

June 27, 2007

Peter Lee, Ph.D
U.S. Nuclear Regulatory Commission – Region III
801 Warrenville Road
Lisle, IL 60532

Re: Supplemental Site Characterization Report
Breckenridge Disposal Site, Breckenridge, Michigan

Dear Dr. Lee:

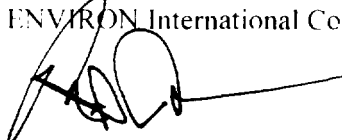
Enclosed with this cover letter is a Supplemental Site Characterization Report (SSCR) for the Breckenridge Disposal Site. The SSCR documents the field efforts undertaken by the Trust in November 2006 and provides volume estimates of surface and subsurface material above the derived concentration guidance levels (DCGLs). The SSCR also proposes a preferred remedial approach.

The Custodial Trust would like to schedule a meeting with the NRC to discuss any questions on the enclosed report and receive any feedback on the proposed remedial approach in the near future.

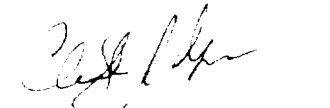
Please contact David Heidlauf, Christopher Greco, or myself at (312) 853-9430 if you have any questions.

Respectfully submitted,

ENVIRON International Corporation


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Enclosures

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The Custodial Trust
Bill Thomas – IEM, Inc.
Alan S. Tenenbaum – U.S. Department of Justice (w/o enclosure)
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James Stropkai – State of Michigan, Department of Attorney General (w/o enclosure)
Scott Cornelius – Michigan Department of Environmental Quality (w/o enclosure)

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**VELSICOL CHEMICAL CORPORATION
BRECKENRIDGE DISPOSAL SITE**

Supplemental Site Characterization Report

Prepared for:

The Custodial Trust

Submitted to:

United States Nuclear Regulatory Commission

Prepared by:

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June 2007

CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
II. BACKGROUND	3
A. Site Description and Historical Uses	3
B. Previous Investigations	3
C. Remedial Work Completed	5
III. REMEDIAL DESIGN CHARACTERIZATION	6
A. Gamma Radiation Survey	6
B. Soil Boring Investigations	6
1. Sampling Methods	7
2. Scanning Methods	7
C. Confirmation Soil Sampling	8
D. Decontamination and Waste Management	8
E. Equipment Release Survey	9
IV. RESULTS AND ANALYSIS	10
A. Gamma Radiation Survey Results	10
B. Soil boring Investigation Results	10
C. Waste Inventory Estimates	12
V. REMEDIAL APPROACH	14
A. Introduction	14
B. Analysis of Alternatives	
1. Alternative 1 – Excavation and Disposal at Energy Solution’s Clive, Utah Facility	14
2. Alternative 2 – Excavation and Disposal at EQ’s Bellville, Michigan Facility	15
3. Alternative 3 – Use of Intentional Mixing with On-Site Disposal	15
C. Selected Alternative	17
VI. REFERENCES	18

CONTENTS

(continued)

T A B L E S

Table 1:	Summary of Confirmation Samples
Table 2:	November 2006 Laboratory Results
Table 3:	Background Adjusted DCGLs
Table 4:	DCGL Comparison
Table 5:	EVS Volume Estimates by Remedial Area
Table 6:	Manually Calculated Volume Estimates by Remedial Area

F I G U R E S

Figure 1:	Site Location Map
Figure 2:	Site Layout Map
Figure 3:	Historical Sampling Locations
Figure 4:	Extent of Remediation Completed During Fall 2004
Figure 5:	November 2006 Boring Locations
Figure 6:	Walk Over Survey Results
Figure 7:	November 2006 Surface Impacts
Figure 8:	November 2006 Subsurface Impact
Figure 9:	Data Correlation
Figure 10:	Estimated Extent of Surface Impacts
Figure 11:	Estimated Extent of Subsurface Impacts

A P P E N D I C E S

Appendix A:	IEM Field Data Sheets
Appendix B:	Soil Boring Logs
Appendix C:	Outreach Laboratory Data Package
Appendix D:	Backup Material for Data Correlation
Appendix E:	EQ's Permit Modification

ACRONYMS AND ABBREVIATIONS

AEC	Atomic Energy Commission
Bgs	below ground surface
CWA	confirmed waste area
DCGLs	Derived Concentration Guideline Levels
ENVIRON	ENVIRON International Corporation
GM	geiger-mueller radiation detector
GPR	ground penetrating radar
GPS	Global Positioning System
IEM	Integrated Environmental Management, Inc.
LANL	Los Alamos National Laboratory
m ²	square meters
m ³	cubic meters
mrem/yr	millirem per year
MCC	Michigan Chemical Corporation
NRC	Nuclear Regulatory Commission
ORAU	Oak Ridge Associated Universities
PPE	personal protective equipment
PWAs	potential waste areas
RCRA	Resource Conservation and Recovery Act
RESRAD	Dose modeling software
Sciencetech	Sciencetech Inc.
Site	Breckenridge Disposal Site, Breckenridge, Michigan
SSCWP	Supplemental Site Characterization Work Plan
TCLP	Toxicity characteristic Leach Procedure
UCL	upper confidence limit
USEPA	United States Environmental Protection Agency
Velsicol	Velsicol Chemical Corporation
NaI	2-inch by 2-inch sodium iodide gamma scintillation detector
U-238+D	Uranium 238 and the progeny associated with the decay of U-238
Th-232+D	Thorium 232 and the progeny associated with the decay of Th-232

I. INTRODUCTION

The Breckenridge Disposal Site, located in Breckenridge, Michigan (the "Site"), contains radioactive wastes that were buried in accordance with the regulations in effect in the late 1960s and early 1970s. Subsequently, the United States Nuclear Regulatory Commission (NRC) directed in a June 19, 2002 letter that licensable waste material be removed from the Site. With the bankruptcy of Fruit of the Loom, responsibility for the Site was transferred to a Custodial Trust in August 2002. Based on available data, the Bankruptcy Settlement Agreement allocated \$700,000 to a successor Liquidation Trust to fund the remediation and closure of the Site.

ENVIRON International Corporation (ENVIRON) on behalf of the Custodial Trust, prepared an August 17, 2004 Remedial Work Plan for the Site, which was approved by the NRC on August 31, 2004. The Remedial Work Plan outlined procedures to remove the radioactive filtercake and soils (the "impacted material") from the Site in order to achieve site closure for unrestricted use.

Remedial activities began in the field on September 20, 2004, but were suspended on October 15, 2004 due to unanticipated site conditions. As a result of the unexpected increase in the volume of material requiring off-site management, it was determined that the Successor Liquidation Trust did not have sufficient funds to complete the waste excavation work at the time. At the direction of the NRC, ENVIRON, on behalf of the Custodial Trust, prepared a May 3, 2005 letter report summarizing the fall 2004 remedial actions.

In order to determine the level of funding needed to achieve an unrestricted use release, a Work Plan for Supplemental Site Characterization (the "SSCWP") was prepared and submitted to the NRC in June 2005. The NRC provided comments in a June 23, 2005 telephone conversation record, which were transmitted to ENVIRON via facsimile on July 1, 2005. ENVIRON retained Integrated Environmental Management, Inc. (IEM) of Knoxville, TN in the fall of 2005 to assist with the finalization and implementation of the SSCWP. As a precursor to the submittal of the Revised SSCWP, ENVIRON submitted an April 25, 2006 Revised Dose Assessment Methodology letter to the NRC. This letter presented rationale and justification for revised derived concentration guideline levels (DCGLs), as the existing DCGLs were determined to be overly conservative and resulted in potential radiation doses that were far below the limits established by the NRC for the unrestricted use of the Site. The NRC provided comments to ENVIRON's Revised Dose Assessment Methodology in a May 12, 2006 letter. In order to expedite the resolution of the NRC's concerns, the Custodial Trust and ENVIRON met with the NRC on June 22, 2006. At this meeting, the NRC requested ENVIRON collect a confirmation sample in the area designated as CWA-3 to verify the concentrations of Uranium-238 (U-238) and Radium-226 (Ra-226) in the

subsurface soil.¹ ENVIRON submitted a notice of sampling activities to the NRC on July 11, 2006 and sampling was conducted on July 14, 2006. ENVIRON submitted a response to NRC's May 12, 2006 comments letter on August 3, 2006.

ENVIRON submitted the Revised SSCWP on September 19, 2006 which included a response to the NRC's June 23, 2005 comments. The Revised SSCWP was approved in an October 26, 2006 letter from the NRC and the Revised SSCWP was implemented during November 2006.

The purpose of this report is to document the field activities completed during November 2006, present volume estimates of material exceeding the DCGLs, and to propose a conceptual approach for achieving the NRC's unrestricted release criteria. After receiving NRC input on the proposed remedial approach, ENVIRON, on behalf of the Custodial Trust, will upon receipt of additional funding into the Successor Liquidation Trust, prepare a Revised Remedial Work Plan to complete the remediation of the Site.

¹ It was observed that this sample, CWA-3, exhibited equal concentrations of uranium and radium (i.e. secular equilibrium), while all other CWA samples exhibited a much higher concentration of U-238 than Ra-226.

II. BACKGROUND

A. Site Description and Historical Uses

The Site is located at 4490 East Madison Road about 4 miles east of downtown St. Louis, in Bethany Township, Michigan (see Figure 1). The Breckenridge property is a narrow triangular-shaped parcel of land that is mostly flat and grassy with scattered large trees. The Site, bounded by Madison Road on the north, by Bush Creek on the east, and by farmland on the west, is approximately 1.25 acres. A Site Layout Map is provided in Figure 2. The nearest residence is located approximately one-quarter mile to the east, across Bush Creek.

Between 1967 and 1970, the Site was used for the disposal of process wastes (a solid waste byproduct) from an yttrium recovery operation managed by Michigan Chemical Corporation (MCC). These disposal activities were authorized under U.S. Atomic Energy Commission (AEC), License No. SMB-0833, and were performed in accordance with 10 CFR 20.304, "Disposal by Burial in the Soil", which has since been repealed. The buried waste material is a solid waste byproduct known as filtercake, which originated from an yttrium extraction process. The filtercake is a dense, clay-like material containing elevated levels of naturally occurring uranium and thorium. Disposal records reported that the wastes were disposed in trenches predominantly oriented in a north-south direction. All waste burial was reportedly performed inside the fenced area. After MCC ceased yttrium recovery operations, the AEC License No. SMB-0833 was terminated.

When elevated levels of surface radioactivity were identified at the Site by the NRC in 1996, the NRC requested that the radiological conditions at the Site be evaluated in terms of contemporary regulations. In response to the NRC's request, several radiological evaluations have been performed at the Site in recent years. These and other previous investigations are discussed in the next section.

B. Previous Investigations

Multiple radiological characterization investigations have been conducted at the Site during the last 25 years. Investigations conducted include:

- 1981-1982: Oak Ridge Associated Universities (ORAU) conducted a ground penetrating radar (GPR) geophysical survey of Site that identified subsurface disturbed areas that corresponded to non-vegetative areas in a 1970 aerial photograph; collected 40 surface soil samples, and conducted 18 on-site soil borings (18 feet deep) surrounding buried filtercake disposal areas (by ORAU, Reference 1). Investigation details and sample locations are shown on Figure 3.

- 1996: NRC conducted five “shallow” excavation trenches; NRC conducted a radiological scoping survey (by NRC, Reference 2).
- 1997–1999: Sciencetech conducted 56 soil borings (8 feet deep); collected 229 soil samples to demarcated the “affected area” based on average activity levels from the soil boring samples, and conducted a historical radiological process review (by Sciencetech, Reference 3). Investigation details and sample locations are shown on Figure 3.
- 2001–2002: Sciencetech conducted a magnetic gradiometer geophysical survey of the Site that identified multiple magnetic anomalies that Sciencetech identified as potential waste areas (PWAs); conducted a surface screening radiological survey; conducted 80 soil borings for visual and screening determination of the presence of filtercake to try to delineate the extent of wastes (the soil borings were conducted in 7 of the 9 geophysical target areas); soil boring data was used to designate 7 “confirmed waste areas” (CWAs) and the remaining 2 non-drilled geophysical targets were designated as PWAs; filtercake samples were collected from 19 soil borings and 2 or 3 soil samples from each CWA were composited for off-site radiological analysis; developed a filtercake waste volume estimate of 113 m³ for the Site (by Sciencetech, Reference 4). Investigation details and sample locations are shown on Figure 3.
- March 2004: ENVIRON conducted nine soil borings (8 feet deep), collected nine samples for Resource Conservation and Recovery Act (RCRA) Toxicity Characteristic Leach Procedure (TCLP) characterization analysis, and collected two soil samples for radiological analysis. Filtercake waste/impacted soil wastes were determined to not constitute a RCRA characteristic waste (by ENVIRON, Reference 5). Investigation details and sample locations are shown on Figure 3.
- September/October 2004: ENVIRON, conducted 41 soil borings (10 feet deep) with on-site scanning and radiological analysis of 0 to 10 feet composite samples; conducted 13 pre-excavation trenches for visual identification of filtercake waste and for radiologically screening for impacted soils (by ENVIRON, Reference 6). In addition to nine filtercake disposal areas that were previously identified, pre-excavation trenches conducted as part of the fall 2004 remedial action identified the apparent presence of an additional four to five disposal areas of filtercake and/or radiologically impacted soils. Investigation details and sample locations are shown on Figure 3.

- July 2006: ENVIRON conducted two soil borings (10 feet deep) from the area designated as CWA-3 with on-site scanning and radiological analysis on a composite sample from the filter cake horizon from each boring. Investigation details and sample locations are shown on Figure 3.

C. Remedial Work Completed

The August 17, 2004 Remedial Work Plan (by ENVIRON / Sciencetech, Reference 7) called for the removal and off-site disposal of radioactive filtercake and associated radiologically impacted soils from nine CWAs. The projected extent and waste inventory estimates were approximately 410 m² and 113 cubic meters (m³) respectively. The anticipated volume of material to be sent for off-site disposal was 226 m³ in anticipation of unavoidable mixing of adjacent soils with the filtercake during the excavation process.

Remedial activities began in the fall of 2004 when two of the CWAs were remediated. The extents of the remediated areas are shown on Figure 4. Approximately 200 tons of waste material (i.e., filtercake, debris, and impacted soil) were containerized and shipped to the Envirocare disposal facility located in Clive, Utah for disposal. An estimated 77 m³ of filtercake and soils were removed from CWA-2, and 24 m³ of filtercake were removed from CWA-7, compared with an expected volume of 12 m³ and 32 m³ respectively. Remedial work was suspended and a number of test trenches were completed as shown on Figure 4 to better understand conditions at the Site. Due to the increase in the projected volume of material requiring offsite management, the decision was made to halt the remedial activities and preserve the remaining funds for additional characterization. This decision was transmitted to the NRC in an October 15, 2004 letter.

The Remedial Work Plan also called for the collection of confirmation samples from the bottom of the excavation; however, these confirmation samples were not collected due to the suspension of remedial activities. A total of 57 soil borings were also planned as part of the Final Status Survey. The Site was subdivided into 3 survey units, and 19 borings were to be completed in each of these survey units. Prior to the suspension of field work, 41 of the planned borings, primarily located in non-impacted areas of the Site, were completed. This data was reported in ENVIRON's May 3, 2005 letter report documenting remedial activities.

III. REMEDIAL DESIGN CHARACTERIZATION

A. Gamma Radiation Survey

ENVIRON subcontracted IEM to perform the walkover radiation survey. The purpose of the walk over radiation survey was to locate additional soil boring and provide information on the relative extent of surficial impacts.² The walkover radiation survey was conducted using a calibrated gamma scintillator and was completed between November 6 – 7, 2006.³ The detector was used in conjunction with a global positioning system (GPS) device that recorded the position of each reading. The surveyor walked to each grid intersection and held the detector as close to the surface of the ground as possible, approximately six (6) inches from the surface of the soil. The associated radiation measurement was recorded and the procedure was repeated at the next grid intersection. Daily logs, calibration logs, and background radiation readings are provided in Appendix A.

B. Soil Boring Investigations

1. Sampling Methods

ENVIRON subcontracted Mateco Drilling Company (Mateco) of Grand Rapids, Michigan to perform the drilling activities and IEM to provide radiological screening and health and safety support. Each soil boring was advanced at the locations shown on Figure 5 using a track-mounted Geoprobe® 54DT soil sampling system using 4-foot-long stainless steel macro-core or closed-piston samplers. The following procedures were completed for each soil:

- The location of each soil sample was based on measurement from a Site specific reference point (i.e., a fence corner) and site features. The locations were then marked with a post labeled with the soil boring ID.⁴

² Previous Site investigations suggested that measurements made using 2x2 NaI detectors were representative of the concentrations of contaminants in the surface and near-surface soils and that the readings were not impacted significantly by the buried filtercake material several feet below the ground surface.

³ The radiation survey was conducted with a Ludlum Model 2241 with a Ludlum Model 44-10 probe 2x2 NaI gamma scintillation detector.

⁴ The locations of the 97 borings were surveyed by an licensed professional surveyor at the completion of the field work.

- All sampling equipment was decontaminated as described below prior to commencing soil sampling activities.
- Each soil boring was continuously sampled using a 4-foot-long stainless steel macro-core samplers fitted with a new, disposable plastic liner. Upon removal, the soil core boring number and sample interval was marked on the plastic liner using a permanent marker. All soil cores were transported to a non-impacted area near the north end of the site for processing.
- The lithologic description of each soil boring was logged on a field log sheet by an ENVIRON geologist. The lithologic description included the soil matrix (i.e., clay, sand, silt); color, hardness, grain size, moisture content, visual or olfactory evidence of impact, and activity levels measured as gamma radiation count rates.

At the majority of the sample locations, the soil borings were advanced to approximately 12 feet below ground surface (bgs) or to at least 2 feet below the deepest interval exhibiting elevated radiation readings. However, boring refusal was encountered SB-35 and SB-58 prior to delineating the vertical extent of elevated activity levels. Multiple attempts were made to advance the borings deeper, but all were unsuccessful. Vertical delineation at these locations will be part of the remedial work at the Site. In addition to the deeper soil borings, eight soil borings (SB-90 to SB-97) were advanced to 4 feet bgs to evaluate potential surface impacts identified during the gamma radiation walkover survey. The soil boring logs are included in Appendix B.

2. Scanning Methods

Each soil core was surveyed for gamma radiation (gross count rates) using a Ludlum Model 2241 with a 44-10 probe 2x2 NaI detector with a lead cuff located at the end of the detector. Daily logs, calibration logs, and background readings are provided in Appendix A. The lead cuff was used to decrease the detectable background and increase the directional dependence of the detector. The detector was used to measure 10-second static counts at 6-inch intervals along the recovered soil core as follows:

- IEM calibrated the scanning equipment using a radiation check source daily.
- Any excess dirt or other material on the outside of the sample sheath and on the work surfaces was wiped off.

- Each core in the core set was scanned with the detector in a fixed geometry (determined by the Project Health Physicist) with respect to the sheath. The counts were accumulated for ten (10) seconds each, beginning at a point 3 inches from the top of the core and every 6 inches thereafter. The readings were recorded on a field log sheet along with the geologic description.
- Each 6-inch or 12-inch interval was placed in a plastic Ziploc bag directly from the Geoprobe sample sheaths using stainless steel sampling tools and a clean, gloved hand. Each bag was labeled with the boring location and sample depth interval. The sample interval was selected based on the activity readings. If elevated activity or the presence of filter cake was only detected in a 6-inch interval, only that 6-inch interval was bagged. If similar readings were detected over the 12-inch interval, the entire 12-inch interval was bagged. After collection, the sample bags were set aside on covered plastic tarps for potential laboratory analysis.

C. Confirmation Soil Sampling

Soil samples selected for laboratory analysis are summarized in Table 1. The sample locations and sample intervals were chosen to represent the full range of activity levels encountered during the investigation. Samples not selected for off-site analysis were left on site and covered with several layers of plastic tarp. Samples with activity levels greater than 12,000 cpm were buried approximately 6-inches bgs in an area with documented impacts.

The samples collected for confirmation testing were analyzed by Outreach Laboratory in Broken Arrow, Oklahoma for gamma spectroscopy to quantify uranium-238+D and thorium-232+D activity levels. These isotopes were quantified using the photo peaks of their decay daughters. The laboratory was required to provide a minimum detectable activity of 2 pCi/g for uranium-238+D, and thorium-232+D. Alpha spectroscopy analysis was used for selected samples to measure isotopic uranium and isotopic thorium analyses using Los Alamos National Laboratory (LANL) Method ER200 and LANL ER290, respectively. The samples analyzed via alpha spectroscopy are described in Table 1.

D. Decontamination and Waste Management

All equipment was decontaminated by either steam cleaning with a high-pressure washer or washing in a low phosphate detergent such as Alconox™ followed by a clean water rinse. All sampling equipment was surveyed for contamination prior to being released as clean waste for disposal as general trash. All decontamination water was allowed to drain out on the ground in the vicinity of the work area. All materials and vehicles brought to the Site were surveyed and radiologically released prior to leaving the Site.

E. Equipment Release Survey

All equipment used during intrusive activities was decontaminated at the completion of all work. Following appropriate decontamination, all equipment was subject to a release survey prior to leaving the Site. This equipment included hand tools, Geoprobe, survey instruments, and personnel protective clothing. The equipment release survey consisted of scanning with a GM detector. The GM thin window "pancake" detector was used to "frisk" equipment, personnel, waste containers, etc., to verify that no contamination was tracked off site. Release limits for personnel and equipment are presented in the table below. These values are traditional values originally presented in the NRC Regulatory Guide 1.86 (NRC, Reference 8). Since the natural thorium limit is more restrictive than the natural uranium limit and field-screening techniques cannot distinguish between the two, the natural thorium limit was used.

Acceptable Surface Contamination Levels:

Nuclide	Average ¹	Maximum	Removable
Natural Thorium	1,000 dpm/100cm ²	3,000 dpm/100cm ²	200 dpm/100cm ²

Notes:

dpm = disintegration per minute

¹ Count rates were not averaged over an area greater than 1 m².

IV. RESULTS AND ANALYSIS

A. Gamma Radiation Survey Results

The results of the walkover survey are shown in Figure 6. The background of the gamma scintillation detector was determined to be $7,243 \pm 339$ counts per minute (cpm) when the detector was held approximately six inches above non-impacted soil. The grids that exhibited elevated readings are identified in Figure 6. Grids with radiation measurements that were more than two times (2x) background (e.g. greater than 14,486 cpm) were colored "yellow" in the figure. Those grids that exhibited a radiation level in excess of 3x background (e.g. greater than 21,729 cpm) were colored "red". The walk over survey was a qualitative measure responding to radioactive materials in the surface soils and larger concentrations of buried filtercake. There was no method to correlate the readings to actual concentrations of radioactive materials or to identify the specific isotope that contributed to the elevated reading. As discussed in Section III.A, the results of the walk over radiation survey were used to locate borings SB90 through SB97. As shown on Figure 6, a large number of borings were located in the area of relative impacts identified during the walkover survey. Based on the review of the available borings in the areas of relative impacts, field screening results for the borings are sufficient for use in estimating surface volumes.

B. Soil Boring Investigation Results

As discussed in Section III.C, samples from a subset of the total borings were sent to an offsite laboratory for analysis. From the 97 borings completed at the Site, 34 samples were analyzed for gamma spectroscopy and 9 samples were analyzed for isotopic uranium and thorium at Outreach Labs in Broken Arrow, Oklahoma. The laboratory results for Thorium 232, Uranium 238, and Radium 226 are shown in Table 2. The laboratory data package is provided in Appendix C.

The results were compared to the DCGLs previously derived for the Site; the contribution from natural background was added to the DCGL for purposes of direct comparison to the analytical results. The background levels were presented in ENVIRON's September 19, 2006 submittal. The DCGLs and associated radiation background are provided in Table 3. Table 4 compares the laboratory sample results with the DCGLs plus background. Samples that exceed the DCGLs are shown in italics and shaded with a grey background. For samples that were analyzed for isotopic uranium and thorium via alpha spectroscopy, those results are used in place of the U-238 and Th-232 results from the gamma spectroscopy analysis. The results provided by alpha spectroscopy provide a lower detection limit and a higher precision result compared to the results provided by gamma spectroscopy. In areas where the soil samples indicate the presence of uranium and radium in secular equilibrium, the DCGLs for uranium and radium will be set to equal concentrations of 1.3 pCi/g on the surface and 10.5 pCi/gram in the subsurface above background..

Locations that exceed the DCGLs are shown on Figures 7 and 8, for surface and subsurface soils respectively.

A regression correlation was derived between gamma count rates measured in the field and the laboratory determined radionuclide activities for Site soils. The correlation was used to determine whether a field screening value is above the Site specific DCGL and incorporated into volume estimate calculations. As the gamma count rate does not differentiate between isotopes, the sum of U-238, Th-232, and Ra-226 activities were compared with field screening values. Based on the statistical evaluation described below, the subsurface field screening value that indicates a potential DCGL exceedance is 4,700 cpm.

In general, regression correlations between field screening instruments and laboratory analytical results can be used to predict the laboratory values corresponding to various field measurements, along with confidence limits for the predictions. To develop the correlation for this Site, a subset of the samples values linearly correlated around the sum of the Site specific DCGLs (66 pCi/g), as opposed to correlating over the entire range of detected values were used. Six samples outside the linear range were excluded from the calculations (SB58-6-9, SB58-9-10, SB40-4-55, SB29-5.5-6, SB54-3-4, and SB40-11-12). In addition, due to heterogeneity of the soils, six outlier values were also removed from the correlation analysis (SB60-0-1, SB58-10-11, SB63-4-5, SB22-1-2, and SB40-6-7).

The selected data were log transformed and a least-squares linear regression was performed. Figure 9 shows the regression correlation together with the 75% prediction limits calculated using Microsoft Excel statistical add-on software Analyse-it version 1.73. Excellent correlation between the two methods was obtained as indicated by the R-squared value of 0.80. The results suggest that a field screening value of 4,700 cpm (log 3.67), the point at which the 75% upper prediction limit (UPL) equals the sum of the DCGLs, 66 pCi/g (log = 1.82), should be used as a field screening value to identify samples that exceed the site-specific subsurface DCGLs. Figure 8 shows the location of field screening values that exceed this action level. The dose assessment conceptual model was taken into consideration on Figure 8. A boring that had readings above 4,700 cpm may not have been indicated as impacted if the readings were close to 4,700 cpm, the thickness of elevated readings were less than two feet, and at least 5 feet of cover material with readings below 4,700 cpm was present. For example, while SB-5 recorded a field screening reading of 5,030 cpm from 5.0 to 6.5 feet bgs. Since the thickness of material at the DCGL is less than 2 feet and there is 5 feet of clean cover material, SB-5 was not considered to be impacted above the DCGLs. Backup material for the data regression is provided in Appendix D.

Due to the response limitations of the field screening instrument, it was not possible to calculate a surficial action level by this method.⁵ Therefore, the action level was selected by

⁵ The action level calculated by the same method used for the subsurface soils would be below the instrument background readings recorded by IEM during the field activities and provided in Appendix A.

inspection. As shown in Table 4, the lowest representative field screening reading that corresponds to an exceedance of the DCGL is 3,700 cpm in boring SB-44. Therefore, the action level for surface soils will be 3,700 cpm. Figure 7 shows the location of field screening values that exceed this action level.

C. Waste Inventory Estimates

Historical data was incorporated with the most recent data to develop the estimated extent of material above the DCGLs as shown on Figures 10 and 11. Because the data has changed the footprints of existing CWAs and added newly identified impacted areas, ENVIRON has renamed areas that require remedial action as Remedial Areas (RAs) in order to avoid confusion. The designated RAs are shown on Figures 10 and 11. In cases where the most recent data contradicts historical data, more weight is given to the recent data. This compilation of data was interpreted to develop volume estimates to be used for remedial planning.

For surficial impacts, the waste inventory estimate was developed by calculating the area of impacted material as shown on Figure 10 and multiplying it by 15 centimeters (cm), or 0.5-feet (ft). Based on this methodology, surface impacts occupy a footprint of approximately 10,000 square feet with a volume of 185 cubic yards.

Volume estimates for subsurface material were developed using two methods. First, Environmental Visualization Software (EVS) developed by Ctech, was used to estimate the volume of materials exceeding 4,700 cpm. EVS uses geostatistical methods (i.e., krigging) to create a 3-Dimensional model of all the activity readings collected in November 2006. Using this model, EVS then calculates a volume of material above a certain action level, in this case 4,700 cpm. EVS calculated a volume of material above 4,700 cpm to be 542 cubic yards. This volume calculated by EVS represents the precise volume based on the statistical model, and does not account for practical considerations of soil excavation. Therefore, a 2:1 mixing ratio is assumed for the volume estimate. The volume estimate based on the modeling is 1,084 cubic yards. Table 5 breaks down the volumes estimates by RAs.

The second method was to manually interpret the data to estimate the volume of material exceeding the DCGLs. An ENVIRON engineer reviewed the data, again taking into consideration the dose assessment conceptual model, to develop the length and width of the RAs, as well as the average thickness of the impacted material for each RA. The volume estimate based on this method was 985 cubic yards. This methodology already factors in the soils mixing, therefore, no mixing ratio is applied. The results for each RA are shown in Table 6.

The subsurface volume estimates calculated by each method are consistent, therefore, the average value, 1,035 cubic yards, will be used as the volume estimate for subsurface soils. These estimates represent the volume in place. During excavation, the volume of material increases, therefore, a fluff factor of 1.25 was used to account for this expansion. Based on this evaluation, a

surface volume of 231 cubic yards and a subsurface volume of 1,293 cubic yards will be used for remedial planning purposes. The actual volume remediated may be more or less, depending on the effectiveness of the remedial action.

V. REMEDIAL APPROACH

A. Introduction

The primary objective of Site remediation will be to achieve compliance with the NRC's unrestricted use release criteria. ENVIRON has previously established DCGLs to be used during remediation to satisfy this criteria of less than 25 mrem/year over the period of 1,000 years in the future. Section IV identifies RAs and provides volume estimate of areas that do not meet the release criteria. ENVIRON has identified the following four alternatives to address material exceeding the DCGLs at the Breckenridge Disposal Site. Each is discussed in detail below.

- Alternative 1 – Excavation and disposal at Energy Solution's Clive, Utah Facility
- Alternative 2 – Excavation and disposal at EQ's Bellville, Michigan Facility
- Alternative 3 – Intentional mixing and on-site disposal.
- Alternative 4 – Combination of Alternatives 1 and 3.

B. Analysis of Alternatives

1. Alternative 1 – Excavation and Disposal at Energy Solution's Clive, Utah Facility

Alternative 1 includes the excavation and offsite disposal of waste materials exceeding the subsurface DCGLs. Material exceeding the subsurface DCGLs would be removed from the waste areas and loaded into special containers. The containers will be transported by truck in approved shipping containers to a transfer station where they will be loaded onto railcars for transport to the disposal facility. The disposal facility under Alternative 1 is Energy Solution's (f/k/a Envirocare) facility located in Clive, Utah. Surface material exceeding the surface DCGL, but below the subsurface DCGLs will be placed in the excavations. Alternative 1 is a similar remedial approach initiated at the Site in 2004 prior to being halted due to unexpected conditions.

From past experience, Alternative 1 is implementable and fully protective of human health provided adequate funding is available. Compared with the other alternatives, the *relative risk of remedy* is higher than the four other remedies considered because of the volume of material transported and the distance to the disposal facility. The Trust would be able to achieve the NRC's unrestricted release criteria under Alternative 1. The major drawback of Alternative 1 is the transportation cost associated with shipping almost 1,300 cubic yards of waste material over 2,000 miles to Utah. Alternative 1 is the most expensive alternative and there would be little contingency for unexpected conditions.

2. Alternative 2 – Excavation and Disposal at EQ's Bellville, Michigan Facility

Alternative 2 includes the excavation and offsite disposal of waste materials exceeding the DCGLs. Material exceeding the DCGLs will be removed from the waste areas and loaded directly into trucks for transport to the disposal facility. The disposal facility under Alternative 2 is EQ's facility located in Bellville, Michigan. The EQ facility is licensed by the State of Michigan to receive limited quantities of naturally occurring radioactive materials under a permit modification granted in 2006.

Whether Alternative 2 is a viable option is unknown at this time because the disposal of waste at EQ's facility would require certain NRC exemptions and MDEQ approval. According to EQ's permit modification, a copy of which is provided in Appendix E, the material would need an exemption under 10 CFR 40.14 and declared to be no longer a low level radioactive waste. This exemption is required in order for the State of Michigan to approve the disposal at the EQ site. It is estimated that the exemption would cost on the order of \$100,000 to pursue and defer remedial actions at the Site by approximately one year.

If the necessary approvals are granted, the implementation of Alternative 2 would achieve the NRC's unrestricted release criteria and be fully protective of human health. Alternative 2 provides many advantages over Alternative 1. First, EQ's facility only 140 miles from the Site, thereby reducing transportation costs significantly. Additionally, since the material is directly loaded into the transport vehicle, the waste staging and handling process will be more efficient. Alternative 2 has a lower risk of remedy compared with Alternative 1 because of its comparatively shorter distance to the disposal facility. The one drawback to disposal at EQ's facility, besides the cost and uncertainty of the obtaining the exemption, is the waste acceptance criteria (WAC) of 50 pCi/g for Ra-226. In order to meet the WAC, some dilution and/or mixing of excavated material would be required prior to shipment. Alternative 2 would cost less than Alternative 1, mainly from the savings transportation cost.

3. Alternative 3 – Use of Intentional Mixing with On-Site Disposal

Alternative 3 includes the onsite mixing of waste materials with clean materials to achieve compliance with the release criteria. This approach, presented in NUREG-1757 revision 2 (NRC, Reference 9), released in September 2006, would eliminate all transportation and disposal costs from remediation. Mixing would occur *ex situ*, though the exact mechanism has not been identified. After mixing and confirmation sampling, the material would be placed back in the excavations. Alternative 3 would also include the

placement of a 1 foot of clean fill over the remedial footprint and the re-vegetation of the Site.

The implementation of Alternative 3 would achieve the NRC's unrestricted release criteria and be fully protective of human health. The use of intentional mixing with onsite disposal would require specific approval from the NRC Region III. The main advantage of Alternative 3 would be the elimination of transportation and disposal costs. Alternative 3 has a lower risk of remedy compared with Alternatives 1 and 2 because no offsite transport is required. However, the volume of material handled would increase as clean material would be needed to be excavated and mixed with impacted material in order to achieve the release criteria. The additional volume of non-impacted material required to achieve NRC's unrestricted release criteria may be burdensome in areas of high activity, such as RA-7. Alternative 3 is the lowest cost option because of the elimination of transportations and disposal cost.

4. Alternative 4 – Combination of Alternative 1 and 3

Alternative 4 includes the excavation and disposal of a smaller quantity of highly impacted material and the onsite mixing of the remaining waste materials with clean materials to achieve compliance with the release criteria. Material selected for off-Site disposal would be removed from the waste areas and loaded into special containers. The containers will be transported by truck in approved shipping containers to a transfer station where they will be loaded onto railcars for transport to the disposal facility. The disposal facility under Alternative 1 is Energy Solution's (facility located in Clive, Utah. The amount of material selected for off-Site disposal has not been evaluated, so for cost estimated purposes, it is assumed that 312 cubic yards of the material exhibiting the highest activity would be selected for off-Site disposal.⁶ The remaining material would be excavated and mixed with clean overburden and surrounding soils until it is below the DCGLs.⁷ Alternative 4 would also include the placement of a 1 foot of clean fill over the remedial footprint and the re-vegetation of the Site.

The implementation of Alternative 4 would achieve the NRC's unrestricted release criteria and is fully protective of human health. The use of intentional mixing with onsite disposal would require specific approval from the NRC Region III. Alternative 4 has a lower risk of remedy compared with Alternatives 1 and 2 because of its reduced volume of material requiring offsite disposal. The cost of Alternative 4 lies somewhere in between Alternatives 1 and 3, depending on actual amount disposed of offsite.

⁶ The volume estimate is based on the volume estimate of RA-7 and one half the volume of estimate of RA-4. From Table 5, these two RAs exhibited higher levels of activity.

C. Selected Alternative

Based on ENVIRON's review, on behalf of the Custodial Trust, of the available remedial alternatives, Alternative 4 is proposed as the preferred remedial approach at the Site. All Alternatives are fully protective of human health. Alternative 1 has the highest relative risk of remedy. Alternative 2 was eliminated due to the high uncertainty associated with obtaining the necessary exemptions and approvals. Alternative 1 was eliminated because of the risk of remedy and the high transportation costs. Alternative 3 and 4 have similar cost, but since Alternative 4 involves the removal of the material exhibiting the highest activity, Alternative 4 was selected as the preferred remedy. The Custodial Trust believes that Alternative 4 is appropriate for the Site under NRC regulations and Site conditions and allows the Custodial Trust to achieve the unrestricted release criteria in a cost effective manner. The Custodial Trust proposes that material above a yet to be determined activity level be excavated and disposed of at Energy Solution's Clive, Utah Disposal Facility. After confirmation sampling, the material will be returned to the excavations and covered with 1 foot of clean fill from an off-site location.

The Custodial Trust and ENVIRON would like to schedule a meeting to discuss the above options and ENVIRON's selected remedy. Upon receiving NRC feedback on the proposed remedy, ENVIRON, barring sufficient funds, will proceed with a detailed cost estimate and design.

⁷ A revision to the conceptual model is required because this remedial approach does not fit within the current model.

VI. REFERENCES

Reference

No.

- 1 Oak Ridge Associated Universities. 1982. *Radiological Assessment of the Breckenridge Disposal Site, Velsicol Chemical Corporation, St. Louis, Michigan* July.
- 2 Nuclear Regulatory Commission. 1996. Report on the Inspection of the Breckenridge Disposal Site by NRC Region III
- 3 Sciencetech, Inc. 1999. *Radiological Evaluation of the Breckenridge Disposal Site*. August.
- 4 Sciencetech, Inc. 2002. *Breckenridge Disposal Site, Buried Filtercake Waste Characterization Report*. Document No. 82A9433, Rev. 0. March 1.
- 5 ENVIRON International Corporation. 2004. Data package from March 9, 2004 waste sampling at the Breckenridge Disposal Site. April 16.
- 6 ENVIRON International Corporation. 2005. Letter report to Dr. Peter Lee, U.S. Nuclear Regulatory Commission, Region 3, regarding the Fall 2004 Breckenridge Disposal Site Remedial Activities. May 3.
- 7 ENVIRON International Corporation / Sciencetech, Inc. 2004. *Remedial Work Plan, Waste Excavation and Site Restoration, Breckenridge Disposal Site*. Document No. 82A9514, Rev.2. August 27.
- 8 U.S. Atomic Energy Commission. 1974. Regulatory Guide 1.86. *Termination of Operating Licenses for Nuclear Power Reactors*. June.
- 9 U.S. Nuclear Regulatory Commission, 2006. NUREG 1757, Consolidated Decommissioning Guidance, Decommissioning Process for Materials Licensees, Volume 1, Revision 2, September.

TABLES

TABLE 1

**Summary of Confirmation Soil Samples
Breckenridge Disposal Site
Breckenridge, Michigan**

Sample ID	Boring ID	Sample Depth (feet bgs)	Analysis Requested
SB3-6-7	SB3	6-7	GS
SB4-11-12	SB4	11-12	GS
SB5-6-7	SB5	6-7	GS
SB6-0-1	SB6	0-1	GS
SB10-0-1	SB10	0-1	GS
SB21-7-8	SB21	7-8	GS
SB22-1-2	SB22	1-2	GS
SB25-4-5	SB25	4-5	GS
SB27-0-10	SB27	0-10	GS
SB28-0-10	SB28	0-10	GS
SB29-5.5-6	SB29	5.5-6	GS, Isoptic
SB29-6-6.5	SB29	6-6.5	GS
SB32-4-4.5	SB32	4-4.5	GS
SB35-9-10	SB35	9-10	GS, Isoptic
SB36-6-7	SB36	6-7	GS, Isoptic
SB38-0-1	SB38	0-1	GS
SB40-6-7	SB40	6-7	GS, Isoptic
SB40-11-12	SB40	11-12	GS, Isoptic
SB40-4-5.5	SB40	4-5.5	GS
SB41-3-4	SB41	3-4	GS, Isoptic
SB44-0-1	SB44	0-1	GS
SB46-0-1	SB46	0-1	GS
SB52-9-10	SB52	9-10	GS
SB52-4.5-6	SB52	4.5-6	GS, Isoptic
SB53-4-5	SB53	4-5	GS
SB54-3-4	SB54	3-4	GS
SB57-6-7	SB57	6-7	GS
SB58-6-9	SB58	6-9	GS
SB58-10-11	SB58	10-11	GS, Isoptic
SB58A-9-10	SB58A	9-10	GS, Isoptic
SB60-0-1	SB60	0-1	GS
SB62-6-7	SB62	6-7	GS
SB63-4-5	SB63	4-5	GS
SB87-0-10	SB87	0-10	GS

Notes:

bgs: Below ground surface

GS Gamma Spectroscopy

Isoptic: Isotopic uranium and thorium using LANL methods ER200 and ER290

TABLE 2

**November 2006 Laboratory Results
Breckenridge Disposal Site
Breckenridge, Michigan**

Sample ID	Boring ID	Sample Depth (feet bgs)	Gamma Spectroscopy Results (pCi/g)			Isotopic Results (pCi/g)	
			Th-232*	U-238**	Ra-226***	Th-232	U-238
SB3-6-7	SB03	6-7	1.57	1.68	0.663	NA	NA
SB4-11-12	SB04	11-12	0.88	2.95	0.753	NA	NA
SB5-6-7	SB05	6-7	6.69	24.3	4.79	NA	NA
SB6-0-1	SB06	0-1	18.0	26.9	3.16	NA	NA
SB10-0-1	SB10	0-1	17.4	3.8	2.23	NA	NA
SB21-7-8	SB21	7-8	2.77	0.221	1.78	NA	NA
SB22-1-2	SB22	1-2	288.0	6.95	37.6	NA	NA
SB25-4-5	SB25	4-5	43.5	129	9.84	52.5	42.7
SB27-0-10	SB27	0-10	0.72	0.505	0.745	NA	NA
SB28-0-10	SB28	0-10	1.62	1.14	0.957	NA	NA
SB29-5.5-6	SB29	5.5-6	450.0	287	95.1	221	80.1
SB29-6-6.5	SB29	6-6.5	183.0	19.5	18.8	NA	NA
SB32-4-4.5	SB32	4-4.5	296.0	225	43.3	NA	NA
SB35-9-10	SB35	9-10	156.0	350	18.6	178	260
SB36-6-7	SB36	6-7	40.7	9.9	5.93	43.9	50.5
SB38-0-1	SB38	0-1	14.1	7.06	8.72	NA	NA
SB40-6-7	SB40	6-7	250.0	39.3	138	248	37.7
SB40-11-12	SB40	11-12	0.92	0.2885	0.847	0.3	0.49
SB40-4-5.5	SB40	4-5.5	881.0	65.6	468	NA	NA
SB41-3-4	SB41	3-4	3.53	6.46	2.1	2.2	1.74
SB44-0-1	SB44	0-1	8.58	8.71	4.19	NA	NA
SB46-0-1	SB46	0-1	39.9	48.2	9.92	NA	NA
SB52-9-10	SB52	9-10	0.92	3.12	0.713	NA	NA
SB52-4.5-6	SB52	4.5-6	97.0	330	85.7	52.5	26.8
SB53-4-5	SB53	4-5	66.3	25.4	41.1	NA	NA
SB54-3-4	SB54	3-4	0.67	0.368	0.561	NA	NA
SB57-6-7	SB57	6-7	8.24	10.1	1.97	NA	NA
SB58-6-9	SB58	6-9	778.0	3150	7200	NA	NA
SB58-10-11	SB58	10-11	1.86	14.9	14.2	5.8	18.3
SB58A-9-10	SB58A	9-10	529.0	4500	4910	453	3810
SB60-0-1	SB60	0-1	1.27	2.61	2	NA	NA
SB62-6-7	SB62	6-7	8.53	59.6	3.33	NA	NA
SB63-4-5	SB63	4-5	107.0	174	14.2	NA	NA
SB87-0-10	SB87	0-10	0.62	0.66	0.761	NA	NA

Notes:

bgs: Below ground surface

Isotopic: Isotopic uranium and thorium using LANL Methods ER200 and ER290

LANL: Los Alamos National Laboratory

GS: Gamma Spectroscopy

pCi/g: pico Curies per gram

NA: Not Analyzed

* Ac-228 used as a surrogate for Th-232

** Th-234 used as a surrogate for U-238

*** Bi-214 used as a surrogate for Ra-226

TABLE 3

**Background Adjusted DCGLs
Breckenridge Disposal Site
Breckenridge, Michigan**

Isotope	Background Levels (pCi/g)		Background adjusted DCGLs (pCi/g)			
			DCGLs in Areas that Ra-226 and U-238 are less than 50% Equilibrium		DCGLs in Areas that Ra-226 and U-238 are greater than 50% Equilibrium	
	Surface	Subsurface	Surface	Subsurface	Surface	Subsurface
Th-232	0.5	0.4	4.4	34.4	4.4	34.4
U-238	1.9	4	4.4	25.5	3.2	14.5
Ra-226	0.3	0.5	1.6	11	1.6	11

Notes:

DCGLs = Derived Concentration Guideline Levels

pCi/g = picoCuries per gram

TABLE 4

**DCGL Comparison
Breckenridge Disposal Site
Breckenridge, Michigan**

Sample ID	Boring ID	Sample Depth (feet bgs)	Representative Field Screening Level (cpm)	Laboratory Results (pCi/g)		
				Th-232 ⁺	U-238 ⁺⁺	Ra-226 ⁺⁺⁺
Surface Soils			DCGLs	4.4	4.4	1.6
SB6-0-1	SB06	0-1	4,155	18.0	26.9	3.16
SB10-0-1 ⁺	SB10	0-1	5,000	17.4	3.8	2.23
SB38-0-1 ⁺	SB38	0-1	5,580	14.1	7.06	8.72
SB44-0-1	SB44	0-1	3,700	8.58	8.71	4.19
SB46-0-1	SB46	0-1	4,385	39.9	48.2	9.92
SB60-0-1 ⁺	SB60	0-1	3,815	1.27	2.61	2
SubSurface Soils			DCGLs	34.4	25.5	11
SB3-6-7	SB03	6-7	3,200	1.57	1.68	0.663
SB4-11-12	SB04	11-12	2,450	0.88	2.95	0.753
SB5-6-7	SB05	6-7	4,440	6.69	24.3	4.79
SB21-7-8 ⁺	SB21	7-8	2,945	2.77	0.221	1.78
SB22-1-2 ⁺	SB22	1-2	22,555	288.0	6.95	37.6
SB25-4-5	SB25	4-5	6,580	43.5	129	9.84
SB29-5.5-6 ⁻	SB29	5.5-6	8,790	221	80.1	95.1
SB29-6-6.5 ⁺	SB29	6-6.5	12,420	183.0	19.5	18.8
SB32-4-4.5	SB32	4-4.5	11,190	296.0	225	43.3
SB35-9-10	SB35	9-10	14,450	178	260	18.6
SB36-6-7	SB36	6-7	7,320	43.9	50.5	5.93
SB40-6-7 ⁺	SB40	6-7	33,545	248	37.7	138
SB40-11-12 ⁺	SB40	11-12	4,120	0.3	0.49	0.847
SB40-4-5.5 ⁺	SB40	4-5.5	73,983	881.0	65.6	468
SB41-3-4 ⁺	SB41	3-4	3,380	2.2	1.74	2.1
SB52-9-10	SB52	9-10	3,510	0.92	3.12	0.713
SB52-4.5-6 ⁺	SB52	4.5-6	11,350	52.5	26.8	85.7
SB53-4-5 ⁺	SB53	4-5	9,905	66.3	25.4	41.1
SB54-3-4 ⁺	SB54	3-4	3,385	0.67	0.368	0.561
SB57-6-7	SB57	6-7	5,160	8.24	10.1	1.97
SB58-6-9 ⁺	SB58	6-9	528,163	778.0	3150	7200
SB58-10-11 ⁺	SB58	10-11	12,355	5.8	18.3	14.2
SB58A-9-10 ⁺	SB58A	9-10	615,655	453	3810	4910
SB62-6-7	SB62	6-7	4,790	8.53	59.6	3.33
SB63-4-5	SB63	4-5	5,140	107.0	174	14.2

TABLE 4

**DCGL Comparision
Breckenridge Disposal Site
Breckenridge, Michigan**

Sample ID	Boring ID	Sample Depth (feet bgs)	Representative Field Screening Level (cpm)	Laboratory Results (pCi/g)		
				Th-232 [*]	U-238 ^{**}	Ra-226 ^{***}
Composite Samples			DCGLs	4.4	4.4	1.6
SB27-0-10 ⁺	SB27	0-10	3,040	0.72	0.505	0.745
SB28-0-10 ⁺	SB28	0-10	3,007	1.62	1.14	0.957
SB87-0-10 ⁺	SB87	0-10	3,957	0.62	0.66	0.761

Notes:

Grey shading indicates DCGL exceedance

bgs: Below ground surface

pCi/g: pico Curies per gram

cpm: counts per minute

* Ac-228 used as a surrogate for Th-232

** Th-234 used as a surrogate for U-238

*** Bi-214 used as a surrogate for Ra-226

+ The Ra-226 DCGL will be applied to U-238 because the Ra-226 to U-238 equilibrium ratio is greater than 50% as discussed in ENVIRON's September 19, 2006 submittal

TABLE 5

**EVS Volume Estimates by Remedial Area
Breckenridge Disposal Site
Breckenridge, Michigan**

Remedial Area	Volume Estimate (cubic yards)	Average Activity (cpm)
1 and 2	89	5,986
3	43	5,473
4	175	8,560
5	3	6,446
6	11	5,617
7	91	18,501
8	129	6,510
9	2	5,213
Total	542	8,996

Notes:

cpm = counts per minute

TABLE 6

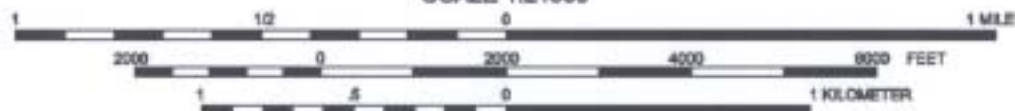
**Manually Calculated Volume Estimates by Remedial Area
Breckenridge Disposal Site
Breckenridge, Michigan**

Remedial Area	Subsurface Volume (cubic yards)
1 and 2	153
3	231
4	147
5 and 6	45
7	83
8	260
9	66
Total	985

FIGURES



SCALE 1:24000



CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

SOURCE: U.S.G.S. 7.5 minute series (topographic)
Saint Louis, Michigan Quadrangle 1973



ENVIRON

SITE LOCATION MAP
BRECKENRIDGE DISPOSAL SITE
BRECKENRIDGE, MICHIGAN

Figure
1

Drafter: APR

Date: 02/13/07

Contract Number:

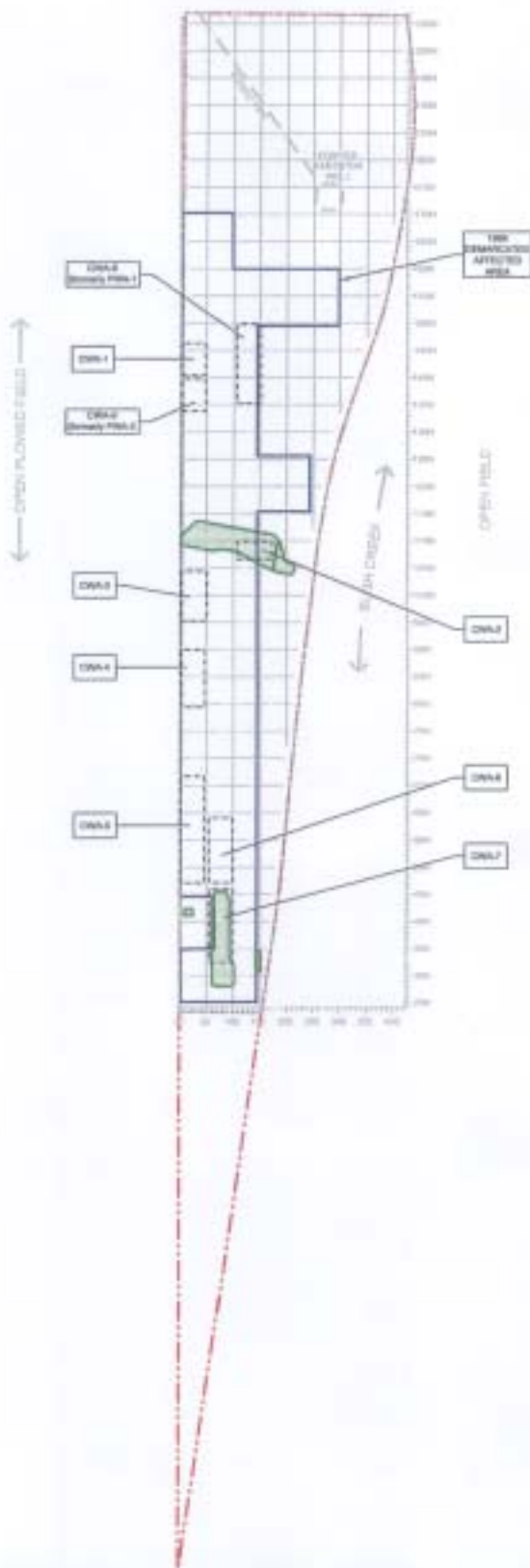
21-11010G

Approved:

Revised:



← EAST JACKSON ROAD (DINWEL) →



LEGEND	
---	APPROXIMATE PROPERTY BOUNDARY
---	EXISTING FENCE
 	CONFIRMED WASTE AREAS (CWA)
CWA-1	= WASTE AREA ID
 	REMEDIATED AREAS (SEPTEMBER-OCTOBER 2004)

0 35 70
SCALE IN FEET

ENVIRON

SITE LAYOUT
BRECKENRIDGE DISPOSAL SITE
BRECKENRIDGE, MICHIGAN

FIGURE
2

DRAFTER: APH

DATE: 03/14/07

CONTRACT NUMBER:

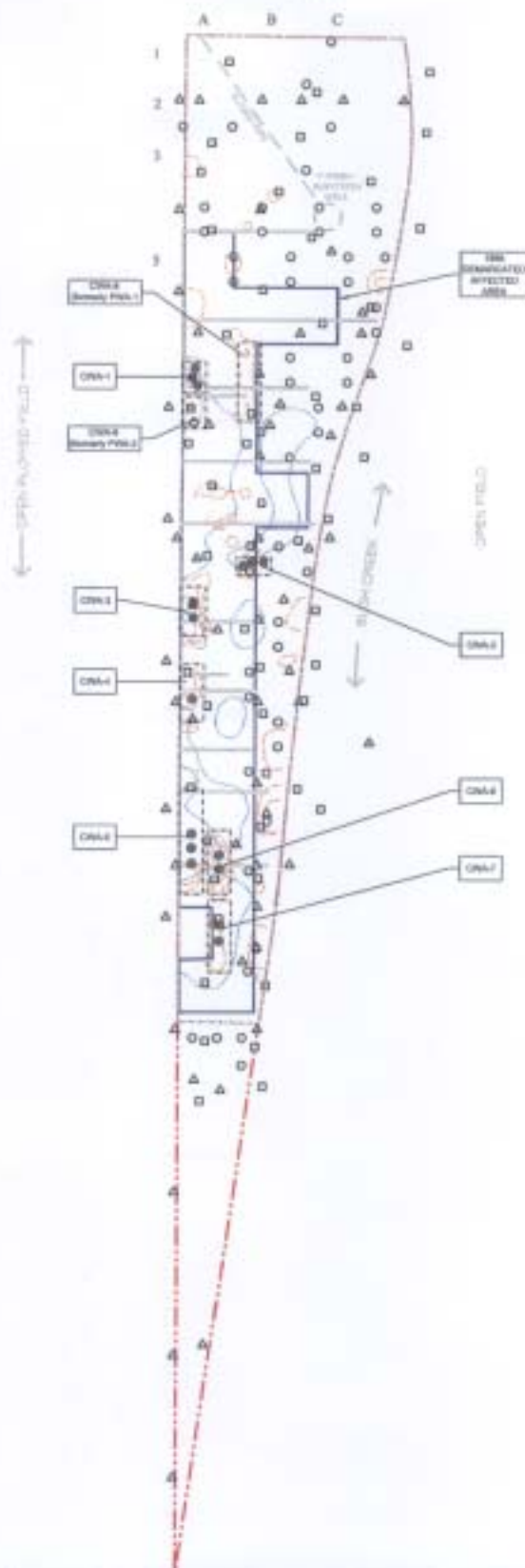
21-110100

APPROVED:

REVISED:



← EAST WARDEN FENCE SURVEY →



- LEGEND**
- APPROXIMATE PROPERTY BOUNDARY
 - EXISTING FENCE
 - CONFIRMED WASTE AREAS (CWA)
 - WASTE AREA ID
 - PRE-EXCAVATION TRENCH
 - OUTLINE BASED ON 1981 GROUND PENETRATING RADAR ANOMALIES
 - OUTLINE BASED ON 2001 MAGNETIC GRADIOMETER SURVEY ANOMALIES
 - ▲ 1981 BORINGS
 - 1981-1985 BORINGS
 - 2001 WASTE SAMPLING LOCATIONS
 - ◆ MARCH 2004 BORINGS
 - SEPT/OCT. 2004 BORINGS
 - A-7-14, 2008 SAMPLE LOCATION

75 0 75
SCALE IN FEET

ENVIRON

HISTORIC SAMPLING LOCATIONS
BRECKENRIDGE DISPOSAL SITE
BRECKENRIDGE, MICHIGAN

FIGURE

3

DRAFTER: APB

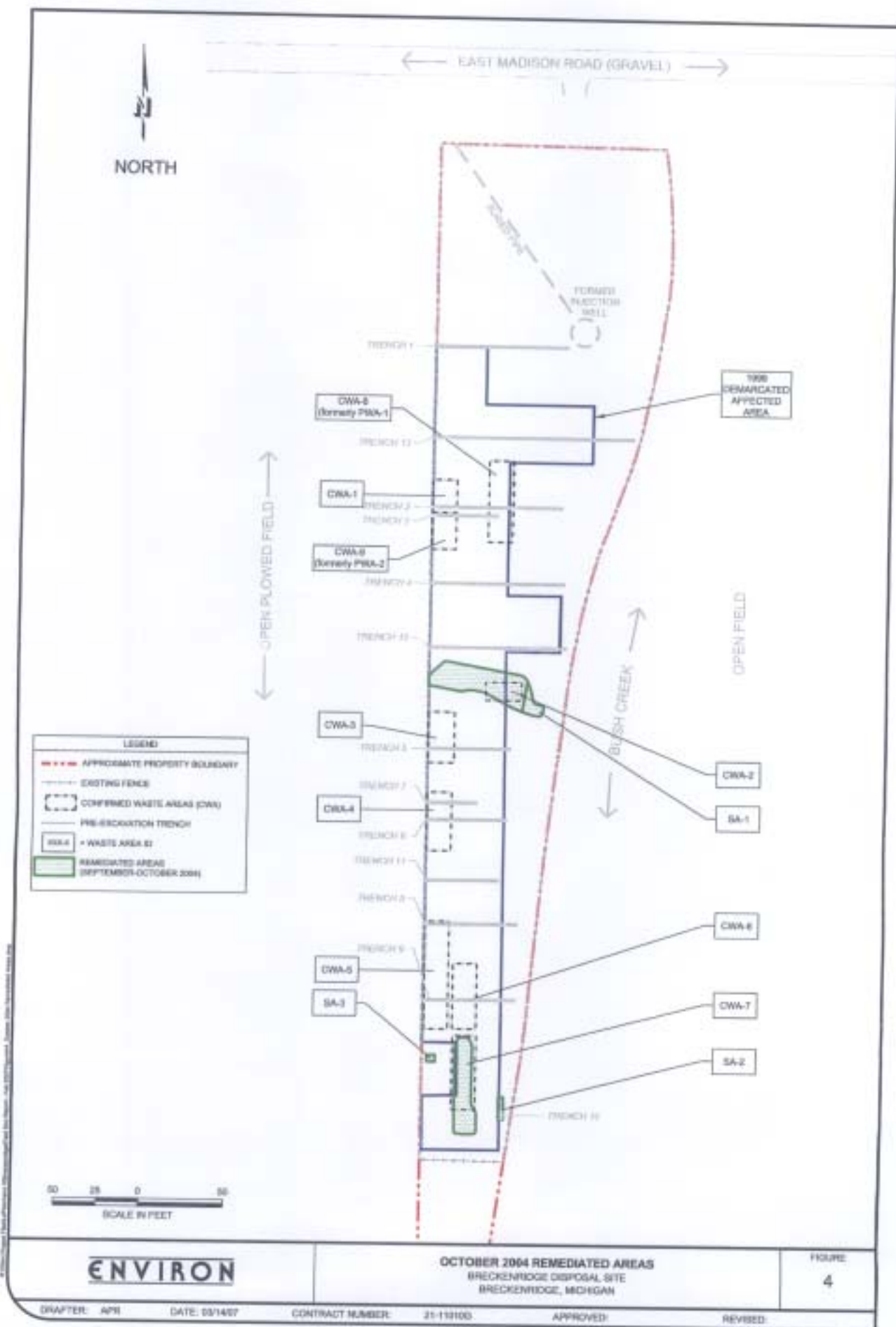
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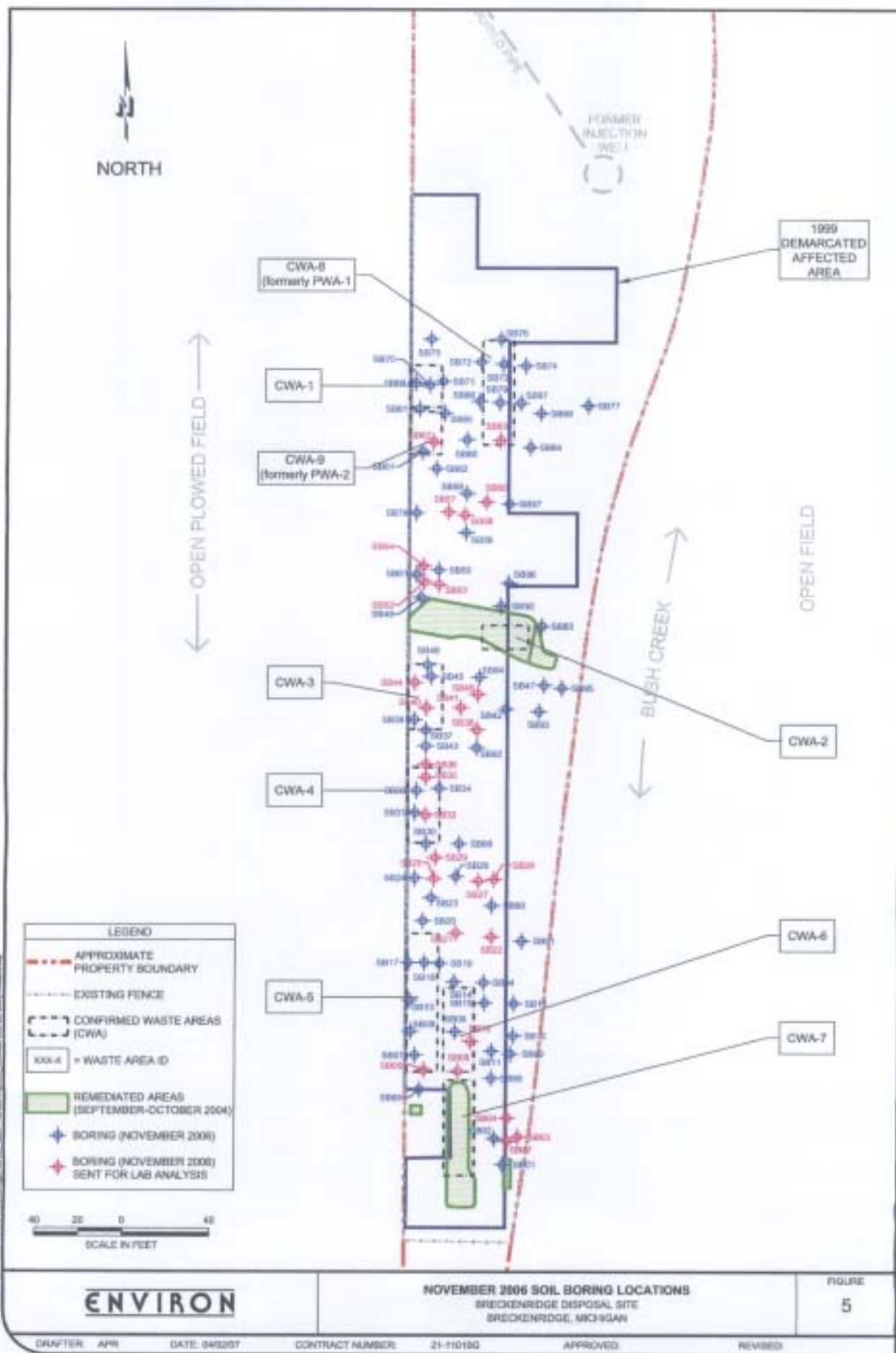
CONTRACT NUMBER:

21-110100

APPROVED:

REVISED:





NORTH

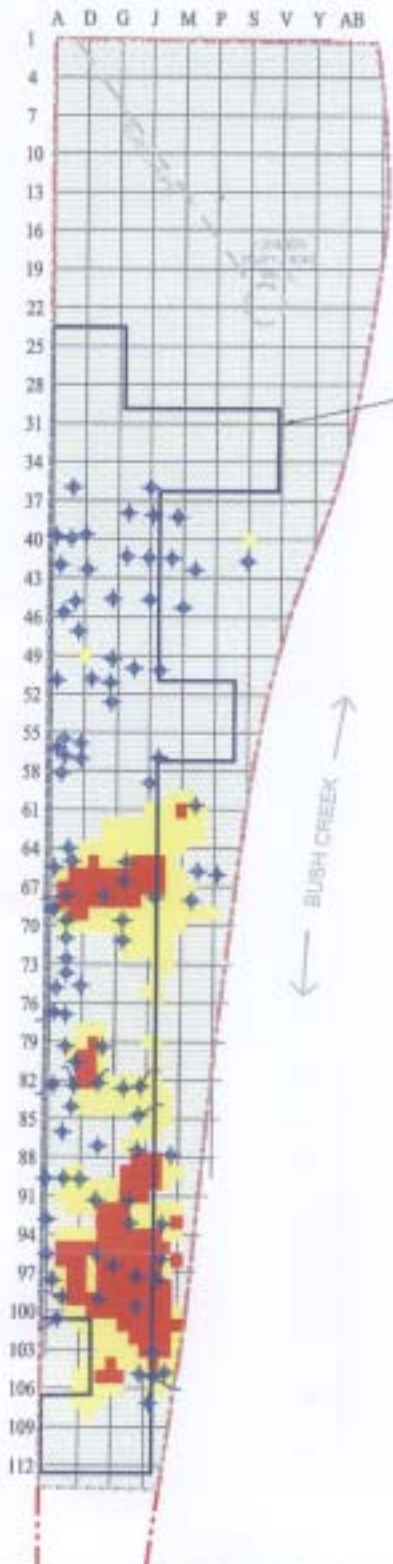
EAST MADISON ROAD (GRAVEL)

OPEN PLOWED FIELD

BUSH CREEK

OPEN FIELD

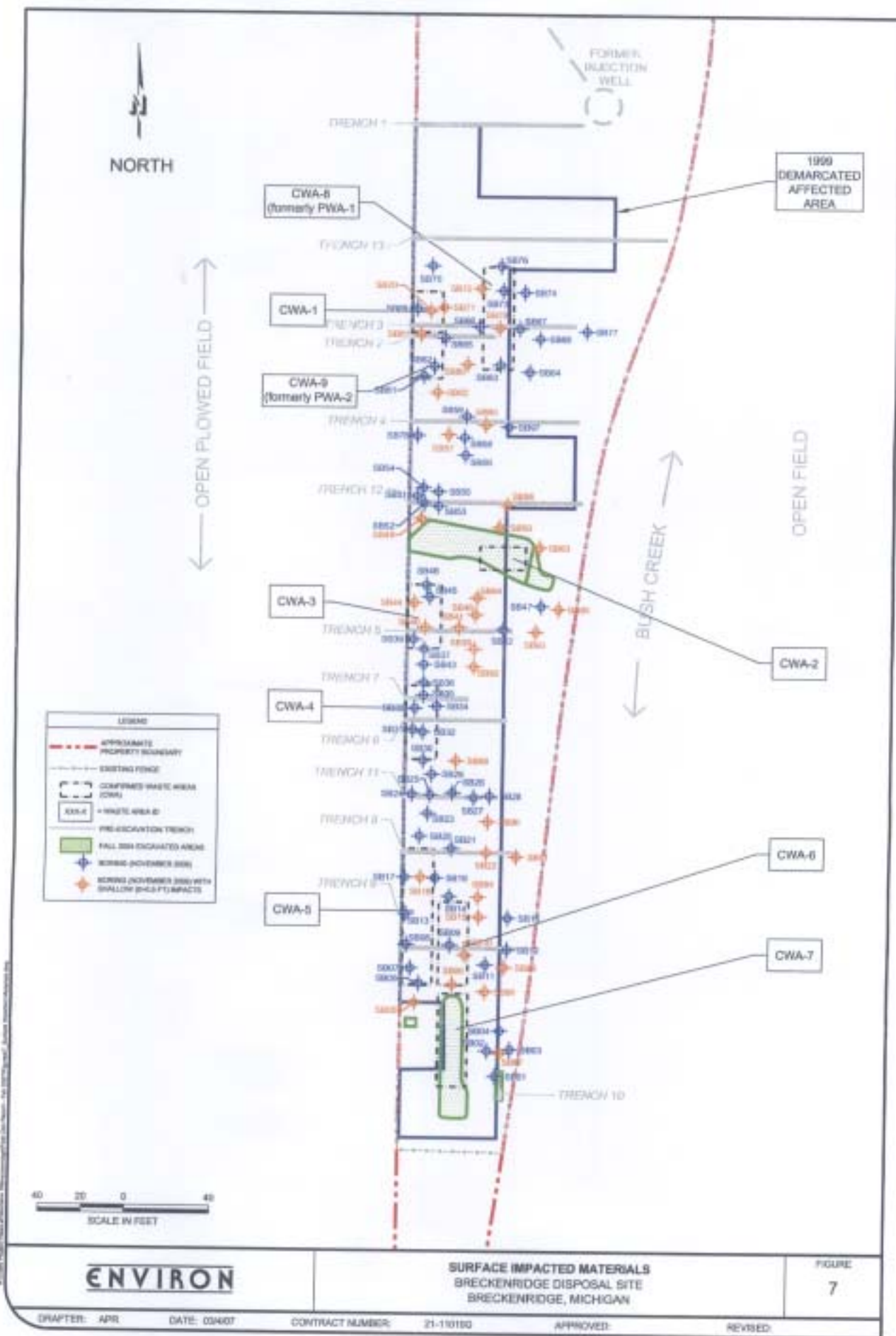
1996 DEMARCATED AFFECTED AREA



ENVIRON

WALKOVER SURVEY RESULTS
BRECKENRIDGE DISPOSAL SITE
BRECKENRIDGE, MICHIGAN

FIGURE
6



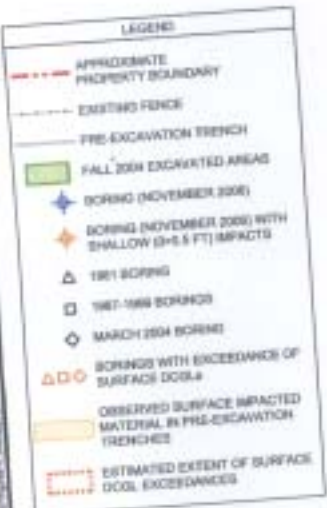
NORTH

EAST JACKSON ROAD (GRAVEL)

OPEN PLOWED FIELD

OPEN FIELD

BUSH CREEK

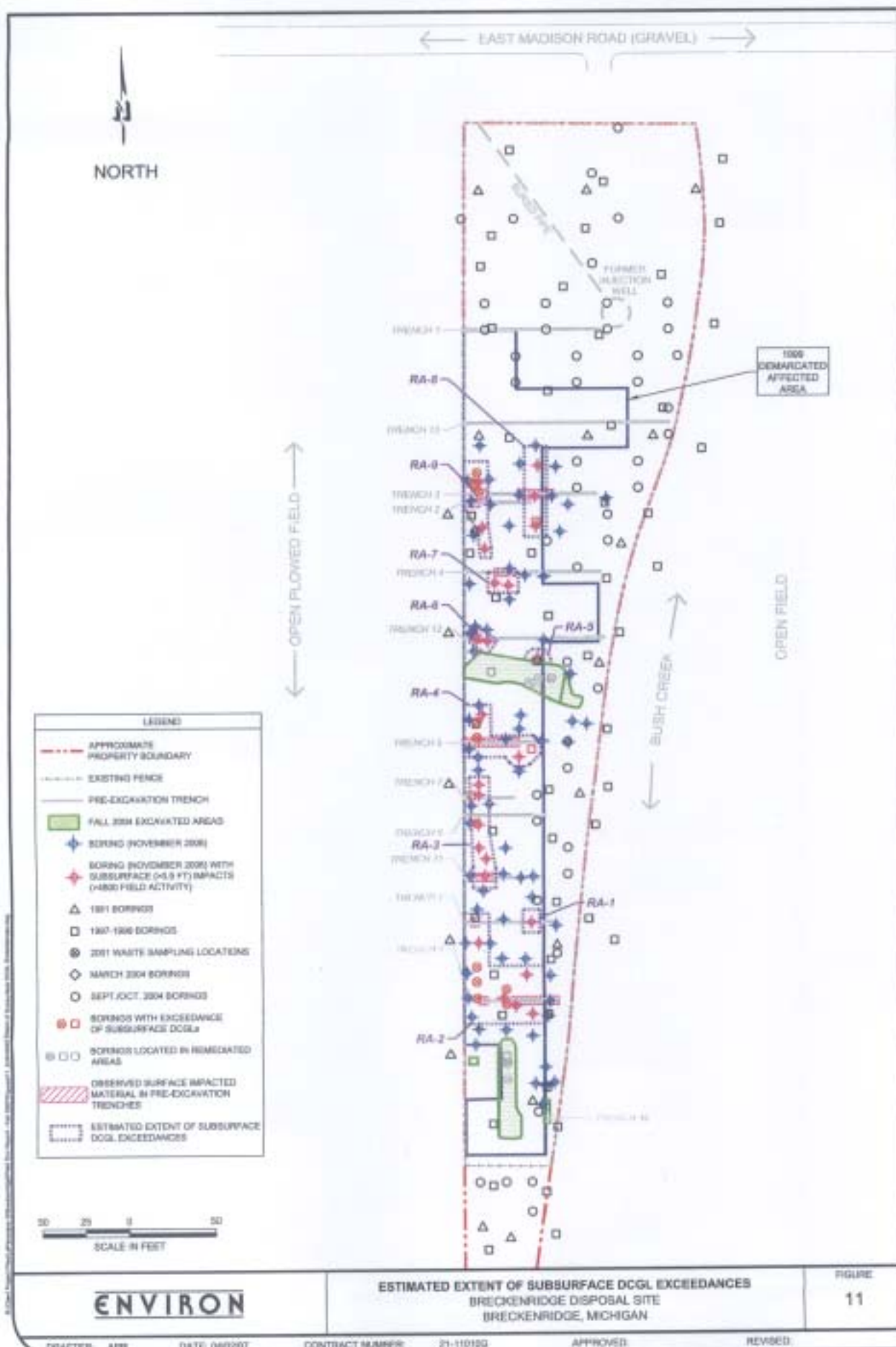


ESTIMATED EXTENT OF SURFACE DCGL EXCEEDANCES
BRECKENRIDGE DISPOSAL SITE
BRECKENRIDGE, MICHIGAN

FIGURE
10

ENVIRON

DRAFTER: APR DATE: 03/14/07 CONTRACT NUMBER: 21-110190 APPROVED: REVISED:



A P P E N D I X A

IEM Field Data Sheets

Page 1 of 1

Facility: Breckenridge	
Date: 11/6/06	Job/Task Number: 2003008.00B
Client Name: ENVIRON	
Address of Work Site: 4490 East Madison Road, Breckenridge, MI	
Description of Work: Geoprobe Sampling	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

Arrived on site at (insert date and time): 11/6/06 / 1100

1100 ON SITE, MET WITH CHRIS CRIZCO

1145 COMPLETED INSTRUMENT DAILY RESPONSE CHECKS


1230 SUBMITTED SIGNATURE BASE LOG SIN 148 SEE SURVEY 110606-1

1300 COMPLETED WATER QUALITY SURVEY

1600 GREG PERFORMED END OF SHIFT INSTRUMENT CHECKS

1630 OFF SITE

Departed site at (insert date and time): 11/6/06 / 1630

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:	
Weather Conditions: Cloudy, cool, breezy	Important Telephone Calls and Interactions:
Personnel on Site: Jeffrey Sumlin	
Name (print): Jeffrey W. Sumlin	Signature: 

Page 1 of 1

Facility: Breckenridge	
Date: 11/7/06	Job/Task Number: 2003008.005
Client Name: ENVIRON	
Address of Work Site: 4490 East Madison Road, Breckenridge, MI	
Description of Work: Geoprobe Sampling	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

Arrived on site at (insert date and time): 11/7/06 / 0730

0730 ON SITE

0745 PERFORMED DAILY INSTRUMENT CHECKS

0800 RESUMED WALK OVER STUDY

0830 COMPLETED SPENDING GEOPROBE SAMPLES

1130 SUPERVISOR PERSONNEL AND REMOVABLE PPE FOR WALKH BOTTLE

1630 SUPERVISOR 1 MTR TRASH AND 1 BUNDLE GEOPROBE SCREWS

1640 SUPERVISOR PERSONNEL AND REMOVABLE PPE FOR END OF SHIFT

1650 PERFORMED END OF SHIFT INSTRUMENT CHECKS

1700 OFF SITE

Departed site at (insert date and time): 11/7/06 / 1700

Changes from Plans and Specifications, and Other Special Orders and Important Decisions: SPOKE WITH B. THOMAS ABOUT WORKER SURVEY INTERVIEWS. WILL GO BACK TO AREAS > 2X BKGD FOR US 26 DTTA PLANTS. TALKED TO ENVIRO ABOUT SURVEYS OUTSIDE OF FENCE. WAS TOLD WE HAVE PERMISSION TO SURVEY OUTSIDE FENCE	
Weather Conditions: RAINY, CLOUD, WINDY	Important Telephone Calls and Interactions:
Personnel on Site: Jeffrey Sumlin	
Name (print): Jeffrey W. Sumlin	Signature Jeffrey W. Sumlin

Page 1 of 1

Facility: Breckenridge	
Date: 11/8/06	Job/Task Number: 2003008.002
Client Name: ENVIRON	
Address of Work Site: 4490 East Madison Road, Breckenridge, MI	
Description of Work: Geoprobe Sampling	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

Arrived on site at (insert date and time): 11/5/06 / 0730

0730 ON SITE

0745 (COMPLETED) DAILY INSTRUMENT CHECKS

0800 BEGAN SCANNING, GET PROBE SAMPLES

1130 SURVEYED PERSONNEL AND REUSABLE PPE FOR LUNCH BREAK

1700 SURVEYED PERSONNEL AND REUSABLE PPE FOR END OF SHIFT

1715 SURVEYED 1 BAG TILTH AND 1 BUNDLE USED GEO. PROBE SAMPLES

1725 PERFORMED END OF SHIFT INSTRUMENT CHECKS

1730 OFF SITE

Departed site at (insert date and time): 11/5/06 / 1730

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:	
Weather Conditions: <i>CAD, WINDY</i>	Important Telephone Calls and Interactions:
Personnel on Site: Jeffrey Sumlin	
Name (print): Jeffrey W. Sumlin	Signature <i>Jeffrey W. Sumlin</i>

Page of

Page 1 of 1

Facility: Breckenridge	
Date: 11/10/06	Job/Task Number: 2003008.008
Client Name: ENVIRON	
Address of Work Site: 4490 East Madison Road, Breckenridge, MI	
Description of Work: Geoprobe Sampling	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

Arrived on site at (insert date and time): 11/10/06 / 0700

0700 ON SITE

0715 COMPLETED DAILY INSTRUMENT CHECKS

0730 CONTINUED WALKING SUBJECT

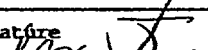
0745 COMMENCED SEARCHING FOR PROBE SITES

1340 SURVEYED PERSONNEL AND REASONABLE PPE FOR END OF SHIFT

1350 PERFORMED END OF SHIFT INSTRUMENT CHECKS

1400 OFF SITE

Departed site at (insert date and time): 11/10/06 / 1400

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:	
Weather Conditions: OVERCAST, WINDY	Important Telephone Calls and Interactions:
Personnel on Site: Jeffrey Sumlin	
Name (print): Jeffrey W. Sumlin	Signature 

Page 1 of 1

Facility: Breckenridge	
Date: 11/13/01	Job/Task Number: 2003008.005
Client Name: ENVIRON	
Address of Work Site: 4490 East Madison Road, Breckenridge, MI	
Description of Work: Geoprobe Sampling	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

Arrived on site at (insert date and time): 11/13/06 / 0730

0730 ON SITE

0745 COMPLETED DAILY INSTRUMENT CHECKS, COMMENCED SAMPLE SURVEYS

1200 SURVEYED PERSONNEL AND REMAINING PPE FOR LUNCH BREAK


1625 SURVEYED 1 BGE TANK 7 BUNDLES GEOPRICE TENDERS FOR REUSE

1640 SURVEYED PERSONNEL AND REMAINING PPE FOR END OF SHIFT

1650 PERFORMED END OF SHIFT INSTRUMENT CHECKS

1700 OFF SITE

Departed site at (insert date and time): 11/13/06 / 1700

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:	
Weather Conditions: CLOUDY COL-9	Important Telephone Calls and Interactions:
Personnel on Site: Jeffrey Sumlin	
Name (print): Jeffrey W. Sumlin	Signature 

Page 1 of 1

Facility: Breckenridge	
Date: 11/14/06	Job/Task Number: 2003008.008
Client Name: ENVIRON	
Address of Work Site: 4490 East Madison Road, Breckenridge, MI	
Description of Work: Geoprobe Sampling	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

Arrived on site at (insert date and time): 11/14/06 / 0730

0730 ON SITE

0740 COMPLETED DAILY INSTRUMENT CHECKS

0915 BEGAN SENSING SAMPLES

1140 SURVEYED PERSONNEL AND REASONABLE PPE FOR LUNCH BREAK

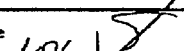
1610 SURVEYED PERSONNEL AND REASONABLE PPE FOR END OF SHIFT

1615 SURVEYED 1 BIG TRASH, 1 BUNDLE CIGARETTE SKEWERS FOR REUSE

1650 PERFORMED END OF SHIFT INSTRUMENT CHECKS

1700 OFF SITE

Departed site at (insert date and time): 11/14/06 / 1700

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:	
Weather Conditions: FOGGY, COLD, OVERCAST	Important Telephone Calls and Interactions:
Personnel on Site: Jeffrey Sumlin	
Name (print): Jeffrey W. Sumlin	Signature 

Page 1 of 1

Facility: Breckenridge	
Date: 11/15/02	Job/Task Number: 2003008.008
Client Name: ENVIRON	
Address of Work Site: 4490 East Madison Road, Breckenridge, MI	
Description of Work: Geoprobe Sampling	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

Arrived on site at (insert date and time): 11/15/06/0800

0800 ON SITE

0810 PERFORMED DAILY INSTRUMENT CHECKS

0945 BEGAN SCANNING SAMPLES

1140 SURVEYED PERSONNEL AND REUSABLE PPE FOR LUNCH BREAK

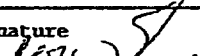
1530 SURVEYED PERSONNEL AND REUSABLE PPE FOR END OF SHIFT

1600 SURVEYED GEAR/ROBE UNIT FOR OFF SITE RELEASE

1615 PERFORMED END OF SHIFT INSTRUMENT CHECKS

1630 OFF SITE

Departed site at (insert date and time): 11/15/06/1530

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:	
Weather Conditions: FOGgy, OVERCAST, (C-U-V)	Important Telephone Calls and Interactions:
Personnel on Site: Jeffrey Sumlin	
Name (print): Jeffrey W. Sumlin	Signature 

Page i of i

Facility: Breckenridge	
Date: 4/15/04	Job/Task Number: 2003035.005
Client Name: SRVIRON	
Address of Work Site: 4450 East Madison Road, Breckenridge, MI	
Description of Work: Geoprobe Sampling	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

Arrived on site at (insert date and time): 11/16/06 / 0730

0730 ON SITE

0740 PERFORMED DAILY INSTRUMENT CHECKS

0900 SORTED SAMPLES TO BE SENT TO LBS FOR ANALYSIS

1000 SORTED SAMPLES DIZE CPM


1030 BURIED SAMPLES DIZE CPM, 1 FT DEEP, MARKED WITH STAKE AND
/ PLAZ, MARKED "SAMPLES"

1145 CONSOLIDATION SAMPLES TO BE LEFT ON SITE AND ACCESSIBLE

1155 COMPLETED END OF SHIFT INSTRUMENT CHECKS

1200 OFF SITE

Departed site at (insert date and time): 11/16/06 / 1200

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:	
Weather Conditions: Rain, Wind	Important Telephone Calls and Interactions:
Personnel on Site: Jeffrey Sumlin	
Name (print): Jeffrey W. Sumlin	Signature 

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number 110600-1

Page 1 of 1

Instrument/SN: <u>12/121265</u>	Calibration Due: <u>3/21/07</u>	Site Name: <u>APPROXIMATE</u>	Date: <u>11/6/06</u>	Time: <u>1236</u>
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>NORTH END OF SITE</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>ROCK-PILE</u>		
Survey Performed By (Print): <u>SHAWN</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>N/A</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input type="checkbox"/> feet <input type="checkbox"/> centimeters		

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Notes: TURNED JOHN DEERE TRACTOR SIN 148 AND BUSH HOG ATTACHMENT, PAYING CLOSE ATTENTION TO WIRES, OPERATOR CAB, ALL EXTERIOR SURFACES AND CUTTING BLADES, NO READINGS ABOVE BACKGROUND

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number 110700-1

Page 1 of 1

Instrument/SN: <u>12121268</u>	Calibration Due: <u>3/21/07</u>	Site Name: <u>BELKNAP Pt</u>	Date: <u>11/16/06</u>	Time: <u>1640</u>
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>NORTH END OF SITE</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>RELATSE</u>		
Survey Performed By (Print): <u>Sumner</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>N/A</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input type="checkbox"/> feet <input type="checkbox"/> centimeters	

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Notes: PERFORMED RELATSE SURVEYS THROUGHOUT THE DAY, NO READINGS ABOVE BACKGROUND

BOOTS x2
 BOOTS x2
 BOOTS x2
 BOOTS x2
 GLOVES x2
 GLOVES x2
 TRASH x1
 GAD PROBE SLEEVES x1

HARD HAT x2
 HARD HAT x2

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number 110506-1

Page 1 of 1

Instrument/SN: <u>12/121258</u>		Calibration Due: <u>3/21/07</u>		Site Name: <u>Backside Dye</u>		Date: <u>1/9/06</u>		Time: <u>1715</u>	
Instrument/SN: <u>N/A</u>		Calibration Due: <u>N/A</u>		Location: <u>North end of site</u>					
Instrument/SN: <u>N/A</u>		Calibration Due: <u>N/A</u>		Purpose: <u>Release</u>					
Survey Performed By (Print): <u>James N</u>				Survey Performed By (Signature): <u>[Signature]</u>					
<input checked="" type="checkbox"/> Battery OK		<input checked="" type="checkbox"/> HV OK		<input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>N/A</u>			
						<input type="checkbox"/> meters <input type="checkbox"/> inches <input type="checkbox"/> feet <input type="checkbox"/> centimeters			

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Notes: PERFORMED RELEASE SURVEYS THROUGHOUT THE DAY. NO READINGS ABOVE BACKGROUND

BOOTS X2

BOOTS X2

BOOTS X2

BOOTS X2

GLOVES X2

GLOVES X2

TEETH X1

GOODRIDE SWANED X1

AIRPORT X2

AIRPORT X2

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number 110906-1

Page 1 of 1

Instrument/SN: <u>1212268</u>		Calibration Due: <u>3/21/07</u>		Site Name: <u>HEZKONRIORC</u>		Date: <u>YALC</u>		Time: <u>1650</u>	
Instrument/SN: <u>N/A</u>		Calibration Due: <u>N/A</u>		Location: <u>NORTH END OF SITE</u>					
Instrument/SN: <u>N/A</u>		Calibration Due: <u>N/A</u>		Purpose: <u>PERMISE</u>					
Survey Performed By (Print): <u>Sumner</u>					Survey Performed By (Signature): <u>[Signature]</u>				
<input checked="" type="checkbox"/> Battery OK		<input checked="" type="checkbox"/> HV OK		<input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>N/A</u>			
						<input type="checkbox"/> meters <input type="checkbox"/> inches <input type="checkbox"/> feet <input type="checkbox"/> centimeters			

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Notes: PERFORMED PERMISE SURVEYS THROUGHOUT THE DAY. NO DETAILINGS ABOVE BACKGROUND

FOOTS X2

FOOTS X2

GROUND X2

GROUND X2

TRASH X1

GROUND SURVEYS X1

HARDWARE X2

HARDWARE X2

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number 11006-1

Page 1 of 1

Instrument/SN: <u>12/121298</u>	Calibration Due: <u>3/21/07</u>	Site Name: <u>Brickwork</u>	Date: <u>9/10/06</u>	Time: <u>1340</u>
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>W/TH end of site</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>Release</u>		
Survey Performed By (Print): <u>James</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>21 ft</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input type="checkbox"/> feet <input type="checkbox"/> centimeters		

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Note: Performed Release surveys throughout the PM. No readings above background

BWS X1
 BWS X1
 GLOVES X1
 GLOVES X1
 HARD HAT X1
 HARD HAT X1
 BAG TRENCH X1
 BUNDLE CLOTHES X1

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number 111006-2

Page 1 of 13

Instrument/SN: <u>2241 (114535) 44-10 (152524)</u>		Calibration Due: <u>7/28/07</u>		Site Name: <u>BLAZKOWICZ</u>		Date: <u>7/24/06</u>		Time: <u>1300</u>	
Instrument/SN: <u>N/A</u>		Calibration Due: <u>N/A</u>		Location: <u>SITE WALKOVER</u>					
Instrument/SN: <u>N/A</u>		Calibration Due: <u>N/A</u>		Purpose: <u>COMPARISON</u>					
Survey Performed By (Print): <u>Sum...</u>				Survey Performed By (Signature): <u>[Signature]</u>					
<input type="checkbox"/> Battery OK		<input type="checkbox"/> HV OK		<input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>2 x 2</u>			
						<input type="checkbox"/> meters		<input type="checkbox"/> inches	
						<input checked="" type="checkbox"/> feet		<input type="checkbox"/> centimeters	

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Notes: SURVEY OF SITE. STATIC COUNTS EVERY 2 FEET. GRID A1 IS NW FENCE CORNER. LETTERS ARE WEST TO EAST, NUMBERS ARE NORTH TO SOUTH. BACKGROUND NOISE IS 7243 CPM

Map	CPM	V2	6900	N4	6690	F6	6290
A1	6960	W2	7040	O4	7010	G6	6880
B1	7170	X2	7110	P4	6890	H6	6580
C1	7970	Y2	7310	Q4	7220	I6	6730
D1	7930	Z2	6680	R4	7000	J6	6480
E1	7490	AA2	6940	S4	6940	K6	6330
F1	6990	AB2	7030	T4	6750	L6	6010
G1	6820	AC2	7110	U4	6990	M6	6630
H1	6860			V4	6840	N6	6740
I1	6860	A3	6710	W4	6480	O6	6380
J1	6940	B3	Tree	X4	6670	P6	6500
K1	7030	C3	Tree	Y4	6030	Q6	6420
L1	7380	D3	Tree	Z4	6120	R6	6100
M1	7990	E3	7920	AA4	6420	S6	6720
N1	7650	F3	6330	AB4	6200	T6	7010
O1	7340	G3	5980	AC4	6380	U6	6300
P1	7220	H3	5720			V6	6740
Q1	7110	I3	5580	A5	7080	W6	6240
R1	6860	J3	6120	B5	6980	X6	6490
S1	6560	K3	6680	C5	6890	Y6	6460
T1	6580	L3	6450	D5	6900	Z6	6600
U1	6520	M3	6140	E5	6950	AA6	6380
V1	6300	N3	6280	F5	6730	AB6	6580
W1	6090	O3	6380	G5	6610	AC6	6100
X1	6310	P3	6000	H5	6780		
Y1	6460	Q3	5710	I5	6770	A7	7310
Z1	6570	R3	5810	J5	6750	B7	7200
AA1	6660	S3	6310	K5	6720	C7	7140
AB1	6230	T3	6430	L5	6330	D7	6960
AC1	6170	U3	6510	M5	5990	E7	6700
		V3	6310	N5	5910	F7	7230
A2	6840	W3	6290	O5	5940	G7	7630
B2	Tree	X3	6550	P5	5830	H7	7320
C2	Tree	Y3	6740	Q5	5740	I7	7170
D2	Tree	Z3	7020	R5	5900	J7	6900
E2	7220	AA3	7140	S5	6220	K7	6680
F2	6490	AB3	6800	T5	6220	L7	7020
G2	6640	AC3	6780	U5	6280	M7	7140
H2	6890			V5	6380	N7	7890
I2	7130	A4	6090	W5	6490	O7	6720
J2	6450	B4	Tree	X5	6480	P7	6640
K2	6730	C4	Tree	Y5	6410	Q7	5450
L2	6660	D4	Tree	Z5	6550	R7	5990
M2	7380	E4	6230	AA5	6640	S7	6060
N2	7100	F4	6640	AB5	6710	T7	6490
O2	7050	G4	6790	AC5	6880	U7	6460
P2	7320	H4	6500			V7	6570
Q2	6740	I4	7120	A6	5990	W7	6670
R2	7360	J4	6680	B6	6420	X7	6540
S2	6300	K4	6350	C6	6300	Y7	6380
T2	6740	L4	6780	D6	6280	Z7	6450
U2	6590	M4	6570	E6	6640	AA7	6490

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AB7	6890	T9	6300	L11	7330	D13	6980
AC7	7270	U9	6110	M11	7490	E13	7170
		V9	6490	N11	7320	F13	7100
A8	6670	W9	6550	O11	6900	G13	7040
B8	6390	X9	6670	P11	6940	H13	6890
C8	7020	Y9	6820	Q11	7000	I13	6720
D8	6930	Z9	6670	R11	6890	J13	6990
E8	6590	AA9	6520	S11	6530	K13	7000
F8	6010	AB9	6600	T11	6470	L13	7130
G8	6740	AC9	6640	U11	6320	M13	7250
H8	6330			V11	6650	N13	7010
I8	6670	A10	6780	W11	6720	O13	6860
J8	6580	B10	6570	X11	6100	P13	6800
K8	6390	C10	6900	Y11	5900	Q13	6750
L8	6660	D10	7210	Z11	6380	R13	6530
M8	6390	E10	6870	AA11	6480	S13	6150
N8	6840	F10	6470	AB11	6400	T13	6200
O8	7030	G10	6380	AC11	6360	U13	6240
P8	7120	H10	6740			V13	6350
Q8	6790	I10	6660	A12	6590	W13	6740
R8	6490	J10	7010	B12	6740	X13	6960
S8	6760	K10	6940	C12	6390	Y13	7180
T8	6640	L10	6730	D12	6740	Z13	6920
U8	6980	M10	6590	E12	6590	AA13	6670
V8	6200	N10	6900	F12	6330	AB13	6740
W8	6360	O10	6590	G12	6780	AC13	6730
X8	6420	P10	6740	H12	6780		
Y8	6680	Q10	6390	I12	6460	A14	6740
Z8	6470	R10	6740	J12	6480	B14	6940
AA8	6190	S10	6590	K12	6230	C14	6480
AB8	6570	T10	6330	L12	7230	D14	5990
AC8	6760	U10	6780	M12	7230	E14	6420
		V10	6780	N12	7010	F14	6600
A9	6780	W10	6460	O12	6920	G14	6380
B9	6990	X10	6480	P12	6980	H14	6580
C9	7140	Y10	6230	Q12	7170	I14	6100
D9	7230	Z10	6900	R12	6960	J14	6300
E9	7580	AA10	6590	S12	6890	K14	6330
F9	7510	AB10	6480	T12	6910	L14	6010
G9	7160	AC10	6900	U12	6330	M14	6630
H9	7230			V12	6210	N14	6740
I9	7290	A11	7310	W12	6630	O14	6380
J9	7010	B11	7280	X12	6740	P14	6500
K9	6920	C11	7030	Y12	6380	Q14	6640
L9	6980	D11	7210	Z12	6500	R14	6290
M9	7170	E11	7320	AA12	6450	S14	6880
N9	6960	F11	7340	AB12	6100	T14	6580
O9	6890	G11	7310	AC12	6720	U14	6730
P9	6910	H11	7290			V14	6480
Q9	6880	I11	7220	A13	6750	W14	6420
R9	6450	J11	7010	B13	6810	X14	6100
S9	6250	K11	6930	C13	6840	Y14	6720

Z14	7010	R16	7210	M18	6850	I20	7420
AA14	6300	S16	6840	N18	6700	J20	7360
AB14	6740	T16	6800	O18	6580	K20	7360
AC14	6740	U16	7030	P18	6890	L20	7320
		V16	7120	Q18	7190	M20	7250
A15	6970	W16	6840	R18	6960	N20	7060
B15	6890	X16	7140	S18	6750	O20	6890
C15	6820	Y16	6750	T18	6960	P20	6690
D15	6910	Z16	6960	U18	6990	Q20	7110
E15	7010	AA16	6990	V18	6380	R20	7340
F15	7100	AB16	6380	W18	6880	S20	7500
G15	7190			X18	6970	T20	7260
H15	7190	A17	7040	Y18	7100	U20	7320
I15	7190	B17	7340	Z18	6840	V20	6630
J15	7340	C17	7640	AA18	7140	W20	6730
K15	7720	D17	7280			X20	7790
L15	7530	E17	7010	A19	6910	Y20	7020
M15	7120	F17	6960	B19	7220	Z20	7100
N15	6900	G17	6850	C19	7640	AA20	7160
O15	6680	H17	6700	D19	7100		
P15	6770	I17	6580	E19	6990	A21	8680
Q15	6890	J17	6890	F19	7050	B21	8210
R15	7070	K17	7190	G19	7110	C21	8000
S15	7160	L17	7330	H19	7340	D21	7440
T15	6850	M17	7480	I19	7500	E21	7240
U15	6620	N17	7420	J19	7260	F21	7390
V15	6390	O17	7360	K19	7020	G21	7580
W15	6010	P17	7360	L19	7100	H21	7450
X15	6990	Q17	7320	M19	7160	I21	7360
Y15	5950	R17	7250	N19	7110	J21	7340
Z15	6980	S17	7060	O19	7010	K21	7320
AA15	6080	T17	6890	P19	7140	L21	7400
AB15	6120	U17	6690	Q19	7250	M21	7620
AC15	6140	V17	6630	R19	6990	N21	7280
		W17	6730	S19	6920	O21	6910
A16	6890	X17	6420	T19	6800	P21	7370
B16	6740	Y17	6230	U19	6840	Q21	7790
C16	6690	Z17	6200	V19	6560	R21	7390
D16	6580	AA17	6110	W19	6530	S21	6000
E16	7020			X19	6320	T21	6360
F16	6950	A18	7050	Y19	6230	U21	6580
G16	7130	B18	6950	Z19	6260	V21	6830
H16	6890	C18	7210	AA19	6260	W21	7090
I16	6870	D18	6840			X21	6430
J16	6980	E18	6800	A20	6360	Y21	6080
K16	6939	F18	7030	B20	6580	Z21	6000
L16	6850	G18	7120	C20	6830	AA21	6030
M16	6770	H18	7040	D20	7090		
N16	6970	I18	7340	E20	7100	A22	6890
O16	7100	J18	7640	F20	6990	B22	7100
P16	7050	K18	7280	G20	7050	C22	6990
Q16	6950	L18	7010	H20	7010	D22	7050

E22	7110	A24	7100	Y25	6340	V27	7370
F22	7050	B24	7430	Z25	6490	W27	7170
G22	7010	C24	7270	AA25	6510	X27	7210
H22	7420	D24	7020			Y27	7300
I22	7360	E24	7190	A26	7430	Z27	7220
J22	7360	F24	7200	B26	7770		
K22	7020	G24	7480	C26	7990	A28	7250
L22	7190	H24	7550	D26	7810	B28	7300
M22	7200	I24	7270	E26	7610	C28	7240
N22	7480	J24	7640	F26	7370	D28	7490
O22	7550	K24	7320	G26	7920	E28	7590
P22	7320	L24	7250	H26	7650	F28	7260
Q22	7250	M24	7060	I26	7480	G28	7060
R22	7060	N24	7100	J26	7550	H28	7100
S22	7100	O24	7020	K26	7270	I28	7390
T22	6990	P24	7100	L26	7880	J28	7470
U22	7340	Q24	7160	M26	7640	K28	7380
V22	7500	R24	7110	N26	7260	L28	7200
W22	7260	S24	7010	O26	7110	M28	7360
X22	7020	T24	7280	P26	7100	N28	7430
Y22	7270	U24	7570	Q26	7430	O28	7770
Z22	5850	V24	7910	R26	7270	P28	7480
AA22	7350	W24	7500	S26	7020	Q28	7770
		X24	7250	T26	7190	R28	7390
A23	7640	Y24	7140	U26	7200	S28	7280
B23	7630	Z24	7250	V26	7390	T28	7570
C23	7720	AA24	6970	W26	7470	U28	7190
D23	7110			X26	7380	V28	7160
E23	6680	A25	7860	Y26	7200	W28	7170
F23	7170	B25	7830	Z26	7000	X28	7250
G23	7100	C25	7710			Y28	7240
H23	7130	D25	7620	A27	7110	Z28	7660
I23	7250	E25	7340	B27	7640		
J23	7020	F25	7400	C27	7920	A29	7710
K23	6970	G25	7660	D27	7650	B29	7490
L23	7100	H25	7390	E27	7490	C29	7390
M23	7430	I25	7280	F27	7200	D29	7310
N23	7270	J25	7570	G27	6930	E29	7220
O23	7020	K25	7910	H27	7190	F29	7530
P23	7190	L25	7500	I27	7180	G29	7760
Q23	7200	M25	7250	J27	7250	H29	7640
R23	7480	N25	7640	K27	7240	I29	7430
S23	7550	O25	7880	L27	7390	J29	7300
T23	7270	P25	7640	M27	7470	K29	7240
U23	5850	Q25	7260	N27	7380	L29	7490
V23	7350	R25	7110	O27	7200	M29	7590
W23	7120	S25	7000	P27	7360	N29	7260
X23	6690	T25	7340	Q27	7430	O29	7060
Y23	6340	U25	7680	R27	7770	P29	7100
Z23	6300	V25	7490	S27	7990	Q29	7190
AA23	6230	W25	6950	T27	7810	R29	7160
		X25	6660	U27	7610	S29	7170

T29	6870	R31	7480	P33	7640	P35	7940
U29	6610	S31	7260	Q33	7510	Q35	8110
V29	6890	T31	6970	R33	7480	R35	7860
W29	7060	U31	6790	S33	7310	S35	7540
X29	7660	V31	7350	T33	7320	T35	7510
Y29	8140	W31	8050	U33	7260	U35	7830
Z29	7590	X31	7610	V33	7300	V35	7590
		Y31	7500	W33	7430	W35	7390
A30	7160	Z31	7300	X33	7380	X35	6990
B30	7170			Y33	7260	Y35	6530
C30	7250	A32	7240				
D30	7240	B32	7660	A34	7120	A36	7830
E30	7240	C32	7660	B34	6960	B36	7590
F30	7390	D32	7630	C34	7770	C36	7770
G30	7470	E32	7240	D34	7390	D36	7660
H30	7380	F32	7120	E34	7280	E36	7480
I30	7200	G32	6960	F34	7570	F36	7740
J30	7480	H32	6850	G34	7860	G36	7360
K30	7770	I32	7480	H34	7540	H36	7430
L30	7660	J32	7740	I34	7510	I36	7770
M30	7630	K32	7360	J34	7680	J36	7660
N30	7740	L32	7430	K34	7730	K36	7630
O30	7800	M32	7390	L34	7630	L36	7430
P30	7770	N32	7280	M34	7740	M36	7680
Q30	7240	O32	7570	N34	7800	N36	7730
R30	7120	P32	7190	O34	7770	O36	7830
S30	6960	Q32	7160	P34	7240	P36	7810
T30	7770	R32	7770	Q34	7430	Q36	7850
U30	7390	S32	7660	R34	7750	R36	7900
V30	7280	T32	7630	S34	7940	S36	7430
W30	7570	U32	7430	T34	7830	T36	7750
X30	6850	V32	7770	U34	7590	U36	7390
Y30	7770	W32	7480	V34	7770	V36	7280
Z30	7990	X32	7770	W34	7660	W36	7570
		Y32	7170	X34	7590	X36	7190
A31	7040	Z32	7250	Y34	7360		
B31	7290					A37	7630
C31	7420	A33	7260	A35	7990	B37	7690
D31	7370	B33	7640	B35	7760	C37	7640
E31	7230	C33	8120	C35	7580	D37	7370
F31	7210	D33	7790	D35	7600	E37	7900
G31	7320	E33	7380	E35	7640	F37	7420
H31	7240	F33	7410	F35	7580	G37	7320
I31	7120	G33	7760	G35	7520	H37	8500
J31	6960	H33	7660	H35	7490	I37	7730
K31	6850	I33	7550	I35	7350	J37	7680
L31	7480	J33	7620	J35	7360	K37	7730
M31	7770	K33	7630	K35	7430	L37	7590
N31	7660	L33	7480	L35	7750	M37	7530
O31	7630	M33	7390	M35	7940	N37	7310
P31	7740	N33	7770	N35	7830	O37	7240
Q31	7800	O33	7950	O35	7590	P37	7670

Q37	8350	S39	7220	U41	8010	A44	7590
R37	7220	T39	7160	V41	7980	B44	10030
S37	6690	U39	6350	W41	8050	C44	12400
T37	7360	V39	7240			D44	13560
U37	7510	W39	7740	A42	8700	E44	12890
V37	7520	X39	7820	B42	9890	F44	9990
W37	7470			C42	13400	G44	9830
X37	7370	A40	7930	D42	12120	H44	10100
		B40	8220	E42	13580	I44	9240
A38	7590	C40	8490	F42	8640	J44	11680
B38	7890	D40	8330	G42	10030	K44	13600
C38	7220	E40	8990	H42	9040	L44	12670
D38	7160	F40	8450	I42	8890	M44	14890
E38	6350	G40	9980	J42	9100	N44	10030
F38	7240	H40	8790	K42	8990	O44	9240
G38	8970	I40	8570	L42	9780	P44	9420
H38	8900	J40	9100	M42	10340	Q44	10060
I38	8840	K40	9890	N42	9960	R44	9450
J38		L40	10030	O42	9450	S44	7890
K38	7730	M40	11230	P42	9570	T44	7670
L38	7590	N40	10080	Q42	10070	U44	6990
M38	7530	O40	8660	R42	10540	V44	7030
N38	7310	P40	8590	S42	28750	W44	7310
O38	7240	Q40	8570	T42	8580		
P38	7670	R40	9570	U42	7950	A45	7640
Q38	8350	S40	16650	V42	7400	B45	7990
R38	7220	T40	7340	W42	7670	C45	8390
S38	6690	U40	7000			D45	8570
T38	7740	V40	7480	A43	7510	E45	9380
U38	7820	W40	7640	B43	11370	F45	11050
V38	7800	X40	7730	C43	16360	G45	12390
W38	7730			D43	14090	H45	10070
X38	7680	A41	8810	E43	13610	I45	9160
		B41	9270	F43	8970	J45	13600
A39	7610	C41	9770	G43	8740	K45	15190
B39	7780	D41	9650	H43	9110	L45	15270
C39	7830	E41	9540	I43	9380	M45	15420
D39	7810	F41	9880	J43	9090	N45	12070
E39	7850	G41	11260	K43	8900	O45	9150
F39	7900	H41	8950	L43	9130	P45	9200
G39	7970	I41	8730	M43	9320	Q45	9390
H39	8340	J41	9260	N43	9430	R45	8760
I39	8630	K41	10840	O43	9460	S45	7580
J39	8880	L41	11380	P43	9870	T45	7530
K39	9140	M41	12790	Q43	11500	U45	7840
L39	8790	N41	11020	R43	9640	V45	7130
M39	8300	O41	9270	S43	8480		
N39	8670	P41	8880	T43	7350	A46	7340
O39	8970	Q41	8290	U43	6920	B46	7740
P39	8900	R41	11540	V43	7000	C46	8790
Q39	8840	S41	32390	W43	7150	D46	8900
R39	7890	T41	8990			E46	8730

F46	9970	L48	9850	T50	7660	F53	9480
G46	10650	M48	9240	U50	7380	G53	8710
H46	9760	N48	8380			H53	8610
I46	8880	O48	7870	A51	7010	I53	8370
J46	11340	P48	7890	B51	7440	J53	9170
K46	14780	Q48	8320	C51	7770	K53	9790
L46	12650	R48	7730	D51	8260	L53	9120
M46	11120	S48	7850	E51	8830	M53	8470
N46	10030	T48	7610	F51	8670	N53	8680
O46	8870	U48	7290	G51	8520	O53	8760
P46	7940			H51	8480	P53	8700
Q46	7450	A49	7270	I51	8560	Q53	8480
R46	7770	B49	16340	J51	8980	R53	9010
S46	7490	C49	20420	K51	9330	S53	7760
T46	7600	D49	18900	L51	8780	T53	7390
U46	7340	E49	14430	M51	8130	U53	7060
V46	7020	F49	10300	N51	8370		
		G49	8500	O51	8610	A54	8110
A47	7280	H49	8470	P51	8700	B54	9370
B47	7750	I49	8370	Q51	8750	C54	11240
C47	9560	J49	8870	R51	8760	D54	9830
D47	9180	K49	9710	S51	8730	E54	9960
E47	8600	L49	9160	T51	7980	F54	9360
F47	8730	M49	8780	U51	7530	G54	9420
G47	8800	N49	8110			H54	8910
H47	8690	O49	7790	A52	7100	I54	8600
I47	8590	P49	8180	B52	7950	J54	9150
J47	9840	Q49	8560	C52	8870	K54	9420
K47	11930	R49	8240	D52	9560	L54	9100
L47	10350	S49	7840	E52	9940	M54	8890
M47	9380	T49	7630	F52	9000	N54	10020
N47	8490	U49	7310	G52	8730	O54	10070
O47	7920			H52	8650	P54	8970
P47	7890	A50	7100	I52	8470	Q54	8500
Q47	7820	B50	13670	J52	9010	R54	8420
R47	7610	C50	13450	K52	9730	S54	7590
S47	7570	D50	11980	L52	9120	T54	7340
T47	7520	E50	10030	M52	8350		
U47	7110	F50	9940	N52	8470	A55	8950
V47	6970	G50	8460	O52	8690	B55	10030
		H50	8480	P52	8640	C55	12550
A48	7190	I50	8450	Q52	8720	D55	9580
B48	10300	J50	8880	R52	8940	E55	8670
C48	18760	K50	9490	S52	9340	F55	8830
D48	16590	L50	8980	T52	7440	G55	9810
E48	9970	M50	8450	U52	7210	H55	9100
F48	11010	N50	8320			I55	8720
G48	8790	O50	8100	A53	7050	J55	9230
H48	8630	P50	8480	B53	8430	K55	9390
I48	8680	Q50	8670	C53	9000	L55	9020
J48	9230	R50	8560	D53	9760	M55	9030
K48	10650	S50	8010	E53	10090	N55	10070

O55	11340	D58	10040	O60	12460	H63	16480
P55	9980	E58	10780	P60	9980	I63	14640
Q55	8340	F58	10050	Q60	8830	J63	14880
R55	7770	G58	9460	R60	8260	K63	14830
S55	7420	H58	9790	S60	7460	L63	15010
T55	7360	I58	10230			M63	16580
		J58	9830	A61	12370	N63	15030
A56	10020	K58	9680	B61	12780	O63	15330
B56	12100	L58	10990	C61	13550	P63	12850
C56	11980	M58	10030	D61	13760	Q63	8860
D56	9950	N58	9570	E61	13740	R63	8250
E56	9560	O58	8890	F61	12270		
F56	8940	P58	8640	G61	12660	A64	8580
G56	9300	Q58	7950	H61	13890	B64	10090
H56	9460	R58	7890	I61	14320	C64	13890
I56	9760	S58	7530	J61	15020	D64	16640
J56	9340	T58	7300	K61	15730	E64	21660
K56	9010			L61	16740	F64	17760
L56	8980	A59	10300	M61	21780	G64	16450
M56	8460	B59	11780	N61	19890	H64	17020
N56	9910	C59	10730	O61	15210	I64	20030
O56	9830	D59	10800	P61	11380	J64	18980
P56	8430	E59	10970	Q61	8730	K64	21200
Q56	8120	F59	11360	R61	8240	L64	16890
R56	7680	G59	11400	S61	7510	M64	15830
S56	7590	H59	11040			N64	13780
T56	7460	I59	10700	A62	10880	O64	13570
		J59	11890	B62	12310	P64	12030
A57	11960	K59	12870	C62	13670	Q64	9130
B57	13050	L59	12120	D62	13880	R64	8940
C57	12710	M59	11360	E62	13270		
D57	11890	N59	9990	F62	14690	A65	9690
E57	10570	O59	9850	G62	15770	B65	10020
F57	9100	P59	9130	H62	15010	C65	13790
G57	8860	Q59	8930	I62	14500	D65	18970
H57	9740	R59	8010	J62	14780	E65	24710
I57	10410	S59	7430	K62	15120	F65	21570
J57	9230			L62	16330	G65	15620
K57	8730	A60	9890	M62	19870	H65	17470
L57	8670	B60	10400	N62	17700	I65	27400
M57	8360	C60	12450	O62	15310	J65	26940
N57	8390	D60	11600	P62	11290	K65	26880
O57	8320	E60	12650	Q62	8680	L65	21340
P57	7990	F60	11780	R62	8190	M65	14360
Q57	7790	G60	12010			N65	12980
R57	7700	H60	12900	A63	9210	O65	12680
S57	7680	I60	13430	B63	11380	P65	11790
T57	7610	J60	14890	C63	14430	Q65	9630
		K60	13870	D63	14260	R65	9380
A58	11030	L60	14560	E63	13010		
B58	12780	M60	18890	F63	15980	A66	9600
C58	11200	N60	16570	G63	17350	B66	17470

C66 23530		P71 7940	N74 9870
D66 22870	A69 10770	Q71 7870	O74 8780
E66 27750	B69 19580		P74 7770
F66 26090	C69 25800	A72 10050	Q74 7470
G66 29660	D69 22790	B72 10560	
H66 23410	E69 18950	C72 12430	A75 10410
I66 28130	F69 18300	D72 12290	B75 10900
J6 25220	G69 17590	E72 12060	C75 11560
K66 24560	H69 19120	F72 12780	D75 11740
L66 20010	I69 19230	G72 13640	E75 12170
M66 14590	J69 16380	H72 15200	F75 11390
N66 13650	K69 14400	I72 16980	G75 11320
O66 13000	L69 18040	J72 16480	H75 11210
P66 10340	M69 19680	K72 16990	I75 12130
Q66 8320	N69 12730	L72 14540	J75 14780
R66 8410	O69 10180	M72 11000	K75 16610
	P69 9830	N72 9590	L75 12490
A67 9560	Q69 8150	O72 8459	M75 9470
B67 24670		P72 8170	N75 8880
C67 32500	A70 11060	Q72 7840	O75 8010
D67 31090	B70 16300		P75 7540
E6 30210	C70 19040	A73 9410	Q75 7320
F67 38650	D70 17340	B73 9970	
G67 45430	E70 16480	C73 12210	A76 9830
H67 32680	F70 15100	D73 12330	B76 9850
I67 28720	G70 15210	E73 12170	C76 10460
J67 24990	H70 17890	F73 13000	D76 11660
K67 22620	I70 19020	G73 13730	E76 11780
L67 18600	J70 18460	H73 12740	F76 11200
M67 14610	K70 17750	I73 12710	G76 11180
N67 14640	L70 16460	J73 13890	H76 11190
O67 13060	M70 14730	K73 15750	I76 12020
P67 10090	N70 11340	L73 14670	J76 13760
Q67 7580	O70 9840	M73 11110	K76 14680
	P70 8130	N73 10400	L76 11380
A68 9740	Q70 7950	O73 9600	M76 9760
B68 21980		P73 8320	N76 8910
C68 28900	A71 11640	Q73 7930	O76 8450
D68 28760	B71 12020		P76 7850
E68 23420	C71 12830	A74 9690	Q76 7580
F68 26780	D71 12640	B74 10020	
G68 31580	E71 12180	C74 11490	A77 8840
H68 26580	F71 12660	D74 12060	B77 9100
I68 23010	G71 13730	E74 12090	C77 10250
J68 19870	H71 16890	F74 12360	D77 11470
K68 18760	I71 18710	G74 12870	E77 11100
L68 18410	J71 19900	H74 12040	F77 11080
M68 17380	K71 20390	I74 12540	G77 11150
N68 13090	L71 14760	J74 13910	H77 11250
O68 11780	M71 10010	K74 15780	I77 11340
P68 9980	N71 9090	L74 13880	J77 11260
Q68 7640	O71 8050	M74 10020	K77 11170

L77	10470	J80	14000	H83	20780	H86	13340
M77	10480	K80	15080	I83	20510	I86	14740
N77	9440	L80	13390	J83	19000	J86	14870
O77	8680	M80	11280	K83	19030	K86	15650
P77	8130	N80	9380	L83	14570	L86	13390
Q77	7670	O80	8540	M83	10170	M86	10900
		P80	1990	N83	9780	N86	9330
A78	9120	Q80	7760	O83	8870	O86	9450
B78	10560			P83	7730	P86	9240
C78	14380	A81	8480	Q83	7450		
D78	15830	B81	12330			A87	11170
E78	17010	C81	14210	A84	9190	B87	11440
F78	14790	D81	28670	B84	11890	C87	12780
G78	11330	E81	31360	C84	12880	D87	13020
H78	11340	F81	19890	D84	15690	E87	10940
I78	11280	G81	12730	E84	15850	F87	10740
J78	12790	H81	12750	F84	16560	G87	11130
K78	13990	I81	12790	G84	17380	H87	14980
L78	12680	J81	13870	H84	16480	I87	16420
M78	11310	K81	14950	I84	16640	J87	13870
N78	9670	L81	12330	J84	17670	K87	13260
O78	8460	M81	10410	K84	18020	L87	11480
P78	7980	N81	8990	L84	14670	M87	9780
Q78	7550	O81	8730	M84	11200	N87	9110
		P81	8340	N84	9630	O87	7950
A79	9520	Q81	8110	O84	8800	P87	8180
B79	13280			P84	7930		
C79	15390	A82	8730			A88	9930
D79	18900	B82	12290	A85	9200	B88	1280
E79	21970	C82	14020	B85	11600	C88	13760
F79	16630	D82	23400	C85	12340	D88	13790
G79	11480	E82	26490	D85	11940	E88	12020
H79	11580	F82	19950	E85	11670	F88	12210
I79	11640	G82	16670	F85	13480	G88	12770
J79	14760	H82	15380	G85	14350	H88	19490
K79	15840	I82	15780	H85	13010	I88	25690
L79	13980	J82	16480	I85	12590	J88	22890
M79	12350	K82	17490	J85	15310	K88	25520
N79	9890	L82	13750	K85	17000	L88	16600
O79	8180	M82	10290	L85	14950	M88	12290
P79	7740	N82	9240	M85	12290	N88	10060
Q79	7450	O82	8810	N85	9480	O88	8170
		P82	7970	O85	8740	P88	7750
A80	9140	Q82	7730	P85	8360		
B80	12780					A89	8310
C80	14760	A83	9130	A86	9870	B89	13010
D80	23450	B83	12360	B86	11610	C89	15820
E80	26480	C83	13180	C86	12420	D89	14780
F80	18800	D83	17480	D86	12890	E89	13780
G80	12390	E83	20130	E86	11270	F89	13700
H80	12040	F83	20760	F86	12230	G89	13680
I80	12210	G83	20810	G86	13480	H89	24790

I89	32510	L92	17560	A96	12080	F99	25570
J89	34760	M92	15670	B96	23450	G99	28540
K89	36110	N92	11980	C96	28000	H99	31030
L89	21470	O92	8980	D96	22700	I99	34150
M89	14630			E96	19540	J99	40030
N89	11280	A93	8160	F96	24440	K99	47630
O89	8670	B93	10040	G96	27510	L99	29580
P89	7790	C93	12250	H96	49960	M99	12200
		D93	12780	I96	74570	N99	10480
A90	8360	E93	12790	J96	53900	O99	9370
B90	13680	F93	45590	K96	42780		
C90	17740	G93	80270	L96	21110	A100	8480
D90	17690	H93	38740	M96	93450	B100	13290
E90	17730	I93	13430	N96	8920	C100	18890
F90	16690	J93	16880			D100	18930
G90	16730	K93	19650	A97	12140	E100	22180
H90	24070	L93	21490	B97	19010	F100	23420
I90	31780	M93	22660	C97	28110	G100	27580
J90	27700	N93	14680	D97	21750	H100	33230
K90	25590	O93	10490	E97	17300	I100	37890
L90	16690			F97	25580	J100	44560
M90	11800	A94	9840	G97	30140	K100	51230
N90	9830	B94	18870	H97	54830	L100	31230
O90	7870	C94	19980	I97	63280	M100	19980
		D94	17890	J97	47890	N100	13440
A91	8390	E94	16490	K97	42930	O100	9400
B91	14780	F94	29890	L97	21390		
C91	19180	G94	47680	M97	9460	A101	8180
D91	20340	H94	41090	N97	9320	B101	9350
E91	21110	I94	39870	O97	9480	C101	10810
F91	19980	J94	35630			D101	15680
G91	19390	K94	27890	A98	11290	E101	21440
H91	24670	L94	21660	B98	18700	F101	21320
I91	30470	M94	14890	C98	28470	G101	21580
J91	21980	N94	10020	D98	22390	H101	34620
K91	13790	O94	9100	E98	19670	I101	40560
L91	11200			F98	25560	J101	49690
M91	9220	A95	11360	G98	28990	K101	54520
N91	8350	B95	26380	H98	43560	L101	33670
O91	7180	C95	27070	I98	45390	M101	26750
		D95	24840	J98	43560	N101	17740
A92	8240	E95	22610	K98	44780	O101	9480
B92	12360	F95	23770	L98	26730		
C92	16640	G95	24960	M98	11490	A102	7990
D92	15630	H95	44730	N98	9980	B102	8880
E92	16690	I95	97510	O98	9430	C102	10570
F92	32320	J95	68570			D102	13450
G92	48780	K95	42380	A99	9070	E102	16120
H92	32020	L95	21730	B99	16850	F102	18890
I92	20090	M95	9239	C99	28660	G102	19590
J92	18740	N95	8720	D99	24630	H102	17760
K92	17560			E99	23100	I102	31260

J102 40120	C10E 11870	B11C 7340	E114 8690
K102 43570	D10E 16080	C11C 7960	F114 8560
L102 27580	E10E 18780	D11C 9170	G114 8340
M102 21340	F10E 19840	E11C 9700	H114 8410
N102 14860	G10E 19980	F11C 10030	I114 8680
	H10E 17460	G11C 10490	J114 9120
A10E 7710	I10E 12930	H11C 9710	K114 9910
B10E 8340	J10E 13570	I110 9740	
C10E 10300	K10E 15290	J110 9670	A11E 6700
D10E 10620	L10E 14660	K11C 9760	B11E 6990
E10E 10570	M10E 13250	L110 8840	C11E 7280
F10E 14790			D11E 7870
G10E 18050	A107 7220	A111 7320	E11E 8810
H10E 19920	B107 8720	B111 7780	F11E 8110
I10E 20550	C107 11030	C111 8530	G11E 7650
J10E 28730	D107 15870	D111 9250	H11E 8460
K10E 34360	E107 19020	E111 9710	I11E 9620
L10E 24590	F107 14490	F111 9940	J11E 9320
M10E 16280	G107 12630	G111 10000	K11E 9050
N10E 11200	H107 12740	H111 9890	
	I107 12900	I111 9760	A11E 7450
A104 7600	J107 13110	J111 9850	B11E 7120
B104 8560	K107 14200	K111 9950	C11E 7330
C104 11350	L107 10060		D11E 7770
D104 13340		A112 7110	E11E 8780
E104 14760	A10E 7110	B112 7450	F11E 8000
F104 18870	B10E 7850	C112 8470	G11E 7610
G104 23870	C10E 9790	D112 8880	H11E 7690
H104 21370	D10E 13500	E112 8680	I11E 7850
I104 16790	E10E 14560	F112 9120	J11E 7940
J104 21370	F10E 12230	G112 9640	K11E 8110
K104 24470	G10E 11750	H112 9570	
L104 21100	H10E 10980	I112 8940	A117 7880
M104 17890	I10E 10040	J112 9230	B117 7730
N104 13240	J10E 11320	K112 9810	C117 7550
	K10E 13780		D117 7580
A10E 7500	L10E 9680	A11E 6740	E117 8790
B10E 8840		B11E 7130	F117 7940
C10E 12010	A10E 6850	C11E 8220	G117 7530
D10E 16390	B10E 7170	D11E 8370	H117 7500
E10E 17000	C10E 7880	E11E 8410	I117 7570
F10E 23490	D10E 9010	F11E 8800	J117 7240
G10E 27600	E10E 9650	G11E 8980	K117 7070
H10E 22370	F10E 10850	H11E 8390	
I10E 12880	G10E 10750	I11E 7960	
J10E 14270	H10E 9790	J11E 8890	
K10E 16170	I10E 9460	K11E 9850	
L10E 18440	J10E 9500		
M10E 19100	K10E 9560	A114 6640	
	L10E 9420	B114 7040	
A10E 7410	A11C 7140	C114 7760	
-B10E 8800		D114 8280	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number 111306-1

Page 1 of 1

Instrument/SN: <u>12/121298</u>	Calibration Due: <u>3/2/07</u>	Site Name: <u>BLUENEDGE</u>	Date: <u>11/3/06</u>	Time: <u>1640</u>
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>NORTH END OF SITE</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>RELEASE</u>		
Survey Performed By (Print): <u>Sumner</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>N/A</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input type="checkbox"/> feet <input type="checkbox"/> centimeters		

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Notes: PERFORMED RELEASE SUBJECTS THROUGHOUT THE DAY. NO READINGS ABOVE BACKGROUND

BOOTS x2

BOOTS x2

GLOVES x2

GLOVES x2

HARDHAT x2

HARDHAT x2

BAG TRASH x1

BUNDLE COLLAR GLOVES x2

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM**

Survey Number 111406-1

Page 1 of 1

Instrument/SN: <u>12121298</u>	Calibration Due: <u>3/21/07</u>	Site Name: <u>BLIZZARD DOG</u>	Date: <u>11/14/06</u>	Time: <u>1645</u>
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>NORTH END OF SITE</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>RECEASE</u>		
Survey Performed By (Print): <u>Sumner</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>N/A</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input type="checkbox"/> feet <input type="checkbox"/> centimeters		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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Notes: PERFORMED REVERSE SURVEYS THROUGHOUT THE DAY. NO READINGS ABOVE BACKGROUND

BOOTS x 2

BOOTS x 2

GLOVES x 2

GLOVES x 2

HARDHAT x 2

HARDHAT x 2

AIR TRASH x 1

HANDLE GEOPROBE SCOUTS x 1

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM**

Survey Number 11506-1

Page 1 of 1

Instrument/SN: <u>12 / 121298</u>	Calibration Due: <u>3/21/07</u>	Site Name: <u>BLOCK 2.040</u>	Date: <u>11/16/06</u>	Time: <u>1530</u>
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>NORTH END OF SITE</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>PERMISE</u>		
Survey Performed By (Print): <u>Sumner</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>N/A</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input type="checkbox"/> feet <input type="checkbox"/> centimeters		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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Notes: PERFORMED PERMISE SURVEYS THROUGHOUT THE DAY. NO RETURNING ABOVE
BACKGROUND

BWTS x2
BWTS x2
GLWJS x2
GLWJS x2
HARD CUT x2
HARD CUT x2
BAZ TRASH x1
BUNDLE GAD PROBE SLEEVES x1

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number 11506-2

Page 1 of 1

Instrument/SN: <u>12/121298</u>		Calibration Due: <u>3/21/07</u>		Site Name: <u>Blackburn Ave</u>		Date: <u>7/1/06</u>		Time: <u>1600</u>	
Instrument/SN: <u>N/A</u>		Calibration Due: <u>N/A</u>		Location: <u>NORTH END OF SITE</u>					
Instrument/SN: <u>N/A</u>		Calibration Due: <u>N/A</u>		Purpose: <u>REUSE</u>					
Survey Performed By (Print):				Survey Performed By (Signature): <u>[Signature]</u>					
<input checked="" type="checkbox"/> Battery OK		<input checked="" type="checkbox"/> HV OK		<input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>N/A</u>			
						<input type="checkbox"/> meters <input type="checkbox"/> inches <input type="checkbox"/> feet <input type="checkbox"/> centimeters			

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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Notes: SURVEYED GEO PROBE RIA SIN 2213754 FOR REUSE. SURVEYED ALL EXTERIOR SURFACES, PAYING CLOSE ATTENTION TO AREAS THAT CAME IN CONTACT WITH THE GROUND, SAMPLING BOOM, OPERATOR ARM, BORING EQUIPMENT, EXTENSIONS AND TOOLS ASSOCIATED WITH THE MACHINE. SURVEY WAS PERFORMED AFTER PRESSURE WASHING. NO READING ABOVE BACKGROUND

Minor Change
Number:
By:
Date: / /

No. RSP-008
Rev. No. 004
Date: 3/30/06
Page: 24 of 25

Project No. 200205, 058	Defector		Meter		
Site Location/Background Location: H222001:000 W1001:000	Type: 44-10	Serial No. 2A132520	Type: 2741	Serial No: 114535	Operating Voltage: 500

Check Source Number 217A	Radionuclide: 210Pb	Calibration Activity and Date: 2/1/81
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[illegible]

BACKGROUND WITH SHIELDED PROBE, ONLY RESPONSE (uR/hr)
COMPLETED ON UNSHIELDED DATA SHEET

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
CONTAMINATION SURVEY INSTRUMENT DATA SHEET**

Project No: 2003008.008			Detector			Meter		
Site Location/Background Location: B225002.D06			Type: Ludlum Model 44-9	Serial No. P2 131564	Probe Area (cm ²)	Type: Ludlum Model 12	Serial No: 121268	Operating Voltage: 900
Check Source No: 2398.98			Check Source No: N/A			Check Source No: N/A		
Radionuclide: Tc-99	Activity: 19.200 DPM	Date: 8/6/98	Radionuclide: N/A	Activity: N/A	Date: N/A	Radionuclide: N/A	Activity: N/A	Date: N/A

Date	Start of Shift Background (cpm for a <u>15/15</u> minute count)								End of Shift Background (cpm for a <u>15/15</u> minute count)								(Daily Source Check #1)		Daily Source Check (#)		ALDA** - Stake Mode (dpm)		Bat. OK	HV OK	Initials
	Alpha				Beta				Alpha				Beta				Source (cpm)	Eff.	Source (cpm)	Eff.	a	b			
	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.									
11/6/00	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	3000	15.6	3000	15.6	✓	✓	5	
11/7/00	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	3000	15.6	3000	15.6	✓	✓	5	
11/8/00	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	3000	15.6	3000	15.6	✓	✓	5	
11/9/00	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	3000	15.6	3000	15.6	✓	✓	5	
11/10/00	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	3000	15.6	3000	15.6	✓	✓	5	
11/11/00	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	3000	15.6	3000	15.6	✓	✓	5	
11/12/00	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	3000	15.6	3000	15.6	✓	✓	5	
11/13/00	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	3000	15.6	3000	15.6	✓	✓	5	
11/14/00	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	3000	15.6	3000	15.6	✓	✓	5	
11/15/00	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	3000	15.6	3000	15.6	✓	✓	5	
11/16/00	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	3000	15.6	3000	15.6	✓	✓	5	

$$MDA = \frac{2.71 + 4.65 \sqrt{BKG_{avg} \times t}}{t \times E \times \frac{A}{100}}$$

where MDA = the activity level (dpm/100 cm²), BKG_{avg} = (the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm²).

CALIBRATION CERTIFICATE FOR

2241

SERIAL#

114535

Owner: IEM

DATE: 07/28/06

LOCATION:

Griffin Inst

TECH: Joanne Glenn

DATE LAST CAL EXPIRES:

07/09/06

Reason For Calibration:

☒ Due For Calibration

☐ Repair (See Remarks)

☐ Other (See Remarks)

☐ Due and Repair (See Remarks)

NIST TRACEABLE EQUIPMENT USED DURING CALIBRATION

MODEL: M-500

SERIAL #: 114512

CAL DUE: 11/14/06

MODEL:

SERIAL #:

CAL DUE:

☒ Fast/Slow Switch working properly

☒ Audio Response

☐ Geotropism

CABLE LENGTH 39"

CONDITION: Sat

NEW BATTERIES: ☒ Yes ☐ No

BATTERY CHECK: Sat

HV TEST N/A ☒ Sat ☐ Unsat

AF INPUT SENSITIVITY (mV) #1:

10

AL INPUT SENSITIVITY (mV) #1:

A.F.

AF INPUT SENSITIVITY (mV) #2:

N/A

AL INPUT SENSITIVITY (mV) #2:

N/A

AF INPUT SENSITIVITY (mV) #3:

N/A

AL INPUT SENSITIVITY (mV) #3:

N/A

RATE CPM AS FOUND % ERROR AS LEFT % ERROR

250	250	0.0%	A.F.	
2500	2500	0.0%	A.F.	
25K	25	K 0.0%	A.F.	
250K	250	K 0.0%	A.F.	

Is the As Found Data Within 2% of the Set Point?:

☒ Yes ☐ No

DETECTOR 1:

AF 1-6

AL 1-6

0006 S-6

A.F.

N/A

0100 -2

A.F.

N/A

10

A.F.

N/A

10

A.F.

N/A

100 s

A.F.

N/A

DETECTOR 2:

AF 1-6

AL 1-6

N/A

N/A

N/A

N/A

N/A

DETECTOR 3:

AF 1-6

AL 1-6

N/A

N/A

N/A

N/A

N/A

Remarks: Calibrated w/44-10 #PR132520

Does Instrument Meet Final Acceptance Criteria?:

☒ Yes

☐ No

Calibration Sticker Attached?:

☒ Yes

☐ No

Date Instrument is Due For Next Calibration:

07/28/07

Performed/Reviewed by:

Joanne Glenn

Date: 7/28/2006

Entered by:

JP Initials



GRIFFIN INSTRUMENTS



CALIBRATION CERTIFICATE FOR 44-10 PROBE # PR132520

Owner: IEM

DATE: 07/28/06

LOCATION:

Griffin Inst

TECH: Joanne Glenn

DATE LAST CAL EXPIRES:

☒ Due For Calibration☐ Other (See Remarks)

Cable Length: 39"

☐ Repair (See Remarks)☐ Due and Repair

I.S.: 10 mV

NIST TRACEABLE EQUIPMENT AND STANDARDS USED DURING CALIBRATION

MODEL: 2241

SERIAL #: 114535

CAL DUE: 07/28/07

MODEL:

SERIAL #:

CAL DUE:

SOURCE #: Other

ISOTOPE:

ACTIVITY:

ASSAY DATE:

SOURCE #: 99-1816

ISOTOPE: Cs137

ACTIVITY: 1.23 uCi

ASSAY DATE: 08/12/99

GEOMETRY: For G-5 Probe - Source placed in desk drawer, no planchet or jig, probe on top of desk. All Others: Jig upside down with source underneath, activity side up.

Physical Condition: ☒ Sat ☐ Unsat

Efficiency From Last Calibration:

Previous HV Set Point:

V

Counts (CPM)

Background (CPM)

Net CPM:

Decay (yrs): 6.92

AF Efficiency:

Is the AF efficiency within 20% of the efficiency from the last calibration?

Yes

☐ No

Reproducibility: 117080

115670

116100

Average:

116283 33

Are the individual counts within 10% of the average?

☐ Yes

No

High Voltage:

Source Response (CPM):

Background (CPM):

Net CPM:

700
750
800
850

104890
108020
113440

6310
7820
8630
9690

98580
100200
104810

HV

RESPONSE

BACKGROUND

NET CPM

Decay (yrs):

6.92

800 V

117080

8580

108500

Efficiency:

4.66%

Remarks: No previous cal data. Calibrated w/2241 #114535.

Does Instrument Meet Final Acceptance Criteria?:

☒ Yes☐ No

Calibration Sticker Attached?:

☒ Yes☐ No

Date Instrument is Due For Next Calibration:

07/28/07

Performed/Reviewed by:

Joanne Glenn

Date: 7/28/2006

Entered by:

Initials



GRIFFIN INSTRUMENTS



CALIBRATION CERTIFICATE FOR 44-9 PROBE # PR131864

Owner: IEM

DATE: 03/21/06

LOCATION:

Griffin Inst

TECH: J. Glenn

DATE LAST CAL EXPIRES:

03/30/06

REASON FOR CALIBRATION:

☒ Due For Calibration ☐ Repair (See Remarks) ☐ Other (See Remarks) ☐ Due and Repair

CABLE LENGTH: 39"

INPUT SENSITIVITY: 35 mV

NIST TRACEABLE EQUIPMENT USED DURING CALIBRATION

MODEL: 12 SERIAL #: 178479 CAL. DUE: 12/22/06
MODEL: SERIAL #: CAL. DUE:

NIST TRACEABLE SOURCES

SOURCE #: 2695-00 SOURCE #:
ISOTOPE: Tc99 ISOTOPE:
ACTIVITY (dpm): 18400 ACTIVITY:
ASSAY DATE: 03/01/00 ASSAY DATE:

PHYSICAL CONDITION: Sat EFF. FROM LAST CAL.: AF BKG: 81 65 HV 900V

3 ONE MINUTE COUNTS: 5000 4870 5260 AVERAGE: 5043.3

TC-99 EFFICIENCY: 13.30%

SR-90 COUNT:

SR-90 EFF:

AS LEFT ONE MINUTE COUNTS:

4920 4995 4987

AVERAGE: 4967.3

TC-99 EFFICIENCY: 13.14%

SR-90 COUNT:

SR-90 EFF:

Is the as found efficiency within 20% of eff. from last cal.?

☐ Yes ☒ No *See Remarks

Saturation Test Satisfactory

☒ Yes ☐ No

Reproducibility: Are the individual counts within 10% of the average?

☒ Yes ☐ No

Does the probe meet final acceptance criteria?

☒ Yes ☐ No

Calibration sticker attached?

☒ Yes ☐ No

Remarks: No previous cal data. Cleaned GM Tube and screen due to high bkg. Calibrated w/12 NS #121268.

DATE PROBE IS DUE FOR NEXT CALIBRATION:

03/21/07

Performed/Reviewed by:

Date: 3/21/2006

Entered by: Initials

Geometry: Flat surface unless otherwise noted.

Calibrations performed to ANSI N323A-1997 standards

CALIBRATION CERTIFICATE FOR

12 NS

SERIAL#

121268

Owner: IEM

DATE: 03/21/06

LOCATION:

Griffin Inst

TECH: J Glenn

DATE LAST CAL EXPIRES:

03/30/06

Reason For Calibration:

☒ Due For Calibration

☐ Repair (See Remarks)

☐ Other (See Remarks)

☐ Due and Repair (See Remarks)

NIST TRACEABLE EQUIPMENT USED DURING CALIBRATION

MODEL: M-500

SERIAL #: 114512

CAL DUE: 11/14/06

MODEL:

SERIAL #:

CAL DUE:

☒ Fast/Slow Switch working properly

☒ Audio Response

☒ Geotropism

CABLE LENGTH 39"

CONDITION: Sat

AF MECHANICAL ZERO: 0

AL MECHANICAL ZERO: 0

NEW BATTERIES: Yes ☒ No

BATTERY CHECK: Sat

HV RANGE FOR M-3 ONLY 400 - 1500 VOLTS

☒ N/A ☐ Sat ☐ Unsat

HV

AS FOUND HV

AS LEFT HV

500 V:

500

A.F.

1250 V: 1000 V for 177s

1250

A.F.

2000 V: 1500 V for 177s

2010

A.F.

AF INPUT SENSITIVITY (mV): 35

AL INPUT SENSITIVITY (mV): A.F.

DATE ENTERED

SCALER

SCALE RATE CPM AS FOUND % ERROR AS LEFT % ERROR AS FOUND % ERROR AS LEFT % ERROR

x.1 or x1	100	100	0.0%	A.F.					
	250	250	0.0%	A.F.					
	400	400	0.0%	A.F.					
x1 or x10	1000	1000	0.0%	A.F.					
	2500	2500	0.0%	A.F.					
	4000	4000	0.0%	A.F.					
x10 or x100	10K	10 K	0.0%	A.F.					
	25K	25 K	0.0%	A.F.					
	40K	40 K	0.0%	A.F.					
x100 or x1000	100K	100 K	0.0%	A.F.					
	250K	250 K	0.0%	A.F.					
	400K	400 K	0.0%	A.F.					

Is the As Found Data Within 20% of the Set Point?:

☒ Yes

☐ No

Remarks: Repaired loose bezel glass Calibrated w/44-9 #pr131864.

Does Instrument Meet Final Acceptance Criteria?:

☒ Yes

☐ No

Calibration Sticker Attached?:

☒ Yes

☐ No

Date Instrument Is Due For Next Calibration:

03/21/07

Performed/Reviewed by:

Joanne Glenn

Date: 3/21/2006

Entered by:

[Signature] Initials

APPENDIX B

Soil Boring Logs

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-94 DATE: 1/11/50 Time: 1550 FIELD PERSON: J. K. ELLER					
DRILLING CONTRACTOR: MATELO DRILLER: GARY RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						TOTAL DEPTH: 4 BOREHOLE DIAMETER: 2 Inch					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
		↑	↑	4560		1		0.4' : Silty clay, brown, moist
		4	3.2	3910		2		
				3680		3		
		↓	↓	3890		4		
				3470		5		
				3570		6		
				NR		7		
						8		
						9		
						10		
						11		
						12		
						13		
						14		

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan										SOIL BORING NUMBER: SB-93 DATE: 11/15/06 Time: 1540 FIELD PERSON: R. KERRICK									
DRILLING CONTRACTOR: MATECO DRILLER: GARY RIG TYPE: Geoprobe Track Rig										TOTAL DEPTH: 4' BOREHOLE DIAMETER: 2 Inch									
SAMPLING METHODS: Push Core NORTH: EAST:										DATUM: AZIMUTH:									
SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET		GRAPHIC LOG		SAMPLE DESCRIPTION									
		↑	↑	4350 3750		1				0-4' : Silty Clay, brown, moist									
		4	1.4	3110 3520		2													
		↓	↓	NR		3													
						4													
						5													
						6													
						7													
						8													
						9													
						10													
						11													
						12													
						13													
						14													

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: <i>SB-91</i> DATE: <i>11/15/06</i> Time: <i>1545</i> FIELD PERSON: <i>2 KEDER</i>					
DRILLING CONTRACTOR: <i>MATELO</i> DRILLER: <i>GARY</i>						TOTAL DEPTH: <i>41</i> BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						DATUM: AZIMUTH:					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
		↑	↑	<i>4110</i>		1		<i>0-4' : silty clay, dk brown, orange/bk brown @ 4'</i>
		4	3	<i>3860</i>		2		
		↓	↓	<i>3090</i>		3		
				<i>4080</i>		4		
				<i>4290</i>		5		
				<i>3750</i>		6		
				<i>NR</i>		7		
						8		
						9		
						10		
						11		
						12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-90 DATE: 11/15/06 Time: 1525 FIELD PERSON: R. KEELER					
DRILLING CONTRACTOR: MATCO DRILLER: GARY RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						TOTAL DEPTH: 4' BOREHOLE DIAMETER: 2 Inch					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
		↑	↑	4520		1		0-4' : Silty clay, brown
				3820				
		↑	3	3920		2		
				4010				
		↓	↓	3670		3		
				4100				
		↓	↓	NA		4		
						5		
						6		
						7		
						8		
						9		
						10		
						11		
						12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: <u>SB-89</u> DATE: <u>11/15/86</u> Time: <u>1139</u> FIELD PERSON: <u>R. KEELER</u>					
DRILLING CONTRACTOR: <u>MATELO</u> DRILLER: <u>GARY</u> RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						TOTAL DEPTH: <u>12</u> BOREHOLE DIAMETER: 2 Inch					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3		↑	↑	4520				0-3': silty clay, brown, moist
3-4				4440		1		
4-15		3	2.2	4160				
15-21				4060		2		
21-27		↓	↓	4180				
27-33				3630		3		3-6': A/A
3-35		↑	↑	4050				
35-4				4110		4		
4-45		3	3	4180				
45-5				4010		5		
5-55		↓	↓	4020				
55-6				4220		6		
6-65		↑	↑	4020				6-9': silt, hard, moist
65-7				4080		7		
7-75		3	3	4260				
75-8				4450		8		
8-85		↓	↓	3630				
85-9				4120		9		
9-95		↑	↑	4200				9-10.5': Sand, brown, Fm, silty, wet
95-10				3950		10		
10-10.5		3	3	3690				10.5-12': clayey, silty, dk gray, hard, friable, moist
10.5-11				3650		11		
11-11.5		↓	↓	3560				
11.5-12				3970		12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: <i>SB-88</i> DATE: <i>11/15/06</i> Time: <i>1041</i> FIELD PERSON: <i>R. KEELER</i>					
DRILLING CONTRACTOR: <i>MATECO</i> DRILLER: <i>GARY</i> RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						TOTAL DEPTH: <i>12ft.</i> BOREHOLE DIAMETER: 2 inch					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"								
3-4'		↑	↑	3720		1		0-3' Silty clay, dk brown, plastic, moist.
4-15'		3	1.5	4280		2		
15-21'				3820		3		
21-27'		↓	↓	NR		4		
27-33'						5		3-4.5' Silty clay, brown, hard, moist
33-35'		↑	↑	4380		6		
35-4'				4140		7		4.5-4.7' Sand, brown, silty, fine, wet
4-4.5'		3	3	3580		8		4.7-6' Silty clay, brown, hard, moist.
4.5-5'				4530		9		
5-5.5'		↓	↓	4010		10		
5.5-6'				4070		11		6-6.8' Sand, brown, silty, fine, wet
6-6.5'		↑	↑	3900		12		6.8-9' Silty clay, dk gray, hard, moist
6.5-7'		3	3	4100		13		
7-7.5'				3870		14		
7.5-8'				3990				
8-8.5'		↓	↓	3840				
8.5-9'				3920				9-9.5' dk gray clayey silt, hard, moist.
9-9.5'		↑	↑	3760				
9.5-10'								
10-10.5'		3	0.5					
10.5-11'								
11-11.5'		↓	↓					
11.5-12'								

Background 4110

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-86 DATE: 1/11/5706 Time: 1330 FIELD PERSON: E. J. LEPLER						
DRILLING CONTRACTOR: MATELO DRILLER: GAY							TOTAL DEPTH: 12' BOREHOLE DIAMETER: 2 Inch						
RIG TYPE: Geoprobe Track Rig													
SAMPLING METHODS: Push Core													
NORTH:							DATUM:						
EAST:							AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	4600				0-3': Silty clay, brown, moist.
3-9"				4246		1		
9-15"		3	2.5	3540		2		
15-21"				3540				
21-27"		↓	↓	3570		3		3-6': A/A, moist.
27-33"				3820				
3-3.5'		↑	↑	4220		4		
3.5-4'				3890				
4-4.5'		3	2	3840		5		
4.5-5'				3920				
5-5.5'		↓	↓	3830		6		
5.5-6'				A/A				6-9': A/A, hard, moist
6-6.5'		↑	↑	4140		7		
6.5-7'				3820				
7-7.5'		3	3	3560		8		
7.5-8'				3750				
8-8.5'		↓	↓	4080		9		
8.5-9'				3600				
9-9.5'		↑	↑	3970		10		9-9.5' A/A
9.5-10'				3900				9.5-12': Clayey silty dk gray, hard, friable, moist.
10-10.5'		3	3	3920		11		
10.5-11'				4010				
11-11.5'		↓	↓	4100		12		
11.5-12'				4060				
						13		
						14		

Bg = 4/1/0

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: <i>SB-85</i> DATE: <i>11/15/05</i> Time: <i>1429</i> FIELD PERSON: <i>R. KEELER</i>					
DRILLING CONTRACTOR: <i>MATECO</i> DRILLER: <i>GARY</i> RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3		↑	↑	3850				0-3': Silty Clay, brown, moist
3-9		↑	↑	4160		1		
9-15		3	2	3650		2		
15-21		↓	↓	3670		3		3-6': A/A, moist
21-27		↓	↓	3690		4		
27-33		↑	↑	NA		5		
3-3.5		↑	↑	3700		6		6-9' A/A, V hard, moist
3.5-4		↑	↑	3590		7		
4-4.5		3	3	3850		8		
4.5-5		↓	↓	3610		9		9-10': Sandy Clay, brown, soft, moist
5-5.5		↓	↓	3760		10		
5.5-6		↑	↑	3970		11		10-12': Clayey Silty dk gray, hard, friable, moist.
6-6.5		↑	↑	3720		12		
6.5-7		3	3	4090		13		
7-7.5		↓	↓	3570		14		
7.5-8		↓	↓	3500				
8-8.5		↑	↑	3600				
8.5-9		↑	↑	4050				
9-9.5		↑	↑	4130				
9.5-10		3	2.8	3960				
10-10.5		↓	↓	4160				
10.5-11				4310				
11-11.5				4310				
11.5-12				4150				

LB = 4110

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-04 DATE: 11/15/06 Time: 1115 FIELD PERSON: R. KEEFER		
DRILLING CONTRACTOR: MATECO DRILLER: GARY RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core							TOTAL DEPTH: 12' BOREHOLE DIAMETER: 2 Inch		
NORTH: EAST:							DATUM: AZIMUTH:		

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3		↑	↑	5360				0-3': Silty Clay, brown, moist.
3-4				4740		1		
4-15		3	2.5	4060		2		
15-21				3770				
21-27		↓	↓	3590		3		3-6': A/L, hard @ 4' Bgs
27-33				4210				
33-35		↑	↑	4210		4		
35-4				4520				
4-20-4.5		3	3	3700		5		
4.5-5				3920				
5-5.5		↓	↓	4050		6		6-9': A/L dense, hard, moist, friable.
5.5-6				4160				
6-6.5		↑	↑	4050		7		
6.5-7				3970				
7-7.5		3	3	4000		8		
7.5-8				3730				
8-8.5		↓	↓	4160		9		9-12': Clayey silt, hard, friable, moist
8.5-9				4350				
9-9.5		↑	↑	4610		10		
9.5-10				3960				
10-10.5		3	2.5	4090		11		
10.5-11				4040				
11-11.5		↓	↓	3530		12		
11.5-12				3620				
						13		
						14		

36 = 4/10

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site		SOIL BORING NUMBER: <i>SB-83</i>	
PROJECT NUMBER: 21-11010G		DATE: <i>11/15/06</i>	
PROJECT LOCATION: Breckenridge, Michigan		Time: <i>10:25</i>	
DRILLING CONTRACTOR: <i>MATELO</i>		FIELD PERSON: <i>R. KEDER</i>	
DRILLER: <i>GARY</i>		TOTAL DEPTH: <i>12 ft</i>	
RIG TYPE: Geoprobe Track Rig		BOREHOLE DIAMETER: 2 Inch	
SAMPLING METHODS: Push Core			
NORTH:		DATUM:	
EAST:		AZIMUTH:	

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3'		↑	↑	4090				0-3': Silty clay, brown, moist
3-9'				4890		1		
9-15'		3	2.5	4620		2		
15-21'				4170				
21-27'		↓	↓	3910		3		
27-33'				3840				
3-3.5'		↑	↑	4370		4		3-6': All hard, moist
3.5-4'				4490				
4-4.5'		3	3	4280		5		
4.5-5'				4220				
5-5.5'		↓	↓	3670		6		
5.5-6'				3820				6-9': All, dk gray 8.7 to 9'
6-6.5'		↑	↑	3866		7		
6.5-7'				3410				
7-7.5'		3	2.5	3890		8		
7.5-8'				4316				
8-8.5'		↓	↓	4310		9		
8.5-9'				4010				
9-9.5'		↑	↑	4420		10		9-10.3': Sand, silty, dk gray, fine, wet.
9.5-10'				3980				
10-10.5'		3	3	3680		11		10.3-12': Sandy, clayey silty dk gray, hard, moist.
10.5-11'				4100				
11-11.5'		↓	↓	3770		12		
11.5-12'				4000				
						13		
						14		

Background 4110

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: <i>SB-81</i> DATE: <i>1/15/06</i> Time: <i>0845</i> FIELD PERSON: <i>R. KOELTZ</i>					
DRILLING CONTRACTOR: <i>MAREO</i> DRILLER: <i>GARY</i>						TOTAL DEPTH: <i>10.5'</i> BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	4280				0-3' : Silty clay, brown, moist.
3-9"		↑	↑	4340		1		
9-15"		3	2.1	3890		2		
15-21"				4520				
21-27"		↓	↓	3650		3		
27-33"		↓	↓	NR				
3-35"		↑	↑	4260		4		3-5.5' : A/A
35-41"		↑	↑	4490				
4-45"		3	3	4010		5		5.5-6' : A/A, gray, sandy, soft, plastic, v. moist to wet
45-51"				4080				
5-55"		↓	↓	3850		6		
55-61"		↓	↓	4200		7		6-9' : Silty clay, brown, hard, dense, moist
6-65"		↑	↑	2880				
65-71"		↑	↑	4200		8		
7-75"		3	3	4400				
75-81"				4080		9		9-10.5' : A/A, moist.
8-85"		↓	↓	4220				
85-91"		↓	↓	4910		10		
9-95"		7.5	1	3870				
95-101"		↓	↓	3830		11		
10-105"		↓	↓	4140				
105-111"						12		Terminated @ 10.5'
11-115"								
115-121"						13		
						14		

Borehole 4/110

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: <i>SB-80</i> DATE: <i>11/15/06</i> Time <i>0902</i> FIELD PERSON: <i>ZKORER</i>						
DRILLING CONTRACTOR: <i>MATECO</i> DRILLER: <i>GARY</i> RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core							TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch						
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3'		↑	↑	4070		1		0-3': Silty clay, brown, moist
3-9		↑	↑	4180				
9-15		3	2.4	4170		2		
15-21				4180				
21-27		↓	↓	3830		3		3-5.5': H. Sandy clay, brown, silty, plastic, moist
27-33				NR				
33-35		↑	↑	4410		4		
35-4				4210				
44-5		3	2.7	4450		5		5.5-6': Silty clay, brown, hard, dense, moist
45-5				3850				
5-5.5		↓	↓	4350		6		
5.5-6				3720				
6-6.5		↑	↑	4250		7		6-9': A/A, moist.
6.5-7				3980				
7-7.5		3	3	4340		8		
7.5-8				4180				
8-8.5		↓	↓	4000		9		
8.5-9				3980				
9-9.5		↑	↑	4330		10		9-11.2': A/A
9.5-10				4100				
10-10.5		3	3	4040		11		
10.5-11				4280				
11-11.5		↓	↓	3840		12		11.2-12': Clayey sand, dense, hard, moist
11.5-12				4040				
						13		
						14		

Background 4/10

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site		SOIL BORING NUMBER: SB-79	
PROJECT NUMBER: 21-11010G		DATE: 11/15/06	
PROJECT LOCATION: Breckenridge, Michigan		Time: 0853	
DRILLING CONTRACTOR: MATELO		FIELD PERSON: R. KEEFER	
DRILLER: G. H. 24		TOTAL DEPTH: 12'	
RIG TYPE: Geoprobe Track Rig		BOREHOLE DIAMETER: 2 inch	
SAMPLING METHODS: Push Core			
NORTH:		DATUM:	
EAST:		AZIMUTH:	

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3		↑	9	6330		1		0-3': Silty clay, brown, soft, plastic, moist
3-9"				5310				
9-15"		3	3	5640		2		
15-21"				5690				
21-27"		↓	↓	6040		3		3-3.5' A/A
27-33"				5720				3.5-4': Filler cake, white and orange, wet
3-35"		↑	↑	6580		4		4-4.5': Silty clay, brown, plastic, moist
35-4				22630				4.5-6': NO RECOVERY
4-5		3	1.8	23030		5		
4.5-5				7280				
5-5.5		↓	↓	NR		6		6-6.5': Filler cake, orange & white
5.5-6								piece of black plastic @ 6.5' BGS
6-6.5		↑	↑	19460		7		6.5-9' BGS: Silty clay, brown, hard, dense, moist
6.5-7				25220				
7-7.5		3	3	10440		8		
7.5-8				5710				
8-8.5		↓	↓	4900		9		
8.5-9				4930				
9-9.5		↑	↑	6570		10		9-12': Clayey sand, brown, hard, dense, moist
9.5-10				5530				
10-10.5		3	2	5780		11		
10.5-11				5230				
11-11.5		↓	↓	5190		12		
11.5-12				NR				
						13		
						14		

Background 4110

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-78 DATE: 11/15/06 Time: 1520 FIELD PERSON: R KEELER					
DRILLING CONTRACTOR: MATTELLO DRILLER: Vince						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3230		1		0-4": Silty Clay, brown, moist.
3-9"		↑	↑	3230				
9-15"		4	2.5	3370		2		
15-21"				3200				
21-27"		↓	↓	3280		3		
27-33"				2450				
3-3.5"		↓	↓	NA		4		4-8": A/A, hard, moist.
3.5-4"								
4-4.5"		↑	↑	3280		5		
4.5-5"				3430				
5-5.5"		4	4.35	3310		6		
5.5-6"				3300				
6-6.5"		↓	↓	3130		7		
6.5-7"				2430				
7-7.5"		↓	↓	3400		8		8-11": A/A, hard, moist
7.5-8"				3450				
8-8.5"		↑	↑	3280		9		
8.5-9"				3300				
9-9.5"		4	4.65	3090		10		
9.5-10"				3320				
10-10.5"		↓	↓	3140		11		11-12": Silty clay to clayey silt, all gray, hard, moist.
10.5-11"				3100				
11-11.5"		↓	↓	3450		12		
11.5-12"				3380				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-77 DATE: 11/14/06 Time: 1510 FIELD PERSON: R. KOWLER					
DRILLING CONTRACTOR: MATECO DRILLER: VINCE RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						TOTAL DEPTH: 10' BOREHOLE DIAMETER: 2 inch					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3830				0-1.5': Silty Clay, brown
3-4"				3320		1		
4-5"		4	3	3960		2		1.5-2': Clayey sand, brown, Fm.
5-6"				3310				WET
6-7"				3220		3		2-4': Silty clay, brown, moist
7-8"				NA				
8-9"				NA		4		
9-10"		↑	↑	3540		5		4-8': A/A, hard, moist
10-11"				3140				
11-12"		4	3.5	3310		6		
12-13"				3240				
13-14"				3030		7		
14-15"				3190				
15-16"				3100		8		
16-17"				NR				
17-18"		7	7	3350		9		8-10': Clayey Silty dk gray, hard, moist
18-19"		2	2	3240				
19-20"				3320		10		
20-21"				3380				
21-22"						11		EOB 10' BGS
22-23"								
23-24"						12		
24-25"								
25-26"						13		
26-27"								
27-28"						14		

+ Boring Advanced to evaluate potential Surface impact detected during the Site Walkover Scan by DEM.

PROJECT NAME: Breckenridge Disposal Site		SOIL BORING NUMBER: <i>SB 76</i>	
PROJECT NUMBER: 21-11010G		DATE: <i>9/14/06</i>	
PROJECT LOCATION: Breckenridge, Michigan		Time: <i>1428</i>	
		FIELD PERSON: <i>R. KEEZER</i>	
DRILLING CONTRACTOR: <i>MATELO</i>		TOTAL DEPTH:	
DRILLER: <i>VICK</i>		BOREHOLE DIAMETER: 2 Inch	
RIG TYPE: Geoprobe Track Rig			
SAMPLING METHODS: Push Core			
NORTH:		DATUM:	
EAST:		AZIMUTH:	

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3240				0-3': Silty Clay, brown, moist
3-9"		↑	↑	3500		1		
9-15"		3	2.2	3250				
15-21"		↓	↓	3560		2		
21-27"		↓	↓	3470				
27-33"		↓	↓	NR		3		3-6': A/A, moist, sandy, wet
3-35"		↑	↑	3030				5.5-6' BGS
35-41"		↑	↑	3260		4		
41-45"		3	3	3480				
45-55"		↓	↓	3190		5		
55-59"		↓	↓	2940				
59-65"		↓	↓	3160		6		6-6.5' A/A
65-71"		↑	↑	3340				6.5-7': Clayey sand, brown, wet
71-75"		↑	↑	3320		7		
75-81"		3	3	3080				7-9': Silty clay, dk brown, hard, sl. moist. to dry
81-85"		↓	↓	2860		8		
85-91"		↓	↓	2960				
91-95"		↑	↑	3170		9		
95-101"		↑	↑	3510				9-12': Clayey silty dk gray
101-105"		↑	↑	3140		10		
105-111"		3	2	3480				
111-115"		↓	↓	3330		11		
115-121"		↓	↓	3160				
121-127"		↓	↓	NA		12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-75 DATE: 11/14/06 Time: 1420 FIELD PERSON: R. KEEFER					
DRILLING CONTRACTOR: MATECO DRILLER: Vince RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 inch					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3440		1		0-3': Silty clay, brown, plastic, moist
2-9"				3180				
9-10"		3	2.5	3360		2		
10-21"				3170				
21-27"		↓	↓	3240		3		
27-33"				3370				
3-35"		↑	↑	3400		4		3-6': AFA, moist
35-41"				3330				
41-45"		3	2.8	3440		5		
45-55"				3170				
55-56"		↓	↓	3080		6		
56-65"				3170				
65-75"		↑	↑	3490		7		6-8.3': AFA, hard, dense, moist
75-85"		3	3	3210				
85-88"				3240		8		
88-89"		↓	↓	2880				8.3-8.5': Sand, brown, silty, wet
89-95"				3370		9		8.5-9': Silty clay AFA
95-105"		↑	↑	3160		10		9-10' AFA
105-115"		3	3	2490				10-12': clayey silt, dk gray, sandy, hard, moist
115-122"				3490		11		
		↓	↓	3180		12		
				3230				
				3090		13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-74 DATE: 12/14/06 Time: 1310 FIELD PERSON: R. KEELER						
DRILLING CONTRACTOR: Mateco DRILLER: Vince RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core							TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 Inch						
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3'		↑	↑	3310				0-3': Silty Clay, brown, moist
3-9'				3220		1		
9-15'		3	2.5	3460		2		
15-21'				3350				
21-27'		↓	↓	2960		3		
27-33'				3310				
3-3.5'		↑	↑	3240		4		3-6': A/A, moist, plastic
3.5-4'				3360				
4-4.5'		3	2.5	3220		5		
4.5-5'				2970				
5-5.5'		↓	↓	3430		6		
5.5-6'				3210				
6-6.5'		↑	↑	3470		7		6-9': A/A, hard, moist
6.5-7'				3190				
7-7.5'		3	3	3460		8		
7.5-8'				3290				
8-8.5'		↓	↓	3170		9		
8.5-9'				3400				
9-9.5'		↑	↑	3390		10		9-10 A/A, hard moist
9.5-10'				3210				
10-10.5'		3	3	3630		11		10-12 Clayey SILT dk gray, hard moist, Tr. gravel
10.5-11'				3160				
11-11.5'		↓	↓	3010		12		
11.5-12'				3660				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-73 DATE: 11/14/06 Time: 1330 FIELD PERSON: T. Uys TOTAL DEPTH: 12.11 ft. BOREHOLE DIAMETER: 2 Inch						
DRILLING CONTRACTOR: MATELO DRILLER: VINCE RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core													
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"				3350				0-3": Silty clay, brown, moist
3-4"		↑	↑	3510		1		
4-15"		3	2.5	3340		2		3-5": A/A moist
15-21"				3040				5-55": filler cake, orange, moist
21-27"		↓	↓	3500		3		
27-33"				3340				
3-3.5"		↑	↑	3400		4		6-6.5": mix of filler cake, gravel, clay, orange, brown, wet
3.5-4"				3570				6.5-6.5": silty clay, dk gray, hard, dense, moist
4-4.5"		3	2.0	3860		5		
4.5-5"				10440				
5-5.5"		↓	↓	10580		6		
5.5-6"				N/A				
6-6.5"		↑	↑	17310		7		
6.5-7"				7720				
7-7.5"		3	2.5	4140		8		
7.5-8"				3810				
8-8.5"		↓	↓	3310		9		9-11": clayey silty dk gray, hard, wet on outside from above
8.5-9"		↑	↑	3430				
9-9.5"		2	1.5	7330		10		
9.5-10"				3880				
10-10.5"		↓	↓	3460		11		
10.5-11"				NL				
11-11.5"						12		
11.5-12"								
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-72 DATE: 11/14/06 Time: 1351 FIELD PERSON: R. KEEFER					
DRILLING CONTRACTOR: MATTELLO DRILLER: K. KEEFER						TOTAL DEPTH: 12' BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"								0-3': Silty Clay, brown, moist.
3-9"		↑	↑			1		
9-15"		3	2.5			2		
15-21"								
21-27"		↓	↓			3		
27-33"								
3-3.5'		↑	↑			4		3-6': A/A, moist to U. moist
3.5-4'								
4-4.5'		3	3			5		
4.5-5'								
5-5.5'		↓	↓			6		
5.5-6'								
6-6.5'		↑	↑			7		6-7': A/A Sandy, soft, brown, wet
6.5-7'								
7-7.5'		3	2.2			8		7-9': Silty Clay, dk gray, hard, dense, moist.
7.5-8'								
8-8.5'		↓	↓			9		
8.5-9'								
9-9.5'		↑	↑			10		9-12': Clayey silt, dk gray, hard, moist.
9.5-10'								
10-10.5'		3	1.8			11		
10.5-11'								
11-11.5'		↓	↓			12		
11.5-12'								
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-70 DATE: 11/14/06 Time: 1030 FIELD PERSON: R KEELER					
DRILLING CONTRACTOR: MATECO DRILLER: VINIE						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3800		1		0-3': Silty Clay, brown, plastic, moist.
3-9"		↑	↑	3410				
9-15"		3	2.4	3590		2		
15-21"				3450				
21-27"		↓	↓	2650		3		
27-33"				NR				
3-3.5"		↑	↑	3860		4		3-4': A/A
3.5-4"				4170				4-4.4': Mix of sand, clay & filter cake, V. moist to wet
4-4.5"		3	1.8	8220		5		4.4-5': Filter cake orange, pieces of plastic, V. moist to wet.
4.5-5"				21360				5-6': No recovery
5-5.5"		↓	↓	10560		6		
5.5-6"				NR				
6-6.5"		↑	↑	19660		7		6-6.5': Mix of filter cake & clay, orange, wet.
6.5-7"				NR				
7-7.5"		3	0.5			8		
7.5-8"								
8-8.5"		↓	↓			9		
8.5-9"								
9-9.5"		↑	↑	7410		10		9-12': Clayey silty sandy, dk gray, hard, moist
9.5-10"				4180				
10-10.5"		3	2.8	4710		11		
10.5-11"				3570				
11-11.5"		↓	↓	3500		12		
11.5-12"				3500				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-69 DATE: 11/14/06 Time: 1012 FIELD PERSON: R. KELLER		
DRILLING CONTRACTOR: MATECO DRILLER: V. L. L. R. RIG TYPE: Geoprobe Track Rig							TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 Inch		
SAMPLING METHODS: Push Core									
NORTH:							DATUM:		
EAST:							AZIMUTH:		

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3270				0-3": Silty clay, brown, moist.
3-4"		↑	↑	3340		1		
4-15"		3	2.2	2890				
15-21"				3200		2		
21-27"		↓	↓	3230				
27-33"				NR		3		3-3.4' A1A
3-35"		↑	↑	3430				
35-4"		↑	↑	2800		4		3.4-6': Sand, brown, silty, F-m sand, wet
4-45"		3	2	3220				
45-5"				3020		5		
5-55"		↓	↓	3370				
55-6"				NR		6		
6-65"		↑	↑	3280				6-6.5': Sand, dk, wet
65-7"		↑	↑	3190		7		6.5-9': Silty clay, dk brown, hard, dense, moist
7-75"		3	3	3400				
75-8"				3230		8		
8-85"		↓	↓	3110				
85-9"				3100		9		9-11.2: Clayey silty dk gray, moist
9-9.5"		↑	↑	3300				
9.5-10"				3250		10		
10-10.5"		3	3	3510				
10.5-11"				3140		11		11.2-11.5': Silty sand, F-m graded, wet dk gray
11-11.5"		↓	↓	3270				
11.5-12"				2790		12		11.5-12': Clayey silty dk gray, moist
						13		
						14		

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan		SOIL BORING NUMBER: SB-608 DATE: 11/14/06 Time: 1253 FIELD PERSON: R. KOELER	
DRILLING CONTRACTOR: MHECO DRILLER: VINCE RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core		TOTAL DEPTH: BOREHOLE DIAMETER: 2 inch	
NORTH: EAST:		DATUM: AZIMUTH:	

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3610				0-3': Silty clay, brown, moist
3-9"		↑	↑	3610		1		
9-15"		3	2.4	3680		2		
15-21"				3700				
21-27"		↓	↓	3560		3		3-6': Silty clay, brown, hard, moist
27-33"				NR 2830				
33-35"		↑	↑	3260		4		
35-41"		↑	↑	3410				
41-45"		3	3	3720		5		
45-55"				3780				
55-58"		↓	↓	3280		6		
58-66"		↓	↓	3080				
66-70"		↑	↑	3040		7		6-9": A/I, moist
70-77"		↑	↑	3210				
77-85"		3	3	3090		8		
85-91"		↓	↓	3270				
91-95"		↓	↓	3470		9		9-10': A/I, brown
95-100"		↑	↑	3450				
100-105"		↑	↑	3310		10		
105-110"		3	3	3860				
110-115"		3	3	3680		11		10-12': Clayey silt, dk gray, hard, moist
115-120"		↓	↓	3130				
				3120		12		
				3100		13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-66 DATE: 11/14/06 Time: 1109 FIELD PERSON: R. KOELER					
DRILLING CONTRACTOR: MATECO DRILLER: V. L. L.						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3470		1		0-3' : Silty clay, brown, moist
3-9"				3280				
9-15"		3	1.8	3170		2		
15-21"				3340				
21-27"		↓	↓	NR		3		3-4' : M/A
27-33"								4-4.5' : Sandy, Silty, clay, brown,
3-3.5"		↑	↑	3400		4		plastic, wet
3.5-4"				3420				4.5-6' : Silty clay, brown, hard, moist
4-4.5"		3	2.5	3240		5		
4.5-5"				3410				
5-5.5"		↓	↓	3100		6		
5.5-6"				3280				6-6.5' : Sand brown, F-M, wet
6-6.5"		↑	↑	3170		7		6.5-9' : Silty clay, brown, hard, moist
6.5-7"				3340				
7-7.5"		3	3	3160		8		
7.5-8"				3290				
8-8.5"		↓	↓	2820		9		
8.5-9"				3440				
9-9.5"		↑	↑	3330		10		9-12' : Clayey silty dk gray, hard, moist
9.5-10"				3220				
10-10.5"		3	2.5	3320		11		
10.5-11"				3380				
11-11.5"		↓	↓	3250		12		
11.5-12"				3150				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-65 DATE: 11/14/06 Time: 0441 FIELD PERSON: R. KEELER						
DRILLING CONTRACTOR: MATECO DRILLER: V. LILL							TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 inch						
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core													
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3470				0-3': Silty Clay, brown, moist.
3-9"		↑	↑	3240		1		
9-15"		3	2.2	3020		2		
15-21"				3320				
21-27"		↓	↓	3040		3		3-4': A/A
27-33"		↑	↑	NR.				4-4.8': Sandy, Silty Clay, brown,
3-3.5"		↑	↑	3100		4		Soft, wet
3.5-4"		↑	↑	3360				4.8-6': Silty Clay, brown, moist
4-5"		3	3	3380		5		
5-5.5"		↓	↓	3080				
5.5-6"		↓	↓	3300		6		
6-6.5"		↑	↑	3000				6-6': Silty Clay, brown, hard, moist
6.5-7"		↑	↑	3410		7		
7-7.5"		3	3	3350				
7.5-8"				3160		8		
8-8.5"		↓	↓	3280				9-12': Silty Clay, dk gray, hard,
8.5-9"		↑	↑	3200		9		moist
9-9.5"		↓	↓	3030				
9.5-10"		↑	↑	3490		10		
10-10.5"		3	3	3340				
10.5-11"		↑	↑	2730		11		
11-11.5"		↓	↓	3030		12		
11.5-12"				3360				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-64 DATE: 11/14/06 Time: 0910 FIELD PERSON: R. KEELEK					
DRILLING CONTRACTOR: WHITELO DRILLER: Vince						TOTAL DEPTH: 12ft. BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3390				0-3': Silty clay brown, soft, organic rich
3-9"				3520		1		
9-15"		3	2.4	3380				
15-21"				3200		2		
21-27"		↓	↓	3050				
27-33"				NR		3		
3-3.5"		↑	↑	3520				3-4.3': A/A
3.5-4"				3330		4		
4-4.5"		3	3	3403410				4.3-4.10': Sandy clay brown, soft, plastic, moist.
4.5-5"				3250		5		
5-5.5"		↓	↓	3420				4.6-6': Silty clay, brown, hard, moist
5.5-6"				3080		6		
6-6.5"		↑	↑	3610				6-9': A/A, brown, hard, moist
6.5-7"				3300		7		
7-7.5"		3	3	3430				
7.5-8"				3270		8		
8-8.5"		↓	↓	3310				
8.5-9"				3200		9		
9-9.5"		↑	↑	3350				9-12': Clayey silty dk gray, hard friable, moist
9.5-10"				3130		10		
10-10.5"		3	2.2	3420				
10.5-11"				3040		11		
11-11.5"		↓	↓	3360				
11.5-12"				NR		12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-63 DATE: 11/14/06 Time: 0427 FIELD PERSON: E. KEELER					
DRILLING CONTRACTOR: MATELO DRILLER: Vince						TOTAL DEPTH: 12' BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3330				0-3' : Silty clay, brown, moist.
3-4"				3080		1		
4-15"		3	2.7	3450		2		
15-21"				3240				
21-27"		↓	↓	3310		3		
27-33"				NR				
3-3.5'		↑	↑	3450		4		3-4' : A/A
3.5-4'				3470				4-4.8' : Mix of clay, gravel & organic material, brown, wet
4-4.5'		3	1.8	3210		5		4.8-5' : Filler cake, orange brown, moist
4.5-5'				5140				
5-5.5'		↓	↓	17220		6		5-6' : NO Recovery
5.5-6'				NR				
6-6.5'		↑	↑	4760		7		6-9' : Silty clay, brown to off gray, moist.
6.5-7'				3350				
7-7.5'		3	1.8	3120		8		
7.5-8'				3500				
8-8.5'		↓	↓	3070		9		
8.5-9'				NR				
9-9.5'		↑	↑	3620		10		9-10' : Clayey silty dk gray, moist
9.5-10'				3570				
10-10.5'		3	3	3420		11		10-10.5' : Silty sand w/ silt, dk gray, F-M sand, wet
10.5-11'				3230				
11-11.5'		↓	↓	3110		12		10.5-12' : Clayey silty dk gray, moist
11.5-12'				3160				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-62 DATE: 11/13/06 Time: 1610 FIELD PERSON: P. KEELEB					
DRILLING CONTRACTOR: MATELO DRILLER: VINCE						TOTAL DEPTH: 12' BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3450		1		0-3': Silty clay, brown, plastic, moist
3-4"				3150				
4-15"		3	2.5	3150		2		
15-21"				3270				
21-27"		↓	↓	3270		3		
27-33"				3560				
33-35"		↑	↑	3560		4		3-6': Aft, fr orange specks
35-41"		3	2	4090				
41-55"				4080		5		
55-56"		↓	↓	4060		6		
56-61"				5390				
61-67"		↑	↑	4190		7		6-7': Gravelly clay, brown, orange mottled, moist
67-71"		3	3	3250				
71-78"				3500		8		7-9': Silty clay, brown, hard, dense, moist
78-81"		↓	↓	3450				
81-85"				3160		9		
85-95"		↑	↑	3540				
95-100"		3	2.4	3370		10		9-12': Clayey silty dk gray, hard, fr fine sand moist
100-105"				3310				
105-111"				3370		11		
111-115"		↓	↓	3010		12		
115-119"				3040				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: <i>SB-61</i> DATE: <i>11/13/06</i> Time: <i>15:40</i> FIELD PERSON: <i>L. LEELER</i>						
DRILLING CONTRACTOR: <i>MATELO</i> DRILLER: <i>WHLR</i>							TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch						
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core													
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3300		1		0-3' Silty clay, dk brown, moist.
3-4"				3410				
4-15"		3	2.2	3230		2		
15-21"				3340				
21-27"		↓	↓	3120		3		
27-32'				NR				
3-3.5'		↑	↑	3440		4		3-6' : A/A, hard, dense, moist
3.5-4'				3110				
4-4.5'		3	3	3400		5		
4.5-5'				3370				
5-5.5'		↓	↓	3220		6		
5.5-6'		↓	↓	3310				
6-6.5'		↑	↑	3420		7		6-9' : A/A
6.5-7'				3210				
7-7.5'		3	2.5	2940		8		
7.5-8'				3030				
8-8.5'		↓	↓	3070		9		
8.5-9'		↓	↓	2930				
9-9.5'		↑	↑	3530		10		9-12' : clayey silty hard, dk gray, moist.
9.5-10'				3310				
10-10.5'		3	3	3220		11		
10.5-11'				3270				
11-11.5'		↓	↓	3350		12		
11.5-12'				3390				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-59 DATE: 11/13/06 Time: 1520 FIELD PERSON: R Keeler						
DRILLING CONTRACTOR: MATECO DRILLER: H. Lee							TOTAL DEPTH: 12ft- BOREHOLE DIAMETER: 2 Inch						
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core													
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3100				0-3': Silty clay, brown, moist
3-4"		↑	↑	3100		1		
4-15"		3	3	3520				
15-21"		↓	↓	3330		2		
21-27"		↓	↓	3440				
27-33"		↓	↓	3120		3		
3-3.5"		↑	↑	3710				3-6': Silty clay, brown, moist
3.5-4"		↑	↑	3210		4		
4-4.5"		3	2.5	2980				
4.5-5"		↓	↓	3310		5		
5-5.5"		↓	↓	3470				
5.5-6"		↓	↓	3580		6		
6-6.5"		↑	↑	3490				6-9': Silty clay, brown, hard, friable, dry
6.5-7"		↑	↑	3310		7		
7-7.5"		3	3	3310				
7.5-8"		↓	↓	3150		8		
8-8.5"		↓	↓	3140		9		
8.5-9"		↑	↑	3280				9-10': Sandy silt/clay, dk gray, moist
9-9.5"		↑	↑	3550		10		
9.5-10"		3	2.5	3070				10-12': Silty sand, dk gray, fm, wet
10-10.5"		↓	↓	3030		11		
10.5-11"		↓	↓	3040		12		
11-11.5"				2800				
11.5-12"						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan		SOIL BORING NUMBER: SB-58A DATE: 11/14/06 Time: 1547 FIELD PERSON: Z. KEELER	
DRILLING CONTRACTOR: MARECO DRILLER: Vince		TOTAL DEPTH: 11.5' BOREHOLE DIAMETER: 2 Inch	
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core			
NORTH: EAST:		DATUM: AZIMUTH:	

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3750				0-3' : Silty Clay, brown
3-9"				3390		1		
9-15"		3	2.5	3300		2		
15-21"				3430				
21-27"		↓	↓	3190		3		
27-33"				2850				
3-35"		↑	↑	3330		4		3-6' : Silty Clay, to filter cake
35-41"				3570				4-6' BGS
41-47"		3	2	2430		5		
47-53"				9160				
53-59"		↓	↓	9900		6		
59-65"				NA				
65-71"		↑	↑	10150		7		6-9' : A/A
71-77"				11630				
77-83"		3	3	13330		8		
83-89"				17140				
89-95"		↓	↓	14580		9		
95-101"				25210				
101-107"		↑		14530		10		9-11.5' Silty Sand, black to 10' then
107-113"				43590				all gray, wet. Hard when
113-119"		2.5		149440		11		packed.
119-125"		↓		1969510				
125-131"				83720		12		Refused @ 11.5' BGS Due to hard
131-137"				NA				silt
137-143"						13		
143-149"						14		

MOVE OVER ~ 6" from original borehole - 2nd try.

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-58 DATE: 13505 Time 11/13/06 FIELD PERSON: R. LEACH					
DRILLING CONTRACTOR: MITTEL DRILLER: VINCE						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig											
SAMPLING METHODS: Push Core											
NORTH:						DATUM:					
EAST:						AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3430	X			0-3' : silty clay, brown, moist.
3-4"		↑	↑	3020	X	1		
9-15"		3	2.4	3010	X	2		
15-21"				3280	X			
21-27"		↓	↓	3070	X	3		
27-33"		↓	↓	NR				
3-3.6"		↑	↑	380	X	4		3-6' : A/A soft plastic
3.6-4"		↑	↑	3410	X			black @ 1' end of sample w/
4-4.5"		3	2	3920	X	5		petro-like odor.
4.5-5"				2920	X			
5-5.5"		↓	↓	2700	NS	6		
5.5-6"		↓	↓	NR				
6-6.5"		↑	↑	9570		7		6-9' Black fill, frothy white
6.5-7"		↑	↑	1123610				bubble material, piece of thin
7-7.5"		3	1	311310		8		metal @ base. HAS aluminum /
7.5-8"				NR				cleaner-like odor. likely drilled
8-8.5"		↓	↓	NR		9		through a core.
8.5-9"		↓	↓	NR				
9-9.5"		↑	↑	148500		10		9-10' : Clayey silty dk gray, moist.
9.5-10"		↑	↑	153120				Wet on outside
10-10.5"		3	2	16540		11		10-11' : Sand, silty, dk gray Fm
10.5-11"				8170				trace gravel, wet.
11-11.5"		↓	↓	6940		12		
11.5-12"				NR				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-57 DATE: 11/13/06 Time 1425 FIELD PERSON: E. KEEFER		
DRILLING CONTRACTOR: MATECO DRILLER: Vince							TOTAL DEPTH: 12' BOREHOLE DIAMETER: 2 inch		
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core									
NORTH: EAST:							DATUM: AZIMUTH:		

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	2430	✓	1		0-3' : Silty clay, brown, gravelly, moist.
3-9"		↑	↑	5180	✓	1		
9-15"		3	2.5	5240	×	2		
15-21"		3	2.5	5270	×	2		
21-27"		↓	↓	5380		3		
27-33"		↓	↓	NP		3		
33-39"		↑	↑	6000	×	4		3-5' : A/A, Plastic, moist
39-45"		↑	↑	4100	×	4		
45-51"		3	2.2	3890	×	5		
51-57"		3	2.2	4450	×	5		
57-63"		↓	↓	4680		6		5-5.2' Black, clay, sand & organic mix
63-69"		↓	↓	5600	NP	6		5.2-6' NO Recovery
69-75"		↑	↑	5300	×	7		6-6.6' A/A, black mixture
75-81"		↑	↑	4720	×	7		6.6-9' : Silty clay, dk gray, moist.
81-87"		3	2.5	4170	×	8		
87-93"		3	2.5	3570	×	8		
93-99"		↓	↓	4240	×	9		
99-105"		↓	↓	3330	×	9		
105-111"		↑	↑	4400	×	10		9-12' : Clayey silt, dk gray, hard, moist
111-117"		↑	↑	4120	×	10		
117-123"		3	2	4140	×	11		2' of Silty Sand, dk gray, wet.
123-129"		3	2	3830	×	11		
129-135"		↓	↓	3690		12		
135-141"		↓	↓	NA		12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-56 DATE: 11/13/06 Time: 1340 FIELD PERSON: Z. KEDLER					
DRILLING CONTRACTOR: MATZCO DRILLER: VINCE RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						TOTAL DEPTH: 11 ft. BOREHOLE DIAMETER: 2 inch					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3'		↑	↑	3240				0-3': Silty clay, brown, moist
3-9'		↑	↑	3150		1		
9-15'		3	3	3180		2		
15-21'		3	3	2820		3		
21-27'		↓	↓	2850		4		
27-33'		↓	↓	2890		5		
3-3.5'		↑	↑	3150		6		3-6': Silty clay alk, dry, trace gravel
3.5-4'		↑	↑	3490		7		
4-4.5'		3	3	3490		8		
4.5-5'		3	3	3230		9		
5-5.5'		↓	↓	3010		10		
5.5-6'		↓	↓	2970		11		
6-6.5'		↑	↑	3220		12		10-9' clay PRK silty clay, brown, hard, friable, V. silty, dry
6.5-7'		↑	↑	3250		13		
7-7.5'		3	3	3180		14		
7.5-8'		3	3	3350		15		
8-8.5'		↓	↓	3150		16		
8.5-9'		↓	↓	3000		17		
9-9.5'		↑	↑	3030		18		9-11' clayey silt, dk gray, hard, moist
9.5-10'		↑	↑	3150		19		
10-10.5'		2	2	3220		20		
10.5-11'		2	2	3030		21		EOB @ 11'
11-11.5'						22		
11.5-12'						23		
						24		
						25		
						26		
						27		
						28		
						29		
						30		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-55 DATE: 11/4/06 Time: 10:49 FIELD PERSON: R. KOELER					
DRILLING CONTRACTOR: MATCO DRILLER: SCOTT						TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					
SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG				SAMPLE DESCRIPTION
0-3"		↑	↑	3420							0-3': Silty clay, brown, plastic, moist
3-4'		↑	↑	3350		1					
4-15'		3	2.5	3350		2					
15-21'				3300							
21-27'		↓	↓	2920		3					
27-33'				NR							
3-3.5'		↑	↑	3360		4					3-3.8' = A/A
3.5-4'		↑	↑	3120							3.8-4': Sand, silty, brown, wet
4-4.5'		3	3	3370		5					4-6': Silty clay, brown, hard, moist
4.5-5'				2900							
5-5.5'		↓	↓	2940		6					
5.5-6'				3050							
6-6.5'		↑	↑	2780		7					6-9': Silty clay, dk gray, hard, moist
6.5-7'				3160							
7-7.5'		3	3	3380		8					
7.5-8'				3280							
8-8.5'		↓	↓	3170		9					9-9.3': Silty sand, gray, wet
8.5-9'				3080							9.3-12': Silty clay, gray, moist
9-9.5'		↑	↑	3400		10					
9.5-10'				3250							
10-10.5'		3	1.5	3630		11					
10.5-11'				3060							
11-11.5'		↓	↓	2840		12					
11.5-12'				3120							
						13					
						14					

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site		SOIL BORING NUMBER: <i>SB-54</i>	
PROJECT NUMBER: 21-11010G		DATE: <i>11/9/06</i>	
PROJECT LOCATION: Breckenridge, Michigan		Time: <i>0956</i>	
DRILLING CONTRACTOR: <i>MATELO</i>		FIELD PERSON: <i>R. KEELER</i>	
DRILLER: <i>SLOH</i>		TOTAL DEPTH: <i>12 ft</i>	
RIG TYPE: Geoprobe Track Rig		BOREHOLE DIAMETER: 2 Inch	
SAMPLING METHODS: Push Core		DATUM:	
NORTH:		AZIMUTH:	
EAST:			

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3750		1		0-0.3' Topsoil, dk brown, moist.
3-9"				3220				0.3-3' Silty clay, brown, plastic, moist.
9-15"		3	2.4	3050		2		
15-21"				3020				
21-27"		↓	↓	2870		3		3-4.4' H/A
27-33"				NR				
33-39"		↑	↑	3320		4		4.4-4.6' Silty Sand, brown, wet
39-45"		3	3	3250				4.6-6' Silty clay, brown, hard, dense, moist
45-51"				2970		5		
51-57"		↓	↓	3200		6		
57-63"				3180				
63-69"		↑	↑	3090		7		6-9' Silty clay, dk brown, w/ pebbles, hard, moist.
69-75"				3280				
75-81"		3	3	3360		8		
81-87"				3040				
87-93"		↓	↓	3060		9		
93-99"				2970				
99-105"		↑	↑	3170		10		9-11.4' Clayey silt, dk gray, moist
105-111"				3000				
111-117"		3	3	3340		11		
117-123"				3260				
123-129"		↓	↓	2920		12		11.4-11.5' Sand, gray, silty, wet
129-135"				3250				11.5-12' Clayey silt, dk gray, moist
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-53 DATE: 11/9/06 Time: 11:22 FIELD PERSON: R. KEELE					
DRILLING CONTRACTOR: MHT TLO DRILLER: Scott						TOTAL DEPTH: 12ft BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"				3270				0-3': Silty clay, brown, plastic, moist
3-9"		↑	↑	3180		1		
9-15"				3280				
15-21"		3	2.6	2980		2		
21-27"				3130				
27-33"		↓	↓	3120		3		
33-35"				3300				3-4': A/A
35-4'		↑	↑	3120		4		
4-4.5'				10810				4-4.8': White filter cake, wet
4.5-5'		3	1.6	9000		5		black plastic piece @ base of sampler. Filter cake very soft
5-5.5'		↓	↓	NR		6		
5.5-6'				4820				6-6.5': White filter cake, wet
6-6.5'		↑	↑	5940		7		6.5-9': Silty clay, brown, moist
6.5-7'				4080				
7-7.5'		3	3	3300		8		
7.5-8'				3160				
8-8.5'		↓	↓	3280		9		
8.5-9'				3270				9-10.8': A/A, dk gray
9-9.5'		↑	↑	10140		10		
9.5-10'				3790				10.8-11': Sand, compact, gray, wet
10-10.5'		3	2.1	3750		11		11-12': NR
10.5-11'				3320				
11-11.5'		↓	↓	NR		12		
11.5-12'								
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-52 DATE: 11/9/06 Time: 1250 FIELD PERSON: P. KOEHLER		
DRILLING CONTRACTOR: MATTEL DRILLER: SLOH RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core							TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch		
NORTH: EAST:							DATUM: AZIMUTH:		

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3480				0-4': Silty clay, brown, plastic, moist.
3-4"		↑	↑	3380		1		
4-15"		4	3	3150		2		
15-21"		↓	↓	3020		3		
21-27"		↓	↓	3050		4		
27-33"		↓	↓	3580		5		
3-4'		↓	↓	NK		6		
4-4.5'		↑	↑	3480	Bag	7		4-4.5' A/A
4.5-5'		2	1.8	12880	↑	8		4.5-6': Filler cake, white & orange, soft, wet. Plastic @ bottom of sampler
5-5.5'		↓	↓	14570	Bag	9		
5.5-6'		↓	↓	16000	↓	10		
6-6.5'		↑	↑	3780		11		6-9': Silty clay, dk gray, moist. Plastic piece @ 6' BGS
6.5-7'		↑	↑	3940		12		
7-7.5'		3	3	3820		13		
7.5-8'		3	3	2810		14		
8-8.5'		↓	↓	3060				
8.5-9'		↓	↓	3690				
9-9.5'		↑	↑	3510				9-12': Clayey, sandy, silt, dk, gray, F-9 sand, moist to wet.
9.5-10'		↑	↑	3510				
10-10.5'		3	2.4	3270				
10.5-11'		3	2.4	3170				
11-11.5'		↓	↓	3360				
11.5-12'		↓	↓	NK				

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-371 DATE: 11/9/06 Time: 10B FIELD PERSON: E. KEEVER					
DRILLING CONTRACTOR: MATELO DRILLER: Scott RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3310				0-3" Silty clay, brown, plastic, moist
3-4"				3150		1		
4-15"		3	1.7	3300		2		
15-21"				3340				
21-27"		↓	↓	NR		3		
27-33"		↑	↑	3600				3-6" Silty clay, brown, hard, moist.
3-3.5"		↑	↑	3510		4		
3.5-4"				3260				
4-4.5"		3	3	3090		5		
4.5-5"		↓	↓	2400				
5-5.5"		↓	↓	3210		6		6-7.5' : A1A, gray
5.5-6"		↑	↑	3390				
6-6.5"				3620		7		
6.5-7"				3250				7.5-7.6' : Silty sand, gray, F-M, wet
7-7.5"		3	3	2810		8		7.6-9' Silty clay, gray, hard, moist.
7.5-8"		↓	↓	3640				
8-8.5"		↓	↓	3010		9		9-11' : A1A, moist
8.5-9"		↑	↑	3500, 3120				
9-9.5"		↑	↑	3350		10		
9.5-10"		3	3	2230				
10-10.5"				3140		11		11-11.3' : Sand, silty, gray, wet
10.5-11"		↓	↓	3210				11.3-12' Sand clayey silt, gray, friable, moist.
11-11.5"				2970		12		
11.5-12"						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site		SOIL BORING NUMBER: <u>B-50</u>	
PROJECT NUMBER: 21-11010G		DATE: <u>11/13/06</u>	
PROJECT LOCATION: Breckenridge, Michigan		Time <u>1300</u>	
DRILLING CONTRACTOR: <u>MATECO</u>		FIELD PERSON: <u>F. KELLER</u>	
DRILLER: <u>VINCE</u>		TOTAL DEPTH:	
RIG TYPE: Geoprobe Track Rig		BOREHOLE DIAMETER: 2 Inch	
SAMPLING METHODS: Push Core		DATUM:	
NORTH:		AZIMUTH:	
EAST:			

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3800		1		0-3' : Silty clay, brown, hard, dense, moist orange specks
3-9"		↑	↑	3750				
9-15"		3	3	6130		2		
15-21"		3	3	3420				
21-27"		↓	↓	3020		3		
27-33"		↓	↓	3010				
33-35"		↑	↑	3700		4		3-6' : Silty clay, brown, moist.
35-41"		↑	↑	3520				
41-45"		3	3	2890		5		
45-51"		3	3	3240				
51-55"		↓	↓	2120		6		
55-61"		↓	↓	2950				
61-65"		↑	↑	3350		7		6-7' : Aft, hard, friable
65-71"		↑	↑	3020				
71-75"		3	3	3370		8		7-9' : Clayey silty dark gray, hard, friable, moist to dry
75-81"		3	3	5000				
81-85"		↓	↓	3110		9		9-12' : Sandy silty dk gray, hard, friable, dry
85-91"		↓	↓	2950				
91-95"		↑	↑	3170		10		
95-101"		↑	↑	3340				
101-105"		3	3	3120		11		
105-111"		3	3	2940				
111-115"		↓	↓	3100		12		
115-121"		↓	↓	2970				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site		SOIL BORING NUMBER: SB-49	
PROJECT NUMBER: 21-11010G		DATE: 11/9/06	
PROJECT LOCATION: Breckenridge, Michigan		Time: 1320	
DRILLING CONTRACTOR: MATCHCO		FIELD PERSON: L. KOELER	
DRILLER: SLAT		TOTAL DEPTH:	
RIG TYPE: Geoprobe Track Rig		BOREHOLE DIAMETER: 2 Inch	
SAMPLING METHODS: Push Core			
NORTH:		DATUM:	
EAST:		AZIMUTH:	

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3810				0-3': Silty clay, brown, moist
3-9"				3390		1		
9-15"		3	2.3	3570		2		
15-21"				3230				
21-27"		↓	↓	3150		3		
27-33"				NK				3-6: Silty clay, brown, hard, moist
3-3.5"		↑	↑	3600		4		
3.5-4"				3290				
4-4.5"		3	3	3070		5		
4.5-5"				3130				
5-5.5"		↓	↓	2890		6		6-9': Silty clay, brownish gray,
5.5-6"				2960				hard, dense, dry
6-6.5"		↑	↑	3170		7		
6.5-7"				3520				
7-7.5"		3	3	3560		8		
7.5-8"				3120				
8-8.5"		↓	↓	3230		9		
8.5-9"				3470				9-12': Clayey silt, dk gray,
9-9.5"		↑	↑	2960		10		friable, dry, hard
9.5-10"				3490				
10-10.5"		3	3	3050		11		
10.5-11"				2990				
11-11.5"		↓	↓	3250		12		
11.5-12"				3290				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-48 DATE: 11/8/06 Time: 0900 FIELD PERSON: R. Keeler					
DRILLING CONTRACTOR: M. H. HECO DRILLER: Scott						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3080				0-0.4' : dk brown topsoil, moist
3-9"				3170		1		0.4-3' : Silty clay, brown, moist
9-15"		3	2.5	3360				
15-21"				3250		2		
21-27"				3530				
3-3.5'		↑	↑	3570		3		3-6' : Sandy Silty clay, soft, brown, wet
3.5-4'				3850		4		
4-4.5'		3	2.1	3050				
4.5-5'				3090		5		
5-5.5'				3460				
6-6.5'		↑	↑	3780		6		6-9' : dk gray clayey silt
6.5-7'				3460		7		
7-7.5'		3	2.1	3240				
7.5-8'				3240		8		
8-8.5'				3500				
NR		↓	↓	NR		9		
3.5-9.5'		↑	↑	3180				9-10' : clayey silt, dk gray
9.5-10'				3680		10		10-10.3' : sand, dk gray, clayey, wet
10-10.5'		3	2.5	3390				10.3-12' : clayey silt, dk gray, dry.
10.5-11'				3370		11		
11-11.5'				2220				
11.5-12'		↓	↓	3400		12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: <i>SB-47</i> DATE: <i>11/8/06</i> Time: <i>1300</i> FIELD PERSON: <i>R. KEDLER</i>		
DRILLING CONTRACTOR: <i>Marteco</i> DRILLER: <i>Scott</i> RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core							TOTAL DEPTH: <i>12</i> BOREHOLE DIAMETER: 2 Inch		
NORTH: EAST:							DATUM: AZIMUTH:		

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	4060				0-2.4": Topsoil, dk brown, Umoist
3-4"				3230		1		2.4-3": Silty clay, soft, brown, moist.
4-15"		3	2.4	3090		2		
15-21"				2970				
21-27"		↓	↓	2770		3		
NR				NR				
3-3.5"		↑	↑	330		4		3-6": Silty clay, brown, hard, dense, moist.
3.5-4"				2970				
4-4.5"		3	3	3120		5		
4.5-5"				3280				
5-5.5"		↓	↓	2930		6		6-9": Silty clay, brown, hard, dense, moist.
5.5-6"				2710				
6-6.5"		↑	↑	2760		7		
6.5-7"				3220				
7-7.5"		3	3	3180		8		
7.5-8"				3260				
8-8.5"		↓	↓	3140		9		
8.5-9"				3000				9-12: Clayey silt, gray, dense, dry
9-9.5"		↑	↑	3020		10		
9.5-10"				3120				
10-10.5"		3	3	2910		11		
10.5-11"				2830				
11-11.5"		↓	↓	3010		12		
11.5-12"				2840				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-46 DATE: 11/8/06 Time: 1018 FIELD PERSON: R. KEELER					
DRILLING CONTRACTOR: MARCO DRILLER: SCOTT						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	4780				0-0.4': Topsoil, brown, moist
3-9"		↑	↑	4190		1		0.4-3': Silty clay, brown, firm, moist. Tr. orange oxidation
9-15"		3	2.7	4380		2		
15-21"				3310				
21-27"		↓	↓	3070		3		
27-33"				3310				
3-3.5'		↑	↑	3070		4		3-6': Silty clay, brown, firm, moist.
3.5-4'				3380				
4-4.5'		3	3	3300		5		
4.5-5'				3250				
5-5.5'		↓	↓	2960		6		
5.5-6'				3260				
6-6.5'		↑	↑	2880		7		6-8': A/A
6.5-7'				3320				
7-7.5'		3	3	3190		8		
7.5-8'				3130				
8-8.5'		↓	↓	2950		9		8-9': Clayey silt, brownish gray, moist.
8.5-9'				2940				
9-9.5'		↑	↑	3070		10		9-10.5': A/A
9.5-10'				3280				
10-10.5'		3	2.6	3090		11		10.5-11': Gravel, broken rock, wet.
10.5-11'				3640				11-12': Clayey silt A/A. wet.
11-11.5'		↓	↓	2870		12		
11.5-12'				3040				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan								SOIL BORING NUMBER: <i>SB-45</i> DATE: <i>11/7/06</i> Time: <i>1525</i> FIELD PERSON: <i>R KEELER</i>							
DRILLING CONTRACTOR: <i>Mateco</i> DRILLER: <i>Scott</i>								TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch							
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core															
NORTH: EAST:								DATUM: AZIMUTH:							

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3590				0-0.4: Dk brown topsoil, moist
3-9"				3270		1		0.4-3': Silty clay, brown, moist
9-15"		3	2.2	3260		2		
15-21"				3310		3		
NR		↓	↓	NR		4		3-4.5: Silty clay etc
3-3.5		↑	↑	3600		5		4.5-5': mixed up silty clay, all brown & black, wet.
3.5-4				3650		6		
4-4.5		3	2.	4000		7		6-9: Black muck, wet, sl. petro odor
4.5-5				9770		8		
NR		↓	↓	10320		9		
		↑	↑	NR		10		
		3	1.5	10530		11		9-12: Silty clay, v silty, firm, wet, sl. petro odor
				30420		12		
		↓	↓	1620		13		
		↑	↑	11950		14		12-15: Clayey silt, gray, dry @ bottom
		3	0.5					
		↓	↓					
		↑	↑	4720				
				4240				
		3	3	3350				
				3310				
		↓	↓	3400				
				3300				

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-44 DATE: 11/8/06 Time: 0810 FIELD PERSON: R KEELEN						
DRILLING CONTRACTOR: MATECO DRILLER: Scott							TOTAL DEPTH: 12' BOREHOLE DIAMETER: 2 Inch						
RIG TYPE: Geoprobe Track Rig													
SAMPLING METHODS: Push Core													
NORTH:							DATUM:						
EAST:							AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	4510				0-0.5': Topsoil, dk brown
3-5"		↑	↑	3520		1		0.5-3': Silty clay, brown, moist
9-15"		3	2.5	3291				
15-21"				3120		2		
21-27"		↓	↓	3130				
NK		↓	↓	NK		3		3-3.6': Sandy clay, soft, brown, v. moist
3-3.5'		↑	↑	3320				3.6-6': Silty clay, brown, moist.
3.5-4'				3390		4		
4-4.5'				3140				
4.5-5'		3	3	3130		5		
5-5.5'		↓	↓	3170				
5.5-6'		↓	↓	3320		6		
6-6.5'		↑	↑	3760				6-9': Silty clay, brown to 8', then
6.5-7'				3350		7		dk gray 8-9' - clay, silty
7-7.5'		3	3	3240				
7.5-8'				3170		8		
8-8.5'		↓	↓	2860				
8.5-9'		↓	↓	3140		9		
9-9.5'		↑	↑	3340				9-12: clayey silty, dk gray, dry
9.5-10'		↑	↑	3180		10		
10-10.5'		3	3	3060				
10.5-11'				3090		11		
11-11.5'		↓	↓	2150				
11.5-12'		↓	↓	2810		12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan								SOIL BORING NUMBER: <i>SB-43</i> DATE: <i>11/15/06</i> Time: <i>1545</i> FIELD PERSON: <i>R. K. [Signature]</i>							
DRILLING CONTRACTOR: <i>Mateco</i> DRILLER: <i>Scott</i> RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core								TOTAL DEPTH: <i>12</i> BOREHOLE DIAMETER: 2 Inch							
NORTH: EAST:								DATUM: AZIMUTH:							

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3310				0-0.3': DK Brown topsoil
3-4"		↑	↑	3190		1		0.3-4': Silty clay, brown, dense, hard, moist.
4-15"		↑	↑	3140		2		
15-21"		↑	↑	2590		3		
21-27"		4	3.2	2700		4		
27-33"		↓	↓	3230		5		
33-39"		↓	↓	2970		6		
4-4.5'		↑	↑	NA		7		4-6': A/A, moist.
4.5-5'		↑	↑	3080		8		
5-5.5'		↑	↑	3190		9		
5.5-6'		↓	↓	3000		10		
6-6.5'		↓	↓	3150		11		6-9': Silty clay, gray, moist, brown sand lenses 10.5-6.7' BGS.
6.5-7'		↑	↑	2970		12		
7-7.5'		↑	↑	2820		13		
7.5-8'		3	3	2620		14		
8-8.5'		↓	↓	3180		15		
8.5-9'		↓	↓	2790		16		
9-9.5'		↑	↑	3010		17		9-10.6': Clayey silty dk gray, moist.
9.5-10'		↑	↑	2880		18		
10-10.5'		3	3	3150		19		10.6-11.2': silty sand
10.5-11'		3	3	3330		20		11.2-12': clayey silty dk gray, dry
11-11.5'		↓	↓	2990		21		
11.5-12'		↓	↓	3200		22		
						23		
						24		
						25		
						26		
						27		
						28		
						29		
						30		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-42 DATE: 11/8/06 Time: 1100 FIELD PERSON: R. KEELER					
DRILLING CONTRACTOR: Mateco DRILLER: Scott RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"								
3-9"		↑	↑		3390			0-0.5' : Top soil, dk brown
9-15					3350	1		0.5-0.7' : 2nd sand
15-21		3	1.6		2840	2		0.7-3' Silty clay, brown, soft, v moist.
21-27					2800			
NR		↓	↓		3350 NR	3		
3-3.5					3440			
3.5-4		↑	↑		3350	4		3-4.1' : Silty clay, brown sandy, soft moist
4-4.5					3940			
4.5-5		3	2.7		3140	5		4.1-6.0' : Silty clay, brown, hard, moist
5-5.5					2860			
5.5-6		↓	↓		2990	6		
6-6.5					3110			
6.5-7		↑	↑		3360	7		6-9' : Clayey silt, dk gray, friable, dry
7-7.5					2900			
7.5-8		3	3		3400	8		
8-8.5					2620			
8.5-9		↓	↓		3240	9		
9-9.5					2850			
9.5-10		↑	↑		3010	10		9-12 : Clayey silt, dk gray, w/ gravel, dry
10-10.5					3010			
10.5-11		3	3		2160	11		
11-11.5					3190			
11.5-12		↓	↓		3010	12		
					2970			
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: 5B-41 DATE: 11/8/06 Time: 0956 FIELD PERSON: R KEBLER					
DRILLING CONTRACTOR: Matzco DRILLER: Scott						TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3420				0-0.4: Dk brown tape, moist
3-4"				3740		1		0.4-3": Silty clay, brown w/ orange mottles, firm, moist
4-15"		3	2.6	4060		2		
15-21"				4600				
21-27"		↓	↓	3490		3		3-6: A/A, silty, brown to 5' then dk brown 5-6' Bgl, moist.
27-33"				3080				
33-35"		↑	↑	3370		4		
35-4'				3450				
4'-4.5'		3	2.7	2820		5		
4.5-5'				3110				
5-5.5'				2560		6		
5.5-6'		↓	↓	3230				6-7': Silty clay, brown soft, moist.
6-6.5'		↑	↑	3160		7		
6.5-7'				2770				7-9': Clayey silt, dk gray, moist.
7-7.5'		3	2.7	2860		8		
7.5-8'				3130				
8-8.5'		↓	↓	3140		9		
8.5-9'				3020				9-12: A/A, dry
9-9.5'		↑	↑	3160		10		
9.5-10'				3510				
10-10.5'		3	3	3090		11		
10.5-11'				3160				
11-11.5'		↓	↓	3190		12		
11.5-12'				3010				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-40 DATE: 11/8/06 Time: 0750 FIELD PERSON: R. KETLER					
DRILLING CONTRACTOR: Mateco DRILLER: S. H.						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	11060	4490			0-8' : Silty clay, brown, soft, wet.
3-9"				11060	4830	1		
9-15"		3	2.4	2770	14300	2		
15-21"				7840	15260	3		
21-27"		↓	↓			4		3-4.7' : A/A, wet
3-3.5		↑	↑	6250		5		4.7-5.2' : Clayey silt, dk brown, sh. petro odor, moist, to wet frag.
3.5-4		↑	↑	5960		6		6-6.6' : A/A
4-4.5		3	2.3	13420		7		6.6-7.7' : Silty clay, dk brown
4.5-5				80970		8		7.7-8' : Sand, silty, gray, wet. From
5-5.5		↓	↓	12750		9		8-9' : Silty clay, dk brown to gray, moist
5.5-6		↓	↓	NR		10		9-9.7' : A/A
6-6.5		↑	↑	48570		11		9.7-10.1' : Silty sand, gray, to silty, wet
6.5-7				18520		12		10.1-12' : clayey silt, gray, dry, to pebbles.
7-7.5		3	2.5	4480		13		
7.5-8				4270		14		
8-8.5		↓	↓	4090				
8.5-9		↑	↑	3770				
9-9.5				3910				
9.5-10				3560				
10-10.5		3	2.5	3590				
10.5-11				3020				
11-11.5		↓	↓	4030				
11.5-12				4210				

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: PB-39 DATE: 11/8/06 Time: 1509 FIELD PERSON: E. KERLER		
DRILLING CONTRACTOR: M&C DRILLER: Scott RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core							TOTAL DEPTH: 12' BOREHOLE DIAMETER: 2 Inch		
NORTH: EAST:							DATUM: AZIMUTH:		

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3450		1		0-3' Silty clay, brown, soft, plastic, moist
3-9"				3470				
9-15"		2	2	3270		2		
15-21"				3470				
21-27"		↓	↓	NR		3		
27-33"								
3-35"		↑	↑	3050		4		3-6' Silty clay, brown, moist
35-41"				2020				
41-45"		3	3	3140		5		
45-51"				2860				
51-55"		↓	↓	2740		6		
55-61"				2920				
61-65"		↑	↑	3270		7		6-9' Silty clay, dk gray, dry, hard, dense
65-71"				2970				
71-75"		3	3	2960		8		
75-81"				3010				
81-85"		↓	↓	2930		9		
85-91"				2760				
91-95"		↑	↑	3260		10		9-12' Clayey silt, dk gray, brittle, dry
95-101"				3500				
101-105"		3	3	3180		11		
105-111"				3050				
111-115"		↓	↓	3080		12		
115-121"				3360				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-38 DATE: 11/8/06 Time: 1352 FIELD PERSON: R. COELER					
DRILLING CONTRACTOR: Matzo DRILLER: Scott						TOTAL DEPTH: 12 Ft. BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3650				0-0.4: Topsoil, dk brown, moist
3-4"				6030		1		ad-3: Silty clay, brown, fill
4-5"		3	2.6	6010				1.1-1.4' LGS, fr white specs.
5-6"				3090		2		
6-7"		↓	↓	2890				
7-8"				3060		3		
8-9"		↑	↑	3550				3-6' silty clay, brown, hard, dense, moist.
9-10"		3	3	2900		4		
10-11"				3030				
11-12"		3	3	2720		5		
12-13"		↓	↓	3000				
13-14"				3150		6		6-9: Clayey silt, brown to dk gray w/ b brown, hard, brittle, moist.
14-15"		↑	↑	2580				
15-16"				3120		7		
16-17"		3	3	3220				
17-18"				3080		8		
18-19"		↓	↓	2800				
19-20"				3090		9		
20-21"		↑	↑	3110				9-12: Clayey silt, dk gray, gravelly, brittle, hard, dry
21-22"				3210		10		
22-23"		3	3	3120				
23-24"				3230		11		
24-25"		↓	↓	2990				
25-26"				2950		12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-36 DATE: 11/8/06 Time: 1630 FIELD PERSON: R. KEELE						
DRILLING CONTRACTOR: MATELO DRILLER: SLUH							TOTAL DEPTH: 12 BOREHOLE DIAMETER: 2 Inch						
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core													
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3530		1		0-0.4: Topsoil, dk brown, moist
3-9"				3340				
9-15"		3	2	3100		2		0.4-3': Silty clay, brown, moist
15-21"				3300				
NR		↓	↓	NR		3		
3-3.5		↑	↑	3100		4		3-6': Silty clay, brown, moist, gvl @ base - cause of poor recovery
3.5-4				2950				
4-4.5		3	1.2	2890		5		
4.5-5				NR				
5-5.5		↓	↓	NR		6		
5.5-6				3650	6330			6-7: Sandy silt w/ clay, v. dark gray, wet
6-6.5		↑	↑	3310		7		
6.5-7				3460		8		7-9: Silty clay, dk gray, hard, moist
7-7.5		3	2.5	2750				
7.5-8				3330		9		
8-8.5		↓	↓	2790				
8.5-9		↑	↑	3240		10		9-12': Clayey silt, dk gray, hard, gvl zone @ ~ 10.5' BGS
9-9.5				2860				
9.5-10		3	2.4	3140		11		
10-10.5				3190				
10.5-11				2820		12		
11-11.5		↓	↓	NR				
11.5-12						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-35 DATE: 11/13/06 Time: 1130 FIELD PERSON: P. KEELER					
DRILLING CONTRACTOR: MATECO DRILLER: Vince						TOTAL DEPTH: 10' BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (VIN)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3'		↑	↑	3320	X	1		0-3': silty clay, brown plastic, moist
3-4'		↑	↑	3280	X	2		
4-5'		3	2	3170	X	3		
5-6'		3	2	3010	X	4		
6-7'		↓	↓	NR	NA	5		
7-8'		↑	↑	3360	X	6		3-4.5' A/A
8-9'		↑	↑	3570	X	7		4.5-5': muck, black liquid, pebbles
9-10'		3	2	3030	X	8		
10-11'		3	2	4100	X	9		
11-12'		↓	↓	3910	X	10		
12-13'		↓	↓	NR		11		
13-14'		↑	↑	5940		12		6-9' No Recovery, black liquid. Material too soft to enter sleeve. Hits on liquid material in the sleeve.
14-15'		↑	↑	10170		13		
15-16'		3	0	NR	X	14		
16-17'		↓	↓	↓		15		
17-18'		↓	↓	↓		16		
18-19'		1.0	1.0	14240	X	17		9-10' clayey silty black, wet
19-20'				14660		18		
20-21'						19		Refused @ 10'
21-22'						20		
22-23'						21		
23-24'						22		
24-25'						23		
25-26'						24		
26-27'						25		
27-28'						26		
28-29'						27		
29-30'						28		
30-31'						29		
31-32'						30		
32-33'						31		
33-34'						32		
34-35'						33		
35-36'						34		
36-37'						35		
37-38'						36		
38-39'						37		
39-40'						38		
40-41'						39		
41-42'						40		
42-43'						41		
43-44'						42		
44-45'						43		
45-46'						44		
46-47'						45		
47-48'						46		
48-49'						47		
49-50'						48		
50-51'						49		
51-52'						50		
52-53'						51		
53-54'						52		
54-55'						53		
55-56'						54		
56-57'						55		
57-58'						56		
58-59'						57		
59-60'						58		
60-61'						59		
61-62'						60		
62-63'						61		
63-64'						62		
64-65'						63		
65-66'						64		
66-67'						65		
67-68'						66		
68-69'						67		
69-70'						68		
70-71'						69		
71-72'						70		
72-73'						71		
73-74'						72		
74-75'						73		
75-76'						74		
76-77'						75		
77-78'						76		
78-79'						77		
79-80'						78		
80-81'						79		
81-82'						80		
82-83'						81		
83-84'						82		
84-85'						83		
85-86'						84		
86-87'						85		
87-88'						86		
88-89'						87		
89-90'						88		
90-91'						89		
91-92'						90		
92-93'						91		
93-94'						92		
94-95'						93		
95-96'						94		
96-97'						95		
97-98'						96		
98-99'						97		
99-100'						98		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-34 DATE: 11/13/86 Time: 1:20 FIELD PERSON: R. KEEL ET					
DRILLING CONTRACTOR: MATELO DRILLER: J. L. LEE RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						TOTAL DEPTH: 12 ft BOREHOLE DIAMETER: 2 inch					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3280				0-3": Silty clay, brown, moist.
3-9"		↑	↑	3150		1		
9-15"		3	3	3080		2		
15-21"		3	3	3320		3		
21-27"		↓	↓	3250		4		
27-33"		↓	↓	3090		5		3-36' APT
33-35"		↑	↑	3110		6		
35-41"		↑	↑	3100		7		316"-7.1": Lts. sandy clay, brown, very fine grained sand, moist
41-45"		3	3	3070		8		4.1-6.1" Silty clay, brown, moist, hard
45-55"		↓	↓	2880		9		
55-56"		↓	↓	2920		10		
56-65"		↓	↓	2750		11		
65-71"		↑	↑	3240		12		60-9": Silty clay, brown, hard, moist.
71-75"		↑	↑	2780		13		
75-81"		3	3	3420		14		
81-85"		3	3	2800				
85-89"		↓	↓	2850				
89-95"		↓	↓	2850				
95-101"		↑	↑	3440				9-12.1" Silty, clayey, sandy, c/c
101-105"		↑	↑	3170				gray, hard, friable
105-111"		3	2.7	2980				
111-115"		3	2.7	3100				
115-121"		↓	↓	2830				
121-122"		↓	↓	2940				

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: <i>SB-33</i> DATE: <i>11/9/06</i> Time: <i>0800</i> FIELD PERSON: <i>R. K. [unclear]</i>						
DRILLING CONTRACTOR: <i>Matco</i> DRILLER: <i>Slott</i>							TOTAL DEPTH: <i>12 ft.</i> BOREHOLE DIAMETER: 2 Inch						
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core													
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3160		1		0-0.9" Topsoil, dk brown, moist
3-9"				3230				0.9-3' Silty clay, brown, moist
9-15"		3	2.5	3110		2		
15-21"				3000				
21-27"		↓	↓	3300		3		
NR				NR				
3-3.5"		↑	↑	3050		4		3-6" Silty clay, brown, to pebbles
3.5-4"				3000				
4-4.5"		3	3	3350		5		
4.5-5"				3340				
5-5.5"		↓	↓	2920		6		
5.5-6"				3130				
6-6.5"		↑	↑	2940		7		6-9' Silty clay, brown to dk gray, hard, moist.
6.5-7"				3300				
7-7.5"		3	3	2950		8		
7.5-8"				3120				
8-8.5"		↓	↓	3080		9		
8.5-9"				3060				
9-9.5"		↑	↑	3210		10		9-12 Clayey silty sandy, gray, moist
9.5-10"				3600				
10-10.5"		3	3	3420		11		
10.5-11"				3590				
11-11.5"		↓	↓	2800		12		
11.5-12"				2870				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-32 DATE: 11/13/06 Time: 1050 FIELD PERSON: P. KEDER					
DRILLING CONTRACTOR: MATECO DRILLER: VINCE						TOTAL DEPTH: 11 ft. BOREHOLE DIAMETER: 2 inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3060				0-3': Silty clay, brown, v moist, f
3-9"				2890		1		
9-15"		3	2.8	2700		2		
15-21"				2960				
21-27"		↓	↓	2780		3		
27-33"		↑	↑	2850				
3-3.5'				3250		4		3-3.5' A/A
3.5-4'				6890				3.5-5': like cake, light greenish gray, black from 4.3-5', moist, silty-like clay
4-4.5'		3	2.2	1190	X	5		5-5.5': sand, silty, brown, wet
4.5-5'				10560	X			
5-5.5'		↓	↓	3680		6		
5.5-6'				AK				
6-6.5'		↑	↑	3670		7		6-9': Silty clay, dk brownish gray, hard, moist
6.5-7'				3360				
7-7.5'		3	2.7	3490		8		
7.5-8'				3170				
8-8.5'		↓	↓	3460		9		
8.5-9'		↑	↑	3360				
9-9.5'		2	2	3470		10		9-11': Clayey silt, dk gray, hard, friable, moist
9.5-10'				3320				
10-10.5'		↓	↓	3460		11		
10.5-11'								EDB @ 11' BGS
11-11.5'						12		
11.5-12'						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: <i>SB-31</i> DATE: <i>11/9/06</i> Time: <i>0835</i> FIELD PERSON: <i>R. E. ELLER</i>						
DRILLING CONTRACTOR: <i>MATELO</i> DRILLER: <i>SLCH</i>							TOTAL DEPTH: <i>12.41</i> BOREHOLE DIAMETER: 2 Inch						
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core													
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3420		1		0-0.5: Topsoil, dk brown, moist
3-5"				3520				0.5-3: Silty clay, brown, moist
9-15"		3	2.4	3120		2		plastic
15-21"				3070				
21-27"		↓	↓	3200		3		
NR				NR				
3-3.5		↑	↑	3330		4		3-6: Silty clay, brown, to sand & pebbles, moist
3.5-4				3210				
4-4.5		3	3	3010		5		
4.5-5				2980				
5-5.5		↓	↓	3160		6		
5.5-6				2930				
6-6.5		↑	↑	3250		7		6-9: Silty clay Ht
6.5-7				3170				
7-7.5		3	3	3170		8		
7.5-8				3940				
8-8.5		↓	↓	3210		9		
8.5-9				2960				
9-9.5		↑	↑	3080		10		9-11.3: Sandy clayey silt, dk gray, friable, moist
9.5-10				3060				
10-10.5		3	3	3000		11		11.3-11.6: Silty sand to gravel, gray, moist
10.5-11				3579				
11-11.5		↓	↓	3000		12		11.6-12: Sandy clayey silt, dk gray, moist
11.5-12				2870				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: 50-30 DATE: 11/13/06 Time: 10:15 FIELD PERSON: Z. KEELE TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 inch					
DRILLING CONTRACTOR: MPT ECO DRILLER: V. MEE RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						DATUM: AZIMUTH:					
NORTH: EAST:											

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3220	X	1		0-2' : Silty clay, brown, moist.
3-4"				3210	X			
4-15"		4	28	3370	X	2		
15-21"				5280	X			
21-27"				4760	X	3		2-2.8' Mix of white filler cake + silty clay, moist
27-31"				3400	X			2.8-4' = No Recovery
31-35"		↓	↓	NR	NA	4		
35-41"				3530	X	5		4-5.5' : Silty clay, brown, soft, plastic, moist.
41-45"		↑	↑	4150	X			
45-51"				3670	X	6		5.5-5.7' : Filler cake - drains (pile) - black plastic
51-57"		3	2	4090	X			5.7-6' : Silty clay, brown, plastic, moist
57-63"		↓	↓	3260	NA	7		6-7' : No Recovery
63-69"				NR	NA			7-9' : Silty clay, dk gray, v silty, moist.
69-75"		↑	↑	4320	3420	8		
75-81"				3420				
81-87"				3370		9		
87-93"				3360				
93-99"				3240		10		9-12' Clayey silty dk gray, hard, friable, moist, fine sand
99-105"				3140				
105-111"				3200		11		
111-117"				2960				
117-123"				2930		12		
123-129"				3010				
129-135"						13		
135-141"								
141-147"						14		
147-153"								
153-159"								
159-165"								
165-171"								
171-177"								
177-183"								
183-189"								
189-195"								
195-201"								
201-207"								
207-213"								
213-219"								
219-225"								
225-231"								
231-237"								
237-243"								
243-249"								
249-255"								
255-261"								
261-267"								
267-273"								
273-279"								
279-285"								
285-291"								
291-297"								
297-303"								
303-309"								
309-315"								
315-321"								
321-327"								
327-333"								
333-339"								
339-345"								
345-351"								
351-357"								
357-363"								
363-369"								
369-375"								
375-381"								
381-387"								
387-393"								
393-399"								
399-405"								
405-411"								
411-417"								
417-423"								
423-429"								
429-435"								
435-441"								
441-447"								
447-453"								
453-459"								
459-465"								
465-471"								
471-477"								
477-483"								
483-489"								
489-495"								
495-501"								
501-507"								
507-513"								
513-519"								
519-525"								
525-531"								
531-537"								
537-543"								
543-549"								
549-555"								
555-561"								
561-567"								
567-573"								
573-579"								
579-585"								
585-591"								
591-597"								
597-603"								
603-609"								
609-615"								
615-621"								
621-627"								
627-633"								
633-639"								
639-645"								
645-651"								
651-657"								
657-663"								
663-669"								
669-675"								
675-681"								
681-687"								
687-693"								
693-699"								
699-705"								
705-711"								
711-717"								
717-723"								
723-729"								
729-735"								
735-741"								
741-747"								
747-753"								
753-759"								
759-765"								
765-771"								
771-777"								
777-783"								
783-789"								
789-795"								
795-801"								
801-807"								
807-813"								
813-819"								
819-825"								
825-831"								
831-837"								
837-843"								
843-849"								
849-855"								
855-861"								
861-867"								
867-873"								
873-879"								
879-885"								
885-891"								
891-897"								
897-903"								
903-909"								
909-915"								
915-921"								
921-927"								
927-933"								
933-939"								
939-945"								
945-951"								
951-957"								
957-963"								
963-969"								
969-975"								
975-981"								
981-987"								
987-993"								
993-999"								
1000-1006"								
1006-1012"								
1012-1018"								
1018-1024"								
1024-1030"								
1030-1036"								
1036-1042"								
1042-1048"								
1048-1054"								
1054-1060"								
1060-1066"								
1066-1072"								
1072-1078"								
1078-1084"								
1084-1090"								
1090-1096"								
1096-1102"								
1102-1108"								
1108-1114"								
1114-1120"								
1120-1126"								
1126-1132"								
1132-1138"								
1138-1144"								

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-29 DATE: 11/3/06 Time: 0950 FIELD PERSON: R. KEEFER					
DRILLING CONTRACTOR: MATECO DRILLER: VMLR						TOTAL DEPTH: 10.5' BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3460	X	1		0-3': Silty clay, brown, plastic, moist
3-4"				3600				
4-11"		3	2.4	3620	X	2		
15-21"				3770	X			
21-27"		↓	↓	3310	X	3		
27-33"				NR				
3-3.5'		↑	↑	3210	X	4		3-4.5': Silty clay, brown, moist
3.5-4'				370				
4-4.5'		3	2.8	3900	X	5		4.5-5.5': Fill, black silty clay, organic rich, pebbles
4.5-5'				7370	X			
5-5.5'		↓	↓	4700	X	6		5.5-5.8': Filler clay, yellowish orange, soft
5.5-6'				8790	X			
6-6.5'		↑	↑	12420	X	7		6-6.5': UBlack muck, wet
6.5-7'				5310	X			
7-7.5'		3	3	430	X	8		6.5-9': Silty clay, brown, gravelly, hard, moist.
7.5-8'				3460	X			
8-8.5'		↓	↓	3040	X	9		9-10.5': Clayey silty dk gray, w/ Fine sand, hard, friable, moist.
8.5-9'				3030	X			
9-9.5'		1.5	1.5	3210	X	10		
9.5-10'				2040				
10-10.5'				3190		11		Refused @ 10.5' BGS
10.5-11'						12		
11-11.5'						13		
11.5-12'						14		

Λ = bag interval

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-27 DATE: 11/13/06 Time: 0841 FIELD PERSON: P. KEELER						
DRILLING CONTRACTOR: MATELO DRILLER: V. HILL							TOTAL DEPTH: 12' BOREHOLE DIAMETER: 2 Inch						
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core													
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"				3210				0-3': Silty clay, brown, plastic, moist.
3-4"		↑	↑	3260		1		
4-5"				2850				
5-6"		3	2.8	3070		2		
6-7"				3110				
7-8"		↓	↓	2930		3		
8-9"				3060				3-4.5': Silty clay, brown, hard, dense, moist.
9-10"		↑	↑	2850		4		4.5-4.7': Sand, silty, brown, F-M grained, moist to wet
10-11"		3	3	2840		5		4.7-6': Silty clay, brown, hard, dense, moist.
11-12"		↓	↓	2930		6		6-6.5': Silty clay, brown, moist
12-13"				2920		7		6.5-7': Clayey gravel, brown, wet
13-14"		↑	↑	3100		8		7-9': Silty clay, brown, hard, moist
14-15"		3	3	3260		9		
15-16"				3020				
16-17"		↓	↓	32930 3920		10		9-12': Silty clay, dk gray, hard, dense, moist
17-18"		↑	↑	3220				
18-19"				3060		11		
19-20"		3	2.2	3260				
20-21"				3070		12		
21-22"		↓	↓	2740				
22-23"				NR		13		
23-24"						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: 58-26 DATE: 11/13/06 Time: 0820 FIELD PERSON: R & B & C						
DRILLING CONTRACTOR: MATECO DRILLER: J. HILL RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core							TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 Inch						
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3260				0-3": Silty clay, brown, plastic, moist
3-5"				2830		1		
5-11"		3	2.7	2830		2		
11-21"				2670				
21-27"		↓	↓	2710		3		
27-33"				NK				
33-35"		↑	↑	2740		4		3-4.5": Alt. hard, moist
35-41"				2720				
41-45"		3	3	3260		5		4.5-4.7": Sand, brown, F-M, Silty, V. moist
45-51"				2720				
51-55"		↓	↓	2880		6		4.7-6": Silty clay Alt
55-61"				2670				
61-65"		↑	↑	2870		7		6-9": Silty clay, brown, hard, dry, friable
65-71"				2540				
71-75"		3	3	3090		8		
75-81"				2630				
81-85"		↓	↓	2830		9		9-9.5": Sand, gray, Silty, F-M, wet
85-91"				2820				
91-95"		↑	↑	2920		10		9.5-12": Silty clay, dk gray, dense, moist
95-101"				2820				
101-105"		3	2.2	3150		11		
105-111"				2860				
111-115"		↓	↓	2970		12		
115-121"				NK				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: 138 ^{PDF} SB-25 DATE: 11/9/06 Time 1327 FIELD PERSON: R. KOEHLER						
DRILLING CONTRACTOR: Matco DRILLER: Scott							TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 Inch						
RIG TYPE: Geoprobe Track Rig													
SAMPLING METHODS: Push Core													
NORTH:							DATUM:						
EAST:							AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3'		1	↑	3260				0-3': Silty clay, brown, moist
3-4'		1	↑	3230		1		
4-15'		3	2.8	3260				
15-21				3170		2		
21-27		↓	↓	3100				
27-33				3150		3		
3-3.5'		↑	↑	3390				3-4': A1A
3.5-4'				4760		4		
4-4.5'				7010				4-5': Mix of clay & orange filler
4.5-5'		3	2.1	6180		5		Core wet
5-5.5'		↓	↓	4010				5-5.1': Silty clay A1A
5.5-6'				AK		6		5.1-6': NO recovery
6-6.5'		↑	↑	5160				6-9': Silty clay, dk gray, wet
6.5-7'				3420		7		
7-7.5'		3	3	3160				
7.5-8'				3010		8		
8-8.5'		↓	↓	3710				
8.5-9'				2940		9		
9-9.5'		↑	↑	3740				9-10' Clayey silt dk gray, wet
9.5-10'				3390		10		4-10, Aug 10-12'
10-10.5'		3	3	2830				
10.5-11'				3560		11		
11-11.5'		↓	↓	2700				
11.5-12'				3160		12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: <i>SB-24</i> DATE: <i>11/9/06</i> Time: <i>0915</i> FIELD PERSON: <i>L. Koller</i>						
DRILLING CONTRACTOR: <i>MH BLO</i> DRILLER: <i>Scott</i>							TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch						
RIG TYPE: Geoprobe Track Rig													
SAMPLING METHODS: Push Core													
NORTH:							DATUM:						
EAST:							AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"				3300				0-0.5': Topsoil, dk brown, moist
3-4"		↑	↑	3250		1		0.5-3': Silty clay, brown, plastic, moist
4-15"		3	2.4	340		2		
15-21"				3120				
21-27"		↓	↓	3160		3		
NR				NR				
3-3.5		↑	↑	3130		4		3-5' A/A
3.5-4				3300				
4-4.5		3	3	3150		5		5-5.1': Sand, brown, silty, wet
4.5-5				3391				5.1-6': Silty clay, dk, moist
5-5.5		↓	↓	3120		6		6-9': Silty clay, brown, hard, moist
5.5-6				3020				
6-6.5		↑	↑	3170		7		
6.5-7				2950				
7-7.5		3	3	3208		8		
7.5-8				2750				
8-8.5		↓	↓	2700		9		
8.5-9				3000				
9-9.5		↑	↑	3250		10		9-12': Silt, clayey, dk gray, moist
9.5-10				3290				
10-10.5		3	3	3160		11		
10.5-11				370				
11-11.5		↓	↓	3010		12		
11.5-12				3070				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: <i>SB-23</i> DATE: <i>11/9/06</i> Time: <i>1304</i> FIELD PERSON: <i>E. KEELER</i>					
DRILLING CONTRACTOR: DRILLER:						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3'								0-3' : Silty clay, brown, moist.
3-3.9'		↑	↑			1		
3.9-15'								
15-21'		3	2.1			2		
21-27'								
27-33'		↓	↓			3		
33-35'								3-3.9' : A/A
35-4.5'		↑	↑			4		
4.5-5'		3	1.9			5		3.9-4.9' : Clayey sand & silt, brown w/ orange mottles, moist
5-5.5'								
5.5-6'		↓	↓			6		
6-6.5'		↑	↑			7		6-7' : A/A, dk gray, & black, wet
6.5-7'								
7-7.5'		3	3			8		7-9' : Silty clay, dk brown, hard, dense, moist
7.5-8'								
8-8.5'		↓	↓			9		
8.5-9'								
9-9.5'		↑	↑			10		9-12' : Clayey, sandy, silt, dk gray, wet.
9.5-10'								
10-10.5'		3	3			11		
10.5-11'								
11-11.5'		↓	↓			12		
11.5-12'								
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-22 DATE: 11/9/06 Time 1200 FIELD PERSON: R. KRELLER					
DRILLING CONTRACTOR: MATECO DRILLER: Scott						TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3440		1		0-3': Silty clay, brown, moist. Bits of orange material 1-2' BGS.
3-9"				5050				
9-15"		3	2.5	34010		2		
15-21"				11100				
21-27"		↓	↓	3640		3		
27-33"				NR.				
3-3.5'		↑	↑	3130		4		3-6': Aft, moist.
3.5-4'				3340				
4-4.5'		3	3	3190		5		
4.5-5'				3190				
5-5.5'		↓	↓	2650		6		
5.5-6'				2820				
6-6.5'		↑	↑	3120		7		6-9': Silty clay, brown, hard, moist.
6.5-7'				3420				
7-7.5'		3	3	2740		8		
7.5-8'				2020				
8-8.5'		↓	↓	2640		9		
8.5-9'				3000				
9-9.5'		↑	↑	3180		10		9-10.2: Clayey silty dk gray, sandy, moist.
9.5-10'				3260				
10-10.5'		3	3	3320		11		10.2-10.5' Silty sand dk gray, fine sand, moist.
10.5-11'				3070				
11-11.5'		↓	↓	2900		12		10.5-12: Clayey silty Aft, moist.
11.5-12'				3140				
						13		
						14		

+ Bag 1 ft intervals

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-21 DATE: 11/14/06 Time 1223 FIELD PERSON: R. KEELER					
DRILLING CONTRACTOR: MATECO DRILLER: SCOH						TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3160		1		0-3' Silty clay, brown, moist
3-8"				2400				
9-15"		3	2.5	3340		2		
15-21"				2990				
21-27"		↓	↓	2840		3		
27-33"				NR.				
3-3.5'		↑	↑	3000		4		3-6' A/A, v moist to wet
3.5-4'				3260				
4-4.5'		3	2.5	3280		5		
4.5-5'				2940				
5-5.5'		↓	↓	2990		6		6-6.3' Clayey sand, brown, wet
5.5-6'				3010				6.3-9' Silty clay, brown, gravelly, hard, moist
6-6.5'		↑	↑	3110		7		
6.5-7'				3140				
7-7.5'		3	2.8	2970		8		
7.5-8'				2920				
8-8.5'		↓	↓	3150		9		
8.5-9'				2970				
9-9.5'		↑	↑	3450		10		
9.5-10'				2910				
10-10.5'		3	3	3240		11		
10.5-11'				2810				
11-11.5'		↓	↓	3260		12		
11.5-12'				2920				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-20 DATE: 11/9/06 Time 1240 FIELD PERSON: R. KEELEK					
DRILLING CONTRACTOR: MATECO DRILLER: Scott						TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig											
SAMPLING METHODS: Push Core											
NORTH:						DATUM:					
EAST:						AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3'		↑	↑	3480				0-3' : Silty clay, brown, moist
3-4'				3430		1		
4-15'		3	2.4	3220		2		
15-21'				2970				
21-27'		↓	↓	3430		3		
27-33'				NR				
3-35'		↑	↑	3260		4		3-6' : A/A
35-41'				3190				
41-45'		3	3	3540		5		
45-51'				3160				
51-55'		↓	↓	3430		6		6-9' : Silty clay A/A, wet, thin sand streaks 10-6.5' BGS
55-61'		↑	↑	2580				
61-65'				2880		7		
65-71'		3	3	3090		8		
71-75'				2850				
75-81'		↓	↓	2690		9		
81-85'		↑	↑	3740				9-12' : clayey silt dk gray, sandy, moist, gravelly
85-91'				3710		10		
91-95'				3620				
95-101'		3	3	3220		11		
101-105'				3170				
105-111'		↓	↓	3480		12		
111-115'				3190				
115-121'						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: <i>SB-19</i> DATE: <i>11/7/06</i> Time: <i>1330</i> FIELD PERSON:		
DRILLING CONTRACTOR: DRILLER:							TOTAL DEPTH: BOREHOLE DIAMETER: 2 inch		
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core									
NORTH: EAST:							DATUM: AZIMUTH:		

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3690				0-0.5" dk brown topsoil, moist.
3-4"				3590		1		0.5-3' Silty clay, brown.
4-4.5"		3	2.5	3590		2		
15-21"				2910				
21-27"		↓	↓	3220		3		
3-3.5"		↑	↑	3110		4		3-6' : Silty clay, brown
3.5-4"				3820				
4-4.5"		3	2.2	3520		5		
4.5-5"				3120				
5-5.5"		↓	↓	3000		6		
5.5-6"				3230				
		↑	↑	3090	3060	7		6-9: Clayey silty brown, wet
				3360	3150			
		3	3	3230	3020	8		
				3460				
		↓	↓	2950		9		
		↑		3270				
		2		3090		10		9-11: Silty, dk gray
		↓		3360				
				3230		11		Refused @ 11' BGS.
				3140				
						12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site		SOIL BORING NUMBER: SB-17	
PROJECT NUMBER: 21-11010G		DATE: 11/7/06	
PROJECT LOCATION: Breckenridge, Michigan		Time: 1046	
		FIELD PERSON: R Keeler	
DRILLING CONTRACTOR: Matelo		TOTAL DEPTH: 12	
DRILLER: Scott		BOREHOLE DIAMETER: 2 Inch	
RIG TYPE: Geoprobe Track Rig			
SAMPLING METHODS: Push Core			
NORTH:		DATUM:	
EAST:		AZIMUTH:	

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-5"		↑	↑	2870				0-1.5: Topsoil, dk brown
3-9"		↑	↑	3120		1		1.5-3: Silty clay, brown, soft, moist
9-15"		3	2	3220		2		
15-21"		↓	↓	2790		3		3-5.2: As Above
		↓	↓			4		5.2-5.5: Sand & silty wet
3-3.5		↑	↑	3230		5		5.5-6: Brown silty clay
3.5-4		↑	↑	3350		6		
4-4.5		3	2.8	2990		7		6-9: Silty clay, brown, hard, moist
4.5-5		3	2.8	3320		8		
5-5.5		↓	↓	3070		9		
5.5-6		↓	↓	3280		10		9-12: Clayey silty dk gray, moist.
6-6.5		↑	↑	3360		11		
6.5-7		↑	↑	3160		12		
7-7.5		3	3	2980		13		
7.5-8		3	3	3060		14		
8-8.5		↓	↓	2640				
8.5-9		↓	↓	3080				
9-9.5		↑	↑	3150				
9.5-10		↑	↑	3250				
10-10.5		3	3	2850				
10-11		3	3	3360				
11-11.5		↓	↓	2930				
11.5-12		↓	↓	3100				

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-15 DATE: 11/7/06 Time: 1455 FIELD PERSON: R. KEOLEZ					
DRILLING CONTRACTOR: Mateco DRILLER: Scott						TOTAL DEPTH: 12' BOREHOLE DIAMETER: 2 inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					
SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG				SAMPLE DESCRIPTION
0-3"		↑	↑	4630							0-0.4' dk brown topsoil, moist
3-9"		↑	↑	4830		1					0.4-3: silty clay, dk brown
9-15"		3	2.5	6730							few speckles of filler cake @ 1.5-1.7
15-21"				16000		2					
21-27"		↓	↓	4230							
27-33"		↓	↓	3670		3					
33-35"		↑	↑	5440							3-5.5: silty clay, brown, moist
35-4'		↑	↑	3670		4					
4-4.5'		3	3	3910							
4.5-5'				3550		5					
5-5.5'		↓	↓	3830							
5.5-6'		↓	↓	3890		6					5.5-5.7': Sand seam, gray, met
6-6.5'		↑	↑	4760							5.5-9': silty clay, brown, hard, moist
6.5-7'		↑	↑	3600		7					
7-7.5'		3	3	3830							
7.5-8'				3910		8					
8-8.5'		↓	↓	3500							
8.5-9'		↓	↓	3490		9					
9-9.5'		↑	↑	3340							9-12': Clayey silt, gray, moist
9.5-10'		↑	↑	3100		10					
10-10.5'		3	2	3620							
10.5-11'				3100		11					
11-11.5'		↓	↓	3260		12					
						13					
						14					

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-14 DATE: 11/7/06 Time: 1420 FIELD PERSON: R. K. ELLER					
DRILLING CONTRACTOR: Mafz Co DRILLER: Scott						TOTAL DEPTH: 12' BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"					3670			0-0.5" dk brown top soil
3-4"			↑	↑	3700	1		0.5-3: Silty clay, brown
4-15"			3	2.5	3370	2		3-5.5: A/A
15-21"					3100			
21-27"			↓	↓	3500	3		
27-33"					3210			
3-35"			↑	↑	3650	4		3-5.5 - A/A
35-4"					3400			
4-4.5"			3	2.8	3300	5		
4.5-5"					3620			
5-5.5"			↓	↓	3640	6		5.5-5.8: brown silty sand, wet.
5.5-6"					3250			5.8-6': Silty clay, brown, moist.
6-6.5"			↑	↑	3470	7		6-9: Sandy silt, dk gray, moist.
6.5-7"					3330			
7-7.5"			3	3	3200	8		
7.5-8"					3220			
8-8.5"			↓	↓	3440	9		
8.5-9"					3310			
9-9.5"			↑	↑	2990	10		9-12: Clayey silt, dk gray, moist.
9.5-10"					2721			
10-10.5"			3	3	3520	11		
10.5-11"					3620			
11-11.5"			↓	↓	3510	12		
11.5-12"					3030			
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-13 DATE: 11/7/06 Time: 1000 FIELD PERSON: R. Keeler					
DRILLING CONTRACTOR: Mateco DRILLER: Scott						TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig											
SAMPLING METHODS: Push Core											
NORTH:						DATUM:					
EAST:						AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
2-3"		↑	↑	3290				0-6" Black topsoil
3-8"				3140		1		6"-1.5' Brown silty clay, moist
9-15"		3	1.5	2750		2		
15-21"				3170				
NR		↓	↓	NR		3		
5-2.5		↑	↑	2910		4		3-6': Brown silty clay, moisty silt.
3.5-4				3010				
4-4.5		3	3	3190		5		
4.5-5				3090				
5-5.5		↓	↓	3230		6		
5.5-6				3210				
6-6.5		↑	↑	2940		7		6-7.5: Silty clay A/A.
6.5-7				3230				
7-7.5		3	3	3240		8		7.5-9: Clayey silt, brown, blocky, moist
7.5-8				3160				
8-8.5		↓	↓	2970		9		
8.5-9				3190				
9-9.5		↑	↑	3370		10		9-12: dk gray clayey silt, moist
9.5-10				3260				
10-10.5		3	2.5	3250		11		
10.5-11				3220				
11-11.5		↓	↓	2950		12		
11.5-12				3310				
						13		
						14		

NR: No Recovery

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-12 DATE: 4/20 11/9/06 Time: 1100 FIELD PERSON: R. Keeler					
DRILLING CONTRACTOR: Metello DRILLER: Scott RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3350				0-3' silty clay, brown, moist.
3-4"				3600		1		
4-5"		3	2.5	3260				
15-21"				3060		2		
21-27"		↓	↓	2960				
27-33"				3080		3		
3-3.5"		↑	↑	3430				3-6' A/A, moist
3.5-4"				3470		4		
4-4.5"		3	2.5	3320				
4.5-5"				2730		5		
5-5.5"		↓	↓	2670				
5.5-6"				NE		6		6-9' A/A
6-6.5"		↑	↑	3050				
6.5-7"				3040		7		
7-7.5"		3	3	2930				
7.5-8"				2960		8		
8-8.5"		↓	↓	3010				
8.5-9"				3290		9		
9-9.5"		↑	↑	2990				9-11.5' clayey, sandy silt, dk gray, moist
9.5-10"				2720		10		
10-10.5"		3	3	3000				
10.5-11"				2880		11		11.5-11.7' silty sand, dk gray, wet
11-11.5"		↓	↓	2890				11.7-12' clayey silty sand, A/A
11.5-12"				3470		12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: <u>SB-11</u> DATE: <u>11/9/06</u> Time: <u>1045</u> FIELD PERSON: <u>R. KEEZER</u>					
DRILLING CONTRACTOR: <u>MATECO</u> DRILLER: <u>Scott</u>						TOTAL DEPTH: <u>12 ft.</u> BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3330				0-3' : Silty clay, brown, moist
3-4"				3630		1		
4-5"		3	2.5	4240		2		
15-21"				3460				
21-27"		↓	↓	3220		3		
27-34"				2980				
3-3.5'		↑	↑	3630		4		3-6' : A/A, moist, thin sand seam @ 5.5' B.S.
3.5-4'				3650				
4-4.5'		3	2.53	3080		5		
4.5-5'				4840				
5-5.5'		↓	↓	3560		6		
5.5-6'				3070				
6-6.5'		↑	↑	2440		7		6-9' : Clayey silt, gray, wet
6.5-7'				3320				
7-7.5'		3	3	3140		8		
7.5-8'				3080				
8-8.5'		↓	↓	3170		9		
8.5-9'				2940				
9-9.5'		↑	↑	3020		10		9-11.7' : A/A, wet.
9.5-10'				3390				
10-10.5'		3	3	3400		11		11.7-12' : Sand, silty, dk gray, wet.
10.5-11'				3420				
11-11.5'		↓	↓	2840		12		
11.5-12'				2880				
						13		
						14		

+ Bag 1 ft interval

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-10 DATE: 11/9/26 Time: 1015 FIELD PERSON: Z. KEELER		
DRILLING CONTRACTOR: MATELO DRILLER: SCOTT							TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 Inch		
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core									
NORTH: EAST:							DATUM: AZIMUTH:		

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	4180		1		0-0.4' Topsoil, dk brown, plastic, moist
3-9"				4930				
9-15"		3	2.3	5960		2		0.4-3' Silty clay, brown
15-21"				3430				
21-27"		↓	↓	3010		3		
27-33"				NR				
3-3.5'		↑	↑	3500		4		3-6' Silty clay, brown, moist
3.5-4'				3180				
4-4.5'		3	3	3210		5		
4.5-5'				3280				
5-5.5'		↓	↓	3740		6		
5.5-6'				3900				
6-6.5'		↑	↑	5300		7		6-9' Silty clay, brown, hard, moist
6.5-7'				2840				
7-7.5'		3	3	3310		8		
7.5-8'				2610				
8-8.5'		↓	↓	3370		9		
8.5-9'				2580				9-12' Clayey sandy silt, dk grey, friable, moist, dense.
9-9.5'		↑	↑	3340		10		
9.5-10'				3220				
10-10.5'		3	3	3360		11		
10.5-11'				3180				
11-11.5'		↓	↓	5000		12		
11.5-12'				3050				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-9 DATE: 11/4/06 Time: 6:45 FIELD PERSON: REEBER					
DRILLING CONTRACTOR: MATELO DRILLER: Scott						TOTAL DEPTH: BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3660		1		0-3": Silty Clay, brown, moist.
3-4"				3660				
4-15"		3	2.5	3520		2		
15-21"				3610				
21-27"		↓	↓	3570		3		
27-33"				NR				
3-31"		↑	↑	3370		4		3-6": A/A, pushed rock = poor rec.
31-45"				3060				
45-55"		3	1.2	3140		5		
55-65"				NR				
65-75"		↓	↓	NR		6		6-7": A/A, wet
75-85"		↑	↑	4190		7		
85-95"		3	2.5	5740		8		7-8.5": Filter cake, orangeish brown, wet, soft, black plastic @ base of sample
95-105"				12040				
105-115"		3	2.5	10760		9		
115-125"		↓	↓	7570				
125-135"				NR		10		9-12": Clayey silt w/ fine sand, dk gray, wet, black @ top
135-145"		↑	↑	3050				
145-155"				2460		11		
155-165"		3	2.5	2820		12		
165-175"				2980				
175-185"		↓	↓	2890		13		
185-195"				NR				
195-205"		↑	↑	3380		14		
205-215"				3240				
215-225"		3	2.5	3130				
225-235"				3220				
235-245"		↓	↓	3090				
245-255"				2960				

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-8 DATE: 11/7/06 Time: 0850 FIELD PERSON: R. Keeler						
DRILLING CONTRACTOR: <i>Mateen</i> DRILLER: <i>Scott</i> RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core							TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 Inch						
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3220				0-4: Brown silty clay, Trace fine sand, moist.
3-9"		↑	↑	2610	3250	1		
9-15"		↑	↑	3070	3110	2		
		4	1.5"			3		
		↓	↓			4		
4-4.5		↑	↑	3190	3520	5		4-5.5: As above, Unmoist
4.5-5		↑	↑	2950		6		
5-5.5		3	2.5	3130		7		5.5-6: Fine sand, brown, moist
5.5-6		↓	↓	3070		8		6-6.7: Brown silty clay, sgt, moist.
6-6.5		↓	↓	3260		9		
7-7.5		↑	↑	3720		10		7-10: Silty clay, brown, dk gray
7.5-8		↑	↑	3770		11		9.6-10: Blocky, moist, clayey silt.
8-8.5		3	3	3730		12		
8.5-9		↓	↓	3250		13		
9-9.5		↓	↓	3450		14		
9.5-10		↓	↓	3780				
10-10.5		↑	↑	3540				10-12: Clayey silt, dk gray
10.5-11		↑	↑	3460				
11-11.5		↓	↓	3210				
11.5-12		↓	↓	3130				

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: 512-7 DATE: 11/19/06 Time: 0920 FIELD PERSON: P. H. FOLGER					
DRILLING CONTRACTOR: MATECO DRILLER: SLOTT						TOTAL DEPTH: 12.5 ft BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3'		↑	↑	3240		1		0-3' : Silty clay, brown, moist
3-9'				3140				
9-15'		3	2.7	2710	7130	2		
15-21'				2680		3		
21-27'		↓	↓	2810		4		
27-33'				2960		5		
33-39'		↑	↑	2960		6		3-6' : A/A, plastic, moist to wet
39-45'		3	2.3	2830		7		
45-51'		↓	↓	3240		8		
51-57'				NR		9		
57-63'		↑	↑	2540		10		6-9' : Silty clay, brown, hard, friable, moist
63-69'		3	3	2720		11		
69-75'		↓	↓	2680		12		
75-81'		↑	↑	2710		13		
81-87'				3070		14		9-12' : Clayey silty cln grey, V. moist + wet w/ fine sand
87-93'		3	3	2610				
93-99'				2920				
99-105'		↓	↓	2770				
105-111'				3010				
111-117'				2460				

*: Bag every ft.

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan							SOIL BORING NUMBER: SB-6 DATE: 11/9/06 Time: 1603 FIELD PERSON: R. LEELER						
DRILLING CONTRACTOR: marteo DRILLER: Scott							TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 inch						
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core													
NORTH: EAST:							DATUM: AZIMUTH:						

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3860		1		0-3' silty clay, dk brown, moist.
3-4"				4580				
4-5"		3	2.5	3600		2		
5-6"				3220				
6-7"		↓	↓	3130		3		
7-8"				2840				
8-9"		↑	↑	3130		4		3-6' : Silty clay, brown, moist.
9-10"				3140				
10-11"		3	3	3060		5		
11-12"				3180				
12-13"		↓	↓	2870		6		
13-14"				3250				
14-15"		↑	↑	3070		7		6-9' : A/A, dry
15-16"				3200				
16-17"		3	3	3210		8		
17-18"				2990				
18-19"		↓	↓	2940		9		
19-20"				3220				
20-21"		↑	↑	3400		10		9-11' : clayey silt, dk gray, moist
21-22"				3090				
22-23"		3	2	3030		11		11-11.5'
23-24"				2870				
24-25"		↓	↓	2690		12		11-11.5' : sand silty, gray, wet.
25-26"				NR				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-5 DATE: 11/9/06 Time: 10:15 FIELD PERSON: R. KEELER					
DRILLING CONTRACTOR: MATECO DRILLER: Scott						TOTAL DEPTH: 12ft BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3'		↑	↑	3370		1		0-3': Silty clay brown, moist.
3-4'				3040				
4-5'		3	2.5	2950		2		
5-6'				2860				
6-7'		↓	↓	2780		3		
7-8'				NR				
8-9'		↑	↑	3520		4		3-4.9': A/A, sandy, wet
9-10'				3440				
10-11'		3	2.1	3750		5		5-5.3': Filler cake white, soft, wet -driller encountered steel caused poor recovery
11-12'				3400				5.3-6': no recovery
12-13'		↓	↓	NR		6		
13-14'				5230		7		6-6.8': Mix of Silty clay & gravel, brown, wet
14-15'		↑	↑	3850				6.8-9': Silty clay, brown, hard, moist.
15-16'		3	2.3	3180		8		
16-17'				3200				
17-18'		↓	↓	3320		9		
18-19'				2860				
19-20'		↑	↑	3820		10		9-12': clayey silt, dk gray, dense, friable, moist.
20-21'				340				
21-22'		3	3	340		11		
22-23'				3130				
23-24'		↓	↓	240		12		
24-25'				3140				
25-26'						13		
26-27'								
27-28'						14		

Note: Advanced 2 borings because of refusal @ 9' DGS

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-4 DATE: 11/9/06 Time: 1449 FIELD PERSON: R. KEELEN					
DRILLING CONTRACTOR: Matero DRILLER: Scott						TOTAL DEPTH: 12 BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3280				0-0.5': Topsoil, dk brown, moist.
3-4"				3380		1		0.5-3': Silty clay, brown, moist
9-15"		3	2.5	3080		2		
15-21"				3040				
21-27"		↓	↓	2940				
27-33"				NK		3		
33-43"	3-3.5	↑	↑	3340				3-6': Silty clay, brown sandy @
43-45"	3.5-4			2560		4		4.5-5' BGS, soft, moist.
4-4.5"		3	2.4	3350		5		
4.5-5"				2900				
5-5.5"		↓	↓	2870		6		
5.5-6"				2960				
6-6.5"		↑	↑	3600		7		6-9': Silty clay, dk gray, hard, moist.
6.5-7"				5570				
7-7.5"		3	3	3130		8		
7.5-8"				3290				
8-8.5"		↓	↓	2720		9		
8.5-9"				2920				
9-9.5"		↑	↑	3070		10		9-12': Clayey silt, V moist to wet, dk gray.
9.5-10"				3160				
10-10.5"		3	2.4	3000		11		
10.5-11"				2850				
11-11.5"		↓	↓	2640		12		
11.5-12"				2260				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: SB-3 DATE: 11/9/06 Time 1511 FIELD PERSON: R. KERPER					
DRILLING CONTRACTOR: MATELO DRILLER: Scott						TOTAL DEPTH: 12 ft. BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:						DATUM: AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3'		↑	↑	3550		1		0-3': Silty Clay, dk brown, moist.
3-4"				3130				
4-15"		3	2.5	3070		2		
15-21"				2840				
21-27"		↓	↓	2770		3		
27-33'				NR				
3-3.5'		↑	↑	3442		4		3-4.5' HA, moist.
3.5-4'				3140				
4-4.5'		3	2.5	3280		5		4.5-5.5': Sandy Silty Clay, brown, soft, plastic, v moist.
4.5-5'				3360				
5-5.5'		↓	↓	2900		6		
5.5-6'				2800				
6-6.5'		↑	↑	3200		7		6-9': Silty clay, dk gray, hard, moist.
6.5-7'				3190				
7-7.5'		3	3	3360		8		
7.5-8'				2470				
8-8.5'		↓	↓	2850		9		
8.5-9'				3140				
9-9.5'		↑	↑	2790		10		9-11': Sandy silt, dk gray, wet
9.5-10'				3010				
10-10.5'		3	3	3080		11		11-12' Sand, Silty, dk gray, wet
10.5-11'				3250				
11-11.5'		↓	↓	2920		12		
11.5-12'				2930				
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan						SOIL BORING NUMBER: <i>SB-2</i> DATE: <i>11/9/06</i> Time: <i>1430</i> FIELD PERSON: <i>R. KEEFER</i>					
DRILLING CONTRACTOR: <i>Wetco</i> DRILLER: <i>Scott</i>						TOTAL DEPTH: <i>12</i> BOREHOLE DIAMETER: 2 Inch					
RIG TYPE: Geoprobe Track Rig											
SAMPLING METHODS: Push Core											
NORTH:						DATUM:					
EAST:						AZIMUTH:					

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
<i>0-3"</i>		↑	↑	<i>3280</i>				<i>0-4' : Silty Clay, brown, plastic, moist</i>
<i>3-4"</i>		↑	↑	<i>3370</i>		1		
<i>4-15"</i>		<i>3.4</i>	<i>2.7</i>	<i>3300</i>				
<i>15-21"</i>				<i>3320</i>		2		
<i>21-27"</i>				<i>3180</i>				
<i>27-33"</i>		↓	↓	<i>3130</i>		3		
<i>3-3.5"</i>		↓	↓	<i>NR</i>				
<i>3.5-4"</i>		↓	↓	<i>NR</i>		4		<i>4-5.8' : A1A, moist</i>
<i>4-4.5"</i>		↑	↑	<i>2890</i>				
<i>4.5-5"</i>		↑	↑	<i>2170</i>		5		
<i>5-5.5"</i>		↓	↓	<i>3050</i>				<i>5.8-6' : Sand, brown, wet</i>
<i>5.5-6"</i>		↓	↓	<i>3000</i>		6		<i>6-6.2' : same A1A</i>
<i>6-6.5"</i>		↑	↑	<i>3410</i>				<i>6.2-9' : Silty Clay, brown, hard, moist</i>
<i>6.5-7"</i>		↑	↑	<i>3130</i>		7		
<i>7-7.5"</i>				<i>3070</i>				
<i>7.5-8"</i>		3	3	<i>3010</i>		8		
<i>8-8.5"</i>		↓	↓	<i>2960</i>				
<i>8.5-9"</i>		↓	↓	<i>3700</i>		9		<i>9-11.6' : clayey silt, dk gray, moist</i>
<i>9-9.5"</i>		↑	↑	<i>3370</i>				
<i>9.5-10"</i>		↑	↑	<i>3240</i>		10		
<i>10-10.6"</i>		3	3	<i>3130</i>				
<i>10.6-11"</i>				<i>2950</i>		11		
<i>11-11.6"</i>		↓	↓	<i>2860</i>				<i>11.6-12' : Silty Sand, dk gray, F-m, wet</i>
<i>11.6-12"</i>		↓	↓	<i>2810</i>		12		
						13		
						14		

SOIL BORING LOG

PROJECT NAME: Breckenridge Disposal Site PROJECT NUMBER: 21-11010G PROJECT LOCATION: Breckenridge, Michigan								SOIL BORING NUMBER: 3B-1 DATE: 11/9/06 Time: 1350 FIELD PERSON: R. KEEFER			
DRILLING CONTRACTOR: MCDLW DRILLER: Scott								TOTAL DEPTH: 12ft BOREHOLE DIAMETER: 2 Inch			
RIG TYPE: Geoprobe Track Rig SAMPLING METHODS: Push Core											
NORTH: EAST:								DATUM: AZIMUTH:			

SAMPLE DEPTH	SELECTED FOR ANALYSIS (Y/N)	FEET DRIVEN	FEET RECOVERED	ACTIVITY	SAMPLE NUMBER	DEPTH IN FEET	GRAPHIC LOG	SAMPLE DESCRIPTION
0-3"		↑	↑	3120				0-2.9': Silty clay, brown, moist
3-5"				2980		1		
9-11"		3	2.4	3140				
15-21"				3260		2		
21-27"		↓	↓	3000				2.9-3': Sand, brown, F-m, loose, moist
27-33"				NR		3		
3-3.5		↑	↑	3220				3-6': Silty clay, brown, hard, moist
3.5-4				3330		4		
4-4.5		3	3	3570				
4.5-5				3200		5		
5-5.5		↓	↓	3260				
5.5-6				2930		6		
6-6.5		↑	↑	2870				6-9': Silty clay, brown, hard, moist.
6.5-7				2930		7		
7-7.5		3	3	3120				
7.5-8				3090		8		
8-8.5		↓	↓	310				
8.5-9				3060		9		9-12': Clayey silt dk gray, hard, friable, dry.
9-9.5		↑	↑	2990				
9.5-10				3370		10		
10-10.5		3	3	2890				
10.5-11				3300		11		
11-11.5		↓	↓	2770				
11.5-12				2850		12		
						13		
						14		

APPENDIX C
Outreach Laboratory Data Package



**Outreach
Laboratory**

311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

January 2, 2007

Environ
Chris Greco
123 N Wacker Dr #250
Chicago, IL 60606

CLIENT PROJECT NAME: Breckenridge Site
OUTREACH LAB ID: 20060963

Dear Mr. Greco:

Please find enclosed the analytical report for your samples received in our laboratory on November 17, 2006 for the above captioned project. Thirteen solid samples were received in good condition and analyzed for *Uranium Isotopic*, *Thorium Isotopic* and *Gamma Spec*.

All Quality Control for the requested analyses is reported on the analytical report. The method blank, laboratory control standard and matrix spikes and spike duplicates for all analyses were within method control limits.

Your samples will be returned.

Thank you for choosing Outreach Laboratory and if you have any questions, please call us at 918-251-2515.

Laboratory Director

ODEQ ID #9517
NRC ODEQ LIC. #27522-01



CERT. ID #OK001
See Certified
Parameter List



Client: Environ
Client Project: Breckenridge Site
Lab Number: 20060964
Date Reported: 12/29/06
Date Received: 11/17/06
Page Number: 1 of 5

Analytical Report

Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID: 20060964-01						
Client ID: SB40-6-7						
Date Sampled: 11/18/06 7:50:00 AM						
Matrix: Solid						
Radiochemical Analyses						
TI-208	HASL 300	109 +/- 6.26	pCi/g	2.14	12/20/06	SD
Bi-212	HASL 300	202 +/- 11.8	pCi/g	17.3	12/20/06	SD
Pb-212	HASL 300	306 +/- 35.2	pCi/g	3.46	12/20/06	SD
Bi-214	HASL 300	138 +/- 6.59	pCi/g	3.36	12/20/06	SD
Pb-214	HASL 300	166 +/- 14.5	pCi/g	3.66	12/20/06	SD
Ac-228	HASL 300	250 +/- 8.41	pCi/g	5.44	12/20/06	SD
Th-234	HASL 300	39.3 +/- 5.64	pCi/g	13.0	12/20/06	SD
Th-232	LANL ER 200 M	248 +/- 10.6	pCi/g	2.0	12/22/06	RE
Th-230	LANL ER 200 M	105 +/- 7.2	pCi/g	5.5	12/22/06	RE
Th-228	LANL ER 200 M	234 +/- 10.2	pCi/g	1.6	12/22/06	RE
U-238	ASTM D 3972	37.7 +/- 1.71	pCi/g	0.268	12/11/06	SD
U-235	ASTM D 3972	2.39 +/- 0.666	pCi/g	0.201	12/11/06	SD
U-234	ASTM D 3972	28.3 +/- 1.48	pCi/g	0.258	12/11/06	SD

Lab ID: 20060964-02
Client ID: SB58-6-9
Date Sampled: 11/13/06 1:51:00 PM
Matrix: Solid

Radiochemical Analyses						
TI-208	HASL 300	273 +/- 13.8	pCi/g	5.52	12/20/06	SD
Bi-212	HASL 300	475 +/- 29.9	pCi/g	40.0	12/20/06	SD
Pb-212	HASL 300	438 +/- 74.5	pCi/g	9.45	12/20/06	SD
Bi-214	HASL 300	7200 +/- 239	pCi/g	10.0	12/20/06	SD
Pb-214	HASL 300	6940 +/- 415	pCi/g	22.5	12/20/06	SD
Ac-228	HASL 300	778 +/- 24.0	pCi/g	18.2	12/20/06	SD
Th-234	HASL 300	3150 +/- 212	pCi/g	192	12/20/06	SD

Lab ID: 20060964-03
Client ID: SB589-9-10
Date Sampled: 11/14/06 3:47:00 PM
Matrix: Solid

Radiochemical Analyses						
TI-208	HASL 300	187 +/- 11.8	pCi/g	5.39	12/20/06	SD
Bi-212	HASL 300	423 +/- 27.8	pCi/g	45.0	12/20/06	SD
Pb-212	HASL 300	239 +/- 14.0	pCi/g	4.99	12/20/06	SD

BDL = Below Detection Limit

Client: Environ
Client Project: Breckenridge Site
Lab Number: 20060964
Date Reported: 12/29/06
Date Received: 11/17/06
Page Number: 2 of 5

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Bi-214	HASL 300	4910 +/- 167	pCi/g	19.3		12/20/06	SD
Pb-214	HASL 300	3240 +/- 171	pCi/g	7.86		12/20/06	SD
Ac-228	HASL 300	529 +/- 16.3	pCi/g	21.9		12/20/06	SD
Th-234	HASL 300	4500 +/- 171	pCi/g	49.8		12/20/06	SD
Th-232	LANL ER 200 M	453 +/- 15.8	pCi/g	2.3	12/21/06	12/22/06	RE
Th-230	LANL ER 200 M	3770 +/- 45.4	pCi/g	6.2	12/21/06	12/22/06	RE
Th-228	LANL ER 200 M	428 +/- 15.3	pCi/g	2.4	12/21/06	12/22/06	RE
U-238	ASTM D 3972	3810 +/- 51.0	pCi/g	8.18	12/15/06	12/21/06	SD
U-235	ASTM D 3972	0 +/- 4.07	pCi/g	9.68	12/15/06	12/21/06	SD
U-234	ASTM D 3972	3390 +/- 47.9	pCi/g	3.67	12/15/06	12/21/06	SD

Lab ID: 20060964-04
Client ID: SB44-0-1
Date Sampled: 11/8/06 8:10:00 AM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	3.06 +/- 0.346	pCi/g	0.365		12/20/06	SD
Bi-212	HASL 300	5.16 +/- 1.71	pCi/g	2.08		12/20/06	SD
Pb-212	HASL 300	10.1 +/- 1.14	pCi/g	0.467		12/20/06	SD
Bi-214	HASL 300	4.19 +/- 0.47	pCi/g	0.472		12/20/06	SD
Pb-214	HASL 300	4.52 +/- 0.51	pCi/g	0.397		12/20/06	SD
Ac-228	HASL 300	8.58 +/- 0.67	pCi/g	0.885		12/20/06	SD
Th-234	HASL 300	8.71 +/- 1.18	pCi/g	2.01		12/20/06	SD

Lab ID: 20060964-05
Client ID: SB52-4.5-6
Date Sampled: 11/9/06 12:50:00 PM
Matrix: Solid

Radiochemical Analyses

K-40	HASL 300	16.5 +/- 4.63	pCi/g	6.63		12/21/06	SD
Tl-208	HASL 300	34.0 +/- 2.31	pCi/g	1.68		12/21/06	SD
Bi-212	HASL 300	69.8 +/- 7.21	pCi/g	9.38		12/21/06	SD
Pb-212	HASL 300	50.0 +/- 2.92	pCi/g	2.58		12/21/06	SD
Bi-214	HASL 300	85.7 +/- 4.47	pCi/g	2.00		12/21/06	SD
Pb-214	HASL 300	313 +/- 19.0	pCi/g	2.39		12/21/06	SD
Ac-228	HASL 300	97.0 +/- 3.86	pCi/g	2.73		12/21/06	SD
Th-234	HASL 300	330 +/- 33.1	pCi/g	54.0		12/21/06	SD
U-235	HASL 300	13.9 +/- 1.89	pCi/g	2.41		12/21/06	SD
Th-232	LANL ER 200 M	52.5 +/- 5.2	pCi/g	1.7	12/21/06	12/22/06	RE
Th-230	LANL ER 200 M	476 +/- 15.6	pCi/g	5.8	12/21/06	12/22/06	RE

Client:	Environ
Client Project:	Breckenridge Site
Lab Number:	20060964
Date Reported:	12/29/06
Date Received:	11/17/06
Page Number:	3 of 5

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Th-228	LANL ER 200 M	74.3 +/- 6.1	pCi/g	1.4	12/21/06	12/22/06	RE
U-238	ASTM D 3972	26.8 +/- 1.22	pCi/g	0.095	12/11/06	12/14/06	SD
U-235	ASTM D 3972	0.818 +/- 0.421	pCi/g	0.120	12/11/06	12/14/06	SD
U-234	ASTM D 3972	22.2 +/- 1.12	pCi/g	0.237	12/11/06	12/14/06	SD

Lab ID: 20060964-06
Client ID: SB27-0-10
Date Sampled: 11/13/06 8:41:00 AM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	0.269 +/- 0.061	pCi/g	0.078	12/21/06	SD
Bi-212	HASL 300	0.645 +/- 0.362	pCi/g	0.542	12/21/06	SD
Pb-212	HASL 300	0.614 +/- 0.378	pCi/g	0.099	12/21/06	SD
Bi-214	HASL 300	0.745 +/- 0.148	pCi/g	0.204	12/21/06	SD
Pb-214	HASL 300	0.809 +/- 0.101	pCi/g	0.111	12/21/06	SD
Ac-228	HASL 300	0.717 +/- 0.148	pCi/g	0.273	12/21/06	SD
Th-234	HASL 300	ND	pCi/g	1.01	12/21/06	SD

Lab ID: 20060964-07
Client ID: SB28-0-10
Date Sampled: 11/13/06 9:10:00 AM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	0.591 +/- 0.145	pCi/g	0.198	12/21/06	SD
Bi-212	HASL 300	1.66 +/- 0.965	pCi/g	1.49	12/21/06	SD
Pb-212	HASL 300	0.866 +/- 1.17	pCi/g	0.218	12/21/06	SD
Bi-214	HASL 300	0.957 +/- 0.231	pCi/g	0.314	12/21/06	SD
Pb-214	HASL 300	0.875 +/- 0.173	pCi/g	0.269	12/21/06	SD
Ac-228	HASL 300	1.62 +/- 0.3210	pCi/g	0.514	12/21/06	SD
Th-234	HASL 300	1.14 +/- 0.5030	pCi/g	2.27	12/21/06	SD

Lab ID: 20060964-08
Client ID: SB87-0-10
Date Sampled: 11/15/06 2:21:00 PM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	0.329 +/- 0.067	pCi/g	0.111	12/21/06	SD
Bi-212	HASL 300	0.473 +/- 0.568	pCi/g	0.932	12/21/06	SD
Pb-212	HASL 300	0.472 +/- 0.073	pCi/g	0.116	12/21/06	SD
Bi-214	HASL 300	0.761 +/- 0.148	pCi/g	0.216	12/21/06	SD

Client:	Environ
Client Project:	Breckenridge Site
Lab Number:	20060964
Date Reported:	12/29/06
Date Received:	11/17/06
Page Number:	4 of 5

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Pb-214	HASL 300	0.433 +/- 0.097	pCi/g	0.174		12/21/06	SD
Ac-228	HASL 300	0.616 +/- 0.149	pCi/g	0.437		12/21/06	SD
Th-234	HASL 300	0.660 +/- 1.19	pCi/g	1.44		12/21/06	SD

Lab ID: 20060964-09
Client ID: SB40-4-5.5
Date Sampled: 11/8/06 7:50:00 AM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	334 +/- 14.1	pCi/g	2.35		12/21/06	SD
Bi-212	HASL 300	604 +/- 26.5	pCi/g	13.1		12/21/06	SD
Pb-212	HASL 300	696 +/- 72.7	pCi/g	3.25		12/21/06	SD
Bi-214	HASL 300	468 +/- 16.6	pCi/g	3.01		12/21/06	SD
Pb-214	HASL 300	340 +/- 29.0	pCi/g	2.50		12/21/06	SD
Ac-228	HASL 300	881 +/- 26.3	pCi/g	5.26		12/21/06	SD
Th-234	HASL 300	65.6 +/- 36.7	pCi/g	17.0		12/21/06	SD

Client:
Client Project:
Lab Number:
Date Reported:
Date Received:
Page Number:

Environ
Breckenridge Site
20060964
12/29/06
11/17/06
5 of 5

QC Report

Parameter	Blank	LCS %REC	LCS %REC	LCS RPD	DUP RPD	MS %REC	MSD %REC	MSD RPD	Date
Ac-228					93				12/19/06
Am-241	0.111	92.0	107.0	15.0					12/19/06
Bi-212					12.4				12/19/06
Bi-214					15.2				12/19/06
Co-60	0.291	87.0	95.0	8.9					12/19/06
Cs-137	0.305	96.0	101.0	4.8					12/19/06
Pb-212					31.7				12/19/06
Pb-214					14.5				12/19/06
Th-228	0.081	81.7	86.2	5.4	39.6	DO	DO	26.4	12/22/06
Th-230	0.008	74.3	81.6	9.4	31.8	DO	DO	16.3	12/22/06
Th-232	0.091	82.9	90.5	8.7	26.1	DO	DO	23.1	12/22/06
Th-234					NC				12/19/06
Tl-208					8.1				12/19/06
U-234	0.286	112.0	109.0	1.1	19.4	115.0	107.0	2.2	12/14/06
U-238	0.076	122.0	116.0	2.7	3.0	125.0	103.0	7.7	12/14/06

Lab Approval: _____





Outreach Laboratory
Reaching beyond the standard.

311 North Aspen

Broken Arrow, OK 74012

Phone: (918) 251-2515

Fax: (918) 251-0008

www.outreachlab.com

CHAIN OF CUSTODY

Results To:	
Company	ENVIRON International Corporation
Name	Chris Greco
Address	123 N. Wacker Drive, Suite 250
City	Chicago State IL Zip 60606
Phone	312-853-9430 Fax 312-853-9025

Bill To:	
Company	ENVIRON International Corporation
Name	Accounting Dept.
Address	740 Waukegan Road, Suite 401
City	Deerfield State IL Zip 60015

ANALYSIS REQUESTED

PO #	21-11010G	# Containers	Container Size Plastic or Glass	Preservative # 1. HNO ₃ pH<2 2. Ice <4°C 3. HCl pH<2 4. H ₂ SO ₄ pH<2 5. NaOH pH>11	Uranium-238+D	Thorium-232+D	Isotopic	Remarks (I.E. Filtered, Unfiltered, Grab, Composite)
Project #	21-11010G							
Project Name	Breckenridge Site							
Requested Turnaround Time	Standard							
(Additional Charges May Apply)								
Sampler Signature								
Lab Sample ID	Client Sample ID	Date Sampled	Time Sampled	Matrix				
1	SB40-6-7	11/18/06	0750	Soil	1	10/P	None	
2	SB52-6-9	11/13/06	1351					
3	SB55-4-10	11/14/06	1547					
4	SB44-0-1	11/8/06	0816					
5	SB52-4-5-6	11/9/06	1250					
6	SB27-0-10	11/13/06	0841					
7	SB25-0-10	11/13/06	0910					
8	SB67-0-10	11/15/06	1421					
9	SB40-4-5-5	11/8/06	0750					

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
<i>[Signature]</i>	11/16/06	1900	IF	11/17/06	950
RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME

My signature on this chain of custody form indicates that I am authorized by the above company to release samples for analysis.

The company agrees to pay the entire balance upon receipt of sample data and it is understood and agreed that any balance earned over thirty (30) days is subject to a 1.5% per month (18% per annum) late charge. In the event of default, the company becomes legally liable for any reasonable attorney and/or collection fees and all related costs necessary to remit the entire balance to Outreach Technologies, Inc. (Outreach Laboratory).

SAMPLE RETURN/DISPOSAL: All non-hazardous samples shall be disposed of 30 days after issue of final report. All others will be returned at client's expense.

Method of Transport:
Sample Condition Upon Receipt:
Custody Seals Intact:
Cooler Temperature:

① Isotopic thorium + uranium using LAMC methods ER200 + ER296
* 300 com - in Rad Cabinet



311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

January 2, 2007

Environ
Chris Greco
123 N Wacker Dr #250
Chicago, IL 60606

CLIENT PROJECT NAME: Breckenridge Site
OUTREACH LAB ID: 20060964

Dear Mr. Greco:

Please find enclosed the analytical report for your samples received in our laboratory on November 17, 2006 for the above captioned project. Thirteen solid samples were received in good condition and analyzed for Uranium Isotopic, Thorium Isotopic and Gamma Spec.

All Quality Control for the requested analyses is reported on the analytical report. The method blank, laboratory control standard and matrix spikes and spike duplicates for all analyses were within method control limits.

Your samples will be returned.

Thank you for choosing Outreach Laboratory and if you have any questions, please call us at 918-251-2515.

Laboratory Director

ODEQ ID #9517
NRC ODEQ LIC. #27522-01



CERT. ID #OK001
See Certified
Parameter List



311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

Client: Environ
Client Project: Breckenridge Site
Lab Number: 20060963
Date Reported: 12/29/06
Date Received: 11/17/06
Page Number: 1 of 6

Analytical Report

Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
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Lab ID: 20060963-01
Client ID: SB4-11-12
Date Sampled: 11/9/06 2:49:00 PM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	0.220 +/- 0.068	pCi/g	0.121	12/19/06	SD
Bi-212	HASL 300	0.000 +/- 0.499	pCi/g	0.863	12/19/06	SD
Pb-212	HASL 300	ND	pCi/g	0.361	12/19/06	SD
Bi-214	HASL 300	0.753 +/- 0.148	pCi/g	0.232	12/19/06	SD
Pb-214	HASL 300	0.631 +/- 0.072	pCi/g	0.218	12/19/06	SD
Ac-228	HASL 300	0.877 +/- 0.122	pCi/g	0.368	12/19/06	SD
Th-234	HASL 300	2.95 +/- 9.34	pCi/g	3.92	12/19/06	SD

Lab ID: 20060963-02
Client ID: SB21-7-8
Date Sampled: 11/9/06 12:23:00 PM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	1.16 +/- 0.125	pCi/g	0.145	12/19/06	SD
Bi-212	HASL 300	2.26 +/- 0.730	pCi/g	1.22	12/19/06	SD
Pb-212	HASL 300	3.45 +/- 0.278	pCi/g	0.231	12/19/06	SD
Bi-214	HASL 300	1.78 +/- 0.174	pCi/g	0.204	12/19/06	SD
Pb-214	HASL 300	1.66 +/- 0.190	pCi/g	0.253	12/19/06	SD
Ac-228	HASL 300	2.77 +/- 0.256	pCi/g	0.494	12/19/06	SD
Th-234	HASL 300	0.221 +/- 1.77	pCi/g	0.298	12/19/06	SD

Lab ID: 20060963-03
Client ID: SB-3-6-7
Date Sampled: 11/9/06 3:11:00 PM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	0.522 +/- 0.113	pCi/g	0.136	12/19/06	SD
Bi-212	HASL 300	1.46 +/- 0.631	pCi/g	0.882	12/19/06	SD
Pb-212	HASL 300	1.89 +/- 0.288	pCi/g	0.284	12/19/06	SD
Bi-214	HASL 300	0.663 +/- 0.224	pCi/g	0.345	12/19/06	SD
Pb-214	HASL 300	0.584 +/- 0.172	pCi/g	0.235	12/19/06	SD
Ac-228	HASL 300	1.57 +/- 0.282	pCi/g	0.602	12/19/06	SD
Th-234	HASL 300	1.68 +/- 0.512	pCi/g	1.14	12/19/06	SD



Client: Environ
Client Project: Breckenridge Site
Lab Number: 20060963
Date Reported: 12/29/06
Date Received: 11/17/06
Page Number: 2 of 6

Analytical Report

Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
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Lab ID: 20060963-04
Client ID: SB54-3-4
Date Sampled: 11/9/06 9:56:00 AM
Matrix: Solid

Radiochemical Analyses

K-40	HASL 300	12.1 +/- 1.44	pCi/g	0.892		SD
Tl-208	HASL 300	0.173 +/- 0.047	pCi/g	0.060		SD
Bi-212	HASL 300	0.151 +/- 0.412	pCi/g	0.346		SD
Pb-212	HASL 300	0.431 +/- 0.066	pCi/g	0.068		SD
Bi-214	HASL 300	0.561 +/- 0.117	pCi/g	0.161		SD
Pb-214	HASL 300	0.483 +/- 0.095	pCi/g	0.113		SD
Ac-228	HASL 300	0.665 +/- 0.148	pCi/g	0.286		SD
Th-234	HASL 300	ND	pCi/g	0.736		SD

Lab ID: 20060963-05
Client ID: SB41-3-4
Date Sampled: 11/8/06 9:56:00 AM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	1.26 +/- 0.094	pCi/g	0.153	12/19/06	SD
Bi-212	HASL 300	2.21 +/- 0.741	pCi/g	1.130	12/19/06	SD
Pb-212	HASL 300	3.82 +/- 0.484	pCi/g	0.493	12/19/06	SD
Bi-214	HASL 300	2.10 +/- 0.236	pCi/g	0.285	12/19/06	SD
Pb-214	HASL 300	2.07 +/- 0.245	pCi/g	0.279	12/19/06	SD
Ac-228	HASL 300	3.53 +/- 0.298	pCi/g	0.465	12/19/06	SD
Th-234	HASL 300	6.46 +/- 2.02	pCi/g	4.33	12/19/06	SD
Th-232	LANL ER 200 M	2.2 +/- 0.4	pCi/g	0.2	12/28/06	SD
Th-230	LANL ER 200 M	2.8 +/- 0.5	pCi/g	0.5	12/28/06	SD
Th-228	LANL ER 200 M	1.7 +/- 0.4	pCi/g	0.2	12/28/06	SD
U-238	ASTM D 3972	1.74 +/- 0.261	pCi/g	0.192	12/11/06	SD
U-235	ASTM D 3972	0 +/- 0.133	pCi/g	0.266	12/11/06	SD
U-234	ASTM D 3972	2.00 +/- 0.297	pCi/g	0.266	12/11/06	SD

Lab ID: 20060963-06
Client ID: SB52-9-10
Date Sampled: 11/9/06 12:50:00 PM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	0.450 +/- 0.076	pCi/g	0.112	12/19/06	SD
Bi-212	HASL 300	0.657 +/- 0.492	pCi/g	0.802	12/19/06	SD

BDL = Below Detection Limit

Client: Environ
Client Project: Breckenridge Site
Lab Number: 20060963
Date Reported: 12/29/06
Date Received: 11/17/06
Page Number: 3 of 6

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Pb-212	HASL 300	0.959 +/- 0.125	pCi/g	0.146		12/19/06	SD
Bi-214	HASL 300	0.713 +/- 0.161	pCi/g	0.237		12/19/06	SD
Pb-214	HASL 300	0.706 +/- 0.107	pCi/g	0.160		12/19/06	SD
Ac-228	HASL 300	0.915 +/- 0.166	pCi/g	0.470		12/19/06	SD
Th-234	HASL 300	3.12 +/- 0.471	pCi/g	1.09		12/19/06	SD

Lab ID: 20060963-07
Client ID: SB-38-0-1
Date Sampled: 11/8/06 1:52:00 PM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	5.52 +/- 0.489	pCi/g	0.421		12/19/06	SD
Bi-212	HASL 300	10.3 +/- 1.95	pCi/g	2.89		12/19/06	SD
Pb-212	HASL 300	18.2 +/- 1.99	pCi/g	0.586		12/19/06	SD
Bi-214	HASL 300	8.72 +/- 0.734	pCi/g	0.493		12/19/06	SD
Pb-214	HASL 300	9.94 +/- 0.932	pCi/g	0.430		12/19/06	SD
Ac-228	HASL 300	14.1 +/- 0.906	pCi/g	1.07		12/19/06	SD
Th-234	HASL 300	7.06 +/- 0.809	pCi/g	2.22		12/19/06	SD

Lab ID: 20060963-08
Client ID: SB40-11-12
Date Sampled: 11/8/06 7:51:00 AM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	0.427 +/- 0.076	pCi/g	0.096		12/20/06	SD
Bi-212	HASL 300	0.555 +/- 0.239	pCi/g	0.449		12/20/06	SD
Pb-212	HASL 300	0.675 +/- 0.099	pCi/g	0.117		12/20/06	SD
Bi-214	HASL 300	0.847 +/- 0.137	pCi/g	0.166		12/20/06	SD
Pb-214	HASL 300	0.830 +/- 0.126	pCi/g	0.156		12/20/06	SD
Ac-228	HASL 300	0.919 +/- 0.148	pCi/g	0.258		12/20/06	SD
Th-234	HASL 300	ND	pCi/g	0.577		12/20/06	SD
Th-232	LANL ER 200 M	0.3 +/- 0.2	pCi/g	0.2	12/28/06	12/29/06	SD
Th-230	LANL ER 200 M	0.4 +/- 0.3	pCi/g	0.5	12/28/06	12/29/06	SD
Th-228	LANL ER 200 M	0.4 +/- 0.2	pCi/g	0.2	12/28/06	12/29/06	SD
U-238	ASTM D 3972	0.49 +/- 0.315	pCi/g	0.490	12/11/06	12/14/06	SD
U-235	ASTM D 3972	0 +/- 0.255	pCi/g	0.577	12/11/06	12/14/06	SD
U-234	ASTM D 3972	0.837 +/- 0.221	pCi/g	0.227	12/11/06	12/14/06	SD

Client:	Environ
Client Project:	Breckenridge Site
Lab Number:	20060963
Date Reported:	12/29/06
Date Received:	11/17/06
Page Number:	4 of 6

Analytical Report

Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
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Lab ID: 20060963-09
Client ID: SB10-0-1
Date Sampled: 11/9/06 10:15:00 AM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	6.19 +/- 0.392	pCi/g	0.158	12/19/06	SD
Bi-212	HASL 300	10.6 +/- 1.24	pCi/g	1.28	12/19/06	SD
Pb-212	HASL 300	15.4 +/- 1.65	pCi/g	0.392	12/19/06	SD
Bi-214	HASL 300	2.23 +/- 0.344	pCi/g	0.407	12/19/06	SD
Pb-214	HASL 300	2.82 +/- 0.349	pCi/g	0.339	12/19/06	SD
Ac-228	HASL 300	17.4 +/- 0.779	pCi/g	0.600	12/19/06	SD
Th-234	HASL 300	ND	pCi/g	7.6	12/19/06	SD

Lab ID: 20060963-10
Client ID: SB6-0-1
Date Sampled: 11/9/06 4:03:00 PM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	6.07 +/- 0.384	pCi/g	0.200	12/20/06	SD
Bi-212	HASL 300	11.5 +/- 0.817	pCi/g	1.39	12/20/06	SD
Pb-212	HASL 300	ND	pCi/g	0.755	12/20/06	SD
Bi-214	HASL 300	3.16 +/- 0.305	pCi/g	0.362	12/20/06	SD
Pb-214	HASL 300	3.24 +/- 0.339	pCi/g	0.354	12/20/06	SD
Ac-228	HASL 300	18.0 +/- 0.738	pCi/g	0.532	12/20/06	SD
Th-234	HASL 300	26.9 +/- 3.65	pCi/g	6.76	12/20/06	SD

Lab ID: 20060963-11
Client ID: SB60-0-1
Date Sampled: 11/13/06 3:00:00 PM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	0.490 +/- 0.111	pCi/g	0.158	12/20/06	SD
Bi-212	HASL 300	0.486 +/- 0.520	pCi/g	0.846	12/20/06	SD
Pb-212	HASL 300	0.927 +/- 0.156	pCi/g	0.178	12/20/06	SD
Bi-214	HASL 300	2.0 +/- 0.139	pCi/g	0.228	12/20/06	SD
Pb-214	HASL 300	1.54 +/- 0.174	pCi/g	0.196	12/20/06	SD
Ac-228	HASL 300	1.27 +/- 0.182	pCi/g	0.536	12/20/06	SD
Th-234	HASL 300	2.61 +/- 0.505	pCi/g	1.16	12/20/06	SD

Client:	Environ
Client Project:	Breckenridge Site
Lab Number:	20060963
Date Reported:	12/29/06
Date Received:	11/17/06
Page Number:	5 of 6

Analytical Report

Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
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Lab ID: 20060963-12
Client ID: SB46-0-1
Date Sampled: 11/8/06 10:18:00 AM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	13.7 +/- 0.936	pCi/g	0.560	12/20/06	SD
Bi-212	HASL 300	25.2 +/- 2.91	pCi/g	2.63	12/20/06	SD
Pb-212	HASL 300	38.7 +/- 3.88	pCi/g	2.39	12/20/06	SD
Bi-214	HASL 300	9.92 +/- 0.742	pCi/g	0.664	12/20/06	SD
Pb-214	HASL 300	9.42 +/- 0.861	pCi/g	0.632	12/20/06	SD
Ac-228	HASL 300	39.9 +/- 1.51	pCi/g	0.983	12/20/06	SD
Th-234	HASL 300	48.2 +/- 5.9	pCi/g	11.6	12/20/06	SD

Lab ID: 20060963-13
Client ID: SB5-6-7
Date Sampled: 11/9/06 4:15:00 PM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	2.49 +/- 0.233	pCi/g	0.286	12/20/06	SD
Bi-212	HASL 300	4.50 +/- 1.41	pCi/g	2.24	12/20/06	SD
Pb-212	HASL 300	6.10 +/- 0.549	pCi/g	0.365	12/20/06	SD
Bi-214	HASL 300	4.79 +/- 0.531	pCi/g	0.578	12/20/06	SD
Pb-214	HASL 300	4.50 +/- 0.420	pCi/g	0.358	12/20/06	SD
Ac-228	HASL 300	6.69 +/- 0.535	pCi/g	1.04	12/20/06	SD
Th-234	HASL 300	24.3 +/- 1.93	pCi/g	2.78	12/20/06	SD

Client:
Client Project:
Lab Number:
Date Reported:
Date Received:
Page Number:

Environ
Breckenridge Site
20060963
12/29/06
11/17/06
6 of 6

QC Report

Parameter	Blank	LCS %REC	LCSD %REC	RPD	DUP RPD	MS %REC	MSD %REC	RPD	Date
Ac-228					4.3				12/18/06
Ac-228					9.3				12/19/06
Am-241	0.116	96.0	100.0	4.2					12/18/06
Am-241	0.111	92.0	107.0	15.0					12/19/06
Bi-212					16.3				12/18/06
Bi-212					12.4				12/19/06
Bi-214					13.0				12/18/06
Bi-214					15.2				12/19/06
Co-60	0.332	100.0	95.0	4.3					12/18/06
Co-60	0.291	87.0	95.0	8.9					12/19/06
Cs-137	0.305	96.0	101.0	4.8					12/19/06
Cs-137	0.314	99.0	101.0	2.2					12/18/06
Pb-212					12.4				12/18/06
Pb-212					31.7				12/19/06
Pb-214					14.5				12/19/06
Pb-214					2.5				12/18/06
Th-228	0.081	81.7	86.2	5.4	39.6	DO	DO	26.4	12/22/06
Th-230	0.008	74.3	81.6	9.4	31.8	DO	DO	16.3	12/22/06
Th-232	0.091	82.9	90.5	8.7	26.1	DO	DO	23.1	12/22/06
Th-234					NC				12/19/06
Tl-208					8.1				12/19/06
Tl-208					3.7				12/18/06
U-234	0.286	112.0	109.0	1.1	19.4	115.0	107.0	2.2	12/14/06
U-238	0.076	122.0	116.0	2.7	3.0	125.0	103.0	7.7	12/14/06

Lab Approval: _____





Outreach Laboratory
Reaching beyond the standard.

311 North Aspen

Broken Arrow, OK 74012

Phone: (918) 251-2515

Fax: (918) 251-0008

www.outreachlab.com

CHAIN OF CUSTODY

Results To:					
Company	ENVIRON International Corporation				
Name	Chris Greco				
Address	123 N. Wacker Drive, Suite 250				
City	Chicago	State	IL	Zip	60606
Phone	312-853-9430	Fax	312-853-9025		

Bill To:					
Company	ENVIRON International Corporation				
Name	Accounting Dept.				
Address	740 Waukegan Road, Suite 401				
City	Deerfield	State	IL	Zip	60015

ANALYSIS REQUESTED

PO #	21-11010G				# Containers	Container Size Plastic or Glass	Preservative # 1. HNO ₃ pH<2 2. Ice <4°C 3. HCl pH<2 4. H ₂ SO ₄ pH<2 5. NaOH pH>11	Uranium-238+D	Thorium-232+D	Isotopic	Remarks (I.E. Filtered, Unfiltered, Grab, Composite)
Project #	21-11010G										
Project Name	Breckenridge Site										
Requested Turnaround Time	7 days										
(Additional Charges May Apply)	None										
Sampler Signature	Chris Greco										
Lab Sample ID	Client Sample ID	Date Sampled	Time Sampled	Matrix							
1	SB4-11-12	11/9/06	1449	S	1	1600 P	None	X	X		
2	SB2-7-8	11/9/06	1223					X	X		
3	SB-3-6-7	11/9/06	1511					X	X		
4	SB54-3-4	11/9/06	0956					X	X		
5	SB41-3-4	11/8/06	0956					X	X		
6	SB5-2-9-12	11/9/06	1250					X	X		
7	SB3-36-0-1	11/8/06	1352					X	X		
8	SB40-71-12	11/8/06	0751					X	X		
9	SB10-0-1	11/9/06	1015					X	X		
10	SB6-0-1	11/9/06	1603					X	X		
11	SB60-0-1	11/13/06	1500					X	X		
12	SB46-0-1	11/8/06	1018					X	X		
13	SB5-6-7	11/9/06	1615					X	X		

RELINQUISHED BY Chris Greco DATE 11/16/06 TIME 1700 RECEIVED BY: IF DATE 11/17/06 TIME 950

RELINQUISHED BY _____ DATE _____ TIME _____ RECEIVED BY: _____ DATE _____ TIME _____

My signature on this chain of custody form indicates that I am authorized by the above company to release samples for analysis.

The company agrees to pay the entire balance upon receipt of sample data and it is understood and agreed that any balance carried over thirty (30) days is subject to a 1.5% per month (18% per annum) late charge. In the event of default, the company becomes legally liable for any reasonable attorney and/or collection fees and all related costs necessary to remit the entire balance to Outreach Technologies, Inc. (Outreach Laboratory).

Outreach Technologies, Inc. (Outreach Laboratory).

SAMPLE RETURN/ DISPOSAL: All non-hazardous samples shall be disposed of 30 days after issue of final report. All others will be returned at client's expense.

Method of Transport:

20060963
Sample Condition Upon Receipt:
good

Custody Seals Intact: Q N

Cooler Temperature: 8.0C

① Isotopic + thorium + uranium using LANC methods ER200 + ER290
7300 cpm - in lead cabinet



311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

January 2, 2007

Environ
Chris Greco
123 N Wacker Dr #250
Chicago, IL 60606

CLIENT PROJECT NAME: Breckenridge Site
OUTREACH LAB ID: 20060962

Dear Mr. Greco:

Please find enclosed the analytical report for your samples received in our laboratory on November 17, 2006 for the above captioned project. Thirteen solid samples were received in good condition and analyzed for Uranium Isotopic, Thorium Isotopic and Gamma Spec.

All Quality Control for the requested analyses is reported on the analytical report. The method blank, laboratory control standard and matrix spikes and spike duplicates for all analyses were within method control limits.

Your samples will be returned.

Thank you for choosing Outreach Laboratory and if you have any questions, please call us at 918-251-2515.

Laboratory Director

ODEQ ID #9517
NRC ODEQ LIC. #27522-01



CERT. ID #OK001
See Certified
Parameter List

Client:	Environ
Client Project:	Breckenridge Site
Lab Number:	20060962
Date Reported:	12/29/06
Date Received:	11/17/06
Page Number:	1 of 6

Analytical Report

Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
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Lab ID: 20060962-01
Client ID: SB62-6-7
Date Sampled: 11/13/06 4:10:00 PM
Matrix: Solid

Radiochemical Analyses

TI-208	HASL 300	2.73 +/- 0.225	pCi/g	0.139	12/18/06	SD
Bi-212	HASL 300	4.57 +/- 0.983	pCi/g	1.24	12/18/06	SD
Pb-212	HASL 300	8.24 +/- 1.52	pCi/g	0.407	12/18/06	SD
Bi-214	HASL 300	3.33 +/- 0.285	pCi/g	0.273	12/18/06	SD
Pb-214	HASL 300	4.01 +/- 0.406	pCi/g	0.260	12/18/06	SD
Ac-228	HASL 300	8.53 +/- 0.421	pCi/g	0.448	12/18/06	SD
Th-234	HASL 300	59.6 +/- 6.07	pCi/g	6.84	12/18/06	SD
U-235	HASL 300	0.658 +/- 1.41	pCi/g	1.43	12/18/06	SD

Lab ID: 20060962-02
Client ID: SB57-6-7
Date Sampled: 11/13/06 2:25:00 PM
Matrix: Solid

Radiochemical Analyses

TI-208	HASL 300	3.00 +/- 0.227	pCi/g	0.153	12/18/06	SD
Bi-212	HASL 300	5.66 +/- 1.00	pCi/g	1.34	12/18/06	SD
Pb-212	HASL 300	11.9 +/- 0.949	pCi/g	0.458	12/18/06	SD
Bi-214	HASL 300	1.97 +/- 0.256	pCi/g	0.329	12/18/06	SD
Pb-214	HASL 300	2.06 +/- 0.299	pCi/g	0.379	12/18/06	SD
Ac-228	HASL 300	8.24 +/- 0.406	pCi/g	0.452	12/18/06	SD
Th-234	HASL 300	10.1 +/- 1.23	pCi/g	2.53	12/18/06	SD

Lab ID: 20060962-03
Client ID: SB36-6-7
Date Sampled: 11/8/06 4:30:00 PM
Matrix: Solid

Radiochemical Analyses

TI-208	HASL 300	14.3 +/- 0.919	pCi/g	0.334	12/18/06	SD
Bi-212	HASL 300	20.8 +/- 2.85	pCi/g	3.12	12/18/06	SD
Pb-212	HASL 300	43.6 +/- 5.81	pCi/g	0.950	12/18/06	SD
Bi-214	HASL 300	5.93 +/- 0.607	pCi/g	0.762	12/18/06	SD
Pb-214	HASL 300	6.44 +/- 0.792	pCi/g	0.674	12/18/06	SD
Ac-228	HASL 300	40.7 +/- 1.67	pCi/g	0.932	12/18/06	SD
Th-234	HASL 300	9.90 +/- 6.46	pCi/g	5.56	12/18/06	SD
Th-232	LANL ER 200 M	43.9 +/- 5.5	pCi/g	1.8	12/21/06	RE

Client: Environ
Client Project: Breckenridge Site
Lab Number: 20060962
Date Reported: 12/29/06
Date Received: 11/17/06
Page Number: 2 of 6

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Th-230	LANL ER 200 M	417 +/- 16.7	pCi/g	6.8	12/21/06	12/22/06	RE
Th-228	LANL ER 200 M	40.4 +/- 5.2	pCi/g	1.7	12/21/06	12/22/06	RE
U-238	ASTM D 3972	50.5 +/- 1.53	pCi/g	0.551	12/11/06	12/14/06	SD
U-235	ASTM D 3972	0 +/- 0.484	pCi/g	0.551	12/11/06	12/14/06	SD
U-234	ASTM D 3972	44.4 +/- 1.42	pCi/g	0.430	12/11/06	12/14/06	SD

Lab ID: 20060962-04
Client ID: SB58-10-11
Date Sampled: 11/13/06 1:52:00 PM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	0.721 +/- 0.128	pCi/g	0.173		12/18/06	SD
Bi-212	HASL 300	1.61 +/- 0.730	pCi/g	1.18		12/18/06	SD
Pb-212	HASL 300	0 +/- 0.180	pCi/g	0.294		12/18/06	SD
Bi-214	HASL 300	14.2 +/- 0.740	pCi/g	0.279		12/18/06	SD
Pb-214	HASL 300	7.94 +/- 0.686	pCi/g	0.237		12/18/06	SD
Ac-228	HASL 300	1.86 +/- 0.227	pCi/g	0.504		12/18/06	SD
Th-234	HASL 300	14.9 +/- 4.77	pCi/g	2.09		12/18/06	SD
Th-232	LANL ER 200 M	5.8 +/- 1.9	pCi/g	1.5	12/21/06	12/22/06	RE
Th-230	LANL ER 200 M	28.2 +/- 4.4	pCi/g	5.3	12/21/06	12/22/06	RE
Th-228	LANL ER 200 M	3.4 +/- 1.5	pCi/g	1.4	12/21/06	12/22/06	RE
U-238	ASTM D 3972	18.3 +/- 0.843	pCi/g	0.442	12/11/06	12/14/06	SD
U-235	ASTM D 3972	0 +/- 0.281	pCi/g	0.346	12/11/06	12/14/06	SD
U-234	ASTM D 3972	17.1 +/- 0.826	pCi/g	0.483	12/11/06	12/14/06	SD

Lab ID: 20060962-05
Client ID: SB25-4-5
Date Sampled: 11/19/06 1:27:00 PM
Matrix: Solid

Radiochemical Analyses

Tl-208	HASL 300	15.9 +/- 0.981	pCi/g	0.336		12/18/06	SD
Bi-212	HASL 300	27.6 +/- 2.23	pCi/g	2.55		12/18/06	SD
Pb-212	HASL 300	31.8 +/- 4.32	pCi/g	0.609		12/18/06	SD
Bi-214	HASL 300	9.84 +/- 0.817	pCi/g	0.884		12/18/06	SD
Pb-214	HASL 300	18.0 +/- 1.53	pCi/g	0.646		12/18/06	SD
Ac-228	HASL 300	43.5 +/- 1.58	pCi/g	0.867		12/18/06	SD
Th-234	HASL 300	129 +/- 10.2	pCi/g	14.3		12/18/06	SD
Th-232	LANL ER 200 M	52.5 +/- 4.8	pCi/g	1.1	12/21/06	12/22/06	RE
Th-230	LANL ER 200 M	395 +/- 13.3	pCi/g	4.8	12/21/06	12/22/06	RE
Th-228	LANL ER 200 M	38.7 +/- 4.2	pCi/g	1.2	12/21/06	12/22/06	RE



311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
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Client: Environ
Client Project: Breckenridge Site
Lab Number: 20060962
Date Reported: 12/29/06
Date Received: 11/17/06
Page Number: 3 of 6

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
U-238	ASTM D 3972	42.7 +/- 1.54	pCi/g	0.310	12/11/06	12/14/06	SD
U-235	ASTM D 3972	1.23 +/- 0.545	pCi/g	0.310	12/11/06	12/14/06	SD
U-234	ASTM D 3972	37.2 +/- 1.43	pCi/g	0.310	12/11/06	12/14/06	SD

Lab ID: 20060962-06
Client ID: SB29-5.5-6
Date Sampled: 11/13/06 9:50:00 AM
Matrix: Solid

Radiochemical Analyses

K-40	HASL 300	50.7 +/- 10.6	pCi/g	15.0		12/18/06	SD
Tl-208	HASL 300	158 +/- 7.29	pCi/g	1.87		12/18/06	SD
Bi-212	HASL 300	319 +/- 21.3	pCi/g	25.8		12/18/06	SD
Pb-212	HASL 300	318 +/- 25.5	pCi/g	2.85		12/18/06	SD
Bi-214	HASL 300	95.1 +/- 5.07	pCi/g	5.08		12/18/06	SD
Pb-214	HASL 300	67.9 +/- 5.05	pCi/g	2.53		12/18/06	SD
Ac-228	HASL 300	450 +/- 14.2	pCi/g	5.39		12/18/06	SD
Th-234	HASL 300	287 +/- 27.3	pCi/g	45.5		12/18/06	SD
Th-232	LANL ER 200 M	221 +/- 11.6	pCi/g	2.3	12/21/06	12/22/06	RE
Th-230	LANL ER 200 M	1460 +/- 29.7	pCi/g	6.6	12/21/06	12/22/06	RE
Th-228	LANL ER 200 M	243 +/- 12.1	pCi/g	2.2	12/21/06	12/22/06	RE
U-238	ASTM D 3972	80.1 +/- 2.49	pCi/g	0.824	12/11/06	12/14/06	SD
U-235	ASTM D 3972	0.331 +/- 0.776	pCi/g	0.419	12/11/06	12/14/06	SD
U-234	ASTM D 3972	48.6 +/- 1.95	pCi/g	0.716	12/11/06	12/14/06	SD

Lab ID: 20060962-07
Client ID: SB53-4-5
Date Sampled: 11/9/06 11:22:00 AM
Matrix: Solid

Radiochemical Analyses

K-40	HASL 300	25.6 +/- 9.78	pCi/g	14.2		12/18/06	SD
Tl-208	HASL 300	24.7 +/- 2.00	pCi/g	1.36		12/18/06	SD
Bi-212	HASL 300	46.4 +/- 9.20	pCi/g	12.5		12/18/06	SD
Bi-214	HASL 300	41.1 +/- 3.51	pCi/g	2.87		12/18/06	SD
Pb-214	HASL 300	98.3 +/- 7.83	pCi/g	2.28		12/18/06	SD
Ac-228	HASL 300	66.3 +/- 4.04	pCi/g	4.62		12/18/06	SD
Th-234	HASL 300	25.4 +/- 19.8	pCi/g	22.3		12/18/06	SD
U-235	HASL 300	6.40 +/- 1.34	pCi/g	1.79		12/18/06	SD

APPENDIX D

Backup Material for Data Correlation

APPENDIX D
DATA CORRELATION BACKUP
BRECKENRIDGE DISPOSAL SITE, BRECKENRIDGE MICHIGAN

SAMPLE_ID	Representative Field Screening Value (cpm)	Log Field (cpm)	Sum	Log Lab (pCi/g)	AC-228	BI-214	TH-234
SB-3-6-7	3,200	3.51	4	0.59	1.57	0.663	1.68
SB4-11-12	2,450	3.39	5	0.66	0.877	0.753	2.95
SB52-9-10	3,510	3.55	5	0.68	0.915	0.713	3.12
SB21-7-8	2,945	3.47	5	0.68	2.77	1.78	0.221
SB41-3-4	3,380	3.53	6	0.78	2.2	2.1	1.74
SB57-6-7	5,160	3.71	20	1.31	8.24	1.97	10.1
SB44-0-1	3,700	3.57	21	1.33	8.58	4.19	8.71
SB10-0-1	5,000	3.70	23	1.37	17.4	2.23	3.8
SB-38-0-1	5,580	3.75	30	1.48	14.1	8.72	7.06
SB5-6-7	4,440	3.65	36	1.55	6.69	4.79	24.3
SB6-0-1	4,155	3.62	48	1.68	18	3.16	26.9
SB36-6-7	7,320	3.86	100	2.00	43.9	5.93	50.5
SB62-6-7	4,790	3.68	71	1.85	8.53	3.33	59.6
SB46-0-1	4,385	3.64	98	1.99	39.9	9.92	48.2
SB53-4-5	9,905	4.00	133	2.12	66.3	41.1	25.4
SB25-4-5	6,580	3.82	182	2.26	43.5	9.84	129
SB29-6-6.5	12,420	4.09	221	2.34	183	18.8	19.5
SB52-4.5-6	11,350	4.05	165	2.22	52	85.7	26.8
SB35-9-10	14,450	4.16	457	2.66	178	18.6	260
SB32-4-4.5	11,190	4.05	564	2.75	296	43.3	225

Notes:

pCi/g: pico Curies per gram

* Ac-228 used as a surrogate for Th-232

** Th-234 used as a surrogate for U-238

*** Bi-214 used as a surrogate for Ra-226

APPENDIX D **DATA CORRELATION BACKUP** **BRECKENRIDGE DISPOSAL SITE, BRECKENRIDGE MICHIGAN**

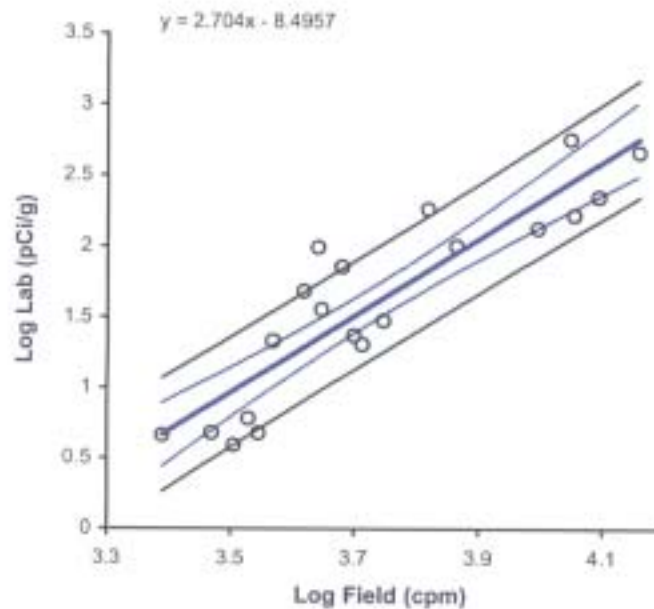
analysed with: Analyse-It + General 1.73

Test | Linear regression
Fit | Log Lab (pCi/g) v. Log Field (cpm)
Performed by |

n | 20
R² | 0.80
Adjusted R² | 0.79
SE | 0.3130

Term	Coefficient	SE	p	75% CI of Coefficient
Intercept	-8.4957	1.1807	<0.0001	-9.8992 to -7.0922
Slope	2.7040	0.3152	<0.0001	2.3293 to 3.0786

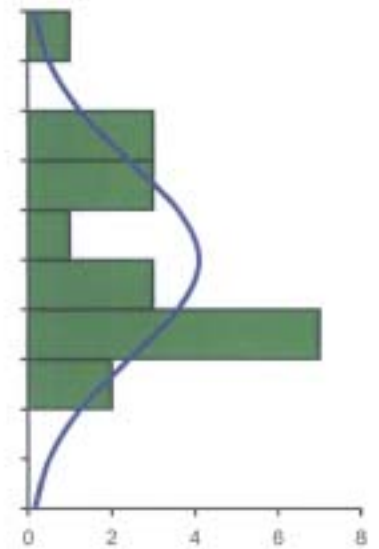
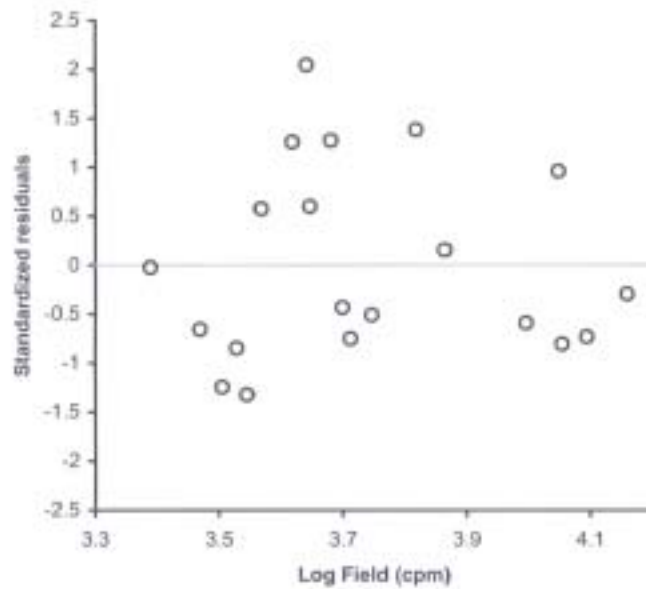
Source of variation	SSq	DF	MSq	F	p
Due to regression	7.209	1	7.209	73.60	<0.0001
About regression	1.763	18	0.098		
Total	8.972	19			



APPENDIX D DATA CORRELATION BACKUP BRECKENRIDGE DISPOSAL SITE, BRECKENRIDGE MICHIGAN

analysed with: Analyse-it + General 1.73

Test	Linear regression
Fit	Log Lab (pCi/g) v Log Field (cpm)
Performed by	



APPENDIX E
EQ's Permit Modification



JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



STEVEN E. CHESTER
DIRECTOR

April 19, 2006

Mr. David Andersen
The Environmental Quality Company
Wayne Disposal, Inc.
49350 North I-94 Service Drive
Belleville, Michigan 48111

Ms. Melinda Keillor
The Environmental Quality Company
Michigan Disposal Waste Treatment Plant
49350 North I-94 Service Drive
Belleville, Michigan 48111

Dear Mr. Anderson and Ms. Keillor:

SUBJECT: Wayne Disposal, Inc. (WDI), Site #2; MID 048 090 633
Michigan Disposal Waste Treatment Plant (MDWTP); MID 000 724 831

The Department of Environmental Quality (DEQ), Waste and Hazardous Materials Division (WHMD), has reviewed your May 16, 2005, requests for a modification to the Waste Analysis Plans (WAPs) for WDI and MDWTP. For both WAPs, the requests are to add procedures for the possible acceptance of waste containing naturally occurring radioactive material (NORM), technically enhanced naturally occurring radioactive material (TENORM), and material exempted from disposal restrictions by the regulations of the state of Michigan or the U.S. Nuclear Regulatory Commission. These low activity and exempt radioactive materials may be disposed in licensed Type I (hazardous waste) or Type II (solid waste) landfills in Michigan. WDI and/or MDWTP staff plans to review the radiochemical analysis and history of each NORM, TENORM, and exempted radioactive material waste stream to determine if the waste stream meets the criteria set forth in the regulations in Title 10 of the Code of Federal Regulations, the criteria of Michigan's "Ionizing Radiation Rules," or the criteria in EQC 1602, "Cleanup and Disposal Guidelines for Sites Contaminated with Radium-226." Because these materials contain radioactive material above typical background concentrations, the MDWTP WAP must be modified to remove the sentence "If a reading is detected above background, the waste stream is rejected" from Appendix B, Radiation Screen.

Based on our review, the WHMD has determined that the proposed waste acceptance procedures for the WDI and MDWTP WAPs are appropriate. As such, the WHMD hereby approves the enclosed NORM, TENORM, and exempted radioactive material

Mr. David Anderson
Ms. Melinda Keillor


2

April 19, 2006

waste acceptance procedures for each facility's WAP and revised Page 8, Revision 6.3, of Appendix B of the MDWTP WAP, pursuant to Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. With this approval, these procedures become Section 3.4.1 of the WAPs for WDI and MDWTP, which is Attachment 1 of their Hazardous Waste Management Facility Operating Licenses. The WHMD concurs that the changes are minor modifications pursuant to R 299.9519(5) and (9) of the Part 111 administrative rules. WDI and MDWTP must provide written notification to their facility's mailing list of this minor modification pursuant to R 299.9519(6) of the Part 111 administrative rules.

Should you have any questions, please contact Mr. Peter Quackenbush, Hazardous Waste Section, WHMD, at 517-373-7397.

Sincerely



George W. Bruchmann, Chief
Waste and Hazardous Materials Division
517-373-9523

Enclosure

cc/enc: Mr. Scott Maris, The Environmental Quality Company
Mr. Tom Caswell, The Environmental Quality Company
Mr. Dan Swallow, Van Buren Township
Mr. Steve Buda/Operating License File, DEQ
Mr. Larry AuBuchon/Mr. Mike Busse, DEQ
Ms. De Montgomery, DEQ
Ms. Christine Grossman, DEQ
Mr. Leo Parks, DEQ
Mr. Peter Quackenbush, DEQ
Mr. Robert Skowronek, DEQ
Ms. Kimberly M. Tyson, DEQ

3.4 Special Wastes

3.4.1 NORM, TENORM, and Exempted Radioactive Material

Waste streams containing NORM, TENORM, and exempted radioactive material may be managed at Site #2 (MDWTP and/or WDI) provided the following steps are taken:

1. During the Site #2 (MDWTP and/or WDI) pre-approval process, obtain a radiochemical analysis and/or other appropriate radiological information on each (NORM, TENORM, and exempted radioactive material) proposed waste stream as well as any other information required by this WAP including the WCR. No material classified as low-level radioactive waste pursuant to Title 42 of the United States Code, Chapter 23, Development and Control of Atomic Energy, Section 2021b, Definitions, is allowed at the site.
2. The radiochemical analysis and appropriate information are evaluated to determine if they can be accepted at the site. All material accepted at the site shall be in at least one of the following categories:

State of Michigan Regulated Materials

- a. Exempt concentrations: IRR Rule 65
- b. Exempt quantities: IRR Rule 74
- c. Specific exemptions: IRR Rules 67(b), 72(1)(b), 72(2), and 73(b)
- d. NORM: The DEQ's *Cleanup and Disposal Guidelines for Sites Contaminated with Radium-226* (EQC 1602)

Note: For the purposes of interpreting the State of Michigan's *Ionizing Radiation Rules (IRR) Governing Radioactive Material*, refer to the definitions contained in IRR Rules 3 thru 20.

U.S. Nuclear Regulatory Commission (NRC) Regulated Materials

Note: For the purposes of interpreting Title 10 of the Code of Federal Regulations (10 CFR), refer to the definitions contained in 10 CFR, Sections 20.1003, 30.4, and 40.4.

- a. Exempt concentrations: 10 CFR, Sections 30.14 and 40.13
- b. Exempt quantities: 10 CFR, Section 30.18
- c. Specific exemptions: 10 CFR, Sections 20.2005, 30.11, 30.15, 30.16, 30.19, 30.20, 30.21, 40.14, and 40.22

Disclaimer: This in no way represents approval or authorization for receipt of NRC regulated material. If you have questions about radioactive material regulated by the NRC, contact the NRC regional office at 830-829-9500.

3. A sample is obtained from the generator, if appropriate, to determine if the level of radioactivity, based on a gamma radiation reading, will be above Site 2's background limit. The reading will be recorded for that (NORM, TENORM, and exempted radioactive material) EQ waste stream.
4. WDI and/or MDWTP may approve for receipt each (NORM, TENORM, and exempted radioactive material) proposed waste stream that meets the above criteria.
5. A (NORM, TENORM, and exempted radioactive material) waste stream may not be received by WDI and/or MDWTP until steps 1-4, above, have been followed.

Questions about radioactive material regulated by the state of Michigan should be directed to the DEQ.