (0,-1)	CDM			10.75			22.89	-2.49	U	20.535	13.69	22.24			9.83	-65.45	U	71.055	47.37	310.42			19.1

Reading No	Time	SAMPLE	Chromium		1.5 * Error	Chromium Error	Cobalt		1.5 * Error	Cobalt Error	Copper		1.5 * Error	Copper Error	Iron		1.5 * Error	Iron Error	Lanthanum		1.5 * Error	Lanthanum Error	Lead		1.5 * Error	Lead Error
189	8/7/2007 8:20	NIST-HIGH	129.89			185.85	-55.53	U	241.665	161.11	1730.21			89.48	19955.69			367.3	19.11			7.36	3243.64			68.45
190	8/7/2007 12:16	SP10 (0,0)	133.89			236.29	53.7			263.96	255.97			87.81	60117.91			663	48.99			10.57	742.77			44.23
191	8/7/2007 12:32	SP10 (0,2)	-82.41	U	285.555	190.37	155.86			190.59	60.62			70.15	31780.21			447.7	40.74			8.75	252.97			29.46
192	8/7/2007 12:55	SP10 (1,1)	88.84			286.33	165.59			339.57	293.08			109.25	73159.63			866.2	67.42			13.62	1488.74			67.57
193	8/7/2007 12:55	SP10 (1,1)	-488.9	U	2865	1910	-807.7	U	3497.745	2331.83	351.9			760.14	77233.62			6203	59.06			91.63	1538.25			474
194	8/7/2007 13:22	SP10 (-1,-1)	132.2			254.4	-106.88	U	469.725	313.15	693.85			99.85	86387.51			818.2	59.75			11.58	1203.85			54.54
195	8/7/2007 16:11	SP2 (0,1)	163.62			201.59	182.43			196.47	854.98			84.52	30438.4			458.9	114.52			11.97	865.41			43.07
196	8/7/2007 16:34	SP2 (0,-1)	-43.84	U	444.225	296.15	373.52			440.57	642			115.9	152500.83			1184	204.73			18.68	4185.29			100.69
197	8/7/2007 16:43	SP2 (0,-2)	63.6			278.84	345.64			330.04	392.8			110.29	71009.91			834.6	361.82			23.45	5902.4			118.77
198	8/7/2007 17:48	SP2 (-1,-1)	107.58			176.24	36.94			178.29	222.27			66.37	31851.28			428.9	49.36			8.48	611.66			34.95
205	8/9/2007 8:20	NIST-STANDARD	29.79			194.8	-43.27	U	259.095	172.73	1918.35			95.01	22857.33			397.9	25.05			8.02	3681.63			73.98
206	8/9/2007 8:28		127.26			173.79	157.1			149.64	108.23			64.16	16181.01			318.4	29.02			7.78	845.19			38.16
208	8/10/2007 8:40	NIST-STANDARD	-214.59	U	277.905	185.27	-130.39	U	250.095	166.73	1909.8			92.76	22364.23			386.8	14.99			7.31	3660.05			72.45
209	8/10/2007 13:18	GM-4OB	-7.43	U	210.45	140.3	-38.64	U	179.325	119.55	75.81			51.79	12422.28			257	16.45			5.78	124.76			21.38
160	8/6/2007 12:27	MT SP20 (0,0)	95.9			210.09	8.08			191.39	181.05			78.86	25832.15			435.5	121.77			12.95	1762.86			56.95
161	8/6/2007 12:37	MT SP20 (0,2)	36.24			182.22	-9.15	U	230.355	153.57	129.2			68.45	15418.19			327.8	211.98			14.27	2568.46			61.74
162	8/6/2007 12:46	MT SP20 (0,1)	-123.08	U	321.105	214.07	206.03			217.8	173.08			80.55	37593.31			516.6	68.22			11.77	1214.07			49.94
163	8/6/2007 12:56	MT SP20 (1,1.5)	91.66			173.74	76.95			142.24	114.27			64.84	12125.05			291.3	94.64			10.45	2561.13			60.05
164	8/6/2007 13:03	MT SP20 (1,0.5)	173.11			195.47	-39.74	U	269.7	179.8	74.53			69.36	28723.95			413.9	32.08			8.4	1083.59			42.64
165	8/6/2007 13:10	MT SP20 (1,-0.5)	9.94			200.05	18.21			194.98	91.78			74.28	30958.59			459.4	66.2			10.43	986.67			44.8
166	8/6/2007 13:23	MT SP20 (-0.5,2)	-67.49	U	281.67	187.78	92.23			163.77	220.29			72.5	16956.94			351.1	171.71			13.54	3557.28			73.41
167	8/6/2007 13:30	MT SP20 (0.5,2)	41.31			233.48	112.34			225.27	248.12			90.77	31559.76			524.9	72.72			12.35	2405.2			71.83
168	8/6/2007 13:36	MT SP20 (0,3)	-55.96	U	227.775	151.85	-29.23	U	181.17	120.78	23.21			55.06	9536.25			239.6	63.36			8.11	855.24			34.68
169	8/6/2007 13:41	MT SP20 (0,4)	-66.96	U	360.6	240.4	398.96			302.03	428.03			93.9	77644.1			774.7	182.02			16.34	3002.78			78.06
170	8/6/2007 15:38	MTSP20 (-1,4)	-208.95	U	327.735	218.49	0.9			212.91	340.52			86.23	32416.2			498.2	123.99			13.47	2657.61			70.1
171	8/6/2007 15:45	MTSP20 (-1,5)	207			269.25	236.62			311.94	225.37			102.14	70525.55			789	80.65			13.31	1587.23			64.35
172	8/6/2007 15:48	MTSP20 (-1,6)	-1495.96	U	4873.56	3249.04	291.67			4650.08	-1030.32	U	1662.27	1108.18	83112.68			11949	-18.37	U	167.04	111.36	1976.94			978.56
173	8/6/2007 15:51	MTSP20 (-1,6)	190.51			308.84	302.81			397.39	373.78			117.4	79708.41			1033	128.44			18.28	2486.41			94.75
174	8/6/2007 15:56	MTSP20 (-1,6B)	48.62			216.3	446.64			284.79	382.79			83.32	80817.86			739	125.04			12.82	2351.91			65.68
175	8/6/2007 16:02	MTSP20 (-2,7)	79.26			221.43	220.17			241.09	304.79			84.46	48566.26			592.2	103.34			12.45	1935.54			61.28
176	8/6/2007 16:08	MTSP20 (-2,8)	0.08			138.1	109			114.21	85.91			51.98	9067.33			230.2	198.2			11.78	1721.45			45.38
177	8/6/2007 16:20	MTSP20 (-2,9)	-7.09	U	217.575	145.05	122.8			115	68.67			54.46	6898.22			218.2	158.63			11.09	2303.81			52.92
178	8/6/2007 16:31	MTSP20 (-2,11)	41.78			221.33	15.43			222.93	117.22			83.3	37125.88			536.3	108.4			12.94	1256.97			52.91
179	8/6/2007 16:38	MTSP20 (-2,12)	-53.31	U	254.37	169.58	54.84			146.58	117.2			63.99	15047.46			313.1	154.33			12.03	848.48			38.64
180	8/6/2007 16:46	MTSP20 (-2,13)	-2.76	U	235.095	156.73	46.83			123.5	22.17			57.34	8580.03			240	110.07			9.95	800.37			35.2
181	8/6/2007 17:17	MTSP20 (-1,2)	79.61			227.25	93.28			211.2	136.88			84.82	28843.96			481.4	42.77			10.25	896.75			46.87
182	8/6/2007 17:23	MTSP20 (-1,1)	-127.36	U	352.875	235.25	186.18			241.9	254.11			90.73	38443.17			574.9	31.8			10.2	749.85			46.6
183	8/6/2007 17:27	MTSP20 (-1,1)	-1	U	340.02	226.68	218.67			228.98	162.39			85.63	38096.24			540.8	33.64			9.82	782.44			44.76
184	8/6/2007 17:34	MTSP20A (-3,1)	19.6			176.67	80.51			156.98	102.91			65.71	18541.34			344.2	81.72			10.02	1666.92			50.39
185	8/6/2007 17:45	MTSP20A (-3,0)	97.09			203.12	1.42			191.03	110.68			75.26	28182.06			443.9	81.11			11.19	2387.6			63.5
186	8/6/2007 18:05	MTSP20 (0,-2)	24.74			192.82	313.7			192.89	117.14			71.73	31252.24			448	115.24			11.68	1722.26			53.55
187	8/6/2007 18:12	MTSP20 (1,-2)	151.85			202.67	-102.69	U	288.24	192.16	150.06			75.41	30127.79			454.1	109.92			11.92	2100.41			59.85
210	8/13/2007 10:22		0.09			0	1.05			0	5.09			0	0.09			0	4.7				0.07			0
211	8/13/2007 10:29	NIST-HIGH	6094.46			307.12	-32.72	U	159.87	106.58	4333.16			83.12	50.7			153.4					150.16			19.88
212	8/13/2007 14:53	WR1	736.96			148.97	-56.34	U	102.375	68.25	511.53			36.48	47.39			113.3					89.79			14.91
213	8/13/2007 15:12	SP37A (0,0)	592.08			964.32	36.42			436.26	37.99			155	243.25			740.6					-48.99	U	107.31	71.54
214	8/13/2007 15:16	SP37A (0,0)	741.48			290.16	-20.57	U	192.015	128.01	23.4			45.85	-51.74	U	329.805	219.9					-70.05	U	31.44	20.96
215	8/13/2007 15:35	SP37A (0,1)	228.08			297.99	-47.9	U	204.39	136.26	75.25			51.27	129.88			244.8					-63.9	U	34.605	23.07
216	8/13/2007 15:53	SP37A (0,-1)	-72.16	U	866.16	577.44	-131.63	U	399.99	266.66	56.51			102.03	7.59			464.4					-35.62	U	65.16	43.44
217	8/13/2007 15:56	SP37A (0,-1)	138.96			374.02	-172.44	U	255.84	170.56	69.63			66.49	74.72			297.1					-69.51	U	41.4	27.6
218	8/13/2007 16:58	SP37 (0,0)	122.93			334.47	-70.75	U	234.21	156.14	11.18			56.3	134.4			221.9					70.45			26.9
219	8/13/2007 17:13	SP37 (0,1)	394.66			197.22	-70.75	U	137.355	91.57	24.12			33.86	-7.7	U	189.705	126.5					112.86			19.26
220	8/13/2007 17:24	SP37 (0,2)	642.2			221.41	-194.91	U	147.345	98.23	36.05			35.91	77.26			133.9					42.76			18.22
221	8/13/2007 17:29	SP37 (0,2)	413.67			257.31	-96.17	U	176.4	117.6	11.01			42.58	-254.84	U	222.09	148.1					41.45			21.32
222	8/13/2007 17:45	SP37 (0,3)	652.09			230.05	16.78			105.02	45.27			37.08	69.14			141.3					46.95			18.13
223	8/13/2007 17:59	SP37 (0,-1)	817.95			325.24	-245.86	U	214.755	143.17	-51.27	U	77.1	51.4	154.25			206.3					51.82			25.5

Reading No	Time	SAMPLE	Manganese		1.5 * Error	Manganese Error	Mercury		1.5 * Error	Mercury Error	Nickel		1.5 * Error	Nickel Error	Palladium		1.5 * Error	Palladium Error	Rubidium		1.5 * Error	Rubidium Error	Selenium		1.5 * Error
189	8/7/2007 8:20	NIST-HIGH	5738.44			324.11	18.76			14.39	21.94			114.2	-0.65	U	32.7	21.8	139.98			21.21	-1.78	U	17.535
190	8/7/2007 12:16	SP10 (0,0)	-246.46	U	473.505	315.67	-17.21	U	23.355	15.57	-189.43	U	214.95	143.3	-61.38	U	38.34	25.56	-50.3	U	33.63	22.42	1.19		
191	8/7/2007 12:32	SP10 (0,2)	449.25			261.45	-14.57	U	18.99	12.66	-64.39	U	177.495	118.33	-57.77	U	31.995	21.33	-7.89	U	29.475	19.65	-10.13	U	16.14
192	8/7/2007 12:55	SP10 (1,1)	8.78			392.85	-13.19	U	29.205	19.47	-60.1	U	267.24	178.16	-70.13	U	47.67	31.78	-39.81	U	42.27	28.18	-9.02	U	24.78
193	8/7/2007 12:55	SP10 (1,1)	664.64			2806.94	-115.1	U	160.95	107.3	-166.75	U	1805.235	1203.5	-122.65	U	313.815	209.21	-8.57	U	297.57	198.38	-42.26	U	158.295
194	8/7/2007 13:22	SP10 (-1,-1)	246.78			355.64	-14.24	U	25.26	16.84	-152.33	U	233.52	155.68	-77.51	U	40.95	27.3	-42.14	U	36.165	24.11	1.02		
195	8/7/2007 16:11	SP2 (0,1)	383.27			270.61	-22.11	U	19.935	13.29	-144.11	U	184.425	122.95	-58.7	U	34.455	22.97	-39.83	U	31.005	20.67	3.45		
196	8/7/2007 16:34	SP2 (0,-1)	581.51			440.67	-32.9	U	30.12	20.08	-112.42	U	281.355	187.57	-87.58	U	48.675	32.45	-73.48	U	42.105	28.07	-9.39	U	26.61
197	8/7/2007 16:43	SP2 (0,-2)	262.69			387.06	-9.2	U	31.35	20.9	-132.91	U	261.135	174.09	-103.49	U	46.98	31.32	-44.91	U	42.93	28.62	0.98		
198	8/7/2007 17:48	SP2 (-1,-1)	197.88			235.88	-8.79	U	17.775	11.85	-40.51	U	162.75	108.5	-81.78	U	29.505	19.67	-2.97	U	28.155	18.77	-9.74	U	15.09
205	8/9/2007 8:20	NIST-STANDARD	6770.53			350.28	40.12			15.73	-22.85	U	179.535	119.69	-7.17	U	33.705	22.47	133.66			21.78	1.07		
206	8/9/2007 8:28		132.48			225.83	9.63			12.33	83.65			108.26	-11.14	U	30.69	20.46	103.1			19.37	4.64		
208	8/10/2007 8:40	NIST-STANDARD	6802.16			341.7	28.22			15.04	29.77			117.01	-0.79	U	33.165	22.11	129.94			21.3	5.21		
209	8/10/2007 13:18	GM-4OB	255.9			185.67	-11.88	U	13.995	9.33	-114.18	U	128.43	85.62	-40.62	U	24.99	16.66	20.01			16.17	-2.15	U	12.39
160	8/6/2007 12:27	MT SP20 (0,0)	-298.48	U	403.365	268.91	-5.12	U	22.125	14.75	-19.07	U	193.92	129.28	-51.71	U	35.535	23.69	10.57			21.67	0.14		
161	8/6/2007 12:37	MT SP20 (0,2)	-156.12	U	349.275	232.85	-16.74	U	19.23	12.82	11.68			113.12	-76.49	U	30.945	20.63	22.07			19.81	2.02		
162	8/6/2007 12:46	MT SP20 (0,1)	-139.93	U	425.115	283.41	-5.14	U	22.59	15.06	-92.74	U	199.56	133.04	-36.96	U	36.555	24.37	55.76			22.51	-10.75	U	19.035
163	8/6/2007 12:56	MT SP20 (1,1.5)	64.16			223.86	-4.2	U	18.855	12.57	-3.25	U	161.055	107.37	-86.01	U	29.64	19.76	5.64			18.96	2.84		
164	8/6/2007 13:03	MT SP20 (1,0.5)	-122.94	U	380.43	253.62	-10.1	U	19.545	13.03	-81.96	U	176.595	117.73	-51.79	U	30.99	20.66	3.48			18.75	-6.62	U	16.68
165	8/6/2007 13:10	MT SP20 (1,-0.5)	-70.04	U	395.25	263.5	-5.5	U	20.85	13.9	-51.67	U	185.505	123.67	-58.51	U	33.96	22.64	0.97			20.89	3.36		
166	8/6/2007 13:23	MT SP20 (-0.5,2)	118.87			247.82	-11.02	U	20.655	13.77	-138.5	U	173.865	115.91	-72.14	U	32.4	21.6	35.61			20.82	-2.52	U	18.315
167	8/6/2007 13:30	MT SP20 (0.5,2)	27.56			308.86	-14.13	U	24.885	16.59	-191.47	U	214.29	142.86	-77.16	U	40.485	26.99	0.68			25.04	-14.7	U	21.315
168	8/6/2007 13:36	MT SP20 (0,3)	-28.91	U	293.88	195.92	-10.52	U	15.57	10.38	-31.71	U	140.835	93.89	-62.51	U	25.47	16.98	-28.8	U	23.745	15.83	1.88		
169	8/6/2007 13:41	MT SP20 (0,4)	14.18			334.09	-19.15	U	25.455	16.97	-94.07	U	227.265	151.51	-99.34	U	40.29	26.86	-6.71	U	37.005	24.67	-19.16	U	21.975
170	8/6/2007 15:38	MTSP20 (-1,4)	125.55			295.37	-16.18	U	23.385	15.59	-23.02	U	207.135	138.09	-71.3	U	37.41	24.94	26.2			23.11	-7.22	U	20.355
171	8/6/2007 15:45	MTSP20 (-1,5)	-260.53	U	541.74	361.16	-16.05	U	27.345	18.23	-21.1	U	251.025	167.35	-85.72	U	44.475	29.65	-6.18	U	40.665	27.11	-14.1	U	23.13
172	8/6/2007 15:48	MTSP20 (-1,6)	-2494.35	U	6523.98	4349.32	-121.15	U	307.515	205.01	59.05			2332.9	-42.96	U	642.075	428.05	-175.54	U	493.515	329.01	1.46		
173	8/6/2007 15:51	MTSP20 (-1,6)	-259.48	U	631.275	420.85	-10.32	U	31.83	21.22	-92.93	U	287.13	191.42	-72.49	U	51.48	34.32	-59.04	U	45.825	30.55	6.31		
174	8/6/2007 15:56	MTSP20 (-1,6B)	487.07			310.04	0.85			15.32	22.62			137.52	-85.66	U	36.075	24.05	-59.22	U	32.505	21.67	-3.71	U	19.59
175	8/6/2007 16:02	MTSP20 (-2,7)	-15.29	U	446.115	297.41	-13.85	U	22.815	15.21	-182.9	U	203.145	135.43	-99.41	U	36.48	24.32	-26.02	U	33.585	22.39	-11.8	U	19.53
176	8/6/2007 16:08	MTSP20 (-2,8)	219.21			180.51	5.38			10.36	-26.32	U	129.375	86.25	-106.34	U	24.12	16.08	-13.27	U	24.285	16.19	-6.71	U	13.215
177	8/6/2007 16:20	MTSP20 (-2,9)	130.06			187.89	-2.77	U	16.215	10.81	-95.28	U	134.415	89.61	-99.55	U	25.305	16.87	-19.1	U	25.17	16.78	-3.88	U	14.265
178	8/6/2007 16:31	MTSP20 (-2,11)	118.3			296.27	-13.24	U	22.785	15.19	-57.18	U	205.185	136.79	-69.52	U	37.68	25.12	-18.18	U	34.575	23.05	-8.89	U	19.515
179	8/6/2007 16:38	MTSP20 (-2,12)	52.99			221.67	1.19			12.08	-38.83	U	158.355	105.57	-88.33	U	28.995	19.33	-15.58	U	27.63	18.42	-1.82	U	15.42
180	8/6/2007 16:46	MTSP20 (-2,13)	90.97			202.75	-20.8	U	15.66	10.44	-125.41	U	143.04	95.36	-74.04	U	26.745	17.83	-32.12	U	25.17	16.78	-10.14	U	13.77
181	8/6/2007 17:17	MTSP20 (-1,2)	35.01			299.41	-12.49	U	23.115	15.41	-152.87	U	207.255	138.17	-76.15	U	37.605	25.07	-18.84	U	34.215	22.81	-5.12	U	19.8
182	8/6/2007 17:23	MTSP20 (-1,1)	124.65			319.12	-14.98	U	24.09	16.06	-67.85	U	221.34	147.56	-90.75	U	39.09	26.06	-15.31	U	36.045	24.03	-16.5	U	20.22
183	8/6/2007 17:27	MTSP20 (-1,1)	39.71			303.23	-21.5	U	22.725	15.15	4.69			141.91	-82.22	U	37.23	24.82	3.01			23.08	-9.99	U	19.605
184	8/6/2007 17:34	MTSP20A (-3,1)	32.46			230.61	-8.18	U	18.6	12.4	-70.6	U	163.2	108.8	-71.11	U	30	20	-8.21	U	28.245	18.83	-2.36	U	16.23
185	8/6/2007 17:45	MTSP20A (-3,0)	-15.45	U	398.895	265.93	-10.52	U	21.435	14.29	-67.03	U	186.615	124.41	-80.16	U	34.08	22.72	59.75			21.89	-5.64	U	18.645
186	8/6/2007 18:05	MTSP20 (0,-2)	291.89			260.19	-8.82	U	20.16	13.44	15.14			120.81	-61.9	U	32.67	21.78	-0.33	U	30.21	20.14	0.1		
187	8/6/2007 18:12	MTSP20 (1,-2)	-22.12	U	398.01	265.34	-14.69	U	20.94	13.96	67.19			125.55	-37.49	U	34.59	23.06	9.6			21.09	-0.1	U	18.57
210	8/13/2007 10:22		0.17			0	0.55			0	3.85			0	18.45			0	0.26			0	0.07		
211	8/13/2007 10:29	NIST-HIGH	20790.38			348.53	419.62			40.25	1858.48			84.93	9.97			28.05	307.84			29.56	3453.64		
212	8/13/2007 14:53	WR1	20870.11			280.34	59.48			11.52	2555.81			66.96	-37.03	U	25.455	16.97	198.13			20.2	174.42		
213	8/13/2007 15:12	SP37A (0,0)	40418.38			1795.48	140.61			79.98	54.67			257.75	-67.33	U	170.175	113.45	-47.56	U	160.155	106.77	553.8		
214	8/13/2007 15:16	SP37A (0,0)	42946.03			545.23	106.22			23.95	54.77			76.31	-54.53	U	50.805	33.87	-90.48	U	47.64	31.76	606.61		
215	8/13/2007 15:35	SP37A (0,1)	49542.6			613	422.34			51.95	332.81			85.69	-55.4	U	53.13	35.42	-117.15	U	52.29	34.86	3900.52		
216	8/13/2007 15:53	SP37A (0,-1)	59081.44			1155.22	461.01			108.05	852.56			178.11	-14.47	U	106.29	70.86	-80.19	U	98.46	65.64	6010.9		
217	8/13/2007 15:56	SP37A (0,-1)	56223.9			736.02	480.93			69	1162.1			118.43	-80.21	U	67.185	44.79	-85.34	U	63.39	42.26	5696.47		
218	8/13/2007 16:58	SP37 (0,0)	23500.66			482.46	53.93			25.99	-108.09	U	140.37	93.58	-51.95	U	63.45	42.3	106.56			39.1	522.73		
219	8/13/2007 17:13	SP37 (0,1)	11664.07			272.67	-4.17	U	19.05	12.7	84.29			56.73	-56.48	U	36.96	24.64	52.14			26.01	93.39		
220	8/13/2007 17:24	SP37 (0,2)	11077.96			271.76	5.12			12.01	-22.12	U	88.44	58.96	-50.74	U	41.04	27.36	35.81			25.79	25.67		
221	8/13/2007 17:29	SP37 (0,2)	10209.04			301.05	-4.77	U	21.675	14.45	-82.04	U	105.825	70.55	-63.06	U	48.63	32.42	30.06			30.55	52.56		
222	8/13/2007 17:45	SP37 (0,3)	13631.12			292.83	11.74			12.19	-23.05	U	91.455	60.97	-27.13	U	42.795	28.53	58.38			26.15	14.64		
223	8/13/2007 17:59	SP37 (0,-1)	20327.35			443.99	11.63			18.21	-101.57	U	130.575	87.05	-59.1	U	59.4	39.6	85.73			36.62	76.62		

Reading No	Time	SAMPLE	Selenium Error
189	8/7/2007 8:20	NIST-HIGH	11.69
190	8/7/2007 12:16	SP10 (0,0)	13.58
191	8/7/2007 12:32	SP10 (0,2)	10.76
192	8/7/2007 12:55	SP10 (1,1)	16.52
193	8/7/2007 12:55	SP10 (1,1)	105.53
194	8/7/2007 13:22	SP10 (-1,-1)	14.55
195	8/7/2007 16:11	SP2 (0,1)	11.9
196	8/7/2007 16:34	SP2 (0,-1)	17.74
197	8/7/2007 16:43	SP2 (0,-2)	18.41
198	8/7/2007 17:48	SP2 (-1,-1)	10.06
205	8/9/2007 8:20	NIST-STANDARD	12.42
206	8/9/2007 8:28		10.42
208	8/10/2007 8:40	NIST-STANDARD	12.21
209	8/10/2007 13:18	GM-4OB	8.26
160	8/6/2007 12:27	MT SP20 (0,0)	12.75
161	8/6/2007 12:37	MT SP20 (0,2)	11.58
162	8/6/2007 12:46	MT SP20 (0,1)	12.69
163	8/6/2007 12:56	MT SP20 (1,1.5)	11.13
164	8/6/2007 13:03	MT SP20 (1,0.5)	11.12
165	8/6/2007 13:10	MT SP20 (1,-0.5)	12.08
166	8/6/2007 13:23	MT SP20 (-0.5,2)	12.21
167	8/6/2007 13:30	MT SP20 (0.5,2)	14.21
168	8/6/2007 13:36	MT SP20 (0,3)	9.17
169	8/6/2007 13:41	MT SP20 (0,4)	14.65
170	8/6/2007 15:38	MTSP20 (-1,4)	13.57
171	8/6/2007 15:45	MTSP20 (-1,5)	15.42
172	8/6/2007 15:48	MTSP20 (-1,6)	224.27
173	8/6/2007 15:51	MTSP20 (-1,6)	18.81
174	8/6/2007 15:56	MTSP20 (-1,6B)	13.06
175	8/6/2007 16:02	MTSP20 (-2,7)	13.02
176	8/6/2007 16:08	MTSP20 (-2,8)	8.81
177	8/6/2007 16:20	MTSP20 (-2,9)	9.51
178	8/6/2007 16:31	MTSP20 (-2,11)	13.01
179	8/6/2007 16:38	MTSP20 (-2,12)	10.28
180	8/6/2007 16:46	MTSP20 (-2,13)	9.18
181	8/6/2007 17:17	MTSP20 (-1,2)	13.2
182	8/6/2007 17:23	MTSP20 (-1,1)	13.48
183	8/6/2007 17:27	MTSP20 (-1,1)	13.07
184	8/6/2007 17:34	MTSP20A (-3,1)	10.82
185	8/6/2007 17:45	MTSP20A (-3,0)	12.43
186	8/6/2007 18:05	MTSP20 (0,-2)	11.75
187	8/6/2007 18:12	MTSP20 (1,-2)	12.38
210	8/13/2007 10:22		0
211	8/13/2007 10:29	NIST-HIGH	65.69
212	8/13/2007 14:53	WR1	19.48
213	8/13/2007 15:12	SP37A (0,0)	128.86
214	8/13/2007 15:16	SP37A (0,0)	39.41
215	8/13/2007 15:35	SP37A (0,1)	85.33
216	8/13/2007 15:53	SP37A (0,-1)	179.66
217	8/13/2007 15:56	SP37A (0,-1)	114.39
218	8/13/2007 16:58	SP37 (0,0)	43.91
219	8/13/2007 17:13	SP37 (0,1)	23.15
220	8/13/2007 17:24	SP37 (0,2)	21.31
221	8/13/2007 17:29	SP37 (0,2)	25.89
222	8/13/2007 17:45	SP37 (0,3)	21.31
223	8/13/2007 17:59	SP37 (0,-1)	31.7

Reading No	Time	SAMPLE	Silver		1.5 * Error	Silver Error	Strontium		1.5 * Error	Strontium Error	Tellurium		1.5 * Error	Tellurium Error	Tin		1.5 * Error	Tin Error	Zinc		1.5 * Error	Zinc Error
189	8/7/2007 8:20	NIST-HIGH	9.14			29.97	271.96			31.68	-0.72	U	25.515	17.01	-28.61	U	54.525	36.35	4068			86.84
190	8/7/2007 12:16	SP10 (0,0)	-43.67	U	57.78	38.52	-63.23	U	51.255	34.17	11.21			22.29	-12.12	U	70.35	46.9	-30.33	U	76.38	50.92
191	8/7/2007 12:32	SP10 (0,2)	-63.29	U	47.475	31.65	-12.07	U	43.47	28.98	-7.96	U	27.12	18.08	-47.24	U	57.645	38.43	41.12			42.27
192	8/7/2007 12:55	SP10 (1,1)	-70.23	U	69.525	46.35	-61.8	U	64.635	43.09	19.51			27	-41.16	U	84.495	56.33	127.47			66.22
193	8/7/2007 12:55	SP10 (1,1)	100.09			332.59	48.82			295.52	53.57			194.44	39.08			403.1	113.82			459
194	8/7/2007 13:22	SP10 (-1,-1)	-56.8	U	61.29	40.86	-54.54	U	55.68	37.12	13.43			23.66	-107.46	U	73.47	48.98	-0.83	U	84.93	56.62
195	8/7/2007 16:11	SP2 (0,1)	-40.03	U	49.545	33.03	-2.11	U	47.55	31.7	0.83			18.89	-63.59	U	59.685	39.79	419.67			52.55
196	8/7/2007 16:34	SP2 (0,-1)	-41.59	U	70.59	47.06	-130.25	U	66.51	44.34	-8.01	U	39.555	26.37	-166.83	U	84.405	56.27	89.84			68.71
197	8/7/2007 16:43	SP2 (0,-2)	29.31			45.94	-73.42	U	65.985	43.99	8.61			25.93	-54.26	U	82.695	55.13	757.49			76.78
198	8/7/2007 17:48	SP2 (-1,-1)	-22.68	U	43.62	29.08	-75.52	U	40.62	27.08	8.88			16.84	-76.18	U	52.515	35.01	60.01			39.61
205	8/9/2007 8:20	NIST-STANDARD	-5.95	U	47.1	31.4	323.29			33.06	3.82			18.02	-15.78	U	57.36	38.24	4602.06			93.51
206	8/9/2007 8:28		-3.29	U	43.62	29.08	252.4			29.43	2.96			16.7	-32.25	U	52.695	35.13	227.69			41.23
208	8/10/2007 8:40	NIST-STANDARD	30.98			30.81	310.11			32.34	20.24			17.91	-52.24	U	55.425	36.95	4551.42			91.3
209	8/10/2007 13:18	GM-4OB	-49.2	U	35.25	23.5	-13.11	U	33.9	22.6	5.38			13.76	-62.7	U	42.96	28.64	-7.76	U	45.705	30.47
160	8/6/2007 12:27	MT SP20 (0,0)	-27.4	U	52.515	35.01	-35.63	U	48.24	32.16	45.03			21.22	-3.39	U	63.975	42.65	154.27			48.75
161	8/6/2007 12:37	MT SP20 (0,2)	-52.26	U	45.555	30.37	-63.64	U	42.975	28.65	10.61			17.88	-30.63	U	55.59	37.06	91.89			41.9
162	8/6/2007 12:46	MT SP20 (0,1)	-25.86	U	54.255	36.17	-30.51	U	48.855	32.57	1.95			20.99	-55.15	U	65.49	43.66	66.58			48.5
163	8/6/2007 12:56	MT SP20 (1,1.5)	-8.12	U	43.83	29.22	-91.2	U	41.415	27.61	14.31			17.12	-14.18	U	53.43	35.62	19.86			38.68
164	8/6/2007 13:03	MT SP20 (1,0.5)	-56.9	U	48	32	-64.63	U	41.19	27.46	25.03			19.1	-13.31	U	58.41	38.94	5.81			41.31
165	8/6/2007 13:10	MT SP20 (1,-0.5)	-32.24	U	50.1	33.4	-13	U	46.485	30.99	34.59			20.02	-24.57	U	60.93	40.62	74.53			45.25
166	8/6/2007 13:23	MT SP20 (-0.5,2)	6.79			32.02	-64.09	U	44.91	29.94	16.79			18.67	-26.69	U	58.065	38.71	59.76			43.49
167	8/6/2007 13:30	MT SP20 (0.5,2)	-57.44	U	58.125	38.75	-71.02	U	55.62	37.08	6.51			22.4	-24.39	U	70.74	47.16	41.05			53.78
168	8/6/2007 13:36	MT SP20 (0,3)	-69.84	U	38.205	25.47	-70.88	U	34.485	22.99	4.51			15	-23.31	U	46.89	31.26	75.27			33.99
169	8/6/2007 13:41	MT SP20 (0,4)	-28.84	U	59.265	39.51	-69.38	U	56.52	37.68	9.74			22.88	-75.1	U	71.76	47.84	40.28			55.2
170	8/6/2007 15:38	MTSP20 (-1,4)	-56.77	U	55.29	36.86	-45.71	U	51.615	34.41	9.08			21.47	-64.82	U	66.54	44.36	206.13			53.22
171	8/6/2007 15:45	MTSP20 (-1,5)	-52.54	U	65.34	43.56	-79.2	U	60.33	40.22	31.52			25.53	-87.95	U	78.33	52.22	34.42			60.57
172	8/6/2007 15:48	MTSP20 (-1,6)	629.32			684.67	-20.61	U	877.56	585.04	19.08			351.72	-338.29	U	1085.79	723.9	631.8			921.1
173	8/6/2007 15:51	MTSP20 (-1,6)	-29.71	U	74.265	49.51	-106.78	U	70.32	46.88	2.9			28.29	-128.82	U	88.86	59.24	102.35			70.75
174	8/6/2007 15:56	MTSP20 (-1,6B)	-16.21	U	52.515	35.01	-79.19	U	50.055	33.37	22.26			20.44	-97.79	U	63.3	42.2	26.3			48.84
175	8/6/2007 16:02	MTSP20 (-2,7)	5.53			36.72	-67.15	U	50.835	33.89	19.98			21.28	-82.55	U	65.7	43.8	58.57			50.15
176	8/6/2007 16:08	MTSP20 (-2,8)	-0.66	U	35.325	23.55	-102.42	U	34.56	23.04	11.94			13.84	-45.87	U	43.125	28.75	134.81			33.02
177	8/6/2007 16:20	MTSP20 (-2,9)	-48.34	U	36.54	24.36	-124.18	U	35.73	23.82	9.38			14.38	-76.57	U	44.355	29.57	61.83			33.48
178	8/6/2007 16:31	MTSP20 (-2,11)	-48.51	U	54.9	36.6	-42.94	U	51.45	34.3	23.74			21.58	-32.23	U	66.735	44.49	66.65			50.38
179	8/6/2007 16:38	MTSP20 (-2,12)	-25.36	U	43.08	28.72	-74.92	U	40.29	26.86	9.88			16.71	-28.88	U	52.395	34.93	10.34			37.82
180	8/6/2007 16:46	MTSP20 (-2,13)	-67.42	U	39.285	26.19	-85.12	U	36.525	24.35	-5.53	U	22.68	15.12	-39.9	U	47.985	31.99	86.47			35.53
181	8/6/2007 17:17	MTSP20 (-1,2)	-58.24	U	56.37	37.58	-37.86	U	51.33	34.22	31.31			22.33	-7.15	U	68.535	45.69	-35.33	U	73.965	49.31
182	8/6/2007 17:23	MTSP20 (-1,1)	-66.21	U	58.875	39.25	-11.83	U	54.405	36.27	20.44			23.11	-12.84	U	71.82	47.88	20.87			53.14
183	8/6/2007 17:27	MTSP20 (-1,1)	-80.39	U	56.04	37.36	-19.46	U	51.09	34.06	17.12			21.96	-40.98	U	67.98	45.32	21.39			50.58
184	8/6/2007 17:34	MTSP20A (-3,1)	-41.74	U	44.28	29.52	-75.3	U	41.1	27.4	13.33			17.38	-58.6	U	53.565	35.71	93.32			40.38
185	8/6/2007 17:45	MTSP20A (-3,0)	-32.85	U	50.55	33.7	-53.85	U	47.385	31.59	26.13			20.03	-21.43	U	61.53	41.02	41.51			45.37
186	8/6/2007 18:05	MTSP20 (0,-2)	-17.57	U	48.195	32.13	-70.49	U	44.49	29.66	7.4			18.55	-14.97	U	58.695	39.13	59.12			43.35
187	8/6/2007 18:12	MTSP20 (1,-2)	-3.3	U	50.4	33.6	-39.39	U	46.575	31.05	10.92			19.4	-60.35	U	60.45	40.3	24.64			44.87
210	8/13/2007 10:22		0.15			0	0.39			0	0.04			0	0.04			0	3.17			0
211	8/13/2007 10:29	NIST-HIGH	-9.64	U	16.275	10.85	-2.82	U	30.27	20.18	58.81			7.82	39.47			16.92	21.82			13.6
212	8/13/2007 14:53	WR1	-24.51	U	11.37	7.58	-33.69	U	20.385	13.59	6.04			4.54	-25.48	U	14.52	9.68	-4.38	U	10.89	7.26
213	8/13/2007 15:12	SP37A (0,0)	-29.22	U	64.44	42.96	-132.93	U	112.2	74.8	7.86			24.43	-67.56	U	88.17	58.78	-14.3	U	69.48	46.32
214	8/13/2007 15:16	SP37A (0,0)	-16.74	U	19.68	13.12	-79.52	U	34.995	23.33	-10.12	U	10.485	6.99	-5.48	U	28.995	19.33	-2.02	U	21.33	14.22
215	8/13/2007 15:35	SP37A (0,1)	-29.81	U	20.295	13.53	-90.97	U	37.635	25.09	8.7			8.6	90.23			22.98	-12.22	U	23.82	15.88
216	8/13/2007 15:53	SP37A (0,-1)	-20.49	U	39.195	26.13	-98.94	U	71.175	47.45	10.92			16.9	59.81			42.35	-11.86	U	47.595	31.73
217	8/13/2007 15:56	SP37A (0,-1)	-16.25	U	25.455	16.97	-99.69	U	45.735	30.49	16.17			11.21	125.25			28.89	-14.06	U	30.39	20.26
218	8/13/2007 16:58	SP37 (0,0)	-6.47	U	24.465	16.31	-29.07	U	43.425	28.95	5.13			9.27	-15.47	U	34.905	23.27	-15.27	U	25.77	17.18
219	8/13/2007 17:13	SP37 (0,1)	-33.82	U	14.925	9.95	-50.07	U	27.675	18.45	-10.37	U	7.71	5.14	-28.91	U	20.67	13.78	-3.23	U	15.525	10.35
220	8/13/2007 17:24	SP37 (0,2)	-6.58	U	16.485	10.99	-49.63	U	28.14	18.76	5.07			6.18	-14.74	U	22.815	15.21	-17.14	U	16.065	10.71
221	8/13/2007 17:29	SP37 (0,2)	11.18			13.4	-29.26	U	34.095	22.73	-1.07	U	10.425	6.95	-41.61	U	26.295	17.53	-18.49	U	19.2	12.8
222	8/13/2007 17:45	SP37 (0,3)	-11.45	U	16.455	10.97	-13.23	U	29.265	19.51	12.78			6.57	-6.51	U	23.61	15.74	-17.53	U	16.545	11.03
223	8/13/2007 17:59	SP37 (0,-1)	0.38			15.7	-16.4	U	41.22	27.48	7.42			8.89	-19.51	U	32.61	21.74	-23.75	U	23.49	15.66

Reading No	Time	SAMPLE	Instrument	Qualifier	Flags	Antimony		1.5 * Error	Antimony Error	Arsenic		1.5 * Error	Arsenic Error	Barium		1.5 * Error	Barium Error	Cadmium		1.5 * Error	Cadmium Error	Cesium		1.5 * Error	Cesium Error
224	8/13/2007 18:20	SP37 (-1,1)	CDM			23.33			23.07	-22.99	U	20.25	13.5	96.54			13	-71.94	U	71.37	47.58	106.94			13.09
225	8/13/2007 18:29	SP37 (1,1)	CDM	R		16.07			21.9	-0.43	U	19.425	12.95	14			8.89	-55.67	U	67.44	44.96	119.76			14.28
226	8/13/2007 18:30	SP37 (1,1)	CDM	R		74.34			101.17	-39.85	U	72.75	48.5	35.57			43.53	64.72			197.26	102.83			56.81
227	8/13/2007 18:34	SP37 (1,1)	CDM			-2.74	U	22.56	15.04	-0.06	U	13.71	9.14	11.63			6.19	-21.21	U	48.165	32.11	144.7			10.88
228	8/14/2007 8:08	NIST-HIGH	CDM			5.08			17.06	1.6			11.75	19.13			7.32	-17.07	U	54.39	36.26	455.93			18.66
229	8/14/2007 14:45	TPTM	CDM			5.87			17.06	-11.21	U	15.09	10.06	94.01			10.38	-4.44	U	53.715	35.81	394.81			17.23
230	8/14/2007 14:50	TPTM2	CDM			23.42			18.56	-0.47	U	16.38	10.92	98.24			11.09	-7.54	U	56.955	37.97	656.45			22.25
231	8/15/2007 8:26		CDM		300.66	0.02			0	0.95			0	0.02			0	3.33			0	0.01			0
232	8/15/2007 8:44	NIST-HIGH	CDM			13.48			14.75	14.03			10.29	17.03			6.17	-33.25	U	46.29	30.86	448.34			15.78
233	8/15/2007 11:45	SP37 (1,0)	CDM			15.44			16.71	5.41			10.04	32.49			7.66	-44.32	U	51.555	34.37	143.46			11.38
234	8/15/2007 11:56	SP37 (1,0) Offset	CDM			66.7			29.34	-3.97	U	25.17	16.78	57.91			13.68	5.27			59.05	584.18			27.88
235	8/15/2007 12:17	SP37 (-1,2)	CDM			-1	U	22.905	15.27	-2.38	U	13.575	9.05	22.54			6.78	-29.99	U	48.24	32.16	189.96			11.81
236	8/15/2007 12:39	SP37 (-2,2)	CDM			21.82			19.2	-3.37	U	16.455	10.97	41.5			8.96	-17.45	U	59.085	39.39	295.63			15.62
237	8/15/2007 12:49	SP37 (-1,3)	CDM			3.62			19.04	-6.12	U	16.47	10.98	27.99			8.48	-12.87	U	59.625	39.75	262.9			15
238	8/15/2007 13:05	SP37 (1,3)	CDM			10			17.21	-0.6	U	15.12	10.08	23.58			7.49	-49.12	U	53.19	35.46	162.21			11.87
239	8/15/2007 13:18	SP37 (1,2)	CDM			-10.79	U	22.02	14.68	-6.57	U	13.32	8.88	16.47			6.37	-60.73	U	47.04	31.36	135.41			10.64
240	8/15/2007 15:51	SP33 (0,0)	CDM			1.38			26.52	-20.98	U	31.29	20.86	208.72			19.29	-197.6	U	83.91	55.94	29			11.97
241	8/15/2007 16:03	SP33 (0,1)	CDM			3.19			20.68	-8.23	U	20.16	13.44	78.56			11.44	-121.49	U	65.295	43.53	50.18			10.32
242	8/15/2007 17:19	SP4 (0,0)	CDM			-15.65	U	31.695	21.13	-6.42	U	19.68	13.12	42.88			10.21	-30.85	U	68.52	45.68	145.23			13.57
243	8/15/2007 17:28	SP4 (0,1)	CDM			27.64			22.78	-18.27	U	20.985	13.99	77.22			11.86	-72.41	U	70.665	47.11	20.65			9.26
244	8/15/2007 17:38	SP4 (0,2)	CDM			-16.3	U	6.48	4.32	8.08			3.43	2.61			1.45	-155.77	U	14.175	9.45	-33.91			1.42
245	8/15/2007 17:52	SP4 (0,0) Offset	CDM			11.19			23.71	-11.77	U	24.525	16.35	109.37			13.89	-133.87	U	73.785	49.19	223.57			17.26
246	8/15/2007 18:08	SP4 (0,-1)	CDM			23.71			25.17	-8.01	U	23.895	15.93	64.48			12.32	-79.25	U	78.135	52.09	173.46			15.65
247	8/16/2007 8:20		CDM		297.24	0.03			0	0.93			0	0.01			0	3.29			0	0.02			0
248	8/16/2007 8:25	NIST-HIGH	CDM			2.71			17.22	1.66			11.93	19.81			7.45	-18.93	U	55.17	36.78	459.02			18.84
249	8/16/2007 11:04	K2 1-0	CDM			8.29			14.51	-8.37	U	12.555	8.37	34.94			6.87	-51.71	U	44.955	29.97	134.07			9.98
250	8/16/2007 11:20	K2 1-20A	CDM			0.13			12.14	1.93			7.39	32.84			5.89	-54.59	U	38.295	25.53	60.6			7.15
251	8/16/2007 11:31	K2 1-40A	CDM			3.84			12.2	-2.71	U	10.89	7.26	19.86			5.28	-74.93	U	37.89	25.26	51.1			6.61
252	8/16/2007 11:44	K2 1-20B	CDM			24.97			15	-5.11	U	12.87	8.58	28.89			6.69	-53.48	U	45.51	30.34	111.82			9.65
253	8/16/2007 11:54	K2 1-40B	CDM			9.96			13.54	0.14			8.02	23.6			5.97	-58.17	U	41.805	27.87	70.03			7.84

Table 5-5e. CDM XRF Results: Spoils - CDM Instrument

Reading No	Time	SAMPLE	Chromium		1.5 * Error	Chromium Error	Cobalt		1.5 * Error	Cobalt Error	Copper		1.5 * Error	Copper Error	Iron		1.5 * Error	Iron Error	Lanthanum		1.5 * Error	Lanthanum Error	Lead		1.5 * Error	Lead Error
224	8/13/2007 18:20	SP37 (-1,1)	891.96			339.92	27.85			151.25	58.66			55.18	101.46			259.4					-30.95	U	37.395	24.93
225	8/13/2007 18:29	SP37 (1,1)	490.37			296.55	-1.96	U	204.735	136.49	18.95			48.79	-162.96	U	261.9	174.6					32.91			24.86
226	8/13/2007 18:30	SP37 (1,1)	945.43			1293.9	-7.43	U	882.195	588.13	-11.1	U	308.49	205.66	140.57			770.2					74.27			106.5
227	8/13/2007 18:34	SP37 (1,1)	692.22			212.71	-37.4	U	143.745	95.83	18.5			34.03	-54.86	U	188.205	125.5					56.49			17.89
228	8/14/2007 8:08	NIST-HIGH	6409.85			329.57	-10.23	U	169.68	113.12	4354.61			88.29	-22.34	U	243.3	162.2					137.74			20.95
229	8/14/2007 14:45	TPTM	238.66			227.77	-54.78	U	159.6	106.4	29.14			38.28	-142.38	U	202.185	134.8					98.82			19.89
230	8/14/2007 14:50	TPTM2	59.68			236.17	-142.59	U	167.01	111.34	-4.34	U	60.57	40.38	-159.72	U	193.05	128.7					235.29			22.34
231	8/15/2007 8:26		0.07			0	1.1			0	5.25			0	0.1			0	33:36.0				0.07			0
232	8/15/2007 8:44	NIST-HIGH	6094.58			278.35	31.21			97.33	4292.44			75.01	-67.49	U	206.835	137.9					135.01			17.88
233	8/15/2007 11:45	SP37 (1,0)	314.18			225.44	-40.88	U	156.24	104.16	0.2			36.83	-37.68	U	210.525	140.4					81.51			19.25
234	8/15/2007 11:56	SP37 (1,0) Offset	369.37			411.53	-54.53	U	275.265	183.51	82.52			67.13	-95.96	U	506.07	337.4					-19.21	U	43.515	29.01
235	8/15/2007 12:17	SP37 (-1,2)	760.98			215.64	-23.94	U	145.575	97.05	30.38			34.31	61.94			127.9					44.86			17.3
236	8/15/2007 12:39	SP37 (-2,2)	762.58			266.98	18.02			120.72	14.95			41.77	335.48			174.6					58.8			19.97
237	8/15/2007 12:49	SP37 (-1,3)	532.95			264.84	-4.64	U	180.645	120.43	11.92			41.96	-17.88	U	243.315	162.2					31.61			19.8
238	8/15/2007 13:05	SP37 (1,3)	664.42			238.21	-15.31	U	161.67	107.78	4.45			37.67	-19.44	U	209.715	139.8					25.2			18.53
239	8/15/2007 13:18	SP37 (1,2)	635.61			209.68	-106.2	U	140.505	93.67	6.41			33.52	-78.89	U	183.63	122.4					33.33			17.6
240	8/15/2007 15:51	SP33 (0,0)	111.95			428.5	-61.94	U	284.67	189.78	186.59			74.45	119.45			418.2					-78.89	U	45.765	30.51
241	8/15/2007 16:03	SP33 (0,1)	284.87			315.72	4.51			142.04	-11.11	U	75.12	50.08	290.29			287					43.55			24.04
242	8/15/2007 17:19	SP4 (0,0)	-115.03	U	457.215	304.81	-29.27	U	212.535	141.69	-30.62	U	74.835	49.89	63.52			238.6					-28.01	U	33.96	22.64
243	8/15/2007 17:28	SP4 (0,1)	133.72			332.3	-21.97	U	226.155	150.77	105.6			57.16	52.76			288.1					-22.71	U	36.465	24.31
244	8/15/2007 17:38	SP4 (0,2)	239.4			57.17	-83.64	U	42.405	28.27	11.68			10.42	-89.11	U	47.16	31.44					82.65			8.81
245	8/15/2007 17:52	SP4 (0,0) Offset	187.87			354.12	-57.28	U	238.65	159.1	134.46			60.98	-197.17	U	457.53	305					-43.42	U	38.94	25.96
246	8/15/2007 18:08	SP4 (0,-1)	504.85			381.82	-45.23	U	251.805	167.87	36.93			60.65	356.32			339.9					2.18			25.9
247	8/16/2007 8:20		0.05			0	1.14			0	5.14			0	0.13			0	48:00.0				0.09			0
248	8/16/2007 8:25	NIST-HIGH	6453.14			334.71	67.96			116.02	4500.49			90.23	-32.32	U	247.86	165.2					146.08			21.3
249	8/16/2007 11:04	K2 1-0	369.2			196.49	-68.08	U	135.66	90.44	-1.17	U	47.4	31.6	42.6			127.4					55.89			16.55
250	8/16/2007 11:20	K2 1-20A	232.63			161.31	-108.36	U	112.845	75.23	39.64			27.18	6.39			96.9					68.21			14.9
251	8/16/2007 11:31	K2 1-40A	-5.4	U	239.37	159.58	-45.58	U	114.63	76.42	33.97			27.24	-22.3	U	151.65	101.1					47.87			14.31
252	8/16/2007 11:44	K2 1-20B	202.1			195.14	-54.2	U	137.565	91.71	18.53			32.5	73.66			127.6					37.07			16.89
253	8/16/2007 11:54	K2 1-40B	154.32			178.95	-22.57	U	127.125	84.75	39.76			30.1	25.86			116.9					60.08			15.81

Table 5-5e. CDM XRF Results: Spoils - CDM Instrument

Reading No	Time	SAMPLE	Manganese		1.5 * Error	Manganese Error	Mercury		1.5 * Error	Mercury Error	Nickel		1.5 * Error	Nickel Error	Palladium		1.5 * Error	Palladium Error	Rubidium		1.5 * Error	Rubidium Error	Selenium		1.5 * Error
224	8/13/2007 18:20	SP37 (-1,1)	50101.58			640.27	127.6			29.4	131.81			92	-56.3	U	59.37	39.58	-88.44	U	55.815	37.21	836.66		
225	8/13/2007 18:29	SP37 (1,1)	10276.55			360.86	-3.47	U	25.485	16.99	17.71			81.39	-34	U	55.845	37.23	43.11			35.49	59.46		
226	8/13/2007 18:30	SP37 (1,1)	10631.52			1531.99	-18.04	U	99.27	66.18	38.59			350.07	-120.74	U	233.535	155.69	97.34			151.74	28.96		
227	8/13/2007 18:34	SP37 (1,1)	10307.78			257.76	14.12			11.54	-50.15	U	84.15	56.1	-34.21	U	39.36	26.24	35.73			25.39	9.1		
228	8/14/2007 8:08	NIST-HIGH	20997.32			371.57	469.16			42.64	1788.6			89.41	21.12			29.84	290.06			31.27	3380.96		
229	8/14/2007 14:45	TPTM	9662.02			270.93	58.86			19.41	-75.45	U	93.885	62.59	-69.03	U	43.65	29.1	-52.56	U	41.085	27.39	481.7		
230	8/14/2007 14:50	TPTM2	4030.91			223.53	20.18			15.87	2.53			67.96	-60.09	U	46.65	31.1	-14.36	U	43.83	29.22	153.35		
231	8/15/2007 8:26		0.24			0	0.56			0	3.99			0	18.36			0	0.28			0	0.06		
232	8/15/2007 8:44	NIST-HIGH	20949.29			316.35	448.13			36.44	1891.57			77.29	21.32			25.53	321.62			27.02	3426.19		
233	8/15/2007 11:45	SP37 (1,0)	13184.33			295.81	13.97			13.02	-29.83	U	92.31	61.54	-56.58	U	42.405	28.27	51.4			26.69	46.17		
234	8/15/2007 11:56	SP37 (1,0) Offset	74371.95			859.84	118.72			27.79	108.77			110.91	-70.19	U	72.645	48.43	-67.81	U	65.85	43.9	364.69		
235	8/15/2007 12:17	SP37 (-1,2)	10677.15			257.97	2.18			11.59	7.74			56.88	-56.4	U	39.465	26.31	41.93			24.66	36.35		
236	8/15/2007 12:39	SP37 (-2,2)	21215.32			375.12	22.18			14.04	-49.65	U	104.205	69.47	-21.41	U	48.915	32.61	101.03			29.11	27.7		
237	8/15/2007 12:49	SP37 (-1,3)	16008.13			339.97	5.69			13.61	-96.91	U	104.115	69.41	-56.24	U	49.155	32.77	64.81			29.12	11.83		
238	8/15/2007 13:05	SP37 (1,3)	11190.98			281.9	9.51			12.45	-70.63	U	93.885	62.59	-49.24	U	44.085	29.39	58.79			26.99	5.72		
239	8/15/2007 13:18	SP37 (1,2)	9406.88			249.41	6.95			11.54	-52.63	U	83.205	55.47	-49.77	U	38.775	25.85	59.27			24.95	25.11		
240	8/15/2007 15:51	SP33 (0,0)	123618.55			1118.03	1192.65			104.12	891.22			123.83	-15.12	U	70.92	47.28	-131.44	U	70.965	47.31	11867.41		
241	8/15/2007 16:03	SP33 (0,1)	76213.38			743.46	447.32			39.98	241.72			85.4	-27.93	U	54.555	36.37	26.02			35.1	1930.76		
242	8/15/2007 17:19	SP4 (0,0)	45092.41			581.19	139.72			28.53	229.63			86.32	-30.43	U	56.685	37.79	-32.68	U	51.105	34.07	899.18		
243	8/15/2007 17:28	SP4 (0,1)	73249.77			741.33	185.72			43.18	877.24			99.48	-1.45	U	58.935	39.29	-61.03	U	55.275	36.85	2604.78		
244	8/15/2007 17:38	SP4 (0,2)	538.09			52.4	-8.43	U	6.81	4.54	65.96			17.06	-50.58	U	11.445	7.63	53.88			10.2	29.69		
245	8/15/2007 17:52	SP4 (0,0) Offset	75883.72			792.93	611.49			66.11	524.31			101.38	-36.76	U	62.025	41.35	-84.22	U	60.045	40.03	5784.86		
246	8/15/2007 18:08	SP4 (0,-1)	95351.95			879.4	349.64			52.67	638.38			104.76	-15.28	U	65.115	43.41	-65.78	U	59.745	39.83	3563.82		
247	8/16/2007 8:20		0.21			0	0.48			0	3.96			0	18.17			0	0.23			0	0.06		
248	8/16/2007 8:25	NIST-HIGH	21794.49			380.08	401.8			43.52	1843.85			91.18	37.3			30.38	276.99			31.89	3571.82		
249	8/16/2007 11:04	K2 1-0	14366.88			273.21	7.67			11.86	1.24			52.89	-61.06	U	36.84	24.56	20.54			23.3	94.81		
250	8/16/2007 11:20	K2 1-20A	6663.19			187.64	15.79			10.11	17.14			44.46	-30.01	U	31.365	20.91	0.71			20.18	61.24		
251	8/16/2007 11:31	K2 1-40A	9714.16			206.73	24.24			10.85	41.06			45.02	-37.77	U	31.35	20.9	-19.71	U	29.82	19.88	124.88		
252	8/16/2007 11:44	K2 1-20B	13124.09			270.28	15.67			11.92	10.34			54.04	-38.22	U	37.425	24.95	30.14			23.66	72.16		
253	8/16/2007 11:54	K2 1-40B	12546.41			248.19	24.52			11.38	32.69			49.62	-61.81	U	34.2	22.8	26.54			22.08	89.46		

Reading No	Time	SAMPLE	Selenium Error
224	8/13/2007 18:20	SP37 (-1,1)	48.41
225	8/13/2007 18:29	SP37 (1,1)	30.52
226	8/13/2007 18:30	SP37 (1,1)	120.81
227	8/13/2007 18:34	SP37 (1,1)	20.31
228	8/14/2007 8:08	NIST-HIGH	69.04
229	8/14/2007 14:45	TPTM	32.7
230	8/14/2007 14:50	TPTM2	27.44
231	8/15/2007 8:26		0
232	8/15/2007 8:44	NIST-HIGH	59.24
233	8/15/2007 11:45	SP37 (1,0)	22.8
234	8/15/2007 11:56	SP37 (1,0) Offset	44.9
235	8/15/2007 12:17	SP37 (-1,2)	20.62
236	8/15/2007 12:39	SP37 (-2,2)	23.87
237	8/15/2007 12:49	SP37 (-1,3)	23.63
238	8/15/2007 13:05	SP37 (1,3)	21.76
239	8/15/2007 13:18	SP37 (1,2)	20.54
240	8/15/2007 15:51	SP33 (0,0)	170.72
241	8/15/2007 16:03	SP33 (0,1)	62.69
242	8/15/2007 17:19	SP4 (0,0)	46.77
243	8/15/2007 17:28	SP4 (0,1)	72.23
244	8/15/2007 17:38	SP4 (0,2)	9.23
245	8/15/2007 17:52	SP4 (0,0) Offset	108.4
246	8/15/2007 18:08	SP4 (0,-1)	86.77
247	8/16/2007 8:20		0
248	8/16/2007 8:25	NIST-HIGH	71.28
249	8/16/2007 11:04	K2 1-0	20.85
250	8/16/2007 11:20	K2 1-20A	17.83
251	8/16/2007 11:31	K2 1-40A	18.73
252	8/16/2007 11:44	K2 1-20B	20.87
253	8/16/2007 11:54	K2 1-40B	19.73

Reading No	Time	SAMPLE	Silver		1.5 * Error	Silver Error	Strontium		1.5 * Error	Strontium Error	Tellurium		1.5 * Error	Tellurium Error	Tin		1.5 * Error	Tin Error	Zinc		1.5 * Error	Zinc Error
224	8/13/2007 18:20	SP37 (-1,1)	-20.19	U	22.725	15.15	-88.77	U	40.995	27.33	8.37			8.79	-17.6	U	33.42	22.28	-8.42	U	24.855	16.57
225	8/13/2007 18:29	SP37 (1,1)	-7.16	U	22.5	15	-26.67	U	39.285	26.19	-3.08	U	11.94	7.96	-35.92	U	29.97	19.98	-8.79	U	22.35	14.9
226	8/13/2007 18:30	SP37 (1,1)	30.57			68.76	106.77			121.27	10.06			37.49	16.78			93.75	-18.59	U	92.88	61.92
227	8/13/2007 18:34	SP37 (1,1)	-21.5	U	15.375	10.25	-26.28	U	27.96	18.64	6.91			5.96	-5.7	U	22.23	14.82	-12.86	U	15.525	10.35
228	8/14/2007 8:08	NIST-HIGH	-9.29	U	17.295	11.53	-0.05	U	32.22	21.48	62.61			8.35	24.81			17.63	19.84			14.39
229	8/14/2007 14:45	TPTM	-17.44	U	17.01	11.34	-62.21	U	30.075	20.05	18.89			7.2	4.76			16.82	-9.63	U	17.835	11.89
230	8/14/2007 14:50	TPTM2	-5.69	U	18.495	12.33	-47.14	U	32.25	21.5	37.26			8.28	8.84			18	4.38			13
231	8/15/2007 8:26		0.15			0	0.41			0	0.03			0	0.04			0	3.34			0
232	8/15/2007 8:44	NIST-HIGH	-2.35	U	15.015	10.01	-6.92	U	27.495	18.33	53.68			6.95	18.87			15.03	16.65			12.22
233	8/15/2007 11:45	SP37 (1,0)	-19.92	U	16.5	11	-35.14	U	29.415	19.61	1.19			6.25	-20.75	U	23.19	15.46	-11.27	U	16.98	11.32
234	8/15/2007 11:56	SP37 (1,0) Offset	-16	U	27.165	18.11	-70.32	U	49.26	32.84	12.19			11.22	-18.39	U	40.455	26.97	-30.47	U	28.935	19.29
235	8/15/2007 12:17	SP37 (-1,2)	-13.73	U	15.465	10.31	-8.98	U	27.69	18.46	5.45			5.94	-14.6	U	21.795	14.53	-14.9	U	15.45	10.3
236	8/15/2007 12:39	SP37 (-2,2)	-11.75	U	18.285	12.19	3.36			21.92	14.05			7.45	-18.02	U	26.175	17.45	-13.14	U	19.2	12.8
237	8/15/2007 12:49	SP37 (-1,3)	-15.97	U	18.27	12.18	-37.92	U	32.265	21.51	8.83			7.36	-1.51	U	27.015	18.01	-11.24	U	19.47	12.98
238	8/15/2007 13:05	SP37 (1,3)	-3.1	U	17.34	11.56	-8.02	U	30.39	20.26	6.76			6.57	-13.26	U	24.24	16.16	-12.42	U	17.4	11.6
239	8/15/2007 13:18	SP37 (1,2)	-0.23	U	16.14	10.76	5.54			18.81	3.15			5.76	-19.54	U	21.51	14.34	-20.09	U	15.045	10.03
240	8/15/2007 15:51	SP33 (0,0)	-34.86	U	25.815	17.21	-84.54	U	50.685	33.79	3.57			10.51	86.74			29.9	-7.6	U	35.715	23.81
241	8/15/2007 16:03	SP33 (0,1)	-41.73	U	19.785	13.19	-60.43	U	37.995	25.33	-6.53	U	11.4	7.6	8.94			20.85	-8.11	U	23.52	15.68
242	8/15/2007 17:19	SP4 (0,0)	-28.69	U	20.67	13.78	-48.82	U	38.175	25.45	5.56			8.18	1.32			21.06	-20.2	U	22.725	15.15
243	8/15/2007 17:28	SP4 (0,1)	-39.37	U	21.195	14.13	-32.29	U	41.355	27.57	-6.54	U	12.24	8.16	16.76			22.59	1.63			17.07
244	8/15/2007 17:38	SP4 (0,2)	-28.16	U	6.195	4.13	-41.33	U	10.425	6.95	-10.41	U	2.535	1.69	-23.41	U	6.69	4.46	-2.06	U	4.965	3.31
245	8/15/2007 17:52	SP4 (0,0) Offset	-20.35	U	23.19	15.46	-78.7	U	43.29	28.86	1.26			9.11	21.6			24.45	-22.97	U	27.735	18.49
246	8/15/2007 18:08	SP4 (0,-1)	-27.38	U	23.145	15.43	-74.38	U	43.56	29.04	-7.65	U	13.485	8.99	3.91			24.51	-6.49	U	28.11	18.74
247	8/16/2007 8:20		0.17			0	0.4			0	0.04			0	0.07			0	3.26			0
248	8/16/2007 8:25	NIST-HIGH	-14.61	U	17.295	11.53	-3.93	U	32.775	21.85	61.1			8.41	32.47			18.1	40.91			15.13
249	8/16/2007 11:04	K2 1-0	-17.74	U	14.43	9.62	-6.54	U	26.25	17.5	5.07			5.58	-9.5	U	20.655	13.77	-6.67	U	14.85	9.9
250	8/16/2007 11:20	K2 1-20A	-14.11	U	12.765	8.51	-12.4	U	22.68	15.12	4.99			4.73	-17.86	U	17.355	11.57	-6.96	U	12.48	8.32
251	8/16/2007 11:31	K2 1-40A	-29.82	U	11.985	7.99	-21.24	U	22.29	14.86	2.86			4.61	-25.22	U	16.995	11.33	-0.22	U	12.81	8.54
252	8/16/2007 11:44	K2 1-20B	-12.54	U	15	10	-29.37	U	26.22	17.48	4.44			5.66	-17.15	U	20.64	13.76	-10.34	U	14.85	9.9
253	8/16/2007 11:54	K2 1-40B	-14.1	U	13.74	9.16	-19.68	U	24.48	16.32	6.39			5.18	-25.01	U	18.825	12.55	-18.75	U	13.26	8.84

Table 5-5f. CDM XRF Results: Spoils - GSI Instrument

Reading No	SAMPLE	Date	Time		Type	Duration	Units	Sequence	Instrument	Res	EScale1	Antimony	Antimony Error	Arsenic	Arsenic Error	Barium	Barium Error	Bismuth	Bismuth Error	Cadmium	Cadmium Error
2467		06/08/2007	9:04:00	AM	SHUTTER_CAL	135.93	cps	Final	GSI	219.68	4.55	0.16	0	0.17	0	0.1	0	0.15	0	1.84	0
2468		06/08/2007	9:12:00	AM	BULK	181.3	ppm	Final	GSI			< LOD	41.55	338.99	39.82	< LOD	172.38	162.26	63.96	< LOD	15.59
2469	**SP20-0-2**	06/08/2007	12:52:00	PM	BULK	21	ppm	Final	GSI			< LOD	1188.46	395.62	253.9	< LOD	5202.22	< LOD	1425.63	500.96	301.22
2470	**SP20-0-2**	06/08/2007	12:52:00	PM	BULK	26.5	ppm	Final	GSI			< LOD	800.83	< LOD	267.57	< LOD	3542.57	< LOD	919.79	390.97	207.21
2471	**SP20-0-2**	06/08/2007	12:53:00	PM	BULK	40.73	ppm	Final	GSI			872.79	524.59	256.44	145.04	< LOD	3512.1	< LOD	1193.89	326.05	193.23
2472	**SP20-0-2**	06/08/2007	12:54:00	PM	BULK	69.3	ppm	Final	GSI			< LOD	491.32	165.94	91.69	< LOD	2153.31	< LOD	551.22	246	123.17
2473	**SP20-0-2**	06/08/2007	12:55:00	PM	BULK	4.95	ppm	Final	GSI			< LOD	1593.17	< LOD	421.57	< LOD	6676.52	< LOD	1936.86	< LOD	563.75
2474	**SP20-0-2**	06/08/2007	12:55:00	PM	BULK	13.01	ppm	Final	GSI			< LOD	1267.24	< LOD	337.37	< LOD	5600.11	< LOD	1364.05	< LOD	484.34
2475	**SP20-0-2**	06/08/2007	12:55:00	PM	BULK	6.76	ppm	Final	GSI			< LOD	1487.97	< LOD	554.14	< LOD	6923.14	< LOD	1855.15	< LOD	502.36
2476	**SP20-0-2**	06/08/2007	12:55:00	PM	BULK	2.48	ppm	Final	GSI			< LOD	2044.88	< LOD	590.79	< LOD	9980.81	< LOD	1636.21	< LOD	677.97
2477	**SP20-0-2**	06/08/2007	12:56:00	PM	BULK	27.82	ppm	Final	GSI			< LOD	697.43	215.78	138.02	< LOD	3004.72	< LOD	622.92	< LOD	254.44
2478	**SP20-0-2**	06/08/2007	12:56:00	PM	BULK	6.77	ppm	Final	GSI			< LOD	1197.4	< LOD	338.53	< LOD	5729.15	< LOD	504.83	< LOD	439.73
2479	**SP20-0-2**	06/08/2007	12:56:00	PM	BULK	4.33	ppm	Final	GSI			< LOD	2149.53	< LOD	564.74	< LOD	9011.39	< LOD	2040.02	< LOD	778.58
2480	**SP20-0-2**	06/08/2007	1:19:00	PM	BULK	184.87	ppm	Final	GSI			445.44	234.58	186.49	70.84	< LOD	1567.53	< LOD	411.84	199.02	86.54
2481	**SP20(0,-1)**	06/08/2007	1:23:00	PM	BULK	52.42	ppm	Final	GSI			< LOD	499.17	< LOD	163.47	< LOD	2222.1	< LOD	436.62	278.73	127.23
2482	**SP20(0,-1)**	06/08/2007	1:24:00	PM	BULK	14.19	ppm	Final	GSI			< LOD	1362.94	< LOD	352.52	< LOD	5872.25	< LOD	1986.93	< LOD	486.16
2483	**SP20(0,-1)**	06/08/2007	1:25:00	PM	BULK	29.64	ppm	Final	GSI			1063.2	577.61	< LOD	265.01	< LOD	3755.88	< LOD	1135.8	342.28	211.82
2484	**SP20(0,-1)**	06/08/2007	1:27:00	PM	BULK	151.52	ppm	Final	GSI			822.31	269.88	186.07	77.55	< LOD	1755.82	< LOD	468.08	345.56	101.01
2485	**SP20(0,-1)**	06/08/2007	1:27:00	PM	BULK	4.34	ppm	Final	GSI			< LOD	3455.48	< LOD	1294.69	< LOD	15922.91	< LOD	6207.03	< LOD	1352.7
2486	**SP20(0,-1)**	06/08/2007	1:31:00	PM	BULK	181.62	ppm	Final	GSI			551.81	234.63	250.94	72.55	< LOD	1549.06	< LOD	413.97	< LOD	124.1
2487	**SP20-(-0.5,1)**	06/08/2007	1:37:00	PM	BULK	88.93	ppm	Final	GSI			595.53	333.17	229.14	93.35	< LOD	2200.29	< LOD	393.96	< LOD	179.25
2488	**SP20-(-0.5,1)**	06/08/2007	1:38:00	PM	BULK	16.04	ppm	Final	GSI			1175.55	715.24	< LOD	370.7	< LOD	4464.77	< LOD	1112.53	< LOD	364.45
2489	**SP20-(-0.5,1)**	06/08/2007	1:40:00	PM	BULK	93.48	ppm	Final	GSI			494.41	324.79	228.93	101.65	< LOD	2146.46	< LOD	557.39	< LOD	177.3
2490	**SP20-(-0.5,1)**	06/08/2007	1:40:00	PM	BULK	4.33	ppm	Final	GSI			< LOD	2274.72	< LOD	730.44	< LOD	10176.72	< LOD	3356.81	< LOD	792.35
2491	**SP20-(-0.5,1)**	06/08/2007	1:41:00	PM	BULK	39.44	ppm	Final	GSI			1081.97	528.84	309.71	164.79	< LOD	3416.85	< LOD	864.01	< LOD	277.69
2492	**SP20-(-0.5,1)**	06/08/2007	1:41:00	PM	BULK	22.79	ppm	Final	GSI			< LOD	929.23	362.36	236.75	< LOD	4145.68	< LOD	1131.83	< LOD	325.4
2493	**SP20-(-0.5,1)**	06/08/2007	1:42:00	PM	BULK	43.72	ppm	Final	GSI			1141.55	459.71	307.19	140.5	< LOD	2860.18	< LOD	909.39	< LOD	238.91
2494	**SP20-(-0.5,1)**	06/08/2007	1:44:00	PM	BULK	101.95	ppm	Final	GSI			728.35	332.83	316.37	106.47	< LOD	2197.22	< LOD	391.45	< LOD	177.57
2495	**SP20-(-0.5,1)**	06/08/2007	1:44:00	PM	BULK	4.94	ppm	Final	GSI			< LOD	13647.25	< LOD	3629.36	< LOD	56474.7	< LOD	5622.08	< LOD	5429.77
2496	**SP20-(-0.5,1)**	06/08/2007	1:45:00	PM	BULK	58.59	ppm	Final	GSI			984.08	385.51	308.94	114.75	< LOD	2501.27	< LOD	640.6	219.67	136.69
2497	**SP20-(-0.5,1)**	06/08/2007	1:45:00	PM	BULK	2.47	ppm	Final	GSI			< LOD	4224.01	< LOD	1684.88	< LOD	21467.82	< LOD	9929.48	< LOD	1739.59
2498	**SP20-(-0.5,1)**	06/08/2007	1:47:00	PM	BULK	85.11	ppm	Final	GSI			1214.76	414.15	172.43	109.49	< LOD	2626.94	< LOD	667.32	292.06	147.69
2499	**SP20-(-0.5,1)**	06/08/2007	1:47:00	PM	BULK	1.24	ppm	Final	GSI			< LOD	3384.19	< LOD	1959.13	< LOD	16244.88	< LOD	6287.15	< LOD	1233.14
2500	**SP20(-0.5,1)**	06/08/2007	1:57:00	PM	BULK	182.85	ppm	Final	GSI			1078.02	295.92	266.12	88.28	< LOD	1926.46	< LOD	516.62	320.72	107.42
2501	**SP20-(-1,3)**	06/08/2007	3:42:00	PM	BULK	184.66	ppm	Final	GSI			642.35	258.54	191.66	80.39	< LOD	1721.59	< LOD	482.67	226.16	94.41
2502	**SP20-(-2,4)**	06/08/2007	3:51:00	PM	BULK	185	ppm	Final	GSI			961.25	283.06	288.12	83.86	< LOD	1880.29	< LOD	426.4	265.4	101.88
2503	**SP20-(0,5)**	06/08/2007	3:57:00	PM	BULK	187.56	ppm	Final	GSI			720.81	252.01	< LOD	116.09	< LOD	1672.99	554.63	328.17	177.73	89.93
2504	**SP20-(0,6)**	06/08/2007	4:04:00	PM	BULK	185.47	ppm	Final	GSI			1376.71	317.28	369.07	94.3	< LOD	2060.39	< LOD	505.3	351.26	113.72
2505	**SP20-(-1,8)**	06/08/2007	4:12:00	PM	BULK	188.4	ppm	Final	GSI			1163.13	289.2	308.35	83.78	< LOD	1851.25	< LOD	504.29	300.73	103.75
2506	**SP20-(-2,10)**	06/08/2007	4:26:00	PM	BULK	147.67	ppm	Final	GSI			1056.42	287.8	201.09	85.09	< LOD	1872.03	< LOD	395.4	318.98	104.75
2507	**SP20-(-2,10)**	06/08/2007	4:26:00	PM	BULK	8	ppm	Final	GSI			< LOD	3296.3	< LOD	1276.54	< LOD	14688.97	< LOD	335.52	< LOD	1161.19
2508	**SP20-(-2,10)**	06/08/2007	4:31:00	PM	BULK	181.15	ppm	Final	GSI			1143.38	322.69	161.35	96.19	< LOD	2134.08	< LOD	440.81	284.94	115.1
2509	**SP20-(-2,10)**	06/08/2007	4:31:00	PM	BULK	3.08	ppm	Final	GSI			< LOD	1195.61	< LOD	441.94	< LOD	4987.78	< LOD	753.25	< LOD	334.84
2510	**SP20-(-2,10)**	06/08/2007	4:35:00	PM	BULK	183.45	ppm	Final	GSI			1373.92	337.91	339.68	100.41	< LOD	2198.18	< LOD	613.86	432	123.65
2511	**SP20a-(-2,1)**	06/08/2007	5:29:00	PM	BULK	186.4	ppm	Final	GSI			869.51	280.65	287.83	82.05	< LOD	1865.26	< LOD	501.49	261.3	101.61
2512	**SP20-(0,-2)**	06/08/2007	6:01:00	PM	BULK	182.53	ppm	Final	GSI			911.3	296.26	296.04	95.11	< LOD	1977.24	< LOD	490.11	359.2	110.09
2513		07/08/2007	8:06:00	AM	SHUTTER_CAL	135.87	cps	Final	GSI	220.39	4.55	0.26	0	0.14	0	0.07	0	0.08	0	1.86	0
2514		07/08/2007	8:12:00	AM	BULK	181.3	ppm	Final	GSI			< LOD	39.65	304.11	36.37	< LOD	162.84	116.04	57.64	< LOD	15.08
2515		07/08/2007	10:00:00	AM	BULK	182.12	ppm	Final	GSI			725.71	258.65	234.7	80.7	< LOD	1696.19	< LOD	451.34	240.76	94.32
2516	**SP20-(-1,-2)**	07/08/2007	10:33:00	AM	BULK	186.79	ppm	Final	GSI			620.18	228.22	276.14	64.9	< LOD	1502	< LOD	362.7	175.5	82.17

Reading No	SAMPLE	Date	Time		Calcium	Calcium Error	Chlorine	Chlorine Error	Chromium	Chromium Error	Cobalt	Cobalt Error	Copper	Copper Error	Iron	Iron Error	Lead	Lead Error	Manganese	Manganese Error
2467		06/08/2007	9:04:00	AM							0.16	0	6.47	0	0.41	0	0.27	0	0.16	0
2468		06/08/2007	9:12:00	AM	7796.75	303.92	4098.92	1688.28	< LOD	60.11	< LOD	152.33	1645.51	50.7	18605.53	265.57	2994.85	50.02	5680.73	182.98
2469	**SP20-0-2**	06/08/2007	12:52:00	PM							< LOD	34376.39	7679.9	2479.32	5738277	60369.78	< LOD	293.36	215567.13	29041.34
2470	**SP20-0-2**	06/08/2007	12:52:00	PM							< LOD	22894.15	6762.29	1677.95	4180547	39557.71	315.45	179.85	178192.09	19385.37
2471	**SP20-0-2**	06/08/2007	12:53:00	PM							< LOD	23017.07	6677.48	1614.7	5232283	39766.65	< LOD	140.55	205681.31	19264.9
2472	**SP20-0-2**	06/08/2007	12:54:00	PM	< LOD	2377.29	< LOD	22519.38	169663.64	3877.14	< LOD	14134.27	4860.39	995.21	3969367	24546.94	< LOD	121.65	157326.58	11928.65
2473	**SP20-0-2**	06/08/2007	12:55:00	PM							< LOD	41893.77	8236.34	3343.95	3226442	72116.21	< LOD	533.05	127672.18	35168.75
2474	**SP20-0-2**	06/08/2007	12:55:00	PM							< LOD	36464.27	5505.92	2537.87	4730476	63149.05	< LOD	96.31	202684.8	30699.63
2475	**SP20-0-2**	06/08/2007	12:55:00	PM							< LOD	42837.48	5011.75	2923.59	3880685	72730.61	< LOD	463.22	146190.59	35157.16
2476	**SP20-0-2**	06/08/2007	12:55:00	PM							< LOD	59030.29	< LOD	6311.04	3240142	100442.7	< LOD	1017.09	123036.48	49400.14
2477	**SP20-0-2**	06/08/2007	12:56:00	PM							< LOD	19846.24	5444.74	1434.74	3802221	34611.94	< LOD	161.79	138146.42	16638.6
2478	**SP20-0-2**	06/08/2007	12:56:00	PM							< LOD	36804.61	4078.13	2528.27	3444654	63485.43	< LOD	555.16	140221.7	31102.17
2479	**SP20-0-2**	06/08/2007	12:56:00	PM							< LOD	60653.5	< LOD	5729.61	4522451	104842.9	< LOD	554.21	170069.31	50853.93
2480	**SP20-0-2**	06/08/2007	1:19:00	PM	< LOD	1021.95	< LOD	8842.97	185021.84	1703.14	< LOD	10216.34	5817.65	737.95	4119102	17805.45	182.17	62.66	160021.89	8619.92
2481	**SP20(0,-1)**	06/08/2007	1:23:00	PM							< LOD	14080.36	4906.37	1010.75	3724399	24759.28	403.69	129.98	158350.53	12075.82
2482	**SP20(0,-1)**	06/08/2007	1:24:00	PM							< LOD	38525.75	6505.8	2743.35	5190582	67075.27	< LOD	126.21	220696.86	32776.94
2483	**SP20(0,-1)**	06/08/2007	1:25:00	PM							< LOD	24387.58	6434.76	1750.09	4783698	42564.18	< LOD	243.47	190258.7	20601.63
2484	**SP20(0,-1)**	06/08/2007	1:27:00	PM	< LOD	1512.49	< LOD	12189.45	178016.39	2317.44	< LOD	11544.92	6158.8	825.48	4564147	20072.79	181.13	69.88	179982.75	9738.21
2485	**SP20(0,-1)**	06/08/2007	1:27:00	PM							< LOD	96970.7	< LOD	9251.94	7409231	171452.3	< LOD	1233.01	311158	83180.55
2486	**SP20(0,-1)**	06/08/2007	1:31:00	PM	< LOD	1055.64	< LOD	8919.85	180652.44	1666.09	< LOD	10046.91	5417.66	720.74	3964664	17476.94	157.05	54.95	159809.28	8513.67
2487	**SP20-(-0.5,1)**	06/08/2007	1:37:00	PM	< LOD	1503.35	< LOD	13454.21	182928.08	2433.93	< LOD	14231.51	5279.43	1014.52	3980326	24799.09	< LOD	101.37	154572.02	11982.99
2488	**SP20-(-0.5,1)**	06/08/2007	1:38:00	PM							< LOD	29355.89	6687.26	2171.65	4247251	51275.88	423.73	257.5	196160.34	25238.58
2489	**SP20-(-0.5,1)**	06/08/2007	1:40:00	PM	< LOD	1478.54	< LOD	12739.22	180762.14	2356.6	< LOD	13987.84	5620.93	1011.2	3990821	24342.43	164.73	86.57	163382.28	11895.6
2490	**SP20-(-0.5,1)**	06/08/2007	1:40:00	PM							< LOD	69570.31	< LOD	7115.59	5239577	120998.1	< LOD	700.78	199451.63	58556.98
2491	**SP20-(-0.5,1)**	06/08/2007	1:41:00	PM							< LOD	22701.83	7984.94	1661.14	5167738	39727.65	206.98	133.4	210392.91	19311.46
2492	**SP20-(-0.5,1)**	06/08/2007	1:41:00	PM							< LOD	26448.98	6233.12	1914.41	4573168	46417.26	388.58	216.32	171419.56	22377.88
2493	**SP20-(-0.5,1)**	06/08/2007	1:42:00	PM							< LOD	19103.36	6580.07	1382.18	4540055	33340.56	< LOD	160.82	177764.7	16108.07
2494	**SP20-(-0.5,1)**	06/08/2007	1:44:00	PM	< LOD	1411.99	< LOD	12600.71	182770.05	2348.18	< LOD	14360.96	5939.42	1026	4354546	24890.37	171.62	82.16	176303.08	12100.73
2495	**SP20-(-0.5,1)**	06/08/2007	1:44:00	PM							< LOD	394176.1	57925.74	30181.83	31321956	685387.4	728.8	399.08	1461882.25	336313.78
2496	**SP20-(-0.5,1)**	06/08/2007	1:45:00	PM							< LOD	16236.98	6201.96	1168.06	4445297	28206.76	120.5	75.61	173945.36	13675.67
2497	**SP20-(-0.5,1)**	06/08/2007	1:45:00	PM							< LOD	141442.9	< LOD	12787.74	7704841	238258.6	< LOD	2082.23	357130.16	117940.8
2498	**SP20-(-0.5,1)**	06/08/2007	1:47:00	PM	< LOD	1747.26	< LOD	14206.05	181859.58	2623.67	< LOD	17516.34	5840.76	1222.07	4925942	30506.94	< LOD	146.01	198585.8	14818.64
2499	**SP20-(-0.5,1)**	06/08/2007	1:47:00	PM							< LOD	114084.1	< LOD	13465.66	4409989	193370.5	< LOD	434.77	213958.3	95755.9
2500	**SP20(-0.5,1)**	06/08/2007	1:57:00	PM	< LOD	1034.85	< LOD	9261.78	184939.27	1698.12	< LOD	12671.19	6843.96	910.71	5059628	22119.44	190.1	72.33	204796.36	10742.93
2501	**SP20-(-1,3)**	06/08/2007	3:42:00	PM	< LOD	1022.69	< LOD	8710.44	183009.92	1681.27	< LOD	11189.43	6944.71	817.27	4437518	19391.78	256.65	73.4	183722.13	9464.9
2502	**SP20-(-2,4)**	06/08/2007	3:51:00	PM	< LOD	1070.27	< LOD	8610.83	181686.31	1655.24	< LOD	12133.88	7875.67	896.58	4850900	21113.29	148.2	63.64	206673.56	10350.28
2503	**SP20-(0,5)**	06/08/2007	3:57:00	PM	< LOD	1018.09	< LOD	8940.46	180284.58	1661.18	< LOD	10786.23	6051.84	776.23	4346844	18749.85	367.01	87.55	174498.02	9120.5
2504	**SP20-(0,6)**	06/08/2007	4:04:00	PM	< LOD	1037.18	< LOD	8801.05	182127.44	1674.17	< LOD	13520.22	7355.56	959.36	5409176	23464.25	115.8	64.39	226052.64	11465.8
2505	**SP20-(-1,8)**	06/08/2007	4:12:00	PM	< LOD	989.08	< LOD	8318.58	176673.42	1596.66	< LOD	12231.56	8125.37	903.38	4894958	21179.35	122.21	55	203241.97	10349.49
2506	**SP20-(-2,10)**	06/08/2007	4:26:00	PM	< LOD	1455.39	< LOD	12523.79	185773.58	2434.21	< LOD	12272.15	8000.61	913.5	4788450	21378.54	236.5	78.61	193407.77	10367.42
2507	**SP20-(-2,10)**	06/08/2007	4:26:00	PM							< LOD	97394.7	17756.86	7301.29	9707299	168232.8	< LOD	1565.36	365083.25	81640.5
2508	**SP20-(-2,10)**	06/08/2007	4:31:00	PM	< LOD	953.84	< LOD	8706.29	177034.61	1603.83	< LOD	13829.72	7688.21	998.04	5385538	24051.06	334.79	98.87	229541.22	11795.44
2509	**SP20-(-2,10)**	06/08/2007	4:31:00	PM							< LOD	33130.59	4443.58	2496.54	1992700	55893.09	< LOD	608.2	93600.95	27821.07
2510	**SP20-(-2,10)**	06/08/2007	4:35:00	PM	< LOD	950.51	< LOD	8228.21	169742.16	1490.79	< LOD	14154.02	8240.62	1031.13	5507918	24655.49	179.32	72.08	225760.95	12033.3
2511	**SP20a-(-2,1)**	06/08/2007	5:29:00	PM	< LOD	1084.14	< LOD	9297.8	184401.89	1694.12	< LOD	12176.01	7207.63	879.57	4895573	21144.65	94.33	60	209816.95	10341.23
2512	**SP20-(0,-2)**	06/08/2007	6:01:00	PM	< LOD	919.31	< LOD	8360.18	170846.94	1504.92	< LOD	12745.23	7590.18	927.83	5071527	22308.28	257.75	81.18	210213.11	10869.95
2513		07/08/2007	8:06:00	AM							0.16	0	6.34	0	0.47	0	0.22	0	0.18	0
2514		07/08/2007	8:12:00	AM	7349.92	290	4263.38	1680.29	64.74	39.29	< LOD	141.6	1439.04	46.24	16379.56	242.84	2630.54	45.64	4947.92	165.89
2515		07/08/2007	10:00:00	AM	< LOD	968.61	< LOD	8632.11	179281.94	1599.9	< LOD	11061.23	6242.94	796.45	4330330	19153.72	223.34	69.3	177294.19	9311.13
2516	**SP20-(-1,-2)**	07/08/2007	10:33:00	AM	< LOD	1019.07	< LOD	9443.75	180906.95	1659.26	< LOD	9681.38	5498.36	694.85	3899969	16847.39	55.46	31.83	159344.03	8218.09

Reading No	SAMPLE	Date	Time		Mercury	Mercury Error	Nickel	Nickel Error	Phosphorus	Phosphorus Error	Potassium	Potassium Error	Rubidium	Rubidium Error	Scandium	Scandium Error	Selenium	Selenium Error	Silver	Silver Error	Strontium	Strontium Error
2467		06/08/2007	9:04:00	AM	3	0	1.72	0					0.1	0			0.98	0	255.07	0	0.19	0
2468		06/08/2007	9:12:00	AM	14.66	9.36	< LOD	41.83	< LOD	17868.57	15222.6	573.97	61.24	4.91	109.69	60.11	< LOD	5.6	< LOD	9.72	128.33	8.33
2469	**SP20-0-2**	06/08/2007	12:52:00	PM	< LOD	423.23	320256.3	12478.07					< LOD	126.27			< LOD	161.46	< LOD	292.11	569.13	113.93
2470	**SP20-0-2**	06/08/2007	12:52:00	PM	< LOD	224.74	231195.6	8171.27					< LOD	37.47			< LOD	116.26	< LOD	189.48	354.23	68.08
2471	**SP20-0-2**	06/08/2007	12:53:00	PM	< LOD	243.49	287184.3	8185					< LOD	72.99			< LOD	81.69	< LOD	191.37	515.41	75.06
2472	**SP20-0-2**	06/08/2007	12:54:00	PM	< LOD	145.36	221555.8	5087.07	< LOD	180600.36	< LOD	3495.89	< LOD	42.49	< LOD	566.77	< LOD	71.7	< LOD	119.55	373.5	47.99
2473	**SP20-0-2**	06/08/2007	12:55:00	PM	< LOD	447.04	171688.9	14642.69					< LOD	128.55			< LOD	256.08	< LOD	364	414.14	184.8
2474	**SP20-0-2**	06/08/2007	12:55:00	PM	< LOD	318.01	263579.5	13082.43					< LOD	137.36			< LOD	149.02	< LOD	300.64	422.59	109.68
2475	**SP20-0-2**	06/08/2007	12:55:00	PM	< LOD	523.35	202350.4	14675.47					< LOD	115.75			< LOD	219.02	< LOD	387.89	400.32	153.64
2476	**SP20-0-2**	06/08/2007	12:55:00	PM	< LOD	697.14	166168.4	20096.61					< LOD	55.74			< LOD	203.61	< LOD	452.77	418.88	253.98
2477	**SP20-0-2**	06/08/2007	12:56:00	PM	< LOD	215.18	209734.1	7126.24					< LOD	63.3			< LOD	79.6	< LOD	164.22	376.44	69.16
2478	**SP20-0-2**	06/08/2007	12:56:00	PM	< LOD	359.72	184664.8	12923.8					< LOD	104.99			< LOD	96.74	< LOD	348.09	286.63	116.5
2479	**SP20-0-2**	06/08/2007	12:56:00	PM	< LOD	592.39	242830.6	21348.28					< LOD	83.13			< LOD	283.65	< LOD	443.67	483.6	220.13
2480	**SP20-0-2**	06/08/2007	1:19:00	PM	< LOD	104.38	229769.9	3685.82	< LOD	72188.01	< LOD	1673.87	< LOD	33.67	< LOD	285.56	< LOD	42.69	115.25	57.8	386.56	34.01
2481	**SP20(0,-1)**	06/08/2007	1:23:00	PM	< LOD	146.99	206057.4	5093.42					< LOD	39.89			< LOD	69.77	< LOD	118.39	297.55	43.24
2482	**SP20(0,-1)**	06/08/2007	1:24:00	PM	< LOD	412.11	293892.2	13987.71					< LOD	196.71			< LOD	163.74	< LOD	342.76	534.53	132.17
2483	**SP20(0,-1)**	06/08/2007	1:25:00	PM	< LOD	254.43	267094.6	8811.76					< LOD	91.64			< LOD	143.51	< LOD	211.64	387.51	65.58
2484	**SP20(0,-1)**	06/08/2007	1:27:00	PM	< LOD	119.76	253884	4151.92	< LOD	122121.87	< LOD	2208.48	< LOD	36.27	< LOD	356.53	< LOD	53.35	160.94	66.2	447.34	38.8
2485	**SP20(0,-1)**	06/08/2007	1:27:00	PM	< LOD	618.38	403261.6	34943.36					< LOD	114.71			< LOD	363.77	< LOD	901.36	685.22	230.52
2486	**SP20(0,-1)**	06/08/2007	1:31:00	PM	< LOD	104.14	221076.3	3618.75	< LOD	85093.9	< LOD	1580.59	< LOD	27.97	< LOD	279.36	< LOD	41.06	145.68	58.66	361.69	32.78
2487	**SP20-(-0.5,1)**	06/08/2007	1:37:00	PM	< LOD	146.81	219687.9	5107.7	< LOD	130494.53	< LOD	2257.53	< LOD	42.04	< LOD	378.48	< LOD	58.77	< LOD	121.01	331.66	43.27
2488	**SP20-(-0.5,1)**	06/08/2007	1:38:00	PM	< LOD	315.66	239601.7	10663.76					< LOD	69.74			< LOD	99.73	< LOD	265.56	329.17	81.48
2489	**SP20-(-0.5,1)**	06/08/2007	1:40:00	PM	< LOD	133.21	224755.1	5063.67	< LOD	118755.42	< LOD	2363.28	< LOD	38.21	< LOD	369.96	< LOD	60.52	< LOD	117.48	379.37	47.61
2490	**SP20-(-0.5,1)**	06/08/2007	1:40:00	PM	< LOD	880.57	268398.1	24048.95					< LOD	166.15			< LOD	387.74	< LOD	666.49	563.99	248.2
2491	**SP20-(-0.5,1)**	06/08/2007	1:41:00	PM	< LOD	234.75	281499.8	8121.44					< LOD	85			< LOD	97.33	< LOD	193.3	546.44	79.13
2492	**SP20-(-0.5,1)**	06/08/2007	1:41:00	PM	< LOD	309.87	255272.3	9597.45					< LOD	83.15			< LOD	110.39	275.32	164.71	449.7	90.6
2493	**SP20-(-0.5,1)**	06/08/2007	1:42:00	PM	< LOD	191.84	249498.4	6849.89					< LOD	39.69			< LOD	95.62	< LOD	161.8	392.92	58.06
2494	**SP20-(-0.5,1)**	06/08/2007	1:44:00	PM	< LOD	145.32	242691.9	5156.82	< LOD	114358.75	< LOD	2321.66	< LOD	45.41	< LOD	376.33	< LOD	59.44	157.38	82.37	412.24	46.17
2495	**SP20-(-0.5,1)**	06/08/2007	1:44:00	PM	< LOD	4840.63	1824080	144888.3					< LOD	170.75			< LOD	1370.42	< LOD	2736.19	3357.66	1095.48
2496	**SP20-(-0.5,1)**	06/08/2007	1:45:00	PM	< LOD	165.73	247943.6	5843.58					< LOD	44.12			< LOD	63.05	147.69	92.7	422.85	52.6
2497	**SP20-(-0.5,1)**	06/08/2007	1:45:00	PM	< LOD	1796.44	403901.8	48268.74					< LOD	116.86			< LOD	471.42	< LOD	1497.48	682.32	311
2498	**SP20-(-0.5,1)**	06/08/2007	1:47:00	PM	< LOD	157.58	269519.9	6256.75	< LOD	114470.51	< LOD	2575.76	< LOD	60.32	< LOD	451.7	< LOD	75.43	157.4	98.48	479.78	57.51
2499	**SP20-(-0.5,1)**	06/08/2007	1:47:00	PM	< LOD	1519.16	251474.4	40716.7					< LOD	323.99			< LOD	148.87	< LOD	685.31	< LOD	659.95
2500	**SP20(-0.5,1)**	06/08/2007	1:57:00	PM	< LOD	134.59	282947.7	4582.28	< LOD	70495.45	< LOD	1645.9	< LOD	35.86	< LOD	282.63	< LOD	56.99	197.01	72.82	527.12	43.82
2501	**SP20-(-1,3)**	06/08/2007	3:42:00	PM	< LOD	123.76	245902.3	4006.62	< LOD	82243.39	< LOD	1652.31	< LOD	32.8	< LOD	279.86	< LOD	49.75	158.84	64.37	441.94	38.64
2502	**SP20-(-2,4)**	06/08/2007	3:51:00	PM	< LOD	123.38	270194.5	4368.59	< LOD	80171.75	< LOD	1662.47	< LOD	38.76	< LOD	268.21	< LOD	51.36	218.25	71.31	474.41	39.69
2503	**SP20-(0,5)**	06/08/2007	3:57:00	PM	< LOD	109.25	243247.2	3889.58	< LOD	83757.53	< LOD	1624.23	< LOD	32.84	< LOD	262.31	< LOD	45.74	106.82	60.15	396.5	34.92
2504	**SP20-(0,6)**	06/08/2007	4:04:00	PM	< LOD	140.73	294042.5	4801.35	< LOD	85768.87	< LOD	1616.68	< LOD	42.5	< LOD	269.6	< LOD	59.34	273.25	79.78	530.97	43.3
2505	**SP20-(-1,8)**	06/08/2007	4:12:00	PM	< LOD	128.2	272254	4384.67	< LOD	75914.48	< LOD	1526.81	< LOD	37.29	< LOD	255.19	< LOD	48.67	230.91	72.09	510.19	42.56
2506	**SP20-(-2,10)**	06/08/2007	4:26:00	PM	< LOD	133.21	267793.1	4431.21	< LOD	84468.61	< LOD	2350.76	< LOD	38.32	< LOD	390.03	< LOD	49.07	< LOD	98.22	440.91	38.39
2507	**SP20-(-2,10)**	06/08/2007	4:26:00	PM	< LOD	1058.08	534932.8	34700.61					< LOD	440.01			< LOD	409.34	< LOD	772.23	1117.1	325.73
2508	**SP20-(-2,10)**	06/08/2007	4:31:00	PM	< LOD	147.11	299247.5	4971.35	< LOD	80186.38	< LOD	1552.86	< LOD	40.12	< LOD	266.72	< LOD	54.96	275.21	82.25	519.55	44.6
2509	**SP20-(-2,10)**	06/08/2007	4:31:00	PM	< LOD	314.44	103968.2	11296.51					< LOD	117.43			< LOD	147.81	< LOD	305.82	< LOD	139.21
2510	**SP20-(-2,10)**	06/08/2007	4:35:00	PM	< LOD	146.41	305375.3	5089.49	< LOD	69590.5	< LOD	1424.94	< LOD	42.67	< LOD	239.09	< LOD	51.87	255.88	83.48	627.08	52.81
2511	**SP20a-(-2,1)**	06/08/2007	5:29:00	PM	< LOD	133.54	269612.9	4353.18	< LOD	80560.16	< LOD	1588.79	< LOD	36.16	< LOD	281.58	< LOD	57.97	175.25	69.28	516.13	43.11
2512	**SP20-(0,-2)**	06/08/2007	6:01:00	PM	< LOD	137.18	276986	4565.88	< LOD	64692.16	< LOD	1471.27	< LOD	38.14	< LOD	245.09	< LOD	54.78	191.91	73.46	512.96	43.18
2513		07/08/2007	8:06:00	AM	2.85	0	1.82	0					0.06	0			1.03	0	252.55	0	0.15	0
2514		07/08/2007	8:12:00	AM	< LOD	12.85	< LOD	37.84	< LOD	19629.95	13491.68	535.65	52.34	4.47	< LOD	81.15	< LOD	5.13	< LOD	9.29	93.68	7.59
2515		07/08/2007	10:00:00	AM	< LOD	121.51	240384.8	3961.74	< LOD	74744.77	< LOD	1465.06	< LOD	35.13	< LOD	263.08	< LOD	47.47	171.45	64.46	413.7	37.01
2516	**SP20-(-1,-2)**	07/08/2007	10:33:00	AM	< LOD	98	213933.4	3460.5	< LOD	79387.21	< LOD	1618.71	< LOD	31.17	< LOD	253.93	< LOD	40.15	133.29	56.14	366.65	32.64

Reading No	SAMPLE	Date	Time		Sulphur	Sulphur Error	Thallium	Thallium Error	Thorium	Thorium Error	Tin	Tin Error	Titanium	Titanium Error	Tungsten	Tungsten Error	Uranium	Uranium Error	Vanadium	Vanadium Error	Zinc	Zinc Error
2467		06/08/2007	9:04:00	AM			0.16	0	0.13	0	42.05	0			6.52	0	0.09	0			5.82	0
2468		06/08/2007	9:12:00	AM	< LOD	4080.31	82.4	30.55	< LOD	51.83	< LOD	37.44	1867.3	167.12	< LOD	154.53	< LOD	20.19	< LOD	122.05	3808.61	69.44
2469	**SP20-0-2**	06/08/2007	12:52:00	PM			< LOD	630.96	< LOD	581.13	< LOD	1148.63			< LOD	3096.16	< LOD	499.44			< LOD	1210.84
2470	**SP20-0-2**	06/08/2007	12:52:00	PM			< LOD	368.18	< LOD	343.08	< LOD	776.69			< LOD	2161.32	< LOD	125.6			< LOD	788.01
2471	**SP20-0-2**	06/08/2007	12:53:00	PM			< LOD	278.18	< LOD	485.65	< LOD	756.77			< LOD	1865.61	< LOD	76.46			< LOD	783.55
2472	**SP20-0-2**	06/08/2007	12:54:00	PM	< LOD	45534.19	< LOD	232.97	< LOD	196.96	< LOD	467.06	< LOD	2048.06	< LOD	1247.77	< LOD	128.58	< LOD	1240.2	< LOD	516.76
2473	**SP20-0-2**	06/08/2007	12:55:00	PM			< LOD	88.88	< LOD	693.59	< LOD	1330.14			< LOD	4306.46	< LOD	402.92			< LOD	1335.53
2474	**SP20-0-2**	06/08/2007	12:55:00	PM			< LOD	487.45	< LOD	521.75	< LOD	1198.64			< LOD	2803.98	< LOD	513.1			< LOD	1286.31
2475	**SP20-0-2**	06/08/2007	12:55:00	PM			< LOD	461.83	< LOD	667.55	< LOD	1410.83			< LOD	4079.51	< LOD	439.31			< LOD	1710.67
2476	**SP20-0-2**	06/08/2007	12:55:00	PM			< LOD	96.86	< LOD	1430.98	< LOD	1999.26			< LOD	5928.73	< LOD	974.16			< LOD	2293.9
2477	**SP20-0-2**	06/08/2007	12:56:00	PM			< LOD	263.83	< LOD	223.13	< LOD	677.64			< LOD	1980.93	< LOD	299.65			< LOD	682.94
2478	**SP20-0-2**	06/08/2007	12:56:00	PM			< LOD	58.82	< LOD	400.83	< LOD	1183.43			< LOD	2689.57	< LOD	397.35			< LOD	1183.04
2479	**SP20-0-2**	06/08/2007	12:56:00	PM			< LOD	1094.39	< LOD	904.3	< LOD	2005.47			< LOD	4007.17	< LOD	1032.04			< LOD	2360.07
2480	**SP20-0-2**	06/08/2007	1:19:00	PM	< LOD	17294.76	< LOD	151.66	< LOD	155.23	< LOD	340.9	< LOD	904.29	< LOD	871.82	< LOD	112.05	777.47	351.79	< LOD	358.8
2481	**SP20(0,-1)**	06/08/2007	1:23:00	PM			< LOD	202.39	< LOD	158.25	< LOD	472.88			< LOD	1157.52	< LOD	157.55			< LOD	491.35
2482	**SP20(0,-1)**	06/08/2007	1:24:00	PM			< LOD	709.55	< LOD	721.54	< LOD	1245.56			< LOD	3838.04	< LOD	414.24			< LOD	1531.43
2483	**SP20(0,-1)**	06/08/2007	1:25:00	PM			< LOD	419.31	< LOD	405.79	< LOD	827.28			< LOD	2064.28	< LOD	280.27			< LOD	965
2484	**SP20(0,-1)**	06/08/2007	1:27:00	PM	< LOD	22075.18	< LOD	176.93	< LOD	168.32	< LOD	381.8	1507.17	744.22	< LOD	1031.43	157.33	91.48	1073.06	453.58	< LOD	437.25
2485	**SP20(0,-1)**	06/08/2007	1:27:00	PM			< LOD	283.62	< LOD	2540.82	< LOD	3460.56			< LOD	7030.19	< LOD	1614.13			< LOD	2751.63
2486	**SP20(0,-1)**	06/08/2007	1:31:00	PM	< LOD	18447.15	< LOD	120.75	< LOD	147.68	< LOD	335.41	< LOD	878.99	< LOD	879.05	144.15	78.68	1246.42	356.32	< LOD	353.39
2487	**SP20-(-0.5,1)**	06/08/2007	1:37:00	PM	< LOD	24879.71	< LOD	237.32	< LOD	142.92	< LOD	474.34	< LOD	1337.87	< LOD	1264.95	< LOD	172.18	< LOD	755.01	< LOD	506.3
2488	**SP20-(-0.5,1)**	06/08/2007	1:38:00	PM			< LOD	543.13	< LOD	399.59	< LOD	1011.81			< LOD	2470.96	< LOD	288.38			< LOD	1036.71
2489	**SP20-(-0.5,1)**	06/08/2007	1:40:00	PM	< LOD	26947.65	< LOD	226.35	< LOD	201.75	< LOD	454.78	< LOD	1316.42	< LOD	1108.97	< LOD	142.92	< LOD	731.8	< LOD	486.65
2490	**SP20-(-0.5,1)**	06/08/2007	1:40:00	PM			< LOD	848.14	< LOD	1197.71	< LOD	2375.04			< LOD	5715.23	< LOD	199.15			< LOD	1888.28
2491	**SP20-(-0.5,1)**	06/08/2007	1:41:00	PM			< LOD	361.88	< LOD	309.05	< LOD	765.55			< LOD	2150.87	< LOD	204.86			< LOD	785.89
2492	**SP20-(-0.5,1)**	06/08/2007	1:41:00	PM			< LOD	480.38	< LOD	405.34	< LOD	900			< LOD	2679.72	< LOD	221.31			< LOD	1007.74
2493	**SP20-(-0.5,1)**	06/08/2007	1:42:00	PM			< LOD	314.94	< LOD	324.01	< LOD	643.65			< LOD	1695.38	< LOD	46.2			< LOD	699.37
2494	**SP20-(-0.5,1)**	06/08/2007	1:44:00	PM	< LOD	24694.2	< LOD	194.75	169.76	112.03	< LOD	475.73	< LOD	1335.82	< LOD	1214.02	< LOD	173.57	< LOD	772.94	< LOD	508.52
2495	**SP20-(-0.5,1)**	06/08/2007	1:44:00	PM			< LOD	1017.06	< LOD	2002.91	< LOD	13787.88			< LOD	32501.23	< LOD	2966.78			< LOD	14193.07
2496	**SP20-(-0.5,1)**	06/08/2007	1:45:00	PM			< LOD	216.1	< LOD	228.35	< LOD	560.37			< LOD	1502.77	210.83	134.03			< LOD	583.8
2497	**SP20-(-0.5,1)**	06/08/2007	1:45:00	PM			< LOD	370.83	< LOD	3558.61	< LOD	4340.96			< LOD	11082.15	< LOD	818.58			< LOD	4999.28
2498	**SP20-(-0.5,1)**	06/08/2007	1:47:00	PM	< LOD	27554.79	< LOD	301.99	< LOD	244.55	< LOD	581.53	< LOD	1489.84	< LOD	1442	< LOD	150.79	< LOD	847.24	< LOD	623.47
2499	**SP20-(-0.5,1)**	06/08/2007	1:47:00	PM			< LOD	2879.71	< LOD	2233.09	< LOD	3767.42			< LOD	11285.81	< LOD	369.67			< LOD	3086.24
2500	**SP20(-0.5,1)**	06/08/2007	1:57:00	PM	< LOD	18351.33	< LOD	167.89	< LOD	197.94	< LOD	420.86	< LOD	898.42	< LOD	1076.25	< LOD	129.86	1001.37	358.09	< LOD	442.92
2501	**SP20-(-1,3)**	06/08/2007	3:42:00	PM	< LOD	17819.75	< LOD	163.07	< LOD	184.96	< LOD	376.11	< LOD	910.52	< LOD	955.85	< LOD	82.16	656.83	349.26	< LOD	390.89
2502	**SP20-(-2,4)**	06/08/2007	3:51:00	PM	< LOD	17797.39	< LOD	176.36	< LOD	152.43	< LOD	401.76	< LOD	881.54	< LOD	1050.38	154.77	94.99	642.58	338.24	< LOD	426.04
2503	**SP20-(0,5)**	06/08/2007	3:57:00	PM	< LOD	17815.94	< LOD	164.71	< LOD	176.93	< LOD	366.76	< LOD	847.11	< LOD	889.95	< LOD	86.4	1112.22	342.82	< LOD	382.37
2504	**SP20-(0,6)**	06/08/2007	4:04:00	PM	< LOD	18093.91	< LOD	208.13	< LOD	186.59	< LOD	451.03	< LOD	912.69	< LOD	1164.43	171	104.67	797.61	353.18	< LOD	483.7
2505	**SP20-(-1,8)**	06/08/2007	4:12:00	PM	< LOD	16983.91	< LOD	184.33	< LOD	187.03	< LOD	408.11	< LOD	825.69	< LOD	1043.37	< LOD	113.15	818.98	325.05	< LOD	419.73
2506	**SP20-(-2,10)**	06/08/2007	4:26:00	PM	< LOD	29030.36	< LOD	193.32	< LOD	141.87	< LOD	414.71	< LOD	1261.74	< LOD	1066.21	148.05	95.66	809.6	494.64	< LOD	448.97
2507	**SP20-(-2,10)**	06/08/2007	4:26:00	PM			< LOD	1692.87	< LOD	289.48	< LOD	3237.93			< LOD	9673.13	< LOD	1342.02			< LOD	3574.56
2508	**SP20-(-2,10)**	06/08/2007	4:31:00	PM	< LOD	18171.46	< LOD	225.45	< LOD	158.47	< LOD	473.95	< LOD	906.96	< LOD	1147.9	< LOD	151.77	< LOD	512.74	< LOD	488.11
2509	**SP20-(-2,10)**	06/08/2007	4:31:00	PM			< LOD	84.97	< LOD	284.65	< LOD	1172.38			< LOD	1839.29	< LOD	580.19			< LOD	1383.24
2510	**SP20-(-2,10)**	06/08/2007	4:35:00	PM	< LOD	16493.26	< LOD	215.77	< LOD	222.6	< LOD	479.97	< LOD	793.49	< LOD	1209.57	< LOD	145.48	768.88	310.17	< LOD	541.64
2511	**SP20a-(-2,1)**	06/08/2007	5:29:00	PM	< LOD	17204.71	< LOD	199.52	< LOD	179.98	< LOD	407.14	< LOD	932.91	< LOD	1057.74	< LOD	119.33	911.09	364.33	< LOD	431.53
2512	**SP20-(0,-2)**	06/08/2007	6:01:00	PM	< LOD	16938.58	< LOD	174.99	< LOD	177.48	< LOD	427.67	< LOD	797.95	< LOD	1118.36	< LOD	142.76	569.68	305.77	< LOD	457.28
2513		07/08/2007	8:06:00	AM			0.2	0	0.15	0	42.02	0			7.02	0	0.09	0			5.19	0
2514		07/08/2007	8:12:00	AM	< LOD	3991.8	69.19	27.86	< LOD	46.87	< LOD	35.68	1790.78	150.36	< LOD	140.78	24.21	12.86	< LOD	109.58	3279.81	62.81
2515		07/08/2007	10:00:00	AM	< LOD	17795.04	< LOD	146.68	< LOD	161.27	< LOD	369.37	< LOD	838.33	< LOD	964.91	< LOD	125.72	560.09	320.29	< LOD	384.71
2516	**SP20-(-1,-2)**	07/08/2007	10:33:00	AM	< LOD	16833.09	< LOD	136.06	< LOD	144.49	< LOD	325.43	< LOD	870.33	< LOD	837.13	283.08	97	686.18	338.56	< LOD	351.69

Reading No	SAMPLE	Date	Time		Type	Duration	Units	Sequence	Instrument	Res	EScale1	Antimony	Antimony Error	Arsenic	Arsenic Error	Barium	Barium Error	Bismuth	Bismuth Error	Cadmium	Cadmium Error
2517	**SP20-(-1,-2)OFFSET**	07/08/2007	10:44:00	AM	BULK	151.34	ppm	Final	GSI			736.47	261.69	240.61	77.88	< LOD	1739.79	< LOD	315.35	276.16	96.54
2518	**SP20-(-1,-2)OFFSET**	07/08/2007	10:44:00	AM	BULK	6.19	ppm	Final	GSI			< LOD	1325.24	< LOD	388.47	< LOD	6292.29	< LOD	1344.07	< LOD	551.89
2519	**SP20-(-1,-2)OFFSET**	07/08/2007	10:52:00	AM	BULK	181.6	ppm	Final	GSI			1121.38	291.45	305.3	96.39	< LOD	1895.36	< LOD	495.41	235.5	102.57
2520	**SP20-(-1,-3)**	07/08/2007	11:01:00	AM	BULK	192.89	ppm	Final	GSI			880.87	273.53	228.51	88.73	< LOD	1800.68	859.91	393.52	269.17	99.2
2521	**SP20-(0,-3)**	07/08/2007	11:09:00	AM	BULK	199.88	ppm	Final	GSI			1054.07	287.39	324.6	86.77	< LOD	1882.01	< LOD	490.84	323.47	104.43
2522		07/08/2007	11:41:00	AM	BULK	191.7	ppm	Final	GSI			869.96	258.13	239.41	76.86	< LOD	1711.49	< LOD	398.34	242.71	93.03
2523		07/08/2007	11:50:00	AM	BULK	181.7	ppm	Final	GSI			1120.05	325.33	237.85	102.53	< LOD	2176.06	< LOD	491.6	353.86	118.6
2524		07/08/2007	12:28:00	PM	BULK	189.32	ppm	Final	GSI			537.14	240.75	179.5	71.32	< LOD	1614.3	< LOD	351.02	209.09	88.3
2525		07/08/2007	4:04:00	PM	BULK	181.44	ppm	Final	GSI			< LOD	67.56	736.55	105.52	< LOD	278.98	638.81	168.08	< LOD	23.42
2526		07/08/2007	4:15:00	PM	BULK	180.99	ppm	Final	GSI			119.88	39.38	137.45	25.08	883.79	165.5	77.02	47.77	32.68	14.78
2527		07/08/2007	4:36:00	PM	BULK	185.78	ppm	Final	GSI			92.4	47.09	1004.62	134.53	< LOD	291.7	1098.95	215.84	< LOD	24.73
2528	**SP2-(0,-1)**	07/08/2007	5:19:00	PM	BULK	181.18	ppm	Final	GSI			< LOD	40.53	85.05	18.47	< LOD	165.91	50.97	33.1	< LOD	15.48
2529	**SP2-(0,2)**	07/08/2007	5:28:00	PM	BULK	181.21	ppm	Final	GSI			64.93	38.91	148.53	29.83	423.81	162.2	< LOD	76.51	< LOD	21.6
2530	**SP2-(0,0)**	07/08/2007	5:34:00	PM	BULK	181.39	ppm	Final	GSI			< LOD	63.97	777.32	108.49	< LOD	264.54	1001.27	178.46	< LOD	22.34
2531	**SP2(1,1)**	07/08/2007	5:51:00	PM	BULK	193.77	ppm	Final	GSI			285.35	55.28	2264.75	186.63	< LOD	328.84	1930.58	302.66	< LOD	28.37
2532	**SP2-(1,-2)**	07/08/2007	6:27:00	PM	BULK	185.98	ppm	Final	GSI			< LOD	70.56	437.06	86.57	< LOD	299.11	696.82	149.98	< LOD	25.46
2533	**SP2-(1,0)**	07/08/2007	6:54:00	PM	BULK	194.16	ppm	Final	GSI			157.35	43.07	367.18	50.41	619.43	178.41	324.71	90.55	< LOD	23.66
2534		08/08/2007	8:00:00	AM	SHUTTER_CAL	137.91	cps	Final	GSI	220.92	4.55	0.29	0	0.11	0	0.12	0	0.12	0	1.82	0
2535		08/08/2007	8:04:00	AM	BULK	125.76	ppm	Final	GSI			< LOD	47.39	411.49	48.41	< LOD	197.44	144.07	76.19	< LOD	17.92
2536		08/08/2007	8:04:00	AM	BULK	17.31	ppm	Final	GSI			< LOD	110.09	274.14	112.65	< LOD	464.51	< LOD	277.4	< LOD	41.91
2537	**SP4(0,0)**	08/08/2007	11:12:00	AM	BULK	191.02	ppm	Final	GSI			492.75	230.03	237.06	71.47	< LOD	1530.04	< LOD	322.21	288.12	87.37
2538	**SP5(0,1)**	08/08/2007	12:28:00	PM	BULK	181.91	ppm	Final	GSI			829.89	302.07	213.17	86.64	< LOD	2035.2	< LOD	501.09	244.37	108.79
2539	**SP5(0,-1)**	08/08/2007	12:51:00	PM	BULK	181.93	ppm	Final	GSI			787.99	263.73	300.93	78.56	< LOD	1730.07	< LOD	301.21	254.14	96.06
2540	**SP5(-1,0)**	08/08/2007	1:10:00	PM	BULK	181.99	ppm	Final	GSI			1169.26	324.5	359.53	106.17	< LOD	2134.2	< LOD	605.37	392.44	119.17
2541	**SP31(0,0)**	08/08/2007	3:46:00	PM	BULK	181.66	ppm	Final	GSI			151.82	36.96	55.51	22.43	2345.84	165.4	< LOD	63.29	31.16	13.76
2542	**SP31(0,1)**	08/08/2007	4:02:00	PM	BULK	181.37	ppm	Final	GSI			191.23	53.28	2776.76	223.91	380.22	226.16	1709	346.9	< LOD	27.6
2543	**SP31(0,1)**	08/08/2007	4:16:00	PM	BULK	183.23	ppm	Final	GSI			244.93	42.74	1760.87	101.1	869.24	176.73	513.27	158.25	40.81	15.57
2544	**SP31(0,-1)**	08/08/2007	4:31:00	PM	BULK	184.42	ppm	Final	GSI			< LOD	39.19	341.75	55.07	< LOD	158.74	230.9	84	< LOD	14.5
2545	**SP31(0,-2)**	08/08/2007	4:44:00	PM	BULK	183.76	ppm	Final	GSI			73.63	38.77	630.26	92.74	< LOD	238.84	545.37	145.48	< LOD	20.77
2546	**SP31(-1,0)**	08/08/2007	5:01:00	PM	BULK	182.85	ppm	Final	GSI			< LOD	50.17	338.73	36.91	< LOD	208.72	105.68	60.46	< LOD	18.91
2547	**SP31(1,0)**	08/08/2007	5:15:00	PM	BULK	181.22	ppm	Final	GSI			109.17	41.29	645.57	83.07	982.8	176.85	433.07	132.42	< LOD	22.77
2548	**SP31(-1,-1)**	08/08/2007	5:33:00	PM	BULK	186.27	ppm	Final	GSI			< LOD	22.18	18.79	6.29	< LOD	86.31	< LOD	17.88	< LOD	8.69
2549	**SP31(-1,-2)**	08/08/2007	6:06:00	PM	BULK	181.18	ppm	Final	GSI			60.08	33.4	274.05	39.5	1393.69	146.67	110.96	63.55	< LOD	18.74
2550	**SP31(1,1)**	08/08/2007	6:19:00	PM	BULK	182.36	ppm	Final	GSI			229.51	38.48	502.66	63.18	1268.14	161.37	284.15	100.96	37.31	14.09
2551	**SP25(0,0)**	08/08/2007	6:58:00	PM	BULK	183.04	ppm	Final	GSI			333.4	43.78	904.52	109.91	543.95	175.57	762.68	174.16	< LOD	22.61
2552	**SP25(0,-1)**	08/08/2007	7:08:00	PM	BULK	182.59	ppm	Final	GSI			416.23	51.59	1577.04	178.66	1224.34	214.05	1887.26	286.9	36.41	17.78
2553	**SP25(0,-1)**	08/08/2007	7:19:00	PM	BULK	183.79	ppm	Final	GSI			652.79	66.39	4231.36	305.32	687.63	266.33	3432.1	484.14	56.76	21.89
2554	**SP25(0,1)**	08/08/2007	7:32:00	PM	BULK	184.24	ppm	Final	GSI			< LOD	43.64	374.73	52.14	< LOD	182.55	367.49	85.05	< LOD	16.22
2555	**SP25(1,0)**	08/08/2007	7:45:00	PM	BULK	181.88	ppm	Final	GSI			350.07	41.96	1267.88	99.55	1472.38	174.27	822.33	161.29	55.37	15.15
2556	**SP25(-1,0)**	08/08/2007	7:53:00	PM	BULK	183.24	ppm	Final	GSI			203.18	45.39	1105.6	119.55	658.49	188.92	1086.15	195.64	< LOD	24.47
2557		09/08/2007	8:08:00	AM	SHUTTER_CAL	135.93	cps	Final	GSI	217.24	4.55	0.18	0	0.14	0	0.11	0	0.07	0	1.86	0
2558	**nist-standard**	09/08/2007	8:12:00	AM	BULK	22.19	ppm	Final	GSI			< LOD	98.46	355.76	101.42	< LOD	415.29	< LOD	248.5	< LOD	38.35
2559	**nist-standard**	09/08/2007	8:15:00	AM	BULK	186.47	ppm	Final	GSI			< LOD	41.73	407.74	42.14	< LOD	172.98	124.6	65.77	< LOD	15.89
2560	**SP25(1,-1)**	09/08/2007	9:45:00	AM	BULK	261.37	ppm	Final	GSI			178.42	34.85	547.44	85.98	1245.6	149.88	653.77	135.34	< LOD	18.56
2561	**SP25(-1,1)**	09/08/2007	9:58:00	AM	BULK	162	ppm	Final	GSI			< LOD	55.46	235.05	89.46	< LOD	233.15	696.32	143.45	< LOD	20.5
2562	**SP25(-1,1)**	09/08/2007	9:59:00	AM	BULK	5.54	ppm	Final	GSI			< LOD	267.1	827.4	416.73	< LOD	1087.07	< LOD	949.85	< LOD	97.38
2563	**SP25-(-1,1)**	09/08/2007	10:04:00	AM	BULK	186.1	ppm	Final	GSI			< LOD	53.1	259.05	83.81	< LOD	222.03	653.93	134.36	< LOD	19.33
2564	**SP34(0,0)**	09/08/2007	3:00:00	PM	BULK	182.1	ppm	Final	GSI			172.52	56.9	918.63	49.34	663.13	237.08	539.74	115.39	< LOD	31.06
2565	**SP34(0,-1)**	09/08/2007	3:14:00	PM	BULK	181.85	ppm	Final	GSI			< LOD	71.24	908.53	47.31	< LOD	303.45	500.69	103.07	< LOD	25.84

Reading No	SAMPLE	Date	Time		Calcium	Calcium Error	Chlorine	Chlorine Error	Chromium	Chromium Error	Cobalt	Cobalt Error	Copper	Copper Error	Iron	Iron Error	Lead	Lead Error	Manganese	Manganese Error
2517	SP20-(-1,-2)OFFSET	07/08/2007	10:44:00	AM	< LOD	1465.24	< LOD	13234.03	182901	2374.68	< LOD	11325.98	5303.53	794.41	4494378	19687.26	175.7	64.58	175097.59	9544.14
2518	SP20-(-1,-2)OFFSET	07/08/2007	10:44:00	AM							< LOD	37788.03	4912.48	2712.26	3310651	64935.14	< LOD	123.6	136420.02	31962.55
2519	SP20-(-1,-2)OFFSET	07/08/2007	10:52:00	AM	< LOD	985.38	< LOD	8278.25	174371.77	1544	< LOD	12198.98	7104.83	887.17	4711358	21122.24	297.47	84.81	190292.78	10276.99
2520	SP20-(-1,-3)	07/08/2007	11:01:00	AM	< LOD	1027.56	< LOD	9104.57	182659.08	1681.36	< LOD	11875.39	7481.63	863.12	4955379	20701.78	283.8	82.74	201643.23	10079.23
2521	SP20-(0,-3)	07/08/2007	11:09:00	AM	< LOD	911.38	< LOD	7763.49	166520.05	1455.12	< LOD	12152.79	6543.92	865.23	5018733	21119.95	146.37	64.77	200315.36	10274.6
2522		07/08/2007	11:41:00	AM	< LOD	994.72	< LOD	8606.9	178026.58	1609.84	< LOD	11021.16	6176.57	786.25	4468443	19027.72	172.96	64.63	178201.81	9247.39
2523		07/08/2007	11:50:00	AM	< LOD	976.97	< LOD	8440.7	181024.27	1636.02	< LOD	14007.69	8699.5	1030.03	5478922	24389.83	348.84	97.79	241815.7	11990.87
2524		07/08/2007	12:28:00	PM	< LOD	1012.37	< LOD	9030.68	182325.91	1672.22	< LOD	10515.71	6136.35	755.48	4273455	18216.91	211.84	63.94	176711.69	8878.05
2525		07/08/2007	4:04:00	PM	< LOD	277.02	< LOD	2761.9	< LOD	74.89	723.19	340.36	5176.84	125.41	101750.4	857.2	11026.4	135.44	567.13	133.6
2526		07/08/2007	4:15:00	PM	3755.78	216.78	< LOD	2378.84	< LOD	48.09	< LOD	281	307.94	31.21	39523.56	478.02	665.33	30.36	205.19	82.73
2527		07/08/2007	4:36:00	PM	< LOD	268.43	< LOD	2773.97	< LOD	72.94	< LOD	536.22	3395.4	106.09	107362	908.73	16949.84	173.32	428.48	135.73
2528	SP2-(0,-1)	07/08/2007	5:19:00	PM	1472.51	182.74	4407.5	1608.82	< LOD	54.07	205.35	115.63	609.02	30.88	24234.43	289.92	653.79	23.13	709.05	71.53
2529	SP2-(0,2)	07/08/2007	5:28:00	PM	2179.93	193.13	< LOD	2340.4	< LOD	50.17	< LOD	286.94	332.29	32.18	41980.72	493.43	999.08	36.99	319.32	86.22
2530	SP2-(0,0)	07/08/2007	5:34:00	PM	< LOD	280.08	< LOD	2592.06	< LOD	74.03	805.45	316.56	2239.77	81.07	94009.48	793.76	12608.71	139.59	563.48	126.56
2531	SP2(1,1)	07/08/2007	5:51:00	PM	< LOD	220.62	< LOD	2594.34	< LOD	66.28	< LOD	633.42	1728.55	86.75	124010	1075.16	26164.17	237.22	< LOD	214.94
2532	SP2-(1,-2)	07/08/2007	6:27:00	PM	< LOD	297.36	< LOD	2885.39	< LOD	75.19	1328.96	541.08	692.79	53.68	229571.1	1371.47	6491.45	111.05	860.25	184.6
2533	SP2-(1,0)	07/08/2007	6:54:00	PM	< LOD	239.86	< LOD	2612.67	< LOD	61.16	< LOD	511.32	396.38	37.42	116543	870.42	2560.23	62.44	374.05	120.99
2534		08/08/2007	8:00:00	AM							0.16	0	6.27	0	0.62	0	0.21	0	0.11	0
2535		08/08/2007	8:04:00	AM	8697.99	452.89	< LOD	3683.68	< LOD	86.14	< LOD	182.12	1814.04	60.87	20580.89	319.76	3344.26	60.53	6487.9	223.58
2536		08/08/2007	8:04:00	AM							< LOD	422.62	1889.41	145.24	20763.73	754.06	3416.05	143.81	6961.85	542.42
2537	SP4(0,0)	08/08/2007	11:12:00	AM	< LOD	1004.61	< LOD	9306.2	183941.33	1693.39	< LOD	9903.14	5320.63	706.66	4088378	17294.09	158.46	61.31	162180.92	8415.79
2538	SP5(0,1)	08/08/2007	12:28:00	PM	< LOD	1054.82	< LOD	8676.59	187917.5	1736.02	< LOD	13363.29	8027.58	975.24	5315826	23243.98	191.64	75.15	210214.08	11252.29
2539	SP5(0,-1)	08/08/2007	12:51:00	PM	< LOD	1019.3	< LOD	9154.13	186397.22	1722.62	< LOD	11365.14	6048.31	814.59	4514758	19789.98	116.21	54.68	182145.16	9658.61
2540	SP5(-1,0)	08/08/2007	1:10:00	PM	< LOD	1079.6	< LOD	9372.85	185463.67	1714.98	< LOD	14180.98	8365.49	1029.57	5616216	24586.98	265.07	86.24	220006.75	11916.38
2541	SP31(0,0)	08/08/2007	3:46:00	PM	1111.57	173.73	< LOD	2219.36	71.94	33.11	< LOD	167.37	78.53	19.13	15043.97	282.03	656.23	28.77	119.71	70.92
2542	SP31(0,1)	08/08/2007	4:02:00	PM	< LOD	227.47	< LOD	2445.55	< LOD	61.13	< LOD	565.95	1536.02	85.12	92420.24	953.97	36143.07	285.95	< LOD	218.32
2543	SP31(0,1)	08/08/2007	4:16:00	PM	< LOD	206.79	< LOD	2355.34	< LOD	51.63	< LOD	364.12	827.98	50.44	61021.8	624.71	10374.94	123.69	< LOD	135.07
2544	SP31(0,-1)	08/08/2007	4:31:00	PM	< LOD	229.32	5065.93	1599.22	< LOD	54.94	230.47	110.4	322.57	23.16	23303.99	274.47	6905.73	71.34	108.08	44.18
2545	SP31(0,-2)	08/08/2007	4:44:00	PM	< LOD	199.48	2633.09	1592.63	< LOD	53.09	< LOD	289.88	593.88	41.33	41983.79	491.93	10847.7	119.56	521.35	98.43
2546	SP31(-1,0)	08/08/2007	5:01:00	PM	< LOD	202.79	3319.37	1476.6	< LOD	49.3	< LOD	213.92	247.73	25.14	28099.29	358.31	1921.96	45.13	< LOD	85.75
2547	SP31(1,0)	08/08/2007	5:15:00	PM	< LOD	226.69	< LOD	2439.44	< LOD	56.25	< LOD	356.05	724.06	47.19	56845.66	602.67	7602.69	105.71	219.69	98.23
2548	SP31(-1,-1)	08/08/2007	5:33:00	PM	805.06	134.55	14954.54	1483.64	< LOD	42.96	< LOD	24.26	8.11	5.37	757.94	39.35	188.88	8.07	226.58	15.2
2549	SP31(-1,-2)	08/08/2007	6:06:00	PM	< LOD	235.75	2884.16	1555.24	96.39	38.11	< LOD	178.68	151.51	21.22	19862.9	299.72	2368.8	49.62	< LOD	81.04
2550	SP31(1,1)	08/08/2007	6:19:00	PM	< LOD	223.58	2344.62	1521.18	< LOD	50.39	< LOD	237.69	352.94	31.98	29370.86	398.87	5141.67	79.97	118.7	75.27
2551	SP25(0,0)	08/08/2007	6:58:00	PM	< LOD	235.51	< LOD	2390.92	< LOD	54.64	< LOD	351.16	832.24	51.04	54699.27	594.73	13386.06	141.07	258.42	101.11
2552	SP25(0,-1)	08/08/2007	7:08:00	PM	< LOD	217.24	< LOD	2464.67	< LOD	57.9	< LOD	473.05	3372.31	109.94	77679.43	800.26	28030.18	230.5	< LOD	189.74
2553	SP25(0,-1)	08/08/2007	7:19:00	PM	< LOD	227.51	< LOD	2553.5	< LOD	60.22	< LOD	688.84	5622.78	170.07	112676	1155.72	55817.32	390.07	< LOD	280.89
2554	SP25(0,1)	08/08/2007	7:32:00	PM	< LOD	222.12	4387	1586.56	63.56	37.93	< LOD	169.71	467.35	29.09	21773.88	285.61	5219.44	66.78	114.85	51.55
2555	SP25(1,0)	08/08/2007	7:45:00	PM	< LOD	220.95	2544.56	1547.03	< LOD	51.07	< LOD	252.05	758.4	46.59	31513.26	432.26	11548.9	125.19	159.93	87.45
2556	SP25(-1,0)	08/08/2007	7:53:00	PM	< LOD	250.45	< LOD	2602.23	< LOD	62.42	< LOD	497.4	1394.51	67.85	98898.79	844.7	13961.65	152.51	344.16	125.71
2557		09/08/2007	8:08:00	AM							0.17	0	6.68	0	0.46	0	0.27	0	0.13	0
2558	nist-standard	09/08/2007	8:12:00	AM							< LOD	394.66	1790.39	126.2	21823.18	686.47	3436.46	127.83	6568.33	470.15
2559	nist-standard	09/08/2007	8:15:00	AM	8667.55	318.22	3369.03	1694.39	< LOD	59.47	< LOD	160.17	1820.7	53.21	20557.1	278.74	3328.74	52.71	6315.25	192.84
2560	SP25(1,-1)	09/08/2007	9:45:00	AM	< LOD	228.82	< LOD	2253.12	< LOD	56.91	< LOD	343.3	1353.46	51.53	78527	582.41	12562.7	111.64	371.87	95.04
2561	SP25(-1,1)	09/08/2007	9:58:00	AM	< LOD	221.41	3828.11	1800.86	73.34	38.08	< LOD	214.02	1809.67	65.45	23426.77	358.91	11074.12	117.49	114.84	69.93
2562	SP25(-1,1)	09/08/2007	9:59:00	AM							< LOD	937.1	1576.01	292.55	22552.01	1674.01	9977.29	531.4	< LOD	492.32
2563	SP25-(-1,1)	09/08/2007	10:04:00	AM	< LOD	187	4487.92	1509.61	65.31	32.68	< LOD	201.52	1687.24	60.8	22932.9	341.1	10488.68	109.9	< LOD	93.87
2564	SP34(0,0)	09/08/2007	3:00:00	PM	< LOD	235.91	< LOD	2752.8	< LOD	66.81	< LOD	938.52	440.72	51.57	240553.7	1595.64	702.67	43.68	379.13	194.97
2565	SP34(0,-1)	09/08/2007	3:14:00	PM	< LOD	295.92	< LOD	3069.62	< LOD	80.86	946.75	540.22	306.08	39.41	227542.2	1376.52	1022.19	45.72	722.17	180.92

Reading No	SAMPLE	Date	Time		Mercury	Mercury Error	Nickel	Nickel Error	Phosphorus	Phosphorus Error	Potassium	Potassium Error	Rubidium	Rubidium Error	Scandium	Scandium Error	Selenium	Selenium Error	Silver	Silver Error	Strontium	Strontium Error
2517	SP20-(-1,-2)OFFSET	07/08/2007	10:44:00	AM	< LOD	111.43	251679.9	4085.52	< LOD	134712.63	< LOD	2289.92	< LOD	28.95	< LOD	407.76	< LOD	48.3	162.49	64.98	442.18	37.75
2518	SP20-(-1,-2)OFFSET	07/08/2007	10:44:00	AM	< LOD	440.95	182667.1	13418.07					< LOD	21.69			< LOD	63.01	< LOD	330.53	310.07	136.76
2519	SP20-(-1,-2)OFFSET	07/08/2007	10:52:00	AM	< LOD	129.55	263029.7	4381.35	< LOD	72347.6	< LOD	1520.93	< LOD	41.55	< LOD	259.79	< LOD	53.01	134.2	68.37	514.04	44.61
2520	SP20-(-1,-3)	07/08/2007	11:01:00	AM	< LOD	119.73	271450.8	4247.29	< LOD	82897.43	< LOD	1667.51	< LOD	36.76	< LOD	274.85	< LOD	50.79	206.38	68.86	489.44	39.38
2521	SP20-(0,-3)	07/08/2007	11:09:00	AM	< LOD	132.66	279890.4	4374.72	< LOD	70273.8	< LOD	1366.79	< LOD	37.98	< LOD	247.13	< LOD	54.5	244.95	72.39	485.72	40.17
2522		07/08/2007	11:41:00	AM	< LOD	111.72	248516.8	3942.19	< LOD	79393.23	< LOD	1600.07	< LOD	37.36	< LOD	260.26	< LOD	46.77	168.15	63.5	434.05	36.77
2523		07/08/2007	11:50:00	AM	< LOD	143.97	303310	5030.65	< LOD	89783.65	< LOD	1539.21	< LOD	45.89	< LOD	265.18	< LOD	56.17	205.79	79.9	569.81	47.57
2524		07/08/2007	12:28:00	PM	< LOD	109.12	236238.9	3759.7	< LOD	73326.25	< LOD	1603.77	< LOD	30.98	< LOD	268.79	< LOD	41.44	143.15	60.01	396.77	33.97
2525		07/08/2007	4:04:00	PM	< LOD	21.78	< LOD	81.71	< LOD	18584.78	8623.88	505.58	102.42	9.72	< LOD	56.08	< LOD	12.61	< LOD	14.78	< LOD	12.56
2526		07/08/2007	4:15:00	PM	< LOD	9.9	< LOD	56.19	< LOD	12595.19	8896.68	426.35	76.28	6.51	< LOD	59.9	< LOD	4.56	21.24	9.1	227.25	12.35
2527		07/08/2007	4:36:00	PM	< LOD	26	< LOD	87.43	< LOD	17981.91	7927.16	491.25	91.13	10.49	< LOD	56.33	< LOD	15.56	< LOD	15.77	< LOD	14.04
2528	SP2-(0,-1)	07/08/2007	5:19:00	PM	< LOD	7.18	< LOD	37	< LOD	14484	5211.19	366.5	31.03	3.44	< LOD	53.43	< LOD	3.1	< LOD	9.34	< LOD	6.52
2529	SP2-(0,2)	07/08/2007	5:28:00	PM	< LOD	10.17	< LOD	56.66	< LOD	12028.87	9073.07	435.32	91.35	7.01	< LOD	56.35	< LOD	4.99	< LOD	13.25	58.69	9.33
2530	SP2-(0,0)	07/08/2007	5:34:00	PM	< LOD	21.98	< LOD	80.1	< LOD	16066.73	9007	511.32	84.46	9.15	< LOD	55.72	< LOD	13	< LOD	14.34	< LOD	12.56
2531	SP2(1,1)	07/08/2007	5:51:00	PM	< LOD	34.33	< LOD	102.37	< LOD	15124.23	2640.03	331.51	35.46	11.24	< LOD	50.17	< LOD	21.51	22.8	11.98	< LOD	17.32
2532	SP2-(1,-2)	07/08/2007	6:27:00	PM	< LOD	18.99	< LOD	103.81	< LOD	20977.03	3552.8	434.67	63.3	8.51	< LOD	64.49	< LOD	11.4	< LOD	15.39	< LOD	11.36
2533	SP2-(1,0)	07/08/2007	6:54:00	PM	< LOD	13.14	< LOD	73.41	< LOD	15162.69	4929.07	402.92	54.85	6.46	< LOD	51.1	< LOD	6.85	< LOD	14.24	< LOD	9.52
2534		08/08/2007	8:00:00	AM	3.03	0	1.88	0					0.13	0			0.81	0	250.4	0	0.21	0
2535		08/08/2007	8:04:00	AM	< LOD	16.99	< LOD	48.2	< LOD	23411.85	16665.61	853.02	67.68	5.86	< LOD	127.21	< LOD	6.47	< LOD	11.14	142.3	9.79
2536		08/08/2007	8:04:00	AM	< LOD	39.27	< LOD	94.05					72.21	14.14			< LOD	15.43	< LOD	26.72	144.43	23.23
2537	SP4(0,0)	08/08/2007	11:12:00	AM	< LOD	107.8	227447.9	3573.56	< LOD	71451.86	< LOD	1611.12	< LOD	34.24	< LOD	277.05	< LOD	47.41	148.33	57.82	387.24	33.74
2538	SP5(0,1)	08/08/2007	12:28:00	PM	< LOD	135.42	297053	4817.86	< LOD	85134.06	< LOD	1648.78	< LOD	38.76	< LOD	268.67	< LOD	60.07	198.48	75.77	552.44	45.12
2539	SP5(0,-1)	08/08/2007	12:51:00	PM	< LOD	130.98	252927.7	4105.81	< LOD	73925.88	< LOD	1661	< LOD	34.61	< LOD	279.63	< LOD	46.52	125.27	63.46	421.98	36.44
2540	SP5(-1,0)	08/08/2007	1:10:00	PM	< LOD	143.99	314031.4	5101.68	< LOD	83516.31	< LOD	1705.56	< LOD	46.8	< LOD	278.85	< LOD	61.45	173.45	78.11	590.71	47.31
2541	SP31(0,0)	08/08/2007	3:46:00	PM	< LOD	9.28	< LOD	45.42	< LOD	13396.38	23464.69	605.57	249.56	10.31	< LOD	44.9	< LOD	4.4	13.48	8.36	< LOD	9.04
2542	SP31(0,1)	08/08/2007	4:02:00	PM	< LOD	39.7	< LOD	102.47	< LOD	15609.27	6495.15	408.25	84.36	13.84	< LOD	48.64	< LOD	24.93	55.89	12.66	43.67	13.05
2543	SP31(0,1)	08/08/2007	4:16:00	PM	< LOD	20.33	< LOD	67.5	< LOD	15290.27	4336.32	343.08	57.27	7.53	< LOD	41.07	< LOD	11.55	26.68	9.64	< LOD	11.01
2544	SP31(0,-1)	08/08/2007	4:31:00	PM	< LOD	10.63	< LOD	34.78	< LOD	13439.84	7191.02	414.04	56.83	4.87	< LOD	46.28	< LOD	6.71	< LOD	8.93	< LOD	6.67
2545	SP31(0,-2)	08/08/2007	4:44:00	PM	< LOD	17.94	< LOD	59	< LOD	12973.32	4120.81	334.53	75.74	7.74	< LOD	41.87	< LOD	10.78	< LOD	12.9	< LOD	10.59
2546	SP31(-1,0)	08/08/2007	5:01:00	PM	< LOD	9.67	< LOD	45.44	< LOD	10490.58	6030.71	364.1	62.44	5.42	< LOD	39.11	< LOD	5.2	< LOD	11.45	< LOD	6.96
2547	SP31(1,0)	08/08/2007	5:15:00	PM	< LOD	16.83	< LOD	62.14	< LOD	13912.2	8520.95	439.68	115.34	8.97	< LOD	44.9	< LOD	10.51	< LOD	14	< LOD	10.46
2548	SP31(-1,-1)	08/08/2007	5:33:00	PM	< LOD	2.69	< LOD	15.12	< LOD	9019.92	761.12	194.43	5.5	1.22	< LOD	37.88	< LOD	1.21	< LOD	5.3	< LOD	3.09
2549	SP31(-1,-2)	08/08/2007	6:06:00	PM	< LOD	10.11	< LOD	45.84	< LOD	10946.71	17533.18	556.33	146.05	7.64	< LOD	44.19	< LOD	5.31	< LOD	11.37	< LOD	7.94
2550	SP31(1,1)	08/08/2007	6:19:00	PM	< LOD	14.24	< LOD	52.22	< LOD	13302.63	12543.77	480.22	155.18	8.94	< LOD	40.63	< LOD	7.91	30.94	8.86	< LOD	9.12
2551	SP25(0,0)	08/08/2007	6:58:00	PM	< LOD	21.69	< LOD	70.35	< LOD	15352.62	12852.71	514.78	169.75	11.02	< LOD	45.88	< LOD	12.96	40.14	9.96	< LOD	12.19
2552	SP25(0,-1)	08/08/2007	7:08:00	PM	< LOD	32.88	< LOD	94.79	< LOD	13543.73	3730.5	339.41	61.43	11.37	< LOD	44.66	< LOD	20.97	43.3	11.5	< LOD	15.7
2553	SP25(0,-1)	08/08/2007	7:19:00	PM	< LOD	55.02	< LOD	134.09	< LOD	15556.36	5329.86	385.04	66.93	17.33	< LOD	49.1	< LOD	34.82	94.86	15.29	60.53	16.02
2554	SP25(0,1)	08/08/2007	7:32:00	PM	< LOD	10.96	< LOD	39.82	< LOD	13302.74	8674.74	427.31	74.33	5.61	< LOD	42.13	< LOD	6.31	< LOD	10.05	< LOD	7.02
2555	SP25(1,0)	08/08/2007	7:45:00	PM	< LOD	20.06	< LOD	62.21	< LOD	13248.55	12272.46	478.87	184.62	10.73	< LOD	39.69	< LOD	12.14	32.52	9.39	< LOD	10.65
2556	SP25(-1,0)	08/08/2007	7:53:00	PM	< LOD	23.32	< LOD	80.8	< LOD	15731.63	5719.15	416.05	75.06	9.28	< LOD	51.17	< LOD	13.75	27.64	10.33	< LOD	12.76
2557		09/08/2007	8:08:00	AM	2.69	0	1.76	0					0.05	0			0.98	0	253.23	0	0.28	0
2558	nist-standard	09/08/2007	8:12:00	AM	< LOD	34.8	< LOD	92.07					61.23	11.97			< LOD	12.63	< LOD	23.67	160.42	21.06
2559	nist-standard	09/08/2007	8:15:00	AM	< LOD	14.72	< LOD	39.49	< LOD	18870.6	15886.73	589.25	67.55	5.12	< LOD	88.01	< LOD	5.82	< LOD	9.83	163.28	8.83
2560	SP25(1,-1)	09/08/2007	9:45:00	AM	< LOD	16.17	< LOD	58.71	< LOD	15763.17	8455.18	414.65	112.23	7.79	< LOD	48.24	< LOD	10.53	< LOD	11.43	< LOD	9.12
2561	SP25(-1,1)	09/08/2007	9:58:00	AM	< LOD	17.04	< LOD	53.7	< LOD	13552.92	4176.16	371.32	66.25	7.33	< LOD	43.42	< LOD	10.57	< LOD	12.75	< LOD	9.62
2562	SP25(-1,1)	09/08/2007	9:59:00	AM	< LOD	80.39	< LOD	311.36					97.19	37.59			< LOD	55.35	< LOD	59.96	< LOD	43.53
2563	SP25-(-1,1)	09/08/2007	10:04:00	AM	< LOD	16.07	< LOD	52.59	< LOD	10115.73	5217.66	335.8	59.24	6.76	< LOD	37.04	< LOD	10.35	13.28	8.17	< LOD	8.84
2564	SP34(0,0)	09/08/2007	3:00:00	PM	< LOD	17.2	< LOD	122.05	< LOD	16255.97	1189.85	330.6	23.11	6.36	< LOD	52.95	< LOD	8.72	23.13	12.9	< LOD	11.67
2565	SP34(0,-1)	09/08/2007	3:14:00	PM	< LOD	15.97	< LOD	101	< LOD	22786.46	1263.66	370.5	24.47	5.78	< LOD	68.43	< LOD	7.82	< LOD	15.81	< LOD	9.9

Reading No	SAMPLE	Date	Time		Sulphur	Sulphur Error	Thallium	Thallium Error	Thorium	Thorium Error	Tin	Tin Error	Titanium	Titanium Error	Tungsten	Tungsten Error	Uranium	Uranium Error	Vanadium	Vanadium Error	Zinc	Zinc Error
2517	SP20-(-1,-2)OFFSET	07/08/2007	10:44:00	AM	< LOD	24619.74	< LOD	154.89	< LOD	123.86	< LOD	380.27	< LOD	1346.5	< LOD	955.64	< LOD	107.84	< LOD	757.76	< LOD	371.38
2518	SP20-(-1,-2)OFFSET	07/08/2007	10:44:00	AM			< LOD	807.93	< LOD	477.3	< LOD	1290.2			< LOD	3361.83	< LOD	296.32			< LOD	1338.7
2519	SP20-(-1,-2)OFFSET	07/08/2007	10:52:00	AM	< LOD	17014.99	< LOD	166.89	< LOD	179.14	< LOD	410.05	< LOD	842.99	< LOD	1085.76	192.32	104.75	608.56	322.67	< LOD	427.8
2520	SP20-(-1,-3)	07/08/2007	11:01:00	AM	< LOD	18273.91	< LOD	194.58	< LOD	220.08	< LOD	392.12	< LOD	957.46	< LOD	1030.06	< LOD	127.01	< LOD	536.33	< LOD	410.77
2521	SP20-(0,-3)	07/08/2007	11:09:00	AM	< LOD	14560.42	< LOD	187.75	< LOD	186.43	< LOD	414.98	< LOD	795.57	< LOD	1035.11	182.74	99.51	903.52	312.01	< LOD	427.33
2522		07/08/2007	11:41:00	AM	< LOD	17810.1	< LOD	170.75	< LOD	142.53	< LOD	364.46	< LOD	862.2	< LOD	945.37	< LOD	111.9	857.86	336.66	< LOD	389.72
2523		07/08/2007	11:50:00	AM	< LOD	18230.66	< LOD	203.64	< LOD	176.35	< LOD	477.03	1185.22	549.92	< LOD	1238.81	< LOD	123.01	945.18	326.75	< LOD	494.25
2524		07/08/2007	12:28:00	PM	< LOD	17897.75	< LOD	128.19	< LOD	127.1	< LOD	351.38	< LOD	894.54	< LOD	885.15	< LOD	109.25	841.62	350.82	< LOD	378.72
2525		07/08/2007	4:04:00	PM	7356.17	3795.77	342.74	80.14	< LOD	138.83	< LOD	59.38	1888.69	184.12	< LOD	153.67	45.94	25.29	< LOD	134.86	1038.59	59.15
2526		07/08/2007	4:15:00	PM	< LOD	3041.48	< LOD	29.92	< LOD	39.28	95.78	35.87	1843.41	136.92	< LOD	82.94	< LOD	27.49	< LOD	97.2	90.18	20.57
2527		07/08/2007	4:36:00	PM	5583.53	3688.52	628.13	103.49	< LOD	177.18	< LOD	62.04	1197.81	173.62	< LOD	159.59	40.56	26.35	< LOD	128.51	1021.76	59.49
2528	SP2-(0,-1)	07/08/2007	5:19:00	PM	< LOD	3313.46	32.19	15.43	< LOD	27.38	< LOD	36.81	1129.66	124.61	< LOD	69.88	< LOD	15.14	< LOD	93.73	548.69	27.22
2529	SP2-(0,2)	07/08/2007	5:28:00	PM	< LOD	3350.41	42.74	24.53	< LOD	42.45	< LOD	53.01	1616.32	134.37	< LOD	83.68	< LOD	27.87	< LOD	96.38	94.72	20.95
2530	SP2-(0,0)	07/08/2007	5:34:00	PM	< LOD	5142.51	515.85	84.44	< LOD	144.19	< LOD	56.01	1710.95	187.51	< LOD	135.52	60.18	24.3	< LOD	138.74	738.12	47.84
2531	SP2(1,1)	07/08/2007	5:51:00	PM	6167.16	3274.68	1099.62	146.12	< LOD	244.49	< LOD	70.86	1266.2	164.01	< LOD	174.51	53.15	28.47	< LOD	122.2	575.42	53.52
2532	SP2-(1,-2)	07/08/2007	6:27:00	PM	< LOD	5594.21	200.84	66.01	< LOD	120.11	< LOD	63.44	1114.71	172.69	< LOD	114.28	35.57	22.9	< LOD	130.83	86.93	32.31
2533	SP2-(1,0)	07/08/2007	6:54:00	PM	< LOD	4174.21	153.76	42.11	< LOD	70.06	< LOD	58.09	1051.89	140.57	< LOD	89.92	< LOD	26.24	< LOD	105.02	69.14	23.73
2534		08/08/2007	8:00:00	AM			0.14	0	0.17	0	41.42	0			6.89	0	0.1	0			5.04	0
2535		08/08/2007	8:04:00	AM	< LOD	6296.7	118.19	37.93	< LOD	61.9	< LOD	42.88	2042.58	232.09	< LOD	185.42	< LOD	23.58	< LOD	170.84	4233.94	83.78
2536		08/08/2007	8:04:00	AM			208.01	93.06	< LOD	147.72	< LOD	100.55			< LOD	422.24	< LOD	55.44			4243.34	196.24
2537	SP4(0,0)	08/08/2007	11:12:00	AM	< LOD	16383.59	< LOD	169.04	< LOD	115.64	< LOD	333.72	< LOD	902.38	< LOD	853.21	< LOD	107.34	629.16	346.37	< LOD	358.46
2538	SP5(0,1)	08/08/2007	12:28:00	PM	< LOD	17275.27	< LOD	190.2	< LOD	179.05	< LOD	438.15	< LOD	937.7	< LOD	1190.9	< LOD	126.79	663.18	360.86	< LOD	468.49
2539	SP5(0,-1)	08/08/2007	12:51:00	PM	< LOD	18097.2	< LOD	168.29	< LOD	113.89	< LOD	379.12	983.75	606.17	< LOD	1038.53	161.47	91.96	1022.7	359.33	< LOD	387.09
2540	SP5(-1,0)	08/08/2007	1:10:00	PM	< LOD	16774.6	< LOD	192.28	< LOD	216.16	< LOD	468.49	< LOD	888.08	< LOD	1239.19	162.07	108	830.73	349.05	< LOD	499.54
2541	SP31(0,0)	08/08/2007	3:46:00	PM	< LOD	2762.78	48.2	19.82	51.66	25.67	146.57	33.81	917.17	183.44	< LOD	70.56	< LOD	35.67	< LOD	137.23	72.07	16.86
2542	SP31(0,1)	08/08/2007	4:02:00	PM	4810.79	2991.53	1318.05	172.36	< LOD	284.41	< LOD	67.8	990.33	196.74	< LOD	201.99	< LOD	48.62	< LOD	148.22	987.89	65.97
2543	SP31(0,1)	08/08/2007	4:16:00	PM	< LOD	3587.96	460.97	80.97	< LOD	127	94.61	37.86	682.58	127.89	< LOD	103.71	< LOD	28.28	< LOD	95.85	118.8	25.87
2544	SP31(0,-1)	08/08/2007	4:31:00	PM	< LOD	3682.56	277.53	42.71	< LOD	70.65	< LOD	35.1	1045.02	140.67	< LOD	56.54	19.77	12.65	< LOD	105.37	160.13	16.45
2545	SP31(0,-2)	08/08/2007	4:44:00	PM	< LOD	3669	363.74	70.73	< LOD	120.08	< LOD	51.28	1029.8	140.95	< LOD	93.43	< LOD	29.13	< LOD	106.17	210.74	26.47
2546	SP31(-1,0)	08/08/2007	5:01:00	PM	< LOD	3060.88	92.43	30.21	< LOD	49.49	< LOD	45.7	589.75	115.22	< LOD	67.17	< LOD	22.12	< LOD	87.17	63.7	16.04
2547	SP31(1,0)	08/08/2007	5:15:00	PM	< LOD	3765.31	256.76	63.9	< LOD	108.37	< LOD	55.27	876.14	167.52	< LOD	98.13	< LOD	33.71	< LOD	125.9	138.3	25.81
2548	SP31(-1,-1)	08/08/2007	5:33:00	PM	< LOD	2173.43	< LOD	7.86	< LOD	9.74	< LOD	20.02	< LOD	103.53	< LOD	22.05	< LOD	6.32	< LOD	55.61	13.73	4.52
2549	SP31(-1,-2)	08/08/2007	6:06:00	PM	< LOD	3214.39	122.83	32.27	< LOD	52.96	45.58	30.27	858.31	196.27	< LOD	66.52	< LOD	28.2	< LOD	148.3	32.15	14.04
2550	SP31(1,1)	08/08/2007	6:19:00	PM	< LOD	3312.5	260.31	50.94	< LOD	83.3	100.68	34.13	1221.09	146.26	< LOD	86.11	< LOD	33.28	< LOD	108.21	185.7	23.75
2551	SP25(0,0)	08/08/2007	6:58:00	PM	< LOD	4283.36	586.14	86.26	< LOD	144.13	< LOD	55.97	1155.69	154.2	< LOD	125.83	< LOD	38.89	< LOD	115.26	685.02	43.5
2552	SP25(0,-1)	08/08/2007	7:08:00	PM	10084.77	3243.66	1150.72	138.66	< LOD	233.66	117.01	44.42	668.88	156.66	< LOD	155.32	< LOD	41.12	< LOD	118.41	439.64	46.96
2553	SP25(0,-1)	08/08/2007	7:19:00	PM	12502.96	3456.76	2339.79	238.3	< LOD	389.96	120.62	54.98	927.27	175.95	< LOD	263.46	< LOD	59.58	< LOD	132.68	1650.26	93.75
2554	SP25(0,1)	08/08/2007	7:32:00	PM	< LOD	3303.62	228.5	41.09	< LOD	69.05	< LOD	39.33	1233.12	168.05	< LOD	61.75	< LOD	21.76	< LOD	125.7	114.79	16.51
2555	SP25(1,0)	08/08/2007	7:45:00	PM	3965.63	2568.04	558.29	79.64	< LOD	129.87	185.61	37.08	865.35	144.68	< LOD	108.78	< LOD	38.64	< LOD	107.22	360.34	32.37
2556	SP25(-1,0)	08/08/2007	7:53:00	PM	5119.47	3312.09	691.5	95.39	< LOD	156.59	< LOD	60.49	1012.83	157.28	< LOD	122.77	< LOD	34.54	< LOD	119.36	315.33	36.94
2557		09/08/2007	8:08:00	AM			0.18	0	0.13	0	41.72	0			6.93	0	0.12	0			5.81	0
2558	nist-standard	09/08/2007	8:12:00	AM			< LOD	115.63	< LOD	130.19	< LOD	90.88			< LOD	386.99	< LOD	51.93			4298.98	176.06
2559	nist-standard	09/08/2007	8:15:00	AM	< LOD	4331.19	113.9	32.91	< LOD	54.2	< LOD	37.22	2252.65	164.29	< LOD	162.54	21.82	14.13	< LOD	118.43	4152.35	72.51
2560	SP25(1,-1)	09/08/2007	9:45:00	AM	< LOD	4243.92	303.84	63.56	< LOD	113	< LOD	46.27	1176.83	170.62	< LOD	88.83	< LOD	28.62	< LOD	128.45	217.5	25.31
2561	SP25(-1,1)	09/08/2007	9:58:00	AM	< LOD	3843.9	392.63	67.94	< LOD	118.4	< LOD	49.61	877.16	154.76	< LOD	90.54	< LOD	27.74	< LOD	115.23	151.26	24.92
2562	SP25(-1,1)	09/08/2007	9:59:00	AM			510.16	334.16	< LOD	532.66	< LOD	228.08			< LOD	467.69	< LOD	131.21			231.75	131.83
2563	SP25-(-1,1)	09/08/2007	10:04:00	AM	< LOD	3197.06	387.17	63.98	< LOD	111.02	< LOD	47.43	1075	138.26	< LOD	83.41	< LOD	25.68	< LOD	101.6	132.95	22.88
2564	SP34(0,0)	09/08/2007	3:00:00	PM	< LOD	4149.46	117.67	48.15	< LOD	80.79	< LOD	77.4	1428.42	154.61	< LOD	127.26	< LOD	26.93	< LOD	113.97	< LOD	43.13
2565	SP34(0,-1)	09/08/2007	3:14:00	PM	< LOD	4954.35	90.65	43.11	< LOD	72.85	< LOD	64.81	2432.56	202.64	< LOD	110.56	< LOD	26.26	< LOD	145.74	< LOD	40.92

Reading No	SAMPLE	Date	Time		Type	Duration	Units	Sequence	Instrument	Res	EScale1	Antimony	Antimony Error	Arsenic	Arsenic Error	Barium	Barium Error	Bismuth	Bismuth Error	Cadmium	Cadmium Error
2566	**SP35(0,-2)**	09/08/2007	3:27:00	PM	BULK	220.79	ppm	Final	GSI			< LOD	48.57	119.5	15.36	< LOD	200.24	70.49	34.88	< LOD	18.23
2567	**SP35(0,1)**	09/08/2007	3:42:00	PM	BULK	181.51	ppm	Final	GSI			112.19	46.44	500.88	34.61	932.42	197.59	351.05	80.73	< LOD	25.69
2568	**SP34-(0,1)**	09/08/2007	3:58:00	PM	BULK	103.72	ppm	Final	GSI			< LOD	88.61	508.74	48.14	428.24	250.57	423.89	112.25	< LOD	32.2
2569	**SP34-(0,1)**	09/08/2007	3:59:00	PM	BULK	7.97	ppm	Final	GSI			< LOD	266.81	545.68	150.86	< LOD	1159.91	< LOD	473.12	< LOD	100.21
2570	**SP34-(0,1)**	09/08/2007	4:01:00	PM	BULK	123.36	ppm	Final	GSI			< LOD	76.76	514.3	42.25	351.44	217.88	259.34	88.17	< LOD	28.57
2571	**SP34-(0,1)**	09/08/2007	4:02:00	PM	BULK	76.4	ppm	Final	GSI			< LOD	97.29	479.41	52.61	609.83	274.74	392.56	119.87	< LOD	35.08
2572	**SP34-(0,1)**	09/08/2007	4:02:00	PM	BULK	10.44	ppm	Final	GSI			< LOD	233.29	534.48	127.73	< LOD	990.07	< LOD	400.86	< LOD	83.77
2573	**SP34-(0,1)**	09/08/2007	4:03:00	PM	BULK	1.24	ppm	Final	GSI			< LOD	513.78	492.23	285.31	< LOD	2177.58	< LOD	1171.74	< LOD	189.36
2574	**SP34(0,1)**	09/08/2007	4:07:00	PM	BULK	181.78	ppm	Final	GSI			109.18	46.14	486.57	36.77	1001.06	197.09	351.41	82.21	27.68	17.21
2575	**SP34(-1,0)**	09/08/2007	4:20:00	PM	BULK	181.52	ppm	Final	GSI			82.3	45.86	394.64	30.44	390.1	191.13	1065.06	110.28	< LOD	25.38
2576	**SP34(1,0)**	09/08/2007	4:35:00	PM	BULK	182.96	ppm	Final	GSI			< LOD	69.05	631.5	44.31	< LOD	290.14	474.78	96.83	< LOD	25.83
2577	**SP34(1,-1)**	09/08/2007	4:42:00	PM	BULK	181.32	ppm	Final	GSI			66.75	44.39	682.63	45.8	< LOD	273.7	414.79	92.6	< LOD	24.61
2578	**SP34-(1,-2)**	09/08/2007	5:09:00	PM	BULK	182.34	ppm	Final	GSI			< LOD	29.31	51.17	6.96	< LOD	113.69	29.56	16.55	< LOD	11.53
2579	**SP34(-1,-2)**	09/08/2007	5:19:00	PM	BULK	182.77	ppm	Final	GSI			< LOD	93.86	1067.55	67.41	< LOD	399.27	620.41	145.01	< LOD	34.55
2580	**SP34(0,-3)**	09/08/2007	5:49:00	PM	BULK	181.63	ppm	Final	GSI			< LOD	76.79	835.36	44.79	< LOD	326.69	598.76	110.15	< LOD	27.7
2581	**SP34(0,-4)**	09/08/2007	6:02:00	PM	BULK	182.44	ppm	Final	GSI			< LOD	98.91	1045.41	58.75	< LOD	420.54	414.2	129.67	< LOD	35.95
2582	**SP34(1,-3)**	09/08/2007	6:14:00	PM	BULK	186.34	ppm	Final	GSI			< LOD	83.4	1630.29	66.54	< LOD	342.16	857.45	145.59	< LOD	30.5
2583	**SP34(1,-4)**	09/08/2007	6:29:00	PM	BULK	184.74	ppm	Final	GSI			< LOD	90.26	1224.46	56.76	513.93	255.53	668.96	134.12	< LOD	33.08
2584		10/08/2007	8:28:00	AM	SHUTTER_CAL	135.91	cps	Final	GSI	222.14	4.55	0.3	0	0.11	0	0.09	0	0.09	0	1.73	0
2585	**nist-standard**	10/08/2007	8:34:00	AM	BULK	183.18	ppm	Final	GSI			< LOD	41.84	434.51	41.88	< LOD	172.94	126.83	65.57	< LOD	15.8
2586	**SP34(-1,-3)**	10/08/2007	10:04:00	AM	BULK	184.48	ppm	Final	GSI			< LOD	95.01	914.13	57.73	< LOD	403.74	474.01	127.36	< LOD	34.1
2587	**SP34(-1,1)**	10/08/2007	10:24:00	AM	BULK	181.35	ppm	Final	GSI			99.87	56.1	857.76	54.04	633.6	237.63	712.51	127.95	< LOD	30.41
2588	**SP34(-2,1)**	10/08/2007	10:47:00	AM	BULK	183.35	ppm	Final	GSI			< LOD	62.29	588.73	39.41	< LOD	263.77	590.21	93.48	< LOD	22.91
2589	**GM1-0**	10/08/2007	12:33:00	PM	BULK	182.94	ppm	Final	GSI			< LOD	32.94	35.92	10.06	< LOD	133.35	33.91	20.54	< LOD	12.47
2590	**GM20-A**	10/08/2007	12:41:00	PM	BULK	182.07	ppm	Final	GSI			< LOD	42.99	39.75	12.94	< LOD	173.77	< LOD	38.77	< LOD	15.94
2591	**GM40-A**	10/08/2007	12:50:00	PM	BULK	184.75	ppm	Final	GSI			< LOD	36.32	52.27	11.23	< LOD	152.48	< LOD	33.71	< LOD	13.66
2592	**GM60-A**	10/08/2007	1:00:00	PM	BULK	128.24	ppm	Final	GSI			< LOD	43.02	45.64	13.48	< LOD	180.66	< LOD	38.59	< LOD	16.17
2593	**GM1-80A**	10/08/2007	1:06:00	PM	BULK	183.62	ppm	Final	GSI			< LOD	43.47	57.07	13.03	< LOD	178.48	< LOD	38.43	< LOD	16.33
2594	**GM1-80B**	10/08/2007	1:15:00	PM	BULK	182.37	ppm	Final	GSI			< LOD	43.84	45.14	11.32	< LOD	182.39	< LOD	35.25	< LOD	16.29
2595	**GM1-20B**	10/08/2007	1:24:00	PM	BULK	180.8	ppm	Final	GSI			< LOD	39.01	60.06	14.36	< LOD	157.69	< LOD	36.57	< LOD	14.68
2596	**PH1-0**	10/08/2007	4:08:00	PM	BULK	182.48	ppm	Final	GSI			< LOD	39.18	54.16	13.94	< LOD	162.12	42.9	27.08	< LOD	14.79
2597	**PH1-10**	10/08/2007	4:16:00	PM	BULK	183.16	ppm	Final	GSI			< LOD	40.04	33.03	13.51	< LOD	165.01	< LOD	38.57	< LOD	15.31
2598	**PH1-20**	10/08/2007	4:22:00	PM	BULK	181.03	ppm	Final	GSI			< LOD	46.03	63.33	17.33	< LOD	190.17	80.16	35.29	< LOD	17.35
2599		16/08/2007	8:23:00	AM	SHUTTER_CAL	135.93	cps	Final	GSI	220.21	4.55	0.19	0	0.11	0	0.09	0	0.12	0	1.98	0
2600	**nist-high**	16/08/2007	8:28:00	AM	BULK	25.23	ppm	Final	GSI			< LOD	87.12	335.41	83.93	< LOD	362.48	< LOD	199.44	< LOD	33.69
2601	**nist-high**	16/08/2007	8:39:00	AM	BULK	181.94	ppm	Final	GSI			< LOD	39.87	320.68	38.2	< LOD	165.4	118.88	60.2	< LOD	15.27
2602	**K2 1-0**	16/08/2007	11:08:00	AM	BULK	182.61	ppm	Final	GSI			< LOD	38.58	27.97	7.16	< LOD	157.25	< LOD	25.88	< LOD	14.64
2603	**K2 1-20a**	16/08/2007	11:19:00	AM	BULK	181.12	ppm	Final	GSI			< LOD	34.44	32.71	6.2	< LOD	142.66	< LOD	23.73	< LOD	12.9
2604	**K2 1-40a**	16/08/2007	11:32:00	AM	BULK	181.25	ppm	Final	GSI			< LOD	41.45	33.19	10.4	< LOD	165.6	< LOD	31.34	20.04	10.69
2605	**K2 1-20b**	16/08/2007	11:43:00	AM	BULK	181.29	ppm	Final	GSI			< LOD	38.71	29.96	7.21	< LOD	161.68	< LOD	25.55	< LOD	14.57
2606	**K2 1-40b**	16/08/2007	11:53:00	AM	BULK	181.16	ppm	Final	GSI			< LOD	43.64	27.77	8.37	< LOD	175.33	< LOD	30.71	27.23	11.15

Reading No	SAMPLE	Date	Time		Calcium	Calcium Error	Chlorine	Chlorine Error	Chromium	Chromium Error	Cobalt	Cobalt Error	Copper	Copper Error	Iron	Iron Error	Lead	Lead Error	Manganese	Manganese Error
2566	SP35(0,-2)	09/08/2007	3:27:00	PM	717.89	188.33	< LOD	2531.79	< LOD	66.03	362.3	238.68	287.24	26.83	81697.66	607.36	246.66	16.96	747.62	99.72
2567	SP35(0,1)	09/08/2007	3:42:00	PM	< LOD	302.74	< LOD	2804.58	< LOD	71.65	< LOD	643.88	423.99	42.07	155973.9	1096.66	601.8	34.13	524.27	150.41
2568	SP34-(0,1)	09/08/2007	3:58:00	PM	< LOD	402.51	< LOD	3865.8	< LOD	105.52	< LOD	836.5	352.27	50.71	156232.2	1415.57	787.18	49.85	637.53	197.44
2569	SP34-(0,1)	09/08/2007	3:59:00	PM							< LOD	2465.57	312.19	147.36	154091.6	4270.32	845.22	156.09	< LOD	827.36
2570	SP34-(0,1)	09/08/2007	4:01:00	PM	< LOD	422.33	< LOD	4077.47	< LOD	103.54	822.69	487.82	340.77	43.83	155794.2	1238.49	792.76	43.77	710.26	175.74
2571	SP34-(0,1)	09/08/2007	4:02:00	PM	< LOD	548.65	< LOD	5657.65	< LOD	150.42	916.83	607.36	358.93	55.71	155431.7	1539.02	820.71	55.59	622.4	213.91
2572	SP34-(0,1)	09/08/2007	4:02:00	PM							< LOD	2212.16	367.11	135.69	155371	3706.34	791.61	131.19	1047.53	570.44
2573	SP34-(0,1)	09/08/2007	4:03:00	PM							< LOD	4461.23	< LOD	469.12	111441.5	7768.62	562.06	279.36	< LOD	1569.59
2574	SP34(0,1)	09/08/2007	4:07:00	PM	< LOD	288.93	< LOD	2882.9	< LOD	75.8	< LOD	657.02	374.68	39.91	163948.4	1117.49	787.27	38.42	690.28	157.98
2575	SP34(-1,0)	09/08/2007	4:20:00	PM	< LOD	217.07	< LOD	2701.24	< LOD	63.74	629.42	392.76	273.05	35.29	132049	998.52	425.24	29.73	486.55	138.39
2576	SP34(1,0)	09/08/2007	4:35:00	PM	< LOD	258.48	< LOD	2944.77	< LOD	71.62	< LOD	700.96	213.04	34.02	178179.8	1191.48	1151.36	47.2	731.42	162.6
2577	SP34(1,-1)	09/08/2007	4:42:00	PM	< LOD	228.14	< LOD	2633.99	< LOD	61.56	846.11	363.16	178.75	30.16	116378.8	916.17	1444.04	49.99	617.83	135.09
2578	SP34-(1,-2)	09/08/2007	5:09:00	PM	< LOD	175.36	9040.1	1500.9	56.48	30.71	130.8	47.78	40.26	8.92	5750.2	114.32	102.62	7.82	181.9	22.18
2579	SP34(-1,-2)	09/08/2007	5:19:00	PM	< LOD	240.64	< LOD	2941.36	< LOD	70.28	< LOD	1246.97	329.04	53.51	349290.5	2125.2	1462.23	68.03	1005	268.94
2580	SP34(0,-3)	09/08/2007	5:49:00	PM	< LOD	310.33	< LOD	3054.05	< LOD	80.79	1127.73	660.33	259.62	40.56	301033.6	1684.91	660.5	39.9	543.38	204.7
2581	SP34(0,-4)	09/08/2007	6:02:00	PM	< LOD	262.72	< LOD	3016.96	< LOD	73.09	2051.42	1024.36	337.65	57.99	471597.7	2609.46	638.57	48.72	801.51	307.85
2582	SP34(1,-3)	09/08/2007	6:14:00	PM	< LOD	244.22	< LOD	2794.8	< LOD	71.87	< LOD	926.89	313.75	45.68	246233.9	1581.32	1491.91	61.21	320.15	188.35
2583	SP34(1,-4)	09/08/2007	6:29:00	PM	< LOD	254.33	< LOD	2844.73	< LOD	65.51	< LOD	1161.66	509.4	58.34	331132.6	1977.78	696.74	45.95	361.45	231.67
2584		10/08/2007	8:28:00	AM							0.23	0	6.47	0	0.55	0	0.24	0	0.11	0
2585	nist-standard	10/08/2007	8:34:00	AM	8587.6	317.67	3383.51	1709.39	< LOD	60.49	< LOD	161.19	1811.33	53.33	20407.73	279.16	3215.84	52.07	6188.72	191.8
2586	SP34(-1,-3)	10/08/2007	10:04:00	AM	< LOD	289.79	< LOD	3183.29	< LOD	77.93	< LOD	1342.49	323.6	52.95	407813.1	2288.15	942.79	54.61	887.07	280.46
2587	SP34(-1,1)	10/08/2007	10:24:00	AM	< LOD	229.2	< LOD	2735.81	< LOD	64.13	942.74	616.08	431.83	51.23	233131.5	1570.3	1113.97	54	518.45	197.72
2588	SP34(-2,1)	10/08/2007	10:47:00	AM	< LOD	255.95	< LOD	2697.97	< LOD	64.55	< LOD	604.96	264.77	33.38	152007.7	1028.67	1019.98	41.59	527.42	137.38
2589	GM1-0	10/08/2007	12:33:00	PM	3052.78	206.12	7114.8	1518.54	< LOD	51.05	< LOD	99.82	108.03	12.66	11487.01	166.67	273.26	12.67	184.25	34.19
2590	GM20-A	10/08/2007	12:41:00	PM	1951.58	157.26	4181.2	1431.13	< LOD	40.74	< LOD	125.01	124.94	17.41	11245.3	208.56	281.57	16.22	145.15	41.74
2591	GM40-A	10/08/2007	12:50:00	PM	2929.24	210.82	6243.68	1504.61	< LOD	53.49	< LOD	127.08	157.45	15.85	16275.29	213.3	276.71	13.82	154.6	40.83
2592	GM60-A	10/08/2007	1:00:00	PM	1999.51	266.7	5415.21	2133.64	< LOD	71.6	< LOD	156.44	115.48	16.94	18362.24	266.73	296.51	16.83	304.88	57.9
2593	GM1-80A	10/08/2007	1:06:00	PM	1688.67	170.48	3414.64	1481.16	< LOD	48.11	< LOD	158.95	102.55	16.47	18874.14	266.28	271.49	15.89	212.17	51.71
2594	GM1-80B	10/08/2007	1:15:00	PM	1766.11	190.67	4274.97	1520.85	< LOD	50.58	< LOD	187.7	187.99	19.98	28041.21	322.75	197.57	13.77	79.68	49.56
2595	GM1-20B	10/08/2007	1:24:00	PM	2412.09	183.88	5681.63	1474.6	< LOD	46.36	< LOD	121.32	169.81	17.23	13275.41	203.89	435.86	17.97	124.97	38.01
2596	PH1-0	10/08/2007	4:08:00	PM	4252.52	229.26	4212.37	1548.6	< LOD	51.89	158.45	103.31	228.46	19.71	20876.29	259.85	392.84	17.42	1065.53	80.74
2597	PH1-10	10/08/2007	4:16:00	PM	925.48	155.65	4421.92	1491.21	< LOD	49.23	< LOD	154.68	213.52	19.7	19810.32	259.36	365.98	17.28	800.55	73.44
2598	PH1-20	10/08/2007	4:22:00	PM	3606.44	218.64	3128.01	1553.04	< LOD	52.6	< LOD	204.89	312.23	25.5	29693.64	348.49	478.31	21.68	1363.87	104.12
2599		16/08/2007	8:23:00	AM							0.25	0	6.3	0	0.55	0	0.33	0	0.09	0
2600	nist-high	16/08/2007	8:28:00	AM							< LOD	313.23	1623	107.61	17781.65	555.42	2894.38	105.34	5255.59	375.97
2601	nist-high	16/08/2007	8:39:00	AM	7843.48	301.3	4212.53	1689.09	71.35	40.62	< LOD	148.08	1591.05	48.86	17730.19	254.5	2868.33	48.04	5587.63	177.47
2602	K2 1-0	16/08/2007	11:08:00	AM	658.09	157.21	5641	1494.31	58.83	34.57	156.08	84.55	57.05	12.24	14491.02	210.01	83.04	8.56	216.42	44.5
2603	K2 1-20a	16/08/2007	11:19:00	AM	1950.78	176.19	7752.47	1386.32	48.11	31.17	90.55	56.12	58.55	11.17	7117.94	137.79	63.2	7.09	122.21	32.31
2604	K2 1-40a	16/08/2007	11:32:00	AM	1154.01	158.77	5851.2	1510.94	508.31	43.24	< LOD	136.09	103.76	15.9	15919.76	232.73	194.36	12.96	373.11	73.96
2605	K2 1-20b	16/08/2007	11:43:00	AM	999.41	163.78	5508.48	1453.65	< LOD	50.82	241.89	90.25	57.38	12.54	15544.69	221.22	78.23	8.53	155.74	43.18
2606	K2 1-40b	16/08/2007	11:53:00	AM	781.78	147.78	5078.7	1497.98	487.13	42.23	153.52	100.75	79.71	15.42	17526.9	252	99.49	10.16	356.56	76.25

Reading No	SAMPLE	Date	Time		Mercury	Mercury Error	Nickel	Nickel Error	Phosphorus	Phosphorus Error	Potassium	Potassium Error	Rubidium	Rubidium Error	Scandium	Scandium Error	Selenium	Selenium Error	Silver	Silver Error	Strontium	Strontium Error
2566	SP35(0,-2)	09/08/2007	3:27:00	PM	< LOD	8.47	< LOD	53.79	< LOD	13635.45	4640.38	389.89	57.21	5	< LOD	55.79	< LOD	3.5	< LOD	11.04	< LOD	7.84
2567	SP35(0,1)	09/08/2007	3:42:00	PM	< LOD	13.88	< LOD	90.06	< LOD	20699.03	5243.16	464.7	43.5	6.25	< LOD	62	< LOD	6.57	< LOD	15.69	< LOD	9.9
2568	SP34-(0,1)	09/08/2007	3:58:00	PM	< LOD	18.23	< LOD	112.25	< LOD	26060.66	5451.97	657.91	61.53	9.23	< LOD	84.96	< LOD	9.01	< LOD	19.74	< LOD	13.5
2569	SP34-(0,1)	09/08/2007	3:59:00	PM	< LOD	49.85	< LOD	360.55					36.63	23.72			< LOD	31.71	< LOD	61.03	< LOD	39.38
2570	SP34-(0,1)	09/08/2007	4:01:00	PM	< LOD	15.3	< LOD	100.62	< LOD	26515.94	6525.21	703.71	50.95	7.5	< LOD	90.8	< LOD	7.55	< LOD	17.08	< LOD	11.84
2571	SP34-(0,1)	09/08/2007	4:02:00	PM	< LOD	19.3	< LOD	127.7	< LOD	42398.32	5410.52	906.23	45.34	9.1	< LOD	116.26	< LOD	8.36	< LOD	21.15	< LOD	14.94
2572	SP34-(0,1)	09/08/2007	4:02:00	PM	< LOD	47.55	< LOD	324.1					72.71	25.48			< LOD	18.01	< LOD	53.79	< LOD	38.19
2573	SP34-(0,1)	09/08/2007	4:03:00	PM	< LOD	114.04	< LOD	557.45					< LOD	68.05			< LOD	40.93	< LOD	82.46	< LOD	60.03
2574	SP34(0,1)	09/08/2007	4:07:00	PM	< LOD	13.32	< LOD	88.26	< LOD	17333.27	6345.39	493.18	55.51	6.82	< LOD	63.35	< LOD	6.19	< LOD	15.39	< LOD	10.33
2575	SP34(-1,0)	09/08/2007	4:20:00	PM	< LOD	12.98	< LOD	80.37	< LOD	17370.54	890.2	299.11	12.38	5.15	< LOD	49.77	< LOD	6.56	< LOD	15.02	< LOD	9.3
2576	SP34(1,0)	09/08/2007	4:35:00	PM	< LOD	14.02	< LOD	91.04	< LOD	19889	1181.51	346.56	19.95	5.41	< LOD	61.32	< LOD	6.74	< LOD	15.36	< LOD	9.66
2577	SP34(1,-1)	09/08/2007	4:42:00	PM	< LOD	13.79	< LOD	77.84	< LOD	17372.04	1703.39	323.3	31.95	5.67	< LOD	48.79	< LOD	6.39	< LOD	15.18	< LOD	9.14
2578	SP34-(1,-2)	09/08/2007	5:09:00	PM	< LOD	3.54	< LOD	20.59	< LOD	9971.36	941.55	214.26	6.44	1.61	< LOD	33.08	< LOD	1.8	< LOD	6.92	< LOD	4
2579	SP34(-1,-2)	09/08/2007	5:19:00	PM	< LOD	22.29	< LOD	148.16	< LOD	17911.37	625.57	323.63	20.24	7.41	< LOD	58.78	< LOD	11.35	< LOD	21.59	< LOD	14.11
2580	SP34(0,-3)	09/08/2007	5:49:00	PM	< LOD	16.6	< LOD	117.88	< LOD	20814.41	961.28	368.91	14.75	5.68	< LOD	67.41	< LOD	8.21	< LOD	16.87	< LOD	10.34
2581	SP34(0,-4)	09/08/2007	6:02:00	PM	< LOD	22.54	< LOD	177.75	< LOD	20562.19	528.3	342.5	25.46	7.67	< LOD	60.42	< LOD	10.35	< LOD	22.26	< LOD	13.61
2582	SP34(1,-3)	09/08/2007	6:14:00	PM	< LOD	19.63	< LOD	121.19	< LOD	17087.33	< LOD	426.41	14.46	6.37	< LOD	54.53	< LOD	10.26	< LOD	18.39	< LOD	11.57
2583	SP34(1,-4)	09/08/2007	6:29:00	PM	< LOD	19.69	< LOD	136.83	< LOD	19982.86	670.94	314.22	17.59	6.65	< LOD	55.94	< LOD	9.76	< LOD	20.38	< LOD	12.53
2584		10/08/2007	8:28:00	AM	3.12	0	1.83	0					0.1	0			1.09	0	254.41	0	0.25	0
2585	nist-standard	10/08/2007	8:34:00	AM	< LOD	14.53	< LOD	39.86	< LOD	17753.14	16250.14	595	66.27	5.09	< LOD	90.69	< LOD	5.65	< LOD	9.85	146.07	8.62
2586	SP34(-1,-3)	10/08/2007	10:04:00	AM	< LOD	20.92	< LOD	153.8	< LOD	25276.28	1330.1	384.37	25.04	7.39	< LOD	64.13	< LOD	10.23	< LOD	20.84	< LOD	13.11
2587	SP34(-1,1)	10/08/2007	10:24:00	AM	< LOD	17.79	< LOD	117.35	< LOD	17758.52	1359.63	332.36	23.18	6.67	< LOD	54.28	< LOD	9.33	< LOD	18.84	< LOD	11.88
2588	SP34(-2,1)	10/08/2007	10:47:00	AM	< LOD	12.2	< LOD	79.93	< LOD	16769.47	1312.38	317.54	23.2	5.17	< LOD	53.1	< LOD	6.64	< LOD	13.71	< LOD	9.07
2589	GM1-0	10/08/2007	12:33:00	PM	< LOD	4.58	< LOD	25.6	< LOD	14285.51	6130.76	372.92	40.02	3.04	< LOD	59.38	< LOD	2.16	< LOD	7.36	< LOD	4.57
2590	GM20-A	10/08/2007	12:41:00	PM	< LOD	5.97	< LOD	34.25	< LOD	8951.08	2886.32	268.92	37.04	3.77	< LOD	43.5	< LOD	2.79	< LOD	9.67	< LOD	6.02
2591	GM40-A	10/08/2007	12:50:00	PM	< LOD	5.33	< LOD	30.45	< LOD	14479.55	7877.22	415.65	51.82	3.69	< LOD	59.15	< LOD	2.57	< LOD	7.99	< LOD	5.45
2592	GM60-A	10/08/2007	1:00:00	PM	< LOD	6.27	< LOD	36.41	< LOD	19907.54	7207.16	560.18	51.78	4.33	< LOD	76.36	< LOD	3.22	< LOD	9.79	< LOD	6.68
2593	GM1-80A	10/08/2007	1:06:00	PM	< LOD	6.53	< LOD	38.53	< LOD	12717.36	5992.46	359.41	55.83	4.41	< LOD	47.91	< LOD	3.03	< LOD	10	< LOD	6.5
2594	GM1-80B	10/08/2007	1:15:00	PM	< LOD	6.51	< LOD	38.82	< LOD	13035.24	8662.37	432.37	70.67	4.89	< LOD	54.19	< LOD	2.95	< LOD	9.8	< LOD	5.9
2595	GM1-20B	10/08/2007	1:24:00	PM	< LOD	5.95	< LOD	30.84	< LOD	11997.39	5060.37	338.19	41.44	3.55	< LOD	51.67	< LOD	2.82	< LOD	8.8	< LOD	5.47
2596	PH1-0	10/08/2007	4:08:00	PM	< LOD	6.24	< LOD	35.5	< LOD	14794.75	6152.69	383.18	46.46	3.8	< LOD	67.02	< LOD	2.7	< LOD	8.86	< LOD	6.67
2597	PH1-10	10/08/2007	4:16:00	PM	< LOD	6.32	< LOD	34.9	< LOD	12169.63	5284.2	346.49	56.08	4.2	< LOD	46.85	< LOD	2.88	< LOD	9.08	< LOD	6.69
2598	PH1-20	10/08/2007	4:22:00	PM	< LOD	8.11	< LOD	41.89	< LOD	15374.55	6247.58	385.33	59.81	4.8	< LOD	63.32	< LOD	3.49	< LOD	10.48	< LOD	8.14
2599		16/08/2007	8:23:00	AM	3.36	0	1.76	0					0.16	0			0.98	0	252.96	0	0.19	0
2600	nist-high	16/08/2007	8:28:00	AM	< LOD	29.64	< LOD	89.02					62.86	10.58			< LOD	11.15	< LOD	20.44	114.76	17.45
2601	nist-high	16/08/2007	8:39:00	AM	15.39	8.94	< LOD	38.31	< LOD	16382.83	14563.92	559.49	57.77	4.7	< LOD	84.49	< LOD	5.45	< LOD	9.39	111.1	7.92
2602	K2 1-0	16/08/2007	11:08:00	AM	< LOD	5.2	< LOD	31.29	< LOD	14656.47	7669.73	397.67	60.05	4.03	< LOD	43.07	< LOD	2.34	< LOD	8.68	< LOD	6.13
2603	K2 1-20a	16/08/2007	11:19:00	AM	< LOD	4.87	< LOD	28.11	< LOD	11273.56	9337.6	412.37	60.08	3.73	< LOD	50.03	< LOD	1.92	< LOD	7.72	< LOD	4.85
2604	K2 1-40a	16/08/2007	11:32:00	AM	< LOD	5.63	250.89	34.1	< LOD	12073.27	5948.99	354.59	49.97	3.97	< LOD	44.83	< LOD	2.74	< LOD	9.48	< LOD	6.13
2605	K2 1-20b	16/08/2007	11:43:00	AM	< LOD	5.22	< LOD	33.22	< LOD	11775.35	7264.22	390.06	54.98	3.95	< LOD	46.52	< LOD	2.47	< LOD	8.72	< LOD	5.93
2606	K2 1-40b	16/08/2007	11:53:00	AM	< LOD	5.82	239.1	35.55	< LOD	13025.43	5516.58	342.78	49.78	4.1	< LOD	43.07	< LOD	2.73	12.48	6.76	< LOD	6.46

Reading No	SAMPLE	Date	Time		Sulphur	Sulphur Error	Thallium	Thallium Error	Thorium	Thorium Error	Tin	Tin Error	Titanium	Titanium Error	Tungsten	Tungsten Error	Uranium	Uranium Error	Vanadium	Vanadium Error	Zinc	Zinc Error
2566	**SP35(0,-2)**	09/08/2007	3:27:00	PM	< LOD	3949.4	< LOD	21.85	< LOD	26.24	< LOD	44.33	2891.34	181.85	< LOD	73.59	< LOD	20.52	187.07	88.25	173.35	21.98
2567	**SP35(0,1)**	09/08/2007	3:42:00	PM	< LOD	5038.29	60.46	32.26	< LOD	57.55	< LOD	63.42	3371.61	208.64	< LOD	105	< LOD	26.11	< LOD	146.73	< LOD	38.21
2568	**SP34-(0,1)**	09/08/2007	3:58:00	PM	< LOD	6328.38	< LOD	63.76	< LOD	81.03	< LOD	81.22	4132.59	323.34	< LOD	143.96	< LOD	36.78	< LOD	226.94	101.68	37.84
2569	**SP34-(0,1)**	09/08/2007	3:59:00	PM			< LOD	192.96	< LOD	221.01	< LOD	244.97			< LOD	318.17	< LOD	120.35			< LOD	145.56
2570	**SP34-(0,1)**	09/08/2007	4:01:00	PM	< LOD	6295.82	61.31	38.08	< LOD	65.41	< LOD	70.95	4426.08	331.71	< LOD	122.69	< LOD	32.89	< LOD	228.18	103.63	32.93
2571	**SP34-(0,1)**	09/08/2007	4:02:00	PM	< LOD	8844.59	107.92	50.34	< LOD	87.31	< LOD	87.56	4315.89	472.56	< LOD	157.96	< LOD	39.98	< LOD	326.56	107.61	41.6
2572	**SP34-(0,1)**	09/08/2007	4:02:00	PM			< LOD	185.53	< LOD	191.18	< LOD	216.52			< LOD	392.02	< LOD	102.41			165.25	108.66
2573	**SP34-(0,1)**	09/08/2007	4:03:00	PM			< LOD	414.56	< LOD	564.11	< LOD	460.19			< LOD	620.85	< LOD	258.51			< LOD	366.61
2574	**SP34(0,1)**	09/08/2007	4:07:00	PM	< LOD	4919.34	74.94	33.82	< LOD	60.08	< LOD	63.82	4088.85	237.78	< LOD	107.4	< LOD	28.25	< LOD	166.63	74.02	27.98
2575	**SP34(-1,0)**	09/08/2007	4:20:00	PM	< LOD	3758.65	89.13	30.75	< LOD	77.46	< LOD	62.09	1038.79	144.68	< LOD	101.02	26.15	16.09	< LOD	106.78	< LOD	34.07
2576	**SP34(1,0)**	09/08/2007	4:35:00	PM	< LOD	4370.18	122.02	40.9	< LOD	69.73	< LOD	62.97	1774.66	175.04	< LOD	106.81	38.25	17.82	< LOD	125.96	< LOD	36.98
2577	**SP34(1,-1)**	09/08/2007	4:42:00	PM	< LOD	4080.47	124.91	41.02	< LOD	68.99	< LOD	60.12	1331.78	145.65	< LOD	98.39	< LOD	24.21	< LOD	109	< LOD	33.08
2578	**SP34-(1,-2)**	09/08/2007	5:09:00	PM	< LOD	2494.45	10.58	6.88	< LOD	12.52	< LOD	26.37	697.98	94	< LOD	29.78	< LOD	8.5	< LOD	69.7	34.76	7.32
2579	**SP34(-1,-2)**	09/08/2007	5:19:00	PM	< LOD	4707.22	165.91	62.89	< LOD	103.46	< LOD	87.73	1401.3	162.29	< LOD	161.36	< LOD	34.96	< LOD	118.43	< LOD	54.84
2580	**SP34(0,-3)**	09/08/2007	5:49:00	PM	< LOD	5208.61	105.17	43.58	< LOD	74.78	< LOD	70.47	2197.95	203.96	< LOD	124.49	42.27	19.41	< LOD	145.57	< LOD	42.37
2581	**SP34(0,-4)**	09/08/2007	6:02:00	PM	< LOD	4875.24	114.95	57.98	< LOD	89.28	< LOD	90.86	1282.55	169.65	< LOD	182.34	< LOD	32.76	< LOD	127.29	< LOD	60.79
2582	**SP34(1,-3)**	09/08/2007	6:14:00	PM	< LOD	4319.37	198.13	62.78	< LOD	100.74	< LOD	76.15	1569	179.53	< LOD	137.01	< LOD	29.4	< LOD	130.94	< LOD	44.52
2583	**SP34(1,-4)**	09/08/2007	6:29:00	PM	< LOD	4059.07	101.74	54.36	< LOD	88.69	< LOD	82.31	1345.21	149.24	< LOD	146.21	< LOD	31.86	< LOD	109.92	< LOD	50.9
2584		10/08/2007	8:28:00	AM			0.11	0	0.15	0	43.09	0			6.66	0	0.13	0			5.65	0
2585	**nist-standard**	10/08/2007	8:34:00	AM	< LOD	4285.57	95.34	32.42	< LOD	53.78	< LOD	37.52	1913.82	165.4	< LOD	161.72	< LOD	20.73	< LOD	120.54	4133.89	72.68
2586	**SP34(-1,-3)**	10/08/2007	10:04:00	AM	< LOD	5326.89	< LOD	76.39	< LOD	91.03	< LOD	87.07	1995.87	204.43	< LOD	151.32	< LOD	33.32	< LOD	144.73	< LOD	53.59
2587	**SP34(-1,1)**	10/08/2007	10:24:00	AM	< LOD	4379.1	137.06	50.84	< LOD	90.44	< LOD	77.17	1435.56	165.58	< LOD	137.88	< LOD	29.1	< LOD	121.15	< LOD	43.83
2588	**SP34(-2,1)**	10/08/2007	10:47:00	AM	< LOD	3983.07	78.64	35.04	< LOD	66.62	< LOD	57.66	1242.58	147.25	< LOD	93.05	< LOD	22.47	< LOD	106.45	< LOD	34.11
2589	**GM1-0**	10/08/2007	12:33:00	PM	< LOD	2671.02	16.62	8.94	< LOD	16.62	< LOD	29.6	1470.54	122.6	< LOD	37.66	< LOD	12.18	< LOD	88.5	61.61	9.66
2590	**GM20-A**	10/08/2007	12:41:00	PM	< LOD	2426.08	< LOD	16.47	< LOD	21.19	< LOD	38.81	912.15	95.71	< LOD	51.45	< LOD	16.54	< LOD	68.9	47.23	12.15
2591	**GM40-A**	10/08/2007	12:50:00	PM	< LOD	3072.7	< LOD	14.64	26.19	12.84	< LOD	32.84	2173.63	140.3	< LOD	45.7	< LOD	15.1	< LOD	99.21	73.26	11.56
2592	**GM60-A**	10/08/2007	1:00:00	PM	< LOD	4053.84	< LOD	17.9	25.2	14.91	< LOD	39.04	2147.11	197.96	< LOD	52.89	< LOD	17.58	< LOD	138.04	56.73	12.85
2593	**GM1-80A**	10/08/2007	1:06:00	PM	< LOD	2590.53	< LOD	16.49	< LOD	21.77	< LOD	39.43	1772.25	128.93	< LOD	54.6	< LOD	17.9	< LOD	90.22	50.07	12.69
2594	**GM1-80B**	10/08/2007	1:15:00	PM	< LOD	3076.75	< LOD	14.51	24.68	13.77	< LOD	39.66	1368.48	126.14	< LOD	53.75	20.04	13.36	< LOD	91.09	55.03	13.26
2595	**GM1-20B**	10/08/2007	1:24:00	PM	< LOD	2604.74	< LOD	17.57	25.02	14.21	< LOD	35.27	1398.7	114.98	< LOD	48.74	< LOD	14.75	< LOD	82.49	84.29	12.64
2596	**PH1-0**	10/08/2007	4:08:00	PM	< LOD	3003.65	< LOD	17.15	< LOD	21.92	< LOD	35.82	1610.21	134.13	< LOD	60.2	< LOD	15.38	< LOD	96.39	348.92	21.34
2597	**PH1-10**	10/08/2007	4:16:00	PM	< LOD	2912.06	< LOD	17.16	< LOD	21.32	< LOD	36.12	1579.83	124.12	< LOD	56.76	< LOD	17.06	< LOD	90.38	189.78	17.38
2598	**PH1-20**	10/08/2007	4:22:00	PM	< LOD	3323.79	28.95	15.08	< LOD	27.72	< LOD	41.86	1794.77	144.61	< LOD	76.68	< LOD	19.27	< LOD	103.09	442.39	27.14
2599		16/08/2007	8:23:00	AM			0.19	0	0.12	0	41.14	0			6.94	0	0.1	0			5.99	0
2600	**nist-high**	16/08/2007	8:28:00	AM			120.12	66.73	< LOD	108.83	< LOD	77.15			< LOD	315.15	< LOD	44.13			3585.59	144.01
2601	**nist-high**	16/08/2007	8:39:00	AM	< LOD	4092.44	91.43	29.63	< LOD	49.5	< LOD	36.14	1916.02	161.47	< LOD	146.62	23.02	13.28	< LOD	116.33	3616.93	66.34
2602	**K2 1-0**	16/08/2007	11:08:00	AM	< LOD	2981.52	< LOD	10.27	< LOD	15.09	< LOD	34.76	2132.45	144.1	< LOD	43.92	< LOD	15.59	< LOD	101.11	38.29	10.1
2603	**K2 1-20a**	16/08/2007	11:19:00	AM	< LOD	2777.04	< LOD	9.27	< LOD	13.65	< LOD	30.99	1628.78	123.91	< LOD	40.9	< LOD	14.68	< LOD	88.48	31.3	8.75
2604	**K2 1-40a**	16/08/2007	11:32:00	AM	< LOD	2873.93	< LOD	13.55	22.27	12.31	< LOD	37.49	1624.01	119.96	< LOD	47.42	< LOD	16.01	< LOD	85.34	51.85	11.64
2605	**K2 1-20b**	16/08/2007	11:43:00	AM	< LOD	2926.81	< LOD	10.69	< LOD	14.86	< LOD	35.04	2251.61	136.54	< LOD	44.59	< LOD	15.59	< LOD	95.66	34.2	10.13
2606	**K2 1-40b**	16/08/2007	11:53:00	AM	< LOD	2735	< LOD	13.01	< LOD	17.22	< LOD	39.49	1558.28	120.99	< LOD	48.45	< LOD	17.14	< LOD	85.63	36.89	11.33

Table 5-6. Metals Analytical Data: Surface Soils

Sample ID	CDM ID	X	Y	Aluminum		Antimony		Arsenic	Barium	Bismuth	Calcium		Cadmium	Chromium		Cobalt		Copper	Iron	Lead	Magnesium
				%		ppm		ppm	ppm	ppm	%		ppm	ppm		ppm		ppm	%	ppm	%
SS1	GM1	320863	182939	1.42		0.72		85.94	34.34	4.88	0.58		0.59	13.24		1.96		283.55	3.40	612.20	0.33
SS2	GM1-2A	320880	182926	1.44		0.96		106.06	49.38	5.83	0.53		0.61	14.24		2.04		359.93	3.44	669.34	0.33
SS3	GM1-2B	320883	182941	1.03		0.75		101.22	35.24	4.95	0.43		0.68	9.58		1.80		327.84	2.83	818.28	0.18
SS4	GM1-4A	320911	182902	1.67		0.69		87.57	31.08	5.11	0.33		0.42	15.69		2.77		261.51	3.83	583.03	0.47
SS5	GM1-4B	320923	182945	1.30		0.41		53.78	23.69	3.08	0.35		0.44	11.67		1.53		201.79	3.09	346.14	0.22
SS6	GM1-8A	320979	182860	2.05		0.54		92.25	49.12	4.57	0.37		0.37	17.56		2.86		192.20	3.79	534.60	0.42
SS7	GM1-8B	321002	182955	1.44		0.42		61.11	25.92	3.01	0.35		0.35	9.52		1.30		353.87	4.86	414.76	0.22
SS8	IF1	320634	183435	0.48		0.39		28.30	14.64	1.74	0.26		0.44	8.00	U	0.85		73.85	1.06	116.82	0.08
SS9	IF1-12B	320372	183443	2.05		0.20	U	27.58	24.90	1.16	0.23		0.18	11.90		1.31		29.51	2.68	62.78	0.62
SS10	IF1-2A	320626	183454	0.99		0.20	U	23.52	12.11	0.98	0.23		0.15	8.00	U	0.47		52.62	1.26	46.93	0.24
SS11	IF1-2B	320614	183433	0.58		0.21		23.50	12.21	1.13	0.47		0.31	8.00	U	0.53		51.62	0.90	61.82	0.11
SS12	IF1-4A	320614	183491	0.74		0.20	U	20.77	13.39	0.72	0.19		0.25	8.00	U	0.57		35.72	1.17	55.44	0.16
SS13	IF1-4B	320572	183431	0.51		0.20	U	15.70	13.01	0.71	0.19		0.17	8.00	U	0.40	U	29.52	0.45	39.22	0.05
SS14	IF1-8B	320491	183431	0.81		0.20	U	20.43	15.46	0.81	0.28		0.26	8.00	U	0.41		26.71	0.78	53.05	0.12
SS15	K1	320905	183597	1.40		0.28		49.89	23.32	0.66	0.61		0.32	10.70		0.90		29.78	2.18	99.54	0.47
SS16	K1-2A	320920	183611	1.29		0.20	U	37.62	28.82	1.46	0.87		0.44	12.06		0.83		34.82	1.28	99.87	0.49
SS17	K1-2B	320885	183596	0.84		0.45		144.44	19.39	0.54	0.84		0.27	8.00	U	0.60		32.06	1.93	169.45	0.38
SS18	K1-4A	320944	183641	1.39		0.20	U	34.17	24.32	4.36	0.92		0.42	11.09		1.39		83.87	2.82	120.26	0.34
SS19	K1-4B	320846	183610	0.81		0.34		32.66	26.23	1.23	1.52		0.72	8.00	U	0.92		71.91	1.00	219.27	0.40
SS20	K2-1	320803	183486	2.28		0.20	U	41.07	44.34	1.48	0.11		0.22	23.72		3.81		91.22	3.24	148.01	0.45
SS21	K2-1-2A	320811	183505	1.09		0.21		40.58	166.67	1.97	0.34		0.38	10.68		1.41		81.04	1.60	148.39	0.17
SS22	K2-1-2B	320784	183497	2.03		0.20	U	43.93	48.97	1.58	0.18		0.27	23.20		3.37		82.95	2.97	142.86	0.34
SS23	K2-1-4A	320828	183542	1.45		0.30		60.65	73.09	3.59	0.26		0.48	16.35		2.58		177.28	2.79	346.47	0.24
SS24	K2-1-4B	320751	183522	1.70		0.20	U	50.51	36.50	2.29	0.17		0.32	17.31		2.15		120.77	2.97	191.21	0.27
SS25	PH1	319686	182274	2.38		0.54		74.25	147.21	5.94	0.69		2.11	29.18		18.95		412.25	4.62	759.65	0.72
SS26	PH1-1	319677	182277	2.56		0.48		70.23	126.14	5.38	0.18		1.08	31.20		18.63		358.76	4.59	658.58	0.70
SS27	PH1-2	319656	182283	2.34		0.38		74.73	132.62	5.89	0.66		1.83	26.78		20.67		515.56	4.76	765.93	0.69
SS28	TM1	319339	181437	2.24		0.71		275.54	66.14	28.65	0.04	U	0.15	13.66		4.93		368.98	7.57	390.12	0.71
SS29	TM1-2A	319347	181418	3.17		0.63		213.70	77.21	29.92	0.15		0.35	16.72		9.80		574.71	6.05	375.53	0.93
SS30	TM1-2B	319333	181418	2.44		0.48		217.97	59.01	22.32	0.21		0.24	15.40		6.62		433.06	5.17	295.24	0.67
SS31	TM1-4A	319360	181381	1.85		0.43		114.80	57.05	12.08	0.27		0.31	14.13		5.19		222.45	3.31	255.93	0.49
SS32	TM1-4B	319320	181379	1.93		0.43		132.66	44.39	15.73	0.43		0.47	12.68		4.23		243.52	4.38	227.16	0.42
SS33	TM1-8A	319398	181307	2.15		1.38		132.47	66.15	5.87	0.30		0.48	12.64		4.00		158.48	3.77	464.43	0.98
SS34	TM1-8B	319303	181302	2.70		1.87		202.87	89.23	7.07	0.32		0.41	29.78		6.11		190.04	4.38	642.63	0.90
SS35	TM2	318916	181252	2.59		0.30		86.23	97.21	8.54	0.29		0.29	14.87		4.02		115.53	2.30	154.70	1.12
SS36	TM2-11A	319070	181180	2.92		0.75		100.84	111.72	4.05	0.31		0.55	56.24		8.63		163.83	5.49	225.02	0.62
SS37	TM2-2A	318934	181243	1.71		0.26		73.21	83.16	5.73	0.42		0.30	9.48		2.62		93.96	1.73	186.36	0.56
SS38	TM2-2B	318914	181231	1.78		0.21		61.20	81.87	6.77	0.49		0.29	12.51		2.95		95.51	2.20	175.27	0.50
SS39	TM2-4A	318969	181223	1.82		0.44		145.68	44.33	11.50	0.29		0.32	11.61		6.80		103.87	3.85	225.23	0.52
SS40	TM2-4B	318918	181191	3.10		0.42		227.85	43.56	23.24	0.08		0.13	11.04		5.87		143.24	11.06	217.09	1.20
SS41	TM2-8B	318940	181113	3.77		0.40		47.61	80.23	1.50	0.36		0.58	73.94		31.95		154.61	5.33	144.61	1.30

Notes: U = below detection limit; GM = Gerald Murphy; IF = Ivor Fitzpatrick; K = Karanagh; PH = Paddy Hogan; TM = Tom Merrigan

Table 5-6. Metals Analytical Data: Surface Soils

Sample ID	Manganese		Mercury		Molybdenum		Nickel		Phosphorus		Selenium		Silver		Sodium		Sulfur		Thorium		Tin		Titanium		Uranium		Vanadium		Zinc	
	ppm		ppm		ppm		ppm		%		ppm		ppm		%		%		ppm		ppm		ppm		ppm		ppm		ppm	
SS1	310.99		0.24		6.50		4.54		0.13		0.80	U	2.52		0.04	U	0.09		5.65		1.94		146.07		2.00		20.87		140.09	
SS2	313.47		0.35		7.09		5.04		0.11		0.80	U	3.36		0.04	U	0.08		5.73		2.02		170.46		1.83		24.90		150.14	
SS3	263.55		0.23		6.72		3.24		0.11		0.80	U	3.11		0.04	U	0.08		4.12		1.85		108.50		1.85		16.86		168.56	
SS4	334.47		0.29		6.62		7.42		0.10		0.80	U	1.96		0.04	U	0.07		5.84		1.65		135.29		1.76		24.01		144.51	
SS5	185.31		0.17		5.05		3.87		0.10		0.80	U	1.02		0.04	U	0.08		4.65		1.61		100.65		1.66		19.85		89.55	
SS6	469.20		0.17		5.38		6.08		0.10		0.80	U	6.01		0.04	U	0.04		6.30		1.43		178.93		1.99		32.87		110.60	
SS7	186.93		0.09		6.93		3.19		0.14		0.81		1.27		0.04	U	0.11		5.48		1.81		103.69		1.56		15.73		139.75	
SS8	23.79		0.07		4.65		1.34		0.07		0.80	U	0.48		0.04	U	0.14		3.21		0.87		47.43		0.81		8.00	U	45.90	
SS9	215.16		0.02		3.23		3.11		0.09		0.80	U	0.16		0.04	U	0.10		6.28		0.80	U	112.07		1.54		26.87		56.51	
SS10	78.93		0.03		2.59		0.83		0.06		0.80	U	0.34		0.04	U	0.07		4.78		0.80	U	51.64		1.24		8.00	U	28.21	
SS11	117.42		0.03		2.22		1.54		0.08		0.80	U	0.29		0.04	U	0.13		3.55		0.80	U	46.10		1.12		10.82		31.82	
SS12	79.42		0.02		2.13		1.93		0.06		0.80	U	0.19		0.04	U	0.09		3.93		0.80	U	55.76		1.08		13.84		28.80	
SS13	22.96		0.02	U	1.04		0.80	U	0.04		0.80	U	0.21		0.04	U	0.10		2.62		0.80	U	40.00	U	0.94		8.00	U	17.32	
SS14	76.77		0.02	U	1.79		0.80	U	0.07		0.80	U	0.16		0.04	U	0.10		3.19		0.80	U	50.55		1.11		8.00	U	26.82	
SS15	147.02		0.15		3.69		3.07		0.06		0.80	U	0.74		0.04	U	0.07		5.97		0.81		81.23		1.38		24.77		39.72	
SS16	143.61		0.07		2.34		2.73		0.07		0.80	U	0.56		0.04	U	0.12		5.08		0.96		96.07		1.37		23.69		40.71	
SS17	90.93		0.13		5.15		1.85		0.06		0.80	U	2.43		0.04	U	0.14		4.39		0.80	U	97.65		1.31		15.60		35.83	
SS18	187.43		0.02		7.16		3.50		0.08		1.06		0.42		0.04	U	0.13		4.95		1.02		143.01		1.32		21.62		55.06	
SS19	159.14		0.18		1.78		3.27		0.11		0.80	U	1.59		0.04	U	0.17		3.44		1.27		86.11		1.36		8.00	U	68.63	
SS20	411.78		0.11		3.47		9.85		0.09		0.80	U	0.38		0.04	U	0.13		6.02		0.80	U	125.12		1.80		34.30		83.26	
SS21	179.79		0.11		3.21		3.37		0.12		0.80	U	0.38		0.04	U	0.11		4.12		0.80	U	78.06		1.87		19.63		61.73	
SS22	310.40		0.13		3.78		10.06		0.10		0.94		0.40		0.04	U	0.12		6.13		0.80	U	127.62		2.16		32.41		73.01	
SS23	330.09		0.15		5.83		5.29		0.14		0.80	U	0.71		0.04	U	0.14		4.48		0.80	U	132.79		1.73		24.53		114.87	
SS24	213.63		0.17		4.79		5.63		0.11		0.80	U	0.53		0.04	U	0.11		5.20		0.80	U	110.45		1.79		23.06		59.48	
SS25	2339.13		0.56		4.62		22.11		0.21		0.80	U	1.57		0.04	U	0.11		6.52		3.52		215.11		2.25		38.05		633.24	
SS26	2204.00		0.34		4.76		21.05		0.20		0.80	U	1.46		0.04	U	0.09		5.42		2.53		175.63		2.57		35.74		344.34	
SS27	2344.56		0.48		4.43		22.25		0.17		0.80	U	1.19		0.04	U	0.14		5.75		2.65		197.20		2.06		33.81		647.20	
SS28	405.24		0.19		12.39		10.32		0.19		1.30		1.83		0.04	U	0.27		7.54		2.69		113.85		2.24		21.13		120.59	
SS29	524.38		0.27		10.10		13.11		0.15		1.10		2.63		0.04	U	0.12		7.83		2.33		137.39		3.76		21.58		227.37	
SS30	506.81		0.13		8.67		11.66		0.16		0.95		1.50		0.04	U	0.12		6.75		1.68		94.94		2.43		19.62		163.28	
SS31	513.56		0.18		5.65		7.49		0.12		0.80	U	2.10		0.04	U	0.01		5.82		1.15		69.55		2.05		21.57		118.66	
SS32	553.40		0.15		6.59		5.99		0.18		0.80	U	2.61		0.04	U	0.14		5.63		1.25		75.91		2.21		21.50		138.91	
SS33	860.52		0.20		6.28		5.17		0.16		0.95		0.72		0.04	U	0.09		5.50		1.43		85.77		2.56		25.42		159.16	
SS34	590.79		0.65		7.59		12.06		0.17		0.80	U	1.43		0.04	U	0.08		6.91		1.27		107.16		3.11		57.20		205.80	
SS35	386.79		0.17		6.74		6.11		0.12		1.42		1.24		0.04	U	0.13		5.40		0.89		92.94		2.77		22.59		81.86	
SS36	1291.76		0.13		9.39		14.29		0.28		0.80	U	0.48		0.04	U	0.16		4.13		0.91		165.88		2.53		106.91		250.25	
SS37	270.70		0.33		4.39		3.42		0.14		0.80	U	0.78		0.04	U	0.13		5.09		1.01		54.25		2.32		19.95		69.68	
SS38	330.47		0.13		4.29		4.18		0.14		1.16		1.67		0.04	U	0.13		4.45		0.80	U	59.13		2.35		23.78		72.35	
SS39	726.71		0.09		7.93		4.84		0.17		0.80	U	0.51		0.04	U	0.11		5.33		0.99		63.03		1.77		19.94		104.73	
SS40	617.86		0.18		18.56		5.40		0.17		1.43		4.12		0.04	U	0.32		8.97		2.67		105.51		2.14		21.52		110.44	
SS41	1381.39		0.13		2.33		41.11		0.16		0.80	U	0.30		0.04	U	0.13		4.43		0.80	U	387.29		1.86		128.28		335.71	

Notes: U = belo

Table 5-7. GSI XRF Results

New Sample ID	Sample ID	Type	ID	Easting	Northing	Location Type	Colour	Field/Lab	Units	Time	Antimony	Arsenic	Barium	Bismuth	Cadmium	Calcium	Chloride	Chromium	Cobalt
1	AVO-07-SP08.1	Spoil	SP08	320096	182526	Surface Grid	Red-brown	Field	ppm	6/5/2007 12:33	0.00	613.97	581.76	879.43	0.00	0.00	0.00	0.00	0.00
2	AVO-07-SP08.2	Spoil	SP08	320096	182526	Surface Grid	Red-brown	Field	ppm	6/5/2007 12:37	0.00	679.29	890.49	801.25	46.75	0.00	0.00	0.00	0.00
3	AVO-07-SP08.3	Spoil	SP08	320096	182526	Surface Grid	Red-brown	Field	ppm	6/5/2007 12:41	0.00	430.69	511.78	494.62	0.00	0.00	0.00	0.00	0.00
4	AVO-07-SP08.4	Spoil	SP08	320096	182526	Surface Grid	Red-brown	Field	ppm	6/5/2007 12:45	0.00	690.17	467.39	453.50	0.00	0.00	0.00	0.00	0.00
5	AVO-07-SP08.5	Spoil	SP08	320096	182526	Surface Grid	Red-brown	Field	ppm	6/5/2007 12:48	269.13	741.09	1354.22	1023.01	71.76	0.00	0.00	0.00	0.00
6	AVO-07-SP08.6	Spoil	SP08	320096	182526	Surface Grid	Red-brown	Field	ppm	6/5/2007 12:52	144.95	616.25	834.18	639.94	0.00	0.00	0.00	0.00	0.00
7	AVO-07-SP08.7	Spoil	SP08	320090	182522	Surface Grid	Grey-green	Field	ppm	6/5/2007 12:57	223.39	1330.39	0.00	1045.27	0.00	0.00	0.00	0.00	0.00
8	AVO-07-SP08.8	Spoil	SP08	320090	182522	Surface Grid	Grey-green	Field	ppm	6/5/2007 13:00	0.00	232.20	0.00	272.38	0.00	0.00	0.00	0.00	0.00
9	AVO-07-SP07.1	Spoil	SP07	320055	182519	Surface	Red-brown	Field	ppm	6/5/2007 13:05	0.00	226.39	445.94	0.00	0.00	0.00	0.00	0.00	0.00
10	AVO-07-SP07.2	Spoil	SP07	320042	182501	Surface	Grey-green	Field	ppm	6/5/2007 13:09	253.40	1987.42	0.00	1467.57	0.00	0.00	0.00	0.00	0.00
11	AVO-07-SP07.3	Spoil	SP07	320042	182501	Surface	Red-brown	Field	ppm	6/5/2007 13:14	0.00	1018.46	0.00	421.49	0.00	0.00	0.00	0.00	1123.57
12	AVO-07-SP07.4	Spoil	SP07	320042	182501	Surface	Grey-green	Field	ppm	6/5/2007 13:18	185.40	2167.52	0.00	702.47	0.00	0.00	0.00	0.00	0.00
13	AVO-07-SP07.5	Spoil	SP07	320042	182501	Surface	Grey-green	Field	ppm	6/5/2007 13:23	346.17	5458.69	0.00	0.00	0.00	0.00	0.00	0.00	1598.72
14	AVO-07-SP07.6v1	Spoil	SP07	320040	182510	Vertical Profile	Grey-green	Field	ppm	6/5/2007 13:27	107.50	1728.31	0.00	514.74	0.00	0.00	0.00	0.00	0.00
15	AVO-07-SP07.6v2	Spoil	SP07	320040	182510	Vertical Profile	Red-brown	Field	ppm	6/5/2007 13:30	239.42	2055.67	994.12	575.63	62.18	0.00	0.00	0.00	0.00
16	AVO-07-SP07.6v3	Spoil	SP07	320040	182510	Vertical Profile	Grey	Field	ppm	6/5/2007 13:32	226.24	1708.02	0.00	1004.11	68.52	0.00	0.00	0.00	1536.72
17	AVO-07-SP06.1	Spoil	SP06	320024	182488	Surface Grid	Red-brown	Field	ppm	6/5/2007 14:41	0.00	967.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	AVO-07-SP06.2	Spoil	SP06	320024	182488	Surface Grid	Red-brown	Field	ppm	6/5/2007 14:45	146.42	2074.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	AVO-07-SP06.3	Spoil	SP06	320024	182488	Surface Grid	Red-brown	Field	ppm	6/5/2007 14:49	0.00	902.94	0.00	0.00	0.00	0.00	0.00	0.00	1994.41
20	AVO-07-SP06.4	Spoil	SP06	320023	182475	Surface	Red-brown	Field	ppm	6/5/2007 14:54	0.00	1074.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	AVO-07-SP06.5	Spoil	SP06	319987	182458	Surface	Red-brown	Field	ppm	6/5/2007 14:59	198.67	825.44	1077.36	356.16	0.00	0.00	0.00	0.00	0.00
22	AVO-07-SP05.1	Spoil	SP05	320001	182427	Surface	Red-brown	Field	ppm	6/5/2007 15:05	126.24	258.76	522.08	165.74	0.00	0.00	0.00	0.00	0.00
23	AVO-07-SP05.2	Spoil	SP05	320020	182440	Surface	Red-brown	Field	ppm	6/5/2007 15:08	0.00	205.25	591.62	0.00	0.00	0.00	0.00	0.00	0.00
24	AVO-07-SP05.3	Spoil	SP05	320032	182421	Surface	Red-brown	Field	ppm	6/5/2007 15:12	0.00	501.41	699.11	0.00	0.00	0.00	0.00	0.00	0.00
25	AVO-07-SP05.4	Spoil	SP05	320015	182410	Surface	Red-brown	Field	ppm	6/5/2007 15:16	0.00	415.46	649.85	188.15	0.00	0.00	0.00	0.00	0.00
26	AVO-07-SP05.5	Spoil	SP05	320016	182424	Surface	Red-brown	Field	ppm	6/5/2007 15:21	0.00	306.78	541.57	0.00	0.00	0.00	0.00	0.00	0.00
27	AVO-07-SP05.6	Spoil	SP05	319983	182388	Surface	Beige Brown	Field	ppm	6/5/2007 15:33	102.86	91.59	730.67	0.00	0.00	0.00	0.00	0.00	427.26
28	AVO-07-SP05.7	Spoil	SP05	319989	182401	Surface	Orange, beige Brown	Field	ppm	6/5/2007 15:38	0.00	149.08	560.33	0.00	0.00	0.00	0.00	0.00	0.00
29	AVO-07-SP05.8	Spoil	SP05	319997	182400	Surface	Red-brown	Field	ppm	6/5/2007 15:42	0.00	366.71	705.97	203.71	0.00	0.00	0.00	0.00	0.00
30	AVO-07-SP05.9	Spoil	SP05	319994	182388	Surface	Red-brown	Field	ppm	6/5/2007 15:46	0.00	55.65	595.91	0.00	0.00	0.00	0.00	0.00	0.00
31	AVO-07-SP05.10	Spoil	SP05	319992	182382	Surface	Red-brown	Field	ppm	6/5/2007 15:49	0.00	215.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	AVO-07-SP05.11	Spoil	SP05	319980	182381	Surface	Brown	Field	ppm	6/5/2007 15:54	0.00	129.09	444.80	0.00	0.00	0.00	0.00	0.00	0.00
33	AVO-07-SP05.12	Spoil	SP05	319979	182406	Surface	Beige Brown	Field	ppm	6/5/2007 15:59	0.00	154.08	773.23	0.00	0.00	0.00	0.00	0.00	0.00
34	AVO_07_SP10.1	Spoil	SP10	320141	182641	Surface Grid	Red-brown	Field	ppm	6/6/2007 13:54	0.00	243.81	517.90	201.86	0.00	0.00	0.00	0.00	0.00
35	AVO_07_SP10.2	Spoil	SP10	320149	182624	Surface Grid	Red-brown	Field	ppm	6/6/2007 14:01	0.00	362.43	0.00	336.46	0.00	0.00	0.00	0.00	0.00
36	AVO_07_SP10.3	Spoil	SP10	320149	182592	Surface Grid	brown	Field	ppm	6/6/2007 14:10	0.00	379.55	479.18	0.00	0.00	0.00	0.00	0.00	0.00
37	AVO_07_SP10.4	Spoil	SP10	320146	182569	Surface Grid	green-brown	Field	ppm	6/6/2007 14:18	0.00	501.07	469.82	632.33	0.00	0.00	0.00	152.58	0.00
38	AVO_07_SP10.5	Spoil	SP10	320144	182553	Surface Grid	green-brown	Field	ppm	6/6/2007 14:25	0.00	184.27	532.00	379.00	0.00	0.00	0.00	0.00	0.00
39	AVO_07_SP10.6	Spoil	SP10	320139	182530	Surface Grid	Red-brown	Field	ppm	6/6/2007 14:31	126.56	750.30	527.03	930.92	0.00	0.00	0.00	0.00	0.00
40	AVO_07_SP10.7	Spoil	SP10	320137	182643	Surface Grid	Red-brown	Field	ppm	6/6/2007 14:41	0.00	230.31	412.92	322.63	0.00	0.00	0.00	0.00	1043.43
41	AVO_07_SP10.8	Spoil	SP10	320152	182627	Surface Grid	Red-brown	Field	ppm	6/6/2007 14:49	0.00	277.79	614.31	268.03	0.00	0.00	0.00	0.00	1000.16
42	AVO_07_SP10.9	Spoil	SP10	320161	182600	Surface Grid	Red-brown	Field	ppm	6/6/2007 14:55	119.08	451.68	796.99	189.70	0.00	0.00	0.00	0.00	0.00
43	AVO_07_SP10.10	Spoil	SP10	320162	182583	Surface Grid	Red-brown	Field	ppm	6/6/2007 15:00	0.00	396.75	0.00	152.94	0.00	0.00	0.00	0.00	0.00
44	AVO_07_SP10.11	Spoil	SP10	320196	182597	Surface	Red-brown	Field	ppm	6/6/2007 15:06	130.57	596.60	678.78	0.00	0.00	0.00	0.00	0.00	0.00
45	AVO_07_SP10.12	Spoil	SP10	320190	182613	Surface	Red-brown	Field	ppm	6/6/2007 15:14	0.00	332.95	511.17	176.51	0.00	0.00	0.00	0.00	0.00
46	AVO_07_SP10.13	Spoil	SP10	320176	182639	Surface	brown	Field	ppm	6/6/2007 15:20	0.00	166.09	907.31	185.86	0.00	0.00	0.00	0.00	0.00
47	AVO_07_SP10.14	Spoil	SP10	320167	182676	Surface	Red-brown	Field	ppm	6/6/2007 15:25	0.00	378.64	644.40	0.00	0.00	0.00	0.00	0.00	0.00
48	AVO_07_SP10.15	Spoil	SP10	320186	182649	Surface	Red-brown	Field	ppm	6/6/2007 15:41	0.00	372.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00
49	AVO_07_SP11.1	Spoil	SP11	320219	182752	Surface	Red-brown	Field	ppm	6/6/2007 15:32	0.00	291.83	511.94	0.00	0.00	0.00	0.00	0.00	0.00
50	AVO_07_SP13.1	Spoil	SP13	320263	182636	Surface	rust red	Field	ppm	6/6/2007 15:53	0.00	719.80	0.00	0.00	0.00	0.00	0.00	0.00	1861.67
51	AVO_07_SP13.2	Spoil	SP13	320267	182649	Surface	rust red	Field	ppm	6/6/2007 16:02	0.00	305.49	452.69	0.00	0.00	0.00	0.00	0.00	0.00
52	AVO_07_SP15.1	Spoil	SP15	320358	182676	Surface	brown	Field	ppm	6/6/2007 16:09	0.00	212.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	AVO_07_SP16.1	Spoil	SP16	320403	182714	Surface Grid	metal grey	Field	ppm	6/6/2007 16:17	273.95	945.70	0.00	0.00	0.00	0.00	0.00	378.29	0.00
54	AVO_07_SP16.2	Spoil	SP16	320403	182714	Surface Grid	metal grey - sulphur yellow	Field	ppm	6/6/2007 16:21	1629.15	10316.37	0.00	0.00	266.26	323.18	0.00	186.68	0.00
55	AVO_I7_SP16.3	Spoil	SP16	320403	182714	Surface Grid	Red-brown	Field	ppm	6/6/2007 16:31	95.45	548.79	416.14	0.00	0.00	0.00	0.00	0.00	0.00
56	AVO_I7_SP16.4	Spoil	SP16	320403	182714	Surface Grid	grey-green	Field	ppm	6/6/2007 16:38	413.74	1088.73	0.00	0.00	0.00	0.00	3225.59	169.77	0.00
57	AVO_I7_SP17.1	Spoil	SP17	320454	182747	Surface	Red-brown	Field	ppm	6/6/2007 16:48	127.35	652.66	823.08	498.28	0.00	0.00	0.00	0.00	0.00
58	AVO_I7_SP17.2	Spoil	SP17	320426	182741	Surface	brown-grey	Field	ppm	6/6/2007 16:53	147.30	309.62	820.29	0.00	0.00	0.00	0.00	0.00	0.00
59	AVO-07-SP20.1	Spoil	SP20	320522	182933	Surface Grid	Red/brown	Field	ppm	6/7/2007 10:35	0.00	533.38	408.50	0.00	0.00	0.00	0.00	0.00	0.00
60	AVO-07-SP20.2	Spoil	SP20	320538	182921	Surface Grid	Beige, red brown	Field	ppm	6/7/2007 10:41	0.00	363.89	552.20	0.00	0.00	0.00	0.00	0.00	0.00
61	AVO-07-SP20.3	Spoil	SP20	320550	182910	Surface Grid	Beige, brown, orange	Field	ppm	6/7/2007 10:45	141.64	1214.28	0.00	341.75	0.00	0.00	0.00	0.00	0.00
62	AVO-07-SP20.4	Spoil	SP20	320561	182923	Surface Grid	Red/brown & Blue	Field	ppm	6/7/2007 10:50	189.25	881.94	0.00	302.79	0.00	0.00	0.00	0.00	0.00
63	AVO-07-SP20.5	Spoil	SP20	320548	182935	Surface Grid	Beige, orange	Field	ppm	6/7/2007 10:54	0.00	381.30	499.72	230.31	0.00	0.00	0.00	0.00	876.77
64	AVO-07-SP20.6	Spoil	SP20	320535	182946	Surface Grid	DK brown, red, blue	Field	ppm	6/7/2007 10:59	177.83	585.34	1053.88	0.00	0.00	0.00	0.00	0.00	0.00
65	AVO-07-SP20.7	Spoil	SP20	320548	182956	Surface Grid	Grey brown	Field	ppm	6/7/2007 11:03	103.91	401.03	507.95	166.68	0.00	0.00	0.00	0.00	0.00
66	AVO-07-SP20.8	Spoil	SP20	320560	182943	Surface Grid	Beige brown	Field	ppm	6/7/2007 11:07	0.00	319.53	573.96	272.04	0.00	0.00	0.00	0.00	0.00
67	AVO-07-SP20.9	Spoil	SP20	320572	182933	Surface Grid	Grey brown	Field	ppm	6/7/2007 11:10	0.00	402.93	592.68	161.42	0.00	0.00	0.00	0.00	0.00
68	AVO-07-SP20.10	Spoil	SP20	320583	182946	Surface Grid	Breige, orange, blue	Field	ppm	6/7/2007 11:14	105.81	395.50	1142.91	227.69	0.00	0.00	0.00	0.00	0.00
69	AVO-07-SP20.11	Spoil	SP20	320572	182958	Surface Grid	Red, brown, orange	Field	ppm	6/7/2007 11:17	0.00	450.69	504.22	247.93	0.00	0.00	0.00	0.00	479.65
70	AVO-07-SP20.12	Spoil	SP20	320565	182965	Surface Grid	Grey, brown, blue	Field	ppm	6/7/2007 11:23	0.00	368.03	498.85	244.64	0.00	0.00	0.00	0.00	0.00
71	AVO-07-SP20.13	Spoil	SP20	320575	182980	Surface Grid	Grey, brown	Field	ppm	6/7/2007 11:26	0.00	278.09	412.07	169.90	0.00	0.00	0.00	0.00	0.00
72	AVO-07-SP20.14	Spoil	SP20	320584	182967	Surface Grid	Beige brown	Field	ppm	6/7/2007 11:30	0.00	361.10	356.89	0.00	0.00	0.00	0.00	0.00	493.17
73	AVO-07-SP20.15	Spoil	SP20	320594	182957	Surface Grid	Red, brown, grey	Field	ppm	6/7/2007 11:34	0.00	416.39	0.00	279.81	0.00	0.00	0.00	0.00	0.00
74	AVO-07-SP20.16v1	Spoil	SP20	320472	182803	Vertical Profile	Red/brown	Field	ppm	6/7/2007 11:55	0.00	481.54	578.66	254.39	0.00	0.00	0.00	0.00	0.00
75	AVO-07-SP20.16v2	Spoil	SP20	320472	182803	Vertical Profile	Blue grey	Field	ppm	6/7/2007 11:58	211.57	440.18	1131.29	534.04	0.00	0.00	0.00	142.93	0.00
76	AVO-07-SP20.16v3	Spoil	SP20	320472	182803	Vertical Profile	Blue/black orange, cream	Field	ppm	6/7/2007 12:02	139.97	136.05	1076.41	0.00	61.15	0.00	3255.69	92.84	0.00
77	AVO-07-SP20.16v4	Spoil	SP20	320472	182803	Vertical Profile	White, blue orange	Field	ppm	6/7/2007 12:07	101.44	149.45	763.07	0.00	0.00	0.00	0.00	221.39	0.00
78	AVO-07-SP20.16v5	Spoil	SP20	320472	182803	Vertical Profile	Peachy orange, blue/black	Field	ppm	6/7/2007 12:11	145.47	79.02	991.50	0.00	57.68	0.00	3224.92	87.71	0.00
79	AVO-07-SP20.16v6	Spoil	SP20	320472	182803	Vertical Profile	Blue/balck	Field	ppm	6/7/2007 12:14	85.99	154.32	920.65	0.00	0.00	0.00	3153.65	105.17	0.00
80	AVO-07-SP20.16v7	Spoil	SP20	320472	182803	Vertical Profile	Grey, orange, blue	Field	ppm	6/7/2007 12:18	174.01	148.72	1455.05	0.00	32.27	0.00	0.00	72.29	0.00
81	AVO-07-SP20.16v8	Spoil	SP20	320472	182803	Vertical Profile	Grey, blue, red	Field	ppm	6/7/2007 12:21	115.10	397.78	939.98	0.00	0.00	0.00	0.00	89.50	0.00
82	AVO-07-SP20.16v9	Spoil	SP20	320472	182803	Vertical Profile	Grey, cream, orange	Field	ppm	6/7/2007 12:25	127.02	218.38	477.88	0.00	0.00	0.00	3429.46	187.76	0.00
83	AVO-07-SP20.16v10	Spoil	SP20	320478	182791	Vertical Profile	Orange, cream, grey	Field	ppm	6/7/2007 12:29	152.29	1124.95	435.06	0.00	0.00	0.00	0.00	108.38	0.00

Table 5-7. GSI XRF Results

Sample ID	Copper	Iron	Lead	Manganese	Mercury	Nickel	Phosphorus	Potassium	Rubidium	Scandium	Selenium	Silver	Strontium	Sulphur	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc
AVO-07-SP08.1	1245.05	203212.80	5102.88	453.75	0.00	0.00	0.00	1560.32	23.43	0.00	0.00	0.00	0.00	0.00	161.20	0.00	0.00	948.63	0.00	0.00	0.00	0.00
AVO-07-SP08.2	1235.67	233979.83	6151.19	461.73	0.00	0.00	0.00	1640.22	34.71	0.00	0.00	0.00	0.00	0.00	230.26	0.00	0.00	1048.06	0.00	0.00	0.00	0.00
AVO-07-SP08.3	1080.80	170810.27	3582.89	408.17	0.00	0.00	0.00	1678.77	34.33	0.00	0.00	0.00	0.00	0.00	135.60	0.00	0.00	1134.70	0.00	44.27	0.00	72.29
AVO-07-SP08.4	770.49	167918.55	4429.50	434.12	0.00	0.00	0.00	2918.62	45.96	0.00	0.00	37.72	0.00	0.00	141.67	0.00	0.00	1033.72	0.00	0.00	0.00	0.00
AVO-07-SP08.5	1479.15	273161.31	6105.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	189.69	0.00	0.00	684.82	0.00	48.17	0.00	0.00
AVO-07-SP08.6	1034.20	187130.34	4883.54	0.00	0.00	0.00	0.00	1644.12	29.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	991.67	0.00	0.00	0.00	0.00
AVO-07-SP08.7	1498.42	113984.10	14221.56	278.16	0.00	0.00	0.00	1035.47	20.03	0.00	0.00	0.00	0.00	0.00	386.45	0.00	0.00	1215.40	0.00	0.00	0.00	411.77
AVO-07-SP08.8	545.80	57310.84	3948.87	317.29	0.00	0.00	0.00	0.00	11.96	0.00	0.00	0.00	0.00	0.00	111.24	0.00	0.00	1456.51	0.00	0.00	0.00	351.02
AVO-07-SP07.1	395.13	61444.55	1609.72	0.00	0.00	0.00	0.00	8038.47	96.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1778.88	0.00	0.00	0.00	65.94
AVO-07-SP07.2	2253.80	108427.86	36837.13	0.00	0.00	0.00	0.00	2397.44	51.20	0.00	0.00	34.35	46.03	8359.00	0.00	0.00	0.00	1186.79	0.00	0.00	0.00	1156.39
AVO-07-SP07.3	1202.94	181289.55	14125.83	1267.32	0.00	0.00	0.00	1111.77	26.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1306.35	0.00	0.00	0.00	436.20
AVO-07-SP07.4	2899.07	114112.47	23439.94	589.44	0.00	0.00	0.00	2423.06	37.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1186.94	0.00	0.00	0.00	379.58
AVO-07-SP07.5	2766.34	123159.15	37068.48	531.69	0.00	0.00	0.00	2028.09	34.88	0.00	0.00	37.29	70.43	0.00	0.00	0.00	0.00	976.27	0.00	0.00	0.00	746.17
AVO-07-SP07.6v1	2035.55	114080.79	16064.85	528.89	0.00	0.00	0.00	2196.27	28.57	0.00	0.00	0.00	0.00	0.00	263.21	0.00	0.00	1638.07	0.00	0.00	0.00	844.19
AVO-07-SP07.6v2	1437.71	582774.25	8570.21	816.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1215.19	0.00	78.24	0.00	0.00
AVO-07-SP07.6v3	6555.41	227086.80	32346.84	777.70	0.00	0.00	0.00	681.16	0.00	0.00	0.00	33.89	0.00	30055.92	0.00	0.00	0.00	745.78	0.00	0.00	0.00	2401.07
AVO-07-SP06.1	1076.15	383307.78	9596.11	1219.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	481.47	0.00	0.00	0.00	0.00
AVO-07-SP06.2	2085.40	260363.98	16427.88	1003.34	0.00	0.00	0.00	956.91	25.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	718.51	0.00	70.71	0.00	471.35
AVO-07-SP06.3	1116.88	306256.66	7461.54	1382.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1154.42	0.00	0.00	0.00	0.00
AVO-07-SP06.4	956.08	388610.75	8434.36	1157.03	0.00	0.00	0.00	0.00	19.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	893.08	0.00	0.00	0.00	0.00
AVO-07-SP06.5	1761.27	237581.06	8009.04	584.65	0.00	0.00	0.00	2090.98	20.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	917.33	0.00	0.00	0.00	159.24
AVO-07-SP05.1	538.81	91803.99	1728.67	0.00	0.00	0.00	0.00	3807.83	54.11	0.00	0.00	21.74	0.00	0.00	0.00	0.00	0.00	913.44	0.00	0.00	0.00	70.78
AVO-07-SP05.2	321.77	67687.38	1049.45	263.41	0.00	0.00	0.00	4507.75	50.39	0.00	0.00	0.00	0.00	0.00	0.00	65.74	0.00	823.57	0.00	0.00	0.00	49.93
AVO-07-SP05.3	340.55	82503.93	1921.19	0.00	0.00	0.00	0.00	6773.28	81.63	0.00	0.00	19.78	0.00	0.00	0.00	0.00	0.00	1690.41	0.00	0.00	0.00	43.76
AVO-07-SP05.4	535.09	79111.77	1766.92	264.91	0.00	0.00	0.00	5725.96	81.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1421.65	0.00	0.00	0.00	0.00
AVO-07-SP05.5	440.82	76602.09	1577.40	217.76	0.00	0.00	0.00	4748.28	69.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1398.68	0.00	0.00	0.00	0.00
AVO-07-SP05.6	245.73	45040.28	1141.29	406.34	0.00	0.00	0.00	9210.15	98.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	81.69	2510.11	0.00	0.00	0.00	126.91
AVO-07-SP05.7	354.82	53919.73	1029.72	356.41	0.00	0.00	0.00	8699.14	94.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3035.50	0.00	0.00	0.00	166.47
AVO-07-SP05.8	473.88	69695.14	1807.80	0.00	0.00	0.00	0.00	7120.85	96.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1897.83	0.00	0.00	0.00	0.00
AVO-07-SP05.9	303.62	49104.27	583.01	585.78	0.00	0.00	0.00	8413.31	102.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2048.31	0.00	0.00	0.00	86.09
AVO-07-SP05.10	347.88	65658.19	1438.95	348.60	0.00	0.00	0.00	7781.88	81.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2306.11	0.00	0.00	0.00	79.32
AVO-07-SP05.11	360.96	53364.25	1098.18	434.95	0.00	0.00	0.00	7208.12	75.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1821.18	0.00	0.00	0.00	99.78
AVO-07-SP05.12	515.92	65471.45	2104.38	390.66	0.00	0.00	0.00	9363.00	75.22	0.00	0.00	23.05	0.00	0.00	0.00	0.00	0.00	2407.99	0.00	0.00	0.00	165.38
AVO_07_SP10.1	730.85	99780.22	467.35	0.00	0.00	0.00	0.00	3763.11	39.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1414.20	0.00	0.00	0.00	0.00
AVO_07_SP10.2	1201.38	229041.13	672.27	0.00	0.00	0.00	0.00	1369.64	21.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	922.80	0.00	0.00	0.00	0.00
AVO_07_SP10.3	543.85	87029.03	2310.37	0.00	0.00	0.00	0.00	6974.23	69.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1794.74	0.00	0.00	0.00	336.66
AVO_07_SP10.4	1988.46	150781.92	6115.13	943.01	0.00	0.00	0.00	1375.20	28.25	0.00	0.00	0.00	0.00	0.00	251.54	0.00	0.00	568.85	0.00	0.00	0.00	136.85
AVO_07_SP10.5	1358.49	113769.66	1319.81	881.87	0.00	0.00	0.00	0.00	15.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	590.77	0.00	0.00	0.00	0.00
AVO_07_SP10.6	1140.63	205613.03	5611.95	482.95	0.00	0.00	0.00	2785.90	39.46	0.00	0.00	0.00	0.00	0.00	150.61	0.00	0.00	960.45	0.00	0.00	0.00	0.00
AVO_07_SP10.7	746.77	105565.91	461.15	0.00	0.00	0.00	0.00	3080.11	34.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1556.01	0.00	0.00	0.00	0.00
AVO_07_SP10.8	778.11	114286.81	897.86	266.16	0.00	0.00	0.00	4474.32	49.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1711.83	0.00	0.00	0.00	0.00
AVO_07_SP10.9	725.98	129309.57	1663.63	445.94	0.00	0.00	0.00	3641.16	50.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1276.43	0.00	0.00	0.00	60.25
AVO_07_SP10.10	755.54	141143.31	1287.76	283.83	0.00	0.00	0.00	4582.33	55.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1279.72	0.00	0.00	0.00	0.00
AVO_07_SP10.11	481.06	53297.78	4395.12	0.00	0.00	0.00	0.00	10972.75	105.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1092.70	0.00	0.00	0.00	100.25
AVO_07_SP10.12	673.03	79355.23	1714.62	349.38	0.00	0.00	0.00	7705.93	88.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1389.60	0.00	0.00	0.00	142.94
AVO_07_SP10.13	646.57	96974.70	613.07	967.54	0.00	0.00	0.00	7812.37	77.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2350.07	0.00	0.00	0.00	0.00
AVO_07_SP10.14	534.86	73916.02	2140.44	0.00	0.00	0.00	0.00	8615.94	90.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1468.95	0.00	0.00	0.00	133.06
AVO_07_SP10.15	1044.01	130733.72	1285.62	363.12	0.00	0.00	0.00	3581.83	53.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1138.92	0.00	0.00	0.00	96.43
AVO_07_SP11.1	676.55	139367.73	1312.35	539.02	0.00	0.00	0.00	4779.48	54.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	891.15	0.00	0.00	0.00	0.00
AVO_07_SP13.1	537.98	401549.44	2444.16	0.00	0.00	0.00	0.00	1832.12	48.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1060.34	0.00	0.00	0.00	0.00
AVO_07_SP13.2	348.72	89817.47	1209.77	0.00	0.00	0.00	0.00	3891.52	57.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	724.13	0.00	0.00	0.00	65.05
AVO_07_SP15.1	214.02	37874.27	656.64	0.00	0.00	0.00	0.00	6397.20	70.97	0.00	0.00	21.98	0.00	0.00	0.00	0.00	0.00	816.12	0.00	0.00	0.00	72.79
AVO_07_SP16.1	1408.40	24785.66	18030.91	0.00	0.00	0.00	0.00	4844.78	56.77	0.00	0.00	0.00	0.00	0.00	310.18	0.00	0.00	2082.67	0.00	44.78	0.00	626.66
AVO_07_SP16.2	14357.53	49264.05	200512.16	0.00	0.00	0.00	0.00	11578.33	0.00	0.00	0.00	126.23	849.56	50066.10	1461.64	0.00	676.92	486.09	0.00	0.00	0.00	12176.55
AVO_I7_SP16.3	503.82	44657.41	4951.06	0.00	0.00	0.00	0.00	7576.03	94.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1311.93	0.00	0.00	0.00	125.78
AVO_I7_SP16.4	490.35	22726.89	24575.50	0.00	0.00	0.00	0.00	10726.89	110.68	0.00	0.00	32.85	74.11	10145.25	335.22	0.00	83.72	2100.57	0.00	0.00	0.00	2352.83
AVO_I7_SP17.1	525.44	79545.27	4754.56	0.00	0.00	0.00	0.00	9525.97	128.68	0.00	0.00	31.00	0.00	0.00	118.79	0.00	0.00	1715.70	0.00	0.00	0.00	174.38
AVO_I7_SP17.2	281.72	35126.19	2323.64	0.00	0.00	0.00	0.00	14692.70	167.75	0.00	0.00	0.00	0.00	0.00	74.92	0.00	0.00	1487.66	0.00	0.00	0.00	226.99
AVO-07-SP20.1	488.05	35577.75	4886.45	0.00	0.00	0.00	0.00	10848.63	134.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1017.52	0.00	0.00	0.00	336.27
AVO-07-SP20.2	668.63	37919.85	2659.28	0.00	0.00	0.00	0.00	10168.39	97.87	0.00	0.00	0.00	0.00	0.00	123.98	0.00	0.00	1239.33	0.00	0.00	0.00	232.40
AVO-07-SP20.3	457.64	54141.85	9369.66	0.00	0.00	0.00	0.00	9644.78	107.03	0.00	0.00	0.00	0.00	0.00	221.09	0.00	0.00	1098.30	0.00	0.00	0.00	893.55
AVO-07-SP20.4	390.84	34290.68	6072.69	0.00	0.00	0.00	0.00	12114.75	127.41	0.00	0.00	19.07	0.00	0.00	199.23	0.00	0.00	1049.61	0.00	0.00	0.00	223.30
AVO-07-SP20.5	313.84	55878.34	1919.76	0.00	0.00	0.00	0.00	9829.90	109.32	0.00	0.00	0.00	0.00	0.00	134.06	0.00	0.00	1183.93	0.00	0.00	0.00	139.57
AVO-07-SP20.6	441.92	67912.98	3130.52	0.00	0.00	0.00	0.00	11090.76	123.17	0.00	0.00	0.00	0.00	0.00	113.42	0.00	99.30	1379.70	0.00	0.00	0.00	117.14
AVO-07-SP20.7	274.79	44969.15	1665.09	0.00	0.00	0.00	0.00	10207.05	108.77	0.00	0.00	0.00	0.00	0.00	83.07	0.00	0.00	1338.16	0.00	0.00	0.00	140.42
AVO-07-SP20.8	328.12	49388.26	2172.86	0.00	0.00	0.00	0.00	10921.71	100.52	0.00	0.00	0.00	0.00	0.00	138.21	0.00	0.00	1419.97	0.00	0.00	0.00	188.86
AVO-07-SP20.9	267.87	37308.30	2320.18	0.00	0.00	0.00	0.00	13716.15	142.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1335.41	0.00	0.00	0.00	121.10
AVO-07-SP20.10	281.09	38374.54	2425.35	0.00	0.00	0.00	0.00	15052.81	158.00	0.00	0.00	0.00	0.00	0.00	81.54	0.00	0.00	1830.81	0.00	0.00	0.00	82.94
AVO-07-SP20.11	343.06	57003.27	1519.07	0.00	0.00	0.00	0.00	10663.91	111.19	0.00	0.00	0.00	0.00	0.00	93.73	0.00	0.00	1284.14	0.00	0.00	0.00	228.61
AVO-07-SP20.12	334.09	37412.79	2707.24	201.22	0.00	0.00	0.00	12861.51	152.04	0.00	0.00	0.00	0.00	0.00	129.76	0.00	0.00	1364.98	0.00	0.00	0.00	106.68
AVO-07-SP20.13	251.56	25471.57	2205.25	0.00	0.00	0.00	0.00	12093.80	118.08	0.00	0.00	0.00	0.00	0.00	116.82	0.00	0.00	934.51	0.00	0.00	0.00	143.92
AVO-07-SP20.14	284.72	42327.02	1697.19	0.00	0.00	0.00	0.00	11190.49	98.99	0.00	0.00	0.00	0.00	0.00	93.46	0.00	0.00	1423.42	0.00	0.00	0.00	197.67
AVO-07-SP20.15	290.42	32546.45	2456.66	0.00	0.00	0.00	0.00	13228.72	137.61	0.00	0.00	0.00	0.00	0.00	133.27	0.00	0.00	950.08	0.00	0.00	0.00	124.66
AVO-07-SP20.16v1	304.37	40813.72	2978.82	0.00	0.00	0.00	0.00	10999.14	123.52	0.00	0.00	0.00	0.00	0.00	209.04	0.00	0.00	1197.05	0.00	0.00	0.00	115.92
AVO-07-SP20.16v2	638.10	26496.94	8086.89	0.00	0.00	0.00	0.00	16512.45	233.33	0.00	0.00	25.88	0.00	0.00	322.18	0.00	101.39	1980.90	0.00	0.00	0.00	425.36
AVO-07-SP20.16v3	103.84	11288.46	326.19	0.00	0.00	0.00	0.00	13409.01	115.17	0.00	0.00	25.78	0.00	0.00	0.00	0.00	161.82	997.54	0.00	0.00	0.00	99.84
AVO-07-SP20.16v4	108.73	10130.50	1281.47	0.00	0.00	0.00	0.00	13033.92	132.65	0.00	0.00	20.92	0.00	0.00	97.44	0.00	113.44	1265.49	0.00	0.00	0.00	157.22
AVO-07-SP20.16v5	60.80	9471.17	390.26	0.00	0.00	0.00	0.00	10411.43	95.79	0.00	0.00	32.08	0.00	0.00	0.00	0.00	136.05	1189.00	0.00	0.00	0.00	125.10
AVO-07-SP20.16v6	168.91	12672.63	724.42	0.00	0.00	0.00	0.00	13217.23	124.31	0.00	0.00	20.68	0.00	0.00	0.00	0.00	96.46	1676.28	0.00	0.00	0.00	135.72
AVO-07-SP20.16v7	219.78	13177.71	1217.93	0.00	0.00	0.00	0.00	13913.78	173.79	0.00	0.00	30.32	0.00	0.00	0.00	0.00	118.53	1395.12	0.00	0.00	0.00	119.81
AVO-07-SP20.16v8	357.56	18974.81	4427.32	0.00	0.00	0.00	0.00	22622.30	278.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1507.22	0.00	0.00	0.00	140.12
AVO-07-SP20.16v9	181.31	12125.26	3302.93	0.00	0.00	0.00	0.00	15388.99	162.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	102.94	1281.34	0.00	0.00	0.00	119.24
AVO-07-SP20.16v10	202.62	23455.59	8555.44	0.00	0.00	0.00	0.00	13277.05	114.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1115.49	0.00	0.00	0.00	150.74

Table 5-7. GSI XRF Results

New Sample ID	Sample ID	Type	ID	Easting	Northing	Location Type	Colour	Field/Lab	Units	Time	Antimony	Arsenic	Barium	Bismuth	Cadmium	Calcium	Chloride	Chromium	Cobalt
84	AVO-07-SP20.17	Spoil	SP20	320511	182818	Surface	Grey, orange	Field	ppm	6/7/2007 12:45	119.63	63.16	1010.85	0.00	0.00	0.00	3606.75	85.78	0.00
85	AVO_07_SP21.1	Spoil	SP21	320478	183063	Surface Grid	Red-brown	Field	ppm	6/7/2007 14:04	0.00	279.11	0.00	150.34	0.00	0.00	3494.03	0.00	0.00
86	AVO_07_SP21.2	Spoil	SP21	320492	183070	Surface Grid	Red-brown	Field	ppm	6/7/2007 14:09	0.00	273.15	0.00	175.59	0.00	0.00	0.00	101.30	0.00
87	AVO_07_SP21.3	Spoil	SP21	320501	183056	Surface Grid	Red-brown	Field	ppm	6/7/2007 14:15	0.00	255.99	368.92	209.44	0.00	0.00	0.00	0.00	0.00
88	AVO_07_SP21.4	Spoil	SP21	320494	183043	Surface Grid	Cream brown	Field	ppm	6/7/2007 14:19	0.00	258.48	421.72	214.97	0.00	0.00	0.00	0.00	0.00
89	AVO_07_SP21.5	Spoil	SP21	320509	183037	Surface Grid	Grey	Field	ppm	6/7/2007 14:24	99.43	463.57	564.72	339.28	0.00	0.00	0.00	0.00	0.00
90	AVO_07_SP21.6	Spoil	SP21	320516	183047	Surface Grid	Red-brown	Field	ppm	6/7/2007 14:28	86.74	286.76	612.55	0.00	0.00	0.00	0.00	0.00	0.00
91	AVO_07_SP21.7	Spoil	SP21	320526	183038	Surface Grid	Brown	Field	ppm	6/7/2007 14:33	0.00	234.71	367.60	0.00	0.00	0.00	0.00	0.00	0.00
92	AVO_07_SP21.8	Spoil	SP21	320521	183027	Surface Grid	Red-brown	Field	ppm	6/7/2007 14:37	84.53	252.72	484.56	184.62	0.00	0.00	0.00	0.00	0.00
93	AVO_07_SP21.9	Spoil	SP21	320506	182991	Surface Grid	Green,grey	Field	ppm	6/7/2007 14:42	77.14	315.65	976.10	225.30	0.00	0.00	0.00	0.00	0.00
94	AVO_07_SP20.18	Spoil	SP20	320714	183039	Surface Grid	Brown	Field	ppm	6/7/2007 14:57	0.00	564.57	435.70	390.18	0.00	0.00	0.00	0.00	0.00
95	AVO_07_SP20.19	Spoil	SP20	320696	183051	Surface Grid	Red-brown	Field	ppm	6/7/2007 15:02	126.77	377.26	1190.97	172.91	0.00	0.00	0.00	0.00	0.00
96	AVO_07_SP20.20	Spoil	SP20	320686	183037	Surface Grid	Grey	Field	ppm	6/7/2007 15:05	133.59	236.73	0.00	342.91	0.00	0.00	5769.52	88.17	0.00
97	AVO_07_SP20.21	Spoil	SP20	320695	183032	Surface Grid	Brown-grey	Field	ppm	6/7/2007 15:10	346.79	835.75	835.75	643.91	0.00	0.00	0.00	0.00	599.27
98	AVO_07_SP20.22	Spoil	SP20	320677	183016	Surface Grid	Grey-black	Field	ppm	6/7/2007 15:15	90.92	190.51	383.70	144.11	0.00	0.00	3172.01	102.41	0.00
99	AVO_07_SP20.23	Spoil	SP20	320672	183021	Surface Grid	Grey	Field	ppm	6/7/2007 15:19	0.00	777.41	0.00	524.23	0.00	0.00	0.00	0.00	0.00
100	AVO_07_SP20.24	Spoil	SP20	320659	183013	Surface Grid	Red-brown	Field	ppm	6/7/2007 15:24	0.00	394.37	0.00	420.30	0.00	0.00	4319.32	0.00	0.00
101	AVO_07_SP20.25	Spoil	SP20	320668	183007	Surface Grid	Grey-black	Field	ppm	6/7/2007 15:28	166.37	144.14	485.90	336.67	0.00	0.00	3699.61	145.65	0.00
102	AVO_07_SP20.26	Spoil	SP20	320669	183046	Surface	Red-brown	Field	ppm	6/7/2007 15:35	0.00	355.05	0.00	232.41	0.00	0.00	0.00	0.00	0.00
103	AVO_07_SP20.27	Spoil	SP20	320684	183052	Surface	Red-brown	Field	ppm	6/7/2007 15:39	0.00	666.64	443.05	382.47	0.00	0.00	0.00	0.00	0.00
104	AVO_07_SP20.28	Spoil	SP20	320674	183052	Surface	Red-brown	Field	ppm	6/7/2007 15:42	0.00	263.90	289.50	0.00	0.00	0.00	3812.91	0.00	0.00
105	AVO_07_SP20.29	Spoil	SP20	320667	183070	Surface	Red-brown	Field	ppm	6/7/2007 15:49	102.08	509.47	710.85	392.83	0.00	0.00	0.00	0.00	0.00
106	AVO_07_SP20.30	Spoil	SP20	320662	183072	Surface	Grey-green	Field	ppm	6/7/2007 15:54	86.01	499.04	764.93	376.10	0.00	0.00	0.00	0.00	0.00
107	AVO_07_SP20.31	Spoil	SP20	320638	183104	Surface	Red-brown	Field	ppm	6/7/2007 16:00	131.08	244.31	820.18	167.22	0.00	0.00	0.00	0.00	0.00
108	AVO_07_SP20.32	Spoil	SP20	320688	183136	Surface	Red-brown	Field	ppm	6/7/2007 16:08	0.00	735.29	0.00	929.29	0.00	0.00	0.00	0.00	0.00
109	AVO_07_SP20.33	Spoil	SP20	320737	183173	Surface	Red-brown	Field	ppm	6/7/2007 16:13	0.00	851.11	0.00	636.74	0.00	0.00	0.00	0.00	1027.02
110	AVO_07_SP20.34	Spoil	SP20	320757	183205	Surface	Red-brown	Field	ppm	6/7/2007 16:17	0.00	791.49	0.00	484.20	0.00	0.00	0.00	0.00	0.00
111	AVO_07_SP20.35	Spoil	SP20	320735	183121	Surface	Red-brown	Field	ppm	6/7/2007 16:26	175.55	966.84	0.00	682.27	0.00	0.00	0.00	0.00	0.00
112	AVO-07-SP36.01	Spoil	SP36	319423	181387	Surface	Beige-brown	Field	ppm	8/22/2007 9:53	176.37	1089.37	0.00	1318.76	0.00	0.00	0.00	0.00	0.00
113	AVO-07-SP36.02	Spoil	SP36	319421	181387	Surface	Grey-beige	Field	ppm	8/22/2007 9:56	499.23	1382.70	840.06	1426.53	0.00	0.00	0.00	0.00	1092.12
114	AVO-07-SP36.03	Spoil	SP36	319419	181398	Surface	Red-brown	Field	ppm	8/22/2007 9:59	118.61	751.55	599.17	335.97	0.00	0.00	0.00	0.00	0.00
115	AVO-07-SP34B.01	Spoil	SP34B	319431	181614	Surface Grid	Red-brown	Field	ppm	8/22/2007 10:18	0.00	1247.06	0.00	557.29	0.00	0.00	0.00	0.00	0.00
116	AVO-07-SP34B.02	Spoil	SP34B	319437	181606	Surface Grid	Red-brown	Field	ppm	8/22/2007 10:22	0.00	907.31	0.00	447.26	0.00	0.00	0.00	0.00	1347.60
117	AVO-07-SP34B.03	Spoil	SP34B	319441	181620	Surface Grid	Red-brown	Field	ppm	8/22/2007 10:26	0.00	1267.70	0.00	868.83	0.00	0.00	0.00	0.00	1201.87
118	AVO-07-SP34B.04	Spoil	SP34B	319447	181616	Surface Grid	Red-brown	Field	ppm	8/22/2007 10:31	0.00	1249.03	0.00	707.02	0.00	0.00	0.00	0.00	1880.24
119	AVO-07-SP34B.05	Spoil	SP34B	319447	181624	Surface Grid	Red-brown	Field	ppm	8/22/2007 10:36	121.59	861.57	0.00	1074.91	0.00	0.00	0.00	0.00	1438.97
120	AVO-07-SP34B.06	Spoil	SP34B	319388	181641	Surface Grid	Red-brown	Field	ppm	8/22/2007 10:49	0.00	1261.47	0.00	550.86	0.00	0.00	0.00	0.00	2150.24
121	AVO-07-SP34B.07	Spoil	SP34B	319406	181651	Surface Grid	Red-brown	Field	ppm	8/22/2007 10:53	0.00	1002.35	0.00	593.01	0.00	0.00	0.00	0.00	0.00
122	AVO-07-SP34B.08	Spoil	SP34B	319415	181658	Surface Grid	Red-brown	Field	ppm	8/22/2007 10:58	0.00	1308.97	0.00	762.95	0.00	0.00	0.00	0.00	1742.10
123	AVO-07-SP34B.09	Spoil	SP34B	319407	181670	Surface Grid	Red-brown	Field	ppm	8/22/2007 11:02	0.00	2035.55	0.00	954.68	0.00	0.00	0.00	0.00	1727.38
124	AVO-07-SP34B.10	Spoil	SP34B	319393	181668	Surface Grid	Red-brown	Field	ppm	8/22/2007 11:06	0.00	1900.01	0.00	976.60	0.00	0.00	0.00	0.00	0.00
125	AVO-07-SP34B.11	Spoil	SP34B	319383	181659	Surface Grid	Red-brown	Field	ppm	8/22/2007 11:11	0.00	2068.82	0.00	1258.46	0.00	0.00	0.00	0.00	0.00
126	AVO-07-SP34A.01	Spoil	SP34A	319438	181687	Surface Grid	Red-brown	Field	ppm	8/22/2007 11:22	0.00	1553.63	0.00	823.17	0.00	0.00	0.00	0.00	2156.63
127	AVO-07-SP34A.02	Spoil	SP34A	319437	181692	Surface Grid	Red-brown	Field	ppm	8/22/2007 11:26	0.00	1272.75	0.00	834.63	0.00	0.00	0.00	0.00	0.00
128	AVO-07-SP34A.03	Spoil	SP34A	319443	181702	Surface Grid	Red-brown	Field	ppm	8/22/2007 11:30	0.00	1596.47	805.96	1057.65	0.00	0.00	0.00	0.00	0.00
129	AVO-07-SP34A.04	Spoil	SP34A	319460	181695	Surface Grid	Red-brown	Field	ppm	8/22/2007 11:34	0.00	1672.06	0.00	862.52	0.00	0.00	0.00	0.00	0.00
130	AVO-07-SP34A.05	Spoil	SP34A	319443	181682	Surface Grid	Red-brown	Field	ppm	8/22/2007 11:41	0.00	1584.04	0.00	1019.03	0.00	0.00	0.00	0.00	0.00
131	AVO-07-34B.12	Spoil	SP34B	319385	181595	Surface Grid	Red-brown	Field	ppm	8/22/2007 12:06	0.00	815.82	0.00	474.67	0.00	0.00	0.00	0.00	1941.98
132	AVO-07-34B.13	Spoil	SP34B	319381	181609	Surface Grid	Red-brown	Field	ppm	8/22/2007 12:10	0.00	986.60	0.00	514.75	0.00	0.00	0.00	0.00	0.00
133	AVO-07-34B.14	Spoil	SP34B	319377	181627	Surface Grid	Red-brown	Field	ppm	8/22/2007 12:14	0.00	1218.31	0.00	538.89	0.00	0.00	0.00	0.00	0.00
134	AVO-07-34B.15	Spoil	SP34B	319365	181623	Surface Grid	Red-brown	Field	ppm	8/22/2007 12:18	0.00	897.38	0.00	356.70	0.00	0.00	0.00	0.00	0.00
135	AVO-07-34B.16	Spoil	SP34B	319372	181608	Surface Grid	Red-brown	Field	ppm	8/22/2007 12:23	0.00	909.14	0.00	384.10	0.00	0.00	0.00	0.00	0.00
136	AVO-07-34B.17	Spoil	SP34B	319375	181594	Surface Grid	Red-brown	Field	ppm	8/22/2007 12:28	0.00	974.46	0.00	438.00	0.00	0.00	0.00	0.00	1887.20
137	AVO-07-34B.18	Spoil	SP34B	319365	181592	Surface Grid	Red, brown, gr	Field	ppm	8/22/2007 12:32	0.00	1412.01	0.00	709.99	0.00	0.00	0.00	0.00	1635.15
138	AVO-07-34B.19	Spoil	SP34B	319358	181607	Surface Grid	Red-brown	Field	ppm	8/22/2007 12:36	0.00	775.30	0.00	434.92	0.00	0.00	0.00	0.00	1438.69
139	AVO-07-34B.20	Spoil	SP34B	319355	181622	Surface Grid	Red-brown	Field	ppm	8/22/2007 12:40	0.00	1183.80	0.00	710.26	0.00	0.00	0.00	0.00	0.00
140	AVO-07-SP34.01	Spoil	SP34	319283	181562	Surface Grid	Red-brown	Field	ppm	8/22/2007 14:09	0.00	1200.88	0.00	705.27	0.00	0.00	0.00	0.00	2209.54
141	AVO-07-SP34.02	Spoil	SP34	319284	181577	Surface Grid	Red-brown	Field	ppm	8/22/2007 14:13	0.00	649.34	0.00	444.91	0.00	0.00	0.00	0.00	1154.36
142	AVO-07-SP34.03	Spoil	SP34	319267	181580	Surface Grid	Red-brown	Field	ppm	8/22/2007 14:16	0.00	619.76	898.01	680.17	0.00	0.00	0.00	0.00	0.00
143	AVO-07-SP34.04	Spoil	SP34	319267	181562	Surface Grid	Red-brown	Field	ppm	8/22/2007 14:20	0.00	634.97	0.00	338.54	0.00	0.00	0.00	0.00	0.00
144	AVO-07-SP34.05	Spoil	SP34	319276	181571	Surface Grid	Red-brown	Field	ppm	8/22/2007 14:24	0.00	1060.72	0.00	554.14	0.00	0.00	0.00	0.00	0.00
145	AVO-07-SP34.06	Spoil	SP34	319230	181534	Surface Grid	Beige brown	Field	ppm	8/22/2007 14:35	0.00	720.10	0.00	589.82	0.00	0.00	0.00	0.00	1613.39
146	AVO-07-SP34.07	Spoil	SP34	319235	181516	Surface Grid	Beige brown	Field	ppm	8/22/2007 14:39	0.00	582.50	0.00	563.62	0.00	0.00	0.00	0.00	0.00
147	AVO-07-SP34.08	Spoil	SP34	319243	181521	Surface Grid	Brown	Field	ppm	8/22/2007 14:42	0.00	667.27	0.00	578.43	0.00	0.00	0.00	0.00	0.00
148	AVO-07-SP34.09	Spoil	SP34	319244	181536	Surface Grid	Red-brown	Field	ppm	8/22/2007 14:46	0.00	312.58	665.86	0.00	0.00	0.00	0.00	0.00	1009.81
149	AVO-07-SP34.10	Spoil	SP34	319255	181534	Surface Grid	Red-brown	Field	ppm	8/22/2007 14:49	110.00	578.08	752.65	349.05	0.00	0.00	0.00	0.00	983.52
150	AVO-07-SP34.11	Spoil	SP34	319259	181526	Surface Grid	Beige brown	Field	ppm	8/22/2007 14:53	0.00	582.13	0.00	553.47	0.00	0.00	0.00	0.00	0.00
151	AVO-07-SP34.12	Spoil	SP34	319260	181537	Surface Grid	Red-brown	Field	ppm	8/22/2007 14:56	0.00	757.26	0.00	447.75	0.00	0.00	0.00	0.00	1378.07
152	AVO-07-SP34.13	Spoil	SP34	319266	181529	Surface Grid	Red-brown	Field	ppm	8/22/2007 14:59	0.00	612.33	0.00	515.45	0.00	0.00	0.00	0.00	0.00
153	AVO-07-SP34.14	Spoil	SP34	319239	181575	Surface	red, brown, be	Field	ppm	8/22/2007 15:10	0.00	141.61	952.01	0.00	0.00	0.00	0.00	0.00	0.00
154	AVO-07-SP34.15	Spoil	SP34	319255	181593	Surface	Red-brown	Field	ppm	8/22/2007 15:15	0.00	179.96	406.13	0.00	0.00	0.00	0.00	0.00	0.00
155	AVO-07-SP34.16	Spoil	SP34	319260	181611	Surface	Red-brown	Field	ppm	8/22/2007 15:19	0.00	1295.82	0.00	704.50	0.00	0.00	0.00	0.00	0.00
156	AVO-07-SP34.17	Spoil	SP34	319333	181569	Surface	Red-brown	Field	ppm	8/22/2007 15:31	0.00	1273.74	0.00	817.81	0.00	0.00	0.00	0.00	0.00
157	AVO-07-SP34.18	Spoil	SP34	319340	181589	Surface	Beige brown	Field	ppm	8/22/2007 15:34	0.00	1437.97	0.00	698.60	0.00	0.00	0.00	0.00	0.00
158	AVO-07-SP34B.21	Spoil	SP34B	319369	181565	Surface	Red-brown	Field	ppm	8/22/2007 15:44	0.00	879.72	0.00	326.86	0.00	0.00	0.00	0.00	0.00
159	AVO-07-SP34B.22	Spoil	SP34B	319413	181580	Surface	Red-brown	Field	ppm	8/22/2007 15:51	0.00	1150.31	0.00	461.61	0.00	0.00	0.00	0.00	0.00
160	AVO-07-SP34B.23	Spoil	SP34B	319342	181524	Surface Grid	Red-brown	Field	ppm	8/22/2007 15:59	0.00	821.95	0.00	421.85	0.00	0.00	0.00	0.00	2964.41
161	AVO-07-SP34B.24	Spoil	SP34B	319336	181515	Surface Grid	Red-brown	Field	ppm	8/22/2007 16:03	0.00	412.15	0.00	400.84	0.00	0.00	0.00	0.00	2172.81
162	AVO-07-SP34B.25	Spoil	SP34B	319333	181519	Surface Grid	Red-brown	Field	ppm	8/22/2007 16:07	0.00	526.96	0.00	460.44	0.00	0.00	0.00	0.00	1804.05
163	AVO-07-SP34B.26	Spoil	SP34B	319331	181520	Surface Grid	Grey brown	Field	ppm	8/22/2007 16:11	0.00	1095.59	0.00	679.57	0.00	0.00	0.00	0.00	1284.01
164	AVO-07-SP34B.27	Spoil	SP34B	319335	181527	Surface Grid	Red-brown	Field	ppm	8/22/2007 16:14	0.00	1119.07	0.00	524.75	0.00	0.00	0.00	0.00	2350.54
165	AVO-07-SP34B.28	Spoil	SP34B	319334	181542	Surface	Red-brown	Field	ppm	8/22/2007 16:17	0.00	1109.72	0.00	720.40	0.00	0.00	0.00	0.00	1659.86
166	AVO-07-SP34B.29	Spoil	SP34B	319321	181541	Surface	Red-brown	Field	ppm	8/22/2007 16:22	0.00	1028.31	0.00	455.67	0.00	0.00	0.00	0.00	0.00

Table 5-7. GSI XRF Results

Sample ID	Copper	Iron	Lead	Manganese	Mercury	Nickel	Phosphorus	Potassium	Rubidium	Scandium	Selenium	Silver	Strontium	Sulphur	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc
AVO-07-SP20.17	86.31	9197.98	1315.20	0.00	0.00	0.00	0.00	18438.25	143.18	0.00	0.00	20.76	0.00	0.00	0.00	0.00	81.20	1491.14	0.00	0.00	0.00	30.62
AVO_07_SP21.1	340.19	23766.63	2475.23	0.00	0.00	0.00	0.00	14397.37	152.58	0.00	0.00	0.00	0.00	0.00	156.66	0.00	0.00	880.86	0.00	0.00	0.00	60.69
AVO_07_SP21.2	196.50	32182.96	1877.45	0.00	0.00	0.00	0.00	12095.90	123.27	0.00	0.00	0.00	0.00	0.00	100.97	0.00	0.00	1464.38	0.00	0.00	0.00	61.33
AVO_07_SP21.3	213.95	27411.88	3382.83	0.00	0.00	0.00	0.00	14127.05	147.61	0.00	0.00	0.00	0.00	0.00	160.85	0.00	0.00	1572.09	0.00	0.00	0.00	78.72
AVO_07_SP21.4	218.96	19592.40	1672.94	0.00	0.00	0.00	0.00	17171.49	168.37	0.00	0.00	0.00	0.00	0.00	102.57	0.00	0.00	1093.55	0.00	0.00	0.00	59.82
AVO_07_SP21.5	243.05	28429.16	3995.23	0.00	0.00	0.00	0.00	17174.62	191.94	0.00	0.00	0.00	0.00	0.00	143.10	0.00	80.33	1029.42	0.00	0.00	0.00	79.44
AVO_07_SP21.6	271.43	31969.65	2697.64	0.00	0.00	0.00	0.00	14052.16	157.15	0.00	0.00	0.00	0.00	0.00	118.98	0.00	87.89	1249.28	0.00	0.00	0.00	89.21
AVO_07_SP21.7	233.92	25248.72	1873.52	0.00	0.00	0.00	0.00	12287.97	129.61	0.00	0.00	0.00	0.00	0.00	104.58	0.00	0.00	998.81	0.00	57.26	0.00	66.75
AVO_07_SP21.8	256.64	35329.54	2861.25	0.00	0.00	0.00	0.00	14310.75	157.90	0.00	0.00	0.00	0.00	0.00	152.33	0.00	0.00	1117.71	0.00	0.00	0.00	102.70
AVO_07_SP21.9	195.56	24978.83	2207.69	0.00	0.00	0.00	0.00	14622.57	158.12	0.00	0.00	0.00	0.00	0.00	123.50	0.00	0.00	2097.46	0.00	0.00	0.00	114.29
AVO_07_SP20.18	497.72	75391.50	3747.34	0.00	0.00	0.00	0.00	10229.32	117.90	0.00	0.00	0.00	0.00	0.00	184.10	0.00	0.00	1844.69	0.00	0.00	0.00	87.68
AVO_07_SP20.19	398.62	102477.59	857.28	0.00	0.00	0.00	0.00	10361.16	93.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2339.68	0.00	0.00	0.00	0.00
AVO_07_SP20.20	190.14	11360.29	3877.56	152.29	0.00	0.00	0.00	3768.38	23.48	0.00	0.00	24.86	0.00	0.00	223.53	0.00	0.00	673.46	0.00	49.42	0.00	167.95
AVO_07_SP20.21	401.68	65457.31	4833.66	0.00	0.00	0.00	0.00	9803.65	99.69	0.00	0.00	0.00	0.00	0.00	184.88	0.00	0.00	1788.91	0.00	53.18	0.00	99.29
AVO_07_SP20.22	94.43	16866.17	2509.03	0.00	0.00	0.00	0.00	15200.37	159.42	0.00	0.00	0.00	0.00	0.00	109.18	0.00	0.00	1386.48	0.00	53.27	0.00	150.59
AVO_07_SP20.23	333.23	37687.49	9740.55	227.33	0.00	0.00	0.00	7452.61	72.55	0.00	0.00	0.00	0.00	0.00	431.18	166.81	0.00	1342.47	0.00	45.87	0.00	414.08
AVO_07_SP20.24	255.57	28783.66	9753.75	281.99	0.00	0.00	0.00	7655.19	75.38	0.00	0.00	0.00	0.00	0.00	383.30	171.85	0.00	1063.43	0.00	49.87	0.00	398.21
AVO_07_SP20.25	227.47	9680.41	5643.43	0.00	0.00	0.00	0.00	17762.30	242.94	0.00	0.00	0.00	0.00	0.00	260.02	0.00	76.72	1322.16	0.00	61.70	0.00	88.15
AVO_07_SP20.26	317.16	44603.57	2675.48	0.00	0.00	0.00	0.00	10076.85	78.08	0.00	0.00	0.00	0.00	0.00	131.89	0.00	0.00	1435.79	0.00	0.00	0.00	102.64
AVO_07_SP20.27	492.53	100083.12	2849.85	0.00	0.00	0.00	0.00	7543.64	63.13	0.00	0.00	0.00	0.00	0.00	165.70	0.00	0.00	1966.69	0.00	0.00	0.00	82.45
AVO_07_SP20.28	210.01	25961.69	1611.24	0.00	0.00	0.00	0.00	9177.54	70.97	0.00	0.00	0.00	0.00	0.00	102.00	63.43	0.00	1245.45	0.00	0.00	0.00	129.85
AVO_07_SP20.29	577.23	62281.90	2968.70	0.00	0.00	0.00	0.00	10601.13	98.84	0.00	0.00	0.00	0.00	0.00	160.18	0.00	0.00	1958.94	0.00	0.00	0.00	184.40
AVO_07_SP20.30	633.61	55080.94	4263.88	217.65	0.00	0.00	0.00	11448.25	104.06	0.00	0.00	0.00	0.00	0.00	155.75	0.00	0.00	1754.91	0.00	0.00	0.00	108.33
AVO_07_SP20.31	397.29	40837.41	2996.34	192.81	0.00	0.00	0.00	9721.23	105.62	0.00	0.00	0.00	0.00	0.00	145.10	0.00	0.00	2929.42	0.00	52.59	0.00	214.50
AVO_07_SP20.32	728.27	167084.16	6717.04	461.69	0.00	0.00	0.00	5712.43	95.46	0.00	0.00	0.00	0.00	0.00	242.54	0.00	0.00	1516.04	0.00	65.07	0.00	145.80
AVO_07_SP20.33	2317.85	162270.19	6344.19	693.30	0.00	0.00	0.00	8936.68	92.74	0.00	0.00	0.00	0.00	0.00	335.25	0.00	0.00	1840.25	0.00	0.00	0.00	197.41
AVO_07_SP20.34	954.26	124545.41	4464.64	511.71	0.00	0.00	0.00	7204.66	83.59	0.00	0.00	0.00	0.00	0.00	178.72	0.00	0.00	1787.00	0.00	69.12	0.00	172.34
AVO_07_SP20.35	844.21	203928.84	7412.83	431.99	0.00	0.00	0.00	4021.03	78.35	0.00	0.00	29.72	0.00	0.00	297.98	0.00	0.00	1312.57	0.00	0.00	0.00	78.39
AVO-07-SP36.01	2168.45	79033.19	16257.12	359.08	0.00	0.00	0.00	2131.25	36.44	0.00	0.00	0.00	0.00	0.00	291.58	0.00	0.00	1023.52	0.00	54.16	0.00	152.88
AVO-07-SP36.02	5451.98	121524.48	18599.33	0.00	0.00	0.00	0.00	1142.02	40.23	0.00	0.00	49.86	0.00	20640.38	490.81	0.00	0.00	0.00	0.00	0.00	0.00	1843.03
AVO-07-SP36.03	640.36	119006.00	3755.65	422.02	0.00	0.00	0.00	3497.35	43.70	0.00	0.00	30.02	0.00	0.00	0.00	0.00	0.00	1901.51	0.00	0.00	0.00	63.70
AVO-07-SP34B.01	268.17	230962.95	4236.95	808.78	0.00	0.00	0.00	5006.18	52.19	0.00	0.00	0.00	0.00	0.00	172.05	0.00	0.00	4170.55	0.00	0.00	0.00	0.00
AVO-07-SP34B.02	299.22	192760.23	4134.85	1132.06	0.00	0.00	0.00	4516.53	48.98	0.00	0.00	0.00	0.00	0.00	200.31	0.00	0.00	3916.17	0.00	0.00	0.00	124.73
AVO-07-SP34B.03	252.67	217990.73	5745.47	1074.92	0.00	0.00	0.00	4705.97	53.12	0.00	0.00	0.00	0.00	0.00	221.99	0.00	0.00	2517.25	0.00	0.00	0.00	140.16
AVO-07-SP34B.04	382.72	245880.58	6996.48	0.00	0.00	0.00	0.00	4350.19	61.18	0.00	0.00	0.00	0.00	0.00	299.67	0.00	0.00	2448.41	0.00	0.00	0.00	148.83
AVO-07-SP34B.05	426.21	255444.58	8756.29	890.31	0.00	0.00	0.00	6264.11	83.60	0.00	0.00	0.00	0.00	0.00	288.97	0.00	0.00	3479.58	0.00	0.00	0.00	167.01
AVO-07-SP34B.06	431.14	421957.03	1891.27	981.31	0.00	0.00	0.00	0.00	20.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2283.78	0.00	51.89	0.00	0.00
AVO-07-SP34B.07	341.61	339301.34	1999.71	941.63	0.00	0.00	0.00	3197.48	43.96	0.00	0.00	0.00	0.00	0.00	122.00	0.00	0.00	3024.83	0.00	0.00	0.00	0.00
AVO-07-SP34B.08	381.07	315043.38	931.90	643.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1953.82	0.00	0.00	0.00	0.00
AVO-07-SP34B.09	431.97	321673.44	1502.22	731.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	249.30	0.00	0.00	2394.75	0.00	0.00	0.00	0.00
AVO-07-SP34B.10	390.42	313563.03	1644.89	993.56	0.00	209.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1927.33	0.00	0.00	0.00	0.00
AVO-07-SP34B.11	444.60	281210.50	2275.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	210.07	0.00	0.00	2264.73	0.00	0.00	0.00	0.00
AVO-07-SP34A.01	590.18	311595.13	694.13	492.06	0.00	0.00	0.00	719.37	22.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1834.12	0.00	0.00	0.00	0.00
AVO-07-SP34A.02	825.97	377501.16	1172.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	143.87	0.00	0.00	1390.07	0.00	58.57	0.00	0.00
AVO-07-SP34A.03	879.53	390072.16	1345.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1914.11	0.00	0.00	0.00	0.00
AVO-07-SP34A.04	761.57	346892.41	1450.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2342.12	0.00	0.00	0.00	0.00
AVO-07-SP34A.05	702.06	405840.38	1198.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1775.83	0.00	0.00	0.00	0.00
AVO-07-34B.12	227.31	368229.09	629.14	861.56	0.00	0.00	0.00	1610.21	26.20	0.00	0.00	0.00	0.00	0.00	95.04	0.00	0.00	2264.46	0.00	0.00	0.00	0.00
AVO-07-34B.13	349.34	356437.81	884.34	1530.18	0.00	0.00	0.00	903.10	18.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1637.26	0.00	0.00	0.00	0.00
AVO-07-34B.14	290.24	320646.31	1347.31	647.69	0.00	0.00	0.00	0.00	22.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1557.20	0.00	0.00	0.00	0.00
AVO-07-34B.15	193.65	246504.31	927.82	1003.04	0.00	0.00	0.00	973.01	45.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1626.61	0.00	0.00	0.00	0.00
AVO-07-34B.16	292.04	347671.34	799.84	1219.51	0.00	0.00	0.00	1523.31	21.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2307.46	0.00	0.00	0.00	0.00
AVO-07-34B.17	278.57	363322.84	756.65	1006.22	0.00	0.00	0.00	1224.30	27.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2592.52	0.00	0.00	0.00	0.00
AVO-07-34B.18	475.96	333518.88	1134.74	1338.90	0.00	0.00	0.00	3882.46	56.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2935.26	0.00	0.00	0.00	0.00
AVO-07-34B.19	282.35	278570.44	746.43	566.36	0.00	0.00	0.00	1067.73	18.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1975.99	0.00	43.69	0.00	0.00
AVO-07-34B.20	373.17	326640.97	1680.71	0.00	0.00	0.00	0.00	1440.77	22.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2675.23	0.00	53.92	0.00	0.00
AVO-07-SP34.01	355.96	374568.66	1449.27	773.43	0.00	0.00	0.00	1488.85	28.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2393.33	0.00	0.00	0.00	0.00
AVO-07-SP34.02	188.39	200558.22	675.00	551.39	0.00	0.00	0.00	861.64	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1725.96	0.00	0.00	0.00	0.00
AVO-07-SP34.03	426.77	189322.44	731.03	513.15	0.00	0.00	0.00	1386.49	14.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1565.53	0.00	50.91	0.00	0.00
AVO-07-SP34.04	290.62	182983.80	686.78	546.72	0.00	0.00	0.00	1169.73	17.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1869.45	0.00	0.00	0.00	0.00
AVO-07-SP34.05	281.51	343468.97	1007.05	587.61	0.00	0.00	0.00	1065.39	15.85	0.00	0.00	0.00	0.00	0.00	116.44	0.00	0.00	2727.32	0.00	55.78	0.00	0.00
AVO-07-SP34.06	382.55	201593.58	868.32	586.60	0.00	0.00	0.00	2350.98	28.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2309.28	0.00	0.00	0.00	0.00
AVO-07-SP34.07	385.66	188479.77	876.76	487.73	0.00	0.00	0.00	1723.62	22.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1401.44	0.00	0.00	0.00	0.00
AVO-07-SP34.08	345.24	207765.48	778.71	331.87	0.00	0.00	0.00	1391.38	21.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1619.55	0.00	0.00	0.00	0.00
AVO-07-SP34.09	199.14	122743.70	801.15	279.39	0.00	0.00	0.00	5592.50	70.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3745.30	0.00	0.00	244.47	101.35
AVO-07-SP34.10	293.22	173387.50	1055.51	0.00	0.00	0.00	0.00	2949.31	36.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1983.33	0.00	0.00	0.00	0.00
AVO-07-SP34.11	368.99	182603.19	889.46	635.17	0.00	0.00	0.00	1788.51	12.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1658.51	0.00	35.74	0.00	0.00
AVO-07-SP34.12	322.04	214168.30	733.97	514.87	0.00	0.00	0.00	1745.78	26.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1646.98	0.00	0.00	0.00	0.00
AVO-07-SP34.13	315.71	154573.64	635.00	395.56	0.00	0.00	0.00	1569.72	26.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1626.57	0.00	0.00	0.00	0.00
AVO-07-SP34.14	288.78	113788.33	459.40	612.21	0.00	0.00	0.00	7731.11	63.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4388.74	0.00	0.00	242.91	128.26
AVO-07-SP34.15	310.77	116013.16	344.27	671.82	0.00	0.00	0.00	8864.36	68.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5154.67	0.00	0.00	0.00	145.22
AVO-07-SP34.16	350.83	292935.59	1488.05	568.01	0.00	0.00	0.00	1602.21	32.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1714.81	0.00	0.00	0.00	0.00
AVO-07-SP34.17	278.88	357433.41	2284.76	723.77	0.00	0.00	0.00	2335.11	40.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2854.25	0.00	0.00	0.00	0.00
AVO-07-SP34.18	394.40	236921.88	1148.92	0.00	0.00	0.00	0.00	1529.33	12.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2011.74	0.00	0.00	0.00	0.00
AVO-07-SP34B.21	255.97	427250.59	857.83	1386.33	0.00	0.00	0.00	2476.58	33.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3479.65	0.00	0.00	0.00	0.00
AVO-07-SP34B.22	439.53	463863.03	869.51	1114.62	0.00	0.00	0.00	2118.38	19.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4308.36	0.00	0.00	0.00	0.00
AVO-07-SP34B.23	221.66	385318.81	1294.11	0.00	0.00	0.00	0.00	2154.86	27.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3068.56	0.00	0.00	0.00	0.00
AVO-07-SP34B.24	300.53	463130.47	982.62	0.00	0.00	0.00	0.00	0.00	20.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1634.16	0.00	0.00	0.00	0.00
AVO-07-SP34B.25	254.91	374917.53	908.05	0.00	0.00	0.00	0.00	1097.22	15.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1458.59	0.00	0.00	0.00	0.00
AVO-07-SP34B.26	266.15	206857.19	2882.34	962.02	0.00	0.00	0.00	4612.70	47.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2336.93	0.00	0.00	0.00	0.00
AVO-07-SP34B.27	336.96	437602.91	964.00	837.07	0.00	0.00	0.00	0.00	17.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2178.74	0.00	0.00	0.00	0.00
AVO-07-SP34B.28	383.19	275229.09	2863.26	906.98	0.00	0.00	0.00	4452.63	75.50	0.00	0.00	0.00	0.00	0.00	193.43	0.00	0.00	3072.94	0.00	0.00	0.00	0.00
AVO-07-SP34B.29	343.68	385086.75	990.68	656.50	0.00	0.00	0.00	1324.89	24.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2482.15	0.00	0.00	0.00	0.00

Table 5-7. GSI XRF Results

New Sample ID	Sample ID	Type	ID	Easting	Northing	Location Type	Colour	Field/Lab	Units	Time	Antimony	Arsenic	Barium	Bismuth	Cadmium	Calcium	Chloride	Chromium	Cobalt
167	AVO-07-SP34B.30	Spoil	SP34B	319271	181451	Surface	Red-brown	Field	ppm	8/22/2007 16:34	0.00	946.45	0.00	842.90	0.00	0.00	0.00	0.00	1364.97
168	AVO-07-SP34B.31	Spoil	SP34B	319305	181472	Surface	Red-brown	Field	ppm	8/22/2007 16:39	0.00	967.29	0.00	675.55	0.00	0.00	0.00	0.00	0.00
169	AVO-07-SP34B.32	Spoil	SP34B	319331	181464	Surface	Red-brown	Field	ppm	8/22/2007 16:44	0.00	449.27	0.00	1011.66	0.00	0.00	0.00	0.00	0.00
170	AVO-07-SP36.4	Spoil	SP36	319438	181376	Surface	Grey, green	Field	ppm	8/22/2007 16:55	248.51	1094.36	1052.79	544.58	0.00	0.00	0.00	0.00	0.00
171	AVO-07-SP02.1	Spoil	SP2	319973	182060	Surafce Grid	Beige-orange	Field	ppm	5/31/2007 9:45	0.00	155.68	452.68	0.00	0.00	0.00	0.00	0.00	0.00
172	AVO-07-SP02.2	Spoil	SP2	319943	182098	Surafce Grid	Red-brown	Field	ppm	5/31/2007 9:53	0.00	747.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
173	AVO-07-SP02.3	Spoil	SP2	319968	182107	Surafce Grid	Red-brown	Field	ppm	5/31/2007 9:58	0.00	236.09	0.00	155.30	0.00	0.00	0.00	0.00	0.00
174	AVO-07-SP02.4	Spoil	SP2	319952	182113	Surafce Grid	Red-brown	Field	ppm	5/31/2007 10:10	0.00	704.69	0.00	0.00	0.00	0.00	0.00	0.00	1141.82
175	AVO-07-SP02.5	Spoil	SP2	319974	182126	Surafce Grid	Red-brown	Field	ppm	5/31/2007 10:35	0.00	374.80	743.05	216.69	0.00	0.00	0.00	0.00	0.00
176	AVO-07-SP02.6	Spoil	SP2	319931	182120	Surafce Grid	Red-brown	Field	ppm	5/31/2007 10:41	133.07	1254.54	0.00	567.89	0.00	0.00	0.00	0.00	0.00
177	AVO-07-SP02.7	Spoil	SP2	319944	182138	Surafce Grid	Grey, blue with red/brown in ar	Field	ppm	5/31/2007 10:48	0.00	1241.15	0.00	749.47	0.00	0.00	0.00	0.00	0.00
178	AVO-07-SP02.8	Spoil	SP2	319960	182147	Surafce Grid	Red-brown, orange	Field	ppm	5/31/2007 10:58	282.53	2004.42	0.00	2024.84	0.00	0.00	0.00	0.00	2042.22
179	AVO-07-SP02.9	Spoil	SP2	319944	182164	Surafce Grid	Orange-brown	Field	ppm	5/31/2007 11:06	0.00	158.23	319.10	0.00	0.00	0.00	0.00	0.00	0.00
180	AVO-07-SP02.10	Spoil	SP2	319923	182144	Surafce Grid	Grey, blue with red/brown in ar	Field	ppm	5/31/2007 11:17	0.00	822.14	0.00	546.87	0.00	0.00	0.00	0.00	1425.49
181	AVO-07-SP02.11	Spoil	SP2	319907	182131	Surafce Grid	Red-brown	Field	ppm	5/31/2007 11:22	0.00	776.20	0.00	589.79	0.00	0.00	0.00	0.00	1228.16
182	AVO-07-SP02.12	Spoil	SP2	319892	182122	Surafce Grid	Beige with blue & orange	Field	ppm	5/31/2007 11:28	0.00	874.06	0.00	886.07	0.00	0.00	0.00	0.00	0.00
183	AVO-07-SP02.13	Spoil	SP2	319880	182141	Surafce Grid	Brown	Field	ppm	5/31/2007 11:35	143.40	977.12	0.00	631.49	0.00	0.00	0.00	0.00	0.00
184	AVO-07-SP02.14	Spoil	SP2	319898	182156	Surafce Grid	Red-brown	Field	ppm	5/31/2007 11:39	134.33	1107.81	0.00	602.96	0.00	0.00	0.00	0.00	0.00
185	AVO-07-SP02.15	Spoil	SP2	319913	182168	Surafce Grid	Beige	Field	ppm	5/31/2007 11:45	240.51	1566.57	0.00	1266.66	0.00	0.00	0.00	0.00	0.00
186	AVO-07-SP02.16	Spoil	SP2	319888	182181	Surafce Grid	Grey-green	Field	ppm	5/31/2007 11:50	552.30	2648.69	0.00	2542.75	0.00	0.00	0.00	171.04	0.00
187	AVO-07-SP02.17	Spoil	SP2	319872	182161	Surafce Grid	Red-brown	Field	ppm	5/31/2007 11:57	0.00	692.57	0.00	527.98	0.00	0.00	0.00	0.00	0.00
188	AVO-07-SP02.18	Spoil	SP2	319861	182177	Surafce Grid	Orange, red-brown	Field	ppm	5/31/2007 12:02	0.00	577.25	0.00	0.00	0.00	0.00	0.00	0.00	1392.52
189	AVO-07-SP02.19	Spoil	SP2	319872	182186	Surafce Grid	Orange, red-brown	Field	ppm	5/31/2007 12:07	0.00	1026.26	0.00	873.41	0.00	0.00	0.00	0.00	0.00
190	AVO-07-SP02.20	Spoil	SP2	319881	182182	Surafce Grid	Grey	Field	ppm	5/31/2007 12:15	0.00	935.60	0.00	539.02	0.00	0.00	0.00	0.00	0.00
191	AVO-07-SP03.1	Spoil	SP3	319893	182212	Surface	Green, grey, red	Field	ppm	5/31/2007 12:33	265.95	1412.63	0.00	1057.95	40.79	0.00	0.00	0.00	0.00
192	AVO-07-SP03.2	Spoil	SP3	319899	182210	Surface	Green - grey	Field	ppm	5/31/2007 12:38	277.83	865.60	423.01	560.60	0.00	0.00	0.00	0.00	0.00
193	AVO-07-SP03.3	Spoil	SP3	319895	182208	Surface	Cream - green	Field	ppm	5/31/2007 12:43	110.58	798.25	0.00	1340.49	0.00	0.00	0.00	0.00	0.00
194	AVO-07-SP03.4	Spoil	SP3	319917	182204	Surface	Dark grey	Field	ppm	5/31/2007 12:48	196.13	862.86	0.00	610.31	0.00	0.00	0.00	364.30	0.00
195	AVO-07-SP03.5	Spoil	SP3	319921	182202	Surface	Green-grey	Field	ppm	5/31/2007 12:53	322.77	746.36	0.00	1347.48	0.00	0.00	0.00	297.92	0.00
196	AVO-07-SP03.6	Spoil	SP3	319917	182200	Surface	Green/red	Field	ppm	5/31/2007 12:58	214.83	586.76	438.66	283.50	0.00	0.00	0.00	0.00	0.00
197	AVO-07-SP01.1	Spoil	SP1	319845	182082	Surface Grid	Brown	Field	ppm	5/31/2007 14:19	131.69	1039.81	0.00	803.41	0.00	0.00	0.00	0.00	1494.57
198	AVO-07-SP01.2	Spoil	SP1	319861	182082	Surface Grid	Grey-Green	Field	ppm	5/31/2007 14:26	0.00	1499.54	0.00	694.77	0.00	0.00	0.00	0.00	0.00
199	AVO-07-SP01.3	Spoil	SP1	319876	182084	Surface Grid	Brown	Field	ppm	5/31/2007 14:29	0.00	644.37	0.00	578.40	0.00	0.00	0.00	0.00	0.00
200	AVO-07-SP01.4	Spoil	SP1	319892	182069	Surface Grid	Brown	Field	ppm	5/31/2007 14:34	0.00	788.82	0.00	524.41	0.00	0.00	0.00	0.00	0.00
201	AVO-07-SP01.5	Spoil	SP1	319877	182065	Surface Grid	Brown	Field	ppm	5/31/2007 14:39	0.00	899.72	0.00	460.42	0.00	0.00	0.00	0.00	0.00
202	AVO-07-SP01.6	Spoil	SP1	319861	182059	Surface Grid	Grey-Green	Field	ppm	5/31/2007 14:43	0.00	1144.21	0.00	711.83	0.00	0.00	0.00	0.00	1773.66
203	AVO-07-SP01.7	Spoil	SP1	319869	182041	Surface Grid	Brown-red	Field	ppm	5/31/2007 14:48	0.00	1151.62	0.00	686.78	0.00	0.00	0.00	0.00	989.55
204	AVO-07-SP01.8	Spoil	SP1	319886	182044	Surface Grid	Grey-Green	Field	ppm	5/31/2007 14:52	199.93	2940.28	0.00	2238.29	0.00	0.00	0.00	0.00	0.00
205	AVO-07-SP01.9	Spoil	SP1	319903	182053	Surface Grid	Brown	Field	ppm	5/31/2007 14:56	0.00	810.58	0.00	919.88	0.00	0.00	0.00	0.00	1106.81
206	AVO-07-SP01.10	Spoil	SP1	319832	182086	Surface	Red-brown	Field	ppm	5/31/2007 15:04	110.37	371.91	914.07	303.38	0.00	0.00	0.00	0.00	0.00
207	AVO-07-SP01.11	Spoil	SP1	319814	182086	Surface	Red-brown	Field	ppm	5/31/2007 15:08	0.00	486.67	1050.04	0.00	0.00	0.00	0.00	0.00	0.00
208	AVO-07-SP01.12	Spoil	SP1	319817	182069	Surface	Red-brown	Field	ppm	5/31/2007 15:12	200.87	844.81	1520.15	0.00	0.00	0.00	0.00	0.00	0.00
209	AVO-07-SP01.13	Spoil	SP1	319833	182072	Surface	Red-brown	Field	ppm	5/31/2007 15:17	228.89	995.39	1087.47	496.22	0.00	0.00	0.00	0.00	0.00
210	AVO-07-SP01.14	Spoil	SP1	319840	182059	Surface	Red-brown	Field	ppm	5/31/2007 15:23	0.00	616.22	513.87	317.68	0.00	0.00	0.00	0.00	873.61
211	AVO-07-SP01.15	Spoil	SP1	319819	182049	Surface	Red-brown	Field	ppm	5/31/2007 15:25	203.76	648.56	1549.41	0.00	0.00	0.00	0.00	0.00	0.00
212	AVO-07-SP01.16	Spoil	SP1	319822	182041	Surface	Brown	Field	ppm	5/31/2007 15:28	0.00	825.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
213	AVO-07-TA01.1 (0.5m)	Tailings	TA01	321591	175371	Vertical Profile	Brown	Field	ppm	8/20/2007 12:48	0.00	60.80	0.00	120.04	0.00	0.00	0.00	0.00	485.48
214	AVO-07-TA01.1 (3M)	Tailings	TA01	321591	175371	Vertical Profile	Grey, brown	Field	ppm	8/20/2007 12:51	0.00	59.38	330.95	142.36	0.00	0.00	0.00	0.00	0.00
215	AVO-07-TA01.1 (5.5m)	Tailings	TA01	321591	175371	Vertical Profile	Grey	Field	ppm	8/20/2007 12:54	0.00	33.56	928.82	93.35	0.00	0.00	0.00	0.00	0.00
216	AVO-07-TA01.2 (0.5m)	Tailings	TA01	321630	175428	Vertical Profile	Grey	Field	ppm	8/20/2007 12:58	0.00	39.44	0.00	75.37	0.00	0.00	4284.49	0.00	0.00
217	AVO-07-TA01.2 (3m)	Tailings	TA01	321630	175428	Vertical Profile	Grey	Field	ppm	8/20/2007 13:01	0.00	38.60	0.00	92.68	0.00	0.00	3519.24	0.00	0.00
218	AVO-07-TA01.2 (5.5m)	Tailings	TA01	321630	175428	Vertical Profile	Grey	Field	ppm	8/20/2007 13:04	0.00	43.24	0.00	136.05	0.00	0.00	0.00	0.00	0.00
219	AVO-07-TA01.3 (0.5m)	Tailings	TA01	321457	175380	Vertical Profile	Brown	Field	ppm	8/20/2007 13:07	0.00	37.10	0.00	94.14	0.00	0.00	0.00	0.00	714.89
220	AVO-07-TA01.3 (3m)	Tailings	TA01	321457	175380	Vertical Profile	Grey, brown	Field	ppm	8/20/2007 13:10	0.00	50.94	606.11	140.62	0.00	0.00	0.00	0.00	0.00
221	AVO-07-TA01.3 (5.5m)	Tailings	TA01	321457	175380	Vertical Profile	Grey	Field	ppm	8/20/2007 13:12	0.00	58.64	294.87	113.73	0.00	0.00	0.00	0.00	0.00
222	AVO-07-TA01.4 (0.5m)	Tailings	TA01	321570	175414	Vertical Profile	Green, grey	Field	ppm	8/20/2007 16:09	0.00	32.62	0.00	75.35	0.00	0.00	3914.46	0.00	0.00
223	AVO-07-TA01.4 (3m)	Tailings	TA01	321570	175414	Vertical Profile	Grey, green, brown	Field	ppm	8/20/2007 16:12	0.00	46.47	0.00	109.56	0.00	0.00	4635.19	0.00	0.00
224	AVO-07-TA01.4 (5.5m)	Tailings	TA01	321570	175414	Vertical Profile	Grey-green	Field	ppm	8/20/2007 16:17	0.00	99.54	316.29	181.00	0.00	0.00	0.00	0.00	0.00
225	AVO-07-TA01.5 (0.5m)	Tailings	TA01	321598	175466	Vertical Profile	Green, grey	Field	ppm	8/20/2007 16:22	0.00	48.66	0.00	82.31	0.00	0.00	4744.81	0.00	322.62
226	AVO-07-TA01.5 (3m)	Tailings	TA01	321598	175466	Vertical Profile	Grey, brown	Field	ppm	8/20/2007 16:25	0.00	71.32	404.02	155.67	0.00	0.00	3440.45	0.00	0.00
227	AVO-07-TA01.5 (5.5m)	Tailings	TA01	321598	175466	Vertical Profile	Grey, brown	Field	ppm	8/20/2007 16:28	0.00	41.60	308.36	67.46	0.00	0.00	0.00	0.00	420.38
228	AVO-07-TA01.6 (0.5m)	Tailings	TA01	321658	175510	Vertical Profile	Green, grey	Field	ppm	8/20/2007 16:35	0.00	18.46	0.00	147.25	0.00	0.00	5328.67	0.00	0.00
229	AVO-07-TA01.6 (3m)	Tailings	TA01	321658	175510	Vertical Profile	Green, grey	Field	ppm	8/20/2007 16:37	0.00	52.66	0.00	130.39	0.00	0.00	0.00	0.00	0.00
230	AVO-07-TA01.6 (5.5m)	Tailings	TA01	321658	175510	Vertical Profile	Grey, Fe staining	Field	ppm	8/20/2007 16:40	0.00	78.52	368.75	149.10	0.00	0.00	0.00	0.00	0.00
231	AVO-07-TA01.7 (0.5m)	Tailings	TA01	321333	175430	Vertical Profile	Grey, green Fe staini	Field	ppm	8/20/2007 16:52	0.00	29.34	0.00	91.48	0.00	0.00	0.00	0.00	0.00
232	AVO-07-TA01.7 (3m)	Tailings	TA01	321333	175430	Vertical Profile	Grey	Field	ppm	8/20/2007 16:58	0.00	37.16	303.10	92.85	0.00	0.00	5850.97	0.00	294.89
233	AVO-07-TA01.7 (5.5m)	Tailings	TA01	321333	175430	Vertical Profile	Grey	Field	ppm	8/20/2007 17:01	0.00	50.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
234	AVO-07-TA01.8 (0.5m)	Tailings	TA01	321514	175426	Vertical Profile	Green, grey	Field	ppm	8/20/2007 17:07	0.00	42.68	0.00	133.38	0.00	0.00	4468.03	0.00	0.00
235	AVO-07-TA01.8 (3m)	Tailings	TA01	321514	175426	Vertical Profile	Grey, Fe staining	Field	ppm	8/20/2007 17:10	0.00	48.37	0.00	120.62	0.00	0.00	0.00	0.00	606.79
236	AVO-07-TA01.8 (5.5m)	Tailings	TA01	321514	175426	Vertical Profile	Grey, Fe staining	Field	ppm	8/20/2007 17:14	0.00	72.48	361.11	118.23	0.00	0.00	0.00	0.00	0.00
237	AVO-07-TA01.9 (0.5m)	Tailings	TA01	321538	175560	Vertical Profile	Green, grey	Field	ppm	8/20/2007 17:17	0.00	47.32	303.45	125.33	0.00	0.00	4562.96	0.00	0.00
238	AVO-07-TA01.9 (3m)	Tailings	TA01	321538	175560	Vertical Profile	Grey	Field	ppm	8/20/2007 17:20	0.00	63.00	0.00	106.48	0.00	0.00	3396.65	0.00	395.48
239	AVO-07-TA01.9 (5.5m)	Tailings	TA01	321538	175560	Vertical Profile	Grey	Field	ppm	8/20/2007 17:23	0.00	58.61	0.00	0.00	0.00	0.00	4111.55	0.00	0.00
240	AVO-07-TA01.10 (0.5m)	Tailings	TA01	321598	175553	Vertical Profile	Green, grey	Field	ppm	8/20/2007 17:28	0.00	40.53	0.00	180.11	0.00	0.00	4756.86	0.00	0.00
241	AVO-07-TA01.10 (3m)	Tailings	TA01	321598	175553	Vertical Profile	Green, grey	Field	ppm	8/20/2007 17:31	0.00	53.46	0.00	79.43	0.00	0.00	3911.92	0.00	0.00
242	AVO-07-TA01.10 (5.5m)	Tailings	TA01	321598	175553	Vertical Profile	Grey	Field	ppm	8/20/2007 17:33	0.00	46.76	0.00	0.00	0.00	0.00	4796.60	0.00	371.50
243	AVO-07-TA01.11 (0.5m)	Tailings	TA01	321289	175511	Vertical Profile	Grey, green	Field	ppm	8/20/2007 17:42	0.00	56.66	0.00	119.28	0.00	0.00	4150.15	0.00	0.00
244	AVO-07-TA01.11 (3m)	Tailings	TA01	321289	175511	Vertical Profile	Grey Fe staining	Field	ppm	8/20/2007 17:44	0.00	63.65	0.00	125.77	0.00	0.00	0.00	0.00	0.00
245	AVO-07-TA01.11 (5.5m)	Tailings	TA01	321289	175511	Vertical Profile	Grey	Field	ppm	8/20/2007 17:49	0.00	44.44	467.57	76.37	0.00	0.00	4467.90	0.00	367.19
246	AVO-07-TA01.12 (0.5m)	Tailings	TA01	321389	175568	Vertical Profile	Green, grey	Field	ppm	8/20/2007 17:53	0.00	50.53	440.27	91.61	0.00	0.00	0.00	0.00	0.00

Table 5-7. GSI XRF Results

Sample ID	Copper	Iron	Lead	Manganese	Mercury	Nickel	Phosphorus	Potassium	Rubidium	Scandium	Selenium	Silver	Strontium	Sulphur	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc
AVO-07-SP34B.30	297.52	295649.66	3137.55	0.00	0.00	0.00	0.00	1734.12	32.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2080.51	0.00	0.00	0.00	0.00
AVO-07-SP34B.31	315.31	439163.09	2502.20	576.21	0.00	0.00	0.00	4185.01	49.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3996.81	0.00	0.00	0.00	0.00
AVO-07-SP34B.32	366.35	360215.94	2617.65	652.04	0.00	0.00	0.00	2185.72	46.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1358.78	0.00	0.00	0.00	0.00
AVO-07-SP36.4	4221.45	363601.59	3553.00	0.00	0.00	0.00	0.00	0.00	30.62	0.00	0.00	0.00	0.00	59155.72	0.00	0.00	0.00	662.50	0.00	0.00	0.00	3997.24
AVO-07-SP02.1	321.74	38801.09	914.72	196.43	0.00	0.00	0.00	8867.54	77.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1250.93	0.00	0.00	0.00	173.21
AVO-07-SP02.2	608.81	120933.40	4704.20	561.88	0.00	0.00	0.00	5672.25	61.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1368.50	0.00	0.00	0.00	119.90
AVO-07-SP02.3	250.54	77561.80	1156.97	356.41	0.00	0.00	0.00	4571.89	53.57	0.00	0.00	0.00	0.00	0.00	60.38	0.00	0.00	1039.83	0.00	0.00	0.00	90.49
AVO-07-SP02.4	1122.67	150170.94	4881.92	611.85	0.00	0.00	0.00	4420.89	80.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1420.57	0.00	0.00	0.00	314.82
AVO-07-SP02.5	274.73	90589.55	2394.40	544.13	0.00	0.00	0.00	7279.53	71.78	0.00	0.00	0.00	0.00	0.00	105.55	0.00	0.00	1898.12	0.00	0.00	0.00	69.92
AVO-07-SP02.6	755.94	132350.52	11187.69	397.79	0.00	0.00	0.00	5759.54	70.56	0.00	0.00	0.00	0.00	0.00	447.72	0.00	0.00	1129.50	0.00	57.48	0.00	159.47
AVO-07-SP02.7	1540.21	67298.11	15623.13	461.98	0.00	0.00	0.00	8449.08	124.61	0.00	0.00	0.00	0.00	9709.34	635.76	0.00	0.00	1176.19	0.00	0.00	0.00	718.02
AVO-07-SP02.8	1816.33	252348.42	22901.25	0.00	0.00	0.00	0.00	0.00	28.58	0.00	0.00	0.00	0.00	0.00	763.23	0.00	0.00	822.85	0.00	0.00	0.00	436.07
AVO-07-SP02.9	191.68	42493.36	885.51	238.83	0.00	0.00	0.00	6648.54	60.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1569.66	0.00	0.00	0.00	112.45
AVO-07-SP02.10	4371.62	123637.80	9674.34	641.97	0.00	0.00	0.00	5374.65	97.54	0.00	0.00	0.00	0.00	12172.51	287.55	0.00	0.00	807.92	0.00	0.00	0.00	549.17
AVO-07-SP02.11	847.79	187856.97	7361.04	592.31	0.00	0.00	0.00	4521.74	61.71	0.00	0.00	0.00	0.00	0.00	282.48	0.00	0.00	1362.81	0.00	0.00	0.00	211.85
AVO-07-SP02.12	2349.75	248199.78	11439.31	767.72	0.00	0.00	0.00	2460.19	45.36	0.00	0.00	37.97	0.00	11545.94	559.78	0.00	0.00	853.47	0.00	0.00	0.00	147.45
AVO-07-SP02.13	777.23	156226.73	10097.43	687.04	0.00	0.00	0.00	5715.58	65.70	0.00	0.00	0.00	0.00	0.00	436.01	0.00	0.00	1259.54	0.00	0.00	0.00	262.75
AVO-07-SP02.14	989.03	204741.33	11328.77	757.27	0.00	0.00	0.00	4029.77	63.36	0.00	0.00	27.01	0.00	0.00	232.44	0.00	0.00	868.66	0.00	0.00	0.00	187.06
AVO-07-SP02.15	1398.66	108821.58	22585.52	0.00	0.00	0.00	0.00	4140.11	81.14	0.00	0.00	0.00	0.00	7444.00	672.89	0.00	0.00	983.67	0.00	0.00	0.00	578.20
AVO-07-SP02.16	1439.83	107016.74	43934.09	0.00	0.00	0.00	0.00	6815.20	94.29	0.00	0.00	57.99	54.90	13994.97	1542.41	0.00	0.00	975.68	0.00	0.00	0.00	1668.35
AVO-07-SP02.17	856.50	221430.91	8558.54	774.87	0.00	0.00	0.00	1722.08	43.29	0.00	0.00	0.00	0.00	0.00	310.31	0.00	0.00	1077.51	0.00	0.00	0.00	198.92
AVO-07-SP02.18	803.39	272561.38	4585.40	1427.60	0.00	0.00	0.00	2279.60	41.44	0.00	0.00	0.00	0.00	0.00	258.76	0.00	0.00	1096.85	0.00	0.00	0.00	122.41
AVO-07-SP02.19	1036.50	362622.50	9946.76	830.49	0.00	0.00	0.00	1061.05	40.10	0.00	0.00	0.00	0.00	0.00	434.89	0.00	0.00	969.63	0.00	0.00	0.00	0.00
AVO-07-SP02.20	3971.94	360555.50	7311.61	2303.82	0.00	0.00	0.00	0.00	35.85	0.00	0.00	0.00	0.00	10590.15	242.68	0.00	0.00	883.64	0.00	0.00	0.00	3794.77
AVO-07-SP03.1	609.07	77791.67	27016.82	0.00	0.00	0.00	0.00	8217.12	107.83	0.00	0.00	37.86	30.94	0.00	743.34	0.00	101.25	1068.89	0.00	69.29	0.00	548.98
AVO-07-SP03.2	455.28	50373.75	13804.47	386.56	0.00	0.00	0.00	6539.28	91.29	0.00	0.00	36.38	0.00	0.00	382.44	0.00	0.00	1085.51	0.00	0.00	0.00	544.41
AVO-07-SP03.3	721.87	78588.77	18981.91	482.36	0.00	0.00	0.00	2747.11	21.74	0.00	0.00	0.00	0.00	0.00	722.79	0.00	0.00	985.63	0.00	48.87	0.00	413.25
AVO-07-SP03.4	173.28	34037.98	7735.99	0.00	0.00	0.00	0.00	14940.71	170.34	0.00	0.00	0.00	0.00	0.00	302.48	0.00	0.00	1362.26	0.00	0.00	0.00	133.24
AVO-07-SP03.5	357.45	41750.36	14214.97	0.00	0.00	0.00	0.00	11512.74	133.43	0.00	0.00	0.00	0.00	7113.43	564.94	0.00	0.00	972.43	0.00	0.00	264.18	403.87
AVO-07-SP03.6	186.10	105923.32	4644.08	0.00	0.00	0.00	0.00	11131.64	110.07	0.00	0.00	0.00	0.00	0.00	206.23	0.00	0.00	2244.31	0.00	0.00	0.00	68.25
AVO-07-SP01.1	1694.03	171197.25	9029.12	489.09	0.00	0.00	0.00	3444.16	64.13	0.00	0.00	0.00	0.00	0.00	455.13	0.00	0.00	1360.96	0.00	0.00	0.00	443.20
AVO-07-SP01.2	3403.56	165216.56	14378.18	720.90	0.00	0.00	0.00	3303.73	65.32	0.00	0.00	0.00	0.00	8693.91	533.82	0.00	0.00	906.10	0.00	0.00	0.00	640.02
AVO-07-SP01.3	973.94	147257.98	5614.08	752.67	0.00	0.00	0.00	5394.29	64.49	0.00	0.00	0.00	0.00	0.00	194.07	0.00	0.00	2298.82	0.00	0.00	0.00	157.80
AVO-07-SP01.4	1081.77	166964.70	6565.74	938.60	0.00	0.00	0.00	7701.41	96.32	0.00	0.00	0.00	0.00	0.00	250.35	0.00	0.00	1762.47	0.00	0.00	0.00	256.88
AVO-07-SP01.5	940.86	156029.92	7346.00	525.69	0.00	0.00	0.00	5922.63	74.52	0.00	0.00	0.00	0.00	0.00	198.88	0.00	0.00	1503.38	0.00	0.00	0.00	208.94
AVO-07-SP01.6	3104.36	168789.41	10770.20	609.85	0.00	0.00	0.00	5230.31	84.26	0.00	0.00	0.00	0.00	12950.80	510.50	0.00	0.00	1162.74	0.00	0.00	0.00	796.11
AVO-07-SP01.7	699.86	169406.98	10362.80	709.66	0.00	0.00	0.00	3682.04	61.43	0.00	0.00	0.00	0.00	0.00	463.48	0.00	0.00	1209.64	0.00	0.00	0.00	216.71
AVO-07-SP01.8	1144.20	93684.92	22877.16	537.35	0.00	0.00	0.00	4231.54	39.57	0.00	0.00	0.00	0.00	7956.54	949.28	0.00	0.00	1283.95	0.00	0.00	0.00	644.86
AVO-07-SP01.9	1921.06	182168.16	7920.78	815.63	0.00	0.00	0.00	5794.53	70.03	0.00	0.00	0.00	0.00	9508.39	369.66	0.00	0.00	1114.03	0.00	0.00	0.00	321.19
AVO-07-SP01.10	614.51	212010.17	2842.87	701.67	0.00	0.00	0.00	3327.43	53.24	0.00	0.00	0.00	0.00	0.00	111.73	0.00	0.00	1332.06	0.00	0.00	0.00	0.00
AVO-07-SP01.11	410.12	233244.83	1128.21	775.87	0.00	0.00	0.00	3171.49	45.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1857.71	0.00	0.00	0.00	0.00
AVO-07-SP01.12	489.97	363041.09	2440.62	678.69	0.00	0.00	0.00	2059.05	37.05	0.00	0.00	0.00	0.00	0.00	124.70	0.00	0.00	1119.06	0.00	0.00	0.00	0.00
AVO-07-SP01.13	899.15	297682.56	9009.20	0.00	0.00	0.00	0.00	1927.95	38.03	0.00	0.00	0.00	0.00	0.00	180.55	0.00	0.00	825.00	0.00	0.00	0.00	285.68
AVO-07-SP01.14	759.62	124939.83	4796.12	654.65	0.00	0.00	0.00	1702.64	54.65	0.00	0.00	0.00	0.00	0.00	114.03	0.00	0.00	601.36	0.00	0.00	0.00	284.14
AVO-07-SP01.15	535.36	281861.44	2909.91	957.37	0.00	0.00	0.00	2430.75	49.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1115.31	0.00	0.00	0.00	0.00
AVO-07-SP01.16	686.05	138127.73	7538.35	807.35	0.00	0.00	0.00	3529.17	66.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1144.28	0.00	0.00	0.00	207.21
AVO-07-TA01.1 (0.5m)	212.25	45607.78	247.44	556.06	0.00	0.00	0.00	3707.64	19.53	0.00	0.00	0.00	0.00	0.00	27.82	0.00	0.00	1284.88	0.00	0.00	0.00	0.00
AVO-07-TA01.1 (3M)	150.80	56248.70	390.87	696.97	0.00	0.00	0.00	4896.33	35.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	577.71	0.00	0.00	0.00	142.31
AVO-07-TA01.1 (5.5m)	130.51	55496.93	118.37	782.65	0.00	0.00	0.00	3529.89	32.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	514.15	0.00	0.00	0.00	79.29
AVO-07-TA01.2 (0.5m)	156.37	37094.67	210.52	453.19	0.00	0.00	0.00	1220.50	19.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	619.39	0.00	0.00	0.00	27.69
AVO-07-TA01.2 (3m)	204.63	42153.66	149.77	659.13	0.00	0.00	0.00	3411.69	24.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	541.38	0.00	0.00	0.00	55.25
AVO-07-TA01.2 (5.5m)	315.04	55937.12	425.15	667.65	0.00	0.00	0.00	3732.90	23.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	539.82	0.00	0.00	0.00	161.75
AVO-07-TA01.3 (0.5m)	216.93	55649.47	188.39	746.48	0.00	0.00	0.00	2986.03	24.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	972.41	0.00	0.00	0.00	51.21
AVO-07-TA01.3 (3m)	200.91	62355.21	355.78	691.13	0.00	0.00	0.00	1925.46	30.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	742.69	0.00	0.00	0.00	127.24
AVO-07-TA01.3 (5.5m)	322.37	51474.36	300.36	667.26	0.00	0.00	0.00	2649.00	22.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	698.47	0.00	0.00	0.00	160.76
AVO-07-TA01.4 (0.5m)	92.06	38848.53	194.60	721.96	0.00	0.00	0.00	2013.34	30.83	0.00	0.00	0.00	0.00	0.00	0.00	35.27	0.00	819.85	0.00	0.00	0.00	36.59
AVO-07-TA01.4 (3m)	219.55	28991.56	84.69	336.49	0.00	0.00	0.00	1594.70	11.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	615.19	0.00	0.00	0.00	35.35
AVO-07-TA01.4 (5.5m)	353.95	58529.25	537.10	718.62	0.00	0.00	0.00	3461.16	28.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	717.47	0.00	0.00	0.00	144.57
AVO-07-TA01.5 (0.5m)	135.14	37703.19	139.56	422.88	0.00	0.00	0.00	1192.67	16.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	438.87	0.00	0.00	0.00	39.02
AVO-07-TA01.5 (3m)	312.09	39594.17	222.47	512.04	0.00	0.00	0.00	2186.49	21.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	461.30	0.00	0.00	0.00	113.85
AVO-07-TA01.5 (5.5m)	159.70	45664.05	226.73	618.29	0.00	0.00	0.00	4490.80	26.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	570.55	0.00	0.00	0.00	58.05
AVO-07-TA01.6 (0.5m)	110.72	31510.16	99.75	449.93	0.00	0.00	0.00	1534.61	17.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	417.70	0.00	0.00	0.00	37.67
AVO-07-TA01.6 (3m)	194.14	64897.38	295.75	787.43	0.00	0.00	0.00	3433.41	22.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	791.60	0.00	0.00	0.00	110.25
AVO-07-TA01.6 (5.5m)	142.89	46077.30	471.36	632.75	0.00	0.00	0.00	1568.72	17.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	379.80	0.00	0.00	0.00	199.05
AVO-07-TA01.7 (0.5m)	146.59	48636.91	174.20	934.43	0.00	0.00	0.00	4637.88	34.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1799.93	0.00	0.00	0.00	61.28
AVO-07-TA01.7 (3m)	265.56	30211.52	121.65	294.70	0.00	0.00	0.00	828.96	12.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	243.88	0.00	0.00	0.00	86.77
AVO-07-TA01.7 (5.5m)	201.79	55686.87	342.00	688.43	0.00	0.00	0.00	2408.22	26.33	0.00	0.00	0.00	0.00	0.00	0.00	44.70	0.00	554.56	0.00	0.00	0.00	101.82
AVO-07-TA01.8 (0.5m)	152.58	36103.66	135.83	399.30	0.00	0.00	0.00	1302.03	13.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	587.05	0.00	0.00	0.00	42.87
AVO-07-TA01.8 (3m)	119.82	53394.65	269.64	741.06	0.00	0.00	0.00	2950.21	26.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	889.63	0.00	0.00	0.00	78.92
AVO-07-TA01.8 (5.5m)	185.24	50873.66	198.73	550.39	0.00	0.00	0.00	2570.95	25.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	415.51	0.00	0.00	0.00	84.63
AVO-07-TA01.9 (0.5m)	157.20	36084.04	243.92	524.80	0.00	0.00	0.00	1107.94	11.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	523.07	0.00	0.00	0.00	41.58
AVO-07-TA01.9 (3m)	378.31	44024.18	244.66	513.91	0.00	0.00	0.00	1915.30	21.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	417.34	0.00	0.00	0.00	180.32
AVO-07-TA01.9 (5.5m)	348.22	40999.15	243.48	476.28	0.00	0.00	0.00	1623.81	16.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	455.21	0.00	0.00	0.00	189.93
AVO-07-TA01.10 (0.5m)	151.47	34751.18	203.09	292.23	0.00	0.00	0.00	1690.68	14.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	525.15	0.00	0.00	0.00	0.00
AVO-07-TA01.10 (3m)	358.66	38706.60	191.00	367.04	0.00	0.00	0.00	809.19	11.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	459.64	0.00	0.00	0.00	174.09
AVO-07-TA01.10 (5.5m)	113.42	39864.67	161.01	557.45	0.00	0.00	0.00	2671.81	23.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	695.10	0.00	0.00	0.00	92.34
AVO-07-TA01.11 (0.5m)	133.19	31498.08	219.47	353.40	0.00	0.00	0.00	761.81	9.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	280.61	0.00	0.00	0.00	44.56
AVO-07-TA01.11 (3m)	145.27	44607.42	408.60	741.06	0.00	0.00	0.00	2754.96	15.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	664.47	0.00	0.00	0.00	132.25
AVO-07-TA01.11 (5.5m)	183.35	38786.47	41.12	456.18	0.00	0.00	0.00	1643.75	14.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	382.22	0.00	0.00	0.00	73.90
AVO-07-TA01.12 (0.5m)	134.76	45550.59	115.60	699.05	0.00	0.00	0.00	2384.10	44.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	967.03	0.00	0.00	0.00	38.55

Table 5-7. GSI XRF Results

New Sample ID	Sample ID	Type	ID	Easting	Northing	Location Type	Colour	Field/Lab	Units	Time	Antimony	Arsenic	Barium	Bismuth	Cadmium	Calcium	Chloride	Chromium	Cobalt
247	AVO-07-TA01.12 (3m)	Tailings	TA01	321389	175568	Vertical Profile	Grey Fe staining	Field	ppm	8/20/2007 17:56	0.00	83.62	328.10	104.29	0.00	0.00	0.00	0.00	626.70
248	AVO-07-TA01.12 (5.5m)	Tailings	TA01	321389	175568	Vertical Profile	Grey	Field	ppm	8/20/2007 18:03	0.00	56.77	0.00	94.77	0.00	0.00	0.00	0.00	0.00
249	AVO-07-TA01.13 (0.5m)	Tailings	TA01	321483	175628	Vertical Profile	Green, grey	Field	ppm	8/21/2007 9:45	0.00	50.10	438.03	76.41	0.00	0.00	4257.05	0.00	341.78
250	AVO-07-TA01.13 (3m)	Tailings	TA01	321483	175628	Vertical Profile	Grey	Field	ppm	8/21/2007 9:48	0.00	80.63	521.65	139.73	0.00	0.00	4182.43	0.00	355.83
251	AVO-07-TA01.13 (5.5m)	Tailings	TA01	321483	175628	Vertical Profile	Grey	Field	ppm	8/21/2007 9:51	0.00	46.49	634.18	0.00	0.00	0.00	5165.82	0.00	0.00
252	AVO-07-TA01.14 (0.5m)	Tailings	TA01	321576	175618	Vertical Profile	Green, grey	Field	ppm	8/21/2007 9:55	0.00	0.00	0.00	183.58	0.00	0.00	5643.43	0.00	0.00
253	AVO-07-TA01.14 (3m)	Tailings	TA01	321576	175618	Vertical Profile	Green, grey	Field	ppm	8/21/2007 9:58	0.00	62.35	327.53	135.15	0.00	0.00	3951.62	0.00	0.00
254	AVO-07-TA01.14 (5.5m)	Tailings	TA01	321576	175618	Vertical Profile	Grey	Field	ppm	8/21/2007 10:01	0.00	25.31	0.00	0.00	0.00	0.00	4395.09	0.00	0.00
255	AVO-07-TA01.15 (0.5m)	Tailings	TA01	321250	175563	Vertical Profile	Grey, green, brown	Field	ppm	8/21/2007 10:04	0.00	65.94	0.00	112.11	0.00	0.00	0.00	0.00	464.88
256	AVO-07-TA01.15 (3.3m)	Tailings	TA01	321250	175563	Vertical Profile	Grey Fe staining	Field	ppm	8/21/2007 10:11	0.00	56.16	0.00	113.36	0.00	0.00	0.00	0.00	0.00
257	AVO-07-TA01.15 (5m)	Tailings	TA01	321250	175563	Vertical Profile	Grey, green, brown	Field	ppm	8/21/2007 10:13	0.00	46.30	0.00	106.30	0.00	0.00	3653.92	0.00	0.00
258	AVO-07-TA01.16 (0.5m)	Tailings	TA01	321364	175605	Vertical Profile	Green, grey	Field	ppm	8/21/2007 10:19	0.00	69.48	0.00	174.44	0.00	0.00	0.00	0.00	0.00
259	AVO-07-TA01.16 (3m)	Tailings	TA01	321364	175605	Vertical Profile	Grey	Field	ppm	8/21/2007 10:22	0.00	52.34	0.00	97.94	0.00	0.00	4067.91	0.00	0.00
260	AVO-07-TA01.16 (5.5m)	Tailings	TA01	321364	175605	Vertical Profile	Grey brown	Field	ppm	8/21/2007 10:24	0.00	76.12	0.00	132.72	0.00	0.00	3909.79	0.00	405.97
261	AVO-07-TA01.17 (0.5m)	Tailings	TA01	321422	175674	Vertical Profile	Green, grey, brown	Field	ppm	8/21/2007 10:28	0.00	47.31	0.00	172.86	0.00	0.00	3597.69	0.00	0.00
262	AVO-07-TA01.17 (3m)	Tailings	TA01	321422	175674	Vertical Profile	Grey, Green	Field	ppm	8/21/2007 10:30	0.00	48.24	435.60	134.26	0.00	0.00	3795.13	0.00	0.00
263	AVO-07-TA01.17 (5.5m)	Tailings	TA01	321422	175674	Vertical Profile	Grey	Field	ppm	8/21/2007 10:33	0.00	38.41	0.00	104.96	0.00	0.00	3511.00	0.00	0.00
264	AVO-07-TA01.18 (0.5m)	Tailings	TA01	321536	175668	Vertical Profile	Grey, green	Field	ppm	8/21/2007 10:36	0.00	65.24	357.21	174.58	0.00	0.00	4379.47	0.00	0.00
265	AVO-07-TA01.18 (3m)	Tailings	TA01	321536	175668	Vertical Profile	Grey, brown	Field	ppm	8/21/2007 10:38	0.00	58.48	346.52	102.69	0.00	0.00	4577.72	0.00	574.75
266	AVO-07-TA01.18 (5.5m)	Tailings	TA01	321536	175668	Vertical Profile	Grey	Field	ppm	8/21/2007 10:41	0.00	55.16	0.00	69.18	0.00	0.00	4583.79	0.00	0.00
267	AVO-07-TA01.19 (0.5m)	Tailings	TA01	321191	175641	Vertical Profile	Green, brown, grey	Field	ppm	8/21/2007 11:58	0.00	71.80	0.00	197.01	0.00	0.00	0.00	0.00	0.00
268	AVO-07-TA01.19 (3m)	Tailings	TA01	321191	175641	Vertical Profile	Grey, green Fe staini	Field	ppm	8/21/2007 12:01	0.00	83.35	0.00	108.83	0.00	0.00	0.00	0.00	444.47
269	AVO-07-TA01.19 (5.5m)	Tailings	TA01	321191	175641	Vertical Profile	Grey, green	Field	ppm	8/21/2007 12:04	0.00	55.68	0.00	132.32	0.00	0.00	0.00	0.00	0.00
270	AVO-07-TA01.20 (0.5m)	Tailings	TA01	321273	175693	Vertical Profile	Grey	Field	ppm	8/21/2007 12:07	0.00	21.80	0.00	208.53	0.00	0.00	4403.03	0.00	381.20
271	AVO-07-TA01.20 (3m)	Tailings	TA01	321273	175693	Vertical Profile	Brown, Grey	Field	ppm	8/21/2007 12:09	0.00	54.57	337.32	118.44	0.00	0.00	0.00	0.00	0.00
272	AVO-07-TA01.20 (5.5m)	Tailings	TA01	321273	175693	Vertical Profile	Red brown	Field	ppm	8/21/2007 12:11	0.00	67.89	0.00	130.20	0.00	0.00	0.00	0.00	484.22
273	AVO-07-TA01.21 (0.5m)	Tailings	TA01	321347	175743	Vertical Profile	Grey	Field	ppm	8/21/2007 12:14	0.00	70.39	0.00	155.10	0.00	0.00	3793.09	0.00	0.00
274	AVO-07-TA01.21 (3m)	Tailings	TA01	321347	175743	Vertical Profile	Grey	Field	ppm	8/21/2007 12:17	0.00	59.17	0.00	166.26	0.00	0.00	3461.14	0.00	0.00
275	AVO-07-TA01.21 (5.5m)	Tailings	TA01	321347	175743	Vertical Profile	Grey	Field	ppm	8/21/2007 12:19	0.00	29.21	315.48	109.18	0.00	0.00	5172.62	0.00	0.00
276	AVO-07-TA01.22 (0.5m)	Tailings	TA01	321497	175729	Vertical Profile	Green grey	Field	ppm	8/21/2007 12:23	0.00	42.97	291.28	126.84	0.00	0.00	3778.05	0.00	0.00
277	AVO-07-TA01.22 (3m)	Tailings	TA01	321497	175729	Vertical Profile	Grey	Field	ppm	8/21/2007 12:26	0.00	75.08	0.00	205.67	0.00	0.00	0.00	0.00	0.00
278	AVO-07-TA01.22 (5.5m)	Tailings	TA01	321497	175729	Vertical Profile	Grey	Field	ppm	8/21/2007 12:28	0.00	67.30	412.17	137.27	0.00	0.00	3581.27	0.00	0.00
279	AVO-07-TA01.23 (0.5m)	Tailings	TA01	321154	175733	Vertical Profile	Green grey	Field	ppm	8/21/2007 15:16	0.00	86.93	0.00	181.41	0.00	0.00	0.00	0.00	0.00
280	AVO-07-TA01.23 (3m)	Tailings	TA01	321154	175733	Vertical Profile	Grey Fe staining	Field	ppm	8/21/2007 15:18	0.00	36.55	0.00	103.87	0.00	0.00	0.00	0.00	0.00
281	AVO-07-TA01.23 (5.5m)	Tailings	TA01	321154	175733	Vertical Profile	Grey Fe staining	Field	ppm	8/21/2007 15:21	0.00	79.13	0.00	158.65	0.00	0.00	0.00	0.00	0.00
282	AVO-07-TA01.24 (0.5m)	Tailings	TA01	321192	175772	Vertical Profile	Grey	Field	ppm	8/21/2007 15:24	0.00	48.94	577.86	0.00	0.00	0.00	0.00	0.00	440.34
283	AVO-07-TA01.24 (3m)	Tailings	TA01	321192	175772	Vertical Profile	Grey	Field	ppm	8/21/2007 15:26	0.00	102.12	505.57	95.38	0.00	0.00	0.00	0.00	0.00
284	AVO-07-TA01.24 (5.5m)	Tailings	TA01	321192	175772	Vertical Profile	Grey brown	Field	ppm	8/21/2007 15:28	0.00	54.17	0.00	112.20	0.00	0.00	0.00	0.00	0.00
285	AVO-07-TA01.25 (0.5m)	Tailings	TA01	321290	175826	Vertical Profile	Green grey	Field	ppm	8/21/2007 15:33	0.00	0.00	0.00	243.44	0.00	0.00	0.00	0.00	0.00
286	AVO-07-TA01.25 (3m)	Tailings	TA01	321290	175826	Vertical Profile	Grey, green, Fe stain	Field	ppm	8/21/2007 15:35	0.00	88.21	0.00	86.84	0.00	0.00	3633.35	0.00	347.42
287	AVO-07-TA01.25 (5.5m)	Tailings	TA01	321290	175826	Vertical Profile	Grey	Field	ppm	8/21/2007 15:37	0.00	55.59	0.00	76.29	0.00	0.00	0.00	0.00	289.72
288	AVO-07-TA01.26 (0.5m)	Tailings	TA01	321454	175779	Vertical Profile	Grey	Field	ppm	8/21/2007 15:40	0.00	83.55	0.00	207.42	0.00	0.00	0.00	0.00	0.00
289	AVO-07-TA01.26 (3m)	Tailings	TA01	321454	175779	Vertical Profile	Grey	Field	ppm	8/21/2007 15:42	0.00	119.18	354.01	254.71	0.00	0.00	3881.92	0.00	0.00
290	AVO-07-TA01.26 (5.5m)	Tailings	TA01	321454	175779	Vertical Profile	Grey	Field	ppm	8/21/2007 15:45	0.00	46.56	344.82	0.00	0.00	0.00	4501.84	0.00	0.00
291	AVO-07-TA01.27 (0.5m)	Tailings	TA01	321070	175845	Vertical Profile	Grey	Field	ppm	8/21/2007 15:48	0.00	55.48	377.80	125.49	0.00	0.00	3719.94	0.00	431.14
292	AVO-07-TA01.27 (3m)	Tailings	TA01	321070	175845	Vertical Profile	Grey	Field	ppm	8/21/2007 15:51	0.00	47.42	0.00	121.07	0.00	0.00	0.00	0.00	392.40
293	AVO-07-TA01.27 (5.5m)	Tailings	TA01	321070	175845	Vertical Profile	Darker Grey	Field	ppm	8/21/2007 15:53	0.00	93.36	0.00	93.73	0.00	0.00	0.00	0.00	442.09
294	AVO-07-TA01.28 (0.5m)	Tailings	TA01	321119	175876	Vertical Profile	Green grey	Field	ppm	8/21/2007 15:59	0.00	48.58	277.57	74.69	0.00	0.00	4507.01	0.00	0.00
295	AVO-07-TA01.28 (3m)	Tailings	TA01	321119	175876	Vertical Profile	Green grey Fe stainin	Field	ppm	8/21/2007 16:01	0.00	66.97	0.00	74.18	0.00	0.00	3534.88	0.00	0.00
296	AVO-07-TA01.28 (5.5m)	Tailings	TA01	321119	175876	Vertical Profile	Green grey Fe stainin	Field	ppm	8/21/2007 16:03	0.00	62.83	0.00	64.64	0.00	0.00	3662.52	0.00	463.31
297	AVO-07-TA01.29 (0.5m)	Tailings	TA01	321164	175952	Vertical Profile	Grey hint green	Field	ppm	8/21/2007 16:07	0.00	84.63	0.00	75.38	0.00	0.00	3720.47	0.00	496.58
298	AVO-07-TA01.29 (3m)	Tailings	TA01	321164	175952	Vertical Profile	Grey	Field	ppm	8/21/2007 16:09	0.00	78.82	308.97	103.14	0.00	0.00	4102.30	0.00	0.00
299	AVO-07-TA01.29 (5.5m)	Tailings	TA01	321164	175952	Vertical Profile	Grey, green Fe staini	Field	ppm	8/21/2007 16:11	0.00	58.89	0.00	92.82	0.00	0.00	4015.04	0.00	415.93
300	AVO-07-TA01.30 (0.5m)	Tailings	TA01	321377	175947	Vertical Profile	Green brown	Field	ppm	8/21/2007 16:15	0.00	35.90	382.12	172.42	0.00	0.00	4767.80	0.00	0.00
301	AVO-07-TA01.30 (3m)	Tailings	TA01	321377	175947	Vertical Profile	Grey brown	Field	ppm	8/21/2007 16:17	0.00	208.31	0.00	245.82	0.00	0.00	0.00	0.00	0.00
302	AVO-07-TA01.30 (5.5m)	Tailings	TA01	321377	175947	Vertical Profile	Green grey Fe stainin	Field	ppm	8/21/2007 16:20	0.00	97.84	0.00	122.46	0.00	0.00	3801.14	0.00	0.00
303	AVO-07-TA01.31 (0.5m)	Tailings	TA01	321012	175920	Vertical Profile	Red brown	Field	ppm	8/21/2007 16:32	0.00	56.55	0.00	143.81	0.00	0.00	0.00	0.00	472.17
304	AVO-07-TA01.31 (3m)	Tailings	TA01	321012	175920	Vertical Profile	Green grey Fe stainin	Field	ppm	8/21/2007 16:34	0.00	78.03	0.00	90.60	0.00	0.00	0.00	0.00	445.66
305	AVO-07-TA01.31 (5.5m)	Tailings	TA01	321012	175920	Vertical Profile	Green grey	Field	ppm	8/21/2007 16:37	0.00	50.65	296.60	86.15	0.00	0.00	0.00	0.00	754.71
306	AVO-07-TA01.32 (0.5m)	Tailings	TA01	321060	175991	Vertical Profile	Grey	Field	ppm	8/21/2007 16:40	0.00	72.56	0.00	109.97	0.00	0.00	3694.12	0.00	0.00
307	AVO-07-TA01.32 (3m)	Tailings	TA01	321060	175991	Vertical Profile	Green grey	Field	ppm	8/21/2007 16:42	0.00	57.47	298.72	0.00	0.00	0.00	0.00	0.00	0.00
308	AVO-07-TA01.32 (5.5m)	Tailings	TA01	321060	175991	Vertical Profile	Brown grey	Field	ppm	8/21/2007 16:44	0.00	60.72	0.00	82.40	0.00	0.00	5085.44	0.00	0.00
309	AVO-07-TA01.33 (0.5m)	Tailings	TA01	321146	176056	Vertical Profile	Grey green	Field	ppm	8/21/2007 16:47	0.00	37.39	0.00	196.44	0.00	0.00	4013.70	0.00	0.00
310	AVO-07-TA01.33 (3m)	Tailings	TA01	321146	176056	Vertical Profile	Grey green Fe stainin	Field	ppm	8/21/2007 16:49	0.00	72.13	282.54	82.68	0.00	0.00	4339.95	0.00	0.00
311	AVO-07-TA01.33 (5.5m)	Tailings	TA01	321146	176056	Vertical Profile	Dark grey	Field	ppm	8/21/2007 16:52	0.00	41.46	288.32	115.80	0.00	0.00	4201.63	0.00	0.00
312	AVO-07-TA01.34 (0.5m)	Tailings	TA01	320959	175986	Vertical Profile	Green grey red/brown	Field	ppm	8/21/2007 16:56	0.00	59.81	0.00	0.00	0.00	0.00	0.00	0.00	345.27
313	AVO-07-TA01.34 (3m)	Tailings	TA01	320959	175986	Vertical Profile	Grey red/brown	Field	ppm	8/21/2007 16:59	0.00	76.57	0.00	97.06	0.00	0.00	0.00	0.00	0.00
314	AVO-07-TA01.34 (5.5m)	Tailings	TA01	320959	175986	Vertical Profile	Grey	Field	ppm	8/21/2007 17:01	0.00	106.17	0.00	94.32	0.00	0.00	3236.83	0.00	366.50
315	AVO-07-TA01.35 (0.5m)	Tailings	TA01	320942	176051	Vertical Profile	Grey	Field	ppm	8/21/2007 17:04	0.00	64.30	0.00	79.10	0.00	0.00	0.00	0.00	504.64
316	AVO-07-TA01.35 (3m)	Tailings	TA01	320942	176051	Vertical Profile	Grey	Field	ppm	8/21/2007 17:06	0.00	62.25	0.00	105.92	0.00	0.00	4558.41	0.00	374.54
317	AVO-07-TA01.35 (5.5m)	Tailings	TA01	320942	176051	Vertical Profile	Grey	Field	ppm	8/21/2007 17:08	0.00	62.55	549.78	0.00	0.00	390.53	0.00	0.00	0.00
318	AVO-07-TA01.36 (0.5m)	Tailings	TA01	321083	176096	Vertical Profile	Red brown	Field	ppm	8/21/2007 17:11	0.00	51.28	329.47	112.93	0.00	0.00	3736.08	0.00	0.00
319	AVO-07-TA01.36 (3m)	Tailings	TA01	321083	176096	Vertical Profile	Grey, red/brown	Field	ppm	8/21/2007 17:13	0.00	58.10	418.78	161.70	0.00	0.00	0.00	0.00	0.00
320	AVO-07-TA01.36 (5.5m)	Tailings	TA01	321083	176096	Vertical Profile	Grey, red/brown	Field	ppm	8/21/2007 17:15	0.00	40.27	318.87	0.00	0.00	0.00	0.00	0.00	0.00
321	AVO-07-TA01.37 (0.5m)	Tailings	TA01	320994	176100	Vertical Profile	Brown grey	Field	ppm	8/21/2007 17:19	0.00	45.90	546.61	106.73	0.00	0.00	0.00	0.00	0.00
322	AVO-07-TA01.37 (3m)	Tailings	TA01	320994	176100	Vertical Profile	Green grey	Field	ppm	8/21/2007 17:21	0.00	58.35	0.00	82.60	0.00	0.00	4296.48	0.00	0.00
323	AVO-07-TA01.37 (5.5m)	Tailings	TA01	320994	176100	Vertical Profile	Grey	Field	ppm	8/21/2007 17:26	0.00	58.93	0.00	123.19	0.00	0.00	0.00	0.00	0.00
324	AVO-07-Proc1.1	Processing Waste	Proc.1	319797	181558	Surface	Brown - green	Field	ppm	7/26/2007 12:35	89.83	92.94	765.68	0.00	0.00	503.57	0.00	117.71	0.00
325	AVO-07-Proc1.2	Processing Waste	Proc.1	319797	181551	Surface	Red-brown	Field	ppm	7/26/2007 12:41	0.00	140.76	442.41	0.00	0.00	1916.90	0.00	0.00	0.00
326	AVO-07-Proc1.3	Processing Waste	Proc.1	319795	181573	Surface	Red-brown	Field	ppm	7/26/2007 13:10	0.00	211.28	810.56	0.00	0.00	0.00	0.00	0.00	0.00
327	AVO-07-Proc1.4	Processing Waste	Proc.1	319792	181599	Surface	Red-brown	Field	ppm	7/26/2007 13:19	0.00	195.81	428.24	177.52	0.00	0.00	0.00	0.00	0.00
328	AVO-07-Proc1.5	Processing Waste	Proc.1	319765	181629	Surface	Red-brown	Field	ppm	7/26/2007 13:29	0.00	343.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
329	AVO-07-Proc1.6	Processing Waste	Proc.1	319807	181760	Surface	Red-brown	Field	ppm	7/26/2007 13:45	0.00	134.19	638.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 5-7. GSI XRF Results

Sample ID	Copper	Iron	Lead	Manganese	Mercury	Nickel	Phosphorus	Potassium	Rubidium	Scandium	Selenium	Silver	Strontium	Sulphur	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc
AVO-07-TA01.12 (3m)	105.96	59258.70	429.03	699.12	0.00	0.00	0.00	2630.41	26.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	544.57	0.00	0.00	0.00	113.13
AVO-07-TA01.12 (5.5m)	157.39	50947.03	271.37	568.62	0.00	0.00	0.00	3413.31	29.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	629.68	0.00	0.00	0.00	77.48
AVO-07-TA01.13 (0.5m)	130.74	35253.45	84.35	727.54	0.00	0.00	0.00	3975.28	28.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1102.70	0.00	0.00	0.00	46.66
AVO-07-TA01.13 (3m)	474.77	41316.48	191.36	439.78	0.00	0.00	0.00	2844.53	19.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	512.31	0.00	0.00	0.00	113.46
AVO-07-TA01.13 (5.5m)	222.72	37737.08	143.69	458.45	0.00	0.00	0.00	2137.59	14.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	448.83	0.00	0.00	0.00	198.22
AVO-07-TA01.14 (0.5m)	88.98	30265.96	223.37	449.86	0.00	0.00	0.00	1650.55	14.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	616.15	0.00	0.00	0.00	0.00
AVO-07-TA01.14 (3m)	553.82	41784.84	149.15	421.55	0.00	0.00	0.00	1681.45	14.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	440.76	0.00	0.00	0.00	83.02
AVO-07-TA01.14 (5.5m)	402.55	35774.61	113.58	504.01	0.00	0.00	0.00	2312.74	14.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	459.16	0.00	0.00	0.00	136.48
AVO-07-TA01.15 (0.5m)	139.86	52011.30	148.04	746.70	0.00	0.00	0.00	4108.83	30.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1078.47	0.00	0.00	0.00	46.13
AVO-07-TA01.15 (3.3m)	284.12	48757.31	477.40	575.69	0.00	0.00	0.00	2108.39	16.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	817.35	0.00	0.00	0.00	179.08
AVO-07-TA01.15 (5m)	76.80	42277.71	131.85	469.85	0.00	0.00	0.00	3055.03	24.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	585.76	0.00	0.00	0.00	45.13
AVO-07-TA01.16 (0.5m)	178.05	42244.25	104.47	485.96	0.00	0.00	0.00	1958.43	23.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	725.60	0.00	0.00	0.00	48.65
AVO-07-TA01.16 (3m)	234.29	32885.44	124.64	315.69	0.00	0.00	0.00	1675.66	14.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	326.70	0.00	0.00	0.00	113.52
AVO-07-TA01.16 (5.5m)	238.47	41177.41	298.63	431.82	0.00	0.00	0.00	2235.75	21.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	585.42	0.00	0.00	0.00	120.73
AVO-07-TA01.17 (0.5m)	283.31	39996.86	189.40	524.09	0.00	0.00	0.00	1181.43	12.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	469.45	0.00	0.00	0.00	79.09
AVO-07-TA01.17 (3m)	479.00	39400.18	179.96	470.13	0.00	0.00	0.00	1667.64	10.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	399.05	0.00	0.00	0.00	110.16
AVO-07-TA01.17 (5.5m)	213.14	35948.34	141.92	399.79	0.00	0.00	0.00	2007.33	17.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	493.49	0.00	0.00	0.00	144.21
AVO-07-TA01.18 (0.5m)	243.24	32276.29	214.23	430.02	0.00	0.00	0.00	1793.17	14.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	455.64	0.00	0.00	0.00	30.36
AVO-07-TA01.18 (3m)	545.47	42785.63	208.53	382.63	0.00	0.00	0.00	693.15	9.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	444.34	0.00	0.00	0.00	55.11
AVO-07-TA01.18 (5.5m)	231.71	36492.16	109.51	435.70	0.00	0.00	0.00	1358.18	15.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	395.03	0.00	0.00	0.00	205.11
AVO-07-TA01.19 (0.5m)	162.40	62381.14	188.29	672.62	0.00	0.00	0.00	820.47	24.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	782.64	0.00	0.00	0.00	41.36
AVO-07-TA01.19 (3m)	190.07	57439.73	190.45	535.51	0.00	0.00	0.00	3717.36	21.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	769.61	0.00	0.00	0.00	90.78
AVO-07-TA01.19 (5.5m)	212.68	55955.21	225.76	734.97	0.00	0.00	0.00	3639.25	31.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	494.36	0.00	0.00	0.00	118.02
AVO-07-TA01.20 (0.5m)	196.90	37637.18	109.62	464.42	0.00	0.00	0.00	1218.20	14.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	721.27	0.00	0.00	0.00	0.00
AVO-07-TA01.20 (3m)	203.46	43483.39	251.30	484.78	0.00	0.00	0.00	2874.92	17.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	467.76	0.00	0.00	0.00	45.34
AVO-07-TA01.20 (5.5m)	148.40	42764.48	237.69	393.34	0.00	0.00	0.00	3698.34	22.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	627.14	0.00	0.00	0.00	43.34
AVO-07-TA01.21 (0.5m)	229.82	40083.59	119.34	546.35	0.00	0.00	0.00	1702.39	13.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	658.51	0.00	0.00	0.00	60.82
AVO-07-TA01.21 (3m)	380.46	40817.49	127.01	457.46	0.00	0.00	0.00	2062.96	16.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	362.33	0.00	0.00	0.00	217.74
AVO-07-TA01.21 (5.5m)	219.95	34710.70	135.84	411.86	0.00	0.00	0.00	1931.49	18.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	106.47
AVO-07-TA01.22 (0.5m)	107.81	36540.13	77.10	617.85	0.00	0.00	0.00	2534.91	23.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	814.09	0.00	0.00	0.00	34.57
AVO-07-TA01.22 (3m)	906.19	51098.80	288.36	614.67	0.00	0.00	0.00	2348.76	20.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	556.46	0.00	0.00	0.00	387.46
AVO-07-TA01.22 (5.5m)	379.63	42659.36	250.91	541.87	0.00	0.00	0.00	920.70	15.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	442.41	0.00	0.00	0.00	328.39
AVO-07-TA01.23 (0.5m)	138.46	46246.32	132.67	790.30	0.00	0.00	0.00	2964.05	34.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1182.07	0.00	0.00	0.00	50.40
AVO-07-TA01.23 (3m)	86.77	52724.88	135.96	807.60	0.00	0.00	0.00	3593.59	28.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1015.22	0.00	0.00	0.00	101.44
AVO-07-TA01.23 (5.5m)	220.67	43751.30	317.90	619.52	0.00	0.00	0.00	2684.88	26.36	0.00	0.00	0.00	0.00	0.00	31.72	0.00	0.00	506.77	0.00	0.00	0.00	118.62
AVO-07-TA01.24 (0.5m)	93.11	44098.78	56.14	1675.74	0.00	0.00	0.00	12230.42	104.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3561.36	0.00	0.00	0.00	45.16
AVO-07-TA01.24 (3m)	255.82	43478.98	211.88	382.70	0.00	0.00	0.00	2350.80	25.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	397.08	0.00	0.00	0.00	156.96
AVO-07-TA01.24 (5.5m)	139.37	42574.43	173.89	444.04	0.00	0.00	0.00	3434.46	25.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	744.24	0.00	0.00	0.00	83.71
AVO-07-TA01.25 (0.5m)	101.17	41834.01	154.37	769.78	0.00	0.00	0.00	587.11	12.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	737.05	0.00	0.00	0.00	0.00
AVO-07-TA01.25 (3m)	241.68	42836.67	149.21	527.41	0.00	0.00	0.00	2594.51	21.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	718.07	0.00	0.00	0.00	53.77
AVO-07-TA01.25 (5.5m)	188.62	32665.66	121.45	356.72	0.00	0.00	0.00	0.00	16.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	92.57
AVO-07-TA01.26 (0.5m)	169.82	48887.27	145.70	675.72	0.00	0.00	0.00	2218.70	25.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	820.34	0.00	0.00	0.00	0.00
AVO-07-TA01.26 (3m)	1028.02	51769.26	120.13	551.26	0.00	0.00	0.00	1262.62	15.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	393.87	0.00	0.00	0.00	222.19
AVO-07-TA01.26 (5.5m)	350.00	40029.30	294.74	526.13	0.00	0.00	0.00	1190.95	17.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	407.17	0.00	0.00	0.00	235.15
AVO-07-TA01.27 (0.5m)	211.25	44045.72	160.05	480.01	0.00	0.00	0.00	1794.96	19.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	523.50	0.00	0.00	0.00	113.84
AVO-07-TA01.27 (3m)	189.03	46969.74	264.61	556.63	0.00	0.00	0.00	2520.43	24.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	592.00	0.00	0.00	0.00	228.91
AVO-07-TA01.27 (5.5m)	184.37	53636.25	314.27	800.03	0.00	0.00	0.00	3752.14	24.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	749.79	0.00	0.00	0.00	67.06
AVO-07-TA01.28 (0.5m)	126.96	40438.17	80.73	565.63	0.00	0.00	0.00	2950.75	43.45	0.00	0.00	0.00	0.00	0.00	23.85	37.11	0.00	872.10	0.00	0.00	0.00	36.21
AVO-07-TA01.28 (3m)	127.48	36805.22	72.67	413.20	0.00	0.00	0.00	2731.38	24.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	747.36	0.00	0.00	0.00	123.48
AVO-07-TA01.28 (5.5m)	131.83	39656.06	145.61	503.08	0.00	0.00	0.00	3112.78	25.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	455.85	0.00	0.00	0.00	76.35
AVO-07-TA01.29 (0.5m)	341.23	45485.05	209.19	567.94	0.00	0.00	0.00	1956.15	18.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	694.18	0.00	0.00	0.00	213.58
AVO-07-TA01.29 (3m)	311.17	41933.63	153.94	517.33	0.00	0.00	0.00	1556.05	18.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	280.40	0.00	0.00	0.00	242.24
AVO-07-TA01.29 (5.5m)	145.59	39502.08	132.10	479.87	0.00	0.00	0.00	3244.40	28.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	619.18	0.00	0.00	0.00	72.99
AVO-07-TA01.30 (0.5m)	320.83	39233.35	115.49	548.35	0.00	0.00	0.00	2312.95	16.90	0.00	0.00	0.00	0.00	0.00	0.00	42.54	0.00	629.71	0.00	0.00	0.00	31.99
AVO-07-TA01.30 (3m)	860.36	56263.80	368.90	583.26	0.00	0.00	0.00	1460.38	11.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	588.76	0.00	0.00	0.00	106.78
AVO-07-TA01.30 (5.5m)	178.60	43943.42	324.06	415.45	0.00	0.00	0.00	2141.51	21.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	486.10	0.00	0.00	0.00	127.73
AVO-07-TA01.31 (0.5m)	119.70	43823.78	117.94	661.52	0.00	0.00	0.00	3620.41	31.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1456.86	0.00	0.00	0.00	28.48
AVO-07-TA01.31 (3m)	185.88	53688.45	298.20	757.43	0.00	0.00	0.00	4085.64	29.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	509.12	0.00	0.00	0.00	135.18
AVO-07-TA01.31 (5.5m)	154.73	61962.06	209.49	862.84	0.00	0.00	0.00	3973.83	40.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	533.54	0.00	0.00	0.00	82.34
AVO-07-TA01.32 (0.5m)	293.79	46094.91	162.71	658.94	0.00	0.00	0.00	2650.70	41.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	776.59	0.00	0.00	0.00	84.03
AVO-07-TA01.32 (3m)	189.90	43273.94	91.58	524.86	0.00	0.00	0.00	2324.96	20.61	0.00	0.00	0.00	0.00	0.00	0.00	36.72	0.00	601.30	0.00	0.00	0.00	128.23
AVO-07-TA01.32 (5.5m)	303.89	37758.56	167.83	390.70	0.00	0.00	0.00	2015.27	17.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	397.94	0.00	0.00	0.00	121.78
AVO-07-TA01.33 (0.5m)	72.11	35678.42	111.89	484.35	0.00	0.00	0.00	3961.75	29.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	994.66	0.00	0.00	0.00	45.14
AVO-07-TA01.33 (3m)	155.62	37419.52	71.34	466.65	0.00	0.00	0.00	1855.83	15.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	523.76	0.00	0.00	0.00	210.46
AVO-07-TA01.33 (5.5m)	346.92	37919.77	117.41	498.65	0.00	0.00	0.00	1982.71	14.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	327.48	0.00	0.00	0.00	154.95
AVO-07-TA01.34 (0.5m)	203.80	41504.30	274.86	628.88	0.00	0.00	0.00	4804.39	27.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1172.75	0.00	0.00	0.00	45.97
AVO-07-TA01.34 (3m)	199.16	47164.55	188.70	596.63	0.00	0.00	0.00	2789.19	22.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	683.37	0.00	0.00	0.00	202.34
AVO-07-TA01.34 (5.5m)	230.62	43620.18	212.97	721.67	0.00	0.00	0.00	1447.82	12.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	599.29	0.00	0.00	0.00	130.77
AVO-07-TA01.35 (0.5m)	307.31	55029.07	287.28	687.44	0.00	0.00	0.00	3542.77	32.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	534.08	0.00	0.00	0.00	143.69
AVO-07-TA01.35 (3m)	180.69	34505.41	110.15	451.77	0.00	0.00	0.00	2190.77	20.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	336.75	0.00	0.00	0.00	58.87
AVO-07-TA01.35 (5.5m)	258.25	56464.15	440.42	767.03	0.00	0.00	0.00	2553.40	28.62	0.00	0.00	0.00	0.00	0.00	0.00	48.56	0.00	433.25	0.00	0.00	0.00	169.63
AVO-07-TA01.36 (0.5m)	66.57	33319.68	69.92	405.43	0.00	0.00	0.00	5307.81	37.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1795.30	0.00	0.00	0.00	33.63
AVO-07-TA01.36 (3m)	286.23	47507.13	175.00	540.04	0.00	0.00	0.00	2436.18	16.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	505.04	0.00	0.00	0.00	187.87
AVO-07-TA01.36 (5.5m)	95.18	39956.85	86.52	953.43	0.00	0.00	0.00	11247.72	75.18	0.00	0.00	0.00	0.00	0.00	0.00	28.05	0.00	2940.75	0.00	0.00	0.00	55.65
AVO-07-TA01.37 (0.5m)	168.44	49302.53	97.79	848.35	0.00	0.00	0.00	8102.66	74.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1949.32	0.00	0.00	0.00	44.65
AVO-07-TA01.37 (3m)	293.42	37292.50	143.85	426.96	0.00	0.00	0.00	2076.92	21.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	412.32	0.00	0.00	0.00	109.85
AVO-07-TA01.37 (5.5m)	245.34	52603.40	163.17	728.78	0.00	0.00	0.00	2268.44	17.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	658.28	0.00	0.00	0.00	188.80
AVO-07-Proc1.1	689.72	64553.20	481.20	649.26	0.00	0.00	0.00	8084.64	77.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2666.96	0.00	0.00	0.00	295.66
AVO-07-Proc1.2	664.73	71979.52	802.28	549.99	0.00	0.00	0.00	7214.02	57.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1586.41	508.04	0.00	0.00	291.65
AVO-07-Proc1.3	999.66	88040.67	991.92	499.73	0.00	0.00	0.00	5765.61	54.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1675.61	0.00	0.00	0.00	241.77
AVO-07-Proc1.4	1312.77	85416.66	1077.39	539.20	0.00	0.00	0.00	4666.49	44.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	913.35	0.00	0.00	0.00	223.08
AVO-07-Proc1.5	662.84	126764.27	2084.51	668.00	0.00	0.00	0.00	4976.77	54.53	0.00	0.00	0.00	0.00	0.00	119.35	0.00	0.00	1431.77	0.00	0.00	0.00	171.82
AVO-07-Proc1.6	124.37	48768.10	148.37	422.57	0.00	0.00	0.00	7368.02	93.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2110.34	0.00	0.00	0.00	106.93

Table 6-1. Metals Analytical Results: Vegetation

Sample ID	Date/Time	X	Y	Aluminium		Arsenic		Cadmium		Chromium		Copper		Iron		Lead		Manganese		Mercury		Nickel		Zinc	
				mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
SP25 Extreme Vegetation	09/08/2007 10:41	321064	183769	47.9		0.4		0.02		0.3		6.3		107.1		16.5		115.4		0.02	U	0.2		26	
TM1 - 40A veg	14/08/2007 11:29	319360	181381	100.2		0.7		0.02		0.3		4.5		165.3		1		29.3		0.02	U	0.2	U	17	
TM1 - 80A veg	14/08/2007 11:40	319398	181307	71.2		0.5		0.03		0.4		5.9		137		1.4		28.1		0.02	U	0.2	U	20	
TM1- Berries	14/08/2007 11:45	319416	181352	12.1		0.1	U	0.06		0.2		3.8		20.3		0.1		66.9		0.02	U	0.2	U	10	
TM2 - 40B veg	14/08/2007 16:22	318918	181191	45.5		0.4		0.02	U	0.2		6.7		146		2.1		84.7		0.02	U	0.2	U	21	
TM2 - Corn	14/08/2007 16:55	318985	181146	316.5		1.1		0.02		1.3		4		468.3		1.9		19		0.02	U	0.3		18	
K-1-40B Veg Sample	15/08/2007 15:18	320846	183610	26		0.1	U	0.03		0.2		5.3		58.1		0.6		40		0.02	U	0.3		24	
IF1-80B Veg	16/08/2007 10:06	320491	183431	36.1		0.1	U	0.02		5.3		6.5		94.7		0.7		67.6		0.02	U	2.2		20	
K2-1-40A Veg	16/08/2007 11:31	320828	183542	788.1		4.1		0.08		1.1		19.4		1437.3		19.4		108.1		0.02	U	0.2		34	

Notes: U = below detection limit; veg = grass

Table 6-2. Avoca River Screening Level BMI Survey (April 3-5, 2007)

Location	Total No. Organisms	No. Mayflies			No. Caddisflies			No. Worms			No. Beetles		
		Left	Center	Right	Left	Center	Right	Left	Center	Right	Left	Center	Right
DS Meet. Waters	140	12	33	42	12	7	20	6	2	5			
DS White's Bridge	29	3	10	3	2	7						1	1
DS Deep Adit	35	3	6	13	4	2	2	1					1
DS Road Adit	15	5		1	1		1		5	1			
DS Avoca Bridge	27	5	2	2		2	2		1	13			
Avoca R. US Aughrim R	4				2	1							1
Aughrim R.	142	42	29	16	4	6	2	8	16	18	1		
US Tailings	113	9	3	9	11	7	4		8	41	15	4	
DS Tailings	317	1	2	1	1	3	4	**100**	**100**	**100**		3	1
DS Fert. Plant	348	44	94	55	6	4	22	10	**100**	7	1		1
Location		**No. Dipterans**			**No. Leeches**			**No. Ostracods**			**No. Snails**		
		Left	**Center**	**Right**	**Left**	**Center**	**Right**	**Left**	**Center**	**Right**	**Left**	**Center**	**Right**
DS Meet. Waters					1								
DS White's Bridge			1						1				
DS Deep Adit				1			1		1				
DS Road Adit		1											
DS Avoca Bridge													
Avoca R. US Aughrim R													
Aughrim R.													
US Tailings			1									1	
DS Tailings					1								
DS Fert. Plant				1	1	1	1						

Numbers shown in **bold** = surrogate for Too Numerous To Count (TNTC) DS = Downstream US = Upstream

Table 6-3. Avoca River Screening Level BMI Survey (April 3-5, 2007)

Location	Total No. Mayflies	No. Mayflies			No. Caddisflies			No. Worms			No. Beetles		
		Left	Center	Right	Left	Center	Right	Left	Center	Right	Left	Center	Right
DS Meet. Waters	87	12	33	42	12	7	20	6	2	5			
DS White's Bridge	16	3	10	3	2	7						1	1
DS Deep Adit	22	3	6	13	4	2	2	1					1
DS Road Adit	6	5		1	1		1		5	1			
DS Avoca Bridge	9	5	2	2		2	2		1	13			
Avoca R. US Aughrim R	0				2	1							1
Aughrim R.	87	42	29	16	4	6	2	8	16	18	1		
US Tailings	21	9	3	9	11	7	4		8	41	15	4	
DS Tailings	4	1	2	1	1	3	4	**100**	**100**	**100**		3	1
DS Fert. Plant	193	44	94	55	6	4	22	10	**100**	7	1		1
Location		**No. Dipterans**			**No. Leeches**			**No. Ostracods**			**No. Snails**		
		Left	**Center**	**Right**	**Left**	**Center**	**Right**	**Left**	**Center**	**Right**	**Left**	**Center**	**Right**
DS Meet. Waters					1								
DS White's Bridge			1						1				
DS Deep Adit				1			1		1				
DS Road Adit		1											
DS Avoca Bridge													
Avoca R. US Aughrim R													
Aughrim R.													
US Tailings			1									1	
DS Tailings					1								
DS Fert. Plant				1	1	1	1						

Numbers shown in **bold** = surrogate for Too Numerous To Count (TNTC) DS = Downstream US = Upstream

Table 6-4. Avoca River Screening Level BMI Survey (April 3-5, 2007)

Location	Total No. Caddisflies	No. Mayflies			No. Caddisflies			No. Worms			No. Beetles		
		Left	Center	Right	Left	Center	Right	Left	Center	Right	Left	Center	Right
DS Meet. Waters	39	12	33	42	12	7	20	6	2	5			
DS Whitesbridge	9	3	10	3	2	7						1	1
DS Deep Adit	8	3	6	13	4	2	2	1					1
DS Road Adit	2	5		1	1		1		5	1			
DS Avoca Bridge	4	5	2	2		2	2		1	13			
Avoca R. US Aughrim R	3				2	1							1
Aughrim R.	12	42	29	16	4	6	2	8	16	18	1		
US Tailings	22	9	3	9	11	7	4		8	41	15	4	
DS Tailings	8	1	2	1	1	3	4	**100**	**100**	**100**		3	1
DS Fert. Plant	32	44	94	55	6	4	22	10	**100**	7	1		1
Location		No. Dipterans			No. Leeches			No. Ostracods			No. Snails		
		Left	Center	Right	Left	Center	Right	Left	Center	Right	Left	Center	Right
DS Meet. Waters					1								
DS Whitesbridge			1						1				
DS Deep Adit				1			1		1				
DS Road Adit		1											
DS Avoca Bridge													
Avoca R. US Aughrim R													
Aughrim R.													
US Tailings			1									1	
DS Tailings					1								
DS Fert. Plant				1	1	1	1						

Numbers shown in **bold** = surrogate for Too Numerous To Count (TNTC) DS = Downstream US = Upstream

Table 6-5. Avoca River Screening Level BMI Survey (April 3-5, 2007)

Location	Total No. Worms	No. Mayflies			No. Caddisflies			No. Worms			No. Beetles		
		Left	Center	Right	Left	Center	Right	Left	Center	Right	Left	Center	Right
DS Meet. Waters	13	12	33	42	12	7	20	6	2	5			
DS Whitesbridge	0	3	10	3	2	7						1	1
DS Deep Adit	1	3	6	13	4	2	2	1					1
DS Road Adit	6	5		1	1		1		5	1			
DS Avoca Bridge	14	5	2	2		2	2		1	13			
Avoca R. US Aughrim R	0				2	1							1
Aughrim R.	42	42	29	16	4	6	2	8	16	18	1		
US Tailings	49	9	3	9	11	7	4		8	41	15	4	
DS Tailings	300	1	2	1	1	3	4	**100**	**100**	**100**		3	1
DS Fert. Plant	117	44	94	55	6	4	22	10	**100**	7	1		1
Location		No. Dipterans			No. Leeches			No. Ostracods			No. Snails		
		Left	Center	Right	Left	Center	Right	Left	Center	Right	Left	Center	Right
DS Meet. Waters					1								
DS Whitesbridge			1						1				
DS Deep Adit				1			1		1				
DS Road Adit		1											
DS Avoca Bridge													
Avoca R. US Aughrim R													
Aughrim R.													
US Tailings			1									1	
DS Tailings					1								
DS Fert. Plant				1	1	1	1						

Numbers shown in **bold** = surrogate for Too Numerous To Count (TNTC) DS = Downstream US = Upstream

Appendix A
Flow Measurement Data

Discharge Measurement Form for Stream Depth of 0.09 to 0.76 Meters

Station	Red Road	Team	AS/LG/LC	Instrument	Marsh Mc Briney Model 2006205 Probe #3090
Date	30-07-07	Gage (Begin)	1.7	Page	1
Time	13:45	Gage (End)	0.8	of	1

Beginning of Interval	Measuring Point	Width (meter)	Depth (meter)	Velocity at 0.6 (meter/second)	Area (width x depth)	Interval Discharge (cms)	Cumulative Discharge (cms)	Percent of Total Q	Comments
	1.7		0	0					REW
1.65	1.6	0.15	0.02	0.19	0.003	0.00057	0.0006	3%	
1.5	1.4	0.15	0.06	0.35	0.009	0.00315	0.0037	16%	
1.35	1.3	0.1	0.05	0.75	0.005	0.00375	0.0075	19%	
1.25	1.2	0.1	0.08	0.7	0.008	0.0056	0.0131	28%	
1.15	1.1	0.1	0.04	0.55	0.004	0.0022	0.0153	11%	
1.05	1	0.1	0.06	0.5	0.006	0.003	0.0183	15%	
0.95	0.9	0.1	0.04	0.35	0.004	0.0014	0.0197	7%	
0.85	0.8		0	0					LEW
						Total Q=	0.0197	100%	

Discharge Measurement Form for Stream Depth of 0.09 to 0.76 Meters

Station	UnknownTrib (avoca handweavers)	Team	AS/LG/LC	Instrument	Marsh Mc Briney Model 2006205 Probe #3090
Date	7/31/2007	Gage (Begin)	3.6	Page	1
Time	11:50	Gage (End)	0.65	of	1

Beginning of Interval	Measuring Point	Width (meter)	Depth (meter)	Velocity at 0.6 (meter/second)	Area (width x depth)	Interval Discharge (cms)	Cumulative Discharge (cms)	Percent of Total Q	Comments
	3.6	Left	edge	of	water				LEW
3.55	3.5	0.3	0.1	0	0.03	0	0.0000	0%	
3.25	3	0.4	0.2	0	0.08	0	0.0000	0%	
2.85	2.7	0.3	0.2	0.11	0.06	0.0066	0.0066	6%	
2.55	2.4	0.25	0.26	0.63	0.065	0.04095	0.0476	34%	
2.3	2.2	0.2	0.2	0.52	0.04	0.0208	0.0684	17%	
2.1	2	0.2	0.25	0.4	0.05	0.02	0.0884	17%	
1.9	1.8	0.2	0.26	0.43	0.052	0.02236	0.1107	19%	
1.7	1.6	0.2	0.2	0.15	0.04	0.006	0.1167	5%	
1.5	1.4	0.25	0.2	0.02	0.05	0.001	0.1177	1%	
1.25	1.1	0.375	0.18	0	0.0675	0	0.1177	0%	
0.875	0.65	0.18	0.08	0.08	0.0144	0.001152	0.1189	1%	REW
0.65						Total Q=	0.1189	100%	

Discharge Measurement Form for Stream Depth of 0.09 to 0.76 Meters

Station	ValeView	Team	AS/LG/LC	Instrument	Marsh Mc Briney Model 2006205 Probe #3090
Date	7/31/2007	Gage (Begin)	1.4	Page	1
Time		Gage (End)	0.2	of	1

Beginning of Interval	Measuring Point	Width (meter)	Depth (meter)	Velocity at 0.6 (meter/second)	Area (width x depth)	Interval Discharge (cms)	Cumulative Discharge (cms)	Percent of Total Q	Comments
	1.4		0	0					REW
1.35	1.3	0.1	0.11	0.03	0.011	0.00033	0.0003	2%	
1.25	1.2	0.1	0.13	0.03	0.013	0.00039	0.0007	2%	
1.15	1.1	0.1	0.14	0.05	0.014	0.0007	0.0014	3%	
1.05	1	0.1	0.14	0.11	0.014	0.00154	0.0030	7%	
0.95	0.9	0.1	0.14	0.09	0.014	0.00126	0.0042	6%	
0.85	0.8	0.075	0.16	0.18	0.012	0.00216	0.0064	10%	
0.775	0.75	0.05	0.14	0.21	0.007	0.00147	0.0079	7%	
0.725	0.7	0.05	0.16	0.24	0.008	0.00192	0.0098	9%	
0.675	0.65	0.05	0.14	0.28	0.007	0.00196	0.0117	9%	
0.625	0.6	0.05	0.16	0.28	0.008	0.00224	0.0140	11%	
0.575	0.55	0.05	0.16	0.29	0.008	0.00232	0.0163	11%	
0.525	0.5	0.05	0.15	0.27	0.0075	0.002025	0.0183	10%	
0.475	0.45	0.05	0.17	0.17	0.0085	0.001445	0.0198	7%	
0.425	0.4	0.075	0.14	0.1	0.0105	0.00105	0.0208	5%	
0.35	0.3	0.1	0.15	0.03	0.015	0.00045	0.0213	2%	
0.25	0.2		0	0					LEW
						Total Q=	0.0213	100%	

Discharge Measurement Form for Stream Depth of 0.09 to 0.76 Meters

Station	Sulfur Brook	Team	AS/LG/LC	Instrument	Marsh Mc Briney Model 2006205 Probe #3090
Date	7/31/2007	Gage (Begin)	4.1	Page	1
Time		Gage (End)	0.7	of	1

Beginning of Interval	Measuring Point	Width (meter)	Depth (meter)	Velocity at 0.6 (meter/second)	Area (width x depth)	Interval Discharge (cms)	Cumulative Discharge (cms)	Percent of Total Q	Comments
	4.1		0	0					LEW
4.05	4	0.2	0.01	0	0.002	0	0.0000	0%	
3.85	3.7	0.3	0.03	0.23	0.009	0.00207	0.0021	2%	
3.55	3.4	0.3	0.04	0.12	0.012	0.00144	0.0035	1%	
3.25	3.1	0.35	0.04	0.33	0.014	0.00462	0.0081	4%	
2.9	2.7	0.3	0.08	0.3	0.024	0.0072	0.0153	6%	
2.6	2.5	0.25	0.12	0.38	0.03	0.0114	0.0267	10%	
2.35	2.2	0.25	0.16	0.4	0.04	0.016	0.0427	14%	
2.1	2	0.25	0.16	0.8	0.04	0.032	0.0747	28%	
1.85	1.7	0.25	0.16	0.31	0.04	0.0124	0.0871	11%	
1.6	1.5	0.25	0.12	0.39	0.03	0.0117	0.0988	10%	
1.35	1.2	0.25	0.12	0.34	0.03	0.0102	0.1090	9%	
1.1	1	0.25	0.16	0.14	0.04	0.0056	0.1146	5%	
0.85	0.7		0	0					REW
						Total Q=	0.1146	100%	

Discharge Measurement Form for Stream Depth of 0.09 to 0.76 Meters

Station	Transect 1	Team	AS/LG/LC	Instrument	Marsh Mc Briney Model 2006205 Probe #3090
Date	30-07-07	Gage (Begin)	27.2	Page	1
Time	11:55	Gage (End)	0	of	1

Beginning of Interval	Measuring Point	Width (meter)	Depth (meter)	Velocity at 0.6 (meter/second)	Area (width x depth)	Interval Discharge (cms)	Cumulative Discharge (cms)	Percent of Total Q	Comments
	27.2		0	0					LEW
26.7	26.2	1.5	0.42	0.05	0.63	0.0315	0.0315	1%	
25.2	24.2	1.5	0.6	0.43	0.9	0.387	0.4185	7%	
23.7	23.2	1	0.58	0.44	0.58	0.2552	0.6737	4%	
22.7	22.2	1.35	0.6	0.68	0.81	0.5508	1.2245	9%	
21.35	20.5	1.6	0.72	0.6	1.152	0.6912	1.9157	12%	
19.75	19	1.25	0.58	0.6	0.725	0.435	2.3507	7%	
18.5	18	1	0.62	0.69	0.62	0.4278	2.7785	7%	
17.5	17	1.1	0.86	0.36	0.946	0.34056	3.1191	6%	
16.4	15.8	1.5	0.58	0.48	0.87	0.4176	3.5367	7%	
14.9	14	1.4	0.58	0.38	0.812	0.30856	3.8452	5%	
13.5	13	1	0.56	0.26	0.56	0.1456	3.9908	2%	
12.5	12	1.25	0.56	0.4	0.7	0.28	4.2708	5%	
11.25	10.5	1.25	0.54	0.51	0.675	0.34425	4.6151	6%	
10	9.5	1.5	0.6	0.3	0.9	0.27	4.8851	5%	
8.5	7.5	1.5	0.52	0.46	0.78	0.3588	5.2439	6%	
7	6.5	1	0.44	0.37	0.44	0.1628	5.4067	3%	
6	5.5	1	0.44	0.3	0.44	0.132	5.5387	2%	
5	4.5	1	0.48	0.41	0.48	0.1968	5.7355	3%	start of overhanging trees
4	3.5	1.25	0.42	0.2	0.525	0.105	5.8405	2%	
2.75	2	1.25	0.25	0.05	0.3125	0.015625	5.8561	0%	
1.5	1	0.65	0.09	0	0.0585	0	5.8561	0%	
0.85	0.7	0.5	0.4	0	0.2	0	5.8561	0%	
0.35	0		0	0					REW
						Total Q=	5.8561	100%	

Discharge Measurement Form for Stream Depth of 0.09 to 0.76 Meters

Station	Transect 2	Team	AS/LG/LC	Instrument	Marsh Mc Briney Model 2006205 Probe #3090
Date	7/30/2007	Gage (Begin)	29.8	Page	1
Time	14:30	Gage (End)	2.1	of	1

Beginning of Interval	Measuring Point	Width (meter)	Depth (meter)	Velocity at 0.6 (meter/second)	Area (width x depth)	Interval Discharge (cms)	Cumulative Discharge (cms)	Percent of Total Q	Comments
	29.8		0	0					LEW
28.9	28	1.4	0.3	0.8	0.42	0.336	0.3360	5%	
27.5	27	1.25	0.4	0.72	0.5	0.36	0.6960	5%	
26.25	25.5	1.5	0.4	0.91	0.6	0.546	1.2420	8%	
24.75	24	1.5	0.44	0.95	0.66	0.627	1.8690	9%	
23.25	22.5	1.25	0.36	1.25	0.45	0.5625	2.4315	8%	plume ends at 23.5m
22	21.5	1	0.38	0.64	0.38	0.2432	2.6747	3%	
21	20.5	1	0.4	0.7	0.4	0.28	2.9547	4%	
20	19.5	1	0.42	0.68	0.42	0.2856	3.2403	4%	
19	18.5	1	0.36	0.94	0.36	0.3384	3.5787	5%	
18	17.5	1	0.36	0.88	0.36	0.3168	3.8955	5%	
17	16.5	1	0.34	0.78	0.34	0.2652	4.1607	4%	
16	15.5	1.25	0.3	0.65	0.375	0.24375	4.4045	4%	
14.75	14	1.25	0.36	0.62	0.45	0.279	4.6835	4%	
13.5	13	1	0.32	0.68	0.32	0.2176	4.9011	3%	
12.5	12	1	0.4	0.4	0.4	0.16	5.0611	2%	
11.5	11	1.25	0.36	0.88	0.45	0.396	5.4571	6%	
10.25	9.5	1.25	0.34	0.95	0.425	0.40375	5.8608	6%	
9	8.5	1.25	0.34	0.76	0.425	0.323	6.1838	5%	
7.75	7	1.5	0.36	0.8	0.54	0.432	6.6158	6%	
6.25	5.5	1.25	0.24	0.59	0.3	0.177	6.7928	3%	
5	4.5	1.25	0.2	0.51	0.25	0.1275	6.9203	2%	
3.75	3	1.2	0.12	0.24	0.144	0.03456	6.9549	0%	
2.55	2.1		0	0				0%	REW
						Total Q=	6.9549	100%	

Discharge Measurement Form for Stream Depth of 0.09 to 0.76 Meters

Station	Transect 3	Team	AS/LG/LC	Instrument	Marsh Mc Briney Model 2006205 Probe #3090
Date	7/30/2007	Gage (Begin)	25.4	Page	1
Time	17:00	Gage (End)	1	of	1

Beginning of Interval	Measuring Point	Width (meter)	Depth (meter)	Velocity at 0.6 (meter/second)	Area (width x depth)	Interval Discharge (cms)	Cumulative Discharge (cms)	Percent of Total Q	Comments
	25.4		0	0					LEW
24.95	24.5	1.2	0.13	0.05	0.156	0.0078	0.0078	0%	
23.75	23	1.5	0.14	0.11	0.21	0.0231	0.0309	0%	
22.25	21.5	1.5	0.2	0.14	0.3	0.042	0.0729	1%	
20.75	20	1.5	0.31	0.21	0.465	0.09765	0.1706	2%	
19.25	18.5	1.5	0.46	0.35	0.69	0.2415	0.4121	4%	
17.75	17	1.25	0.54	0.51	0.675	0.34425	0.7563	6%	
16.5	16	1	0.62	0.45	0.62	0.279	1.0353	5%	
15.5	15	1	0.72	0.46	0.72	0.3312	1.3665	6%	
14.5	14	1	0.72	0.45	0.72	0.324	1.6905	6%	
13.5	13	1	0.8	0.47	0.8	0.376	2.0665	7%	
12.5	12	1	0.9	0.39	0.9	0.351	2.4175	6%	
11.5	11	1	0.9	0.48	0.9	0.432	2.8495	8%	
10.5	10	1	0.92	0.43	0.92	0.3956	3.2451	7%	
9.5	9	1	0.95	0.44	0.95	0.418	3.6631	7%	
8.5	8	1	0.92	0.43	0.92	0.3956	4.0587	7%	
7.5	7	1	1.02	0.31	1.02	0.3162	4.3749	6%	
6.5	6	1	1.1	0.39	1.1	0.429	4.8039	7%	
5.5	5	1	1.1	0.33	1.1	0.363	5.1669	6%	
4.5	4	1	1	0.29	1	0.29	5.4569	5%	
3.5	3	1	0.94	0.23	0.94	0.2162	5.6731	4%	
2.5	2	1	0.55	0.1	0.55	0.055	5.7281	1%	
1.5	1		0	0					REW
						Total Q=	5.7281	100%	

Discharge Measurement Form for Stream Depth of 0.09 to 0.76 Meters

Station	Transect 4	Team	AS/LG/LC	Instrument	Marsh Mc Briney Model 2006205 Probe #3090
Date	7/30/2007	Gage (Begin)	30	Page	1
Time	19:00	Gage (End)	5.2	of	1

Beginning of Interval	Measuring Point	Width (meter)	Depth (meter)	Velocity at 0.6 (meter/second)	Area (width x depth)	Interval Discharge (cms)	Cumulative Discharge (cms)	Percent of Total Q	Comments
	30		0	0					LEW
29.25	28.5	1	0.46	0.4	0.46	0.184	0.1840	3%	
28.25	28	0.75	0.44	0.22	0.33	0.0726	0.2566	1%	
27.5	27	1	0.62	0.25	0.62	0.155	0.4116	3%	
26.5	26	1.25	0.68	0.37	0.85	0.3145	0.7261	5%	
25.25	24.5	1.5	0.7	0.4	1.05	0.42	1.1461	7%	
23.75	23	1.75	0.66	0.3	1.155	0.3465	1.4926	6%	
22	21	1.75	0.79	0.43	1.3825	0.594475	2.0871	10%	
20.25	19.5	1.25	0.9	0.43	1.125	0.48375	2.5708	8%	
19	18.5	1.25	0.96	0.45	1.2	0.54	3.1108	9%	
17.75	17	1.25	0.9	0.46	1.125	0.5175	3.6283	9%	
16.5	16	1	0.64	0.48	0.64	0.3072	3.9355	5%	
15.5	15	1.25	0.78	0.5	0.975	0.4875	4.4230	8%	
14.25	13.5	1.5	0.84	0.42	1.26	0.5292	4.9522	9%	
12.75	12	1.5	0.82	0.28	1.23	0.3444	5.2966	6%	
11.25	10.5	1.5	0.9	0.21	1.35	0.2835	5.5801	5%	
9.75	9	1.5	0.74	0.2	1.11	0.222	5.8021	4%	
8.25	7.5	1.25	0.44	0.1	0.55	0.055	5.8571	1%	
7	6.5	1.15	0.24	0.05	0.276	0.0138	5.8709	0%	
5.85	5.2		0	0					REW
						Total Q=	5.8709	100%	

Discharge Measurement Form for Stream Depth of 0.09 to 0.76 Meters

Station	Transect 1	Team	AS/LG/LC	Instrument	Marsh Mc Briney Model 2006205 Probe #3090
Date	7/31/2007	Gage (Begin)	2.2	Page	1
Time	19:45	Gage (End)	29.6	of	1

Beginning of Interval	Measuring Point	Width (meter)	Depth (meter)	Velocity at 0.6 (meter/second)	Area (width x depth)	Interval Discharge (cms)	Cumulative Discharge (cms)	Percent of Total Q	Comments
	2.2		0	0					REW
2.7	3.2	1.15	0.05	0.22	0.0575	0.01265	0.0127	0%	
3.85	4.5	1.15	0.2	0.35	0.23	0.0805	0.0932	1%	
5	5.5	1	0.24	0.43	0.24	0.1032	0.1964	2%	
6	6.5	1	0.28	0.58	0.28	0.1624	0.3588	3%	
7	7.5	1	0.28	0.82	0.28	0.2296	0.5884	4%	
8	8.5	1	0.34	0.74	0.34	0.2516	0.8400	4%	
9	9.5	1	0.32	0.84	0.32	0.2688	1.1088	5%	
10	10.5	1	0.28	0.85	0.28	0.238	1.3468	4%	
11	11.5	1	0.36	0.31	0.36	0.1116	1.4584	2%	
12	12.5	1.15	0.38	0.7	0.437	0.3059	1.7643	5%	
13.15	13.8	1.2	0.3	0.61	0.36	0.2196	1.9839	4%	
14.35	14.9	1.05	0.26	0.75	0.273	0.20475	2.1886	4%	
15.4	15.9	1.3	0.3	0.69	0.39	0.2691	2.4577	5%	
16.7	17.5	1.3	0.32	0.79	0.416	0.32864	2.7863	6%	
18	18.5	1	0.36	0.78	0.36	0.2808	3.0671	5%	
19	19.5	1	0.36	0.96	0.36	0.3456	3.4127	6%	
20	20.5	1	0.3	1.01	0.3	0.303	3.7157	5%	
21	21.5	1	0.34	0.59	0.34	0.2006	3.9163	3%	
22	22.5	1	0.34	1.01	0.34	0.3434	4.2597	6%	
23	23.5	1	0.42	0.72	0.42	0.3024	4.5621	5%	
24	24.5	1	0.38	1	0.38	0.38	4.9421	7%	
25	25.5	1	0.32	1.04	0.32	0.3328	5.2749	6%	
26	26.5	1	0.38	0.68	0.38	0.2584	5.5333	4%	
27	27.5	1	0.3	0.76	0.3	0.228	5.7613	4%	
28	28.5	0.75	0.18	0.4	0.135	0.054	5.8153	1%	
28.75	29	0.55	0.14	0.23	0.077	0.01771	5.8331	0%	
29.3	29.6		0	0					LEW
						Total Q=	5.8331	100%	

Discharge Measurement Form for Stream Depth of 0.09 to 0.76 Meters

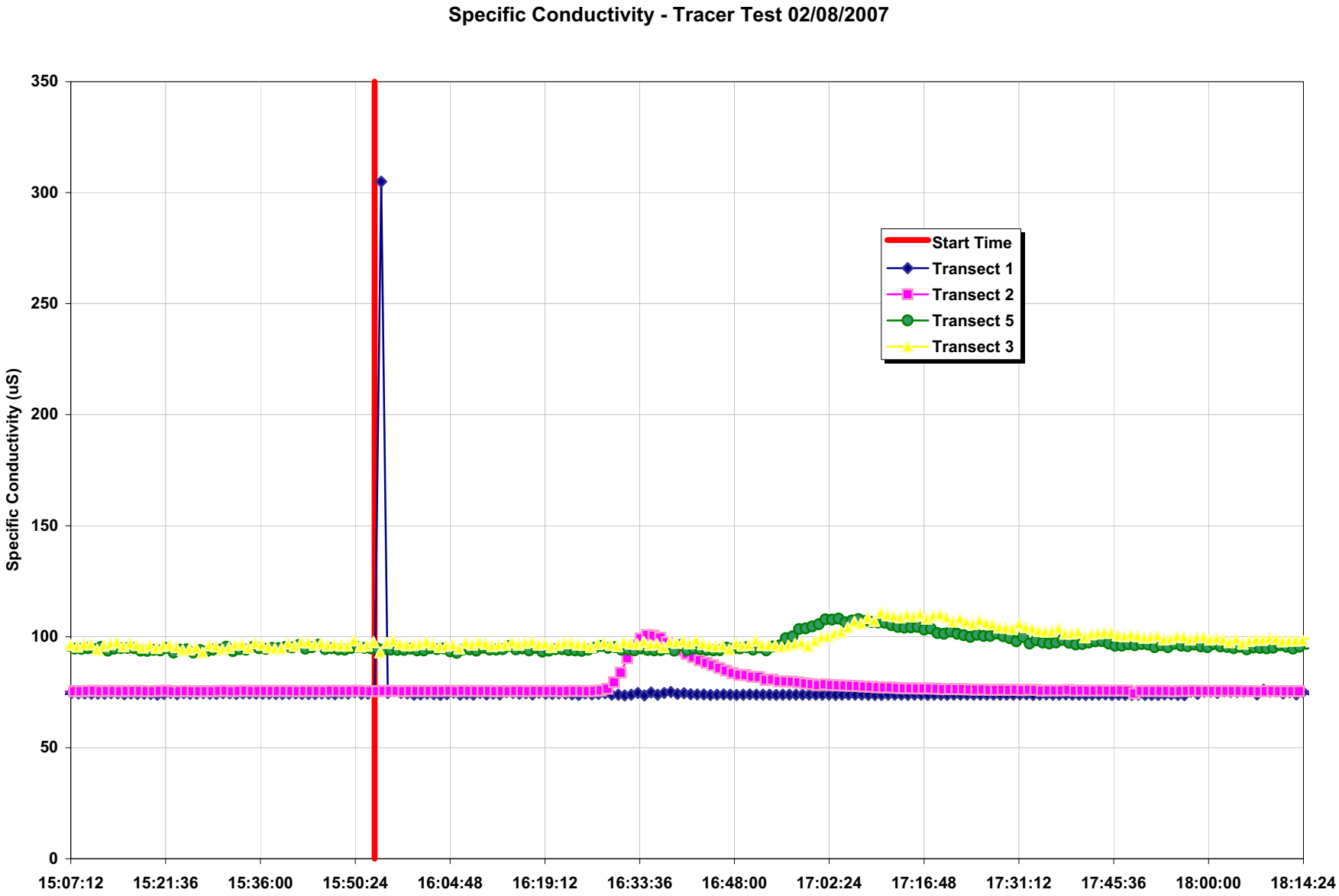
Station	Transect 1	Team	AS/LG/LC	Instrument	Marsh Mc Briney Model 2006205 Probe #3090
Date	7/31/2007	Gage (Begin)	23.6	Page	1
Time	17:30	Gage (End)	2.3	of	1

Beginning of Interval	Measuring Point	Width (meter)	Depth (meter)	Velocity at 0.6 (meter/second)	Area (width x depth)	Interval Discharge (cms)	Cumulative Discharge (cms)	Percent of Total Q	Comments
	23.6		0	0					LEW
23.1	22.6	1	0.6	0.59	0.6	0.354	0.3540	7%	
22.1	21.6	1	0.56	0.29	0.56	0.1624	0.5164	3%	
21.1	20.6	1	0.6	0.47	0.6	0.282	0.7984	6%	
20.1	19.6	1	0.6	0.61	0.6	0.366	1.1644	7%	
19.1	18.6	1	0.62	0.46	0.62	0.2852	1.4496	6%	
18.1	17.6	1	0.6	0.5	0.6	0.3	1.7496	6%	
17.1	16.6	1	0.64	0.51	0.64	0.3264	2.0760	7%	
16.1	15.6	1	0.68	0.55	0.68	0.374	2.4500	7%	
15.1	14.6	1	0.66	0.51	0.66	0.3366	2.7866	7%	
14.1	13.6	1	0.7	0.42	0.7	0.294	3.0806	6%	
13.1	12.6	1	0.64	0.42	0.64	0.2688	3.3494	5%	
12.1	11.6	1	0.55	0.57	0.55	0.3135	3.6629	6%	
11.1	10.6	1	0.58	0.58	0.58	0.3364	3.9993	7%	
10.1	9.6	1.05	0.58	0.46	0.609	0.28014	4.2794	6%	
9.05	8.5	1	0.64	0.5	0.64	0.32	4.5994	6%	
8.05	7.6	0.95	0.56	0.28	0.532	0.14896	4.7484	3%	
7.1	6.6	1	0.37	0.15	0.37	0.0555	4.8039	1%	large boulder u/s
6.1	5.6	1	0.3	0.4	0.3	0.12	4.9239	2%	
5.1	4.6	1	0.22	0.3	0.22	0.066	4.9899	1%	
4.1	3.6	1	0.09	0.18	0.09	0.0162	5.0061	0%	
3.1	2.6	0.65	0.03	0.05	0.0195	0.000975	5.0071	0%	
2.45	2.3		0	0					REW
						Total Q=	5.0071	100%	

Discharge Measurement Form for Stream Depth of 0.09 to 0.76 Meters

Station	Transect 1a	Team	AS/LG/LC	Instrument	Marsh Mc Briney Model 2006205 Probe #3090
Date	8/3/2007	Gage (Begin)	27.3	Page	1
Time		Gage (End)	0.3	of	1

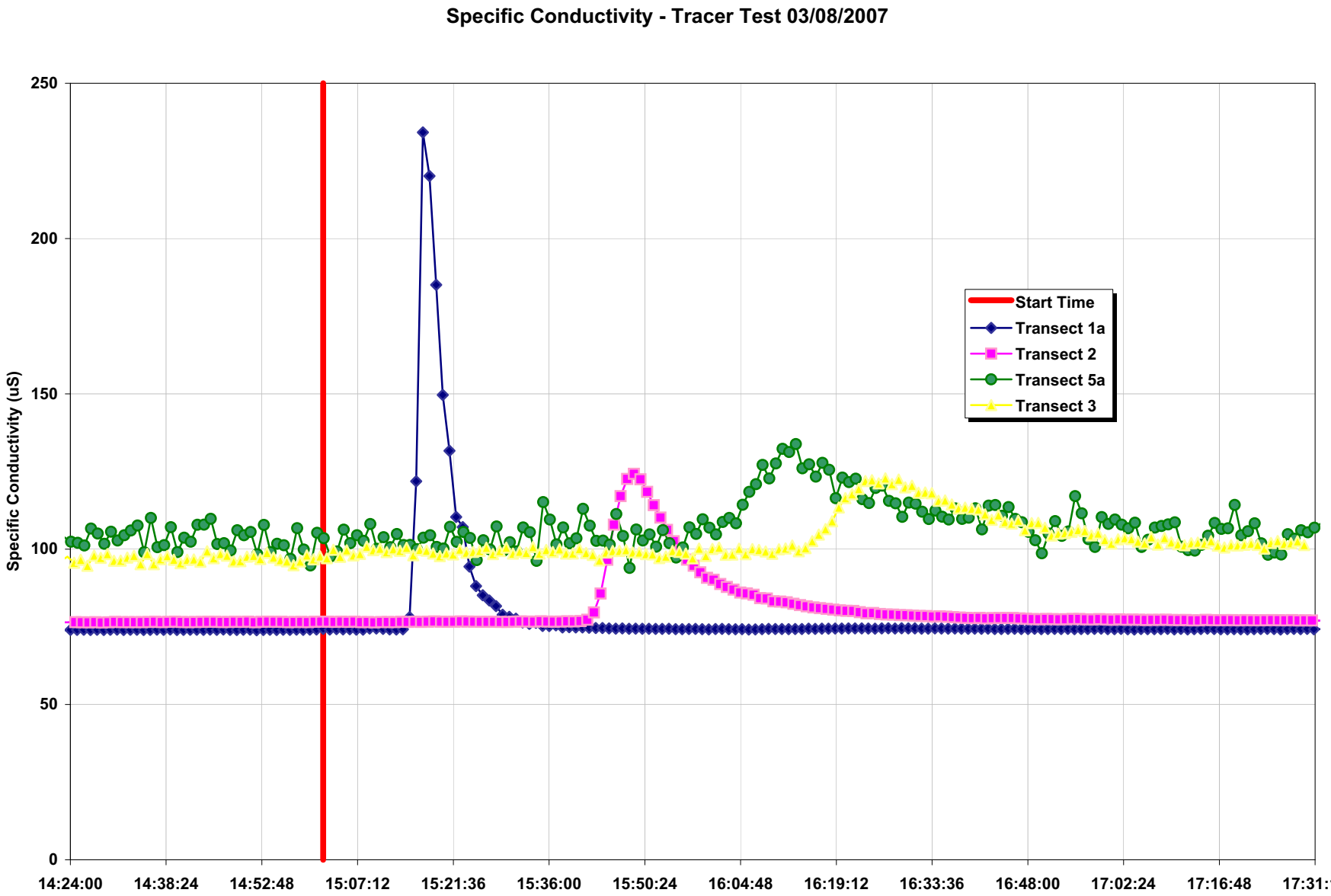
Beginning of Interval	Measuring Point	Width (meter)	Depth (meter)	Velocity at 0.6 (meter/second)	Area (width x depth)	Interval Discharge (cms)	Cumulative Discharge (cms)	Percent of Total Q	Comments
	27.3		0	0					LEW
26.85	26.4	0.95	0.3	0	0.285	0	0.0000	0%	
25.9	25.4	1	0.04	0	0.04	0	0.0000	0%	
24.9	24.4	1.2	0.3	0.13	0.36	0.0468	0.0468	1%	
23.7	23	1.45	0.48	0.29	0.696	0.20184	0.2486	5%	
22.25	21.5	1.5	0.54	0.36	0.81	0.2916	0.5402	7%	
20.75	20	1.5	0.48	0.41	0.72	0.2952	0.8354	7%	
19.25	18.5	1.5	0.54	0.37	0.81	0.2997	1.1351	7%	
17.75	17	1.5	0.6	0.45	0.9	0.405	1.5401	9%	
16.25	15.5	1.5	0.56	0.5	0.84	0.42	1.9601	10%	
14.75	14	1.5	0.58	0.48	0.87	0.4176	2.3777	10%	
13.25	12.5	1.5	0.68	0.4	1.02	0.408	2.7857	9%	
11.75	11	1.5	0.6	0.4	0.9	0.36	3.1457	8%	location of tracer probe at 10.9
10.25	9.5	1.5	0.58	0.35	0.87	0.3045	3.4502	7%	
8.75	8	1.5	0.44	0.36	0.66	0.2376	3.6878	5%	
7.25	6.5	1.5	0.44	0.35	0.66	0.231	3.9188	5%	
5.75	5	1.5	0.5	0.28	0.75	0.21	4.1288	5%	
4.25	3.5	1.5	0.5	0.24	0.75	0.18	4.3088	4%	
2.75	2	1.25	0.48	0.05	0.6	0.03	4.3388	1%	
1.5	1	0.85	0.16	0	0.136	0	4.3388	0%	
0.65	0.3		0	0					REW
						Total Q=	4.3388	100%	


Specific Conductivity - Tracer Test 02/08/2007
Specific Conductivity (uS)
350
300
250
200
150
100
50
0
15:07:12
15:21:36
15:36:00
15:50:24
16:04:48
16:19:12
16:33:36
16:48:00
17:02:24
17:16:48
17:31:12
17:45:36
18:00:00
18:14:24
Start Time
Transect 1
Transect 2
Transect 5
Transect 3

	Area	Mass	Q=A/M	
T1	14029	60	0.004276855	
T2	23664	60	0.002535497	-41%
T5	19088	60	0.003143336	24%
T3	20949	60	0.002864099	-9%

Start Time	16:53	
Conc	60	kg

8/2/2007 15:53	0
8/2/2007 15:53	350


Specific Conductivity - Tracer Test 03/08/2007
Specific Conductivity (uS)
250
200
150
100
50
0
14:24:00
14:38:24
14:52:48
15:07:12
15:21:36
15:36:00
15:50:24
16:04:48
16:19:12
16:33:36
16:48:00
17:02:24
17:16:48
17:31:12
Start Time
Transect 1a
Transect 2
Transect 5a
Transect 3

	A	M		
T1	45582	100	0.002193848	
T2	42491	100	0.00235344	7%
T5	57428	100	0.001741311	-26%
T3	37000	100	0.002702703	55%

Start Time	16:02	
Conc	100	kg

8/3/2007 15:02	0	
8/3/2007 15:02	250	

Appendix B
County Wicklow Staff Gauge Measurements and Well Data Logger Graphs

WICKLOW COUNTY COUNCIL

FAX

Date:- 18/10/07

Number of pages including cover sheet:-

If you do not receive all pages, please contact

at (0404) 20100 Ext.

To:-

Ruairi O'Carroll

CDM

Phone:

Fax Phone: 01 6724744

From: Dave Harrington

Wicklow County Council,
County Buildings,
Wicklow,
Co. Wicklow.

Phone: (0404) 20100

Fax Phone: (0404) 67792
(0404) 20192

REMARKS: ☐ Urgent ☐ For your review ☐ Reply ASAP ☐ Please comment

CDM (Ireland) Ltd.

CI	DI	DWGI	DKI
Recd By:	RO'C		
Actioned:	RO'C		

19 OCT 2007

Job No	File	Seq. No.	Loan
5856K	20	C1/891	

Attach Type & No.

Copy To: RLO
KW

Notes:

BALLYMURTAGH ROAD ADIT

FLOW RECORDS FOR 3" PARTIAL FLUME .20

DATE	STAGE	WEATHER.	FLOW $M^3/HR.$
1-8-07	241 mm	DRY / BRIGHT	69.62
3-8-07	229 mm	DRY / O/C	64.32
7-8-07	210mm	DRY / SUNNY	56.25
8-8-07	220mm	DRY / O/C	60.45
9-8-07	230mm	DRY / OK	64.76
10-8-07	228 mm	DRY / O/C	63.89
13-8-07	220mm	DRY / O/C	60.45
14-8-07	245	MISTY O/C	71.41
15-8-07	248mm	DRY / SUNNY	72.77
16-8-07	225mm	DRY / O/C	62.59
17-8-07	230mm	MISTY	64.76
20-8-07	220mm	SHOWERS	60.45
21-8-07	235mm	DRY / O/C	66.95
22-8-07	245mm	DRY / SUNNY	71.41
23-8-07	250mm	DRY / SUNNY	73.68
24-8-07	240mm	DRY / O/C	69.17
27-8-07	266mm	DRY / O/C	81.10
28-8-07	272mm	DRY / O/C	83.96
29-8-07	258mm	DRY / O/C	77.36
30-8-07	261mm	DRY / O/C	78.76
31-8-07	265mm	DRY / O/C	80.64

O/C = overcast.

DATE	STAGE	WEATHER.	FLOW $M^3/Hr.$
3-9-07	247mm	DRY/BRIGHT	72.32
4-9-07	252mm	DRY/BRIGHT	74.59
5-9-07	252mm	DRY/O/C	74.59
6-9-07	256mm	DRY/O/C	76.43
7-9-07	260mm	DRY/BRIGHT	78.29
10-9-07	250mm	DRY/BRIGHT	73.68
11-9-07	245mm	DRY/O/C	71.41
12-9-07	246mm	DRY/O/C	71.86
13-9-07	261mm	DRY/O/C	78.76
17-9-07	221mm	DRY/DULL	60.88
18-9-07	245mm	DRY/DULL	71.41
19-9-07	249mm	LIGHT DRIZZLE	73.22
20-9-07	240mm	SHOWERS OVERNIGHT DRY/DULL	69.17
21-9-07	221mm	HEAVY SHOWERS OVERNIGHT + AM.	60.88
24-9-07	218mm	SHOWERS OVERNIGHT + AM	59.60
25-9-07	191mm	SHOWERS OVERNIGHT DRY BRIGHT.	48.57
26-9-07	215mm	DRY/BRIGHT	58.34
27-9-07	229mm	DRY/BRIGHT/COOL	64.32

Seamus Breslin

2-10-2007

AVOCA RIVER
STAFF GUAGE AT WICKLOW CO. CO. YARD.

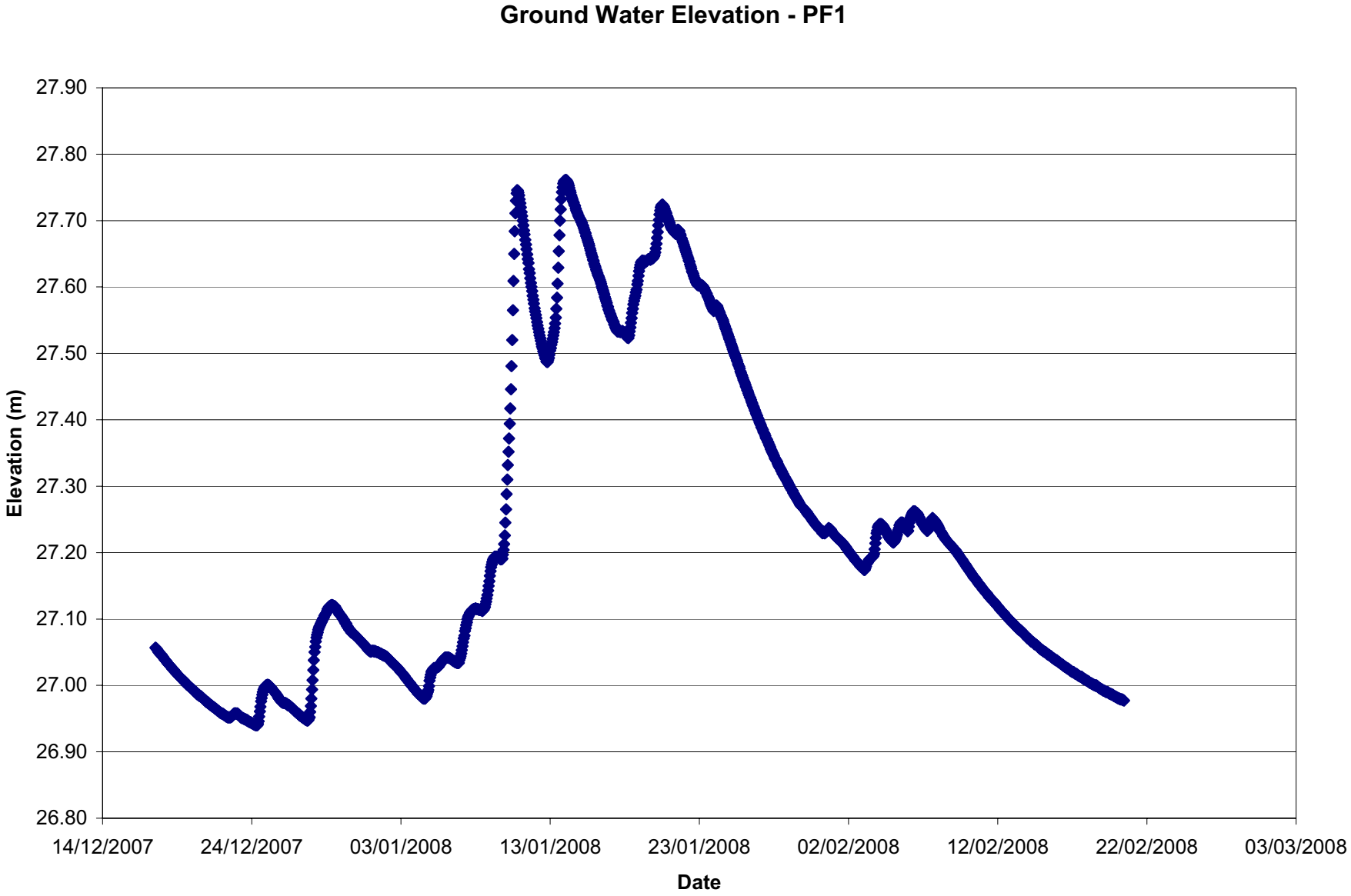
DATE	STAGE HEIGHT in M.	WEATHER.
12-6-07	0.427m	DRY
13-6-07	0.420M	SHOWERS
14-6-07	0.423M	SHOWERS
15-6-07	0.487m	RAIN
18-6-07	0.448m	P.M DRIZZLE
19-6-07	0.462m	SHOWERY
20-6-07	0.773	THUNDERSTORM a/n. FLOOD
21-6-07	0.985	SHOWERS
2-7-07	1.004	SHOWERS
3-7-07	0.930	HEAVY SHOWERS
5-7-07	0.952	SHOWERS
9-7-07	0.961	SHOWERS
10-7-07	1.127	DRY O/C
11-7-07	0.960	DRY O/C
12-707	0.790	DRY BRIGHT
13-7-07	1.00	Rain all day
16-7-07	0.810	HEAVY SHOWERS
17-7-07	0.690	SHOWERS
19-7-07	0.647	DRY BRIGHT
20-7-07	0.670	SHOWERS
24-7-07	0.645	DRY
26-7-07	0.670	SHOWERS
27-7-07	0.640	DRY BRIGHT
30-7-07	0.597	DRY BRIGHT
31-7-07	0.573	DRY BRIGHT
1-8-07	0.558	DRY BRIGHT
3-8-07	0.540	DRY O/C
7-8-07	0.75	DRY BRIGHT
8-8-07	0.66	DRY O/C

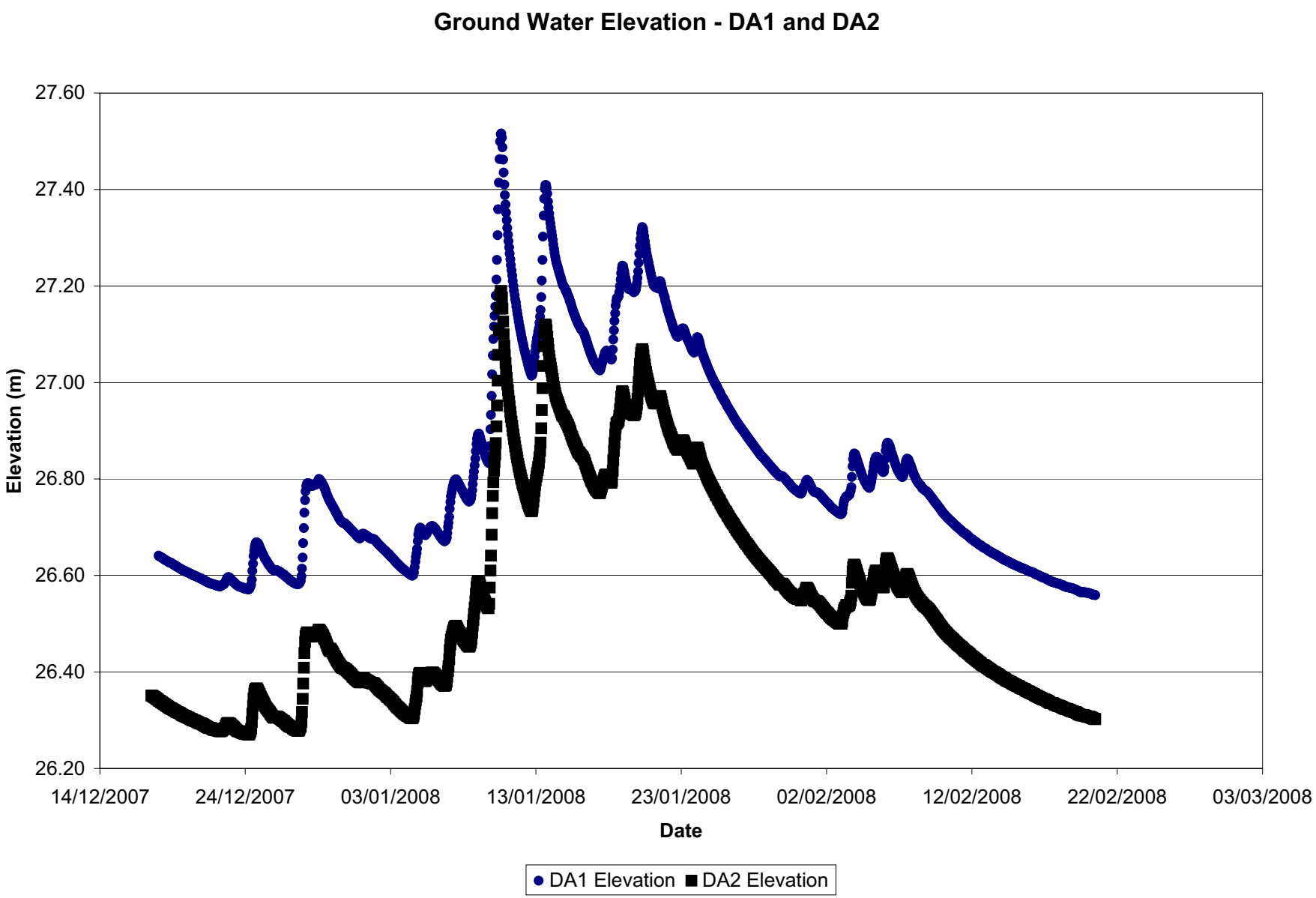
9-8-07	0.610	DRY O/C
10-8-07	0.600	DRY O/C
13-8-07	0.640	DRY O/C
14-8-07	0.620	MISTY
15-8-07	1.05	SUNNY
16-8-07	0.755	DRY O/C
17-8-07	0.680	MISTY O/C
20-8-07	1.080	SHOWERS
21-8-07	0.870	DRY
22-8-07	0.780	SUNNY
23-8-07	0.650	SUNNY
24-8-07	0.640	DRY O/C
27-8-07	0.579	DRY O/C
28-8-07	0.565	DRY O/C
29-8-07	0.558	DRY O/C
30-8-07	0.545	DRY O/C
31-8-07	0.539	DRY O/C
3-9-07	0.548	DRY BRIGHT
4-9-07	0.524	DRY BRIGHT
5-9-07	0.517	DRY BRIGHT
6-9-07	0.505	DRY O/C
7/9-07	0.499	DRY BRIGHT
10/9-07	0.479	DRY BRIGHT
11-9-07	0.471	DRY O/C
12-9-07	0.469	DRY O/C
13-9-07	0.467	DRY O/C
17-9-07	0.462	DRY O/C
18-9-07	0.448	DRY DULL
19-9-07	0.450	DULL DRIZZLE
20-9-07	0.554	SHOWERS OVERNIGHT DULL DAY
21-9-07	0.998	HEAVY SHOWERS
24-9-07	0.611	SHOWERS
25-9-07	0.582	SHOWERS

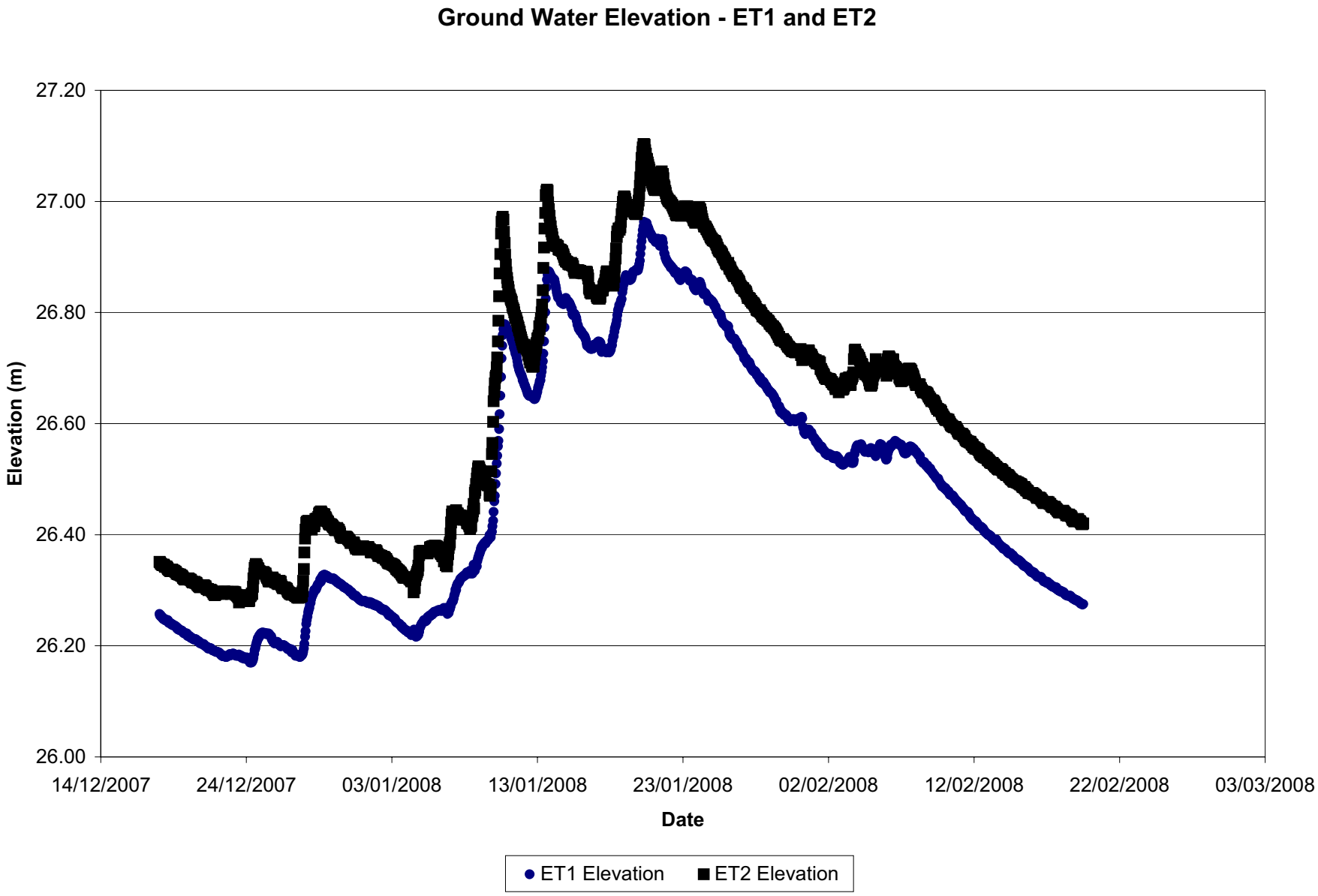
26-9-07	0.553	DRY BRIGHT
27-9-07	0.520	DRY BRIGHT
2-10-07	0.592	DRIZZLE
3-10-07	0.920	HEAVY SHOWERS
4-10-07	0.810	DRY
5-10-07	0.630	DRY BRIGHT
9-10-07	0.558	AM DRY PM SHOWERS
10-10-07	0.568	DRY SUNNY
11-10-07	0.543	DRY BRIGHT
12-10-07	0.500	DRY O/C
15-10-07	0.470	DRY O/C PM SHOWERS
16-10-07	0.482	SHOWERS
17-10-07	0.500	DRY BRIGHT
18-10-07	0.481	DRY FROST
19-10-07	0.468	DRY BRIGHT
22-10-07	0.451	DRY O/C
23-10-07	0.482	SHOWERS O/N DRY TODAY
24-10-07	0.457	DRY COLD
25-10-07	0.453	DRY O/C
26-10-07	0.443	SHOWERS
5-11-07	0.452	DULL, LIGHT DRIZZLE
6-11-07	0.458	DRY BRIGHT
7-11-07	0.447	PM. DRIZZLE
8-11-07	0.443	SHOWERS
9-11-07	0.470	DRY BRIGHT
12-11-07	0.449	DRY BRIGHT
13-11-07	0.460	DRY BRIGHT
14-11-07	0.460	DRIZZLE
15-11-07	0.640	HEAVY SHOWERS O/N.
16-11-07	0.576	DRY DULL
19-11-07	1.10	HEAVY RAIN
21-11-07	0.860	DRY
22-11-07	0.733	DRY BRIGHT

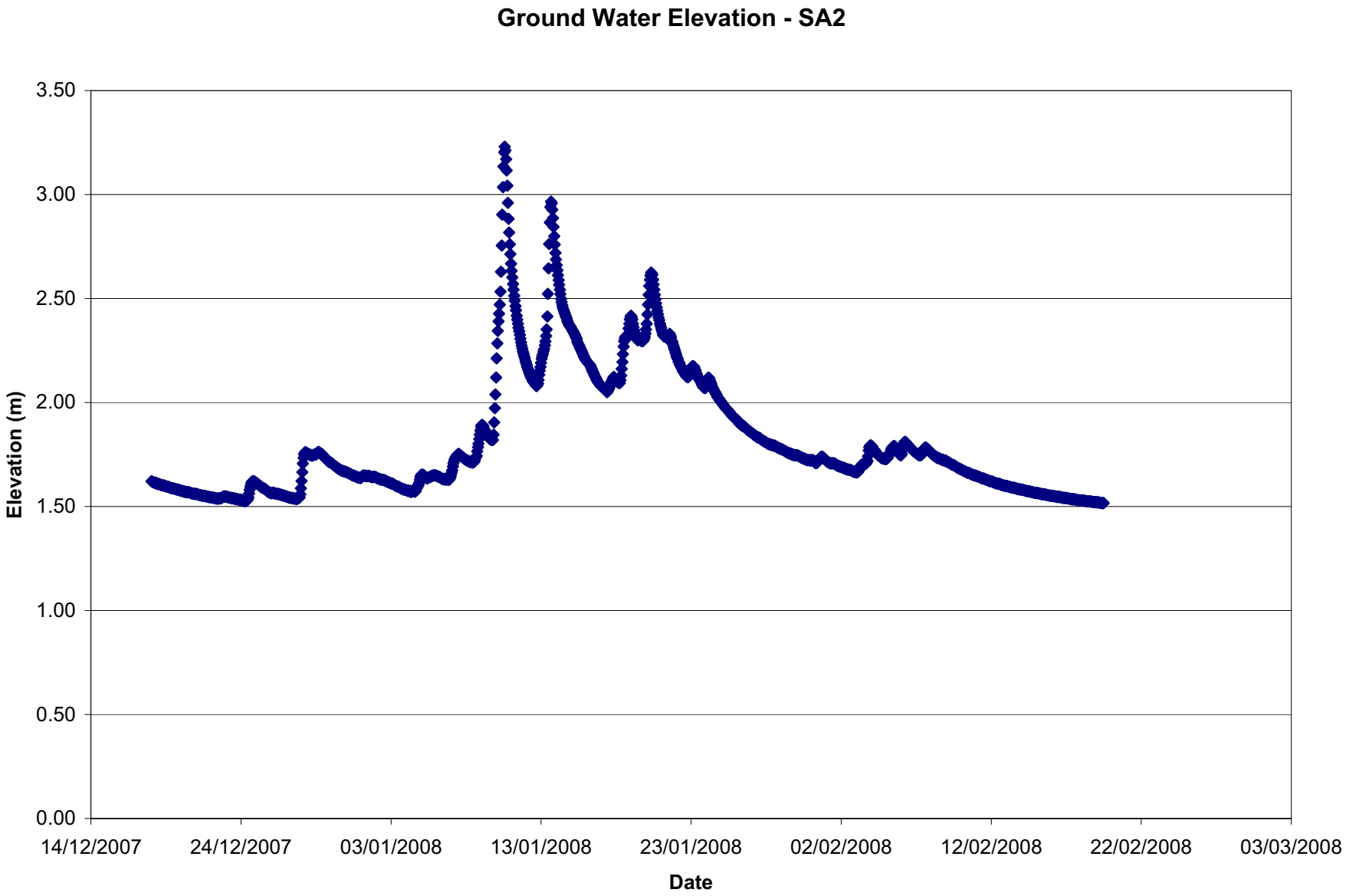
23-11-07	0.670	DRY BRIGHT
26-11-07	0.640	DRY BRIGHT
28-11-07	0.645	HEAVY SHOWERS
29-11-07	0.644	DRY BRIGHT
3-12-07	0.830	DRY BRIGHT
5-12-07	1.02	VERY HEAVY SHOWERS
6-12-07	0.860	HEAVY SHOWERS
7-12-07	1.10	HEAVY SHOWERS
10-12-07	1.80	RAIN
11-12-07	0.910	DRY DULL
12-12-07	0.780	DRY DULL
13-12-07	0.760	DRY BRIGHT
14-12-07	0.710	DRY BRIGHT
18-12-07	0.623	DRY BRIGHT
20-12-07	0.601	DRY BRIGHT
21-12-07	0.528	DRY BRIGHT FRO
2-1-08	0.650	DRY DULL
3-1-08	0.635	DRY BRIGHT FRO
10-1-08	1.70	VERY HEAVY RAIN
11-1-08	1.20	DRY COLD
14-1-08	1.30	DRY C/C AM SHOWER
16-1-08	1.05	DRY BRIGHT
17-1-08	1.20	VERY HEAVY RAIN
18-1-08	1.25	HEAVY SHOWERS
23-1-08	1.03	DRY
25-1-08	1.02	DRY BRIGHT

STAFF GUAGE WASHED AWAY IN FLOOD


Ground Water Elevation - PF1
27.90
27.80
27.70
27.60
27.50
27.40
27.30
27.20
27.10
27.00
26.90
26.80
Elevation (m)
14/12/2007
24/12/2007
03/01/2008
13/01/2008
23/01/2008
02/02/2008
12/02/2008
22/02/2008
03/03/2008
Date


Ground Water Elevation - DA1 and DA2
27.60
27.40
27.20
27.00
26.80
26.60
26.40
26.20
Elevation (m)
14/12/2007
24/12/2007
03/01/2008
13/01/2008
23/01/2008
02/02/2008
12/02/2008
22/02/2008
03/03/2008
Date
DA1 Elevation
DA2 Elevation


Ground Water Elevation - ET1 and ET2
27.20
27.00
26.80
26.60
26.40
26.20
26.00
Elevation (m)
14/12/2007
24/12/2007
03/01/2008
13/01/2008
23/01/2008
02/02/2008
12/02/2008
22/02/2008
03/03/2008
Date
ET1 Elevation
ET2 Elevation


Ground Water Elevation - SA2
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Elevation (m)
14/12/2007
24/12/2007
03/01/2008
13/01/2008
23/01/2008
02/02/2008
12/02/2008
22/02/2008
03/03/2008
Date

Appendix C
Borehole Logs and Completion Diagrams

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. BH/MP1		**SITE** AVOCA - MT. PLATT
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Shell Auger	**DATE DRILLED** 22 to 23-Aug-07
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** 9.6 m
LOGGED BY: A. Cusack		**WELL COORDINATES** 320511 E 182915 N

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (grams)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
0 m									**All Samples, Spoils**
	▨	2/SS	680	9	MI	D	L	W	Sample 2 mixed and reported with (BH/MP2) Sample 10
		0-3/C	---	---	MI	D	L	W	Cuttings, 0-3 m; orange brown; well graded slightly clayey, silty, sandy, gravelly, Silt
	▨	4/SS	720	13	---	D	L	W	Yellow orange, well graded silty, sandy Gravel
5 m									
	▨	6/SS	500	9	---	D	L	W	Orange brown clayer/silty, very sandy, Gravel Sample 6 mixed with (BH/MP2) Sample 14
	▨	8/SS	225	13	---	D	L	W	Orange, well graded, clayey/silty, sandy, Gravel
10 m									Refusal at 9.6 m, Abandoned Offset about 6 meters to drill BH/MP2

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. **BH/MP2**		**SITE** **AVOCA - MT. PLATT**
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Shell Auger	**DATE DRILLED** 23 to 24-Aug-07
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** ~ 17 m
LOGGED BY: A. Cusack		**WELL COORDINATES** 320505 E 182913 N

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (grams)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
0 m									
5 m									
10 m	▨	10/SS	280	15	SM	M	---	---	Orange brown; well graded slightly sandy, gravelly, Silt/Clay
	▨	12/SS	380	13	---	---	---	---	---
	▨	14/SS	425	20	SM	M	---	---	Orange brown; well graded clayey, silty, very sandy, Gravel

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. **BH/MP2**		**SITE** **AVOCA - MT. PLATT**
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Shell Auger	**DATE DRILLED** 23 to 24-Aug-07
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** ~ 17 m
LOGGED BY: A. Cusack		**WELL COORDINATES** 320505 E 182913 N

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (grams)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
15 m									
		16/SS	325	16	---	---	---	---	---
									Refusal, dry, abandoned
20 m									
25 m									
30 m									

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. **BH/EA1**		**SITE** **AVOCA - EAST AVOCA**
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Shell Auger	**DATE DRILLED** 7 to 8-Aug-07
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** 12 m
LOGGED BY: Gormley, Casserly, Whiting		**WELL COORDINATES** 320196 E 182613 N

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
0 m									All Samples, Spoils
		1/SS	53	7	CL	M	M	W	Red brown, well graded gravelly, sandy, Silt/Clay
		2/C	---	---	---	M	H	W	Dark grey, red brown; well graded, gravelly, sandy, Silt/Clay
		3/SS	56	20	GC	M	M	W	Red brown, brown yellow; well graded, clayey/silty, very sandy, Gravel
		4/C	---	---	---	M	M	W	Similar to Sample 3
5 m									
		5/SS	44	11	GC	M	M	W	Brown, brown yellow; well graded
		6/C	---	---	---	M	M	W	Reddish brown clayey/silty, very sandy, Gravel
		7/SS	64	12	GC	M	L	W	Red brown, well graded silty, sandy, Gravel
10 m		8/SS	61	25	GC	M	L	W	Red brown, well graded silty, sandy, gravel.
									Refusal, Abandon Hole

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. BH/TI1	**SITE** AVOCA - TIGRONEY WEST	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Shell Auger	**DATE DRILLED** 08-Aug-07
BOREHOLE DIAMETER 200 mm	**TOTAL DEPTH** 3 m	
LOGGED BY: L. Casserly	**WELL COORDINATES** 319888 E 182128 N	

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
0 m									**All Samples, Spoils**
▼	▨	1/SS	72	11	---	W	L	W	Well graded, slightly gravelly, sandy, Silt/Clay Sample mixed with TI2, Sample 1 *Water @ 2.4 m*
									Refusal, 3 m, Abandon Hole Offset a few meters to drill BH/TI2
5 m									
10 m									

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. **BH/TI2**	**SITE** **AVOCA - TIGRONEY WEST**	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Shell Auger	**DATE DRILLED** 09-Aug-07
BOREHOLE DIAMETER 200 mm	**TOTAL DEPTH** 7 m	
LOGGED BY: A. Cusack	**WELL COORDINATES** 319888 E 182128 N	

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
0 m									**All Samples, Spoils** Sample 1 mixed with BH/TI1. Sample 1 at 2 m
		1/SS	94	35	MI	M	L	W	Grey, turning to red/brown; well graded slightly sandy, slightly gravelly, Silt
		2/SS	100	35	---	D/M	L	W	Red brown; slightly sandy, gravelly, Silt/Clay
5 m									
10 m									Refusal, Abandoned

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

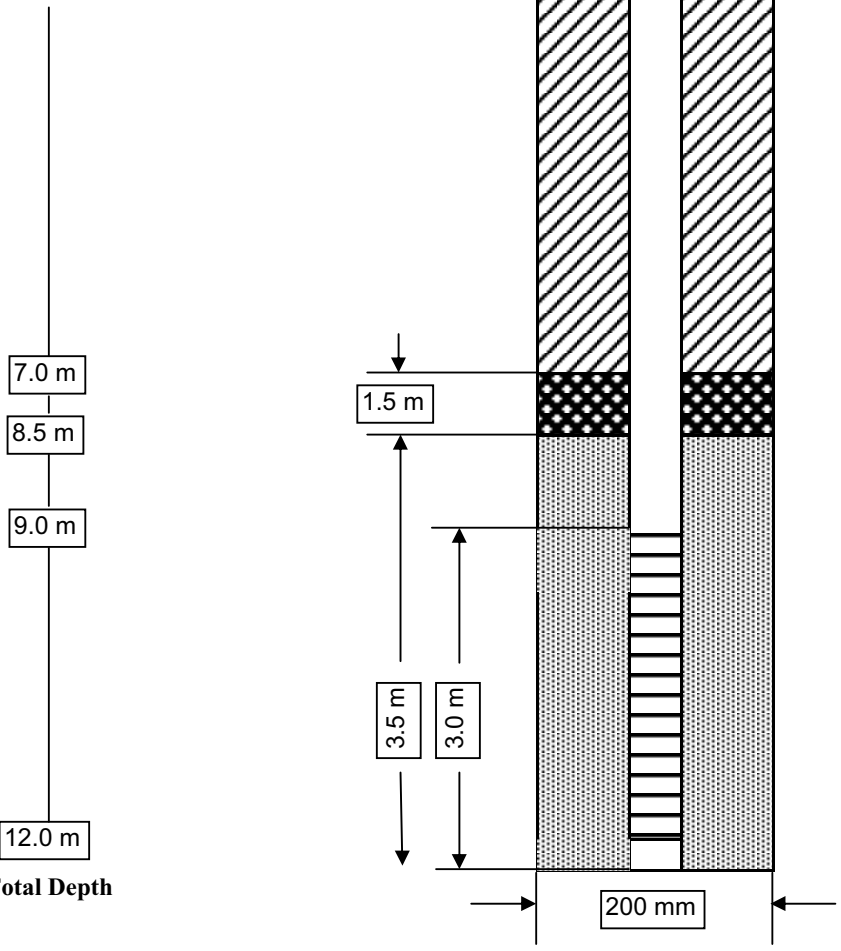
Monitoring Well Construction Log

WELL NO. **MW/DA1**	**SITE** **AVOCA - DEEP ADIT SPOILS AREA**
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	
DATE STARTED 23-Aug-07	**DATE ENDED** 24-Aug-07
LOGGED BY: A. Cusack	**WELL COORDINATES** 319877.150 E 182043.337 N

TOP/CAP ELEVATION (m): 32.789 m

GROUND SURFACE EL (m): 32.186 m

0.00 m
DEPTH BGS (m)



Water Level BGS: 6.13 m

WELL COMPONENTS

PROTECTVE CASING
Material/Type: Steel/Locking Cap
Diameter: 200 mm
Depth BGS: ---

SURFACE PAD
Composition & Size: Concrete, 600 x 600 mm dia.

RISER PIPE
Type: Sch. 40 PVC
Diameter: 50 mm
Total Length: 9.6 m

GROUT
Type: Cuttings, Spoils

SEAL
Type: Bentonite Pellets
Source: Commercial

FILTER PACK
Type: Washed Quartz Pea Gravel
Typical: 500 mm Sand Beneath Seal
Source: Commercial
Grain Size Dist:

SCREEN
Type/Diameter: Sch. 40 PVC/50 mm
Slot Size: 0.5 mm

SUMP
Length: 100 mm
Bottom Cap: YES

BACKFILL PLUG
Material: Builder's Sand
Length: ---

LEGEND
Concrete
Backfill
Seal
Filter Pack
Screen

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. **BH/DA1**	**SITE** **AVOCA - DEEP ADIT SPOILS AREA**	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Air Rotary	**DATE DRILLED** 24-Aug-07
BOREHOLE DIAMETER 200 mm	**TOTAL DEPTH** 12.0 M	
LOGGED BY: A. Cusack	**WELL COORDINATES** 319877.150 E 182043.337 N	

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
0 m									Spoils, orange/brown
5 m									Spoils, orange/brown, slightly moist
		1/C	---	---	---	---	---	---	Light brown slightly sandy, gravelly, Clay
		2/SS	100	45	CL	W	N	W	Brown clayey/silty, very gravelly, sand. Top of alluvium at approximately 7.5 to 8.0 m
10 m		3/C	---	---	---	---	---	---	Alluvium - gravelly, wet
									Total Depth, 12.0 m Note: Samples from twin hole, Aug. 14, 2007.

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

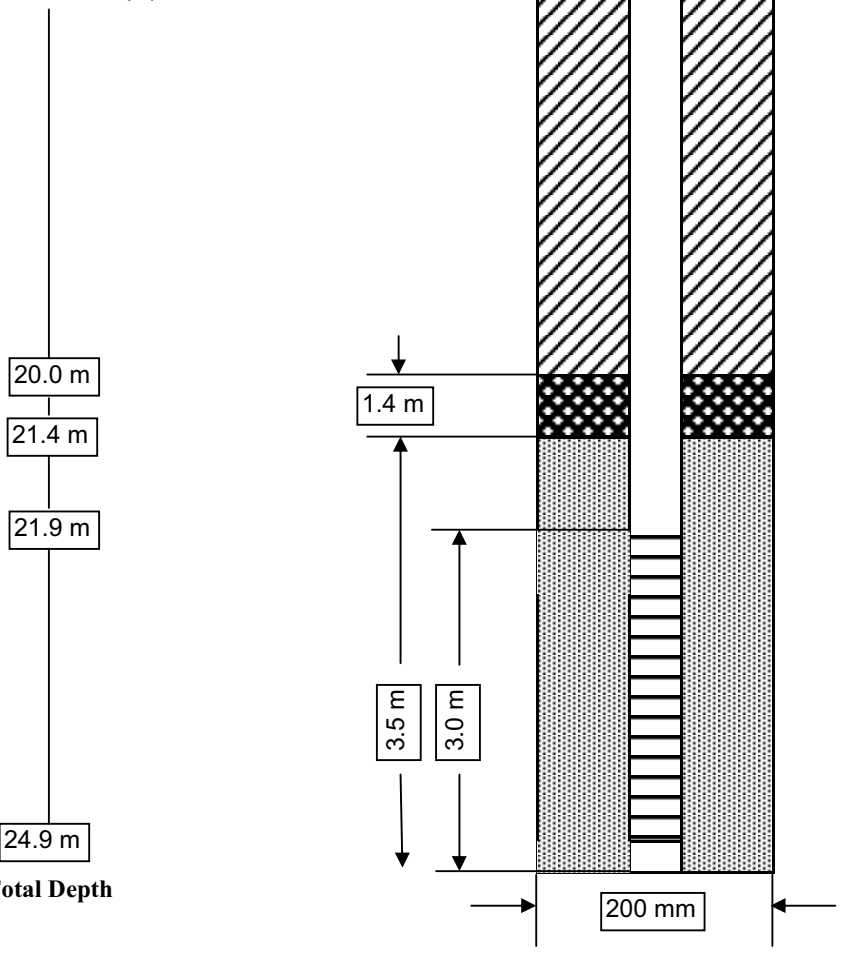
Monitoring Well Construction Log

WELL NO. **MW/DA2**	**SITE** **AVOCA - DEEP ADIT SPOILS AREA**
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	
DATE STARTED 24-Aug-07	**DATE ENDED** 27-Aug-07
LOGGED BY: A. Cusack	**WELL COORDINATES** 319878.798 E 182039.330 N

TOP/CAP ELEVATION (m): 32.615 m

GROUND SURFACE EL (m): 31.886 m

0.00 m
DEPTH BGS (m)



Water Level BGS: 6.29 m

WELL COMPONENTS

PROTECTVE CASING
Material/Type: Steel/Locking Cap
Diameter: 200 mm
Depth BGS: ---

SURFACE PAD
Composition & Size: Concrete, 600 X 600 mm dia.

RISER PIPE
Type: Sch. 40 PVC
Diameter: 50 mm
Total Length: 22.6 m

GROUT
Type: Cuttings, Spoils

SEAL
Type: Bentonite Pellets
Source: Commercial

FILTER PACK
Type: Washed Quartz Pea Gravel
Typical: 500 mm Sand Beneath Seal
Source: Commercial
Grain Size Dist:

SCREEN
Type/Diameter: Sch. 40 PVC/50 mm
Slot Size: 0.5 mm

SUMP
Length: 100 mm
Bottom Cap: YES

BACKFILL PLUG
Material: Builder's Sand
Length: ---

LEGEND
Concrete
Backfill
Seal
Filter Pack
Screen

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. **BH/DA2**		**SITE** **AVOCA - DEEP ADIT SPOILS AREA**
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Air Rotary	**DATE DRILLED** 24-Aug-07
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** 24.9 m
LOGGED BY: A. Cusack		**WELL COORDINATES** 319878.798 E 182039.330 N

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
0 m							L	M	Spoils, orange, moist
									Spoils, brown
5 m									
									Spoils, brown, moist, gravelly. Water encountered
									Gravel, grey, very moist
10 m									Muddy brown water
									Alluvium - sand/gravel, grey, water becomes more clear.

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. **BH/DA2**		**SITE** **AVOCA - DEEP ADIT SPOILS AREA**
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Air Rotary	**DATE DRILLED** 24-Aug-07
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** 24.9 m
LOGGED BY: A. Cusack		**WELL COORDINATES** 319878.798 E 182039.330 N

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
15 m		1/C	---	---	---	---	---	---	Alluvium - large chunks of gravel, fractured rock.
20 m									Drilling becoming more difficult Bedrock
25 m									Total Depth, 24.9 m
30 m									

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. **BH/WA1**		**SITE** **AVOCA - WEST AVOCA**
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Shell Auger	**DATE DRILLED** 9 to 10-Aug-07
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** 5.9 m
LOGGED BY: L. Casserly		**WELL COORDINATES** 319292 E 181558 N

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
0 m									
		1/SS	42	2	MI	M/W	L	M	Tailings, light grey; poorly graded; slightly sandy, Silt
		2/C	---	---	---	M/W	L	M	Same as Sample 1
		3/SS	100	30	MI	M/W	W	M	Tailings, grading to spoils at 4.45 m. Light grey/dark brown, well graded; slightly gravelly, slightly sandy, Silt.
		4/C	---	---	---	---	---	---	Samples 3 and 4 were mixed for testing
5 m									
									Refusal at 5.9 m, Adandoned hole.
10 m									

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

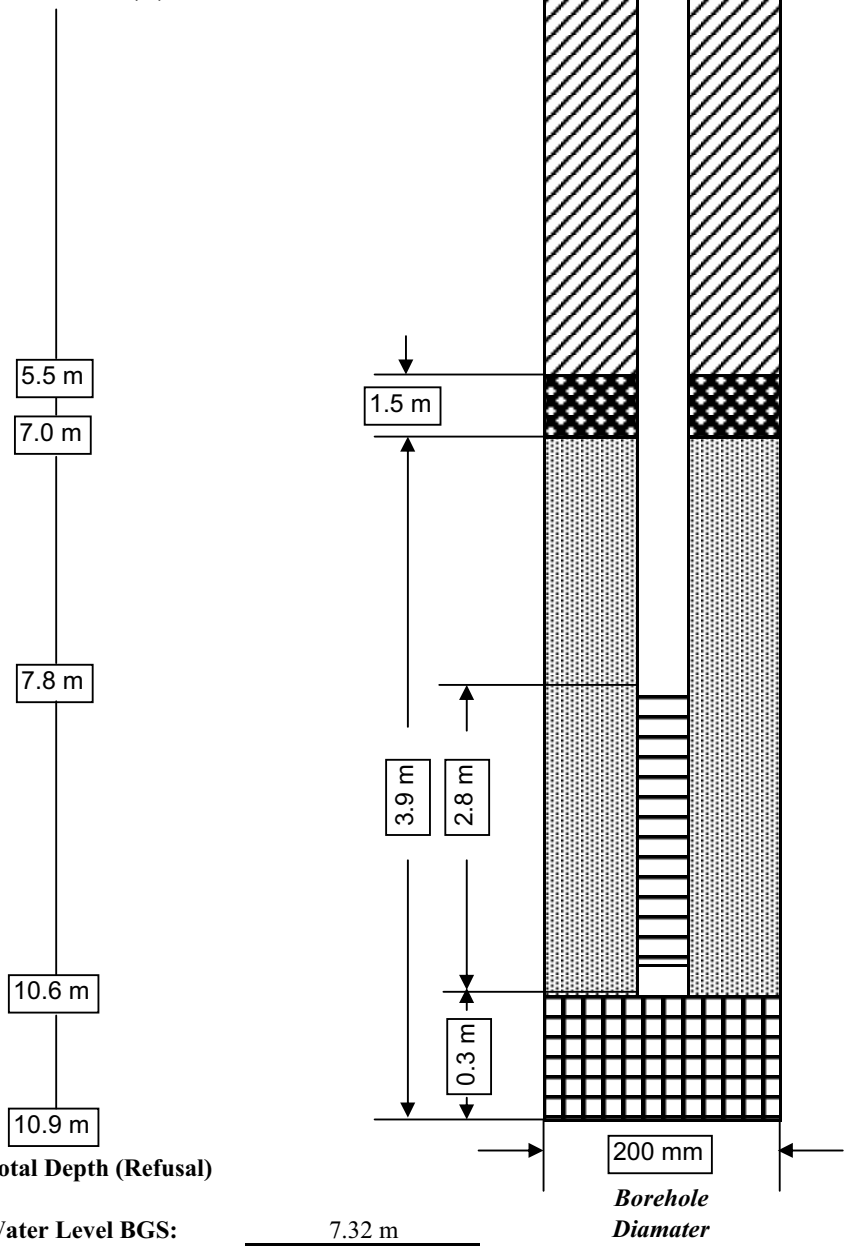
Monitoring Well Construction Log

WELL NO. **MW/ET1**	**SITE** **AVOCA - EMERGENCY TAILINGS POND**
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	
DATE STARTED 17-Aug-07	**DATE ENDED** 21-Aug-07
LOGGED BY: A. Cusack	**WELL COORDINATES** 319877.596 E 181676.916 N

TOP/CAP ELEVATION (m): 30.989 m

GROUND SURFACE EL (m): 30.164 m

0.00 m
DEPTH BGS (m)



Total Depth (Refusal)

Water Level BGS: 7.32 m

WELL COMPONENTS

PROTECTVE CASING
Material/Type: Steel/Locking Cap
Diameter: 200 mm
Depth BGS: ---

SURFACE PAD
Composition & Size: Concrete, 600 X 600 mm dia.

RISER PIPE
Type: Sch. 40 PVC
Diameter: 100 mm
Total Length: 8.6 m

GROUT
Type: Cuttings, Tailings

SEAL
Type: Bentonite Pellets
Source: Commercial

FILTER PACK
Type: Washed Quartz Pea Gravel
Typical: 500 mm Sand Beneath Seal
Source: Commercial
Grain Size Dist:

SCREEN
Type/Diameter: Sch. 40 PVC/100 mm
Slot Size: 0.5 mm

SUMP
Length: 100 mm
Bottom Cap: YES

BACKFILL PLUG
Material: Builder's Sand
Length: 300 mm

LEGEND
Concrete
Backfill
Seal
Filter Pack Sand
Screen

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. BH/ET1		**SITE** AVOCA - EMERGENCY TAILINGS POND
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Shell Auger	**DATE DRILLED** 13 to 20-Aug-07
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** 10.9 m
LOGGED BY: L. Casserly		**WELL COORDINATES** 319877.596 E 181676.916 N

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
0 m									
		1/SS	61	9	---	D	N	W	Tailings, mottled light grey brown slightly sandy, gravelly, Silt/Clay
5 m									
		C	---	---	---	---	---	---	Top of alluvium, between 7.5 m and 7.8 m
10 m									
		C	---	---	CL	D/M	L	---	Top of clay @ 10.5 m, grey brown sandy, slightly gravelly, Clay.
									Top of rock, 10.8 m Total depth, 10.9 m

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

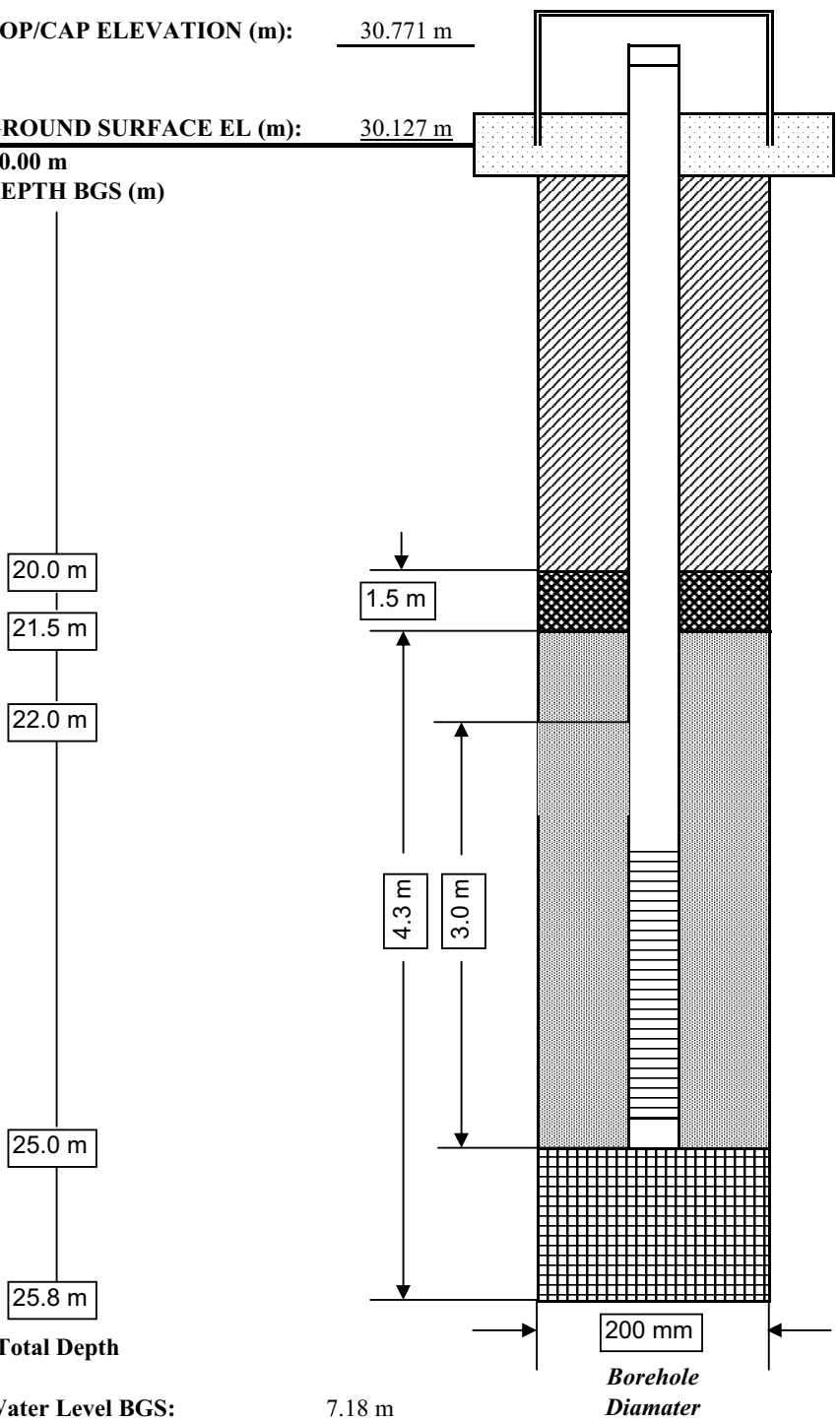
Monitoring Well Construction Log

WELL NO. **MW/ET2**	**SITE** **AVOCA - EMERGENCY TAILINGS POND**
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	
DATE STARTED 22-Aug-07	**DATE ENDED** 23-Aug-07
LOGGED BY: A. Cusack	**WELL COORDINATES** 319878.079 E 181676.072 N

TOP/CAP ELEVATION (m): 30.771 m

GROUND SURFACE EL (m): 30.127 m

0.00 m
DEPTH BGS (m)



Water Level BGS: 7.18 m

WELL COMPONENTS

PROTECTVE CASING
Material/Type: Steel/Locking Cap
Diameter: 200 mm
Depth BGS: ---

SURFACE PAD
Composition & Size: Concrete, 600 X 600 mm dia.

RISER PIPE
Type: Sch. 40 PVC
Diameter: 50 mm
Total Length: 22.6 m

GROUT
Type: Cuttings, Tailings

SEAL
Type: Bentonite Pellets
Source: Commercial

FILTER PACK
Type: Washed Quartz Pea Gravel
Typical: 500 mm Sand Beneath Seal
Source: Commercial
Grain Size Dist:

SCREEN
Type/Diameter: Sch. 40 PVC/50 mm
Slot Size: 0.5 mm

SUMP
Length: 100 mm
Bottom Cap: YES

BACKFILL PLUG
Material: Builder's Sand
Length: 0.8 m

LEGEND
Concrete
Backfill
Seal
Filter Pack
Sand
Screen

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. BH/ET2		**SITE** AVOCA - EMERGENCY TAILINGS POND
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Air Rotary	**DATE DRILLED** 21 to 22-Aug-07
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** 25.8 m
LOGGED BY: A. Cusack		**WELL COORDINATES** 319878.079 E 181676.072 N

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
0 m									
									Tailings, green-grey, slightly moist
5 m ▼									Tailings, grey, increasing moisture at depth
									Alluvium-gravelly, water coming in
10 m									Alluvium-gravelly, less water
									Alluvium, water becomes sand, some clay
									Alluvium, water becomes brown in color
									Alluvium - gravel collapsing, drilling more difficult

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. **BH/ET2**		**SITE** **AVOCA - EMERGENCY TAILINGS POND**
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Air Rotary	**DATE DRILLED** 21 to 22-Aug-07
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** 25.8 m
LOGGED BY: A. Cusack		**WELL COORDINATES** 319878.079 E 181676.072 N

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
15 m									Alluvium - Cobbles, gravel, difficult drilling Water, muddy brown
20 m									Alluvium - fine gravel, grey sand, some silt/clay
									Water color changes to grey
25 m									Alluvium, grey - broken cobbles, gravel.
									Total Depth, 25.8 m Drilling difficult but no refusal
30 m									

Sample Type
SS: Split Spoon
C: Cuttings

Moisture
D: Dry
M: Moist
W: Wet

Plasticity
N: None
L: Low
M: Moderate
H: High

Cementation
W: Weak
M: Moderate
S: Strong

CDM Camp, Dresser, and McKee Inc.

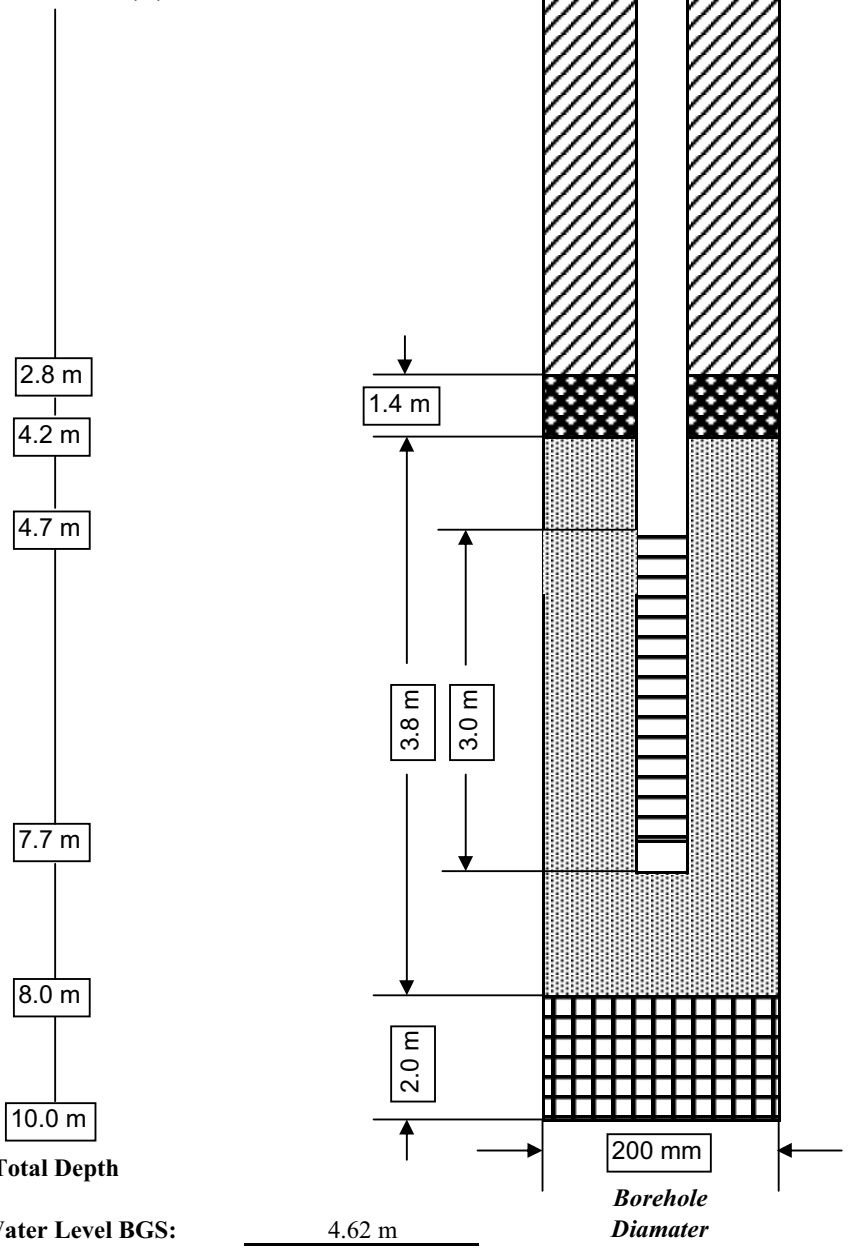
Monitoring Well Construction Log

WELL NO. **MW/PF1**	**SITE** **AVOCA - PADDY HOGAN'S FIELD**
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	
DATE STARTED 22-Aug-07	**DATE ENDED** 23-Aug-07
LOGGED BY: A. Cusack	**WELL COORDINATES** 319677.894 E 182295.747 N

TOP/CAP ELEVATION (m): 31.491 m

GROUND SURFACE EL (m): 30.792 m

0.00 m
DEPTH BGS (m)



Water Level BGS: 4.62 m

WELL COMPONENTS

PROTECTVE CASING
Material/Type: Steel
Diameter: 200 mm
Depth BGS: ---

SURFACE PAD
Composition & Size: Concrete, 600 X 600 mm dia.

RISER PIPE
Type: Sch. 40 PVC
Diameter: 50 mm
Total Length: 4.9 m

GROUT
Type: Drill Cuttings

SEAL
Type: Bentonite Pellets
Source: Commercial

FILTER PACK
Type: Washed Quartz Pea Gravel
Typical: 500 mm sand Beneath Seal
Source: Commercial
Grain Size Dist:

SCREEN
Type/Diameter: Sch. 40 PVC/50 mm
Slot Size: 0.5 mm

SUMP
Length: 100 mm
Bottom Cap: YES

BACKFILL PLUG
Material: Builder's Sand
Length: 2.0 m

LEGEND
Concrete
Backfill
Seal
Filter Pack Sand
Screen

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. BH/PF1	**SITE** AVOCA - PADDY HOGAN'S FIELD	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Shell Auger	**DATE DRILLED** 21 to 23-Aug-07
BOREHOLE DIAMETER 200 mm	**TOTAL DEPTH** 10 m	
LOGGED BY: H.Moe	**WELL COORDINATES** 319677.894 E 182295.747 N	

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY		COMMENTS
0 m									Gravel with clay matrix *Water @ 3.6 m*
5 m									Gravel, pebbles, some clay
									Clay till
10 m									Total Depth, 10 m, No Refusal

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. **BH/SA1**		**SITE** **AVOCA - SHELTON ABBEY TAILINGS SITE**
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Shell Auger	**DATE DRILLED** 10 to 16-Aug-07
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** 20 m
LOGGED BY: A. Cusack		**WELL COORDINATES** 321206 E 175804 N

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
0 m									
		1/SS	100	6	ML	M	L	W	Tailings, grey; poorly graded sandy, Silt/Clay
5 m									
10 m									

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. **BH/SA1**		**SITE** **AVOCA - SHELTON ABBEY TAILINGS SITE**
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Shell Auger	**DATE DRILLED** 10 to 16-Aug-07
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** 20 m
LOGGED BY: A. Cusack		**WELL COORDINATES** 321206 E 175804 N

DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOW COUNT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
15 m		C	---	---	MI	M	N	W	Tailings, grey; poorly graded slightly sandy, Silt.
20 m									Total depth, auger seized, abandoned. Tailings, entire length of bore.
25 m									
30 m									

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

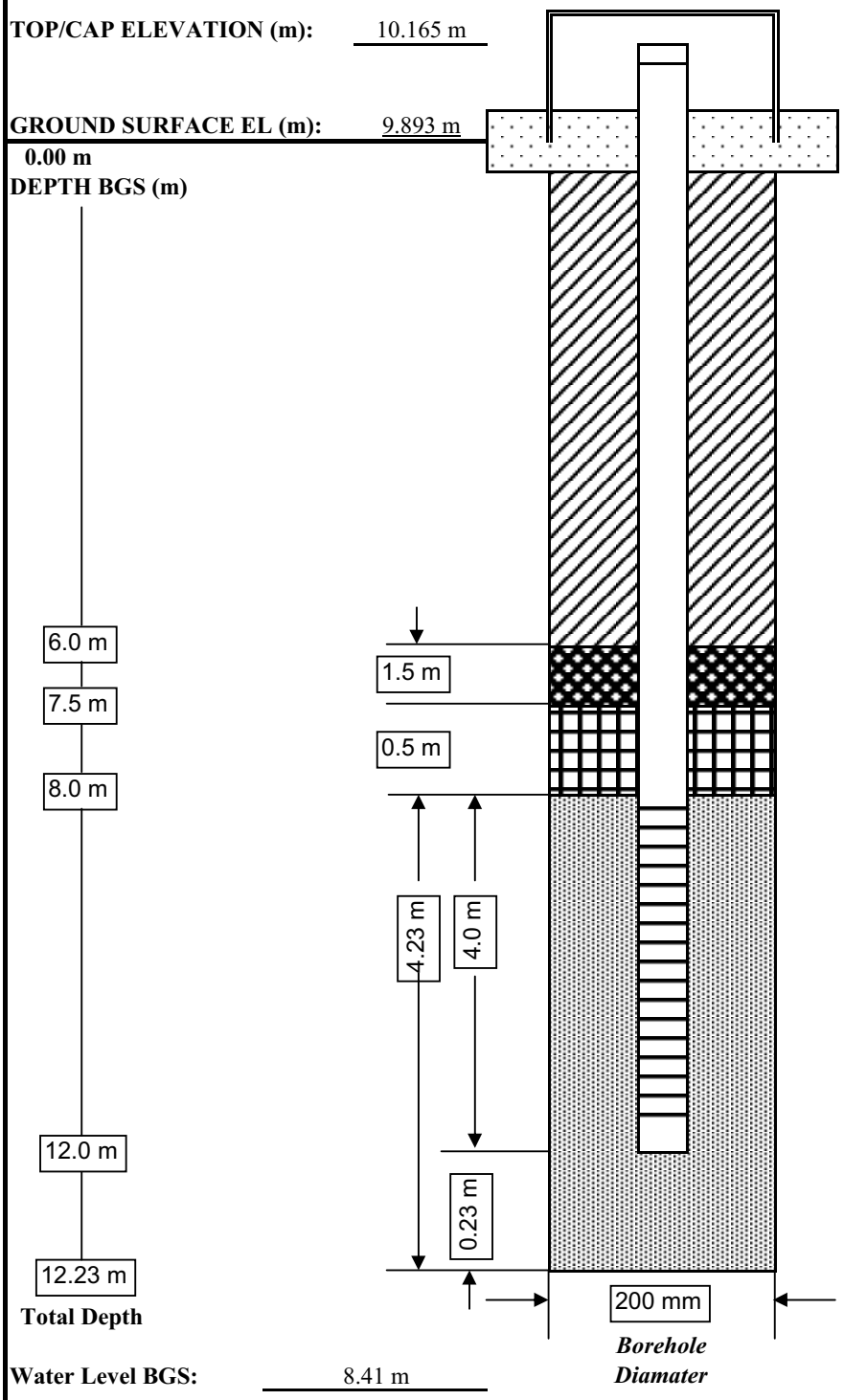
CDM Camp, Dresser, and McKee Inc.

Monitoring Well Construction Log

WELL NO. **MW/SA2**	**SITE** **AVOCA - SHELTON ABBEY TAILINGS SITE**
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	
DATE STARTED 20-Aug-07	**DATE ENDED** 21-Aug-07
LOGGED BY: H. Moe	**WELL COORDINATES** 321566.375 E 175292.425 N

TOP/CAP ELEVATION (m): 10.165 m

GROUND SURFACE EL (m): 9.893 m



Water Level BGS: 8.41 m

WELL COMPONENTS

PROTECTVE CASING
Material/Type: Steel/Locking Cap
Diameter: 200 mm
Depth BGS: ---

SURFACE PAD
Composition & Size: Concrete, 600 X 600 mm dia.

RISER PIPE
Type: Sch. 40 PVC
Diameter: 100 mm
Total Length: 8.272 m

GROUT/FILL
Type: Clay/Tailings

SEAL
Type: Bentonite Pellets
Source: Commercial

FILTER PACK
Type: Washed Quartz Pea Gravel
Typical: 500 mm Sand Beneath Seal
Source: Commercial
Grain Size Dist:

SCREEN
Type/Diameter: Sch. 40 PVC/100 mm
Slot Size: 0.5 mm

SUMP
Length: 1.0 m
Bottom Cap: YES

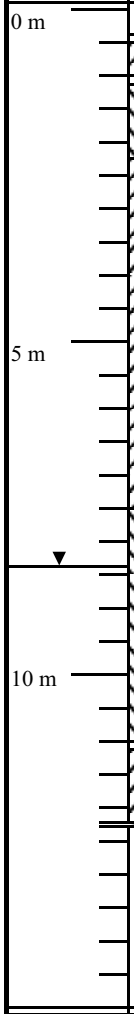
BACKFILL PLUG
Material: Builder's Sand
Length: ---

LEGEND
Concrete
Backfill
Seal
Filter Pack Sand
Screen

CDM Camp, Dresser, and McKee Inc.

FIELD BOREHOLE LOG

BOREHOLE NO. **BH/SA2**		**SITE** **AVOCA - SHELTON ABBEY TAILINGS SITE**
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
DRILLING CONTRACTOR Glover Site Investigations Limited	**DRILLING METHOD** Shell Auger	**DATE DRILLED** August 20-21, 2007
BOREHOLE DIAMETER 200 mm		**TOTAL DEPTH** 12.23 m
LOGGED BY: H. Moe		**WELL COORDINATES** 321556.375 E 175292.425 N



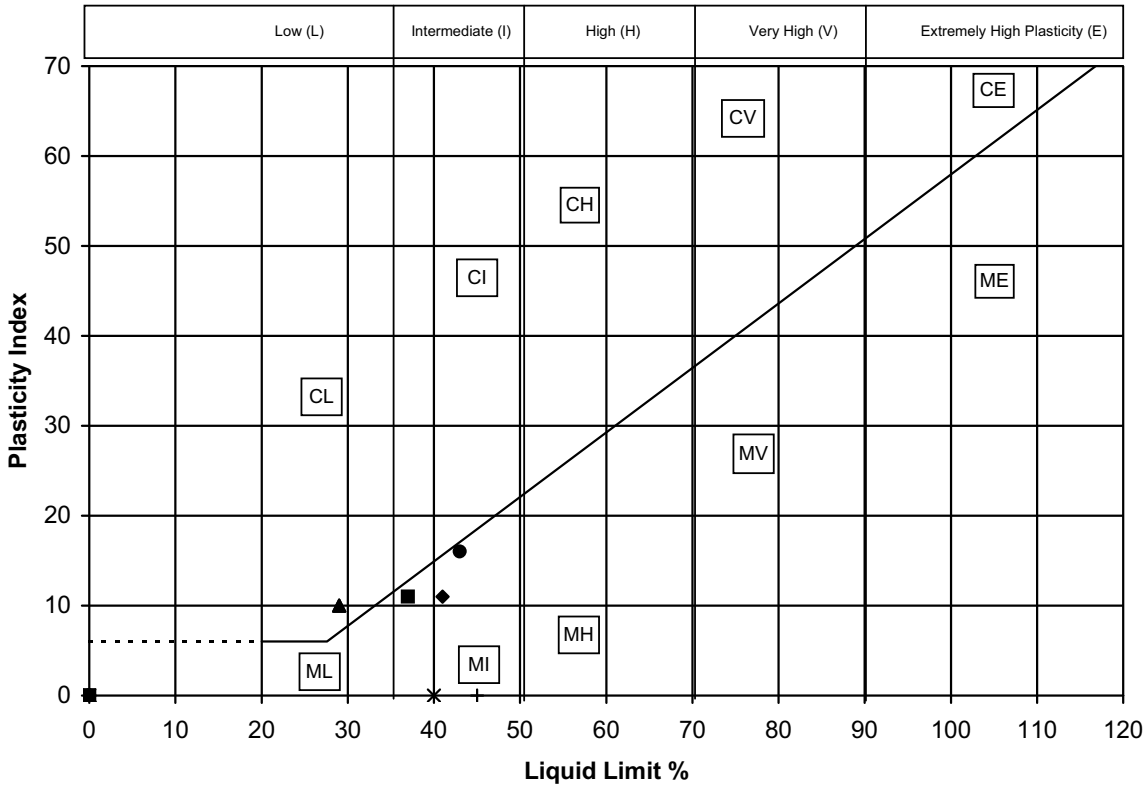
DEPTH (m)	INTERVAL	SAMPLE NO./TYPE	RECOVERY (%)	BLOWS/FT	USCS	MOISTURE	PLASTICITY	CEMENTATION	COMMENTS
0 m									Clay Gravel Sand with rounded cobbles (shale) Grey tailings
									Coarse sand and gravel
5 m									Grey tailings, occasional bands of black-white artificial and unidentified material; black material is tar-like; white material is soft, fibrous. Band more prevalent from 2.2 to 4.0 m. (Sample Taken)
									Water @ 8.41 m
10 m									Gravel with cobbles
									Silt band
									Gravel with cobbles
									Total Depth 12.23 m, Refusal

Sample Type	Moisture	Plasticity	Cementation
SS: Split Spoon	D: Dry	N: None	W: Weak
C: Cuttings	M: Moist	L: Low	M: Moderate
	W: Wet	M: Moderate	S: Strong
		H: High	

Appendix D
Geotechnical Data

Plasticity Chart - Summary of Liquid & Plastic Limit Tests
BS1377:Part 2:1990, clauses 3.2, 4 & 5
Chart in accordance with BS5930:1999, fig.18

Contract No. 12939 Contract: AVOCA MINING SITE SCH 2



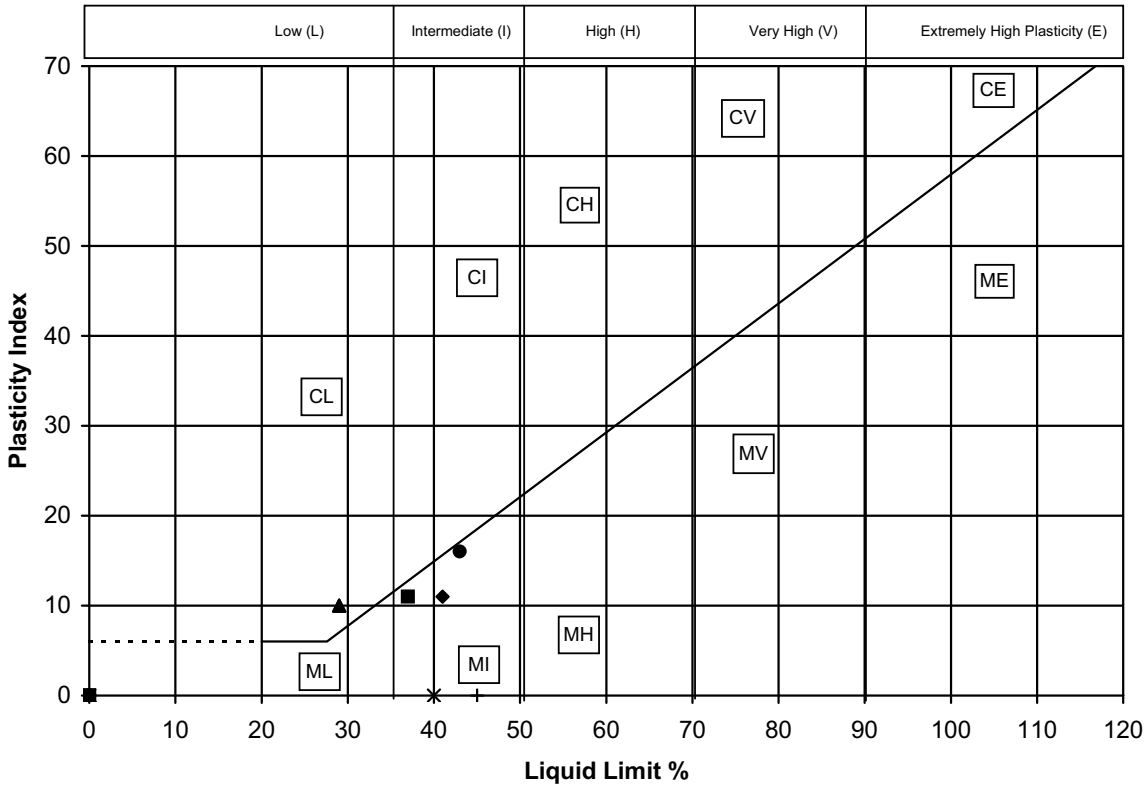
Code	BH/TP	Sample	Depth (m)	MC%	LL%	PL%	PI%	%<425µm	Description
▲	BH /ET1	14/08/2007	10.60	10.5	29	19	10	43	Grey brown sandy slightly gravelly CLAY
■	BH /MP1	23/08/2007	0-3	12.8	37	26	11	37	Orange brown slightly sandy gravelly SILT
●	TP /DA1	09/08/2007	0.3-0.6	9	43	27	16	41	Light brown slightly sandy gravelly SILT
◆	BH/T11 &1	09/08//07	2.00	24.5	41	30	11	29	Orange brown (with pockets of grey clay)slightly sandy slightly gravelly SILT
×	BH/WA1	0'9/08//07	44.0&4.55	31.2	40	NP	0	73	Orange brown (with pockets of grey silt)slightly sandy slightly gravelly SILT
+	BH /SA1	37842	17.50	35.7	45	NP	0	100	Grey slighly sandy SILT
△	BH/DA1	37846	7.40	11.8	29	19	10	45	Light brown slightly sandy gravelly CLAY
□									
○									
◇									
▲									
■									
●									
◆									
×									
+									
△									

NP denotes specimen is non-plastic.

	Issued by	Date			Page
IGSL		22/10/2007			

Plasticity Chart - Summary of Liquid & Plastic Limit Tests
BS1377:Part 2:1990, clauses 3.2, 4 & 5
Chart in accordance with BS5930:1999, fig.18

Contract No. 12939 Contract: AVOCA MINING SITE SCH 2



Code	BH/TP	Sample	Depth (m)	MC%	LL%	PL%	PI%	%<425µm	Description
▲	BH /ET1	14/08/2007	10.60	10.5	29	19	10	43	Grey brown sandy slightly gravelly CLAY
■	BH /MP1	23/08/2007	0-3	12.8	37	26	11	37	Orange brown slightly sandy gravelly SILT
●	TP /DA1	09/08/2007	0.3-0.6	9	43	27	16	41	Light brown slightly sandy gravelly SILT
◆	BH/T11 &1	09/08//07	2.00	24.5	41	30	11	29	Orange brown (with pockets of grey clay)slightly sandy slightly gravelly SILT
×	BH/WA1	0'9/08//07	44.0&4.55	31.2	40	NP	0	73	Orange brown (with pockets of grey silt)slightly sandy slightly gravelly SILT
+	BH /SA1	37842	17.50	35.7	45	NP	0	100	Grey slighly sandy SILT
△	BH/DA1	37846	7.40	11.8	29	19	10	45	Light brown slightly sandy gravelly CLAY
□									
○									
◇									
▲									
■									
●									
◆									
×									
+									
△									

NP denotes specimen is non-plastic.

	Issued by	Date			Page
IGSL		22/10/2007			

Determination of Moisture Content

BS1377:Part 2:1990, clauses 3.2

BH/TP No.	Sample No.	Depth (M)	Sample Type	Moisture Content %	Description
TP /CR1	8/08//07	0.75-0.90	SB	7.7	Orange brown slightly sandy gravelly SILT/CLAY
BH MP1&MP2	8/08//07	2.0 & 10.0	SB	13.0	Orange brown slightly sandy gravelly SILT/CLAY
BH MP1&MP2	8/08//07	6.0 & 14.0	SB	13.3	Reddish brown slightly sandy gravelly SILT/CLAY

IGSL	Contract	Avoca Mining Site sch 2	Contract No.
	Issued By	Date	Page
		22/10/2007	of

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	96	GRAVEL
10	88	
6.3	76	
5	71	
3.35	62	
2	54	
1.18	47	
0.6	40	
0.425	37	SAND
0.3	34	
0.15	29	
0.063	22	
0.037	20	
0.027	18	
0.017	15	SILT/CLAY
0.010	11	
0.007	10	
0.004	7	
0.002	3	

Contract No:

Contract: AVOCA MINING SITE sch 2

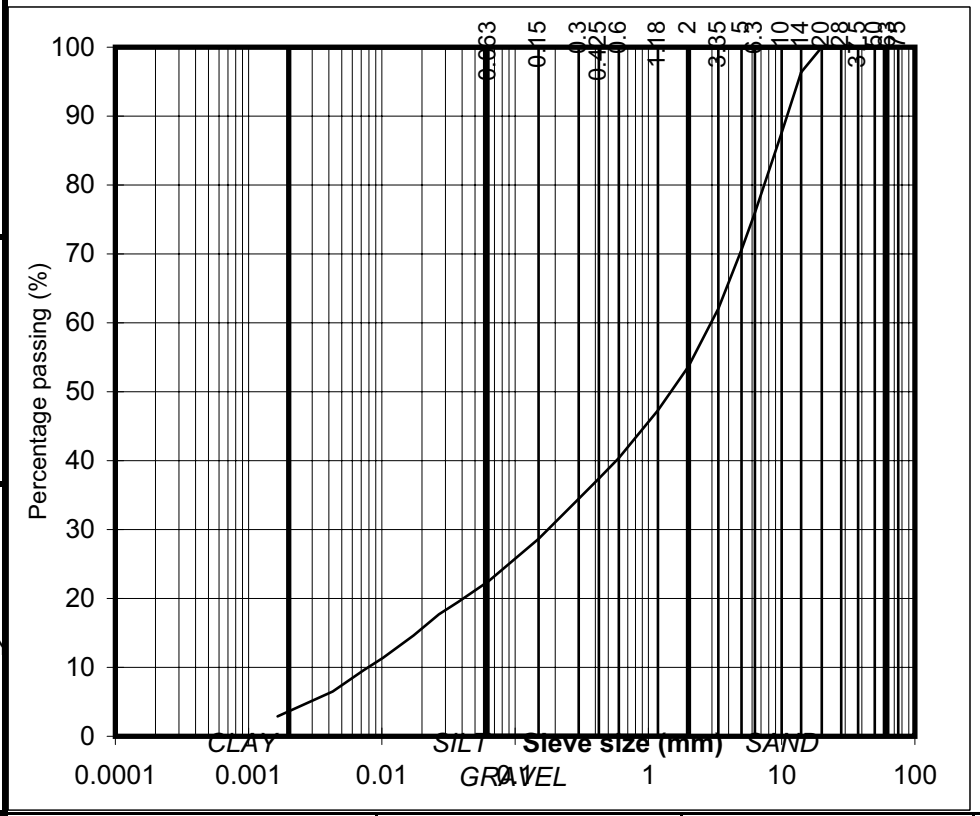
BH/TP No: BH MP 1 & MP 2

SAMPLE No.: N/A DATE: 24/08/07

DEPTH (m): 2.0 & 10.0

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Orange brown slightly sandy, gravelly, SILT/CLAY



IGSL	Issued By	Date:			Page no:
		22/10/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	84	GRAVEL
14	75	
10	69	
6.3	61	
5	58	
3.35	53	
2	47	
1.18	42	
0.6	37	SAND
0.425	34	
0.3	32	
0.15	26	
0.063	20	
0.037	17	
0.027	15	
0.017	12	SILT/CLAY
0.010	9	
0.007	7	
0.004	5	
0.002	2	

Contract No:

Contract: AVOCA MINING SITE sch 2

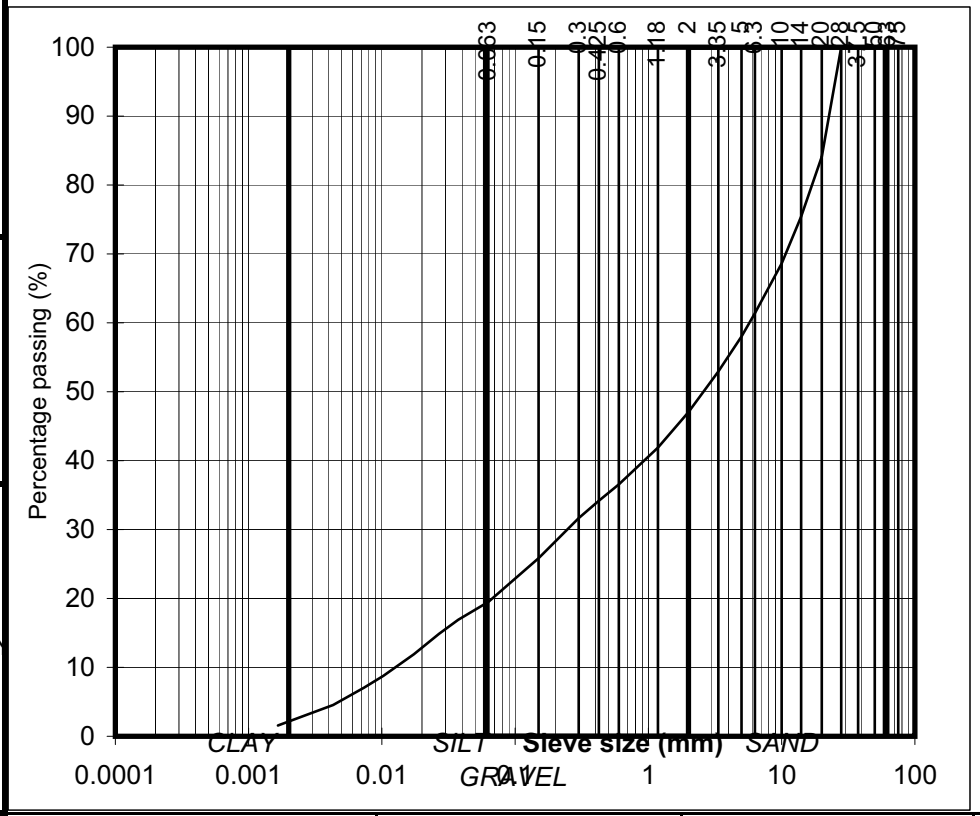
BH/TP No: BH MP 1 & MP 2

SAMPLE No.: N/A DATE: 24/08/07

DEPTH (m): 6.0 & 14.0

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Orange brown clayey/silty, very sandy, GRAVEL



IGSL	Issued By	Date:			Page no:
		22/10/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	100	GRAVEL
10	100	
6.3	100	
5	100	
3.35	100	
2	100	
1.18	100	
0.6	100	
0.425	100	SAND
0.3	100	
0.15	99	
0.063	97	
0.037	93	
0.026	87	
0.017	74	
0.010	58	SILT/CLAY
0.007	46	
0.004	33	
0.002	12	

Contract No:

Contract: AVOCA MINING SITE sch 2

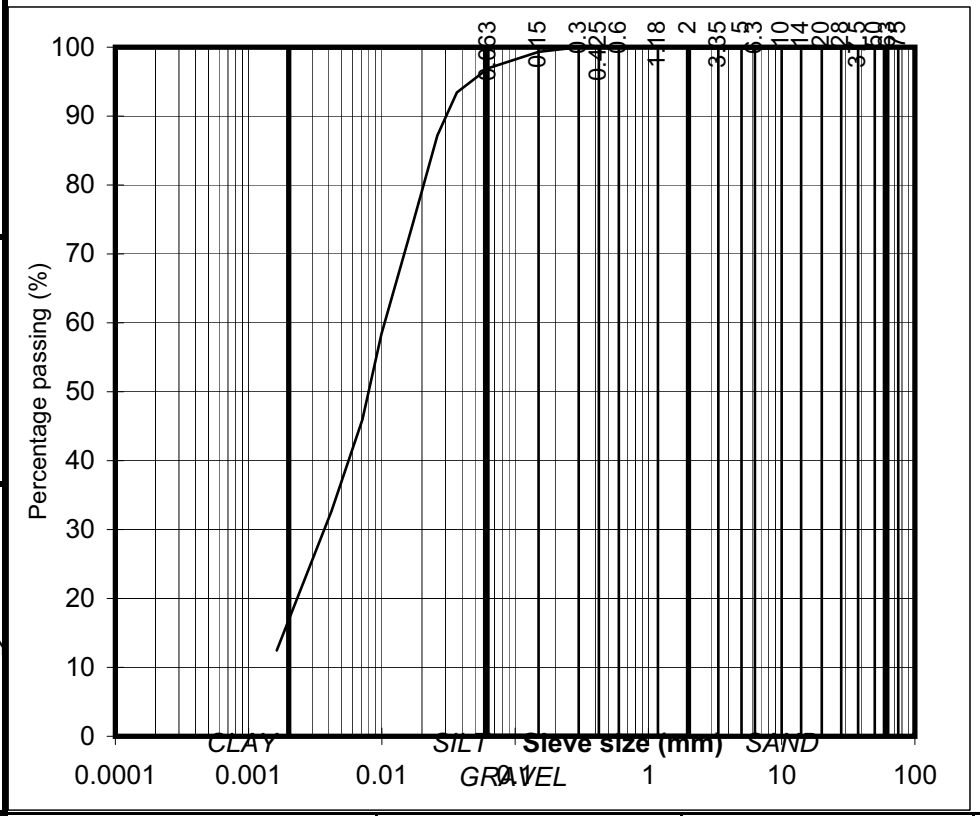
BH/TP No: BH SA1

SAMPLE No.: N/A DATE: 10/08/07

DEPTH (m): 17.50

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Grey slightly sandy, SILT



IGSL	Issued By	Date:			Page no:
		22/10/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	100	GRAVEL
10	100	
6.3	97	
5	95	
3.35	90	
2	84	
1.18	79	
0.6	75	
0.425	73	SAND
0.3	72	
0.15	69	
0.063	60	
0.037	55	
0.027	50	
0.017	41	
0.010	30	SILT/CLAY
0.007	22	
0.004	11	
0.002	2	

Contract No:

Contract: AVOCA MINING SITE sch 2

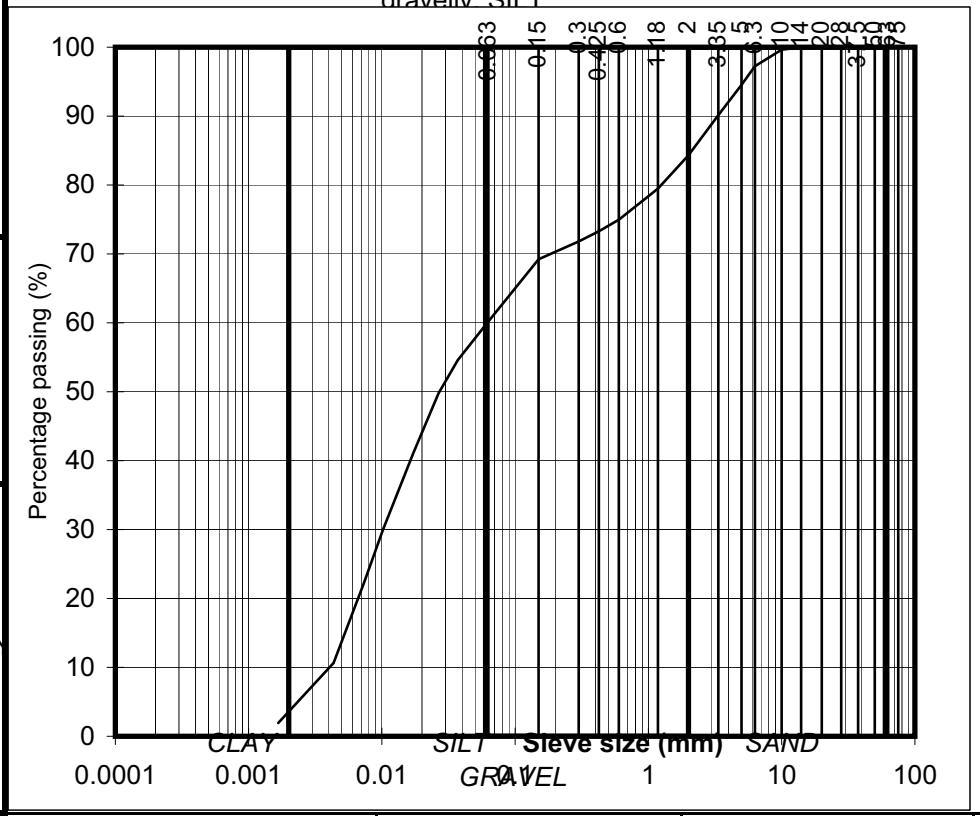
BH/TP No: BH WA1

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 4.0 & 4.55

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Orange brown (with pockets of grey silt) slightly sandy, slightly gravelly SILT



IGSL	Issued By	Date:			Page no:
		22/10/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	98	GRAVEL
10	90	
6.3	79	
5	72	
3.35	64	
2	55	
1.18	49	
0.6	44	
0.425	41	SAND
0.3	39	
0.15	35	
0.063	27	
0.038	20	
0.028	15	
0.018	9	
0.011	5	SILT/CLAY
0.008	4	
0.004	2	
0.002	1	

Contract No:

Contract: AVOCA MINING SITE sch 2

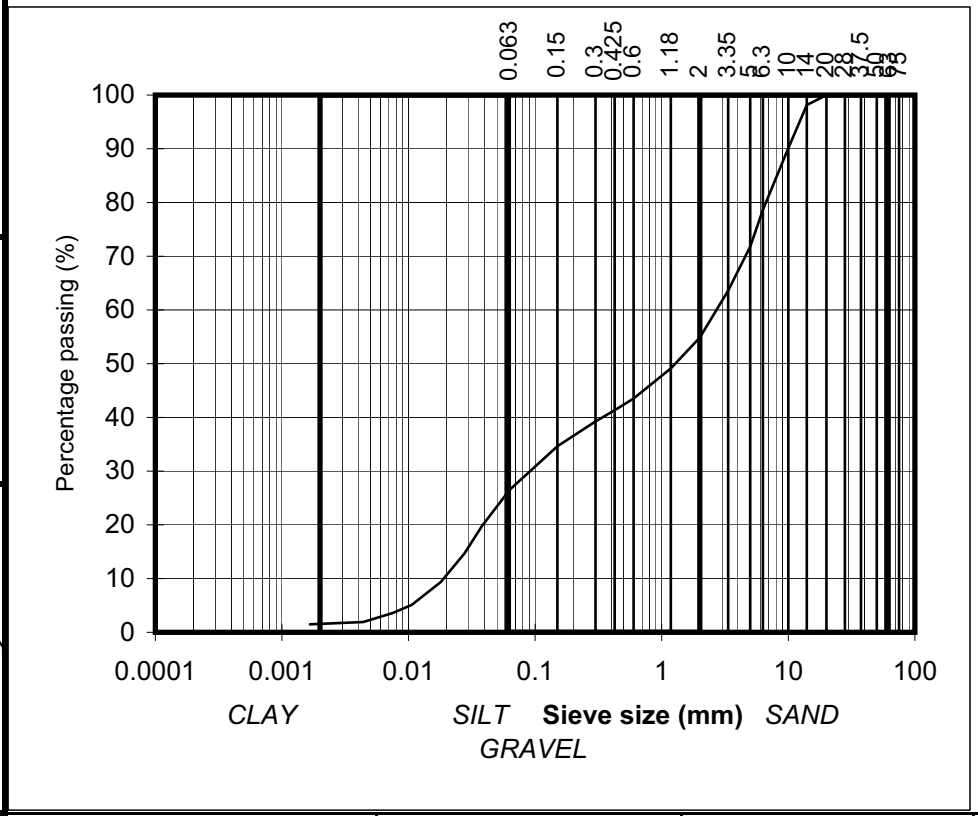
BH/TP No: TP DA1

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 0.3-0.6

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Light brown slightly sandy, gravelly, SILT



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Issued By	Date:			Page no:
	22/10/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	95	GRAVEL
14	64	
10	57	
6.3	48	
5	44	
3.35	40	
2	35	
1.18	30	
0.6	25	SAND
0.425	23	
0.3	20	
0.15	17	
0.063	13	
0.043	#N/A	
0.030	#N/A	
0.019	#N/A	SILT/CLAY
0.011	#N/A	
0.008	#N/A	
0.005	#N/A	
0.002	#N/A	

Contract No:

Contract: AVOCA MINING SITE sch 2

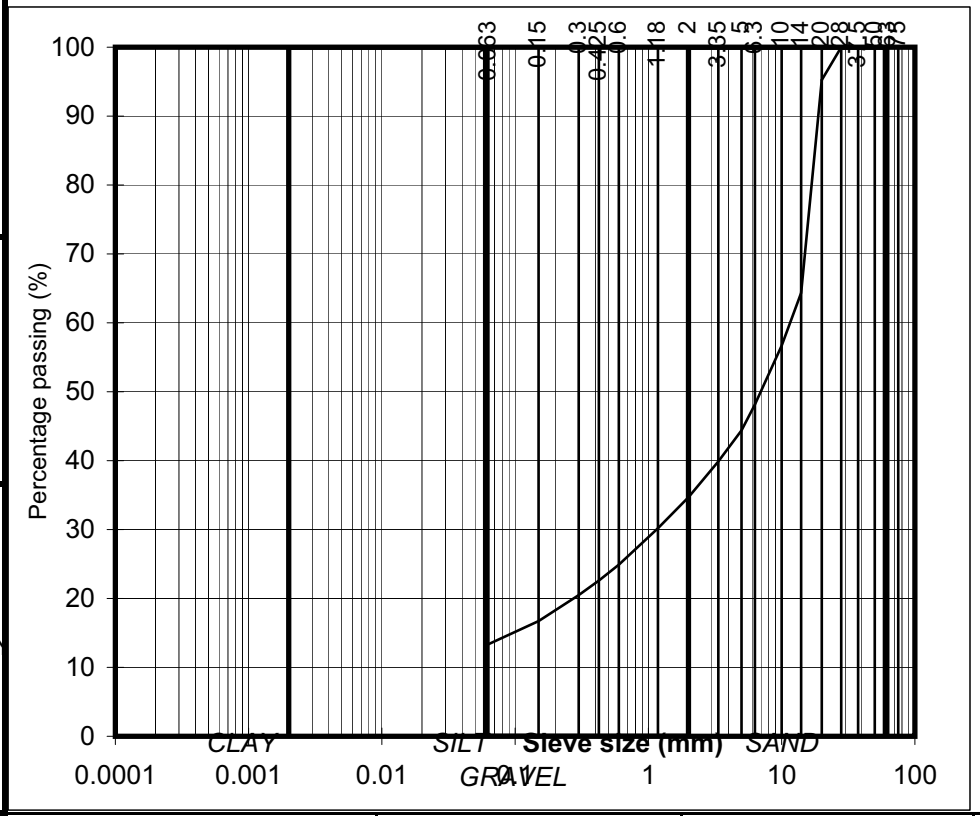
BH/TP No: TP CR 1

SAMPLE No.: N/A DATE: 08/08/07

DEPTH (m): 0.75-0.90

TEST METHOD: Wet sieve

DESCRIPTION: Orange brown clayey/silty, very sandy, GRAVEL



Issued By	Date:			Page no:
	22/10/2007			

IGSL

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	92	
28	87	
20	83	
14	78	GRAVEL
10	73	
6.3	66	
5	63	
3.35	57	
2	50	
1.18	45	
0.6	39	
0.425	37	SAND
0.3	35	
0.15	30	
0.063	24	
0.038	20	
0.027	17	
0.017	14	
0.010	11	SILT/CLAY
0.007	9	
0.004	5	
0.002	2	

Contract No:

Contract: AVOCA MINING SITE sch 2

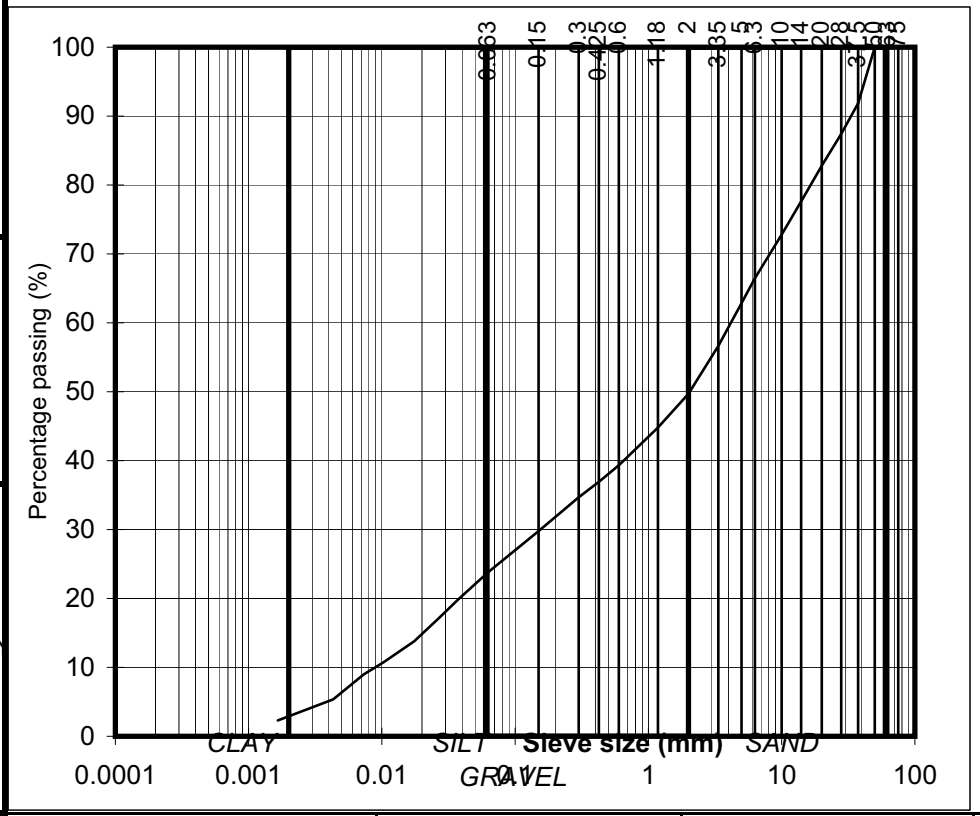
BH/TP No: BH MP 1

SAMPLE No.: N/A DATE: 23/08/07

DEPTH (m): 0-3

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Orange brown slightly sandy, gravelly, SILT



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Issued By	Date:			Page no:
	22/10/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	100	GRAVEL
10	98	
6.3	91	
5	85	
3.35	78	
2	69	
1.18	60	
0.6	48	
0.425	43	SAND
0.3	38	
0.15	30	
0.063	23	
0.037	21	
0.026	20	
0.017	17	
0.010	14	SILT/CLAY
0.007	12	
0.004	8	
0.002	4	

Contract No:

Contract: AVOCA MINING SITE sch 2

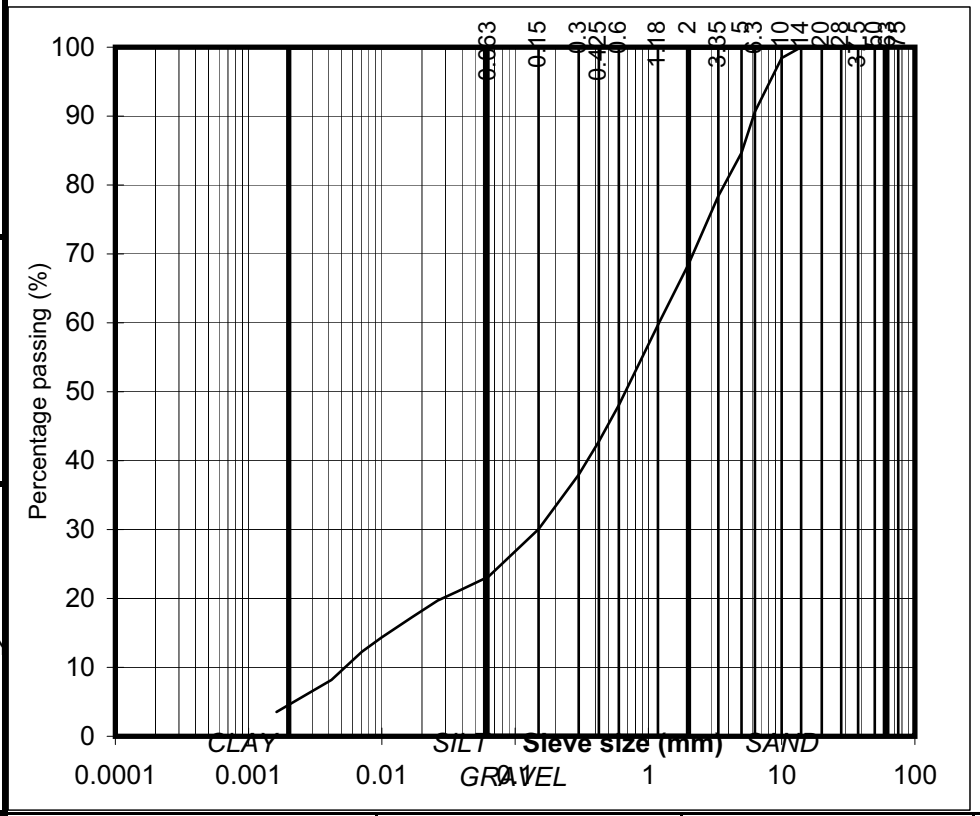
BH/TP No: BH ET1

SAMPLE No.: N/A DATE: 14/08/07

DEPTH (m): 10.60

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Grey brown sandy, slightly gravelly, CLAY



IGSL

Issued By	Date:			Page no:
	22/10/2007			

Determination of Moisture Content

BS1377:Part 2:1990, clauses 3.2

BH/TP No.	Sample No.	Depth (M)	Sample Type	Moisture Content %	Description
TP /CR1	8/08//07	0.3-0.6	SB	9.1	Reddish brown slightly sandy gravelly SILT/CLAY
TP /CR1	8/08//07	1.2-1.5	SB	6.9	Yellowish brown clayey/silt very sandy GRAVEL
TP /CR2	8/08//07	0.2-0.4	SB	10.6	Yellowish brown clayey/silt very sandy GRAVEL
TP /CR2	8/08//07	1.2-1.4	SB	13.3	Reddish brown clayey/silt very sandy GRAVEL
TP/EA1	9/08//07	0.3-.06	SB	14.1	Yellowish brown slightly sandy slightly gravelly SILT/CLAY
TP/EA1	9/08//07	1.05-1.35	SB	14.8	Yellowish brown slightly sandy slightly gravelly SILT/CLAY
TP DA1	9/08//07	0.9-1.5	SB	16.6	Reddish brown clayey/silt very sandy GRAVEL
TP /SA2	9/08//07	1.2-1.4	SB	6.2	Brown slightly clayey/silt very sandy GRAVEL
BH EA1	7/08//07	2.5	SB	17.5	Mottled light grey brown slightly sandy gravelly SILT/CLAY
BH EA1	7/08//07	4.5	SB	9.8	Reddish brown clayey/silt very sandy GRAVEL
BH EA1	7/08//07	6.5	SB	9.9	Reddish brown clayey/silt very sandy GRAVEL
BH T12	9/08//07	4.0-4.5	SB	14.4	Reddish brown slightly sandy gravelly SILT/CLAY
BH/SA1	10/08//07	3.0-3.55	SB	11.4	Grey sandy SILT/CLAY
BH/DA1	14/08//07	7.5	SB	9.1	Brown clayey/silty very gravelly SAND

IGSL	Contract	Avoca Mining Site	Contract No. 12939
	Issued By	Date	Page
		10/09/2007	of

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	98	GRAVEL
10	94	
6.3	90	
5	88	
3.35	83	
2	75	
1.18	66	
0.6	52	
0.425	43	SAND
0.3	29	
0.15	15	
0.063	10	
0.039	9	
0.028	8	
0.018	6	
0.010	4	SILT/CLAY
0.007	4	
0.004	2	
0.002	1	

Contract No: 12939

Contract: AVOCA MINING SITE

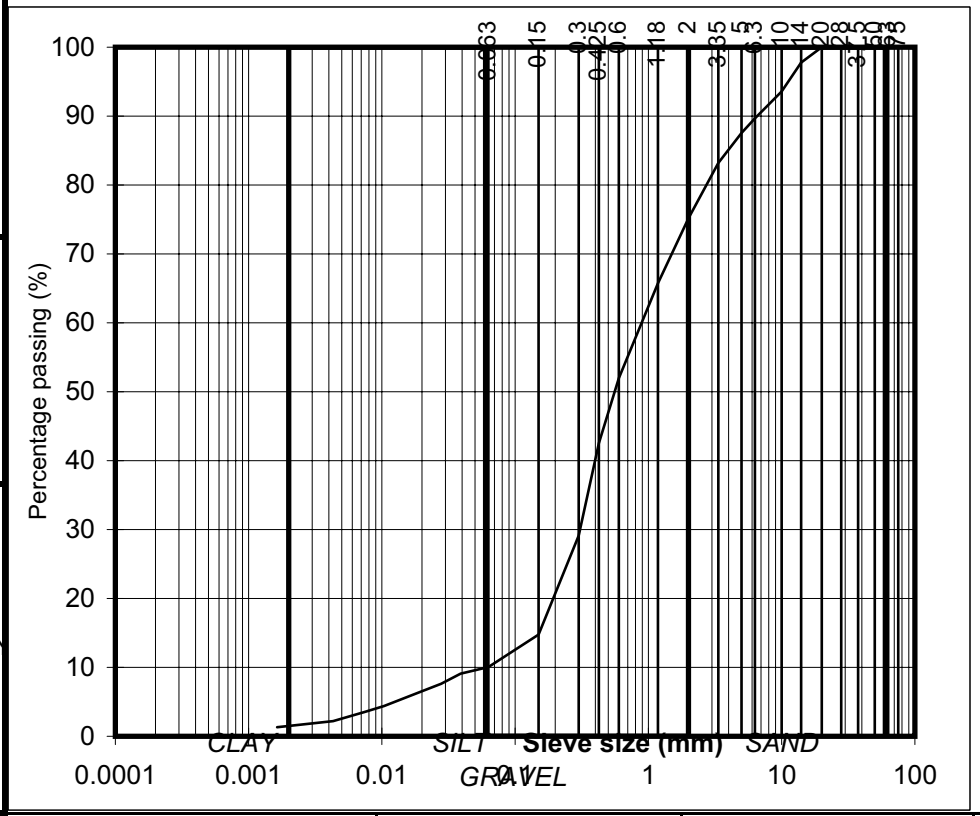
BH/TP No: BH DA1

SAMPLE No.: N/A DATE: 14/08/07

DEPTH (m): 7.50

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Brown clayey/silty, very gravelly, SAND



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	100	GRAVEL
10	100	
6.3	100	
5	100	
3.35	100	
2	100	
1.18	100	
0.6	100	
0.425	100	SAND
0.3	100	
0.15	78	
0.063	41	
0.037	35	
0.027	28	
0.017	21	SILT/CLAY
0.010	14	
0.007	11	
0.004	7	
0.002	3	

Contract No: 12939

Contract: AVOCA MINING SITE

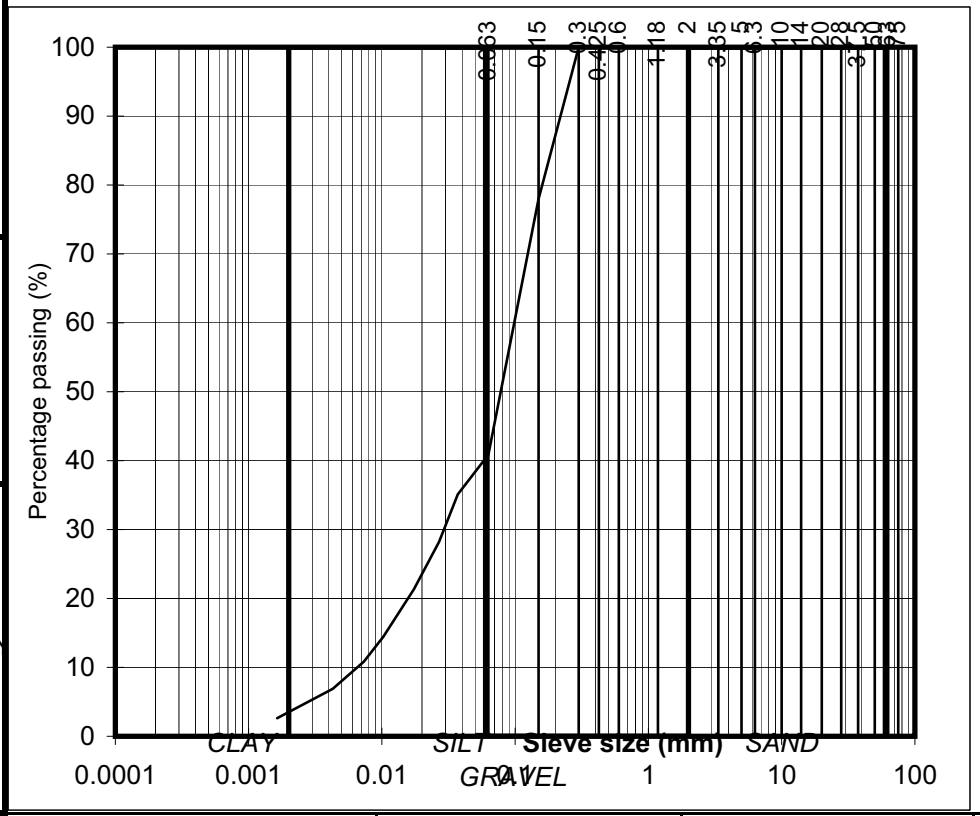
BH/TP No: BH SA1

SAMPLE No.: N/A DATE: 10/08/07

DEPTH (m): 3.0-3.55

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Grey sandy, SILT/CLAY



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	100	GRAVEL
10	100	
6.3	100	
5	100	
3.35	100	
2	100	
1.18	100	
0.6	100	
0.425	100	SAND
0.3	100	
0.15	100	
0.063	99	
0.037	93	
0.026	87	
0.017	77	
0.010	56	SILT/CLAY
0.007	41	
0.004	21	
0.002	2	

Contract No: 12939

Contract: AVOCA MINING SITE

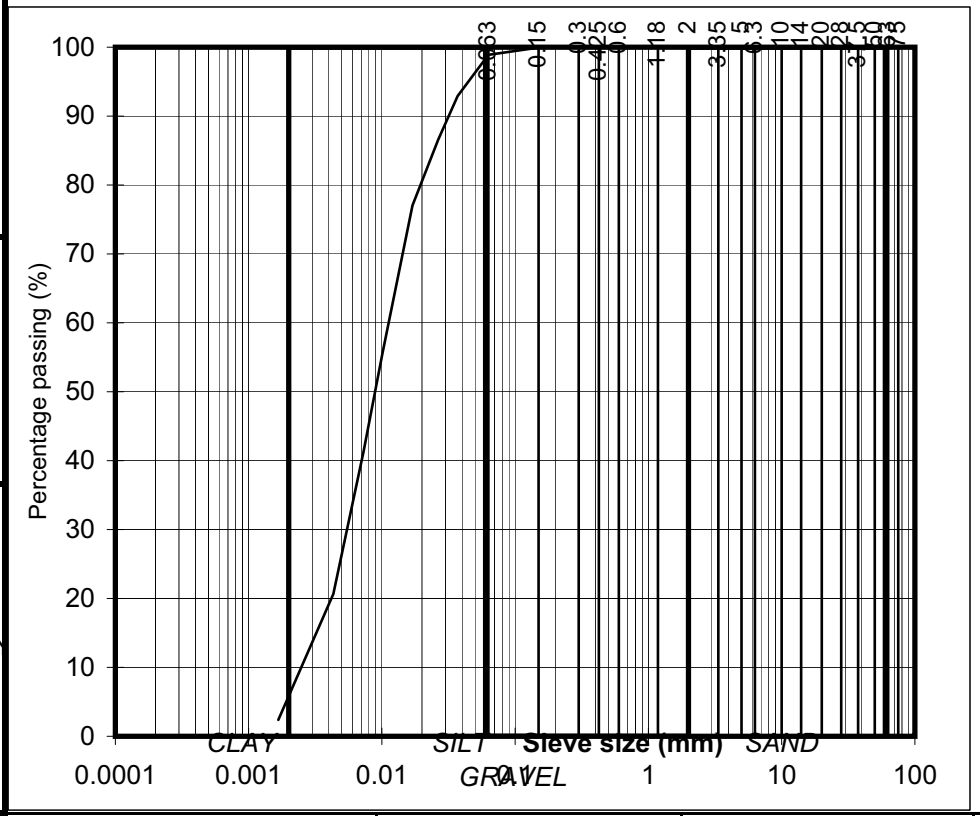
BH/TP No: BH WA1

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 2.55

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Grey slightly sandy, SILT



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	GRAVEL
14	93	
10	88	
6.3	80	
5	76	
3.35	71	
2	64	
1.18	57	
0.6	51	SAND
0.425	48	
0.3	45	
0.15	40	
0.063	35	
0.037	31	
0.027	27	
0.017	21	SILT/CLAY
0.010	15	
0.007	12	
0.004	8	
0.002	3	

Contract No: 12939

Contract: AVOCA MINING SITE

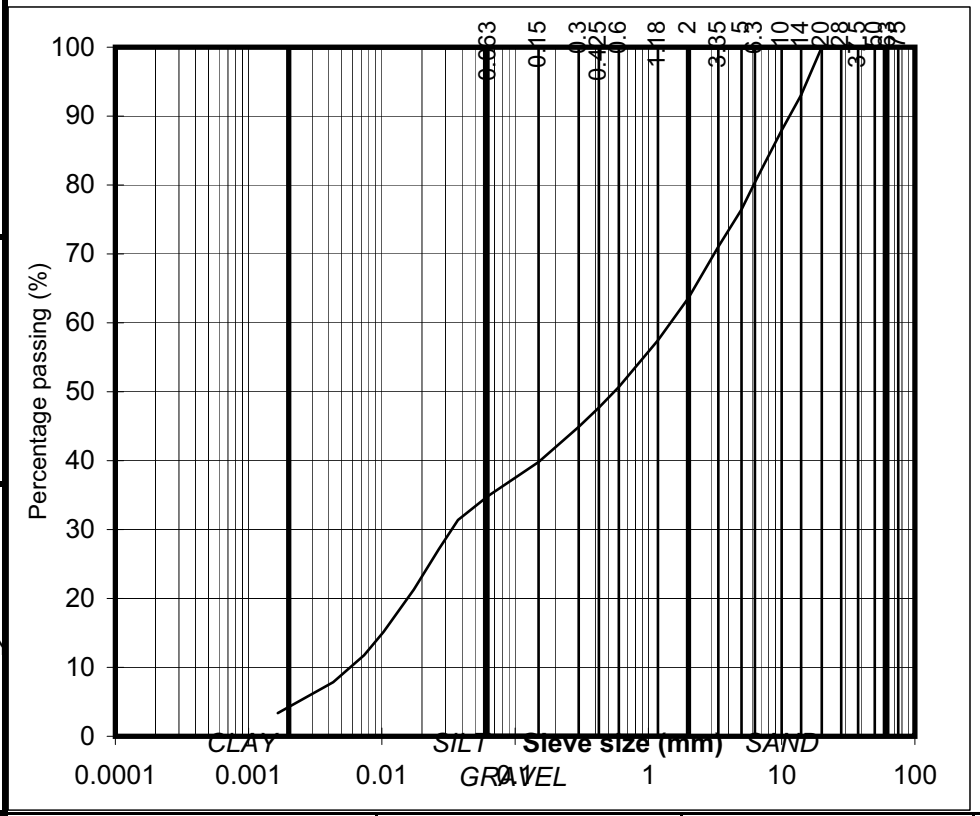
BH/TP No: BH T12

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 4.0-4.5

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Reddish brown slightly sandy, gravelly, SILT/CLAY



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	93	GRAVEL
14	80	
10	66	
6.3	55	
5	51	
3.35	46	
2	40	
1.18	35	
0.6	29	SAND
0.425	27	
0.3	24	
0.15	20	
0.063	16	
0.037	15	
0.027	13	
0.017	11	SILT/CLAY
0.010	9	
0.007	7	
0.004	6	
0.002	3	

Contract No: 12939

Contract: AVOCA MINING SITE

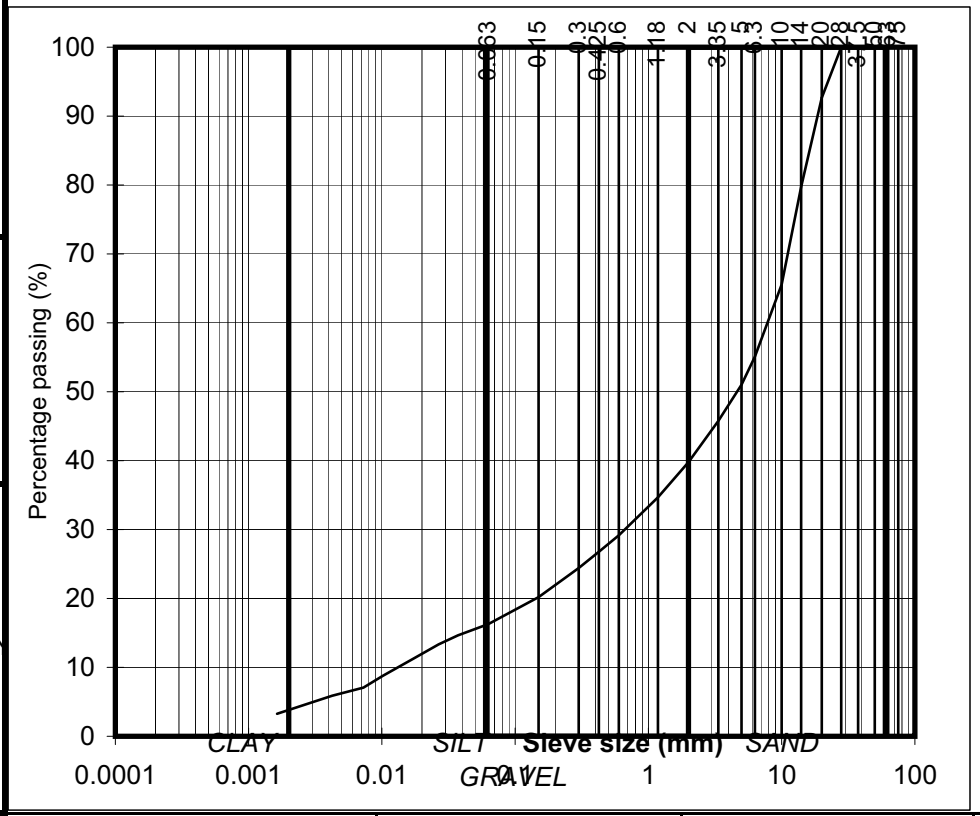
BH/TP No: BH EA1

SAMPLE No.: N/A DATE: 7/08/07

DEPTH (m): 6.50

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Reddish brown clayey/silty, very sandy, GRAVEL



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	92	
20	85	GRAVEL
14	77	
10	64	
6.3	55	
5	51	
3.35	44	
2	39	
1.18	35	
0.6	30	SAND
0.425	27	
0.3	25	
0.15	21	
0.063	18	
0.037	17	
0.026	16	
0.017	14	SILT/CLAY
0.010	11	
0.007	9	
0.004	6	
0.002	3	

Contract No: 12939

Contract: AVOCA MINING SITE

BH/TP No: BH EA1

SAMPLE No.: N/A DATE: 7/08/07

DEPTH (m): 4.50

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Reddish brown clayey/silty, very sandy, GRAVEL

IGSL

Issued By	Date:			Page no:
	10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	92	GRAVEL
14	87	
10	82	
6.3	75	
5	71	
3.35	66	
2	59	
1.18	55	
0.6	49	SAND
0.425	47	
0.3	45	
0.15	40	
0.063	35	
0.037	33	
0.026	32	
0.017	28	SILT/CLAY
0.010	24	
0.007	21	
0.004	16	
0.002	9	

Contract No: 12939

Contract: AVOCA MINING SITE

BH/TP No: BH EA1

SAMPLE No.: N/A DATE: 7/08/07

DEPTH (m): 2.50

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Mottled light grey brown slightly sandy, gravelly, SILT/CLAY

IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	93	GRAVEL
14	83	
10	71	
6.3	59	
5	52	
3.35	43	
2	31	
1.18	20	
0.6	9	SAND
0.425	6	
0.3	5	
0.15	4	
0.063	3	
0.041	#N/A	
0.029	#N/A	
0.019	#N/A	SILT/CLAY
0.011	#N/A	
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	

Contract No: 12939

Contract: AVOCA MINING SITE

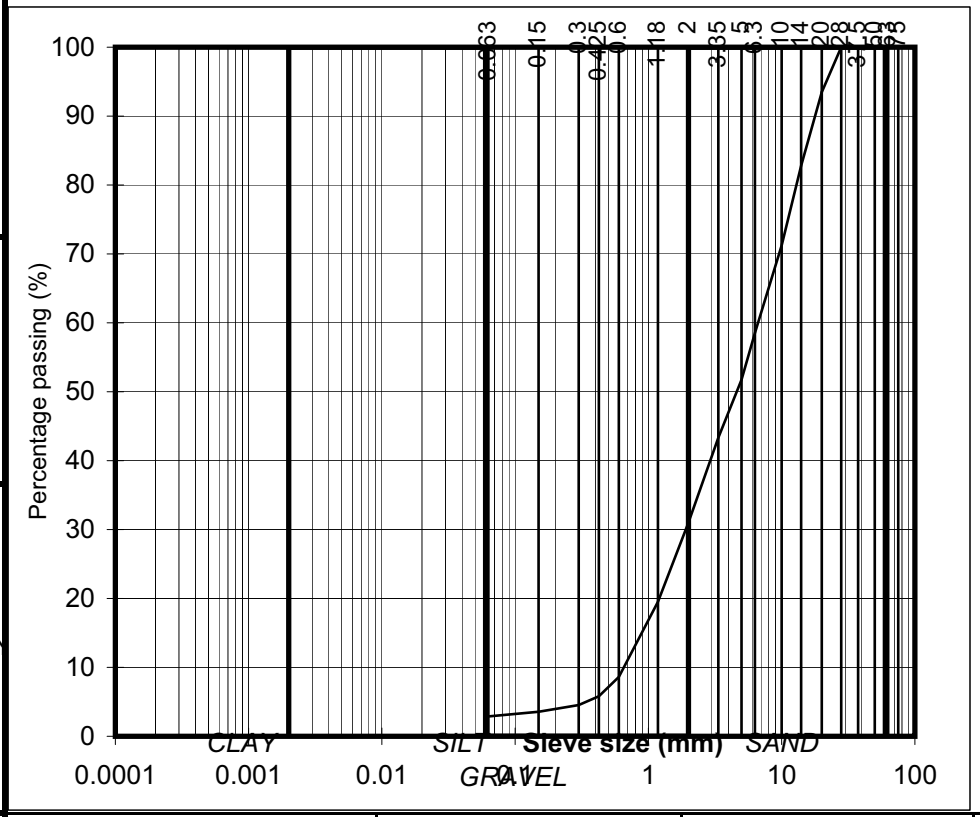
BH/TP No: TP SA2

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 1.2-1.4

TEST METHOD: Wet sieve

DESCRIPTION: Brown slightly clayey/silty, very sandy, GRAVEL



Issued By	Date:			Page no:
	10/09/2007			

IGSL

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	93	GRAVEL
10	79	
6.3	69	
5	64	
3.35	58	
2	50	
1.18	43	
0.6	36	
0.425	34	SAND
0.3	31	
0.15	26	
0.063	20	
0.038	18	
0.027	15	
0.018	11	
0.010	8	SILT/CLAY
0.007	7	
0.004	5	
0.002	3	

Contract No: 12939

Contract: AVOCA MINING SITE

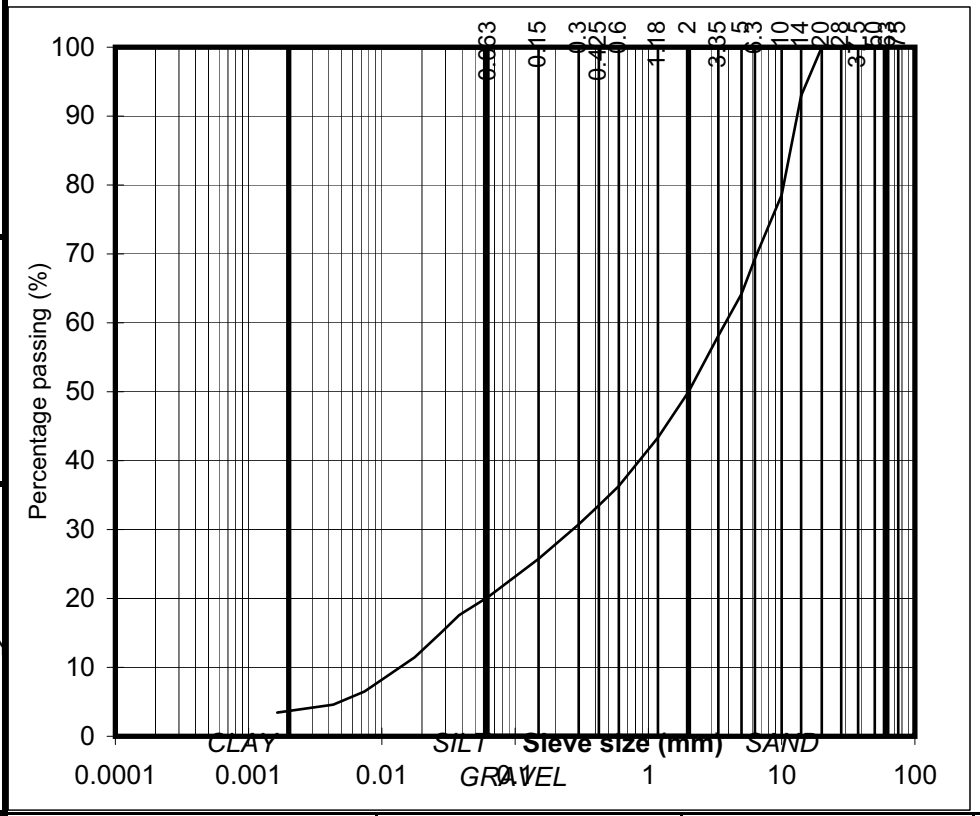
BH/TP No: TP WA3

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 0.9-1.20

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Brown slightly sandy, gravelly, SILT



IGSL

Issued By	Date:			Page no:
	10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	91	GRAVEL
10	80	
6.3	71	
5	67	
3.35	63	
2	56	
1.18	50	
0.6	43	
0.425	40	SAND
0.3	37	
0.15	32	
0.063	25	
0.037	22	
0.027	20	
0.017	17	
0.010	14	SILT/CLAY
0.007	12	
0.004	9	
0.002	6	

Contract No: 12939

Contract: AVOCA MINING SITE

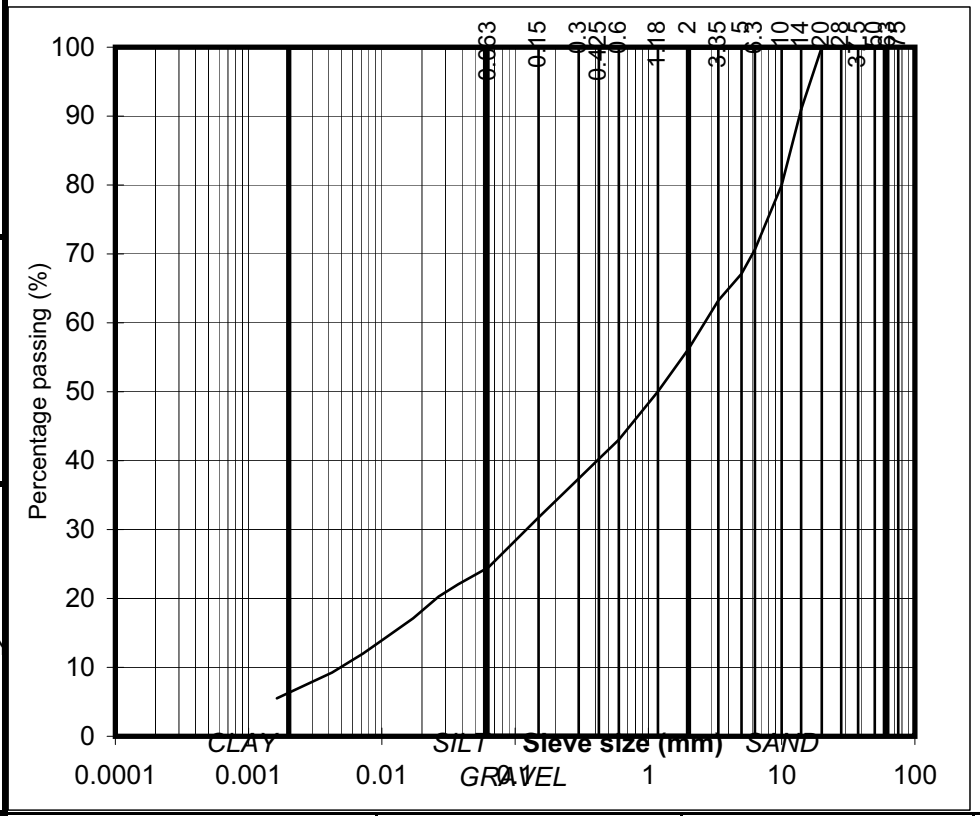
BH/TP No: TP WA2

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 1.05-1.35

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Yellowish brown slightly sandy, gravelly, SILT



IGSL

Issued By	Date:			Page no:
	10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	94	GRAVEL
10	89	
6.3	83	
5	79	
3.35	72	
2	64	
1.18	57	
0.6	51	
0.425	48	SAND
0.3	45	
0.15	39	
0.063	32	
0.037	28	
0.027	26	
0.017	22	
0.010	18	SILT/CLAY
0.007	15	
0.004	12	
0.002	8	

Contract No: 12939

Contract: AVOCA MINING SITE

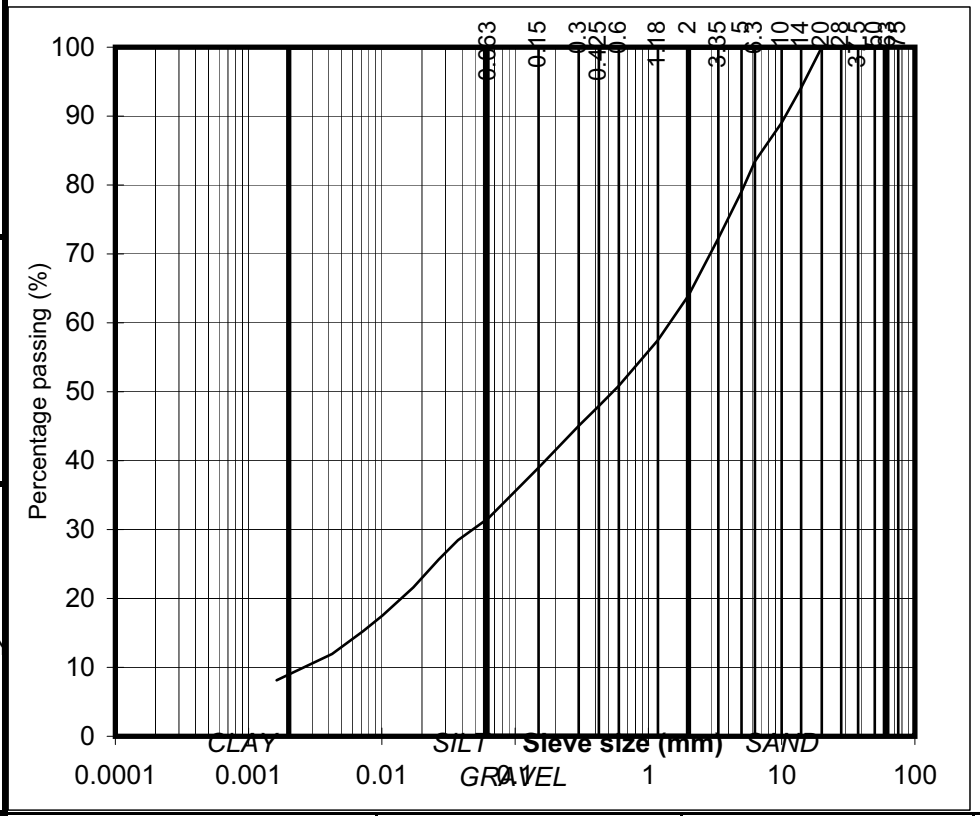
BH/TP No: TP WA2

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 0.3-0.6

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Reddish brown slightly sandy, gravelly, SILT



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	98	GRAVEL
14	95	
10	92	
6.3	83	
5	77	
3.35	70	
2	56	
1.18	43	
0.6	31	SAND
0.425	27	
0.3	25	
0.15	21	
0.063	18	
0.041	#N/A	
0.029	#N/A	
0.019	#N/A	SILT/CLAY
0.011	#N/A	
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	

Contract No: 12939

Contract: AVOCA MINING SITE

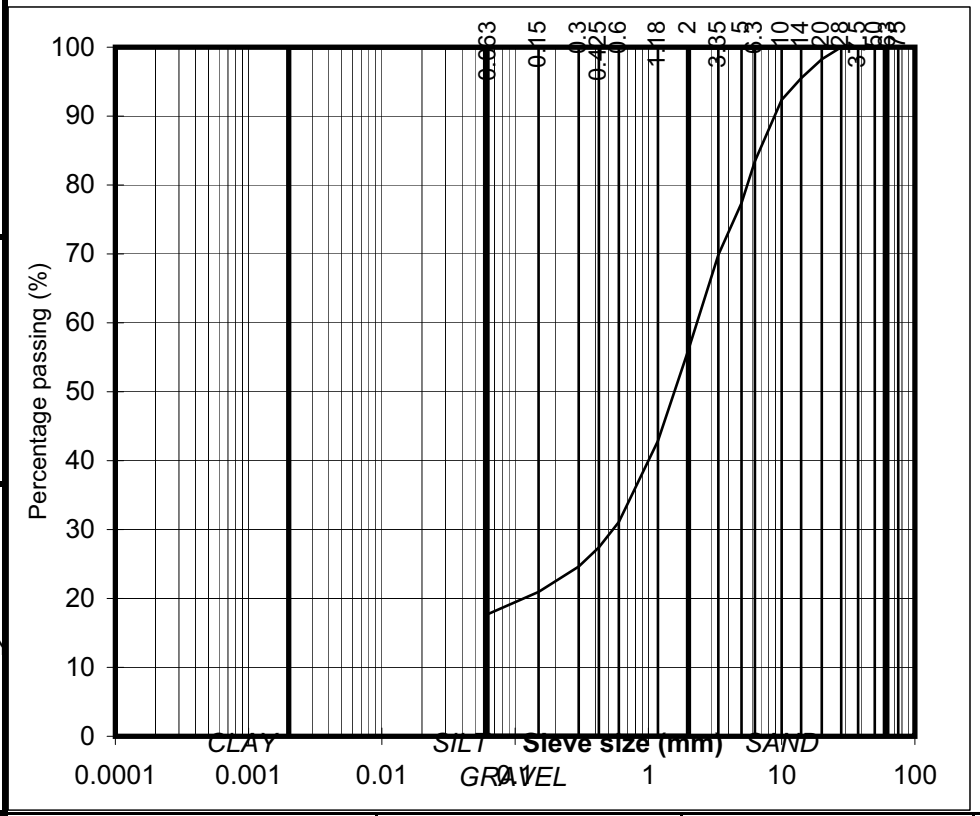
BH/TP No: TP DA1

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 0.9-1.50

TEST METHOD: Wet sieve

DESCRIPTION: Reddish brown clayey/silty, very sandy, GRAVEL



Issued By	Date:			Page no:
	10/09/2007			

IGSL

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	91	GRAVEL
14	84	
10	74	
6.3	63	
5	57	
3.35	50	
2	42	
1.18	36	
0.6	30	SAND
0.425	27	
0.3	25	
0.15	21	
0.063	16	
0.037	15	
0.027	14	
0.017	11	SILT/CLAY
0.010	8	
0.007	6	
0.004	4	
0.002	2	

Contract No: 12939

Contract: AVOCA MINING SITE

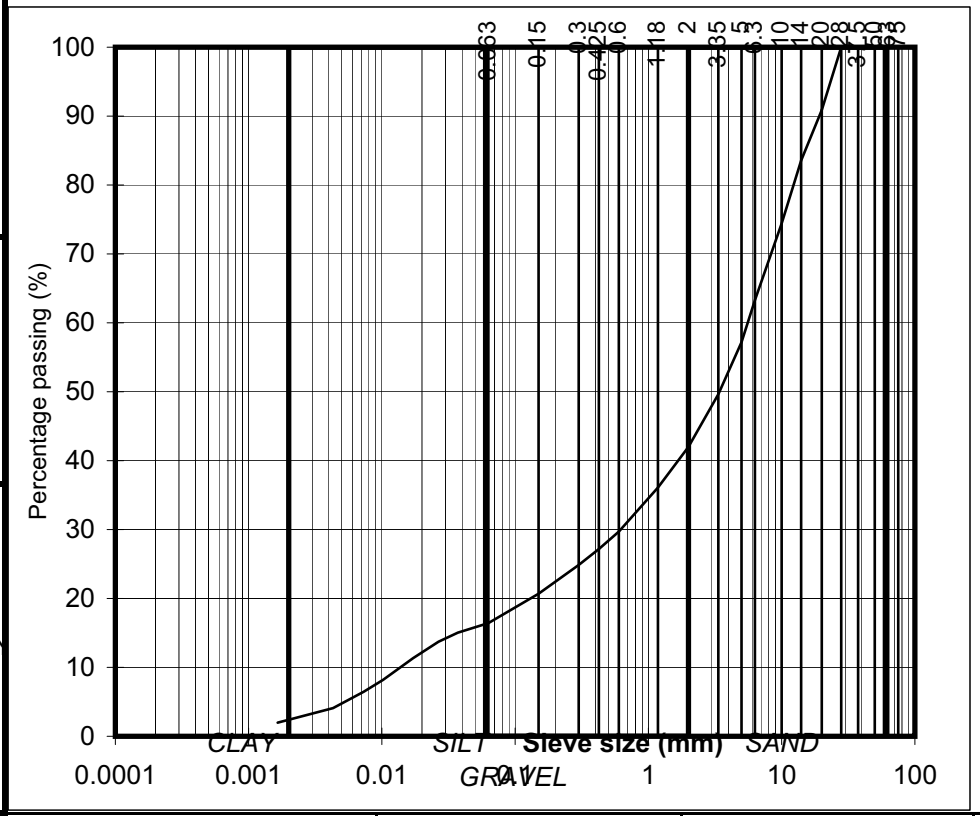
BH/TP No: TP EA2

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 1.05-1.35

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Reddish brown silty, very sandy, GRAVEL



IGSL

Issued By	Date:			Page no:
	10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	95	GRAVEL
10	87	
6.3	71	
5	62	
3.35	53	
2	42	
1.18	36	
0.6	29	
0.425	26	SAND
0.3	24	
0.15	20	
0.063	16	
0.037	15	
0.027	14	
0.017	12	
0.010	9	SILT/CLAY
0.007	7	
0.004	5	
0.002	2	

Contract No: 12939

Contract: AVOCA MINING SITE

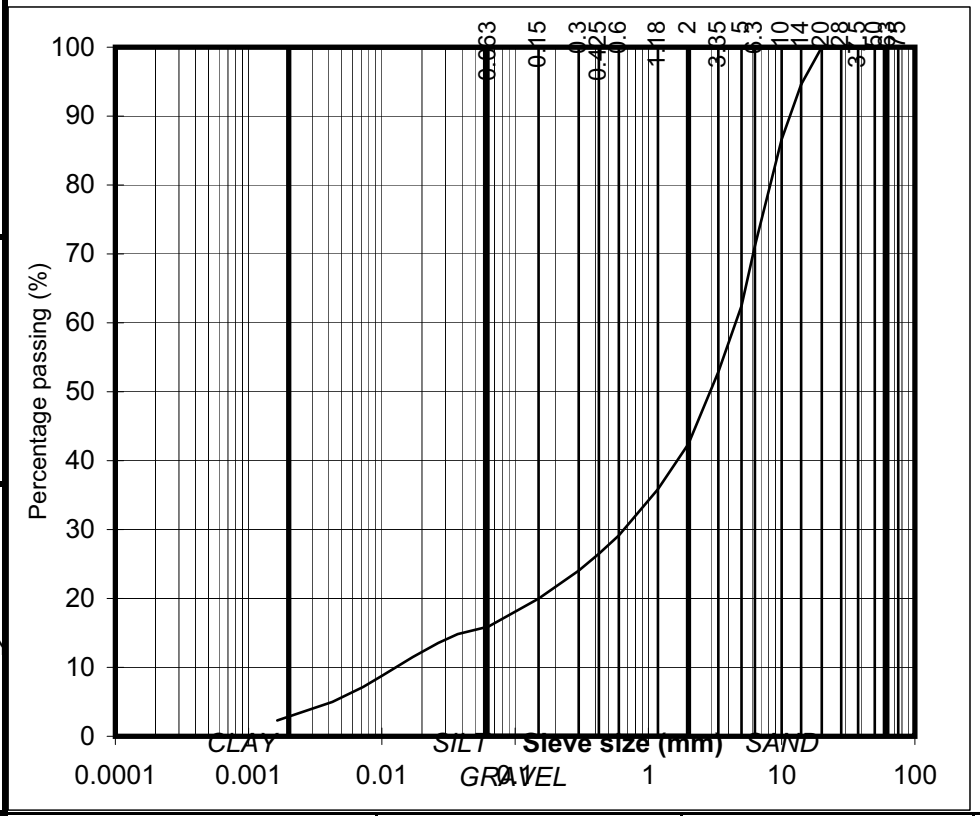
BH/TP No: TP EA2

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 0.3-0.6

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Brown silty, very sandy, GRAVEL



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	97	GRAVEL
10	88	
6.3	78	
5	72	
3.35	65	
2	58	
1.18	52	
0.6	46	
0.425	44	SAND
0.3	41	
0.15	36	
0.063	29	
0.037	27	
0.027	25	
0.017	21	
0.010	17	SILT/CLAY
0.007	15	
0.004	10	
0.002	6	

Contract No: 12939

Contract: AVOCA MINING SITE

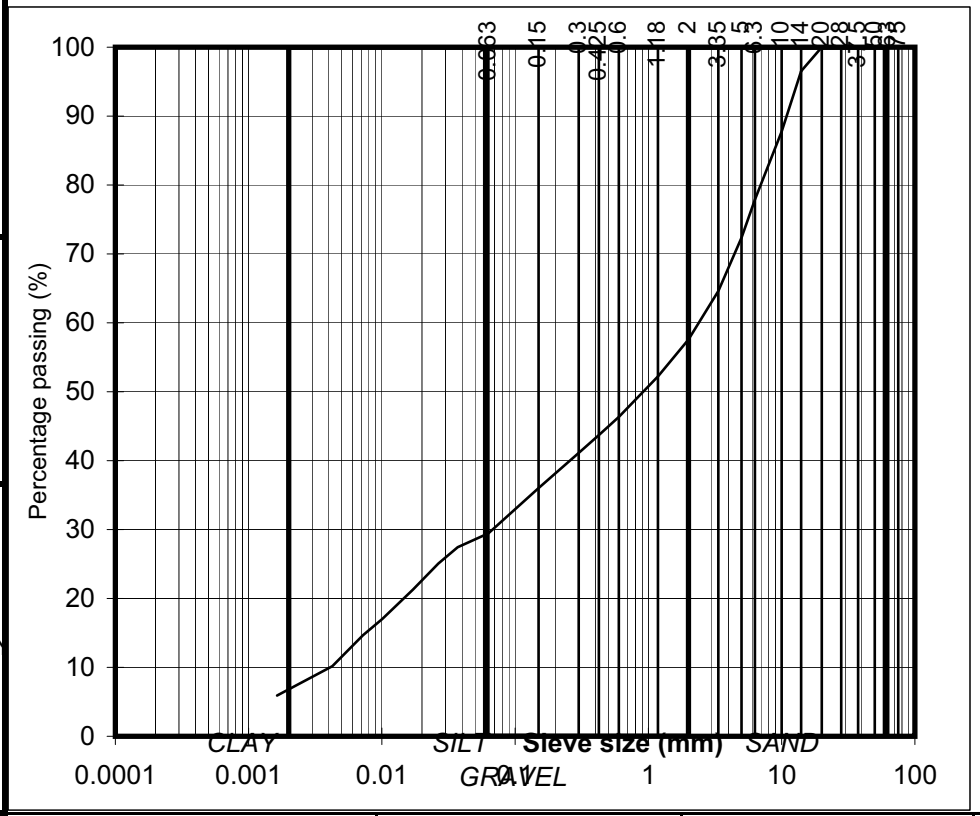
BH/TP No: TP EA1

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 1.05-1.35

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Yellowish brown slightly sandy, gravelly, SILT/CLAY



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	93	GRAVEL
10	87	
6.3	77	
5	72	
3.35	66	
2	58	
1.18	52	
0.6	45	
0.425	42	SAND
0.3	40	
0.15	35	
0.063	28	
0.037	24	
0.027	22	
0.017	18	
0.010	14	SILT/CLAY
0.007	12	
0.004	9	
0.002	4	

Contract No: 12939

Contract: AVOCA MINING SITE

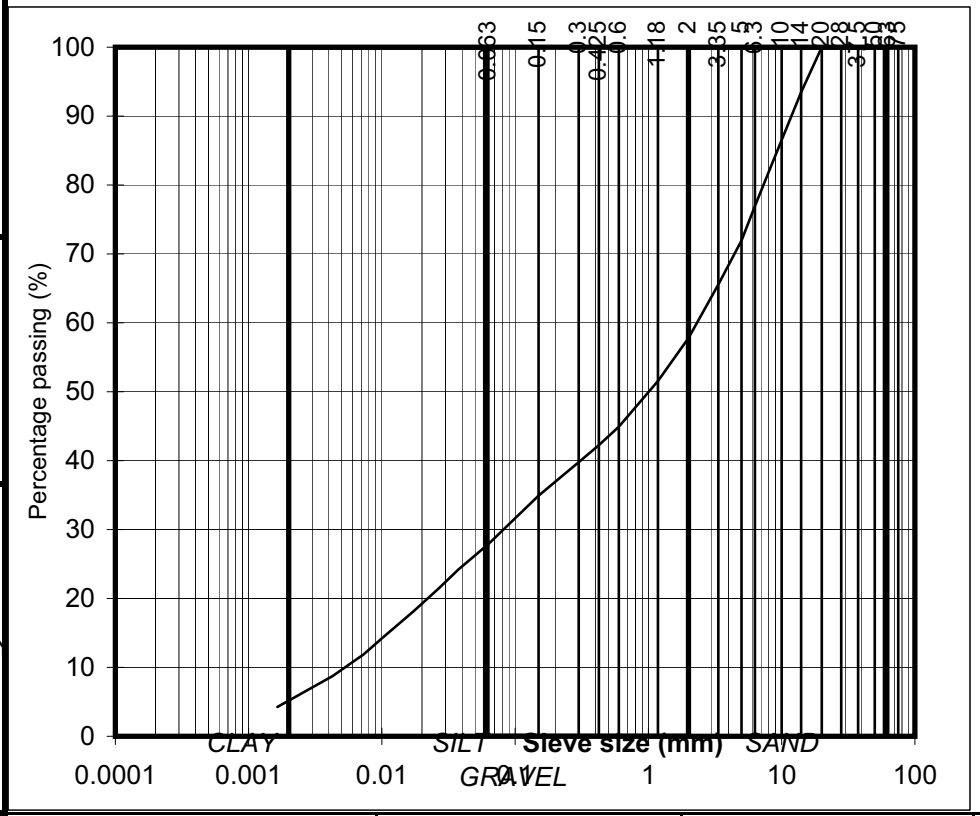
BH/TP No: TP EA1

SAMPLE No.: N/A DATE: 9/08/07

DEPTH (m): 0.3-0.6

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Yellowish brown slightly sandy, gravelly, SILT/CLAY



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	GRAVEL
14	93	
10	87	
6.3	78	
5	74	
3.35	71	
2	65	
1.18	61	
0.6	55	SAND
0.425	53	
0.3	51	
0.15	47	
0.063	44	
0.037	41	
0.026	40	
0.017	36	SILT/CLAY
0.010	30	
0.007	25	
0.004	19	
0.002	11	

Contract No: 12939

Contract: AVOCA MINING SITE

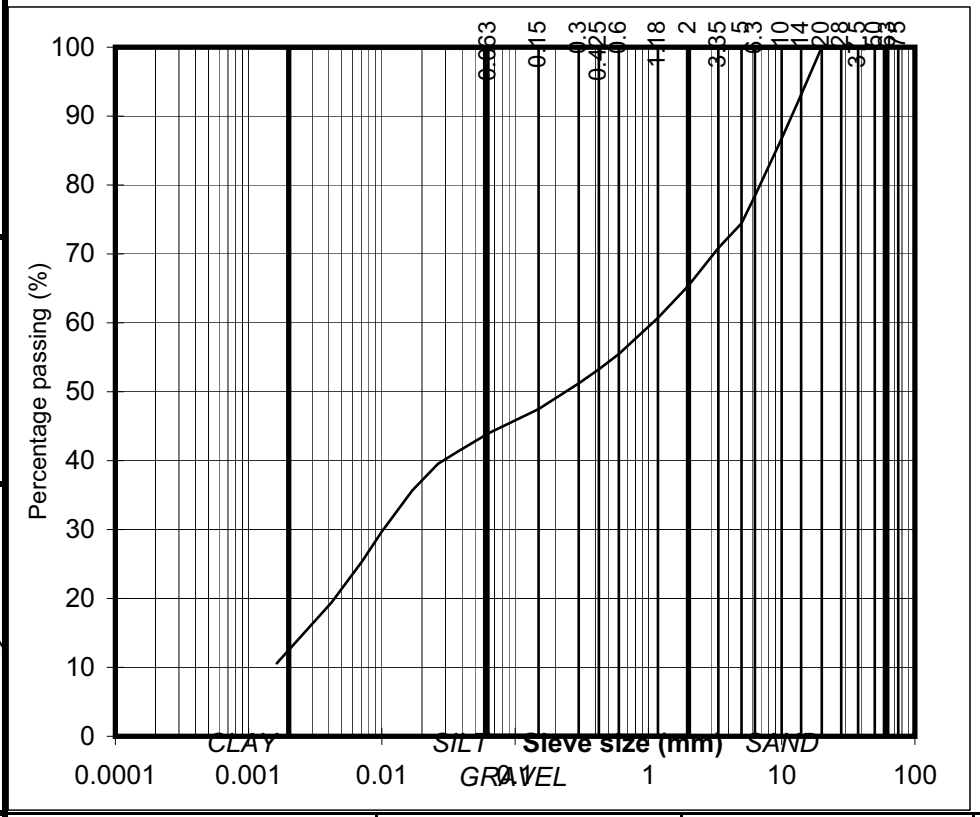
BH/TP No: TP C04

SAMPLE No.: N/A DATE: 8/08/07

DEPTH (m): 0.9-1.2

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Mottled light grey brown slightly sandy, slightly gravelly, SILT



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	90	GRAVEL
10	80	
6.3	74	
5	72	
3.35	67	
2	61	
1.18	55	
0.6	49	
0.425	47	SAND
0.3	45	
0.15	41	
0.063	35	
0.037	33	
0.026	30	
0.017	27	
0.010	22	SILT/CLAY
0.007	18	
0.004	12	
0.002	5	

Contract No: 12939

Contract: AVOCA MINING SITE

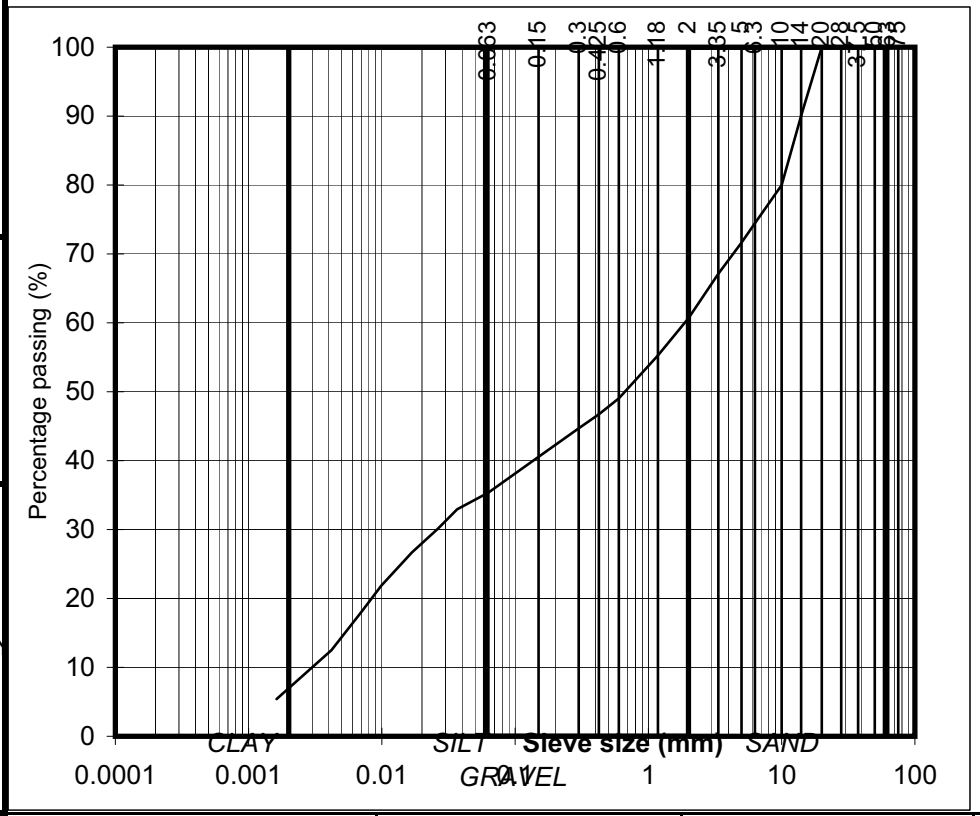
BH/TP No: TP C01

SAMPLE No.: N/A DATE: 8/08/07

DEPTH (m): 0.9-1.10

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Reddish brown slightly sandy, gravelly, SILT



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	96	GRAVEL
14	83	
10	72	
6.3	60	
5	54	
3.35	47	
2	37	
1.18	31	
0.6	26	SAND
0.425	24	
0.3	22	
0.15	18	
0.063	15	
0.038	13	
0.027	11	
0.017	9	SILT/CLAY
0.010	6	
0.007	5	
0.004	3	
0.002	1	

Contract No: 12939

Contract: AVOCA MINING SITE

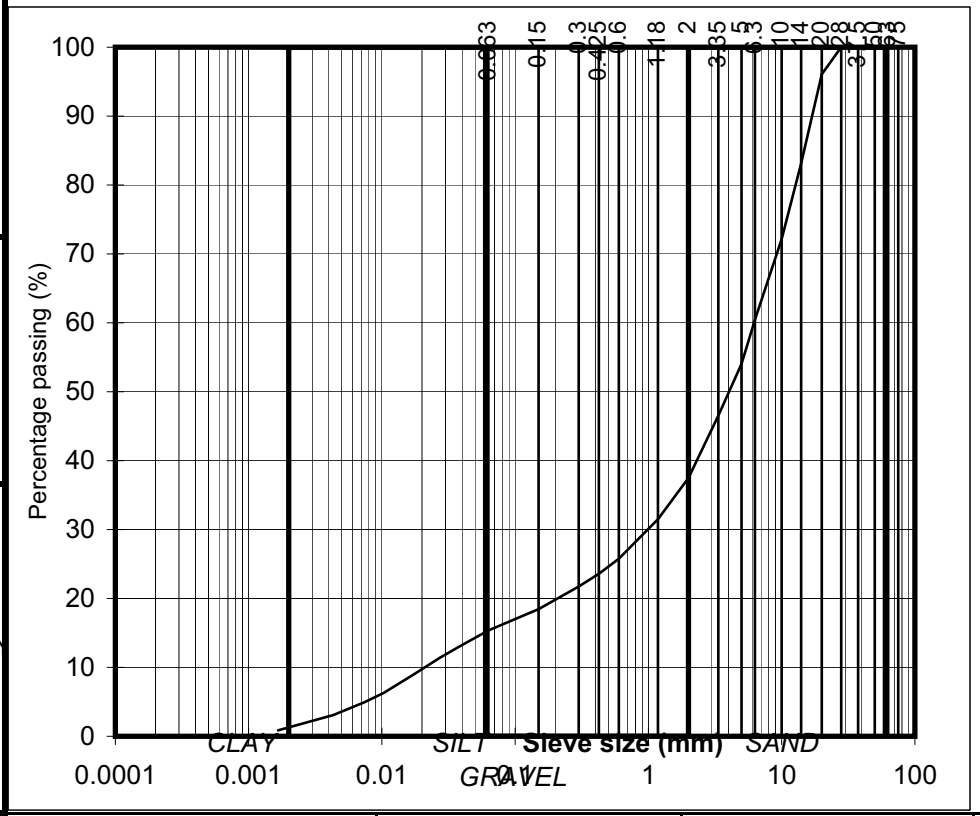
BH/TP No: TP CR 2

SAMPLE No.: N/A DATE: 8/08/07

DEPTH (m): 1.2-1.4

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Reddish brown clayey/silty, very sandy, GRAVEL



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	97	GRAVEL
14	83	
10	76	
6.3	65	
5	59	
3.35	53	
2	44	
1.18	37	
0.6	31	SAND
0.425	28	
0.3	26	
0.15	22	
0.063	18	
0.037	17	
0.027	15	
0.017	13	SILT/CLAY
0.010	10	
0.007	8	
0.004	5	
0.002	3	

Contract No: 12939

Contract: AVOCA MINING SITE

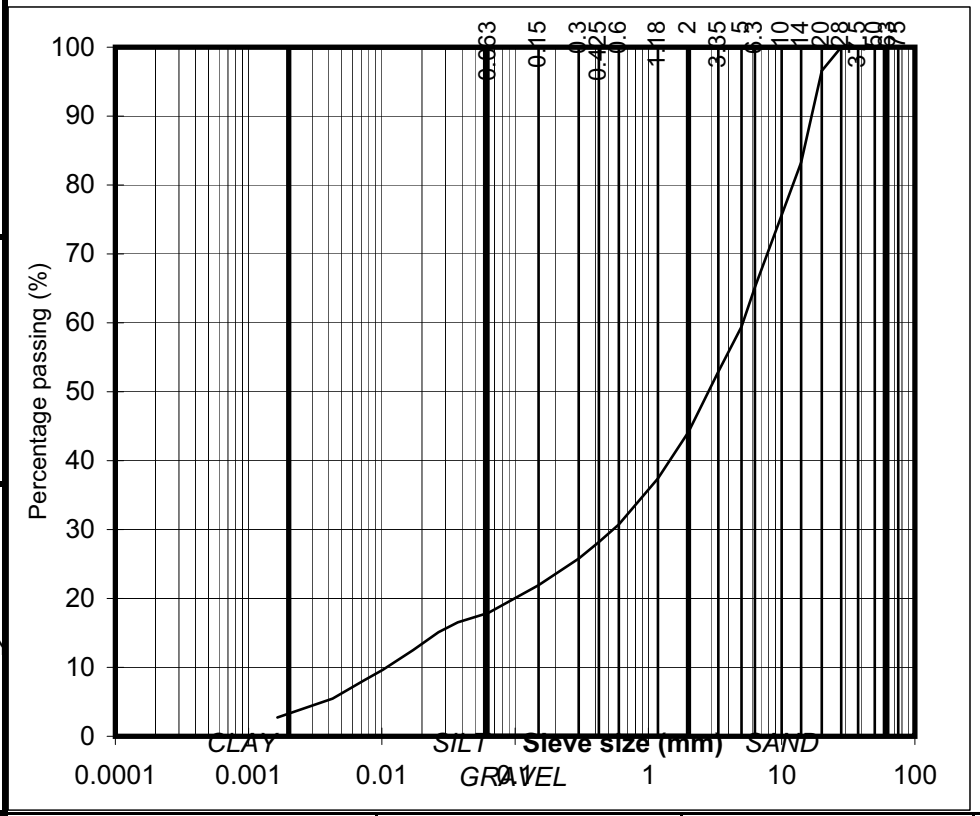
BH/TP No: TP CR 2

SAMPLE No.: N/A DATE: 8/08/07

DEPTH (m): 0.2-0.4

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Yellowish brown clayey/silty, very sandy, GRAVEL



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	90	GRAVEL
14	80	
10	66	
6.3	55	
5	50	
3.35	44	
2	37	
1.18	32	
0.6	27	SAND
0.425	25	
0.3	23	
0.15	20	
0.063	17	
0.037	14	
0.027	13	
0.017	11	SILT/CLAY
0.010	9	
0.007	7	
0.004	6	
0.002	3	

Contract No: 12939

Contract: AVOCA MINING SITE

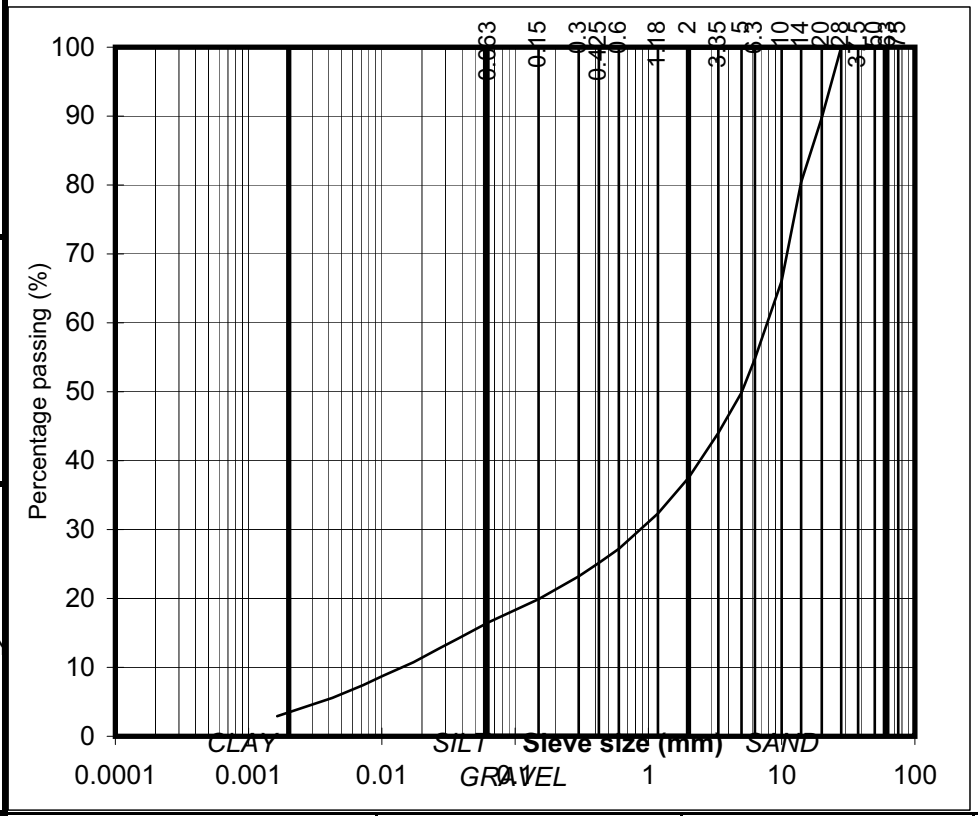
BH/TP No: TP CR 1

SAMPLE No.: N/A DATE: 8/08/07

DEPTH (m): 1.2-1.5

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Yellowish brown clayey/silty, very sandy, GRAVEL



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	94	GRAVEL
10	88	
6.3	83	
5	77	
3.35	70	
2	61	
1.18	52	
0.6	44	
0.425	40	SAND
0.3	37	
0.15	31	
0.063	26	
0.041	#N/A	
0.029	#N/A	
0.019	#N/A	
0.011	#N/A	SILT/CLAY
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	

Contract No: 12939

Contract: AVOCA MINING SITE

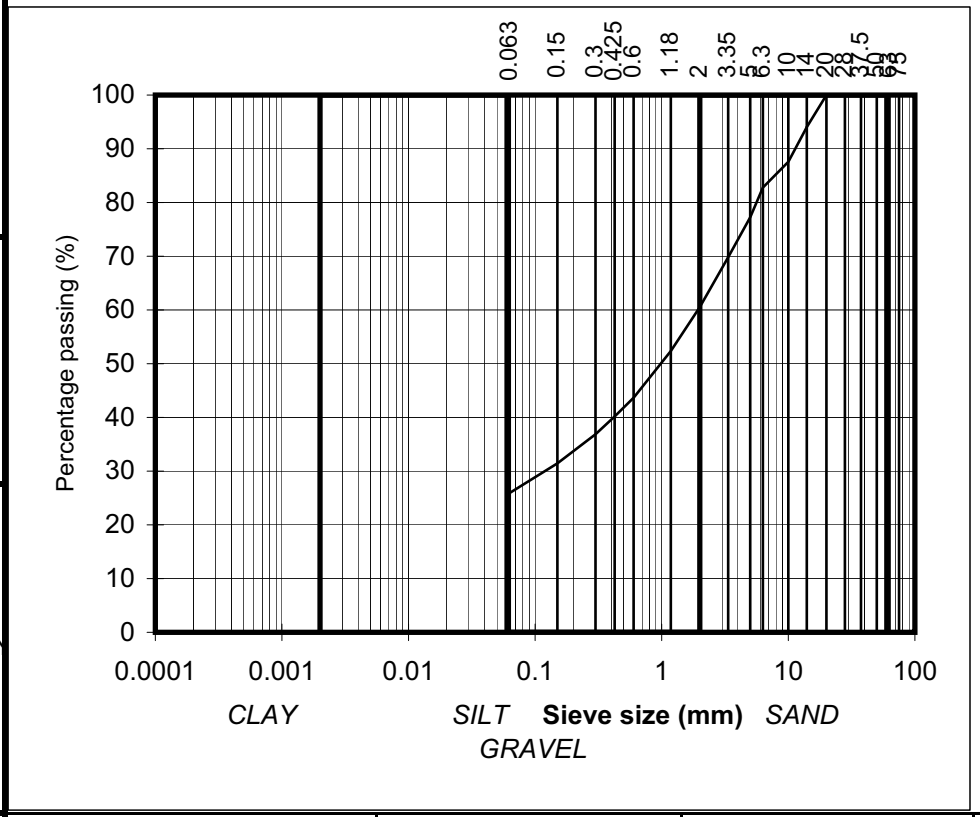
BH/TP No: TP CR 1

SAMPLE No.: N/A DATE: 8/08/07

DEPTH (m): 0.3-0.6

TEST METHOD: Wet sieve

DESCRIPTION: Reddish brown slightly sandy, gravelly, SILT/CLAY



IGSL	Issued By	Date:			Page no:
		10/09/2007			

Summary of Classification Tests

BS1377:Part 2:1990, clauses 3.2, 4.3, 5.3 & 5.4

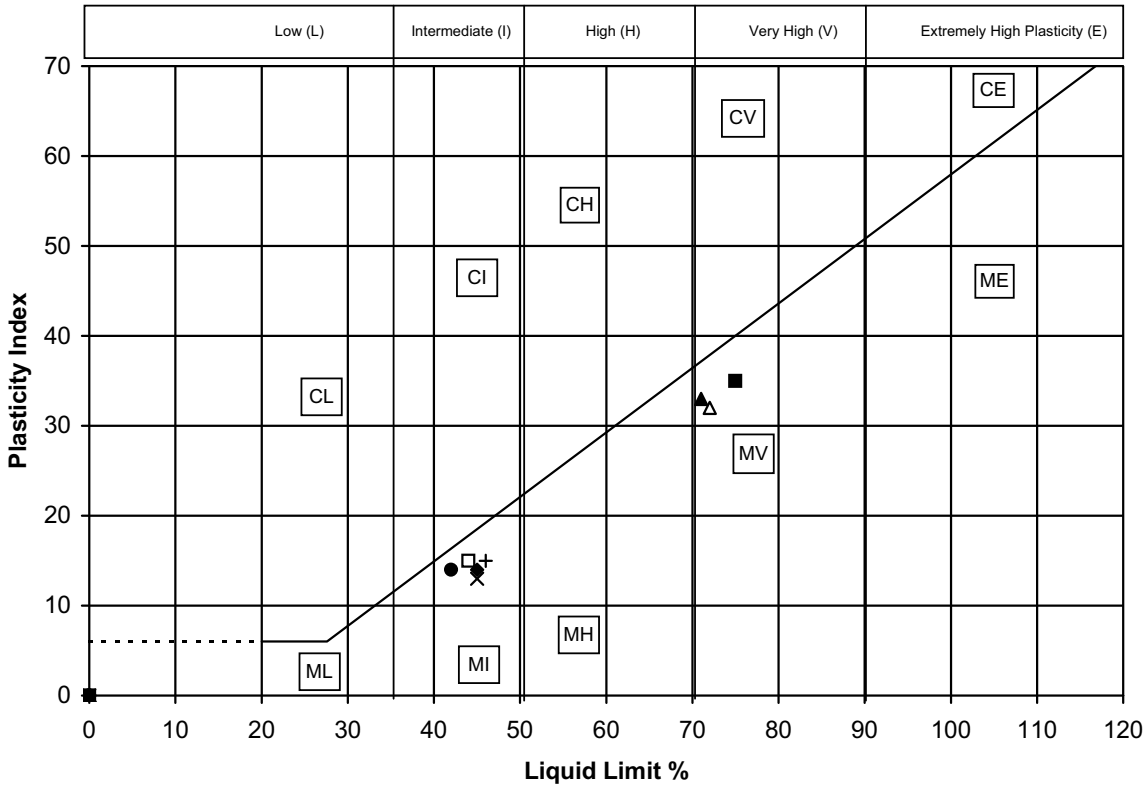
BH/TP No.	DATE	Depth (m)	Sample Type	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	<425µm %	Preparation	Description	Classification
TP C01	08/08/2007	0.9-1.1	SB	39.1	71	38	33	47	WS	Reddish brown slightly sandy gravelly SILT	M V
TP C04	08/08/2007	0.9-1.2	SB	30.7	75	40	35	53	WS	Mottled light grey brown slightly sandy slightly gravelly SILT	M V
TP EA2	09/08/2007	0.3-0.6	SB	10.6	42	28	14	26	WS	Brown silty very sandy GRAVEL	M I
TP EA2	09/08/2007	1.05-1.35	SB	14.5	45	31	14	27	WS	Reddish brown silty very sandy GRAVEL	M I
TP WA2	09/08/2007	0.3-0.6	SB	21	45	32	13	48	WS	Reddish brown slightly sandy gravelly SILT	M I
TP WA2	09/08/2007	1.05-1.35	SB	20	46	31	15	40	WS	Yellowish brown slightly sandy gravelly SILT	M I
TP WA3	09/08/2007	0.9-1.2	SB	30.7	72	40	32	34	WS	Brown slightly sandy gravelly SILT	M V
BH WA1	09/08/2007	2.55	SB	42.6	44	29	15	100	WS	Grey slightly sandy SILT	M I

Notes: NAT - tested as received WS - Wet sieved (425µm) NP - Non Plastic

IGSL	Contract		Contract No.
	AVOCA MINING SITE		12939
	Issued By	Date	Page
		10/09/2007	of

Plasticity Chart - Summary of Liquid & Plastic Limit Tests
BS1377:Part 2:1990, clauses 3.2, 4 & 5
Chart in accordance with BS5930:1999, fig.18

Contract No. 12939 Contract: AVOCA MINING SITE



Code	BH/TP	Sample	Depth (m)	MC%	LL%	PL%	PI%	%<425µm	Description
▲	TP C01	08/08/2007	0.9-1.1	39.1	71	38	33	47	Reddish brown slightly sandy gravelly SILT
■	TP C04	08/08/2007	0.9-1.2	30.7	75	40	35	53	Mottled light grey brown slightly sandy slightly gravelly SILT
●	TP EA2	09/08/2007	0.3-0.6	10.6	42	28	14	26	Brown silty very sandy GRAVEL
◆	TP EA2	09/08/2007	1.05-1.35	14.5	45	31	14	27	Reddish brown silty very sandy GRAVEL
×	TP WA2	09/08/2007	0.3-0.6	21	45	32	13	48	Reddish brown slightly sandy gravelly SILT
+	TP WA2	09/08/2007	1.05-1.35	20	46	31	15	40	Yellowish brown slightly sandy gravelly SILT
△	TP WA3	09/08/2007	0.9-1.2	30.7	72	40	32	34	Brown slightly sandy gravelly SILT
□	BH WA1	09/08/2007	2.55	42.6	44	29	15	100	Grey slightly sandy SILT
○									
◇									
▲									
■									
●									
◆									
×									
+									
△									

NP denotes specimen is non-plastic.

	Issued by	Date			Page
IGSL		10/09/2007			

Appendix E
Test Pit Logs

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/CO1	**SITE** AVOCA	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
TEST PIT LOCATION CONNARY SPOILS	**COORDINATES (Irish National Grid)** 321137 E 183925 N	**ALTITUDE** 240 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 8-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	Brown, yellow brown, moist, well graded cobbles, gravelly (20%), sandy (30%), silt/clay (50%), low plastic.		M
200		150 to 450	
300			
400			
500			
600			
700			
800			
900			
1000	Reddish dark brown, moist/wet, high plastic, well graded slightly sandy, gravelly, Silt. MC = 39.1 USCS = MV	900 to 1100	
1100			
1200			
1300	Reddish dark brown, black nodules, wet, plastic, poorly graded slightly sandy, Silt/Clay	1200 to 1500	
1400			
1500			
1600			
1700	Total Depth - No Water		
1800			
1900			
2000			

Remarks: MC : Moisture Content (%)
USCS: Unified Soil Classification System

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID	SITE	
TP/CO2	AVOCA	
CLIENT	**PROJECT NUMBER**	
Geological Survey of Ireland (GSI)	45446-58568	
TEST PIT LOCATION	**COORDINATES (Irish National Grid)**	**ALTITUDE**
CONNARY SPOILS	321168 E 183870 N	242 m
CONTRACTOR	**EQUIPMENT**	
P. Healy	JCB Excavator	
LOGGED BY:	**DATE**	
JTG	8-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	Varies, spoils cover over topsoil		
200			
300			
400	Cobbly, gravelly, sandy soil/spoil under topsoil		
500			
600			
700	Root zone visible, 600 mm to 900 mm		
800			**M**
900			
1000			
1100			
1200			
1300			
1400			
1500			
1600	Total Depth - No Water		
1700			
1800			
1900			
2000			

Remarks:

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/CO3	**SITE** AVOCA	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
TEST PIT LOCATION CONNARY SPOILS	**COORDINATES (Irish National Grid)** 321096 E 183892 N	**ALTITUDE** 240 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 8-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	In general, rocky, clayey matrix		E/M
200			
300			
400			
500			
600			
700			
800			
900			
1000		900 to 1300	
1100	Yellow brown, slightly moist, well graded cobble, gravelly (shaley) (30%), sandy, silty, clayey		
1200			
1300			
1400			
1500	Total Depth - No Water		
1600			
1700			
1800			
1900			
2000	No original ground detected		

Remarks:

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/CO4		**SITE** AVOCA
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
TEST PIT LOCATION CONNARY SPOILS	**COORDINATES (Irish National Grid)** 321100 E 183894 N	**ALTITUDE** 240 m
CONTRACTOR P. Healy		**EQUIPMENT** JCB Excavator
LOGGED BY: JTG		**DATE** 8-Aug-07

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	Cobbles over topsoil. Root zone observed to 900 mm		E
200			
300			
400	Grey, black, brown yellow, wet, high plastic, well graded gravelly, sandy, Silt/Clay	300 to 600	
500			
600			
700			
800			
900			
1000	Reddish brown, mottled light grey, wet, high plastic, well graded slightly sandy, slightly gravelly, silt.	900 to 1200	
1100	MC = 30.7 USCS = MV		
1200			
1300			
1400			
1500	Total Depth - No Water		
1600			
1700			
1800			
1900			
2000			

Remarks: MC: Moisture Content (%)
USCS: Unified Soil Classification System

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/CR1	**SITE** AVOCA	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
TEST PIT LOCATION CRONEBANE	**COORDINATES (Irish National Grid)** 320785 E 183183 N	**ALTITUDE** 224 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 8-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100			
200			
300	Red brown, slightly moist, well graded, cobbled, gravelly, sandy, Silt/Clay		
400	MC = 9.1		
500		300 to 600	
600			
700			
800			M
900	Orange brown, slightly moist, well graded, clayey/silty, very sandy, Gravel.	750 to 900	
1000	MC = 7.7		
1100			
1200			
1300	Yellow brown, some grey, slightly moist, well graded clayey/silty, very sandy, Gravel	1200 to 1500	
1400	MC = 6.9		
1500	Total Depth - No Water		
1600			
1700			
1800			
1900			
2000			

Remarks: MC : Moisture Content (%)

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/CR2	**SITE** AVOCA	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
TEST PIT LOCATION CRONEBANE	**COORDINATES (Irish National Grid)** 320693 E 183123 N	**ALTITUDE** 223 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 8-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	Yellow brown, some grey, moist, high plasticity, well graded clayey/silty, very sandy, Gravel		
200			
300	MC = 10.6	200 to 400	
400			
500	Some clayey/silty deposits have the appearance of tailings.		
600			
700			
800	Yellow brown, moist, low plasticity, well graded clayey/silty, sandy, gravel		M
900			
1000			
1100			
1200			
1300	Reddish brown, increased moisture, high plasticity, well graded clayey/silty, very sandy, Gravel.	1200 to 1400	
1400	MC = 13.3		
1500	Total Depth - No Water		
1600			
1700			
1800			
1900			
2000			

Remarks: MC : Percent Moisture Content

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/EA1	**SITE** AVOCA	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 46446-58568	
TEST PIT LOCATION EAST AVOCA	**COORDINATES (Irish National Grid)** 320095 E 182528 N	**ALTITUDE** 141 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 9-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100			
200			
300			
400	Yellow brown, moist, low plastic, well graded, many cobbles, gravelly, slightly sandy, Silt/Clay MC = 14.1	**300 to 600**	
500			
600			
700			
800			**M**
900			
1000	Dark brown, brown, moist, medium plastic, well graded gravelly, sandy, Silt/Clay. MC = 14.8	**950 to 1250**	
1100			
1200			
1300			
1400			
1500	Total Depth - No Water		
1600			
1700			
1800			
1900			
2000			

Remarks: MC : Moisture Content (%)
Test pit on top of high spoil pile adjacent to the track to Tigroney West.

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID **TP/EA2**		**SITE** **AVOCA**
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
TEST PIT LOCATION **EAST AVOCA SPOILS**	**COORDINATES (Irish National Grid)** 320193 E 182600 N	**ALTITUDE** 155 m
CONTRACTOR P. Healy		**EQUIPMENT** JCB Excavator
LOGGED BY: JTG		**DATE** 9-Aug-07

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	Light brown (some dark brown at 530 to 600 mm), slightly moist, low plastic, well graded silty, very sandy, Gravel MC = 10.6 USCS = MI		M/D
200			
300			
400		300 to 600	
500			
600			
700			
800			
900			
1000			
1100	Reddish brown, some black, moist, low plasticity, well graded cobbles, silty, very sandy, Gravel MC = 14.5 USCS = MI	1000 to 1350	
1200			
1300			
1400	Seeps coming into pit at 1400 mm		
1500	Total Depth		
1600			
1700			
1800			
1900			
2000			

Remarks: MC : Percent Moisture Content
USCS: Unified Soil Classification System
Test pit is located about 50 m SE of BH/EA1

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID	SITE	
TP/TI1	AVOCA	
CLIENT	**PROJECT NUMBER**	
Geological Survey of Ireland (GSI)	45446-58568	
TEST PIT LOCATION	**COORDINATES (Irish National Grid)**	**ALTITUDE**
TIGRONEY WEST SPOILS AREA	319925 E 182137 E	49 m
CONTRACTOR	**EQUIPMENT**	
P. Healy	JCB Excavator	
LOGGED BY:	**DATE**	
JTG	9-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	In general, material is grey, slick-sided or lumpy, low moisture. It has a hydrocarbon odor - possibly a mill/process waste.		E
200			
300			
400	Grey, brown, slightly moist, slightly plastic, well graded cobbles, gravel, sandy silt.	300 to 600	
500			
600			
700	Same material as 300 to 600, except more moist and odorous		
800			
900			
1000			
1100		1000 to 1350	
1200			
1300			
1400			
1500	Total Depth		
1600			
1700			
1800			
1900			
2000			

Remarks: Test pit located on the bench above the ore bins.

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/DA1		**SITE** AVOCA
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-56568
TEST PIT LOCATION DEEP ADIT SPOILS AREA	**COORDINATES (Irish National Grid)** 319869 E 182070 N	**ALTITUDE** 36 m
CONTRACTOR P. Healy		**EQUIPMENT** JCB Excavator
LOGGED BY: JTG		**DATE** 9-Aug-07

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	The first 600 mm may be mill/process waste; it is odorous and contains wood.		M/D
200			
300			
400	Spoils, grey, light brown, slightly moist, low plastic, well graded slightly sandy, gravelly Silt.	300 to 600	
500	MC = 9 USCS = MI		
600			
700			
800			
900			
1000	Sample taken from excavated spoils pile; material is too hard to recover from test pit wall. Material has the appearance of river cobbles/gravel, rounded, 80 mm, Reddish brown, slightly moist, no plastic, slightly well graded clayey, silty, very sandy, Gravel	900 to 1500	D
1100			
1200			
1300	MC = 16.6		
1400			
1500	Total Depth		
1600	Note: From 900 to 1500 mm, material is highly consolidated, very difficult to excavate. Boulders are encountered.		
1700			
1800			
1900			
2000			

Remarks: MC : Moisture Content (%)
USCS: Unified Soil Classification System

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/WA1	**SITE** AVOCA	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
TEST PIT LOCATION WEST AVOCA NORTH LODE SPOILS	**COORDINATES (Irish National Grid)** 319195 E 181535 N	**ALTITUDE** 187 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 9-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100 200 300	Soil cover; root zone goes to about 400 mm		E
400 500 600	Tailings - blue grey; yellow brown (one over the other), moist, low plasticity, poor to well graded clayey, silty Sand.	**300 to 600**	
700 800 900 1000 1100 1200	Tailings		
1300 1400 1500	Tailings - dark blue grey, increased moisture ranging moist to wet, low plasticity, poor to well graded clayey, silty, Sand. Total Depth	**1200 to 1500**	
1600 1700 1800 1900 2000			

Remarks:

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/WA2	**SITE** AVOCA	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
TEST PIT LOCATION WEST AVOCA NORTH LODE SPOILS	**COORDINATES (Irish National Grid)** 321305 E 181528 N	**ALTITUDE** 179 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 9-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	In general, mine spoils; a mixture of a variety of soils and altered rock		M
200			
300			
400	Yellow brown, reddish brown, some grey shale/clay, moist, medium plastic, well graded slightly sandy, gravelly, Silt. MC = 21 USCS = MI	300 to 600	
500			
600			
700			
800			
900			
1000			
1100	Yellow brown, brown, some grey, moist, medium plastic, well graded with some cobbles, slightly sandy, gravelly, silt. MC = 20 USCS = MI	1050 to 1350	
1200			
1300			
1400			
1500	Total Depth		
1600			
1700			
1800			
1900			
2000			

Remarks: MC : Moisture Content (%)
USCS: Unified Soil Classification System

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/WA3		**SITE** AVOCA
CLIENT Geological Survey of Ireland (GSI)		**PROJECT NUMBER** 45446-58568
TEST PIT LOCATION WEST AVOCA WHEATLY SPOILS AREA	**COORDINATES (Irish National Grid)** 319396 E 181674 N	**ALTITUDE** 172 m
CONTRACTOR P. Healy		**EQUIPMENT** JCB Excavator
LOGGED BY: JTG		**DATE** 9-Aug-07

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	In general, excavation is through mine spoils - rock/soil matrix, possibly overlying bedrock		M/D
200			
300			
400	Yellow brown, plastic, poorly graded, some cobbles, mostly clay.	300 to 600	
500			
600			
700			
800			
900			
1000	Red brown, brown, moist, plastic, poor to well graded, slightly sandy, gravelly, Silt. MC = 30.7 USCS = MV	900 to 1200	
1100			
1200			
1300			
1400	Total Depth		
1500			
1600			
1700			
1800			
1900			
2000			

Remarks: MC: Moisture Content (%)
USCS: Unified Soil Classification System
Test pit site is nearby the Wheatly Promontory.

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/ET1	**SITE** AVOCA	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
TEST PIT LOCATION EMERGENCY TAILINGS POND	**COORDINATES (Irish National Grid)** 319900 E 181774 N	**ALTITUDE** 38 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 13-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100 200 300	Vegetation, Soil Cover		E
400 500 600	Tailings - Grey, moist, clayey/Silty	300 to 600	
700 800 900 1000 1100 1200 1300 1400 1500	Tailings - Tan, moist, some cobbles, gravel; clayey/silty.	600 to 1500	
1600 1700 1800	Total Depth - No Water		
1900 2000			

Remarks:

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/SA1	**SITE** AVOCA	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
TEST PIT LOCATION SHELTON ABBEY TAILINGS AREA	**COORDINATES (Irish National Grid)** 321021 E 175780 N	**ALTITUDE** 24 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 10-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100 200 300 400 500 600	0 to 600 mm, river cobbles/gravel and soil		
700 800 900 1000 1100 1200 1300 1400 1500 1600	600 to 1600 mm, Mill Tailings - blue grey, tan brown, slightly moist Total Depth - No Water	800 to 1000	E/M
1700 1800 1900 2000			

Remarks: MC : Moisture Content (%)
Test pit is at the toe of the tailings embankment towards the norh end

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/SA2	**SITE** AVOCA	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
TEST PIT LOCATION SHELTON ABBEY TAILINGS AREA	**COORDINATES (Irish National Grid)** 320842 E 176036 N	**ALTITUDE** 20 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 10-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	Heavily vegetated, topsoil		
200	Tailings to 1000 mm		E
300			
400			
500			
600			
700			
800			
900			
1000			M/D
1100	Alluvium to Total Depth; 70 to 150 mm cobbles in red brown cobble/sandy matrix.		
1200	Brown, moist, slightly clayey/silty, very sandy, Gravel.		
1300	MC = 6.2	1200 to 1400	
1400			
1500			
1600			
1700	Total Depth - No Water		
1800			
1900			
2000			

Remarks: MC : Moisture Content (%)
Test pit is at the toe of the tailings embankment towards the norh end

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/SA3	**SITE** AVOCA	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
TEST PIT LOCATION SHELTON ABBEY TAILINGS AREA	**COORDINATES (Irish National Grid)** 321059 E 175681 E	**ALTITUDE** 19 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 10-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	0 to 1700 mm Tailings - Yellow brown with lenses of blue to light grey, moist, poorly graded, mostly sandy. No alluvium, no water.		E
200			
300			
400			
500			
600			
700			M
800			
900			
1000			
1100			
1200			
1300			
1400			
1500			
1600			
1700			D
1800	Tailings - Blue grey is dominant, moist		
1900	Total Depth - No Water		
2000			

Remarks: MC : Moisture Content (%)
Test pit is at an intermediate location along the embankment toe.

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID TP/SA4	**SITE** AVOCA	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
TEST PIT LOCATION SHELTON ABBEY TAILINGS AREA	**COORDINATES (Irish National Grid)** 321515 E 175293 N	**ALTITUDE** 20 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 10-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
100	Vegetative cover, topsoil, roots		
200	Mix of river cobbles and tailings		
300	River deposits - cobbles, rounded (10 to 100 mm), sand, gravel, matrix, slightly moist. Root zone observed to 900 mm (top of tailings)		
400			
500			
600			
700			
800			M
900			
1000	Tailings - Yellow brown, blue grey, lenses of orange and light grey		
1100			
1200			
1300			
1400			
1500			
1600	Total Depth - No Water		
1700			
1800			
1900			
2000			

Remarks: MC : Moisture Content (%)
Test pit toward south end of the tailings embankment about 100 m north of the MW/SA2 drill site.

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

CDM Camp, Dresser, and McKee Inc.

TEST PIT LOG

TEST PIT ID **TP/SA5**	**SITE** **AVOCA**	
CLIENT Geological Survey of Ireland (GSI)	**PROJECT NUMBER** 45446-58568	
TEST PIT LOCATION **SHELTON ABBEY TAILINGS AREA**	**COORDINATES (Irish National Grid)** 321351 E 175326 N	**ALTITUDE** 21 m
CONTRACTOR P. Healy	**EQUIPMENT** JCB Excavator	
LOGGED BY: JTG	**DATE** 10-Aug-07	

DEPTH (mm)	SOIL DESCRIPTION	SAMPLE INTERVAL (mm)	EXCAVATION EFFORT
	Vegetation, topsoil		
100	River cobbles in a sandy soil matrix. Root zone to 400 mm (top of tailings)		
200			
300			
400			
500	Tailings		
600			
700			
800			**M**
900			
1000			
1100			
1200			
1300			
1400			
1500	Black, silty soil/spoils, cobble matrix. Possibly a pocket of mill waste mixed in with the tailings		
	Total Depth, 1500 mm - No Water		
1600			
1700			
1800			
1900			
2000			

Remarks: MC : Moisture Content (%)
Test pit is at an intermediate location along the embankment toe.

EXCAVATION EFFORT
E : Easy
M : Moderate
D : Difficult

Appendix F
Report of the August 2007 Field Geotechnical Investigations

1.0 Introduction

A field geotechnical investigation was conducted in August 2007 in support of the "Feasibility Study for Management and Remediation of the Avoca Mining Site." The investigation consisted of test pit excavations and sampling, and geotechnical borehole drilling and sampling, and laboratory testing of selected samples from each of the Avoca Mine Site areas and the Shelton Abbey Tailings site. Test pits were excavated by a JBC excavator. Test pit walls were logged; spoil, tailings, or soil samples were hand-dug from test pit walls. Test pits were backfilled immediately following logging and sampling. Geotechnical boreholes were logged; grab samples as well as samples from split spoon samplers were obtained from the geotechnical borehole drilling program. In addition, Standard Penetration Tests (SPTs) were performed to obtain a measure of penetration resistance. Boreholes were plugged by the end of the drilling program.

SPTs have a long history of use in field geotechnical investigations. The SPT data are commonly used to empirically correlate with a number of soil strength characteristics because of the vast data base that has been assembled from use of this standard procedure. The literature contains empirical correlations between blow counts and, for example, presumptive bearing values of various soils, relative density of sands and unconfined compressive strength of clay. Because of the typically mixed and altered nature of the Avoca spoils materials, SPT blow counts are only correlated to descriptive terms for granular and cohesive soils in this report. The reader is referred to the Data Report where the raw data is available if there is an interest to evaluate other correlations.

The test pit logs, geotechnical and monitoring well borehole logs and laboratory test results (particle size curves, material descriptions, and basic classification parameters (moisture content, liquid limit, plastic limit, plasticity index) are presented in the project's Data Report. Locations of test pit and borehole sites are included in the Data Report. Logs of the monitoring well boreholes are also included with the Data Report.

This report summarises these field investigations and laboratory test results on a site-by-site basis, and by the following general overview. Based on the site geotechnical investigations, the spoils could be reshaped or relocated with a normal amount of energy from conventional earth moving heavy equipment. Large rocks or boulders may be encountered in excavations, but again, they would typically be handled by conventional earth moving heavy equipment of the type that is used in pit mining and other large earth moving projects. The spoils are typically well graded; they should readily compact and develop adequate strength for constructing stable earth backfills and earth structures.

2.0 Site-by-Site Summaries

2.1 Connary

The Connary site consists of relatively shallow spoils covering an area of approximately 4.1 hectares. No drilling occurred at Connary due to the relatively shallow depth of spoils. Four test pits were excavated to depths of between 1,500 to 1,700 millimeters (mm). All of the test pits were dry. They were excavated with easy to moderate effort by the JBC excavator.

Test pits TP/CO1 and TP/CO3 were excavated entirely in spoils. The spoils ranged from moist, well graded, low plastic materials to wet, poorly graded, high plastic materials. Test results from TP/CO1 at 900 to 1,100 mm showed a moisture content (MC) of 39 percent and a soil classification of high plastic silt (MV). Test pit TP/CO2 was primarily a gravelly, sandy soil underlying about 300 mm of topsoil. A root zone was visible at 600 to 900 mm. Test pit TP/CO4 was in mixed zones of spoil and soil. A root zone was visible to 900 mm. The materials were well graded, dominated by silt and silt/clay. Test results from TP/CO4 at 900 to 1,200 mm showed the sample to be wet, with a MC of about 31 percent, and classified as high-plastic silt (MV).

The Connary spoils could be re-graded or removed with a normal heavy earth moving equipment effort. The materials are typically well graded from gravel to clay. There's enough silt/clay content for the material to compact well and to be used for embankment construction, given proper moisture control.

2.2 Cronebane Pit/Mt. Platt

Two test pits were excavated into spoils to depths of 1,500 mm each, in the vicinity of the south end of the partially backfilled Cronebane Pit. The test pits were dry. They were excavated with moderate effort by the JBC excavator. Test pit TP/CR1 to 600 mm was a slightly moist, well graded material, silt/clay dominated, with a MC of about 9 percent. To depth, the materials remained slightly moist and well graded, but sandy gravel dominated with MCs between 7 and 8 percent. TP/CR2 MCs ranged between about 11 percent near the surface to 13 percent at total depth. The material was moist, ranging from high plastic to low plastic consistency. It was a well graded, dominantly sandy gravel spoil.

Two boreholes were drilled at the top of Mt. Platt. No water was encountered. Borehole BH/MP1 was drilled to 9.6 meters (m), where it met refusal. Four SPTs were performed at 2 m intervals to 8 m. Split spoon samples were taken at the same intervals. BH/MP2 was located nearby BH/MP1 with the intent of sampling the same spoil column to a greater depth. BH/MP2 met refusal at about 17 m. Four SPTs were performed at 2 m intervals, starting at 10 m. Where appropriate, like samples from the two boreholes were mixed to obtain enough sample for classification tests. All samples were well graded. MCs were measured at about 13 percent. To 10 m, samples were dry and dominantly gravelly silt or silt/clay. Samples between 2 and 3 m were classified as intermediate plastic silt (MI). Below 10 m, samples were moist, and

ranged from very sandy gravel to silt/clay; the samples were classified as silty sand (SM). SPT blow counts above 10 m ranged from 9 to 13, indicating a medium-consistency cohesive soil. Below 10 m, the blow counts ranged from 13 to 20, indicating a firm-compacted granular soil (Reference: Basic Soils Engineering, B.K. Hough, the Ronald Press Company, NY, 1957, pg. 276).

Like the Connary spoils, the mixture of cohesive and granular spoils in both the test pits and boreholes indicate a material that can be removed or re-graded with a normal heavy equipment effort. With proper mixing and moisture control, the spoils should compact well and could be used as construction of earth structures. The refusals in both boreholes suggest that the spoil heaps and in-fills include large rock or boulders. These may present difficulty in excavating. However, it's reasonable to expect that large rock or boulders were moved there in the first place by the type of conventional heavy earth moving equipment typically used in pit mining.

2.3 East Avoca

The East Avoca site is about four hectares in extent. Two test pits were excavated, one each in the larger spoil heaps, to depths of 1,500 mm. East Avoca test pit EA/TP1 was located about 335 m southwest from the southern limit of the East Avoca Pit, on top of the high spoil heap adjacent to the track leading to Tigroney West. It was excavated with a moderate effort. No water was encountered. Samples were obtained between 300 to 600 mm, and 950 to 1,250 mm; MCs measured about 14 percent and 15 percent, respectively. Both samples were characterized as moist, low to medium plastic silt/clay. TP/EA2 was about 60 m southwest of the southern limit of the East Avoca Pit, and about 20 m east of the East Avoca borehole BH/EA1. It was excavated with a moderate to difficult effort. Seeps were observed at about 1,350 mm below surface. A sample from 300 to 600 mm was characterized as slightly moist, low plastic, well graded very sandy gravel. MC was about 11 percent. A sample from 1,000 to 1,350 mm was characterized as moist, low plastic, well graded very sandy gravel with a MC of 14.5 percent. In contrast to these characterizations, laboratory tests classified both samples as silt of intermediate plasticity (MI).

One borehole was drilled at East Avoca, about 60 m southwest from the southern limit of the East Avoca Pit. No water was encountered. BH/EA1 was drilled to 10 m, where it met refusal. It is not known if refusal was from contact with a large rock or boulder, or form an *in situ*, undisturbed rock surface. Four SPTs were performed at 2 m intervals to 8 m. Split spoon samples were taken at the same intervals, and a few grab samples of cuttings were obtained, typically just below the split spoon samples in order to accumulate enough material for laboratory testing. Above 4 m, the samples were characterized as moist, medium to high plastic, well graded sandy silt/clay, with a MC of 17.5 percent. The deeper samples were distinct from the above sample. At 4 m and deeper, samples were characterized as moist, low to medium plastic, well graded sandy to very sandy gravel; MCs were measured at about 10 percent. The SPT blow count in the upper silt/clay was 7, indicating a medium

consistency cohesive soil. The SPT blow counts in the lower sandy gravel ranged from 11 to 25, indicating a firmly compacted granular soil.

Sampling and observations indicate that the East Avoca spoils are mixtures of cohesive and granular materials that can be removed or regraded with a normal heavy equipment effort. With proper mixing and moisture control, the spoils should compact well and could be used as construction of earth structures. It is expected that the spoil heaps and in-fills include some large rock or boulders. These may present difficulty in excavating. However, it's reasonable to expect that large rock or boulders were moved there in the first place by the type of conventional heavy earth moving equipment typically used in pit mining.

2.4 Tigroney West

One test pit was excavated and two boreholes were drilled in the Tigroney West area east of the railway, an area of approximately one hectare. The test pit, TP/TI1 was excavated nearby and at the same level as the 850 Adit, to a total depth of 1,500 mm. It was excavated with easy effort. The location must be an old dump site. There was a veneer of spoils at the surface; to 300 mm, the material was grey, slick-sided or lumpy, low moisture, and had a hydrocarbon odor. It's possibly a mill/process waste. A sample from between 1,000 and 1,500 mm was the same, except more moist and odorous. An intermediate sample from 300 to 600 mm was slightly moist, low plastic, well graded sandy silt. Excavations at an old mine and mill site may encounter buried wastes and debris anywhere.

Two boreholes were drilled at the next lower level, a level above the Ore Bins. Borehole BH/TI1 met refusal at 3 m; it could have been due to encountering a large rock or boulder, or ledge rock. Water was encountered at 2.4 m. One SPT was performed and a split spoon sample was taken at 2 m. The material was a moist, low plastic, well graded silt/clay, with a MC of 24.5 percent, and classified as silt with intermediate plasticity (MI). BH/TI2 was offset from BH/TI1 by a few meters. It met refusal at 7 m; it could have been due to encountering a large rock or boulder, or ledge rock. No water was encountered. SPTs were performed, and split spoon samples were taken at 2 m and 4 m. The upper sample was a moist, low plastic, well graded slightly gravelly silt, classified as a silt with intermediate plasticity (MI). The sample at 4 m was a dry to moist, low plastic, well graded gravelly silt/clay; MC measured about 14 percent. SPT blow counts measured 35, indicating a hard consistency cohesive soil. There could be some difficulty in regrading or removing some of the spoils, first requiring ripping by a dozer.

2.5 Deep Adit Spoils Area

The Deep Adit Spoils Area is down-gradient from the Ore Bins, west of the railway. It is about 0.4 hectares in extent. One test pit was excavated and two boreholes were drilled in the area. Test pit TP/DA1 was excavated to 1,500 mm. No water was encountered. The excavation was a moderate to difficult effort for the first 900 mm,

but difficult to very difficult from 900 to 1,500 mm, indicating a highly consolidated material that may be relatively difficult to excavate. Possible mill/process waste was encountered in the top 600 mm; it was odorous and contained wood. Spoils at 300 to 600 mm were slightly moist, low plastic, well graded gravelly silt; the MC was 9 percent. The classification was silt with intermediate plasticity (MI). A sample was taken between 900 to 1,500 mm. The material was too hard to dig from the pit wall, so it was recovered from the excavated spoils. The spoils were slightly moist, non-plastic, poorly graded very sandy gravel; the MC was about 17 percent.

Borehole DA/BH1 was drilled into the shallow alluvium beneath the spoils. Drilling was stopped at 12 m to provide for setting the shallow alluvial monitoring well. Slightly moist spoils were encountered to a depth of 6 m, followed by about 1.5 m of slightly sandy, gravelly clay. The alluvium was just beneath the clay. One SPT was performed and a split spoon and grab sample were taken just on either side of the clay/alluvium interface, at 7.4 m. The sample was wet, with little to no plasticity, well graded gravelly clay; the MC was about 12 percent. The blow count was 45, indicating a hard consistency cohesive soil. Just beneath the clay, at about 7.5 to 8 m, the alluvium was wet, very gravelly sand; the MC was about 9 percent. The alluvium became more gravelly at depth. Borehole BH/DA2 was drilled to a total depth of about 25 m, for placement of a deep alluvial monitoring well; no geotechnical samples were obtained. The log shows moist spoils to a depth of about 7 m, where water was encountered. Below 7 m, the alluvium is very moist gravel. Fractured bedrock may have been encountered between 23 and 24 m.

The indication from TP/DA1 is that the spoils in the Deep Adit Spoils Area may be relatively difficult to excavate, first requiring ripping by a dozer.

2.6 West Avoca

The West Avoca spoils and pit areas are about 10 hectares in extent. Three test pits were excavated, two to depths of 1,500 mm and one to 1,400 mm. No water was encountered. Test pit TP/WA1 was located toward the southwest limit of the North Lode Pit infill, on the expectation that it would encounter mill tailings that were reportedly deposited there. The excavation effort was easy. A soil cover extended from the surface to 300 mm and the root zone extended to 400mm. Blue grey tailings were encountered at 300 mm, characterized as moist, low plastic, well graded silty sand. The tailings continued to the total depth of 1,500 mm. The material remained consistent in character, but increased in apparent moisture content. TP/WA2 was located on the eastern flank of the North Lode Pit infill. The excavation effort was moderate. Near surface materials were mine spoils mixed with soil and altered rock. A sample from 300 to 600 mm was a moist, medium plastic, well graded gravelly silt with a MC of 21 percent; the material was classified as silt of intermediate plasticity (MI). A sample from 1,050 to 1,350 mm was similar, with a MC of 20 percent and an MI classification. TP/WA3 was located above the Weaver's Lode Pit, along the northeast/southwest-running ridge. Total depth was 1,400 mm. Excavation effort was moderate to difficult. The excavation was through mine spoils (a rock/soil matrix),

possibly overlying bedrock. A spoils sample at 300 to 600 mm was characterized as plastic, poorly graded clay with some cobbles. A sample at 900 to 1,200 mm was characterized as moist, plastic, poor to well graded gravelly silt; MC was about 31 percent. The sample was classified as silt of very high plasticity (MV).

One borehole was drilled near the lower, northeast limit of the North Lode Pit infill. BH/WA1 was drilled to about 6 m, where it met refusal. No water was encountered. SPTs were performed and split spoon samples were taken at 2 m and 4 m; grab samples of cuttings were obtained just below the split spoon samples. Light grey, moist to low plastic, poorly graded, slightly sandy silt tailings exist at the 2 m level. The MC was about 43 percent; the tailings classified as silt of intermediate plasticity (MI). The SPT blow count was 2, indicating a very soft consistency cohesive soil. The sampling at 4 to 4.5 m showed tailings grading to spoils. The sample was characterized as moist to wet, non-plastic, well graded slightly gravelly silt. The MC was about 41 percent; the classification was silt of intermediate (?) plasticity (MI). The SPT blow count was 30, indicating a hard consistency cohesive soil.

The spoil materials observed at West Avoca are a mix of granular and cohesive materials, suitable for compaction and use in earth structures. The refusal at about 6 m may indicate large rocks or boulders buried in the infill. The apparent wide-spread, near surface presence of stabilized tailings suggest a precautious approach to planning excavation and/or regrading. The tailings varied in moisture from moist to wet, but no water was encountered in the tailings. The tailings are evidently a very low-permeable material.

2.7 Emergency Tailings Pond

The Emergency Tailings pond is located at west Avoca, across from the old mining company offices between the east side of R752 and the Avoca River. The area is about four hectares in extent. One test pit was excavated to verify the planned location of monitoring wells. Test pit TP/ET1 was located in a clearing about 50 m north of the entrance to the area. The test pit was excavated to 1,500 mm. No water was encountered. Excavation effort was easy. The top 300 mm was vegetation and soil cover. Grey and tan moist clayey silt tailings continued from 300 mm to total depth.

Two boreholes were drilled in the vicinity of TP/ET1 for monitoring well installations. BH/ET1 was drilled to a total depth of about 11 m for a monitoring well installation into the shallow alluvium beneath the tailings. One SPT was performed and split spoon sample was taken at the 2 m depth in the tailings. The sample was classified as dry, non-plastic, well graded gravelly silt/clay. The SPT blow count was 9, indicating a medium consistency cohesive soil. Top of alluvium is between 7.5 to 8 m. Water was only encountered when the alluvium was penetrated. A clay layer was encountered at 10.5 m; a grab sample of the cuttings at about 10.6 m give a characterization of dry to moist, low plastic, well graded slightly gravelly clay. MC was 10.5 percent; the classification was clay of low plasticity (CL). BH/ET2 was drilled to a total depth of 30 m for a monitoring well installation into the deeper

alluvium. Water was encountered just beneath the tailings at 7.2 m, at the top of the alluvium. Alluvium, varying in characteristic from silt/clay to cobbles and gravel continued to total depth.

The remarkable observation is that the tailings are moist, but they do not support a water table or contain flowing water. The tailings act as an aquiclude to the groundwater flowing through the alluvium. The tailings are evidently a very low-permeable material.

2.8 Paddy's Field

Paddy's Field is located at the north end of the eastern-most residential track, to the north of the Deep Adit and west of the railway. A borehole was drilled in Paddy's Field for a baseline monitoring well installation. The borehole was drilled to a total depth of 10 m. There was no refusal. Water was encountered at 3.6 m from the surface. The top 4 m of the earth column is gravel with a clay matrix. From 4 m to about 7.5 m, the characterization of the earth column is gravel with some clay. Clay till exists from about 7.5 m to total depth.

2.9 Shelton Abbey Tailings Area

The Shelton Abbey Tailings Area is located about 8 km south of the Avoca mining area, along and adjacent to the east side of the Avoca River. Five test pits were excavated along the lower perimeter road at the toe of the tailings facility embankment. They are situated about 40 to 45 m in from the Avoca River. Test pit TP/SA1 was located at about 130 m south of the north end of the lower perimeter road. The other test pits extended from there, in random intervals, south about 1,000 m. No water was encountered in the test pits. TP/SA1 was excavated to a total depth of 1,600 mm. Excavation effort was easy to moderate. River cobbles, gravel, and soil were present to 600 mm from the surface. Slightly moist mill tailings extended from 600 mm to the total depth. TP/SA2 was excavated to a total depth of 1,700 mm. Excavation effort was easy to 1000 mm, and moderate to difficult from 1,000 mm to total depth. The top 100 mm was heavily vegetated topsoil. Tailings were encountered at 100 mm to 1000 mm. Alluvium, characterized as moist, very sandy gravel continued from the 1000 mm depth to total depth. A sample, taken at 1,200 to 1,400 mm, was characterized as moist, poorly graded very sandy gravel; MC was about 6 percent. TP/SA3 was excavated to a total depth of 1,900 mm. Excavation effort was easy to moderate to difficult as depth increased. Yellow brown, moist, poorly graded sandy tailings exists from surface to 1,700 mm. The test pit material is moist blue tailings from 1,700 mm to total depth. TP/SA4 was excavated to a total depth of 1,600 mm. Excavation effort was moderate. The top 100 mm was vegetated topsoil, followed by 100 mm of a mix of river cobbles and tailings. Slightly moist sand, gravel cobble matrix was encountered from 200 mm to 900 mm. A root zone extended to 900 mm and stopped abruptly at the top of the underlying tailings layer. Lenses of various tailings exist below 900 mm to total depth. TP/SA5 was excavated to 1,500 mm. Excavation effort was moderate. There exists a veneer of vegetation and

topsoil over a sandy soil/river cobbles matrix to 400 mm; the root zone also extends to 400 mm. Tailings were encountered from 400 mm to total depth. The last 100 mm appeared to be a mix of tailings and mill waste.

Two boreholes were drilled at the Shelton Abbey Tailings Area. Borehole BH/SA1 was located on the reclaimed tailings surface in the northern paddock, about 30 m north of the paddock divide and 115 m west of the eastern perimeter. BH/SA1 was drilled entirely in tailings to a total depth of 20 m. The auger seized at total depth; the drilling equipment could not advance the borehole any deeper. No water was encountered. A SPT was performed and a split spoon sample was taken at 3 m below the surface. The tailings were characterized as moist, low plastic, poorly graded sandy silt/clay; the MC was about 11 percent. The sample was classified as silt of low plasticity (ML). The SPT blow count was 6, indicating a soft to medium consistency cohesive soil. BH/SA2 was located along the lower perimeter road, about 1,000 m south from the north end of the road. It is about 43 m in from the Avoca River. It was drilled to a depth of about 12 m, where it met refusal. Refusal may have been caused by large river cobbles or boulders. BH/SA2 was drilled for a monitoring well installation. The top-most 2 m are layered clay, gravel, sand with cobbles, grey tailings and coarse sand and gravel. Grey tailings were encountered from 2 m to 7.5 m deep. Gravel with cobbles predominated from 7.5 m to total depth. Water was encountered at 8.4 m.

BH/SA1 is noteworthy because no water was encountered in the tailings. Based only on this borehole, observation of an excavated trash pit in the vicinity of BH/SA1 and instances of standing water on the reclaimed tailings surface, the Shelton Abbey tailings, like the tailings at the Emergency Tailings Pond, apparently do not support a water table or contain flowing water. The tailings are evidently very low permeable material.

It is also noteworthy that the test pits along the lower perimeter road, at the downstream toe of the embankment, did not encounter water. Water was encountered in BH/SA2 at 8.4 m depth, probably an elevation close to the nearby Avoca River stage. At least at the BH/SA2 location, there is an apparent low groundwater gradient between the tailings site and the Avoca River.

Appendix G
Report on Sites of Industrial Archaeology Importance

Feasibility Study for Management and Remediation of the Avoca Mining Area

Report on Sites of Industrial Archaeology Importance

September 2007

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Foreword.

This report was undertaken by Seán Harrington Architects on behalf of CDM (Ireland) Ltd as part of a Feasibility Study for Management and Remediation of the Avoca Mining Area commissioned by the Department of Communications, Marine and Natural Resources. The survey work, research and consultation for this report was undertaken between May and September 2007.

The cover illustration shows the Williams Engine House at Tigroney in lush, colourful autumnal landscape.

Panoramic view of Cronebane Open Cast Mine from Mount Platt. The Motte Stone is in the centre of the view.

Panoramic view from Ballygahan showing the Hodgson's Tramway Arch and the Ballygahan Engine House on the right, and the Tramway Engine House Chimney and the Twin Shafts Engine House on the left, with Avoca village in the distance.

Introduction and brief history

"abandoned metal mines are perhaps the most appealing of all industrial landscapes ….in no way ugly, but possessing a profound melancholy beauty"
W.G. Hoskins, Landscape historian

View of the Vale of Avoca with Williams Engine House on right

The aims of this report are to;

- To identify the sites of industrial archaeological importance
- To document their conditions
- To make recommendations for actions to preserve these sites

View of Tigroney West from Ballymurtagh with William's Engine House on bottom right and Baronet's Engine House on middle left

Mining has occurred in Avoca as early as the Bronze Age. The Greek geographer Ptolemy made a reference to 'Aboka' in a map around AD 150, from which 'Avoca' probably derived, Since this time various metals have been mined with methods changing little until the early 19th century when industrial means such as water wheels and steam engines were introduced. At this time 'Beam type' engine houses were constructed, based on Cornish models, primarily to pump water up from the underground mines. A tramway was constructed in order to transport ore to Arklow for shipment to Swansea Smelters.

Tigroney West Open Cast Mine

Up to 2000 people were employed in the Avoca Mines at different stages throughout the 19th century. Miners were paid with coinage produced by the company, which they could exchange in the town. In the 20th century, various state owned and international companies mined the site with the last operation closing in 1982.

View across the vale of Avoca from Tigroney towards Ballygahan: The Twin Shaft Engine House and the Tigroney Engine House Chimney are on the right and the village of Avoca is on the left

Avoca valley has encountered a mixture of open cast and underground mining. The metals and minerals mined over the centuries included iron, lead, zinc, copper, sulphur, silver and gold. The mines extend on either side of the river both above and below ground, taking in the townlands of Tigroney, Ballygahan, Ballymurtagh, Cronebane and Connary.

Identification and Conditions of the Sites of Industrial Archaeology Importance

The visible industrial archaeology artifacts consist of;

- The Williams Engine House at Tigroney West
- The Ore Bins at Tigroney
- The Baronet's (or farmer's) Engine House, East Avoca
- The Chimney to the former Waggon Engine House at Connary
- The Tramway Engine House Chimney at Ballygahan
- The Twin Shafts Engine House and Chimney at Ballymurtagh
- The Hodgson's Tramway Arch at Ballygahan
- The Ballygahan Engine House and Chimney
- The Mines Office in east Avoca
- The Open Cast Mines at Cronebane, east and West Avoca

The hidden industrial archaeology consists of;

- The Underground Mines, adits and shafts

Other visible artifacts, which are not industrial in character but have either a direct link to the mining legacy of the area or identify a particular place in the landscape are;

- The Motte Stone
- The Marian Cross

View of Ore Bins and Williams Engine House

Tramway Engine House Chimney in Ballygahan

View of Ballygahan Engine House from the road in the valley

Description, Significance and Current Conditions

All of the mines have been disused since 1982. Some of the shafts have been capped off at the top with concrete. The remaining ruins of some of the Engine Houses and chimneys have been repaired in the recent past. The open cast mines have been fenced around. There are serious issues regarding pollution, destabilisation and general health and safety hazards on the site.

The current conditions of the mines and many structures pose serious health and safety concerns that are noted in the Health and Safety Audit of the Avoca Mine Site by GWP Consultants, April 2007. This report refers to this audit in relation to the conditions of the sites of industrial archaeology. As a general point we would recommend that for all the industrial artifacts on the site a full conditions and physical survey should be carried out by an engineer and a conservation architect in order to fully assess their exact condition and to propose meaningful conservation works. The purpose of such conservation works would be to stabilise the artifacts, protect them from further decay, allow the public to view them in a safe manner and ultimately to preserve their legacy for future generations.

Open cast mine in Cronebane

Open cast mine in Ballymurtagh

The most difficult question is what category one allocates to the mines, both the open cast mines and those that are underground, and what strategy should be adapted for their assessment while giving precedence to health and safety. While the mines are not industrial artifacts in the normal sense of the term they can be interpreted as archaeological artifacts in that they are the physical remnant of an industrial mining process on the landscape and are thus a historical relic of that age-old activity.

Entrance to 850 level adit

On the negative side they present various degrees of physical danger to the public and the natural environment such as rock falls, toxic waste, toxic water reservoirs, open shafts, acidic runoff and so. On the positive side the open cast mines are unusual, attractive landscapes while the underground mines, adits and shafts have an air of mystery about them. In addition both types of mines carry the memory of the arduous labour of the miners on the landscape of Avoca and thus tell a story of this activity. They are a significant physical legacy of the mining process in Avoca. The challenge to be addressed is can any significant part of this physical legacy be maintained for the benefit of public education and recreation while making the site safe and clean?

View of two Engine Houses in Ballygahan with slagheap in foreground and Avoca village and church in background

This issue is re-visited near the end of the report. Firstly, the obvious industrial artifacts of the site are documented.

The Avoca Engine Houses and Chimneys; Introduction and history

The Engine House and Chimneys are probably the most important industrial archaeology artifacts on the site.

The purpose of the Engine Houses was to pump water up from the mines so that the work of mining could continue in dry conditions. The house provided a mounting structure for the engine and also protected it from the elements. The site at Avoca contains ruins of several engine houses with just a chimney remaining at Connary. One source estimates that there were up to thirteen engine houses working on the site in the past.

The surviving Engine Houses at Avoca are the largest and most significant group of buildings of this kind in Ireland. Most of the Engine Houses in Avoca were of the Cornish model. The beam pumping engines would have been built in Cornwall based on a type established by James Watt in the 1780s. The basic operations consisted of a steam engine that, through a piston operation, raised and lowered a giant beam that was supported on one of the thick walls of the Engine House. The actions of this beam in turn raised and lowered a long timber pump rod that extended down the mineshaft to which a series of plunger pumps were attached. These forced the water up the rising main in the shaft.

The purpose of the characteristic chimney was to extract smoke and fumes from the boiler house. All the engine houses were constructed in stone with the top part of the chimneys being in brick.

Williams Engine House at Tigroney

Most of the research available is on the William's Engine House. Since it is also the best preserved of the Avoca Mines Engine Houses this report will concentrate on it.

The Williams Engine House is the most striking, the most visible and the most accessible remnant of the industrial mining heritage of Avoca. It is close to the White Bridge within walking distance of the main road from Avoca, on the Tigroney side of the valley. Nestling among pine and birch trees, it is also clearly visible from the main road. It was one of the last Engine Houses to be built in Avoca, which may in part account for its good condition.

Williams Engine House: view from above

Williams Engine house: View from below

Williams Engine House: view inside the walls

The Parraun Foundary in Cornwall built the William's pump engine around 1860. It is called after the William's Brothers of Perranarwortal, Cornwall who operated the mine from 1811-1880. It pumped water from 600 feet below the Engine House. The engine was dismantled in 1884. Experts have claimed that the William's Engine House has certain features over and above those of the typical Cornish model, which along with its good condition makes it highly significant.

The engine shed is built in stone with openings arched in brick. Only some walls remain. Some decay is evident at the top of walls. The chimney has a stone base and a brick top capped with a decorative brick coping. The chimney has been re-pointed in recent years.

For further information on its condition refer to EA134 of GWP Consultants Site Map 7 and Sections 2.4.5 and 3.8 of the Health and Safety Audit of the Avoca Mine Site by GWP Consultants.

In order to preserve this unique Engine House and make it safe for viewing by the public we would recommend the following works;

- removing the ivy from the walls and controlling further growth
- stitching, bracing and pointing the stonework to the walls to stabilize them and make them safe
- re-build collapsed arch in wall
- cleaning up and leveling the ground both around and within the space of the walls and laying substrate and gravel on the surface
- removing the concrete cappings over the shafts and installing metal grills within new concrete surround caps
- floodlighting the shaft from above
- installing a detailed story-board sign on one of the stone walls
- installing a metal or wooden staircase to safely connect the two different levels of the Engine House
- floodlighting the whole ruin at night time
- installing a lightning conductor on the chimney

Any repair work that is carried out to the stonework should be done in a lime and sand mortar only (i.e. no cement) in accordance with good conservation practice.

Williams Engine House: View of chimney stack

Williams Engine House: view of stone arch in reasonably good condition

View from road in the valley with the Williams Engine House and Chimney clearly expressed above the landscape

The Ore Bins at Tigroney

While not buildings as such, the Ore Bins are a very visible and striking industrial artifact. They are located adjacent to the White Bridge and below the William's Engine House. The Ore Bins would have been used for storing the extracted ore prior to transporting it away from the site. They consist of large cylindrical steel bins, a metal platform and timber shoring. They present a striking visual legacy of the operations of the mines in an easily accessible location to the main road and they should be retained if possible.

Ore Bins: View from road

The condition of the Ore Bins is not good. Several structural components have corrosion damage probably caused by acidic runoff. The wooden crib wall is also showing a certain amount of decay and is leaning forward. All of the materials in and around the bins exhibit toxic metal concentrations.

For further information on its condition refer to T145 of GWP Consultants Site Map 7 and Sections 2.5.5 and 3.8 of the Health and Safety Audit of the Avoca Mine Site by GWP Consultants.

Ore Bins: View of metal drums

If it is judged feasible to retain this artifact we would recommend removal and/or treatment of all toxic materials, stabilisation work to both the steel bins and the timber wall and treatment to protect the steel from further erosion and the timber from further decay. The intention would be to devise a method of allowing the public to view this artifact and learn about one process of the mining industry while providing protection, distance and safety.

Ore Bins: View of crib wall

The Baronet's (or Farmer's) Engine House, East Avoca

This is further up the slope from the William's Engine House. Some historians note that this engine house is more typical of the Cornish Engine Houses.

This artifact consists of a partially ruined building and chimney stack. There is much vegetation on and in the building. The stone walls have been braced by a steel structure and have been re-pointed in the recent past. The chimney is in reasonable order though some brick faces and the top is missing. There is no lightening conductor on the chimney.

For further information on its condition refer to EA140 of GWP Consultants Site Map 7 and Section 2.4.5 of GWP Consultants Health and Safety Audit of the Avoca Mine Site.

View of Baronets Engine House

Like with the William's Engine House we would recommend that this artifact be repaired and made safe and accessible to the public.

View of Ballygahan Engine House with Avoca village in the distance

The Chimney to the former Waggon Engine House at Connary

Like all the chimney stacks on the site this is built with stone to the bottom part and with brick to the top section. Some bricks are missing and there is no lightening conductor. The arch at the base of the chimney is partially damaged.

For further information on its condition refer to C03 of GWP Consultants Site Map 5 and Section 2.2.5 of GWP Consultants Health and Safety Audit of the Avoca Mine Site.

View of Tramway Engine House chimney and the Twin Shaft Engine House in Ballygahan

The Engine House at Ballygahon

There are substantial remains to this engine house and chimney and it presents quite a striking feature in the landscape. Some of the remaining walls are up to 9.om high.

The Twin Shaft Engine House.

The walls of the Engine House are up to 8m high and the chimney approx. 16m high with re-pointing to the stonework and brickwork. Some of the pointing has deteriorated and some of the wall is bulging. Further repair work is strongly recommended. This Engine House and Shaft has been restored in recent years.

For further information on its condition refer to WA3 of GWP Consultants Site map 8 and section 2.6.5 of GWP Consultants Health and Safety Audit of the Avoca Mine Site.

View of Twin Shaft's Engine House in Ballygahan

The Ballygahan Tramway Engine House Chimney

Some historians believe that this Engine House may have been built to haul the ore trucks on the tramway (see below). The Engine House has been demolished but the chimney is standing and has been re-pointed in recent years.

For further information on its condition refer to WA4 of GWP Consultants Site Map 8 and Section 2.6.5 of GWP Consultants Health and Safety Audit of the Avoca Mines Site.

The Hodgson's Tramway Arch at Ballygahan

A tramway line was built in 1847 by Henry Hodgson proprietor of the Wicklow Copper Mine Company reputedly because of a shortage of manpower due to the famine.
The purpose of the tramway was to haul ore trucks from Avoca to the harbour in Arklow. Locomotives and horses worked different sections of the tramway. In 1861 as railways were extended from Dublin to Gorey, the Railway Company took over the Hodgson's Tramway. The only visible remnant of this tramway is the Tramway Arch and hence it is a unique industrial artifact of the mining legacy of the site.

View of Hodgson's Tramway Arch with Ballygahan Engine House behind and the hills of Tigroney in the distance

The Tramway Arch is generally in good repair and is not considered a risk. It has been repaired in the recent past including the installation of an impermeable membrane at the former tramway level probably to stop the effects of water erosion on the joints.

For further information on its condition refer to WA8 of GWP Consultants Site Map 8 and Section 2.6.5 of GWP Consultants Health and Safety Audit of the Avoca Mine Site.

Detail view of Hodgson's Tramway Arch in Ballygahan

The Mines Office in West Avoca

This building dates from the 1960s and was used by Avoca Mines Ltd. up until 1982 when the mines finally ceased operations. It is located at the centre of the mining site on the main Avoca/Arklow Road. It is a flat roofed, concrete slab construction. Most of the windows have been boarded up for some time. Some glass is broken. It appears to be generally in sound condition.

For further information on its condition refer to WA128 of GWP Consultants Site Map 8 and Section 2.6.5 of GWP Consultants Health and Safety Audit of the Avoca Mine Site.

Mine's office in landscape

While it is a rather mundane building it represents a physical memory of the more recent mining legacy. It is also a flexible 2-storey building that could be adapted internally in a number of ways and quite easily be given a brand new face externally.

A proposal by The Avoca Mines Heritage Trust (AMHT) would involve the building being used as a joint Mining Visitor Centre and local Craft Centre. This would be a meaningful use for the building as part of a wider project to protect, enhance and provide access to all the physical artifacts of the mining legacy on the Avoca site.

Mines office front view

The Open Cast Mines

There are several open cast mines on both sides of the valley in Tigroney, Cronebane and Ballymurtagh. While these mines are attractive remnants of the age-old mining industry on the natural landscape of Avoca they pose serious health and safety hazards to the environment and the public.

The main rock faces are as follows with the reference given for their condition from the *GWP Consultants Health and Safety Audit of the Avoca Mine Site*;

- Cronebane; Reference Section 2.3.2, Map 6 and Appendix 2, Table 2.1
- East Avoca; Reference Section 2.4.2, Map 7, Table 2 and
- Appendix 2, Table 2.2
- West Avoca; There are three here named Pond Lode Pit, North Lode Pit and The Weaver's Lode Pit. Reference Section 2.6.2, Map 8, Table 5 and Appendix 2, Table 2.3

The long canyon-like open cast mine of Cronebane with its adjacent spoil heap of ochre earth (Mount Platt) is the largest over-ground intervention on the site and is the most spectacular of the remaining open cast mines. Its cliff face walls along the length of one side sparkle with various hues of red, green, grey, purple and ochre as the sun catches it at various times of day.

In many ways it is a wonderful spectacle of nature. The other open cast mines display equally attractive characteristics but to a smaller scale.

There are serious health and safety hazards regarding all of these open cast mines. These include danger of rockfalls from the rock faces, toxic runoff and the presence of toxic reservoirs and contaminated materials on and around the sites. These are explained in detail in the relevant sections of *GWP Consultants Health and Safety Audit of the Avoca Mine Site*.

However the open cast mines are a significant archaeological remnant of the mining industry on the site. In this respect it is desirable that, provided all health and safety hazards are addressed and are manageable in the long-term, parts of some or all of these are retained. These could provide for educational and recreational viewing by the public.

Tigroney west open cast mine: general view from fence

Tigroney west open cast mine: detail view of cliff wall

Cronebane open cast mine: view from Mount Platt

Cronebane open cast mine: general view

The Underground Mines, adits and shafts

The underground mines have not been inspected for this report for obvious reasons of health and safety concerns and lack of protected access. Therefore we are making no comment on their condition. It is recognised that there are health and safety hazards in these unknown areas.

As part of a previous study in 2004 by Howley Harrinton Architects a guided expedition was undertaken into the 850 level adit in Tigroney. This experience demonstrated to us the possibilities of creating a very special educational and tourist attraction that could ensure the preservation of the legacy of the site. Such a project would be an immense undertaking involving a substantial investment to guarantee that all the critical criteria of the Management and Remediation Plan are satisfied particularly those of public health and safety.

Opening up a mine for public access and providing a guided tour would offer a unique experience into the mining heritage of the area and assist in protecting this heritage. Visitors would be able to see colourful deposits of metals and slim-line metallic stalactites, observe the vertical shafts and the conditions under which the miners worked, and gain an understanding of the whole mining process. It would be a wonderful tourist attraction and help the local economy.

We would only recommend at this stage that the idea be given due consideration as part of the overall remediation plan.

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Kenneth Brown, A Unique Cornish Engine House – William's in Avoca, Journal of the Mining Heritage Trust of Ireland, 2, 2002.

Cronebane open cast mine: close up view of cliff wall

View of entrance to 850 level with Williams Engine above

View of adit 850 level

Views inside adit to 850 level