Isolation Break Excavation Work Plan

Countywide Recycling and Disposal Facility

Prepared for:

Republic Services of Ohio II, LLC

3619 Gracemont Street, SW
East Sparta, OH 44626
(330) 874-3855

Prepared by:

Earth Tech | AECOM
36133 Schoolcraft Road
Livonia, MI 48150

November 14, 2008

Table of Contents

List of Tables

List of Plates

List of Figures

List of Appendices

1.0 Introduction

On October 24, 2008, The United States Environmental Protection Agency (U.S. EPA) formally requested Countywide Recycling and Disposal Facility (Countywide) to submit a Work Plan to construct a physical isolation break to "achieve a complete separation, full containment and isolation of the ongoing reaction affecting Cells 1-6." The request stated that the "following criteria should be taken into consideration in the development of the Work Plan:

- Control of odors which may affect the community,
- Safe and effective management of any leachate generated,
- Monitoring and control of emissions which may impact workers, and
- Prevention and control of conditions which may lead to fire."

Presented herein is an Isolation Break Excavation Work Plan (Work Plan), written to meet the request and address the criteria suggested for consideration by the U.S. EPA. This Work Plan presents:

- Descriptions of the conditions anticipated in the proposed Isolation Break area (Section 2.0).
- Descriptions of areas to receive excavated waste material (Section 3.0).
- Design features of the Isolation Break (Section 4.0).
- Preparation in advance of construction of the Isolation Break (Section 5.0).
- Anticipated means and methods for excavation of the Isolation Break, management of leachate, control of emissions which may impact workers, and prevention and control of conditions which may lead to fire (Section 6.0).
- Observation and documentation procedures (Section 7.0)
- Odor control measures (Section 8.0)
- Ambient air monitoring for protection of workers and documentation of impacts on ambient air on site and in the community (Section 9.0)
- Contingency plans (Section 10.0).
- Post-excavation monitoring to be employed to assess and track conditions (Section 11.0).

Approximate plan limits of the proposed Isolation Break are shown on Figure 1 along with other relevant site features. The Isolation Break excavation will be about 1,000 feet long, 500 feet wide (at the widest) at the top, and maximum 80 feet deep. It will require removal and relocation of approximately 420,000 cubic yards of municipal waste material.

2.0 Conditions in the Isolation Break Area

2.1 Previously Known Conditions

Figure 2 shows locations of features such as gas extraction wells, temperature monitoring probes, etc. in the vicinity of the Isolation Break. Adjacent to each of these features are recent wellhead temperatures, maximum downhole temperatures or waste temperatures, and carbon monoxide values. This type of information has been monitored and tracked for over a year. Presentations of data from this monitoring can be found at ftp://ftp.earthtech.com in the Progress Reports folder and at http://www.epa.state.oh.us/pic/countywide.html as "Weekly Progress Reports."

2.2 Observations from October 2008 Investigation

An "Isolation Break Investigation" was completed in October 2008 (report can be found at ftp://ftp.earthtech.com in the Isolation Break folder). The investigation consisted of nine borings ranging from 15 feet to 80 feet deep, and five test pits ranging from 22 feet to 25 feet deep.

Boring logs and test pit logs were used to record observations on material description, degree of decomposition, moisture condition, odor characteristics, temperature, and whether or not material appeared to be charred or heat-affected. As described in detail in the investigation report, no evidence of fire, near-fire, pyrolysis, characteristic "reaction" odor, forceful emissions or liquid pressures, excessive drying, or any other attributes of reaction/fire-affected areas were found in the excavation zone.

2.3 Aluminum Waste Within the Isolation Break Excavation

No aluminum dross or salt cake is anticipated in the proposed excavation area. These materials were not accepted after 2001. But all waste within the excavation zone was placed well after that, in 2006.

However, fabric bags of waste containing baghouse dust and/or shredder fines generated by the secondary aluminum industry are likely present in relatively small quantities. Both of these materials were delivered to the site in "super sacks". Super sacks are large square fabric bags that can contain from 2,000 to 3,000 lbs of material. Plate 1 shows examples of the super sacks that have been unloaded at the working face in the past.

Operational information from the site indicates that the acceptance of the baghouse dust and shredder fines was not placed above elevation 1180 in the excavation zone. Therefore, these materials should only be encountered in the bottom 30 to 35 feet of the 75-foot deep excavation (the lower 100,000 cubic yards). It is expected that up to 200 of these bags (or about 200 tons) might be encountered. Appendix A presents a summary of the quantities and location of this aluminum baghouse waste.

2.4 Assessment of Conditions Related to Construction

Several large waste excavation and relocation projects have been accomplished in Ohio in the past several years. The conditions observed during the proposed Isolation Break investigation suggest that an Isolation Break can also be accomplished at Countywide. However, because a reaction resides to the south of the proposed Isolation Break, it is different than the other projects. Therefore, additional steps have been taken to address these potential challenges through design and controls measures as discussed below.

2.4.1 Elevated Temperatures

During the October 2008 investigation, waste temperatures generally ranged from 110 deg. F to 150 deg. F with a maximum of 163 deg. F in the excavation zone. At the upper end, these are somewhat higher than normal and will likely mean increased liberation of fugitive gas and odors. In addition, a greater differential temperature between ambient air and the waste will produce a heavier moisture vapor condensation, impeding visibility for the construction workers nearest the freshly-excavated material.

2.4.2 Gas Composition

In addition to methane, which is typically found in landfilled waste, higher than expected levels of carbon monoxide and elevated hydrogen may be present in the proposed excavation zone. The highest level of carbon monoxide and hydrogen present in a gas well within the excavation is 295 ppm, and 18% respectively (PW-315). The potential impact of these parameters will be considered and addressed during the development of health and safety protocol for workers in the excavation area.

2.4.3 Aluminum Waste

Based on the experience of site personnel and individuals from the aluminum industry, these bagged dust aluminum wastes pose less of a safety hazard than the dross type wastes. They are not expected to react quickly or violently or generate significant amounts of heat or ammonia when exposed to air or additional water.

However, if encountered, the super sacks of aluminum waste dust could result in release of some ammonia gas which will be considered during the development of health and safety protocol for workers in the excavation area. Procedures for segregating these materials from the waste transported to the disposal area are provided in Sections 5.6 and 6.2.5.

2.4.4 Waste Moisture

Waste materials within the potential isolation break excavation were described as relatively dry until a depth of about 50 to 60 feet. Beyond that, the materials were described as “moist” to the maximum boring depth and maximum potential isolation break excavation depth of 80 feet. Two of the borings (FB-B5 and FB-B7) yielded samples that were described as “wet” in the bottom portion, suggesting possible saturation. The depths at which this occurred are illustrated on the cross sections on Figure 3, and are seen to be south of, or below (in elevation) the actual excavation zone.

In addition to the “wet” waste observed during the Isolation Break Investigation, fluid levels in gas extraction wells have been evaluated. Liquid levels measured in October 2008 have been added to the cross sections on Figure 3. These suggest that wetter conditions may exist in the lower 10 to 20 feet of the excavation.

3.0 Disposal Areas for Excavated Waste Material

The volume of excavation is expected to be about 420,000 cubic yards. However, when excavated, the waste material will "fluff" by about 20%, and when redeposited, an additional 15% of volume in the disposal area will be occupied by soil cover materials. Therefore, adequate disposal capacity must be found for a total of about 580,000 cubic yards.

3.1 Cells 7 and 8A

The primary disposal area will be in Cells 7 and 8A, just north of the Isolation Break. This area features a relatively short average haul of about 800 feet, and provides about 750,000 cubic yards of capacity—sufficient for the entire excavated volume. See Figures 1 and 4 for location of this disposal area and Figures 4 and 5 for potential filled configuration.

3.2 "Bowl" Area

A second disposal area could be used if desired or if conditions warrant. This area is known as the "bowl" area and is situated in the middle of the 88-acre area as shown on Figure 1. This area could accommodate a significant amount of waste (over 100,000 cubic yards).

At present, it is anticipated that the "bowl" area would only be used in special circumstances (such as disposal of materials that all parties agree would best be kept out of the Cell 7/8A area). Such circumstances would require mutual decision between the U.S. EPA, Ohio EPA, and Countywide.

It is recognized that the project criteria (odor control, effective leachate management, emission control, and fire prevention and control) would need to be addressed prior to use of this disposal option. Therefore, Countywide would work with U.S. EPA and Ohio EPA to develop an acceptable operating practice if use of this disposal option is deemed necessary or desirable by the U.S. EPA.

4.0 Design of Isolation Break

4.1 Design Objectives

The concept of the Isolation Break is very simple—to create a physical separation of waste material between the 88-acre area and the expansion area. Careful attention has been given to details that will be important to long-term success so that the break will be stable (now and in the future), allow for control of fugitive emissions, provide necessary access, and promote good surface water drainage.

4.2 Design Concept and Features

As shown on Figures 4, 5, and 7, the Isolation Break will be accomplished by total removal of waste down to the top of an existing lined soil/rock berm that separates the two areas within the excavation area. Precise as-built surveys and detailed records were kept during construction of the existing soil/rock berm and liner tie-in between the 88-acre area and Cell 7 as shown in Appendix B.

Key features of the excavation are described below and construction of these features is described in Section 6.0.

4.2.1 Excavation Slopes

The excavation slopes will be 3:1. Section 4.3 presents analyses that demonstrate that these slopes will be stable with current and long-term factors of safety greater than 1.5.

4.2.2 Gas Extraction Wells

Sixteen (16) new gas extraction wells will be installed on the slopes of the excavation. These wells will provide odor control during excavation and be incorporated into the facility's permitted gas control and collection system. The new gas well locations are shown on Figure 7. Details for the new gas extraction well installations are included on Figures 8-11.

4.2.3 88-Acre Slope Features

It has been observed elsewhere at the facility that the active reaction tends to push evaporated water out of the waste and in front of the reaction. Therefore, conditions at the face at the 88-acre slope face will likely get wetter in the future as (if) the reaction advances toward it. For these reasons, the design will include lateral drains across the slope, especially near the bottom of the excavation, to convey liquids to the existing collection system. These collectors are shown on Figure 7 and detailed on Figures 10 and 11. This design is consistent with that used for the temporary cap in other areas and is intended to pre-empt the potential detrimental effects of the moisture and gas pressure that may result from a proximate reaction.

After excavation, the 88-acre slope will be covered with a temporary FML cap resulting in full cap coverage anticipated in the "Landfill Cover and Long Term Capping Plan" approved on July 2, 2008.

4.2.4 Cell 7 Slope Features

The Cell 7 slope will be covered with intermediate soil cover material (as defined in OAC 3745-27-19).

4.2.5 Excavation Bottom Detail

The bottom of the excavation must perform many functions:

1. Completely separate the waste mass from one side of the Isolation Break to the other,
2. Provide a seal to prevent migration of gas or liquid across the break,
3. Allow collection and transmission of leachate and undercap seepage from the 88-acre slope face,
4. Provide a stable corridor for placement of a low-slope gas collection header near the toe of the 88-acre slope face,
5. Prevent oxygen intrusion into the gas/leachate collection system,
6. Protect the geosynthetic liner of Cell 5 and Cell7,
7. Provide separation of surface water from liner components , and
8. Provide vehicle access for future inspection, operation, and maintenance of the cap, gas, and leachate systems.

Several options for achieving these criteria are under development as of this writing. Figure 5 presents one of the options being developed that meets these requirements. This option provides a physical tie-in of the 88-acre temporary FML cap with the FML liner of the base liner system, thereby satisfying Items 1 and 2 above. A collection drain on the 88-acre side of the excavation satisfies Item 3. The addition of soil over the physical tie-in satisfies Items 4-8.

4.3 Slope Stability

A rock/soil berm exists between Cells 5 and 7. This berm provides and excellent foundation and anchor for the excavated waste slopes as it was constructed of heavily-compacted rock/soil fill material overlying bedrock as indicated on Figure 5. Appendix B contains further as-built information and photos of this berm during construction. Additional details regarding construction of this berm can be found in the Cell 4, Cell 5B, Cell 5C, and Cell 7 Structural Fill and As-Built reports at the facility.

Stability analyses (presented in Appendix C) were conducted on the 88-acre slope because it is higher and may in the future be subjected to adverse effects of the reaction (increased gas and liquid pore pressures and reduced coefficient of friction for the waste). These analyses demonstrate that the proposed design will remain stable even under the development of adverse conditions. The safety factor is greater than 1.5 under current conditions, 1.3 if adverse conditions develop (elevated pore pressures and $\Phi' = 24°$), and 1.9 under long-term/permanent conditions (pore pressures dissipated and $\Phi' = 24°$).

Section 11.3 describes a plan for monitoring the 88-acre slope. If any instability is identified, additional soils could be added to create a stabilizing buttress, as was done on the South Slope of the 88 acre area.

5.0 Site Preparation

5.1 Removal and Reconfiguration of Existing FML Temporary Cap and Features

The proposed Isolation Break area is currently covered by a recently-installed 60-mil FML temporary cap as shown on Figure 2. Related features include undercap collectors, and LFG and leachate collectors. These will be removed within the limits of the Isolation Break as shown on Figure 6 and then the remaining piping systems will either be tied into existing or new pipes to convey liquids to the existing leachate conveyance and transfer system as shown on Figure 7. Leachate system reconfiguration details are included on Figures 8-11.

5.2 Decommissioning and Relocation of Gas Extraction Components and FBMPs

Several gas collection wells must be removed within the proposed Isolation Break area. These will be decommissioned (possibly in phases) by fully grouting the well casing with a cement/bentonite mixture. See Figure 6 for identification of these wells. The gas header line will be relocated outside the excavation zone and then re-connected to the collection system as shown on Figure 7.

Temperature monitoring probes (know as FBMPs) FBMP-3R and -5R are located within the Isolation Break. Both FBMPs will be abandoned by removing the panel box and cutting the wires at ground surface and removing the subsurface components during excavation activities. See Figure 6 for location of these two probes (note also that FBMP 2R and -11 were destroyed by the September 14, 2008 windstorm and are not planned for replacement).

5.3 Construction of Stormwater Diversion

Stormwater control is regulated through the facility's current NPDES discharge permit. Construction of the Isolation Break will result in changes to the current and future stormwater patterns but will not immediately require changes to, or notifications for, any of the current permit requirements.

Storm water diversion berms will be constructed adjacent to the excavation zone to minimize surface water run-on into the excavation area (see Figure 4). The diversion berms will be supplemented, as necessary, with diversion ditches to reroute surface water flow to the storm water management system and prevent flow into the excavation zone.

5.4 Preparation of Disposal Areas

Disposal areas for excavated waste will be prepared with the following:

- Portable litter fences,
- Portable odor control product systems,
- Extensions on gas wells to get top of wells above first lift of relocated waste,
- Surface water run-on/runoff berms to divert clean surface water away from the waste disposal area, and
- Where possible, gas well laterals and headers will be relocated out of the fill zone.

Existing intermediate cover and/or temporary FML cap will only be removed or disrupted just prior to fill over a particular area. Leading edges will be anchored to prevent uplift during windy conditions.

5.5 Construction of Access Routes.

Potential access routes to the disposal locations from the Isolation Break are shown on Figure 4. Alternate routes may become more viable or expeditious, so the illustrated routes should just be considered preliminary concepts at this time.

5.6 Temporary Aluminum Waste Management Area

An area will be established for segregation and storage of the small quantities of aluminum containing waste removed from the Isolation Break Excavation area. Covered roll-off containers will be used for storage of the material. The containers will be stored in an area that is mutually agreed upon with the U.S. EPA and Ohio EPA. This area will provide storm water run-on and run-off control. Final disposition and/or treatment of this material will be determined in cooperation with the U.S. EPA and Ohio EPA.

6.0 Construction of Isolation Break

6.1 Selection of Contractor

Countywide has selected The Beaver Excavating Company (Beaver) of Canton, Ohio to be the contractor to construct the Isolation Break. Beaver has over 400 employees and the largest fleet of heavy equipment in Northeast Ohio. Beaver has extensive experience in landfill construction and in waste relocation projects.

Beaver relocated approximately 400,000 cubic yards of waste at the Central Waste Landfill in Mahoning County, Ohio. Beaver is currently at work at Countywide and therefore has significant equipment and manpower resources in place. Table 1 lists the main equipment that will be used on a day-to-day basis for the Isolation Break. Table 2 lists the entire fleet of equipment that Beaver currently has available at Countywide—much of which can be used for the Isolation Break on a routine or as-needed basis. Table 3 lists Countywide and vendor equipment available on-site – much of which can also be used for the Isolation Break on a routine or as-needed basis.

6.2 Waste Excavation

6.2.1 Sequence of Excavation

Waste excavation will proceed from the top-down in "decks," similar to removing the layers off a cake. Each deck will be about 10 to 12 feet thick. The top of the berm that separates the 88-acre area from Cell 7 is about 1000 feet long and pitches from east to west at about an average 2% slope. As a result, the waste excavation decks will likely be canted to slope from east to west with new decks started on the west (see Excavation Schematic Figure 12).

Soil stripped from within the excavation zone may be stockpiled nearby for reuse as daily cover and to serve as emergency fire suppressant. Waste will be excavated with tracked excavators and loaded into off-road dump trucks for transport to the designated disposal areas. Excavation will occur in approximately 25-foot wide north/south oriented strips. The width, separation, and orientation of the work faces will vary depending on weather, access, and proximity to the final slope. One potential arrangement envisions that two excavators will be used and that they will work adjacent strips as illustrated on Figure 12.

6.2.2 Excavation Bottom Treatment

A proposed approach to construction of the bottom detail is shown on Figure 5. Just above the berm dividing the 88-acre are from Cell 7, a small excavation will proceed down to the liner surface using 1:1 slopes. The liner surface will be accessible to laborers to allow the waste materials to be removed without damage to the liner if necessary.

The tie-in between the 88-acre temporary cap FML and the baseliner FML may use alternate joining technologies. Clay soil added over the joined FMLs will provide additional sealing capability and afford protection to the feature.

6.2.3 Covering Practices

Surface area of exposed waste will be minimized with sequential soil covering of newly exposed waste as soon as practical and with application of alternate daily cover materials on vertical or steep surfaces. Alternate daily cover (ADC) materials may consist of aqueous foam, cement-mortar, or tarps. Information on Rusmar and Posi-Shell ADCs and related application equipment is provided in Appendix D.

6.2.4 Litter Control

As with normal landfilling operations, control of blowing litter will be accomplished through the application of daily cover, operational plans that consider the direction of the prevailing winds, and other means where necessary. Since the site is responsible for the collection of all litter, an effective combination of passive (wind fences or screens) and active (manual litter "picking") collection will be utilized.

6.2.5 Aluminum Waste Recognition and Management

As previously discussed, aluminum-containing waste (super sacks of baghouse dust) are not expected to be encountered until the lowest 30 to 35 feet of the excavation. When bags are encountered, they may not be readily identifiable, but the characteristic light-gray to dark-gray powder composition should be recognized. Identified material will be segregated and transported to the temporary aluminum waste management area described in Section 5.6. Final disposition and/or treatment of this material will be determined in cooperation with the U.S. EPA and Ohio EPA.

6.3 Gas Extraction Well Installation and Operation

New gas extraction wells PW-361, -363, -364, -374, -375, and -376 will be installed either prior to or after waste excavation begins based on access and excavation progress. As the excavation advances down to about nominal EL. 1185 it is anticipated that gas extraction wells PW-365, -366, -367, -368, -369, -370, -371, -372, and -373 will be installed utilizing the deck that exists at that time. The concept for new gas well locations is shown on Figure 7. Actual locations will be based on modeling performed after the final approval of the Work Plan. Details for the new gas extraction well installations are included on Figures 8-11.

New and existing gas extraction wells within 150 feet of the active excavation area will be monitored and "tuned" daily. Wells outside this area will be tuned at least weekly. This will be accomplished by a trained technician using a Landtec GEM 2000 or equivalent gas meter in accordance with the Standard Operating Procedures (SOPs) contained in Appendix E.

6.4 Capping/Covering of Isolation Break Slopes

6.4.1 Cell 7 Excavation Slope

The final 3:1 Cell 7 excavation slope will be covered with a minimum 12-inch thick layer of intermediate cover soil as the excavation proceeds down in elevation. Add-on stormwater diversion berms will be constructed of similar cover material to the grades indicated on Figure 4.

6.4.2 88-Acre Excavation Slope

The 88-acre excavation slope will be covered with a minimum 12-inch thick layer of intermediate cover soil, and the subcap drains and leachate and gas collection trenches (see Figures 10 and 11 for details) will be installed. This slope will be covered with temporary FML cap as indicated on Figures 5 and 7. This capping of the slope may proceed in construction segments as the weather allows. It is anticipated that the drains and cap could be deferred until a significant part of the excavation work is completed depending on weather and access conditions. However, temporary seepage control and dewatering measures will be constructed at any time, as needed, to facilitate safe construction.

This work will be performed in accordance with the procedures outlined in the "Landfill Cover and Long Term Capping Plan" which can be found at ftp://ftp.earthtech.com in the "Capping Work Plan Draft 06-24-08" folder.

6.5 Fire Prevention and Control

Several potential scenarios exist for fire during excavation. These include: flash combustible gas fire, spontaneous combustion of waste, digging into active combustion, and equipment fire. As excavation proceeds, observations for evidence of subsurface fire will be made including smoke (visual or olfactory), water vapor with high carbon monoxide, visible flame, or glowing waste material.

Prior to beginning excavation, Countywide will conduct a project meeting to review the project and review the site's most-recent update of the Incident Management System Plan (IMSP). This Plan is located on site and can be found at ftp://ftp.earthtech.com in the Incident Management System Plan folder. In addition, Countywide will have a meeting with local fire departments and emergency management officials to review the project and review the site's most-recent update of the IMSP.

The top-down method of construction described in Section 6.2.1 will help prevent combustible gas flash fires as it will promote air flow across the work area and prevent stagnating pools of combustible gas from occurring. Covering practices described in Section 6.2.3 will reduce exposed waste thereby minimizing chances of spontaneous combustion.

Provisions will be made to control events by:

- Staging a minimum of 30 cubic yards of non-combustible fill material on the active excavation deck,
- Having an on-site 6000 gallon water truck at the site that is capable of spray applying water and or water/ liquid additive mixture at a minimum rate of 750 gallons per minute,
- Stocking a supply of drench(TM) Class A fire fighting water additive ("foam").
- Equipping one bulldozer and one excavator with enclosed cabs, and providing the operators with SCBA equipment.
- Staging fire extinguishers on each piece of heavy equipment.

Smoldering waste, if encountered, should be spread out and smothered, either in-place or adjacent to the location of discovery, with soil to provide temporary control until the appropriate personnel and equipment can be mobilized to completely extinguish and remove the waste from the excavation area.

It should be noted that the waste excavation will be performed in cold weather, and waste temperatures are warmer than atmospheric temperatures. This will result in the formation of plumes or wafts of water vapor condensation rising from the fresh waste excavation and may not be indicative of high temperatures or combustion.

It is also possible that certain conditions could result in the release of substantial vapor plumes for which monitoring will be used to assess the impact on workers and the community in accordance with the provisions of Section 9.0.

6.6 Control of Emissions

Fugitive gas emissions will be controlled by promptly covering exposed waste and by operation of a gas extraction system as described for controlling odors in Sections 8.1 and 8.2.

6.7 Stormwater Management

A combination of diversion berms and ditches will be installed around the perimeter of the excavation to prevent surface water run-off from entering the excavation and generating leachate. The berms and ditches will be designed to accommodate a 10-year/24-hour storm event. The location of the proposed final diversion ditches and let down pipe structures are shown on Figures 4 and 6.

Erosion controls will consist of geotextile silt fences, straw bale erosion control dikes placed in the ditches, seeding and mulching of all disturbed areas (as weather permits), and rock channel protection where necessary.

6.8 Leachate Management

Although not detected in the October 2008 investigation, it is possible that some perched or pockets of leachate might be encountered during the excavation or during installation of lateral gas and leachate collection piping. During rain events, any precipitation that comes in contact with exposed waste must be contained and treated as leachate. Therefore, a portable vacuum truck will be available on site full time for removal of leachate in such events and the leachate and/or contact water generated during construction will be handled per the requirement of Paragraph 22 of the April 2008 AOC.

If a leachate seeps or large emergent wet area should persist, additional excavated drains can be installed as necessary using the detail shown on Figure 10. These local, as-needed drain extensions would be tied into the pre-designed leachate collection trenches.

6.9 Safety Procedures

Work zones will be monitored, and work will be performed in accordance with safety procedures described in the Isolation Break Health and Safety Plan (HASP) which will be provided as a separate document. The Isolation Break HASP will require special provisions for work conducted in areas within the limits of excavation. Worker training is described in Section 8.0 if the Isolation Break HASP.

6.10 Schedule

A potential schedule for construction of the Isolation Break has been estimated based on the following assumptions:

- Start excavation by mid-December
- *One* 10-hour work shift with *two* excavators each removing 2,800 cubic yards per shift per excavator.
- Fifteen workable days per month on average from December through March, then 20 workable days per month
- One and one half week break between December 25 and January 5

Based on these assumptions, the active excavation phase of the project could be completed by late Spring 2009. Then six weeks will be needed to complete temporary FML capping, reconstruct the gas extraction system, and finish detailing the project.

6.11 Construction Progress Meetings

On a weekly basis, a construction meeting will be held on site. Key issues such as: progress/completion forecasting, odor monitoring results, air monitoring results, health and safety reviews, review of observations, etc. will be on each agenda. The meetings will give the project team opportunities to make adjustments, if necessary, to any of the construction issues discussed in Section 6.0 of this Work Plan.

7.0 Observation and Documentation Procedures

Data collected from the 88-acre area indicates that the reaction has not moved to or beyond the limits of this proposed excavation. An important outcome of the Isolation Break project will be the determination of whether or not fire or reaction has moved from the 88-acre area into Cell 7. Simple visual observation of the excavation should allow positive, mutual determination of this fact.

During construction of the Isolation Break, Countywide will employ a third-party monitor to provide full-time observation of the excavation process. Logs of the excavation process will be completed on a daily basis. The logs will include information regarding the condition and volume of waste moved, to which disposal area and/or cell it was moved, the general location within the cell, if any aluminum containing waste was encountered, weather conditions, problems experienced and remedies, etc. Also, the daily logs will include a section dedicated to the identification of any waste that observed to have been impacted by the reaction.

We also expect that the U.S. EPA will provide personnel to monitor the excavation. The third-party monitor and the U.S. EPA monitors will provide redundant observation and will mutually inform each other of observations. All observers will complete the Daily Construction Observation log contained in Appendix F. Then, at the end of the day/shift (or the beginning of the next day/shift) the observers will collaborate and any significant discrepancies will be noted on a Discrepancy Identification Log which is also contained in Appendix F. This vital process will ensure that all parties have communicated their conclusions regarding the daily activities and observations. If there are differences of opinion, those specific instances will be mutually noted.

In addition, photographic documentation will be used. In notable areas (where it appears special conditions exist or reaction symptoms may be present), GPS will be used to correlate observations and photo records to physical location and for potential future re-inspection or verification of observations.

8.0 Odor Control Measures

Odor control measures will be implemented as described in the following paragraphs.

8.1 Prompt Waste Cover

Freshly exposed waste will be covered as soon as practical. With the exception of the active excavation area, areas that are stripped of cover soil will be re-covered with daily cover soil or alternate daily cover (ADC) to promote odor control and minimize the generation of leachate from rainfall events.

On horizontal surfaces, or surfaces sloped at or less than 1:1, cover will be provided by spreading a minimum 6-inch lift of soil. The cover will enhance storm water management and prevent blowing litter. Tarps, foam or other alternate daily cover material will be used on steep temporary faces during the excavation process.

8.2 Landfill Gas Control System

Section 6.3 describes the installation of new gas extraction wells just prior to, and during excavation. Existing and new wells will be used to help control odors by maintaining vacuum on these gas extraction wells. This will afford an additional method for controlling odors that is usually not available during waste excavation projects. The procedure to be used for gas extraction system operation is included in Appendix E.

8.3 Odor Control Product Application

During October 2008, a portable odor control product application system was used during excavation of the test pits. The following observations were made at that time:

- *The excavated waste has a "normal" aged waste odor that is strong when within about 50 feet, but not overpowering.*
- *Without odor control product application, the odor diminished downwind to the point of being difficult to detect about 300 feet from the excavation.*
- *With odor control product application, the waste odor was effectively eliminated about 100 feet downwind of the excavation, after sufficient mixing with the product; however, a distinct product scent was present. All agreed that the product scent was preferable to, and milder than, the raw waste odor.*

However, no test-pit related odors were detected off site by the third-party odor monitor. While odor control product has been determined to be effective, it is not known if it will be necessary during excavation.

Therefore, portable odor control product application systems will be utilized *as necessary and if possible* (as temperatures and weather conditions permit) to minimize odors associated with the excavation. Countywide has commissioned the fabrication of another mobile application unit (bringing the total available to four units). These units include fans for forced-air assistance and spray bars equipped with nozzles for area application. Product application will be considered an optional, tertiary, odor control technique behind based prompt waste covering and landfill gas management.

8.4 Odor Monitoring, Reporting, and Review

The Nasal Ranger monitoring program utilized by Countywide has proven to be a useful, reliable, and objective program for determining relative odor strength since first being used at Countywide in September, 2006. Countywide will continue the use of this program throughout the project. Forms and typical daily and monthly reports and odor complaint tracking forms that are used during the odor monitoring program are included in Appendix G. Results of monitoring will be reviewed, together with the record of odor complaints kept by the Stark County Health Department, and evaluated during weekly project meetings.

Sustained and widespread (over 20 readings during a 3-day period excluding complaint investigations) Nasal Ranger readings of 4 will initiate an odor control meeting between the U.S. EPA, Ohio EPA, and Countywide, during which additional or alternative measures will be assessed (such as use of, or augmentation of, the odor control product application). Sustained and widespread (over 12 readings during a 2-day period excluding complaint investigations) Nasal Ranger readings of 7 or greater, if definitely attributed to the excavation project, may require temporary suspension of the project while the future viability of the project can be evaluated.

9.0 Ambient Air Monitoring

Extensive ambient air monitoring will be performed during the excavation. The program will consist of four "rings" of monitoring as described below beginning with the inner ring and moving to the outer.

9.1 Worker Monitoring

Section 6 of the Isolation Break HASP (submitted as a separate document), describes stringent worker personnel air monitoring as well as construction zone air monitoring which will be performed by the Project Health and Safety Officer. This monitoring includes use of a portable Photo Ionization Detector (PID), 4-gas meter, and ammonia meter. Worker breathing zones will be monitored within the work area.

9.2 Construction Zone Monitoring

Countywide will monitor just outside the construction zone by placing a tripod-mounted ppbRAE ultra-sensitive PID downwind of the work-shift excavation area. The tripod location may be repositioned to maintain a predominately downwind position during the shift. An 8-hour integrated SUMMA canister will be collected and analyzed for VOCs using U.S. EPA Method TO-15 as appropriate (optionally, a benzene Drager tube may be used). These monitoring procedures will be as described in the "Stage A" and/or "Stage B" monitoring found in the "Comprehensive Ambient Air Monitoring Program" submitted October 15, 2008 (found at ftp://ftp.earthtech.com in Ambient Air Monitoring folder).

Because the PID does not speciate constituents and the TO-15 analyses do not provide real-time information, the construction zone monitoring may be supplemented with benzene Drager tubes (or equivalent) to determine the concentration of benzene.

9.3 "Stage C" On-Site Continuous Monitoring

On October 2, 2008, Countywide began the "Stage C" ambient air monitoring program as described in the "Comprehensive Ambient Air Monitoring Program." The program consists of four permanent stations and one transportable station (see Figure 1 for locations). The transportable station will be positioned in a mutually-agreed location prior to commencing excavation.

Each of the stations provides 24/7 continuous monitoring with ultra-sensitive RAEGuard PIDs. These PIDs can detect VOC concentrations of 10 parts per billion (ppb) to 20 parts per million (ppm). Each unit is equipped with a wind direction and velocity instrument and a level-triggered SUMMA canister for collection of air should a certain mutually-agreed PID threshold be exceeded.

U.S. EPA and Ohio EPA on-site representatives will have full access to the real-time data collected at the Stage C ambient air monitoring stations. If data indicates potential unacceptable community risk (see Section 9.5), the excavation project may be modified, postponed, or halted as agreed.

9.4 Community Monitoring

Countywide operates a community ambient air monitoring program as required by the March 28, 2007 Ohio EPA F&Os. The program includes three off-site stations and one on-site station. Every six days, a 24-hour integrated SUMMA canister is collected at these locations and then analyzed for (among other parameters) volatile organic compounds using U.S. EPA Method TO-15. Then,

reports are generated monthly; compiling the results of monitoring that was typically performed four to ten weeks prior.

This program and sampling frequency will be maintained throughout the duration of the excavation. However, during the active excavation, an additional sampling event may be added in between each regularly-scheduled community monitoring events. These extra events will consist of collection of an 8-hour integrated SUMMA canister at each community monitoring station and subsequent analyses for benzene, toluene, ethyl benzene, and toluene (BTEX). The additional community monitoring will be reevaluated during the project to assess its value.

9.5 Air Monitoring Reporting and Review

Data generated by the air monitoring program will be consolidated into a form that can be easily reviewed at the weekly construction progress meetings and posted to the project FTP site.

Sustained and widespread (over 4 hours of construction zone monitoring PID readings over 5000 ppb or benzene Drager tube readings over 0.5 ppm) will initiate a worker safety meeting between the Ohio EPA, U.S. EPA, and Countywide, during which additional or alternative measures will be assessed (such as additional engineering controls or respiratory protection).

Sustained and widespread (average readings at any station during a 3-day period) Stage C PID readings of 2,000 ppb or greater may require temporary suspension of the project while the future conduct of the project can be evaluated.

10.0 Contingency Plans

Unanticipated events or hazards will be dealt with according to the site's most-recent update of the Incident Management System Plan (IMSP). This Plan is located on site and can be found at ftp://ftp.earthtech.com in the Incident Management System Plan folder.

Prior to beginning excavation, Countywide will conduct a meeting with local fire departments and emergency management officials to review the project and review the site's most-recent update of the IMSP.

10.1 Heavy Precipitation/Inclement Weather

If precipitation (rain or snow) shuts down operations, all exposed waste will be covered as described in Section 6.2.3. Heavy precipitation may require additional measures to manage storm water and leachate such as reinforcing or augmenting diversion berms.

Freezing weather conditions require additional measures for worker safety. Project personnel will be trained regarding the added dangers associated with working on frozen ground, moving frozen waste and soil, icy conditions on roadways and materials, and health issues. Daily tailgate meetings will address these issues when appropriate.

10.2 Hot or Smoldering Waste

Smoldering waste, if encountered, should be spread out and smothered, either in-place or adjacent to the location of discovery, with soil to provide temporary control until the appropriate personnel and equipment can be mobilized to completely extinguish and remove the waste from the excavation area.

Waste temperature measurements will be made on waste in the excavator bucket using an infrared temperature gun. Each measurement will be made in five places on the waste surface. If the average temperature reading is above 160 deg. F will be spread out in an adjacent area, covered or mixed with soil and or/with water and allowed to cool before disposal.

10.3 Other Special Handling Waste Material

Regulated, friable asbestos was not disposed in the Isolation Break area. However, excavator operators will be trained in asbestos waste recognition. If asbestos waste is encountered, appropriate, trained, personnel will be contacted to handle such material.

10.4 Unanticipated Conditions or Events

If any conditions occur that make advancement or completion of the Isolation Break unsafe or unduly harmful to the community, work will be temporarily suspended. Such conditions could include:

- Unacceptable worker exposure to gases (see Sections 9.5), temperatures, odors, obstructed visibility, or elevated temperatures,
- Unacceptable community exposure to gases (See Sections 9.5) or odors (see Section 8.4),
- Discovery of unsafe slope stability, unmanageable leachate quantities, or Force Majeure.

If these or other similar conditions occur, Countywide will notify the U.S. EPA and Ohio EPA representatives on site to schedule a conference call or site meeting. The agreed resolution will be

documented in the project record and in the monthly progress report. If the project must be postponed or abandoned, Countywide will develop a plan to achieve stability, control of fugitive emissions and odors, and surface water management at the point where the project is interrupted. In event this occurs, the next steps will be developed in coordination with the U.S. EPA and Ohio EPA.

11.0 Post-Excavation Monitoring

11.1 Monitoring South of the Isolation Break

Countywide will continue monitoring and sampling of the gas extraction wells south of the completed Isolation Break in accordance with the parameters and frequency required by the March 28, 2007 Ohio EPA DFFOs. In addition, the remaining waste temperature monitoring probes (FBMPs) will continue to be monitored weekly in accordance with the "Enhanced Temperature Monitoring System Procedure for Data Collection, Documentation, and Reporting," dated September 23, 2008. This procedure can be found at ftp://ftp.earthtech.com in the Gas Extraction Monitoring folder.

These results will be evaluated so that conditions are assessed and the progression of the reaction to the northwest is monitored. A discussion of the conditions will be included in the monthly progress reports to the U.S. EPA.

11.2 Monitoring North of the Isolation Break

Since October 2007, Countywide has been performing enhanced (and non-required) monitoring on several gas extraction wells north of the Isolation Break area. These wells are: PW-304, 312, 313, 329, 330, and 331 and have been monitored weekly for wellhead temperature, methane, oxygen, and carbon dioxide, and monthly downhole temperature measurements and analyses for hydrogen, methane, and carbon monoxide using the ASTM D-1946 method. The results are included in the web-based Locus database.

The above-described monitoring program will be continued, using the procedures contained in Appendix E, during and after construction of the Isolation Break. Ongoing monitoring requirements will be determined in coordination with the U.S. EPA and Ohio EPA based on monitoring results and field observations.

11.3 Monitoring of the 88-Acre Excavation Slope

Three rows of settlement monitoring pins will be installed on the 88-acre excavation slope after the excavation and temporary FML cap is complete. In addition, plates with survey extensions will be added at 100-foot intervals along the base of the slope. These pins and plates will be surveyed monthly using GPS survey technology and evaluated to determine if non-typical settlement or slope movement is occurring.

TABLES 1-3

Table 1 – Beaver Excavating Equipment List for Project

The minimum Beaver Excavating equipment contemplated is provided below. Excavators, bulldozers, compactors, trucks, and earthmovers will have enclosed cabs with pressurized and filtered air circulation systems capability where necessary.

The following equipment will be anticipated to perform the tasks described in the Isolation Break Excavation Plan:

Excavation Site:
Two (2) tracked excavators
Two (2) waste handling bulldozers
Four (4) off-road dump trucks
One (1) backhoe loader

Disposal Area Working Face:
Two (2) landfill compactors
One (1) track–type tractor
One (1) waste handling bulldozer

Miscellaneous Equipment:
One (1) Water wagon (for standby only)
One (1) Motor grader
Other site equipment as needed

Table 2 – Beaver Excavating Company On-Site Equipment List

Two (2) light plants
Two (2) pumps
Eleven (11) excavators
One (1) hydraulic hammer
Three (3) sheepsfoot rollers
One (1) drag box roller
Four (4) loaders (rubber-tired)
One (1) loader (track-mounted)
Eight (8) D8 bulldozers
One (1) D5 bulldozer
One (1) D9 bulldozer
Two (2) D6 bulldozers
One (1) tractor (4X4)
One (1) backhoe (rubber-tired)
Seventeen (17) of-road dump trucks
One (1) grader
Nine (9) scrapers
One (1) compactor
One (1) vibratory roller
Four (4) fuel tanks (diked)
One (1) hoe pack
One (1) water truck
One (1) water wagon
One (1) soil stabilizer
One (1) pipe laser
One (1) rotating laser
Miscellaneous excavator buckets

Table 3 – Countywide and Vendor Heavy Equipment List for Project

Countywide Heavy Equipment List

One (1) all-terrain utility vehicle
One (1) backhoe (rubber-tired)
One (1) air compressor
Three (3) off-road dump trucks
One (1) tracked excavator
Five (5) generators
One (1) loader (rubber-tired)
One (1) light plant
Two (2) motor graders
Three (3) pumps
One (1) road sweeper
Three (3) landfill compactors
Three (3) waste handling bulldozers
One (1) farm-type tractor
One (1) vacuum truck
One (1) smooth drum roller
One(1) water truck

Vendor Heavy Equipment List

Two (2) vacuum trucks
Three (3) portable odor neutralizing trailers
Mini-excavator
Supplied air trailer
Roll-off containers
Two (2) frac tanks
One (1) water truck equipped with high-volume nozzle

PLATE

PLATE 1

PHOTOGRAPH OF SUPERSACKS
AT CELL 7 WORKING FACE

PHOTO DATE: MARCH 2006

FIGURES 1-12

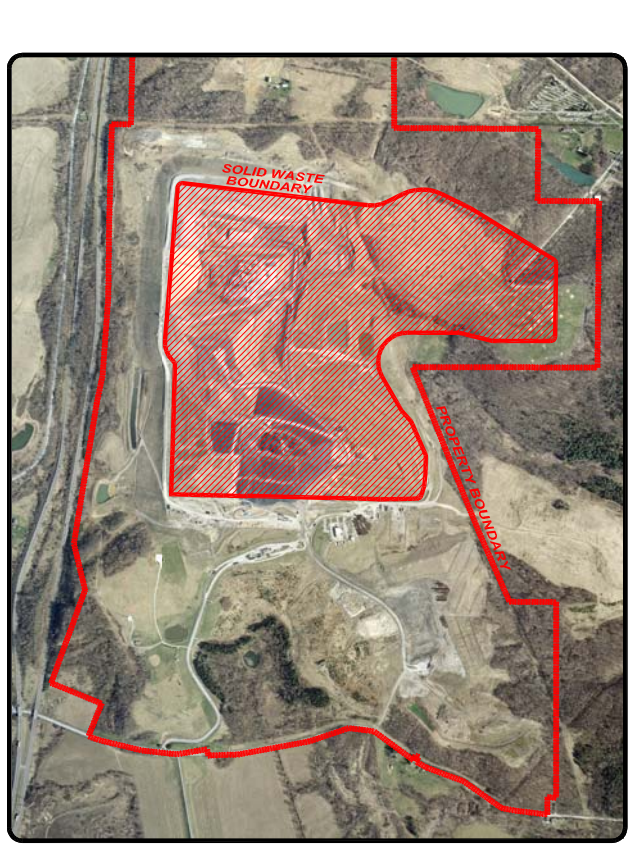
ENGINEERING PLANS FOR:

ISOLATION BREAK EXCAVATION

USEPA SETTLEMENT AGREEMENT AND ORDER ON CONSENT
DOCKET NO. V-W-08-C-897
COUNTYWIDE RECYCLING AND DISPOSAL FACILITY

EAST SPARTA, STARK COUNTY, OHIO

NOVEMBER 2008



LOCATION MAP

Approximate Scale: 1 in . = 1000 ft.

0' 1000' 2000' 3000'

Graphic Scale

PREPARED FOR:

REPUBLIC
SERVICES OF OHIO II, LLC
Stark County, Ohio

COUNTYWIDE
RECYCLING & DISPOSAL FACILITY

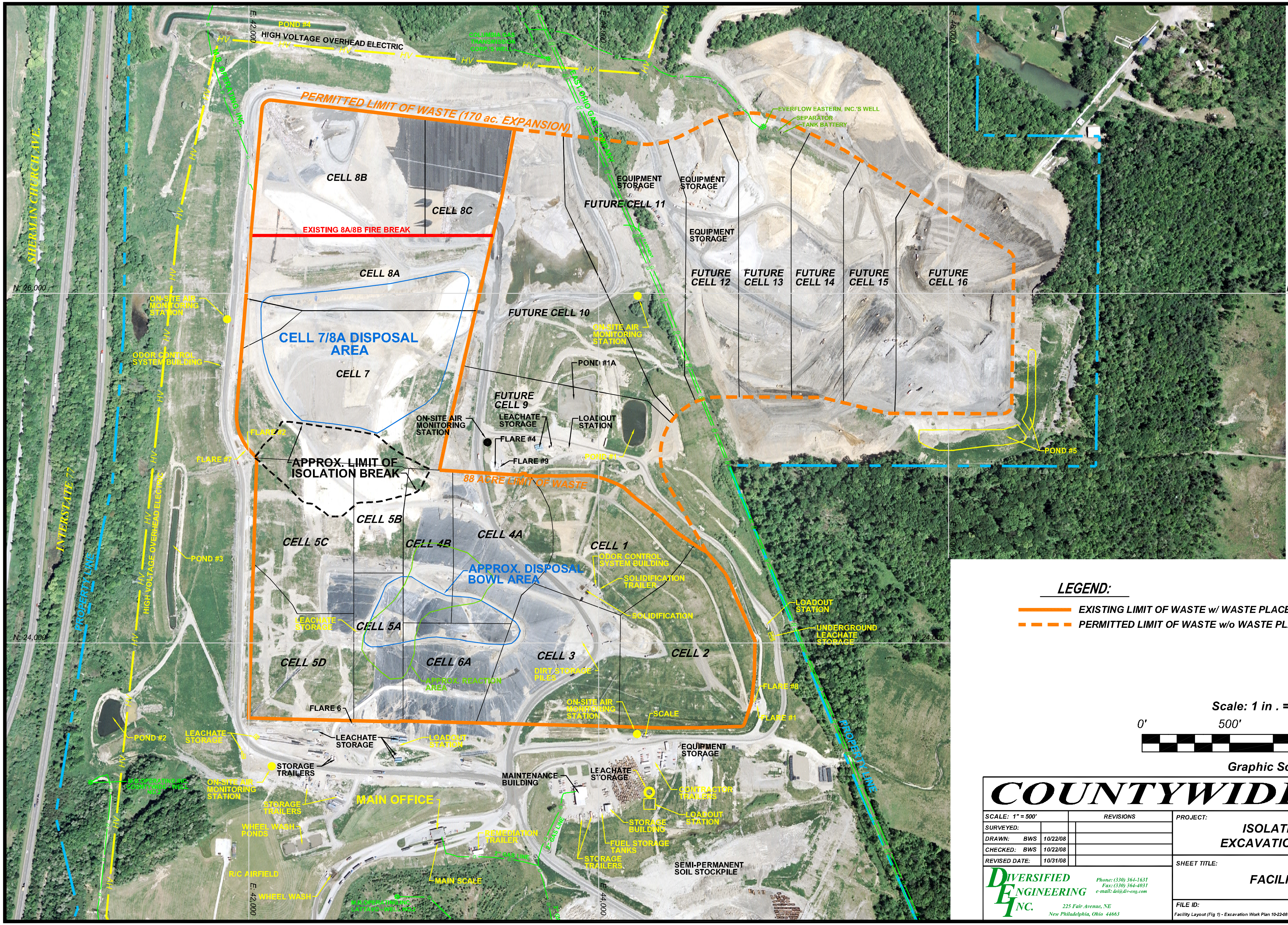
3619 GRACEMONT STREET S.W., East Sparta, OH 44626
Phone: (330) 874-3855 Fax: (330) 874-2426

PREPARED BY:

EARTH TECH | AECOM

36133 Schoolcraft Road
Livonia, MI 48150

INDEX OF FIGURES - REVISED 11/14/08


N
W
E
S
PERMITTED LIMIT OF WASTE (170 ac. EXPANSION)
EXISTING 8A/8B FIRE BREAK
CELL 8B
CELL 8C
CELL 8A
CELL 7/8A DISPOSAL AREA
CELL 7
APPROX. LIMIT OF ISOLATION BREAK
88 ACRE LIMIT OF WASTE
CELL 5B
CELL 5C
CELL 4B
CELL 4A
APPROX. DISPOSAL BOWL AREA
CELL 5A
CELL 5D
CELL 6A
CELL 3
CELL 2
CELL 1
FUTURE CELL 9
FUTURE CELL 10
FUTURE CELL 11
FUTURE CELL 12
FUTURE CELL 13
FUTURE CELL 14
FUTURE CELL 15
FUTURE CELL 16
EQUIPMENT STORAGE
EVERFLOW EASTERN, INC.'S WELL
SEPARATOR
TANK BATTERY
POND #1A
POND #2
POND #3
POND #4
POND #5
LEACHATE STORAGE
LOADOUT STATION
ON-SITE AIR MONITORING STATION
FLARE #1
FLARE #2
FLARE #4
FLARE #7
FLARE #8
FLARE #9
FLARE 6
ODOR CONTROL SYSTEM BUILDING
SOLIDIFICATION TRAILER
SOLIDIFICATION
DIRT/STORAGE PILES
APPROX. REACTION AREA
SCALE
UNDERGROUND LEACHATE STORAGE
CONTRACTOR TRAILERS
STORAGE BUILDING
FUEL STORAGE TANKS
STORAGE TRAILERS
SEMI-PERMANENT SOIL STOCKPILE
MAINTENANCE BUILDING
MAIN OFFICE
REMEDIATION TRAILER
MAIN SCALE
WHEEL WASH PONDS
WHEEL WASH
R/C AIRFIELD
HIGH VOLTAGE OVERHEAD ELECTRIC
HV
PROPERTY LINE
INTERSTATE 77
SHERMAN CHURCH AVE.
N: 26,000
N: 24,000
E: 42,000
E: 44,000
E: 46,000

LEGEND:

- EXISTING LIMIT OF WASTE w/ WASTE PLACEMENT
- PERMITTED LIMIT OF WASTE w/o WASTE PLACEMENT

Scale: 1 in . = 500 ft.

0' 500' 1000' 1500'

Graphic Scale

COUNTYWIDE RDF

SCALE: 1" = 500'			REVISIONS
SURVEYED:			
DRAWN:	BWS	10/22/08	
CHECKED:	BWS	10/22/08	
REVISED DATE:		10/31/08	

PROJECT: ISOLATION BREAK EXCAVATION WORK PLAN

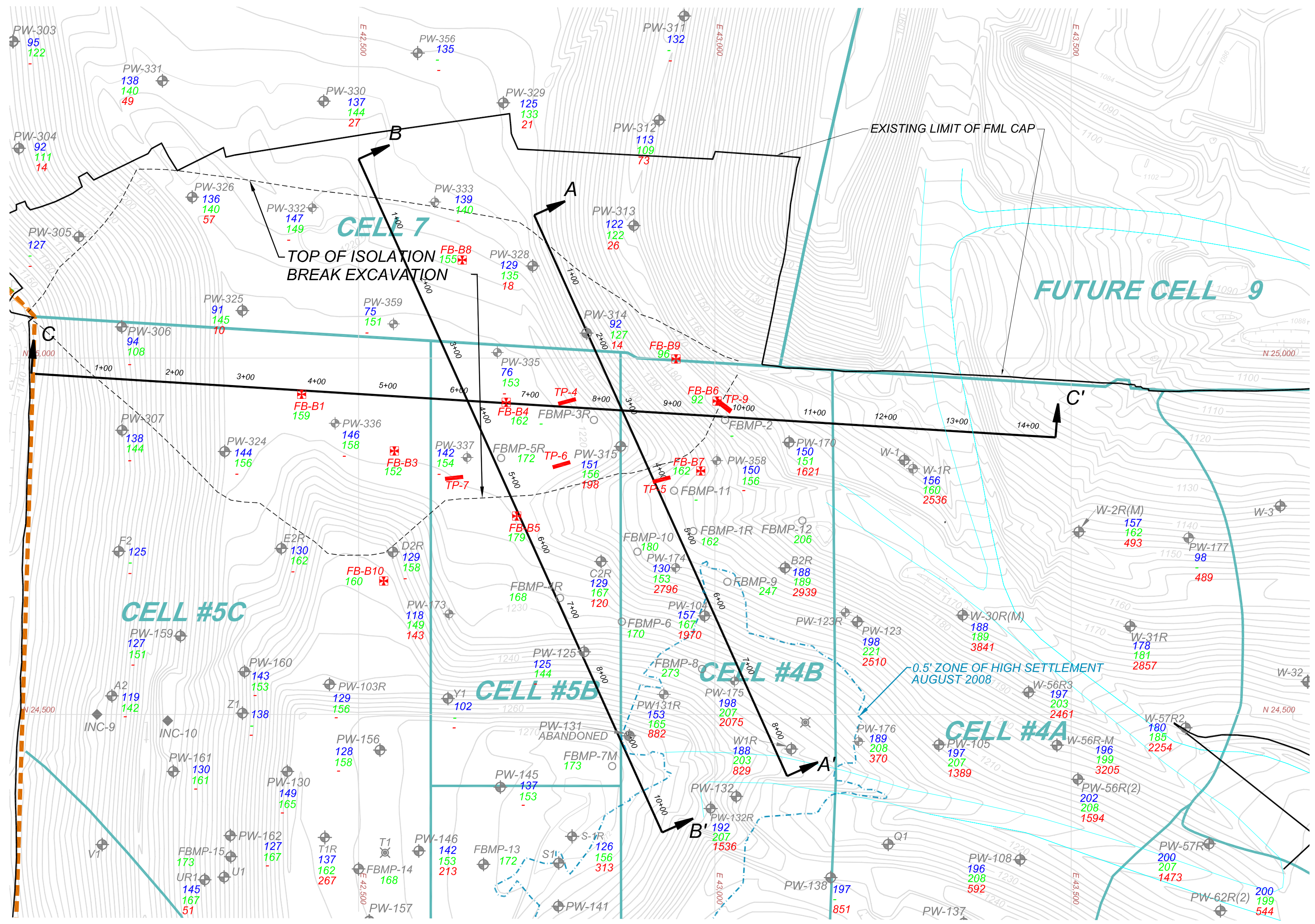
SHEET TITLE: FACILITY LAYOUT

DIVERSIFIED ENGINEERING INC.
225 Fair Avenue, NE
New Philadelphia, Ohio 44663
Phone: (330) 364-1631
Fax: (330) 364-4031
e-mail: dei@dei-eng.com

FILE ID: Facility Layout (Fig 1) - Excavation Work Plan 10-22-08

FIGURE 1

Z:\Data\LANDFILLS\Countywide Landfill\Isolation Break\Cell 5-7 Break\DEI Air Break DWG's\Facility Layout (Fig 1)-Excavation Work Plan 10-31-08.dwg, 11/2/2008 3:42:03 PM



LEGEND - EXISTING CONDITIONS

- 148 — SEPTEMBER 2008 WELL HEAD TEMPERATURE (DEGREES F)
- 158 — SEPTEMBER 2008 MAX GAS EXTRACTION WELL DOWNHOLE TEMPERATURE (DEGREES F) (10-7-08 FBMP DATA) (OCTOBER FB-__ DATA)
- 2332 — AUGUST CO (PPM)
- EXISTING CELL BOUNDARY
- 2' CONTOUR - EXISTING GROUND (5/29/08 AERIAL)
- EXISTING LIMIT OF FML CAP

Scale: 1 in. = 100 ft.

0' 100' 200' 300'

Graphic Scale

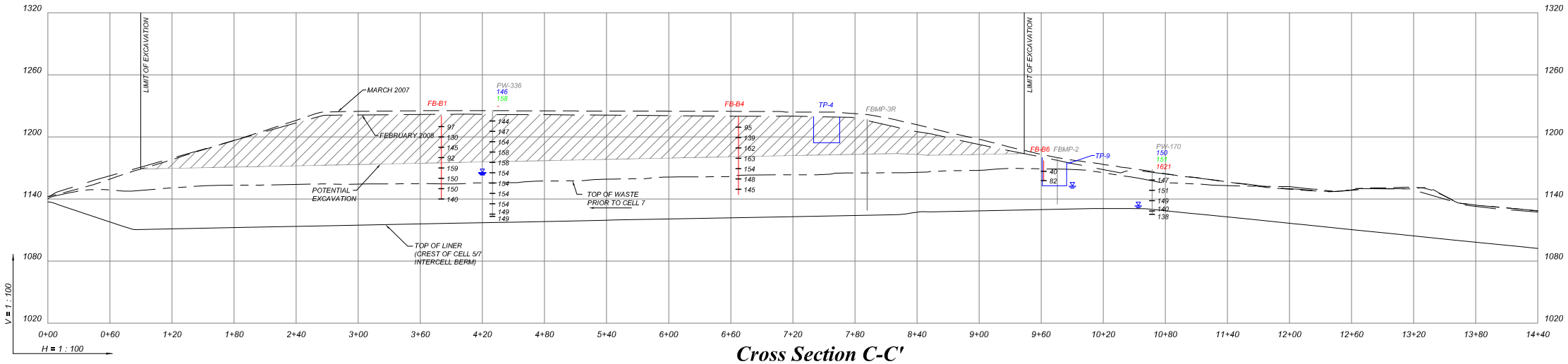
COUNTYWIDE RDF

SCALE: 1" = 100'	REVISIONS	PROJECT: ISOLATION BREAK EXCAVATION WORK PLAN
CONTOUR INTERVAL: 2'		
DRAWN: CRH 10-22-08		
CHECKED: CCV 10-22-08		SHEET TITLE: PLAN VIEW EXISTING CONDITIONS
REVISED DATE:		

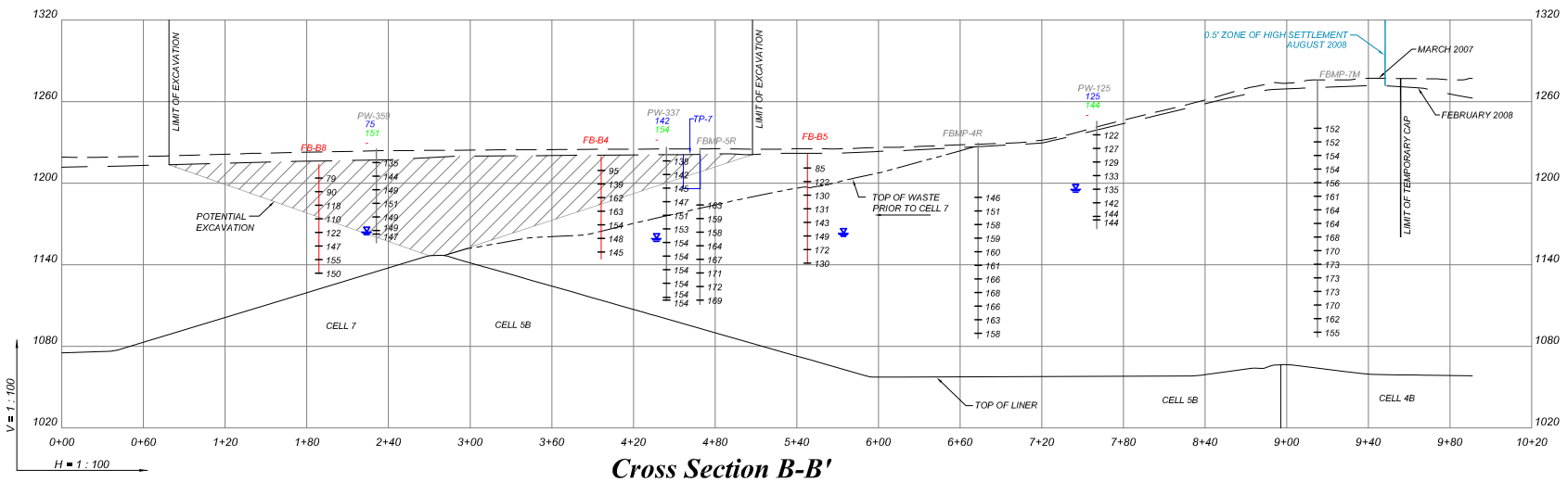
DIVERSIFIED ENGINEERING INC.
225 Fair Avenue, NE
New Philadelphia, Ohio 44663
Phone: (330) 364-1631
Fax: (330) 364-4831
e-mail: dei@dei-eng.com

FILE ID: Cell 5-7 well temperature map 10-13-08 CRH.dwg

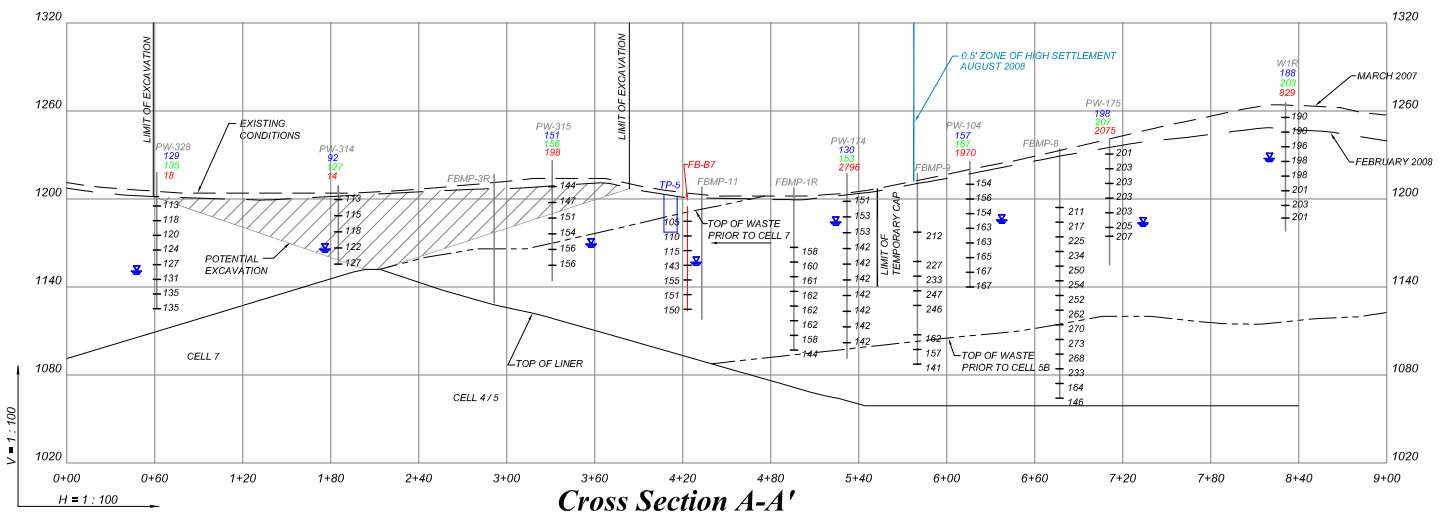
FIGURE 2



Cross Section C-C'



Cross Section B-B'



Cross Section A-A'

LEGEND

148 SEPTEMBER 2008 WELL HEAD TEMPERATURE (DEGREES F)

158 SEPTEMBER 2008 MAX GAS EXTRACTION WELL DOWNHOLE TEMPERATURE (DEGREES F)
(10-7-08 FBMP DATA) (OCTOBER FB-__ DATA)

2332 AUGUST CO (PPM)

OCTOBER 2008

115 DOWNHOLE OR IN-SITU WASTE TEMPERATURE (DEGREES F) SEE NOTE 1

120

APPROXIMATE PROPOSED ISOLATION BREAK EXCAVATION

DEPTH TO FLUID OCTOBER 2008 OR DEPTH AT WHICH WASTE DESCRIBED AS "WET" IN FB-B__ SERIES BORINGS. FOR GAS EXTRACTION WELLS FLUID LEVELS DO NOT REPRESENT A LEVEL OF SATURATION, BUT RATHER THE PERCHED OR PERSISTANT LEVEL TO WHICH LEACHATE OR CONDENSATE ACCUMULATES IN THE BOTTOM OF THE WELL CASINGS.

NOTE 1: TEMPERATURES SHOWN AT VARIUS DEPTHS WERE OBTAINED BY THREE DIFFERENT METHODS AS DESCRIBED BELOW

- GAS EXTRACTION WELLS (E.G. PW-314, W1R) TEMPERATURES WERE OBTAINED IN THE GAS STREAM INSIDE A GAS EXTRACTION WELL. A REELED TEMPERATURE PROBE (PHOENIX MODEL) WAS GRADUALLY LOWERED DOWN THE 6" OF 8" GAS WELL CASINGS.

- IN-SITU TEMPURATURE PROBES (E.G. FBMP-4R). THESE TEMPERATURE WERE OBTRAINED AT DIRECT BURIED THERMOCOUPLES.

- ISOLATION BREAK INVESTIGATION BORINGS. THESE WERE OBTAINED ON SPLIT-SPOON CORE SAMPLES RETRIVED DURING THE DRILLING INVESTIGATION. TEMPERATURE VALUES WERE OBTAINED USING AN ANALOG PROBE-TIPPED THERMOMETER.

COUNTYWIDE RDF

SCALE: AS NOTED	REVISIONS	
CONTOUR INTERVAL:		
DRAWN: CRH	10-22-08	
CHECKED: CCV	10-22-08	
REVISED DATE:	11-12-08	

PROJECT:
ISOLATION BREAK EXCAVATION WORK PLAN

SHEET TITLE:
CROSS SECTIONS EXISTING CONDITIONS

DIVERSIFIED ENGINEERING INC.
225 Fair Avenue, NE
New Philadelphia, Ohio 44663
Phone: (330) 364-1631
Fax: (330) 364-4031
e-mail: dei@dei-eng.com

FILE ID:
Cell 5-7 wet temperature map 11-12-08 CRH.dwg

FIGURE 3

CELL #3

CELL #4A

CELL 8C

BOWL DISPOSAL AREA

CELL #6A

CELL #4B

CELL #8A

CELL #7

CELL 7/8A DISPOSAL AREA
(750,000 CY CAPACITY)

CELL #5B

CELL #5A

DIVERSION BERM

3H:1V

3H:1V

A

A'

ISOLATION BREAK EXCAVATION AREA

CELL 8B

CELL #5C

CELL #5D

7% ROAD

10% min.

10% min.

N: 26,000

N: 25,500

N: 25,000

N: 24,500

N: 24,000

N: 23,500

N: 23,000

N: 22,500

E: 43,000

E: 43,500

E: 42,500

E: 42,000

LEGEND:

- EXISTING SOLID WASTE BOUNDARY
- CELL BOUNDARY
- PROPOSED ISOLATION BREAK EXCAVATION LIMITS
- PROPOSED WASTE DISPOSAL FILL CONTOURS CONTOURS (CTR INT. = 5')
- 1220 PROPOSED ISOLATION BREAK EXCAVATION CONTOURS (CTR INT. = 5')
- 1220 EXISTING CONTOURS (MAY 29, 2008) (CTR INT. = 2')
- POTENTIAL ACCESS ROUTES TO DISPOSAL AREAS

N
W
E
S

Scale: 1 in . = 100 ft.

0' 100' 200' 300'

Graphic Scale

COUNTYWIDE RDF

SCALE: 1" = 100'		REVISIONS	
SURVEYED:			
DRAWN: BWS	11/02/08		
CHECKED: MRB	11/02/08		
REVISED DATE:	11/12/08		

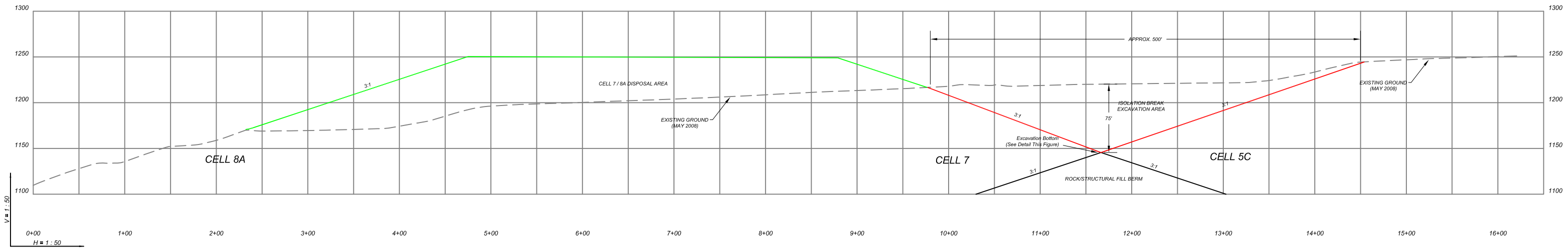
PROJECT:
ISOLATION BREAK
EXCAVATION WORK PLAN

SHEET TITLE:
EXCAVATION - PLAN VIEW

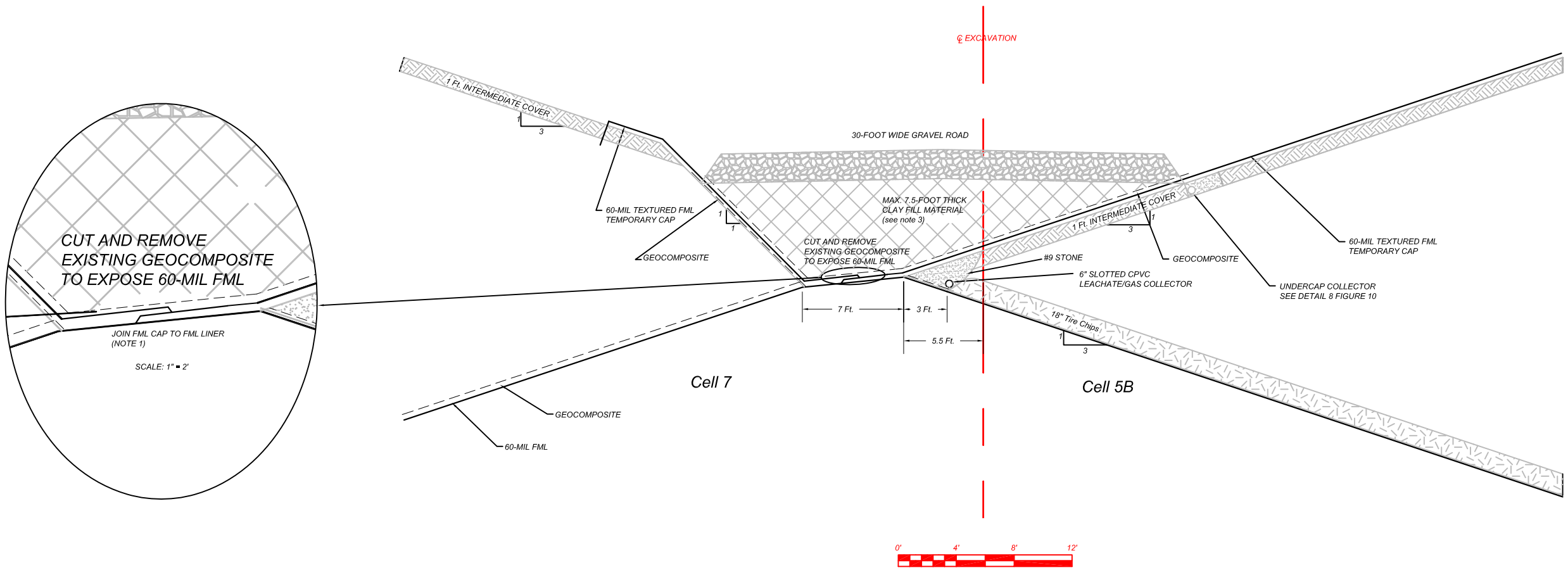
FILE ID:
Excavation - Plan View (Figure 4) 11-12-08

FIGURE 4

DIVERSIFIED ENGINEERING INC.
225 Fair Avenue, NE
New Philadelphia, Ohio 44663
Phone: (330) 364-1631
Fax: (330) 364-4831
e-mail: dei@dei-eng.com



SECTION A-A'



NOTE 1: ALTERNATE JOINING TECHNOLOGIES; INCLUDING GCL, EMULSIONS, TAPES, OR SPRAY APLLICATIONS MAY BE USED TO CREATE A SEAL BETWEEN THE FML MATERIALS

NOTE 2: ADDITIONAL DRAINAGE AND/OR DIMENSION MODIFICATIONS MAY BE NECESSARY TO ACCOMODATE ENCOUTERED GAS OR LIQUID CONDITIONS.

NOTE 3: CLAY MATERIAL SHALL MEET THE SITE PERMIT REQUIREMENTS FOR RECOMPACTED CLAY LINER SOIL. THE SOIL SHALL BE NON-COMBUSTIBLE WITH A MAXIMUM LOSS ON IGNITION (LOI) OF 3%. CLAY MATERIAL WILL BE COMPACTED WITH HAND OR HOE-MOUNTED TAMPERS TO ACHIEVE MAXIMUM DENSITY THAT CAN BE REASONABLY ACHIEVED WITHOUT DAMAGING UNDERLYING FML MATERIALS.

Potential Excavation Bottom Treatment

COUNTYWIDE RDF

SCALE: AS NOTED	REVISIONS
CONTOUR INTERVAL:	
DRAWN: CRH 10-22-08	
CHECKED: CCV 10-22-08	
REVISED DATE: 11-14-08	

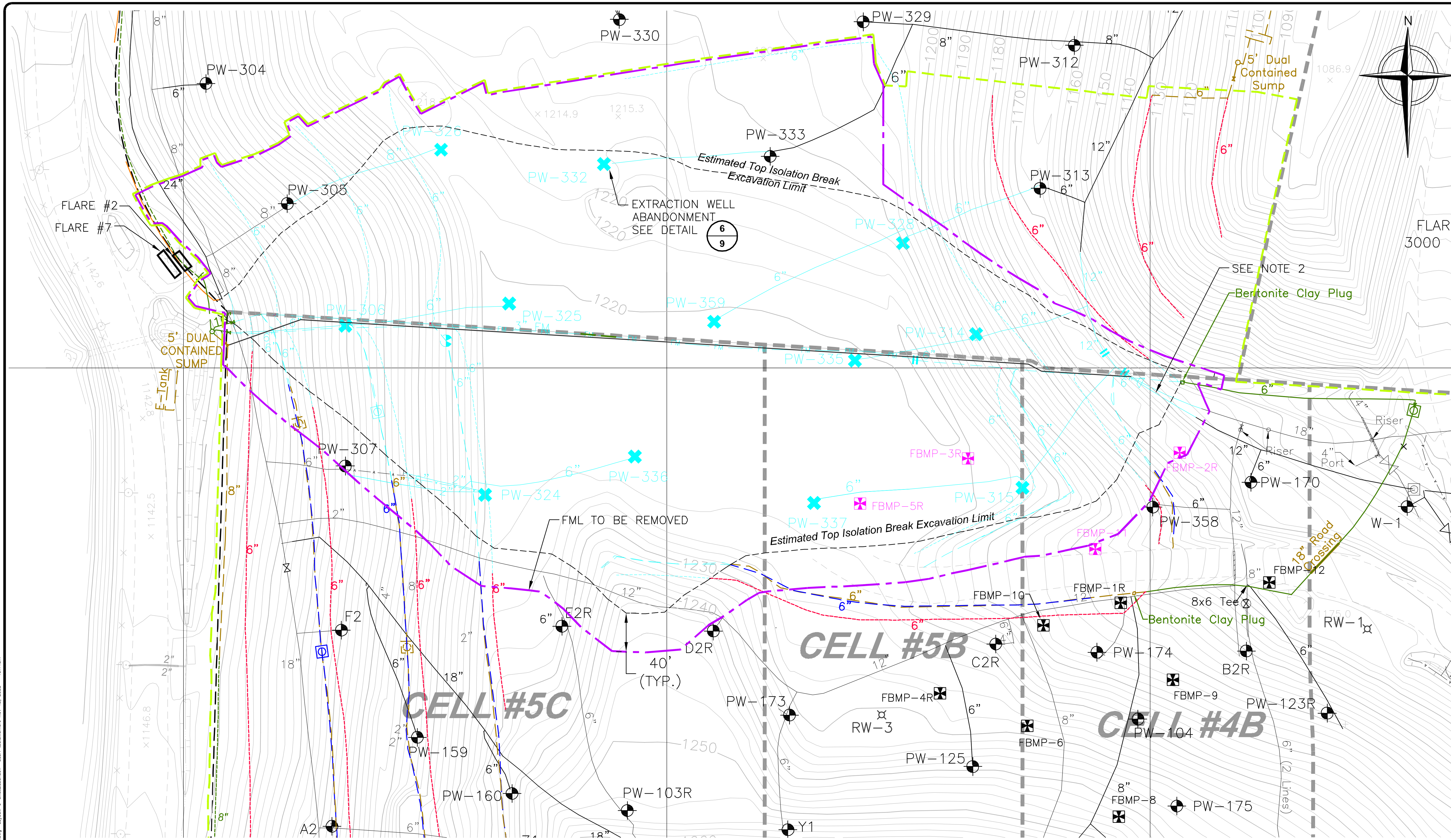
PROJECT: ISOLATION BREAK EXCAVATION WORK PLAN

SHEET TITLE: EXCAVATION CROSS SECTIONS

DIVERSIFIED ENGINEERING INC.
225 Fair Avenue, NE
New Philadelphia, Ohio 44663
Phone: (330) 364-1631
Fax: (330) 364-4831
e-mail: dei@dei-eng.com

FILE ID: Excavation Disposal (Fig 5) Excavation Cross Sections 11-12-08

FIGURE 5



PROPOSED WELL ABANDONMENT SCHEDULE

Well ID	COORDINATES	
	North	East
PW-326	25,226	42,267
PW-332	25,211	42,435
PW-306	25,044	42,168
PW-325	25,067	42,337
PW-359	25,048	42,549
PW-328	25,129	42,744
PW-335	25,008	42,695
PW-314	25,035	42,820
PW-315	24,876	42,868
PW-337	24,860	42,652
PW-336	24,908	42,467
PW-321	24,868	42,312

0 50 100
SCALE IN FEET

LEGEND

- EXISTING SOLID WASTE BOUNDARY
- EXISTING CELL BOUNDARY
- EXISTING TEMPORARY FML CAP LIMIT
- EXISTING TEMPORARY FML CAP LIMIT (TO BE REMOVED)
- 1150 — 2' CONTOUR – EXISTING GROUND
- EXISTING HEADERS/LATERALS
- EXISTING AREA N LEACHATE (ABOVE GROUND)
- EXISTING AREA N LEACHATE HORIZONTAL COLLECTOR (IN COMMON TRENCH BELOW LFG COLLECTOR)
- EXISTING AREA N LFG HORIZONTAL COLLECTOR (IN TRENCH ABOVE LEACHATE COLLECTOR))
- EXISTING AREA N UNDERCAP COLLECTOR (AT GROUND SURFACE)
- PROPOSED HEADERS/LATERALS ABANDONMENT
- PROPOSED LFG/LEACHATE COLLECTOR ABANDONMENT
- FM — PROPOSED FORCEMAIN ABANDONMENT
- EXISTING LFG EXTRACTION WELL
- PW-306 — PROPOSED LFG EXTRACTION WELL ABANDONMENT
- EXISTING RISER
- PROPOSED RISER ABANDONMENT
- EXISTING FIREBREAK MONITORING POINT
- PROPOSED FIREBREAK MONITORING POINT ABANDONMENT

NOTES:

1. ABANDONED WELLS IN EXCAVATION ZONE WILL BE GROUTED BEFORE EXCAVATION.
2. MAINTAIN OPERATIONS DURING EXCAVATION. AMMEND WITH TEMPORARY HEADER AS NECCESSARY.

*DRAWING TO BE PLOTTED IN COLOR

DRAFT

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
DATE OF ISSUE 10/30/08		DRAWN BY TSS DESIGNED BY TAB			CHECKED BY MC APPROVED BY BOS	

CORNERSTONE Environmental Group, LLC

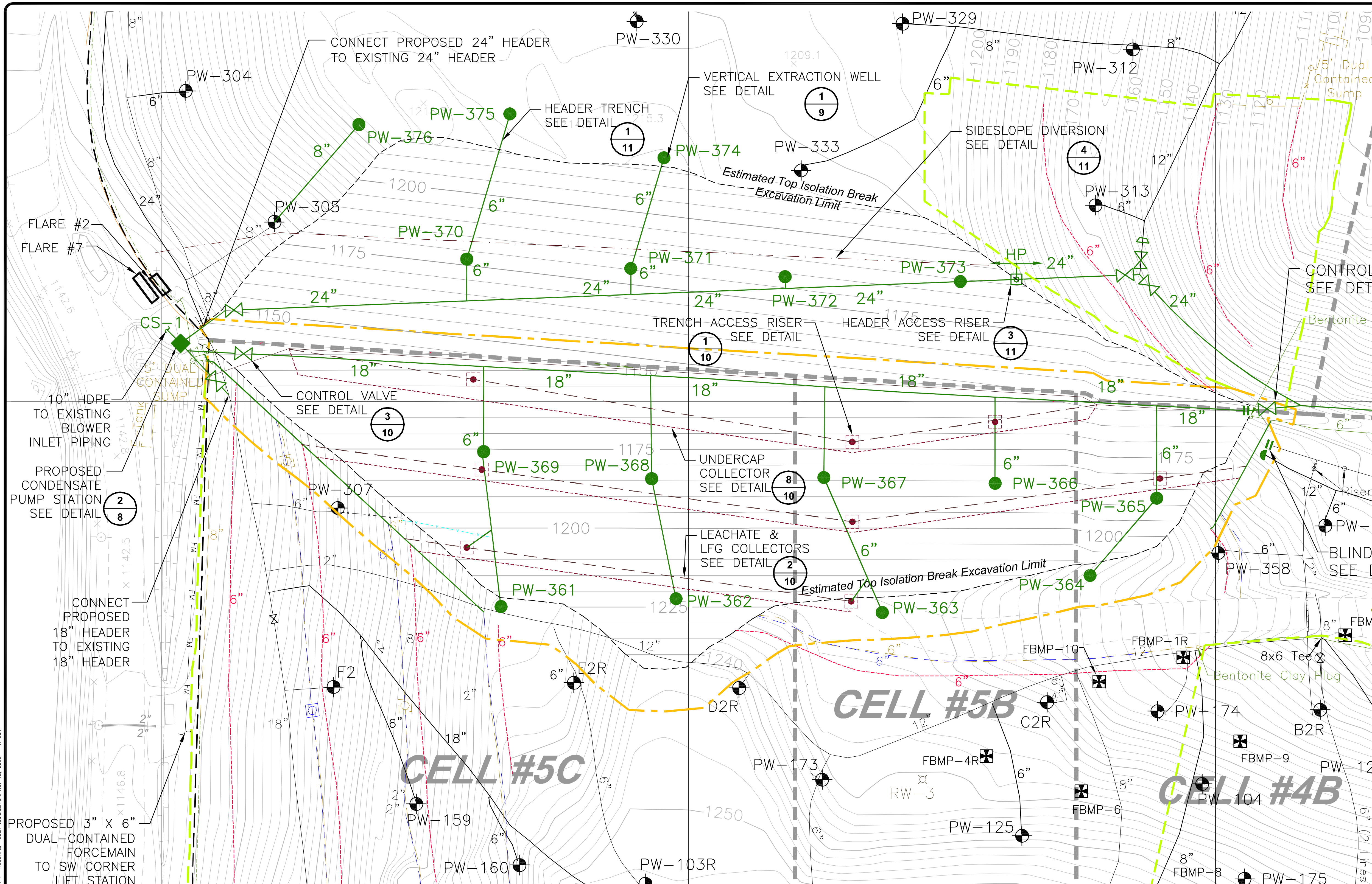
REPUBLIC SERVICES OF OHIO II, LLC
COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
EAST SPARTA, STARK COUNTY, OHIO

DEMOLITION AND ABANDONMENT PLAN

FIGURE NO. 6

PROJECT NO. 070197

File: J:\COUNTYWIDE – LFG AIR BREAK – 070197\PROJ DWGS\bocwsEC01.dwg Layout: 6-existabandon User: tod.skidmore Nov 13, 2008 – 10:14am



Proposed Well Schedule

Well ID	COORDINATES North	COORDINATES East	ELEVATIONS Existing	ELEVATIONS Base	DEPTHS Refuse	DEPTHS Bore	DEPTHS Solid	DEPTHS Perforated
PW-361	24,805	42,322	1,221	1,061	160	100	20	80
PW-362	24,813	42,488	1,222	1,072	150	100	20	80
PW-363	24,800	42,684	1,222	1,075	147	100	20	80
PW-364	24,835	42,881	1,207	1,099	108	88	20	68
PW-365	24,908	17,550	1,188	1,124	64	44	20	24
PW-366	24,922	42,791	1,186	1,121	65	45	20	25
PW-367	24,928	42,629	1,186	1,116	70	50	20	30
PW-368	24,927	42,465	1,184	1,109	75	55	20	35
PW-369	24,952	42,306	1,176	1,109	67	47	20	27
PW-370	25,135	42,290	1,177	1,113	64	44	20	24
PW-371	25,126	42,445	1,180	1,116	64	44	20	24
PW-372	25,118	42,592	1,184	1,118	66	46	20	26
PW-373	25,114	42,758	1,189	1,120	69	49	20	29
PW-374	25,231	42,477	1,216	1,081	135	100	20	80
PW-375	25,273	42,331	1,214	1,074	140	100	20	80
PW-376	25,262	42,188	1,212	1,072	140	100	20	80
					TOTAL	1112	320	792

Note: Field conditions at time of construction must be verified and the schedule is to be revised to reflect actual conditions. A separate well schedule shall be issued at the time of construction. Max. Drill Depth = 100'.

0 50 100
SCALE IN FEET

LEGEND

- EXISTING SOLID WASTE BOUNDARY
- EXISTING CELL BOUNDARY
- EXISTING TEMPORARY FML CAP LIMIT
- PROPOSED NEW TEMPORARY FML CAP LIMIT (APPROXIMATE)
- 1150 — 2' CONTOUR – EXISTING GROUND
- EXISTING HEADERS/LATERALS
- EXISTING AREA N LEACHATE (ABOVE GROUND)
- EXISTING AREA N LEACHATE HORIZONTAL COLLECTOR (IN COMMON TRENCH BELOW LFG COLLECTOR)
- EXISTING AREA N LFG HORIZONTAL COLLECTOR (IN TRENCH ABOVE LEACHATE COLLECTOR))
- EXISTING AREA N UNDERCAP COLLECTOR (AT GROUND SURFACE)
- PROPOSED LFG & LEACHATE COLLECTOR TRENCH SEE DETAIL 3/10
- PROPOSED UNDERCAP COLLECTOR SEE DETAIL 8/10
- PROPOSED HEADERS/LATERALS SEE DETAIL 1/11
- EXISTING GAS WELL
- PROPOSED GAS WELL
- PROPOSED RISER
- EXISTING FIREBREAK MONITORING POINT
- EXISTING RISER
- EXISTING REDUCER
- PROPOSED REDUCER
- EXISTING VALVE
- PROPOSED VALVE
- PROPOSED ROAD CROSSING

NOTES:

1. MAINTAIN 5% MIN. SLOPE ON ALL HEADERS.
2. PROPOSED GAS WELL WILL BE INSTALLED BEFORE AND DURING EXCAVATION AND WILL BE USED FOR ODOR CONTROL UTILIZING TEMPORARY LATERALS, HEADERS, AND REMOTE WELLHEADS AS NECESSARY.

*DRAWING TO BE PLOTTED IN COLOR

DRAFT

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 10/30/08 — DRAWN BY TSS — DESIGNED BY TAB — CHECKED BY MC — APPROVED BY BOS

CORNERSTONE Environmental Group, LLC

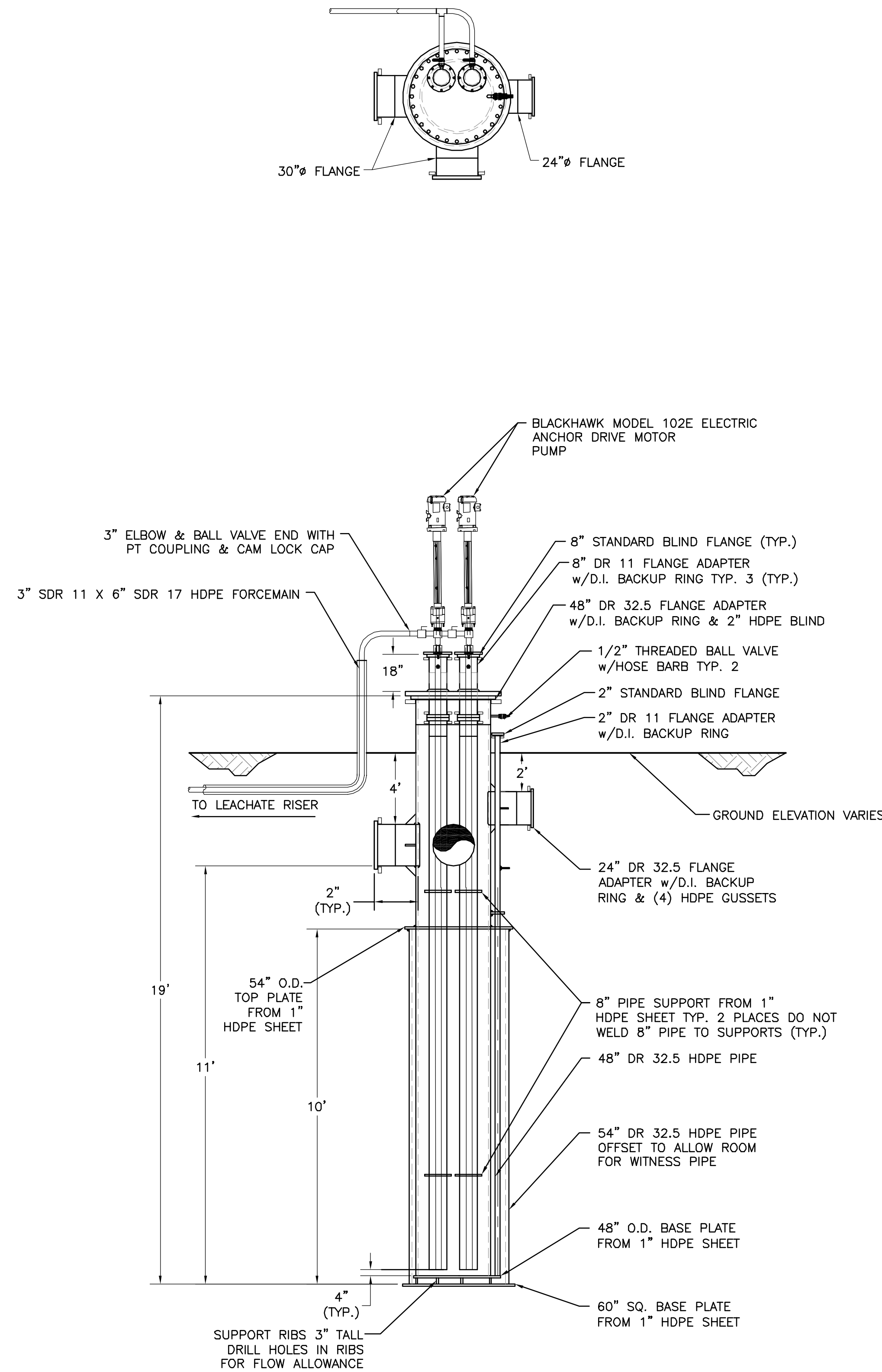
REPUBLIC SERVICES OF OHIO II, LLC
COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
EAST SPARTA, STARK COUNTY, OHIO

GAS, LEACHATE AND COVER SYSTEM RECONFIGURATION

FIGURE NO. 7

PROJECT NO. 070197

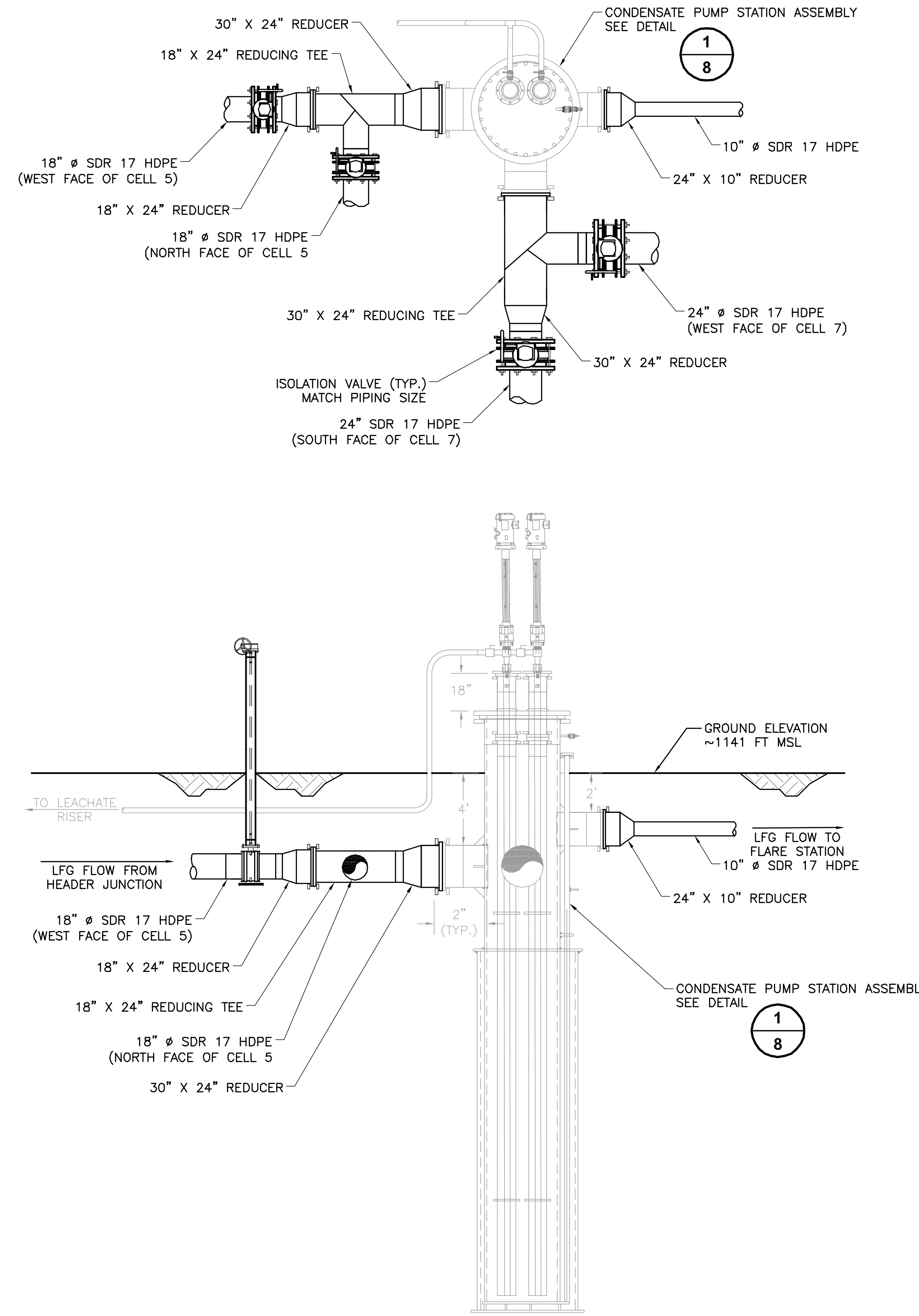
File: J:\COUNTYWIDE – LFG AIR BREAK – 070187\PROJ DWGS\bocweEC01.dwg Layout: 7– RECONFIG User: tod.skidmore Nov 13, 2008 – 1:12pm



CONDENSATE PUMP STATION ASSEMBLY

DETAIL 1/8

SCALE: NOT TO SCALE



CONDENSATE PUMP STATION CS-1

DETAIL 2/8

SCALE: NOT TO SCALE

DRAFT

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 10/30/08 — DRAWN BY TSS — DESIGNED BY TAB — CHECKED BY MC — APPROVED BY BOS

CORNERSTONE Environmental Group, LLC

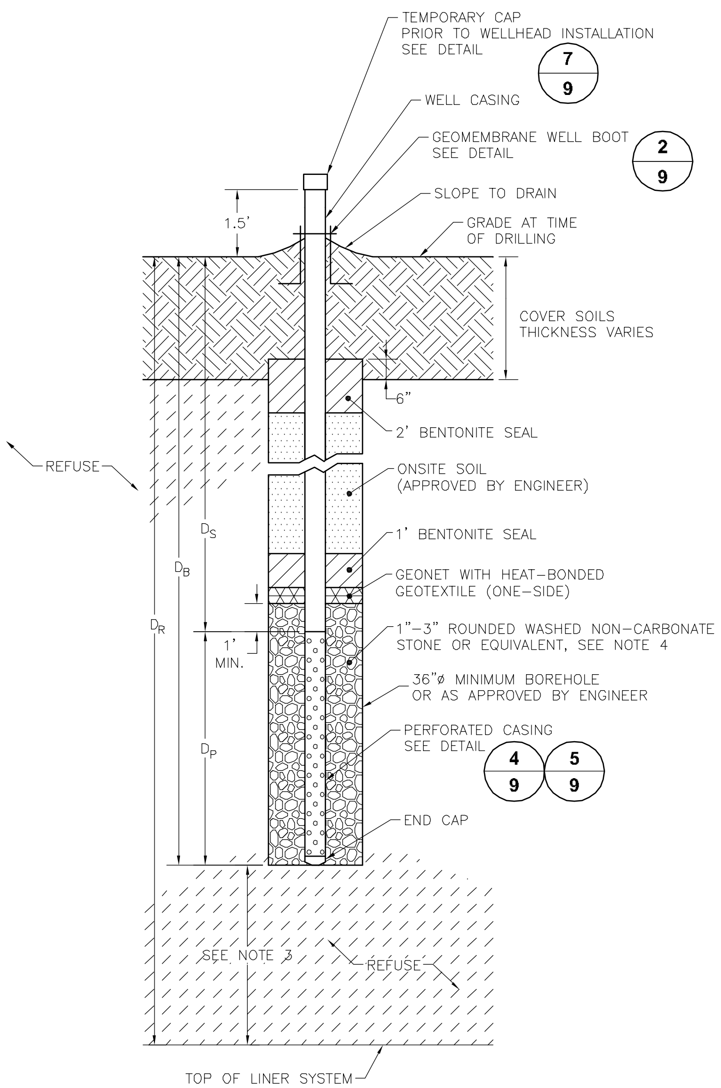
REPUBLIC SERVICES OF OHIO II, LLC
COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
EAST SPARTA, STARK COUNTY, OHIO

GAS, LEACHATE, AND COVER SYSTEM DETAILS (1 OF 4)

FIGURE NO. 8

PROJECT NO. 070197

File: J:\COUNTYWIDE - LFG AIR BREAK - 070187\PROJ DWGS\BOCWDS01.dwg Layout: 8-LFG DETAILS User: tod.skidmore Nov 13, 2008 - 10:21am

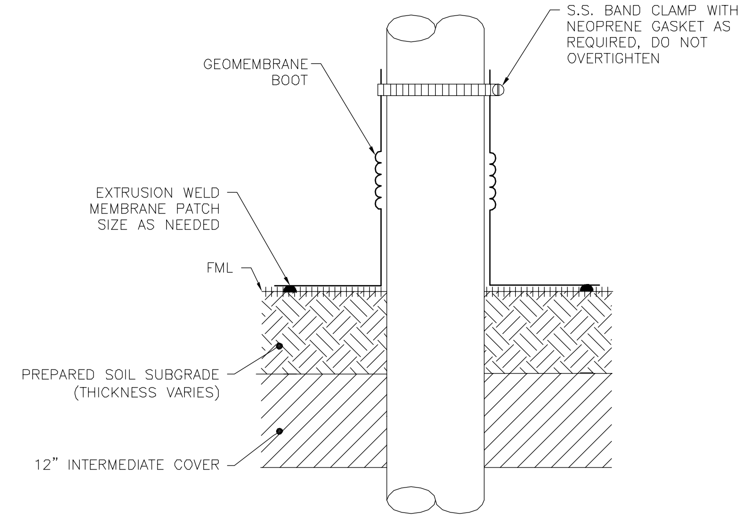


VERTICAL GAS EXTRACTION WELL

DETAIL 1/9
SCALE: NOT TO SCALE

NOTES:

1. D_R = DEPTH OF REFUSE
   D_B = DEPTH OF BORING
   D_S = DEPTH OF SOLID PIPE (BELOW GRADE)
   D_P = LENGTH OF PERFORATED PIPE
2. D_B ~ 75% D_R. 100 FEET MAXIMUM.
3. MINIMUM 20 FEET SEPARATION BETWEEN BASE OF BORING AND TOP OF LINER SYSTEM.
4. LIMESTONE, CRUSHED CONCRETE, AND LIKE MATERIALS ARE NOT APPROVED BACKFILL MATERIALS. TIRE CHIPS MAY BE APPROVED BY ENGINEER.
5. OTHER APPLICABLE MATERIALS MAY BE SUBSTITUTED FOR WELL CASING.
6. CASING SIZE AND WELL BORE DIAMETER MAY BE MODIFIED TO ACCOMMODATE FIELD CONDITIONS.

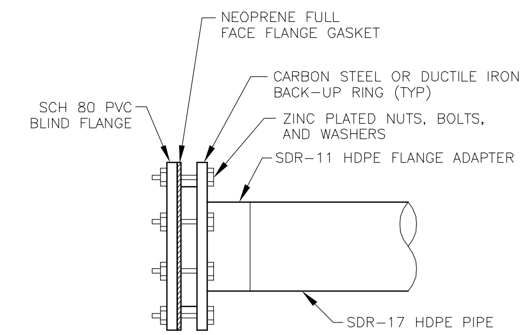


GEOMEMBRANE WELL BOOT

DETAIL 2/9
SCALE: NOT TO SCALE

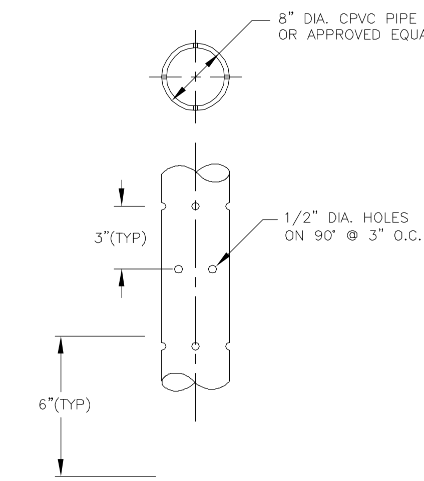
NOTES

1. TYPICAL WELL BOOT SHOWN. APPROVED EQUAL AS PROVIDED BY GEOMEMBRANE LINER INSTALLER.
2. COORDINATE CONSTRUCTION DETAILS WITH GEOMEMBRANE INSTALLER.
3. GEOMEMBRANE BOOT TO BE INSTALLED WITH FOLDS TO ALLOW FOR LOCALIZED WASTE SETTLEMENT.



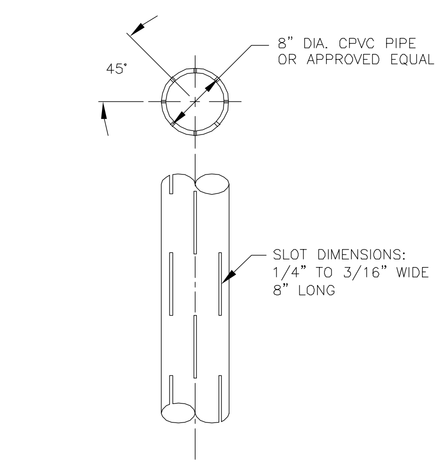
TYPICAL BLIND FLANGE CONNECTION

DETAIL 3/9
SCALE: NOT TO SCALE



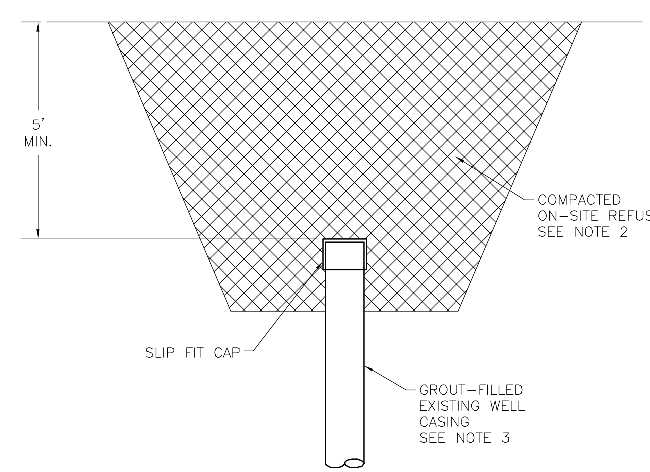
PERFORATED GAS WELL CASING

DETAIL 4/9
SCALE: NOT TO SCALE



SLOTTED GAS WELL PIPE (OPTIONAL)

DETAIL 5/9
SCALE: NOT TO SCALE

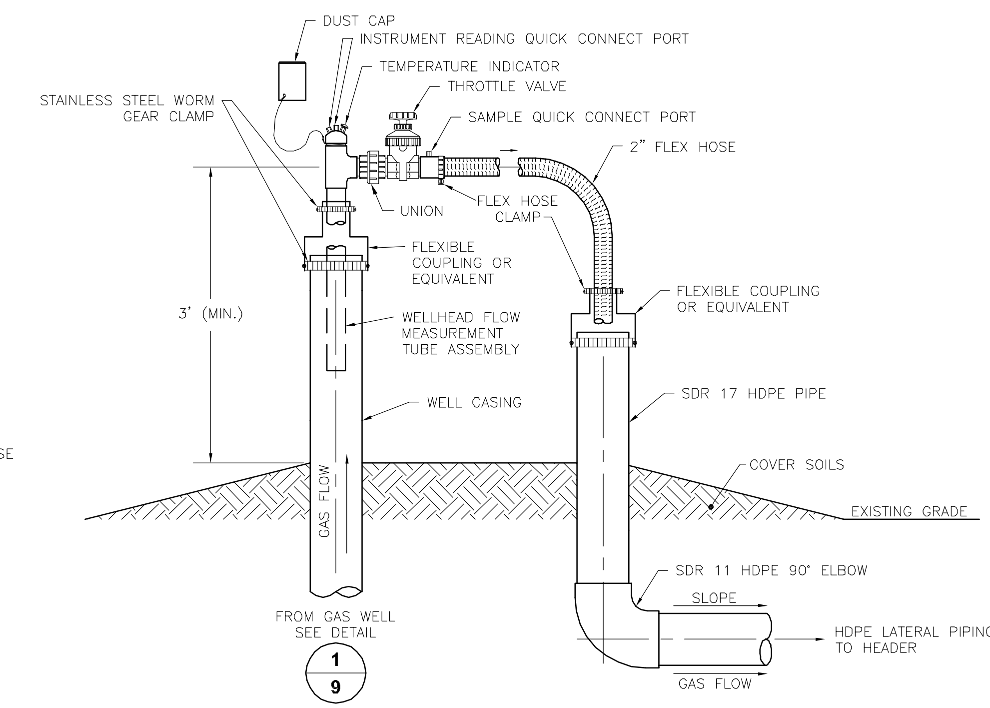


EXTRACTION WELL ABANDONMENT

DETAIL 6/9
SCALE: NOT TO SCALE

NOTES:

1. WELLS ARE TO BE EXCAVATED TO A DEPTH OF NOT LESS THAN FIVE (5) FEET BELOW FINAL EXCAVATED SURFACE GRADE. THE CASING SHALL BE CUT AT THIS POINT, AND CAPPED WITH A PVC SLIP CAP OR APPROVED EQUAL.
2. THE REMAINDER OF THE EXCAVATION IS TO BE BACKFILLED WITH REFUSE. THE REFUSE SHALL BE COMPACTED IN PLACE USING AN EXCAVATOR BUCKET OR OTHER SUITABLE CONSTRUCTION EQUIPMENT.
3. GROUT CASING IN PLACE WITH NEAT CEMENT/BENTONITE GROUT OR APPROVED EQUAL.



WELLHEAD ASSEMBLY

DETAIL 7/9
SCALE: NOT TO SCALE

NOTES:

1. WELLHEAD ASSEMBLY SHOWN REPRESENTS 2" LANDTEC VERTICAL ACCU-FLO MODEL 200 WELLHEAD ASSEMBLY, TEL. 1-800-LANDTEC, FAX 1-909-825-0591.
2. WELLHEAD MAY BE SUBSTITUTED WITH AN APPROVED EQUAL PER ENGINEER.
3. CONTRACTOR TO INSURE DRAINAGE OF SURFACE WATER AWAY FROM THE WELLHEAD.
4. LATERAL PIPING MUST DRAIN TO THE MAIN HEADER, AWAY FROM THE WELLHEAD, AT A MINIMUM SLOPE OF 3%.

DRAFT

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 10/30/08 — DRAWN BY TSS — DESIGNED BY TAB — CHECKED BY MC — APPROVED BY BOS

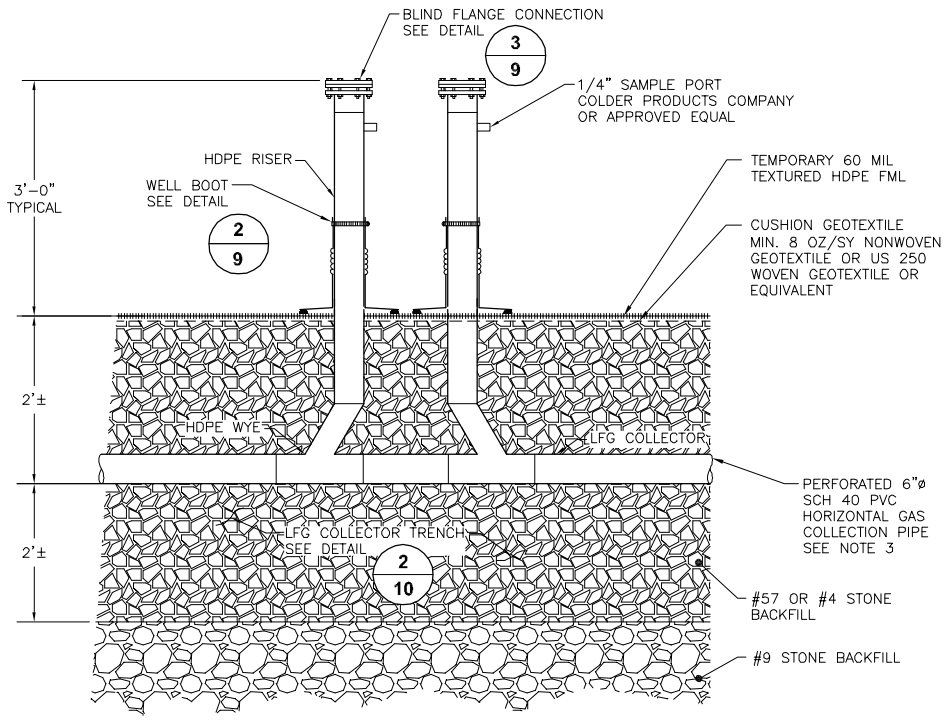
CORNERSTONE Environmental Group, LLC

REPUBLIC SERVICES OF OHIO II, LLC
COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
EAST SPARTA, STARK COUNTY, OHIO

GAS, LEACHATE, AND COVER DETAILS (2 OF 4)

FIGURE NO. 9

PROJECT NO. 070197

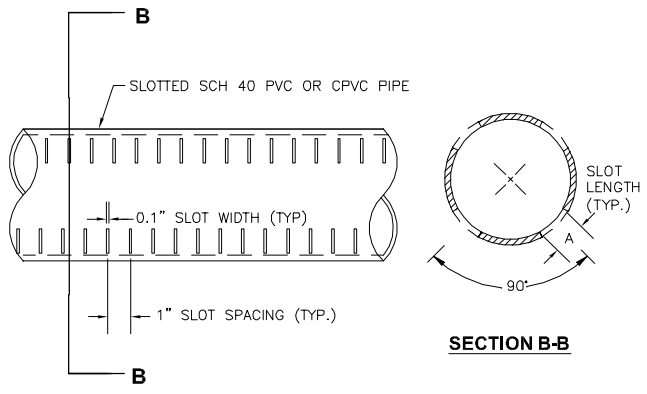


TRENCH ACCESS RISER

DETAIL 1/10
SCALE: 10

NOTES:

1. ACCESS RISER SHALL BE THE SAME DIAMETER AS THE GAS COLLECTION PIPE.
2. ACCESS RISER SPACING TO BE DETERMINED BY FIELD ENGINEER AT TIME OF CONSTRUCTION.
3. GAS COLLECTION PIPE PERFORATIONS WILL BE 1/2" DIAMETER HOLES AT 90° EVERY 3". PATTERN MAY BE ALTERED AS LONG AS THERE ARE 16-1/2"ø HOLES PER FOOT.
4. ONE RISER TO BE OUTFITTED WITH WELL HEAD PER DETAIL 7 SHEET 9.

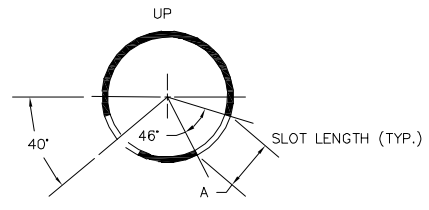


SECTION B-B

NOMINAL PIPE DIAMETER	SLOT LENGTH (A)
6"	2.6"

LEACHATE COLLECTION PIPE

DETAIL 4/10
SCALE: NOT TO SCALE



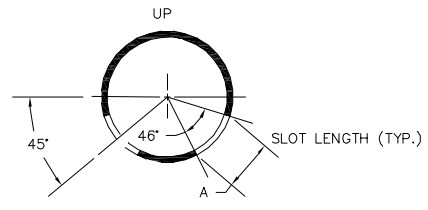
NOTES:

1. FOR LEACHATE COLLECTION PIPING, 6"ø SCH 80 & 40 CPVC.
2. SLOTS SHOWN ARE 0.125" WIDE SPACED BETWEEN 1.75" C/C LEAVING 6" BLANK ON THE PIPE ENDS
3. SLOT DIMENSIONS ARE BASED ON A 5"ø SLOT SAW AND BE REDUCED TO 2.0" WIDE IF BLADE ø USED IS DIFFERENT
4. PIPE TO BE PLACED IN ORIENTATION SHOWN

6"Ø CPVC OR PVC SCH 80 & 40 ,
ALTERNATE LEACHATE COLLECTION PIPE

DETAIL 4A/10
SCALE: NOT TO SCALE

NOTE: DETAILS 3, 4, 8 PROVIDED BY P.J. CAREY ASSOCIATES DRAWING D-1, "TEMPORARY CAP DETAILS", DATED 2/18/08.

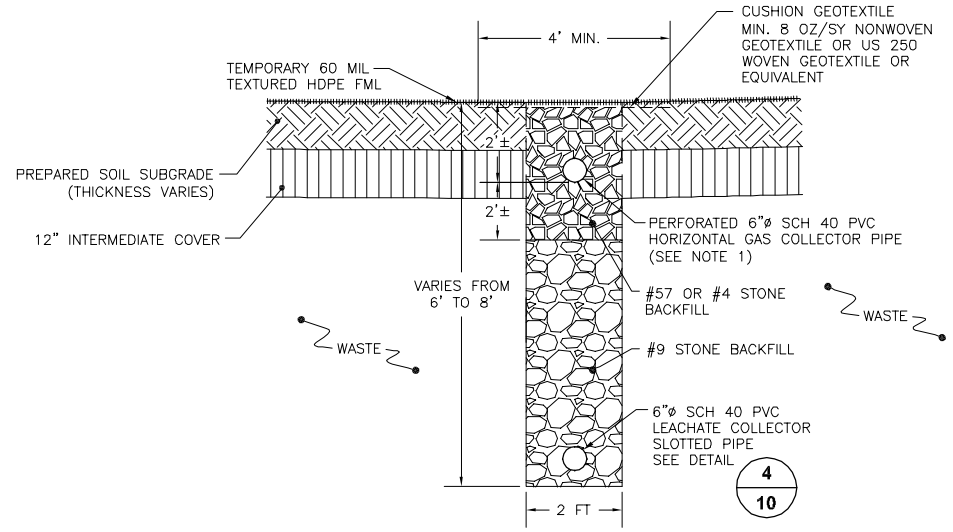


NOTES:

1. FOR LEACHATE COLLECTION PIPING, 8"ø SCH 80 & 40 CPVC.
2. SLOTS SHOWN ARE 0.125" WIDE SPACED 1.5" TO 1.75" C/C LEAVING 6" BLANK ON THE PIPE ENDS
3. SLOT DIMENSIONS ARE BASED ON A 5"ø SLOT SAW AND BE REDUCED TO 2.75" WIDE IF BLADE ø USED IS DIFFERENT
4. PIPE TO BE PLACED IN ORIENTATION SHOWN

8"Ø CPVC OR PVC SCH 80 & 40,
ALTERNATE LEACHATE COLLECTION PIPE

DETAIL 4B/10
SCALE: NOT TO SCALE

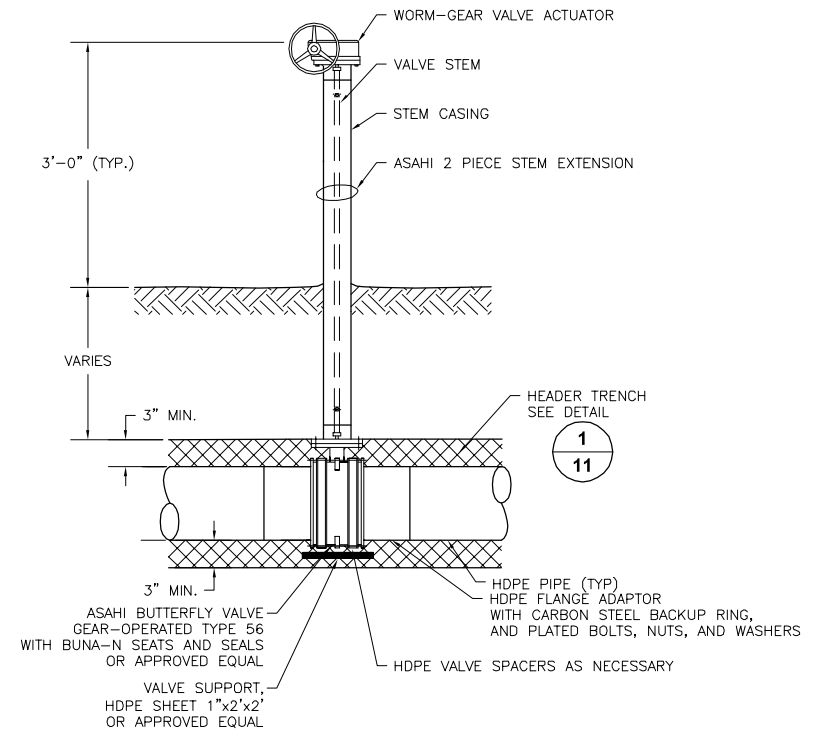


LEACHATE & LFG COLLECTORS

DETAIL 2/10
SCALE: NOT TO SCALE

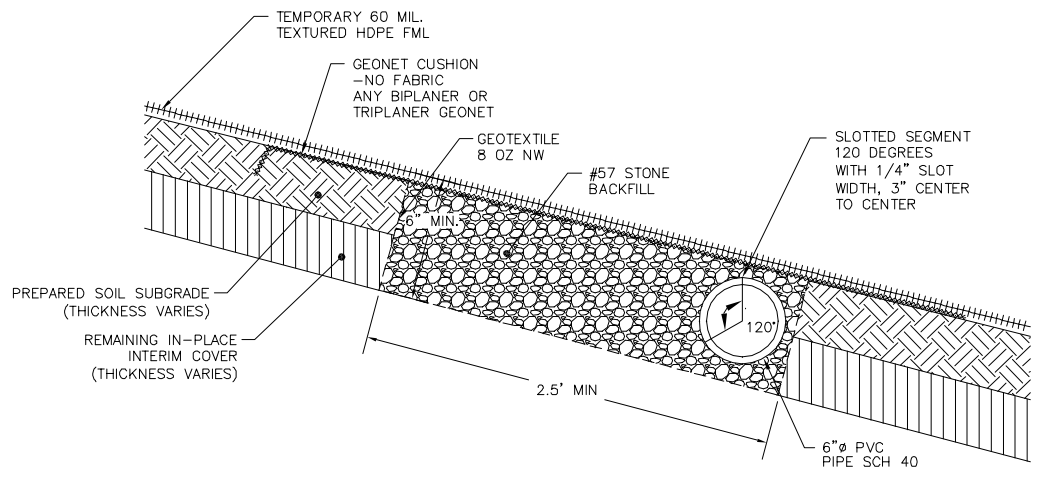
NOTE:

1. GAS COLLECTION PIPE PERFORATIONS WILL BE 1/2" DIAMETER HOLES AT 90° EVERY 3". PATTERN MAY BE ALTERED AS LONG AS THERE ARE 16-1/2"ø HOLES PER FOOT.



CONTROL VALVE

DETAIL 3/10
SCALE: NOT TO SCALE



UNDERCAP COLLECTOR

DETAIL 8/10
SCALE: NOT TO SCALE

NOTE:

1. TEMPORARY GEOTEXTILE FLAP OVER STONE IS ACCEPTABLE AS LONG AS FLAP IS REMOVED PRIOR TO FML INSTALLATION.

DRAFT

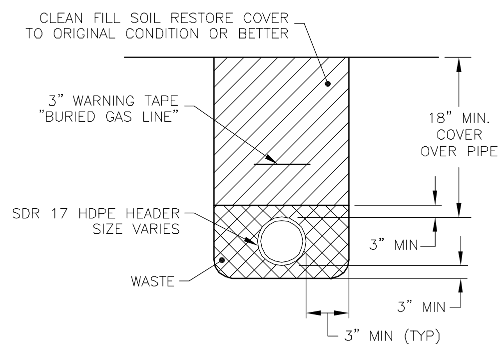
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
	DATE OF ISSUE 10/30/08	DRAWN BY TSS, DESIGNED BY TAB		CHECKED BY MC, APPROVED BY BOS		

CORNERSTONE Environmental Group, LLC

REPUBLIC SERVICES OF OHIO II, LLC
COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
EAST SPARTA, STARK COUNTY, OHIO

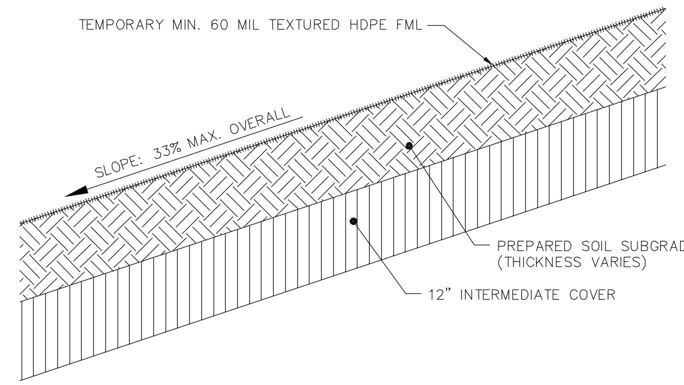
GAS, LEACHATE, AND COVER SYSTEM DETAILS (3 OF 4)

FIGURE NO. **10**
PROJECT NO. 070197



HEADER TRENCH

DETAIL 1/11
SCALE: NOT TO SCALE

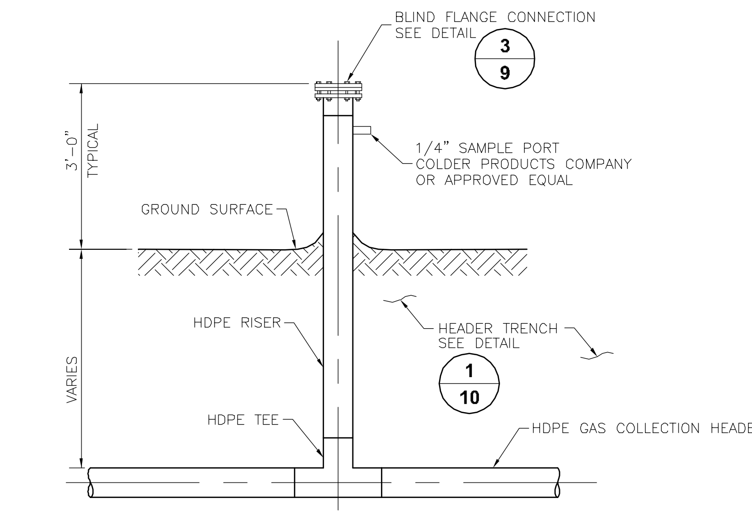


TEMPORARY CAP

DETAIL 2/11
SCALE: NOT TO SCALE

NOTES:

1. FOR SPECIFICATIONS OF TEMPORARY CAP, SEE APPENDIX D OF LANDFILL COVER AND LONG TERM CAPPING PLAN, REVISED JUNE 2008.
2. FOR QA/QC REQUIREMENTS OF TEMPORARY CAP, SEE APPENDIX C OF LANDFILL COVER AND LONG TERM CAPPING PLAN, REVISED JUNE 2008



HEADER ACCESS RISER

DETAIL 3/11
SCALE: NOT TO SCALE

NOTES:

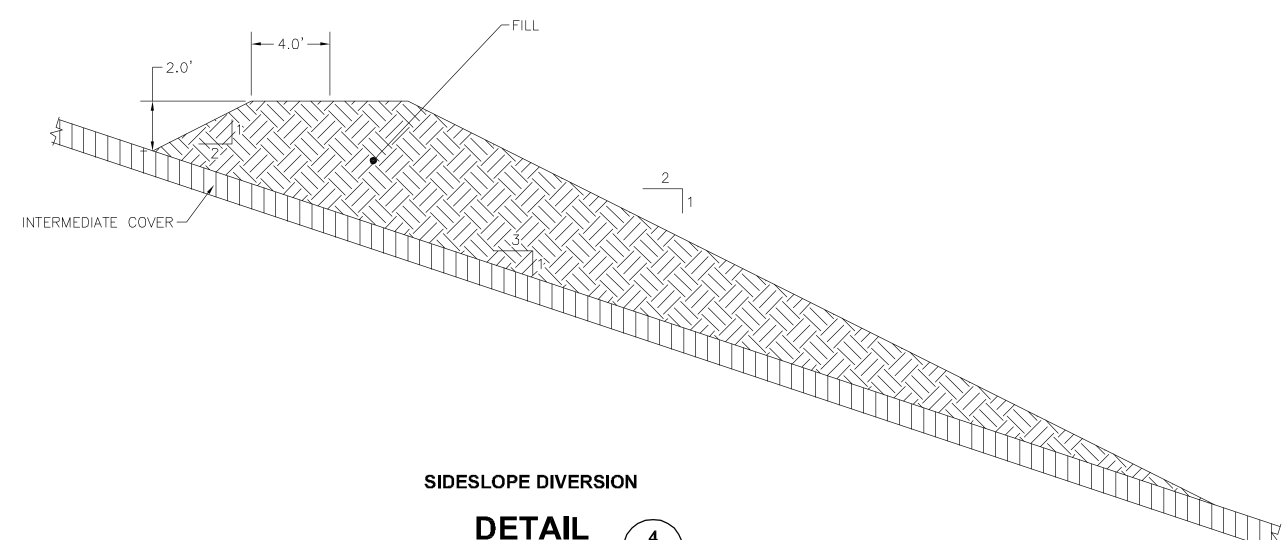
1. ACCESS RISER SHALL BE THE SAME DIAMETER AS THE GAS COLLECTION PIPE.

PIPE MATERIAL SCHEDULE:

TYPE	***DETAIL***	***MIN. PIPE***	***ALT. PIPE***	***SLOT DETAIL***
UNDERCAP COLLECTOR	8/10	6" PVC SCH 40	6" CPVC SCH 40 6" CPVC SCH 80	8/10
LEACHATE COLLECTOR	2/10	6" PVC SCH 40	6" CPVC SCH 40 6" CPVC SCH 80 8" CPVC SCH 40 8" CPVC SCH 80	4/10, 4A/10, 4B/10
LFG COLLECTOR	2/10	6" PVC SCH 40	6" CPVC SCH 40 6" CPVC SCH 80	2/10

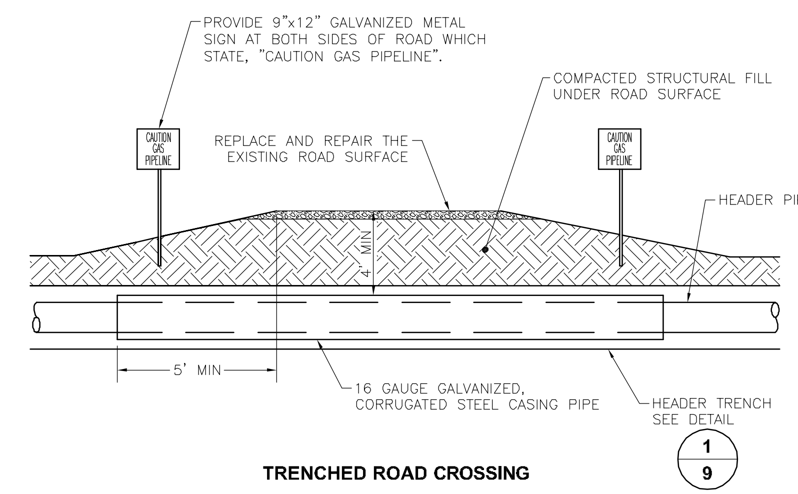
NOTE:

1. IF LANDFILL TEMPERATURES ARE LESS THAN 160° FAHRENHEIT THEN PVC MAY BE USED. IF LANDFILL TEMPERATURES ARE GREATER THAN 160° FAHRENHEIT THEN CPVC MUST BE USED.



SIDESLOPE DIVERSION

DETAIL 4/11
SCALE: NOT TO SCALE



TRENCHED ROAD CROSSING

DETAIL 5/11
SCALE: NOT TO SCALE

PIPE CASING SCHEDULE	
12" HEADER PIPE	18" CASING PIPE OR APPROVED EQUAL

DRAFT

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 10/30/08 — DRAWN BY TSS — DESIGNED BY TAB — CHECKED BY MC — APPROVED BY BOS

CORNERSTONE Environmental Group, LLC

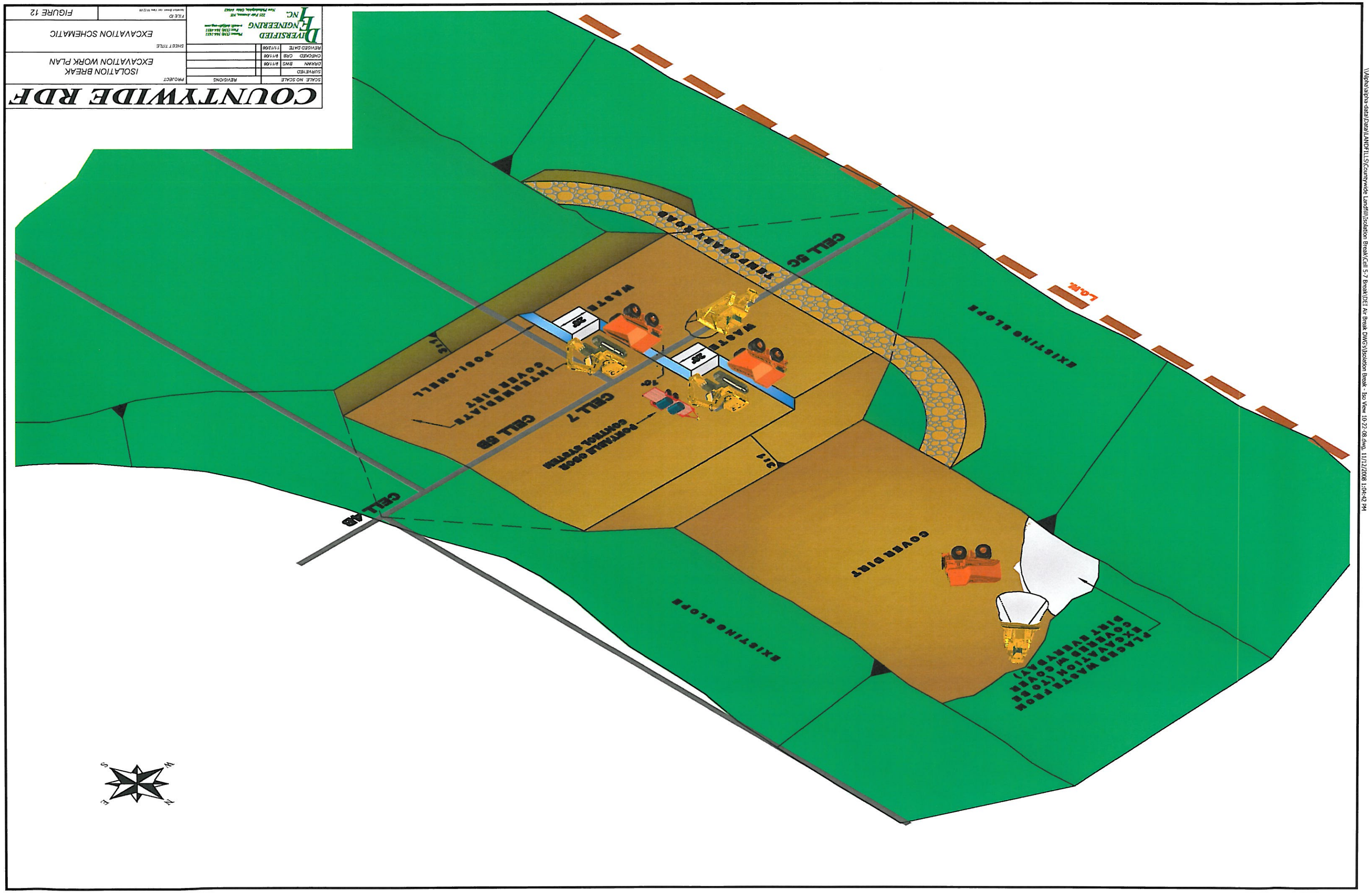
REPUBLIC SERVICES OF OHIO II, LLC
COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
EAST SPARTA, STARK COUNTY, OHIO

GAS, LEACHATE, AND COVER SYSTEM DETAILS (4 OF 4)

FIGURE NO. **11**

PROJECT NO. 070197

File: J:\COUNTYWIDE - LFG AIR BREAK - 070187\PROJ DWGS\B0cw0504.dwg Layout: 11-LFG DETAILS User: tod.skidmore Nov 13, 2008 - 2:16pm



COUNTYWIDE RDF

SCALE: NO SCALE	REVISIONS	PROJECT
SURVEYED		ISOLATION BREAK EXCAVATION WORK PLAN
DRAWN BWS 9/1/08		
CHECKED CRB 9/1/08		
REVISED DATE 11/12/08		SHEET TITLE
		EXCAVATION SCHEMATIC

DIVERSIFIED ENGINEERING NC
225 Fox Avenue, NE
New Philadelphia, Ohio 44663
Phone: (330) 364-4881
Fax: (330) 364-4881
e-mail: info@dfnc.com

FILE ID: Isolation Break - ISO View 10-22-08.dwg

FIGURE 12

\\Alpha\alpha-data\Data\LANDFILLS\Countywide Landfill\Isolation Break\Cell 5-7 Break\DET Air Break DWGs\Isolation Break - Iso View 10-22-08.dwg, 11/12/2008 1:04:42 PM

APPENDIX A

Evaluation of Presence and Location of Aluminum Waste in Isolation Break Area

Appendix A

Aluminum Waste was received at CWRDF during the 1990's until June 15th, 2006. During that time quarterly topographic surveys were performed at the end of each quarter to calculate the density of the waste placement. Another record kept since 2005 is daily fill placement map; these maps show the approximate waste placement location on a daily basis.

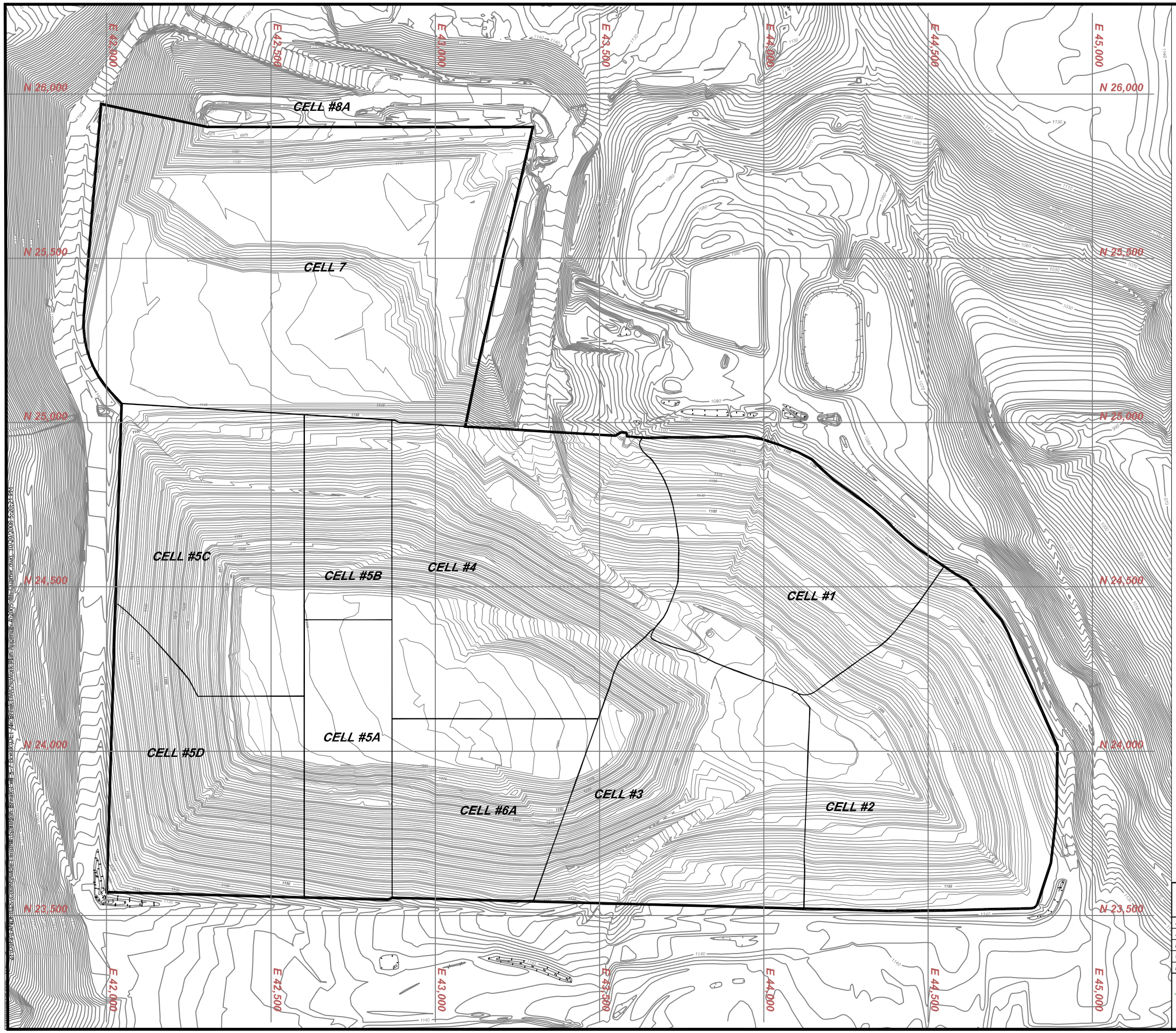
Operations began in the floor of Cell 7 on February 1, 2005. All Waste that was placed in Cell 7 during 2005 was below the elevation of the Cell 5/7 berm (see sheet 1). During the first quarter of 2006 the waste placement reached an elevation higher than the 5/7 berm. Based on daily fill placement map, waste was placed at an elevation higher than the 5/7 berm during two time periods (02/22/2006 – 03/24/2006 and 05/18/2006 – 06/07/2006).

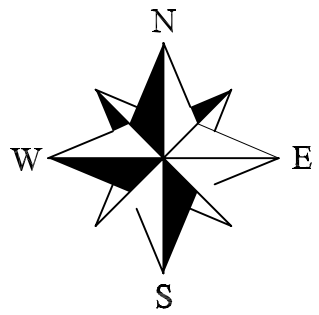
Because the site stopped accepting aluminum waste on June 15, 2006 no aluminum waste will be encountered above the grades of the July 1, 2006 topo survey (see sheet 2). When the July 1 topo is compared to the waste excavation grades, we can determine that there is 84,000 cubic yards of waste to be excavated that may contain aluminum waste (see sheet 3).

We know that the filling above the berm took place during two specific time periods while the site was receiving aluminum waste. We overlaid the waste excavation plan on the daily fill placement maps and prorated the amount of aluminum waste received for each day based on the percentage of the working face that is in the waste excavation area. This calculation yielded 160 tons of aluminum waste likely to be encountered during the waste excavation process (see table below).

Aluminum Waste Placed Within Proposed Cell 5/7 Excavation Limits
Prorated for Average Excavation Footprint of Each Previously Placed Lift

Quarter 1 (Average Footprint Elev. = 1150')		
Type:	Furnace Baghouse Dust	Shredder Cyclone
Total Tonage:	**28.51**	**1.93**
Quarter 2 (Average Footprint Elev. = 1170')		
Type:	Furnace Baghouse Dust	Shredder Cyclone
Total Tonage:	**113.72**	**17.06**
Type Totals:	**142.23**	**18.99**
Grand Total:	**161.22**	





COUNTYWIDE RDF

SCALE: 1" = 300'		REVISIONS	
SURVEYED:			
DRAWN: CWH	10-29-08		
CHECKED: CRB	10-29-08		
REVISED DATE:			

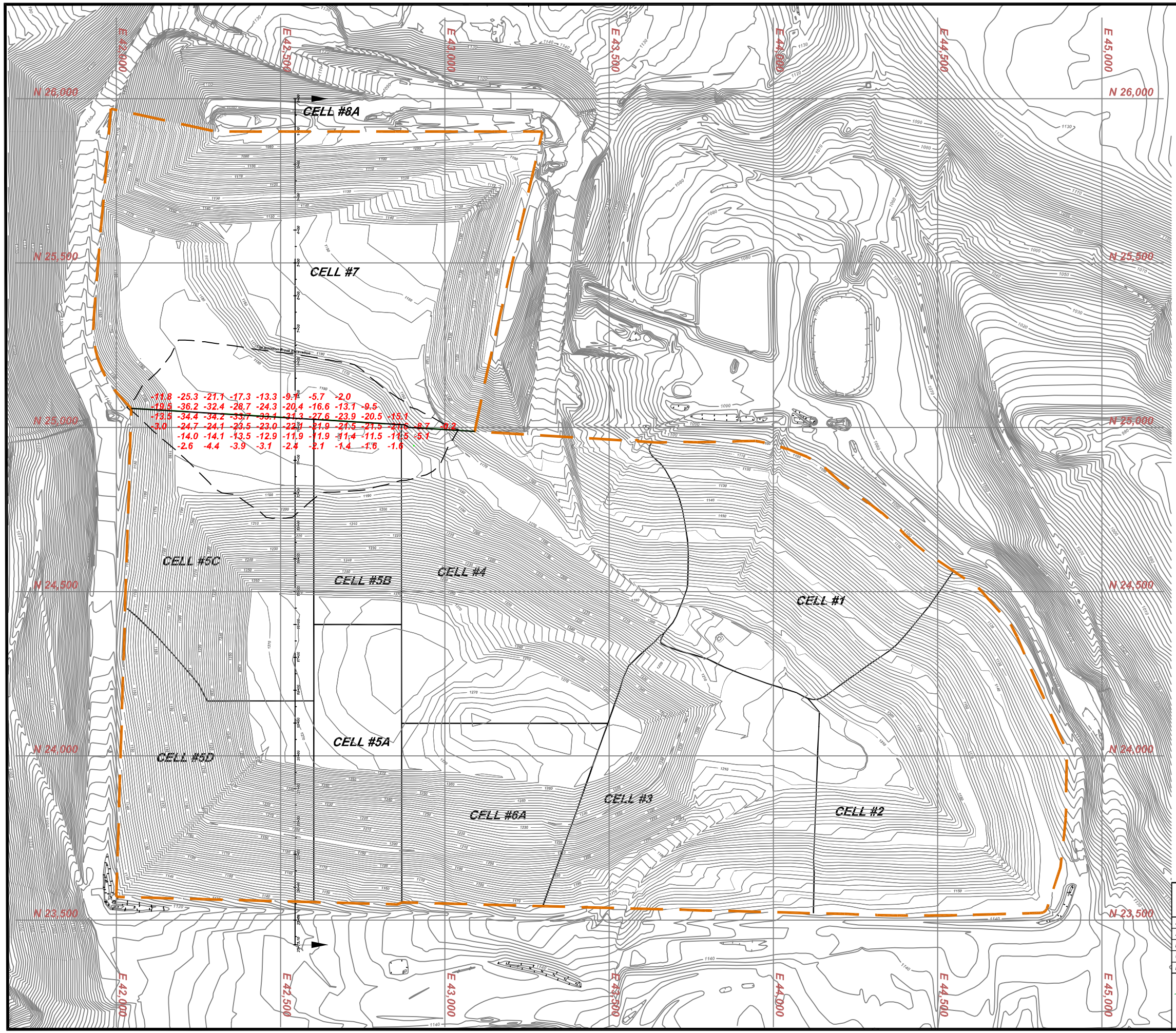
DIVERSIFIED ENGINEERING INC.
Phone: (330) 364-1631
Fax: (330) 364-0931
e-mail: dei@div-eng.com
225 Fair Avenue, NE
New Philadelphia, Ohio 44663

PROJECT:
APPENDIX A

SHEET TITLE:
PLAN VIEW
EXISTING GROUND 01-03-2006

FILE ID:
2005 4th Quarter.dwg

SHEET 1 OF 3



NOTES:

1. ALL ALUMINUM BAG WASTE RECIEPT HALTED ON JUNE 15, 2006

2. VOLUME OF ALL WASTE ACCEPTED BEFORE 07-01-2006 WITHIN THE ISOLATION BREAK PRIOR TO HALTING ALUMINUM BAG WASTE IS 84,000 CY.

3. WITHIN THE 84,000 CY OF MATERIAL APPROXIMATELY 161 TONS MAY BE ALUMINUM BAG WASTE; BASED ON REVIEW OF DAILY WASTE DISPOSAL RECORDS.

-36.2 = DIFFERENCE BETWEEN 07-01-2006 WASTE GRADES AND PROPOSED ISOLATION BREAK GRADES

COUNTYWIDE RDF

SCALE: 1" = 300'		REVISIONS	
SURVEYED:			
DRAWN:	CWH	10-28-08	
CHECKED:	CRB	10-28-08	
REVISED DATE:		11-14-08	

PROJECT:

APPENDIX A

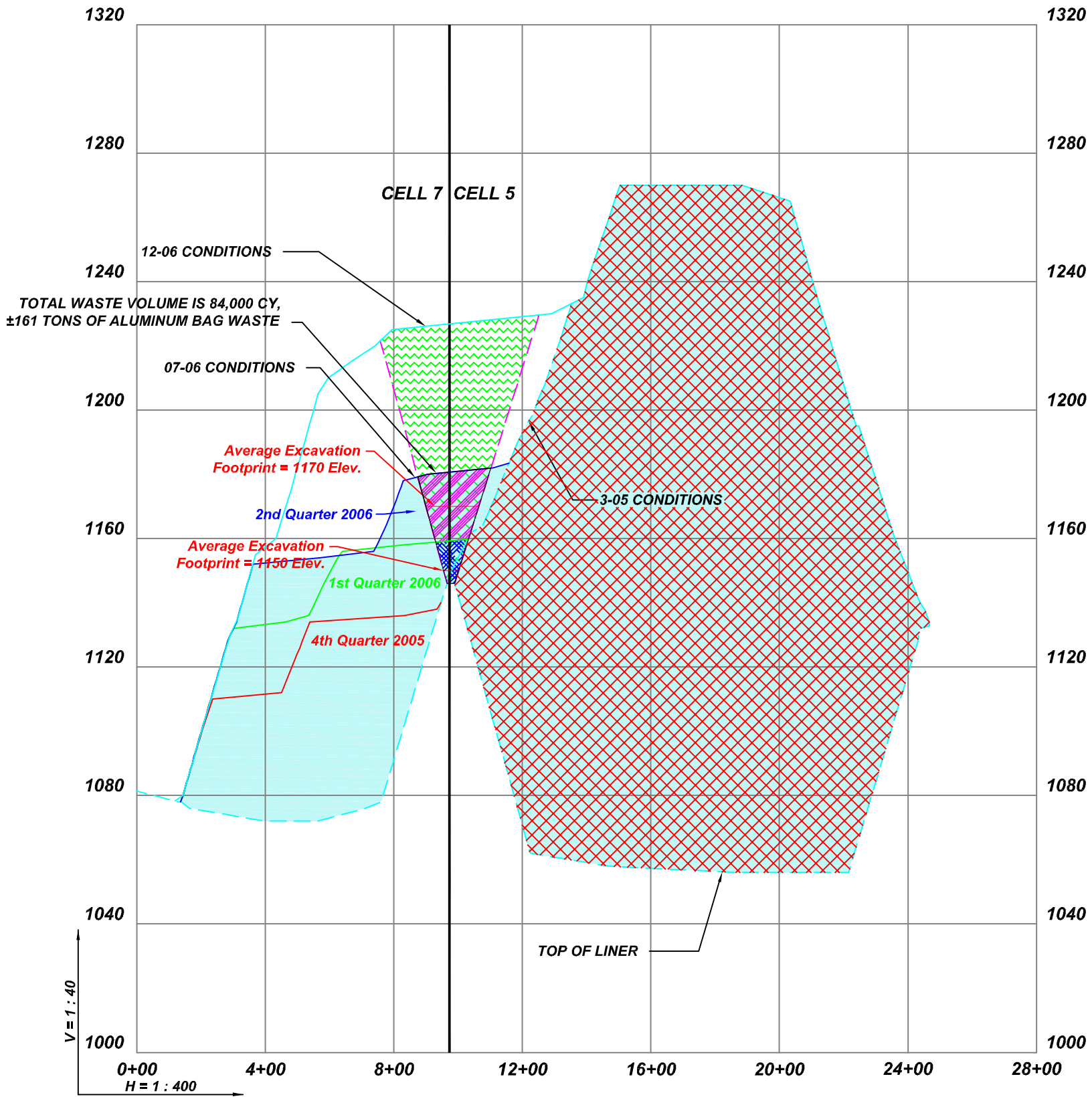
SHEET TITLE:

PLAN VIEW
EXISTING GROUND 07-01-2006

DIVERSIFIED ENGINEERING INC.
225 Fair Avenue, NE
New Philadelphia, Ohio 44663
Phone: (330) 364-1631
Fax: (330) 364-4031
e-mail: dei@div-eng.com

FILE ID: Cell5&7 Cross Section Revised 10-27-08

SHEET 2 OF 3



SALT CAKE DISPOSAL AREA

SHREDDER CYCLONE/DELAC AND BAGHOUSE DISPOSAL AREA

PROPOSED WASTE EXCAVATION AREA

1ST LIFT 2006

2ND LIFT 2006

COUNTYWIDE RDF

SCALE: 1" = 400'		REVISIONS	
SURVEYED:			
DRAWN: CWH	10-28-08		
CHECKED: CRB	10-28-08		
REVISED DATE:	11-14-08		

DIVERSIFIED ENGINEERING INC.
Phone: (330) 364-1631
Fax: (330) 364-4931
e-mail: dei@dei-eng.com
225 Fair Avenue, NE
New Philadelphia, Ohio 44663

PROJECT:
APPENDIX A

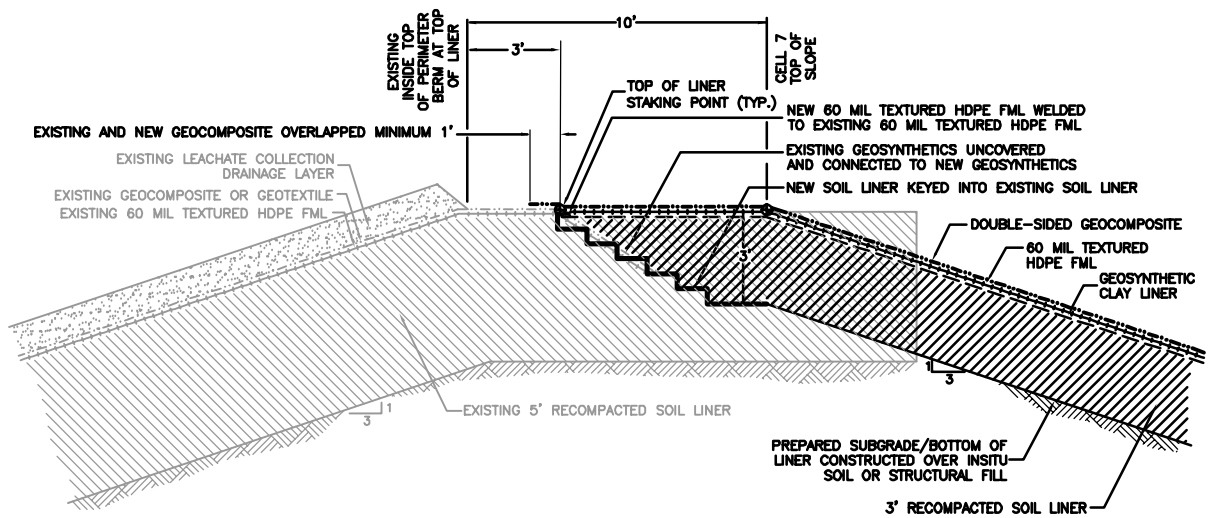
SHEET TITLE:
CELLS 5 & 7 CROSS SECTION

FILE ID:
Cell5&7 Cross Section Revised 10-27-08

SHEET 3 OF 3

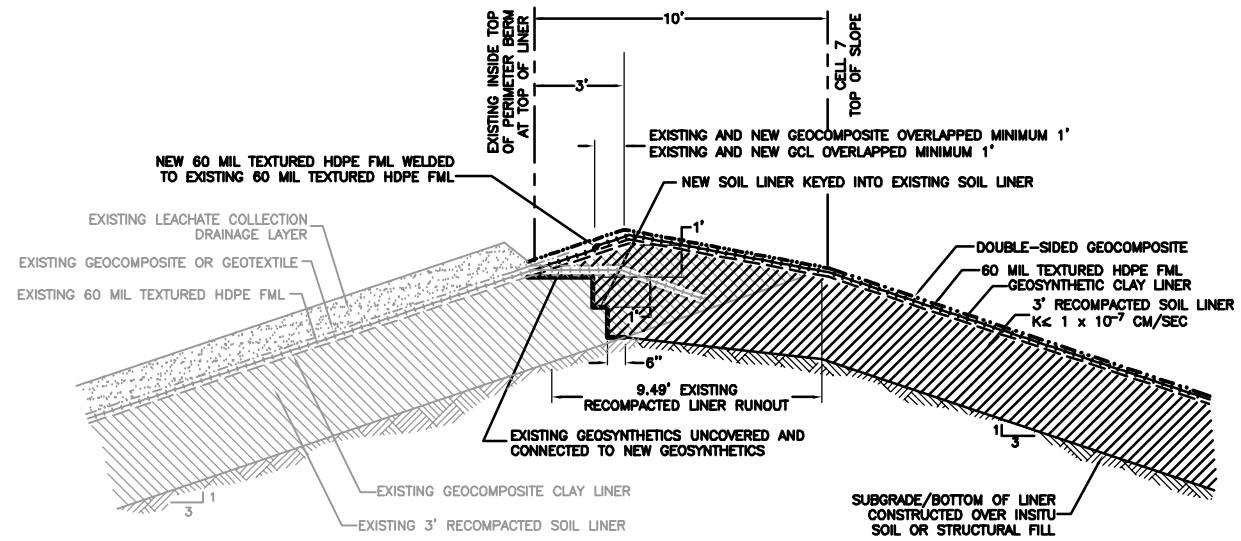
APPENDIX B

As-Built Information for Cell 5/7 Berm



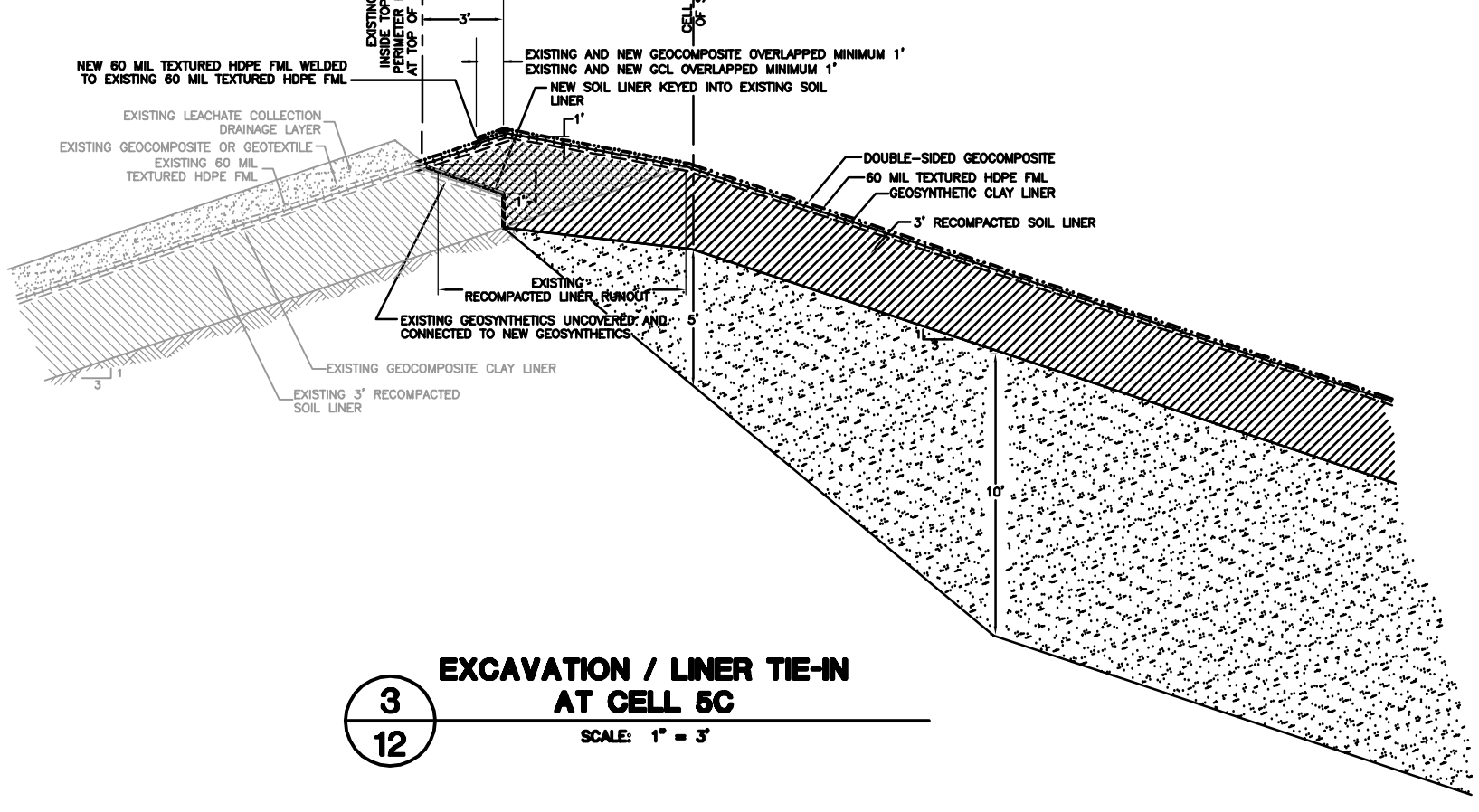
1/12 EXCAVATION / LINER TIE-IN AT CELL 4B

SCALE: 1" = 3'



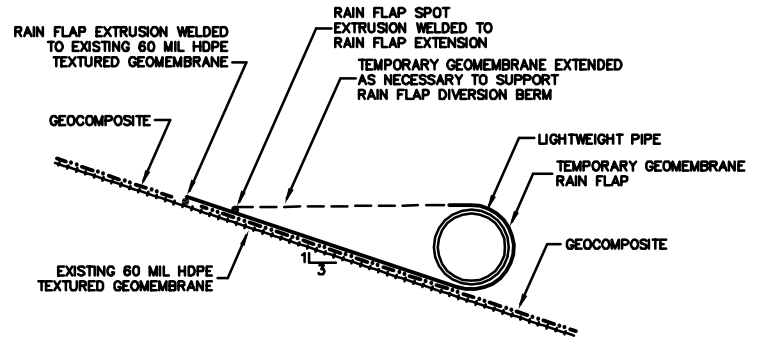
2/12 EXCAVATION / LINER TIE-IN AT CELL 5B

SCALE: 1" = 3'



3/12 EXCAVATION / LINER TIE-IN AT CELL 5C

SCALE: 1" = 3'



4/12 TEMPORARY SIDESLOPE RAIN FLAP DIVERSION BERM

SCALE: 1" = 1'

NOTES:

1. THE DEPTH OF EXISTING SOIL OVER EXISTING GEOSYNTHETICS VARIES. EXISTING LINER DETAILS OBTAINED FROM CERTIFICATION REPORTS.
2. BASE DRAWING ADAPTED FROM "LVCWDSO7B.DWG, LINER TIE-IN DETAILS," PROVIDED BY SHAW/EMCON, DATED 11/08/02.

Golder Associates
Lansing, Michigan

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

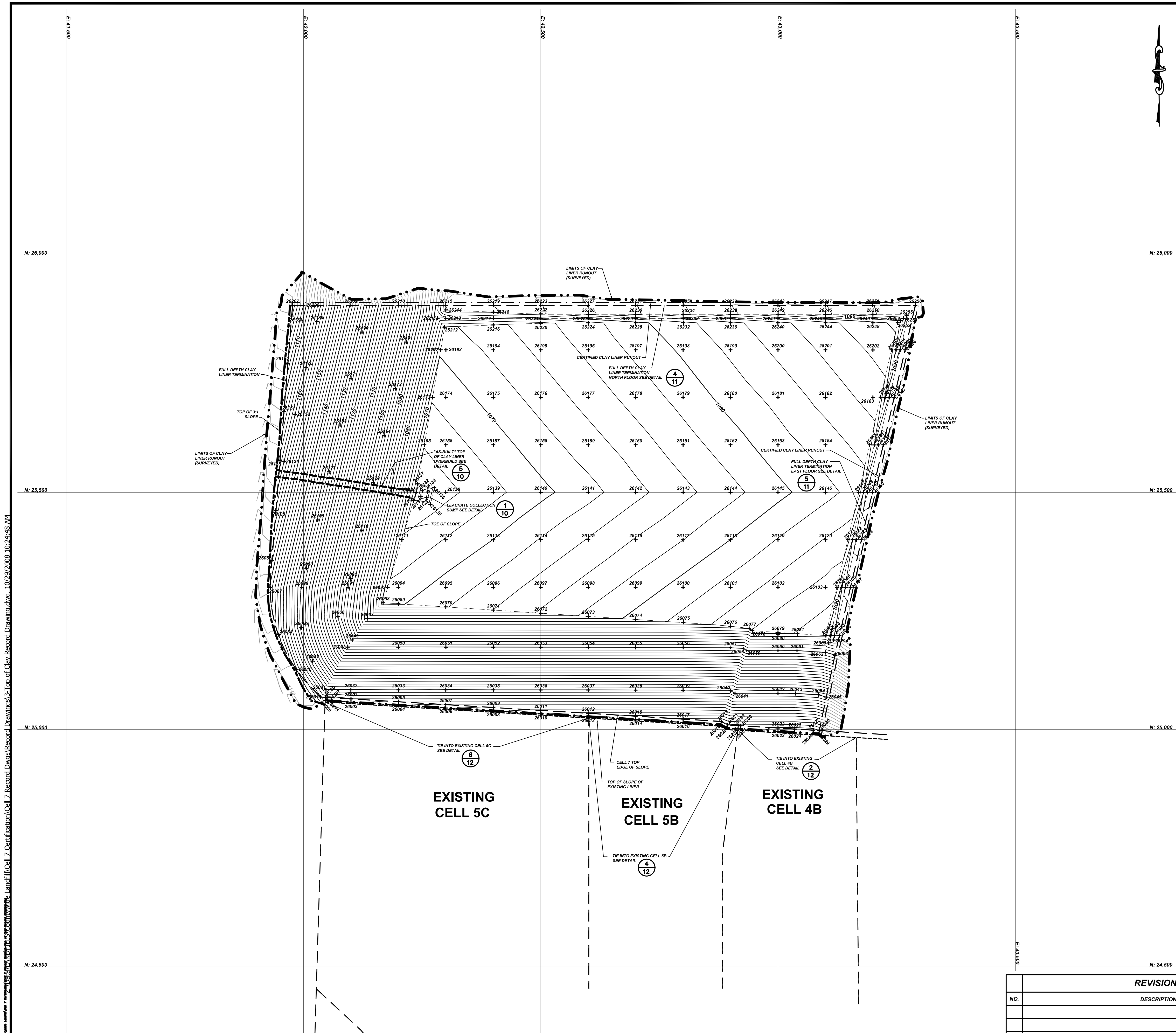
REPUBLIC SERVICES OF OHIO
COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
CELL 7 CONSTRUCTION
EAST SPARTA, STARK COUNTY, OHIO

TITLE

LINER TIE-IN DETAILS

PROJECT No.		043-8956
FILE No.		8956.0006-012
REV. 0	SCALE	AS SHOWN
DESIGN	DGS	11/08/02
CADD	JJS	11/08/04
CHECK		
REVIEW		

FIGURE 12



LEGEND:

- TOP OF LINER RECORD CONTOURS - 2FT INTERVAL
- CLAY LINER RUNOUT CONTOURS - 2FT INTERVAL
- LIMITS OF CLAY LINER RUNOUT AS SURVEYED BY DEI
- 26099 + CERTIFIED POINT

POINT	NORTHING	EASTING	ELEVATION
26000	25061.07	42045.79	1135.44
26001	25068.69	42035.54	1136.28
26002	25064.75	42100.06	1136.38
26003	25057.69	42100.06	1137.59
26004	25051.68	42199.99	1139.78
26005	25058.73	42200.02	1138.55
26006	25045.56	42299.92	1141.78
26007	25052.53	42299.96	1140.38
26008	25039.60	42399.97	1143.65
26009	25046.53	42399.98	1142.40
26010	25033.38	42499.97	1145.85
26011	25040.38	42499.95	1144.48
26012	25034.40	42599.94	1146.43
26013	25027.39	42600.05	1147.87
26014	25021.16	42699.92	1149.79
26015	25028.24	42699.94	1148.43
26016	25015.27	42800.00	1151.69
26017	25022.24	42799.98	1150.42
26018	25010.36	42878.27	1153.23
26019	25016.99	42880.15	1151.96
26020	25002.95	42892.08	1153.47
26021	25009.85	42894.04	1152.54
26022	25003.29	43000.04	1154.30
26023	24996.45	43000.03	1154.63
26024	24994.22	43035.11	1155.38
26025	25001.14	43035.50	1155.15
26026	24991.86	43073.62	1155.43
26027	24998.84	43074.13	1155.18
26029	24991.16	43085.64	1154.79
26030	24998.08	43086.99	1154.07
26031	25083.88	42047.43	1130.17
26032	25083.83	42099.98	1130.11
26033	25083.71	42199.98	1130.03
26034	25083.65	42299.90	1130.15
26035	25083.58	42400.01	1130.05
26036	25083.51	42500.07	1130.03
26037	25083.46	42599.95	1130.09
26038	25083.32	42699.96	1130.03
26039	25083.15	42799.92	1130.03
26040	25081.88	42900.00	1130.01
26041	25076.16	42909.37	1130.10
26042	25076.25	43000.02	1130.11
26043	25076.10	43037.33	1130.02
26044	25073.31	43084.89	1130.03
26045	25068.67	43101.63	1130.01
26046	25126.55	41985.17	1140.02
26047	25144.53	42018.79	1127.17
26048	25173.87	42093.44	1100.12
26049	25188.95	42102.59	1095.16
26050	25173.71	42200.03	1100.06
26051	25173.59	42300.08	1100.06
26052	25173.64	42400.03	1100.02
26053	25173.46	42499.95	1100.05
26054	25173.40	42599.99	1100.11
26055	25173.37	42699.91	1100.06
26056	25173.26	42800.07	1100.06
26057	25172.25	42899.98	1100.04
26058	25170.97	42926.45	1100.09
26059	25166.19	42934.45	1100.02
26060	25166.24	43000.03	1100.02
26061	25166.20	43040.06	1100.08
26062	25162.60	43099.99	1100.04
26063	25156.96	43119.97	1100.10
26064	25200.28	41947.96	1144.29
26065	25215.05	41995.78	1127.22
26066	25238.47	42072.74	1100.04
26067	25233.81	42134.19	1080.09
26068	25267.22	42167.74	1069.01
26069	25265.04	42199.99	1069.71
26070	25258.51	42299.93	1071.87
26071	25251.89	42400.02	1074.02
26072	25245.16	42500.06	1076.27
26073	25238.65	42600.02	1078.46
26074	25232.09	42699.94	1080.60
26075	25226.22	42800.53	1082.71
26076	25217.57	42899.94	1084.93
26077	25213.18	42939.15	1085.87
26078	25208.43	42945.77	1086.06
26079	25204.78	43000.01	1087.26
26080	25200.07	43000.04	1088.84
26081	25201.86	43041.08	1088.19
26082	25198.18	43100.91	1089.67
26083	25182.59	43106.94	1092.86
26084	25197.97	43110.49	1092.58
26085	25197.92	43119.10	1089.87
26086	25198.06	43129.41	1090.07
26087	25299.37	41929.93	1149.38
26088	25356.93	41933.61	1152.23
26089	25299.64	41996.65	1127.25
26090	25339.96	42006.27	1127.18
26091	25300.03	42093.92	1095.08
26092	25318.36	42099.23	1095.01
26093	25300.02	42177.58	1068.36
26094	25300.11	42199.96	1068.73
26095	25299.99	42300.03	1070.79
26096	25299.91	42400.06	1072.80
26097	25300.03	42499.97	1074.81
26098	25299.94	42600.04	1076.81
26099	25300.09	42699.94	1078.77
26100	25300.00	42800.00	1080.77
26101	25300.00	42900.00	1082.73
26102	25300.04	43000.03	1084.74
26103	25299.94	43099.97	1086.63
26104	25300.03	43124.13	1087.27
26105	25300.02	43134.10	1090.34
26106	25299.89	43142.56	1087.63
26107	25299.86	43152.80	1087.73
26108	25462.42	41941.99	1157.64
26109	25441.65	42030.20	1127.19
26110	25419.89	42123.08	1095.02
26111	25400.05	42207.49	1066.26
26112	25400.02	42299.97	1068.13
26113	25400.01	42399.98	1070.02
26114	25400.09	42500.04	1072.13
26115	25400.06	42600.03	1074.12
26116	25400.03	42699.92	1076.14
26117	25400.00	42800.00	1077.98
26118	25400.00	42900.00	1080.01
26119	25400.05	43000.01	1082.11
26120	25399.97	43100.00	1084.12
26121	25400.15	43147.20	1084.99
26122	25400.20	43157.28	1088.06
26123	25399.99	43165.65	1085.36
26124	25400.04	43175.93	1085.54
26125	25567.56	41950.61	1163.12
26126	25565.54	41959.09	1160.05
26127	25543.20	42054.00	1127.19
26128	25521.24	42146.94	1095.12
26129	25482.69	42232.20	1064.44
26130	25499.92	42237.47	1064.19
26131	25491.49	42247.52	1060.54
26132	25503.11	42250.21	1060.55
26133	25488.78	42259.17	1060.67
26134	25500.51	42261.93	1060.76
26135	25474.58	42267.37	1065.36
26136	25509.46	42275.67	1065.07
26137	25517.80	42240.63	1064.54
26138	25500.09	42300.02	1065.40
26139	25500.01	42399.97	1067.44
26140	25499.99	42500.02	1069.44
26141	25500.05	42600.05	1071.30
26142	25499.98	42700.00	1073.44
26143	25499.94	42800.12	1075.43
26144	25499.99	42899.99	1077.38
26145	25499.95	42999.97	1079.42
26146	25499.94	43099.98	1081.38
26147	25500.01	43170.21	1082.85
26148	25499.92	43180.03	1085.91
26149	25499.94	43188.67	1083.08
26150	25499.98	43199.04	1083.28
26151	25669.60	41958.83	1168.14
26152	25664.08	41982.23	1160.01
26153	25641.72	42077.15	1127.20
26154	25619.89	42170.05	1095.02
26155	25600.04	42254.73	1066.12
26156	25600.01	42300.03	1067.09
26157	25600.04	42399.96	1069.10
26158	25600.05	42499.99	1071.11
26159	25599.92	42599.98	1073.07
26160	25599.94	42700.05	1075.06
26161	25600.00	42800.00	1077.10
26162	25600.00	42900.00	1079.08
26163	25599.98	42999.99	1081.10
26164	25600.03	43100.02	1082.98
26165	25600.00	43193.15	1084.92
26166	25599.87	43202.78	1088.08
26167	25599.88	43211.58	1085.32
26168	25600.05	43221.86	1085.45
26169	25771.63	41967.26	1173.24
26170	25762.75	42005.42	1160.01
26171	25740.38	42100.35	1127.23
26172	25718.54	42193.26	1095.02
26173	25700.04	42272.03	1068.23
26174	25699.99	42300.03	1068.80
26175	25700.02	42400.00	1070.80
26176	25700.02	42500.02	1072.79
26177	25700.05	42599.94	1074.81
26178	25700.06	42700.00	1076.78
26179	25700.00	42800.00	1078.74
26180	25700.00	42900.00	1080.77
26181	25700.00	43000.00	1082.68
26182	25699.96	43099.97	1084.78
26183	25700.06	43200.03	1086.74
26184	25700.28	43216.21	1087.10
26185	25699.88	43225.74	1090.29
26186	25700.03	43234.58	1087.47
26187	25700.01	43244.89	1087.66
26188	25871.31	41975.19	1178.31
26189	25859.34	42028.20	1160.00
26190	25837.67	42123.29	1127.25
26191	25816.61	42216.42	1095.05
26192	25800.04	42289.27	1070.29
26193	25799.99	42300.09	1070.49
26194	25800.02	42400.07	1072.48
26195	25800.01	42499.97	1074.46
26196	25800.03	42600.03	1076.46
26197	25800.06	42700.00	1078.49
26198	25800.00	42800.00	1080.34
26199	25800.00	42900.00	1082.38
26200	25800.00	43000.00	1084.44
26201	25800.03	43100.03	1086.38
26202	25799.92	43199.95	1088.31
26203	25799.96	43239.05	1089.16
26204	25799.93	43248.73	1092.33
26205	25800.04	43257.56	1089.65
26206	25800.01	43267.82	1089.69
26207	25893.94	41976.95	1179.42
26208	25894.00	41999.97	1171.92
26209	25893.98	42099.99	1139.11
26210	25894.03	42200.01	1106.32
26211	25866.73	42282.78	1077.53
26212	25847.76	42297.43	1071.33
26213	25866.80	42300.01	1077.39
26214	25884.06	42299.96	1072.30
26215	25894.09	42300.04	1072.25
26216	25852.42	42400.06	1073.37
26217	25866.64	42399.93	1078.10
26218	25879.50	42400.02	1073.68
26219	25894.00	42399.94	1074.05
26220	25855.90	42500.01	1075.43
26221	25866.63	42500.05	1078.64
26222	25875.82	42500.08	1075.78
26223	25893.96	42500.06	1075.91
26224	25856.96	42599.99	1077.31
26225	25866.56	42600.10	1080.59
26226	25874.95	42599.98	1077.64
26227	25894.02	42599.94	1078.09
26228	25856.94	42699.99	1079.44
26229	25866.51	42700.05	1082.57
26230	25875.01	42700.06	1079.77
26231	25894.10	42700.02	1079.93
26232	25857.18	42800.39	1081.45
26233	25866.51	42800.10	1084.41
26234	25874.96	42799.91	1081.68
26235	25894.02	42800.07	1081.91
26236	25857.00	42900.00	1083.44
26237	25866.46	42900.01	1086.46
26238	25875.02	42900.02	1083.66
26239	25893.90	42899.80	1083.97
26240	25856.92	42999.88	1085.46
26241	25866.39	43000.05	1088.56
26242	25875.08	43000.12	1085.69
26243	25893.93	42999.92	1086.00
26244	25857.08	43100.09	1087.42
26245	25866.12	43099.99	1090.53
26246	25875.02	43100.01	1087.73
26247	25893.94	43099.98	1087.92
26248	25857.05	43200.05	1089.41
26249	25866.54	43200.00	1092.48
26250	25874.97	43200.00	1089.76
26251	25894.06	43199.78	1089.91
26252	25857.06	43252.21	1090.45
26253	25861.65	43258.05	1092.12
26254	25866.56	43263.97	1093.76
26255	25871.95	43270.95	1092.00
26256	25893.90	43289.37	1091.73
26294	25188.91	43117.04	1089.81
26295	25060.77	42050.97	1136.70
26296	25068.00	42046.20	1135.20
26297	25067.82	42051.26	1136.59
26298	25001.55	42915.66	1153.86
26299	25008.46	42916.06	1152.63
26300	25008.11	42921.16	1152.69
26301	25001.20	42920.67	1152.96

0' 100' 200' 300'

CHADWICK C. VANSICKLE, P.E. #69173

DAVID A. BOWER, P.S. #5753

NO.	DESCRIPTION	DATE	REV. BY
REVISIONS			

COUNTYWIDE RDF

SCALE:	1"= 100'	
DRAWN:	BWS	10-26-04
REVISED:	BWS	12-01-04
CHECKED:	CCV	12-01-04
DATE:	12-01-04	

DIVERSIFIED ENGINEERING INC. New Philadelphia, Ohio

PROJECT: CELL 7 CERTIFICATION

SHEET TITLE: TOP OF RECOMPACTED SOIL LINER RECORD DRAWING

FILE ID: Top of Clay Record Drawing

FIGURE 5

Photo # 9 – Looking west. Loading scraper at Stockpile 7.

Photo # 10 – Looking south. Recompacted soil liner Lift 1 surface scarifying.

Photo # 19 – Looking southwest. Rototilling and sealing Lift 4.

Photo # 20 - Looking southeast. Lift 1 south slope watering.

Photo # 21 - Looking south. Construction activity Lift 5.

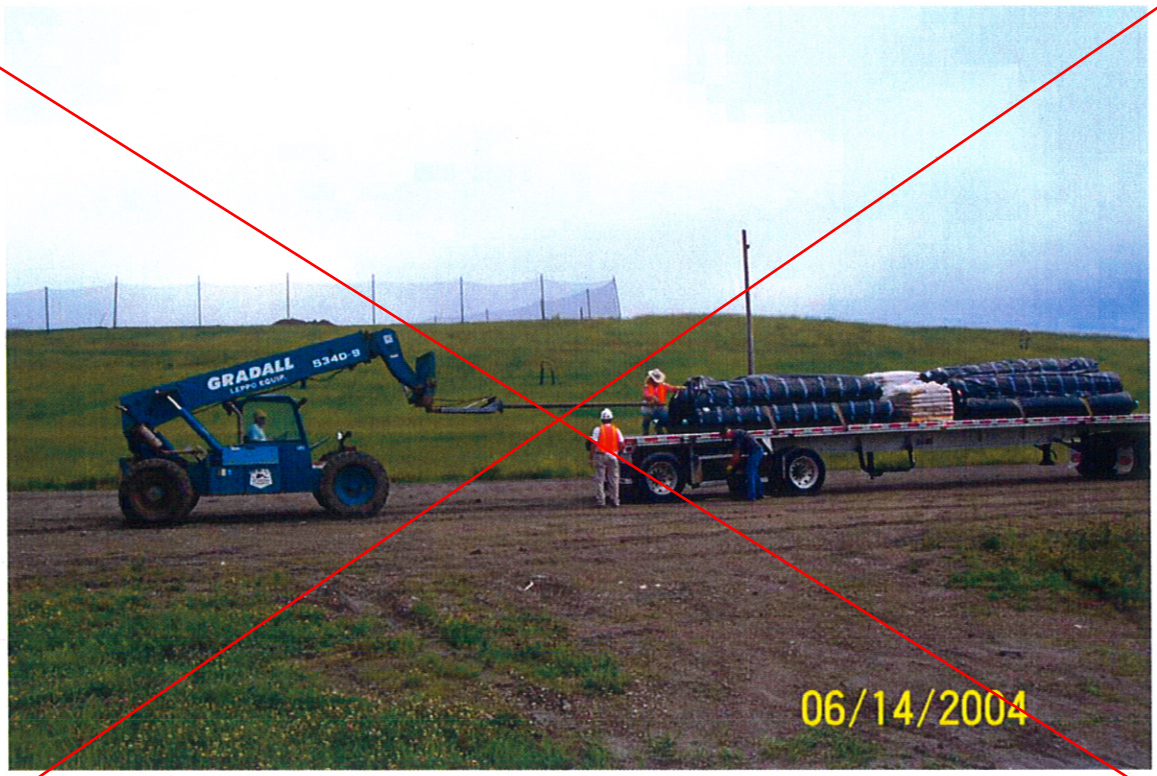


Photo # 22 - Looking north. Unloading GCL.

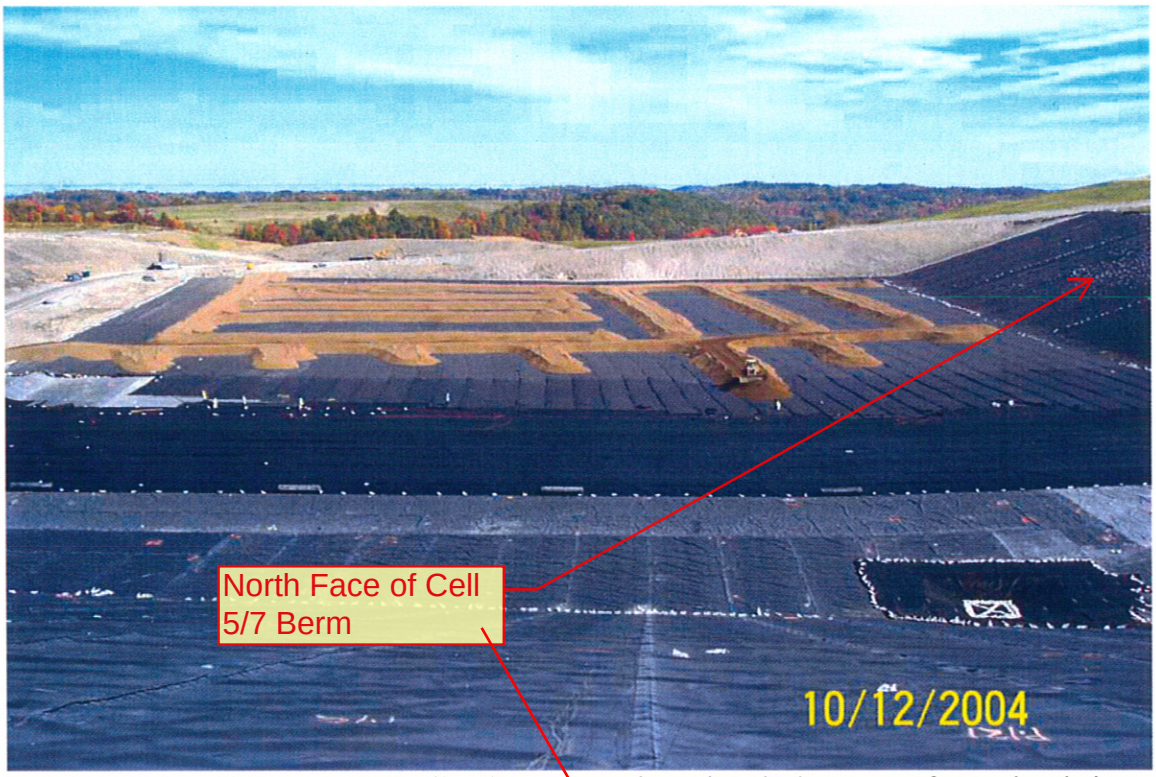


Photo #45 – Looking east, Geotextile placement and continued placement of granular drainage material.

Photo #46 – 12" granular drainage material placement.

Photo #47– Looking north, temporary Intracell berm installation

Photo Taken Standing on Top of Cell 5/7 Berm (at tie-in location)

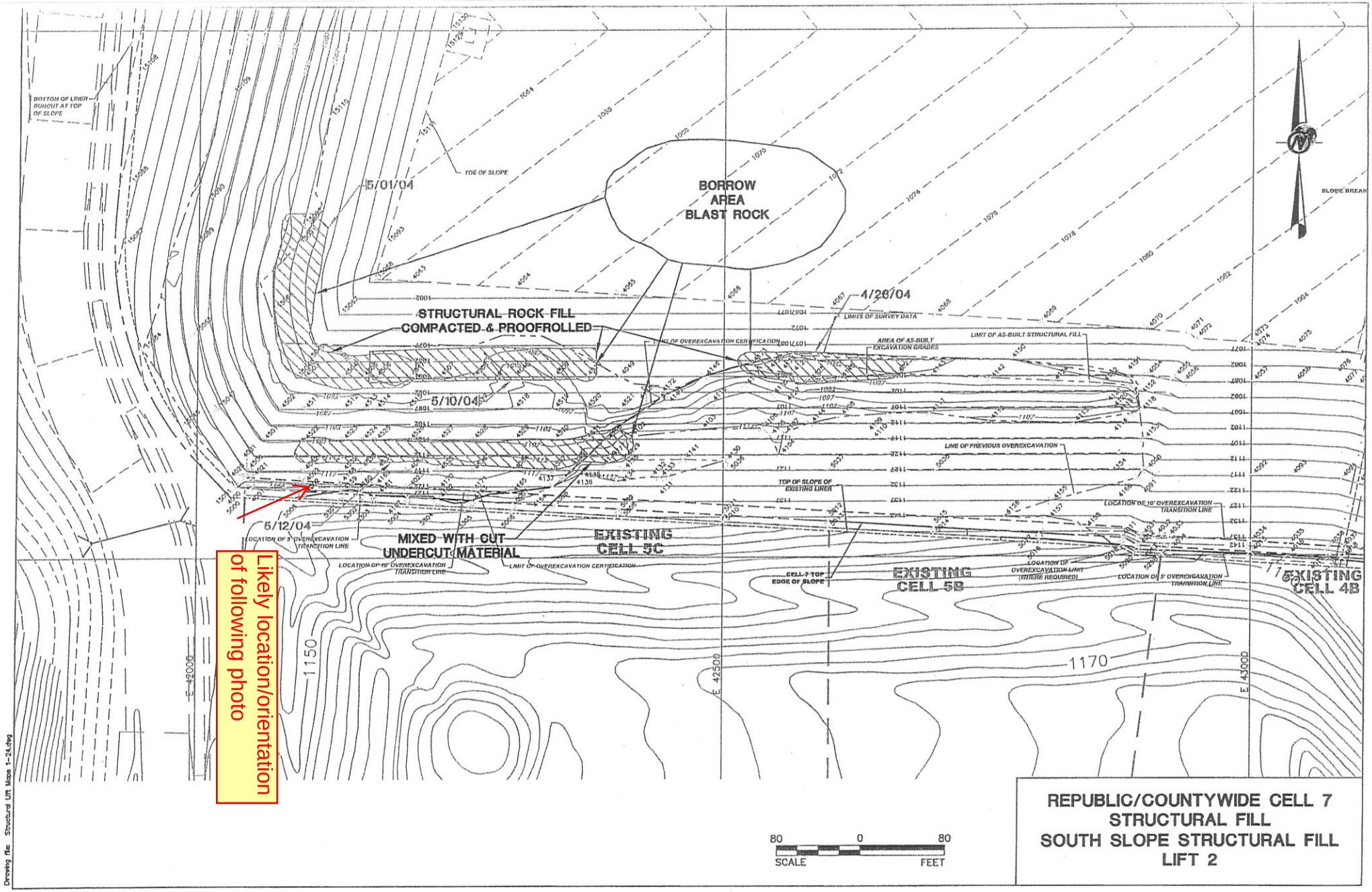

BORROW AREA BLAST ROCK
STRUCTURAL ROCK FILL COMPACTED & PROOFROLLED
MIXED WITH CUT UNDERCUT MATERIAL
EXISTING CELL 5C
EXISTING CELL 5B
EXISTING CELL 4B
5/01/04
5/10/04
5/12/04
4/26/04
TOE OF SLOPE
BOTTOM OF LINER RUNOUT AT TOP OF SLOPE
LIMITS OF SURVEY DATA
AREA OF AS-BUILT EXCAVATION GRADES
LIMIT OF AS-BUILT STRUCTURAL FILL
LINE OF PREVIOUS OVEREXCAVATION
TOP OF SLOPE OF EXISTING LINER
LIMIT OF OVEREXCAVATION CERTIFICATION
LOCATION OF 5' OVEREXCAVATION TRANSITION LINE
LOCATION OF 10' OVEREXCAVATION TRANSITION LINE
CELL 7 TOP EDGE OF SLOPE
LOCATION OF OVEREXCAVATION LIMIT (WHERE REQUIRED)
SLOPE BREAK
E 42000
E 42500
E 43000
1150
1170
80 0 80
SCALE FEET
REPUBLIC/COUNTYWIDE CELL 7
STRUCTURAL FILL
SOUTH SLOPE STRUCTURAL FILL
LIFT 2
Likely location/orientation of following photo
Drawing file: Structural Lift Maps 1-24.dwg

Photo # 23 – Looking west. Beaver placing structural fill on Lift 11.

Photo # 24 – Looking northeast. Placing and compacting Structural Fill Lift 2.

APPENDIX C

Stability Analyses

ISOLATION BREAK STABILITY EVALUATION

NORTH FACE OF CELL 5

PREPARED FOR:

REPUBLIC SERVICES OF OHIO II

Prepared by

P.J. Carey & Associates, P.C.

Sugar Hill, Georgia

10/26/2007

Introduction

The stability of the northern face of Cells 4 and 5 adjacent to Cell 7 of the Countywide Regional Disposal Facility that will be formed when the Isolation Break is constructed, as shown in the attached Drawings and Figures was evaluated to document that it will remain stable under a conditions that are anticipated as well as those, while unanticipated, may develop in the event the ongoing reactions in the areas to the south and east of the excavation extend into the waste mass under the proposed slope.

Analysis

Analysis Section

A single cross section located at station 4+60 was selected for analysis. This location represents the longest slope at 3H:1V in the direction of Cell 5. The baseliner slopes away from the Cell 5-7 divide at a uniform 3:1 slope along the entire Isolation Break alignment. Therefore, the location of the highest waste elevation on the proposed 3:1 uniform slope represents the critical cross section. The chosen cross section is the one depicted in the cross section figures of the main report.

Analysis Methods

The stability analyses were performed using the SlopeW module within Geostudio 2007 version 7.03 software by Geoslope International. The existing geometry was used along with historical liner and waste elevations to construct a simplified model. Waste strengths, densities and piezometric heads were modeled based on site observations and experience. In addition, given that some of the conditions that may develop are in the slope are unknown, the sensitivity of the solution waste strength was identified using the built in sensitivity analysis options in the software. Details of each analysis and the material properties used are presented in the graphic and text outputs attached.

Assigned Piezometric Heads

Piezometric heads were assigned using a reduced unit of weight water table for the soils/wastes. A unit weight of 29 pounds per cubic foot (lb/ft^3) was utilized. The use of this unit weight is only meant to simulate a generalized downward gradient or rate of rise of pore pressure with depth that is less than hydrostatic. Heads were not assigned to the geocomposite/baseliner system, reflecting there generally free draining condition. The pore pressures on the critical failure surface are presented in graphical form for each of the analyses.

Results

The attached figures show the proposed slopes possess a factor of safety of nearly 1.5 for with reasonable assumptions of waste strength and the elevated pore pressures assigned. Further, the analyses also demonstrate that the slope possesses a factor of safety of 1.3 even if the frictional component of the waste strength is significantly degraded (ϕ'=24°).

It can be concluded that the proposed excavation slopes are stable. Further, if conditions considerably more adverse than those assume were to develop, the placement of additional fill on the bench that would buttress the slope from the north would allow the area to be stabilized. The need to construct a buttress will become evident if significant down slope movement is observed. It is recommended that, in the event that temperatures in the gas wells in the south slope exceed 170 degrees, that surface monitoring points should be established similar to that on the west slope and readings be taken. Movement, if occurring, will be evident in these readings and a stabilizing berm of soils can be constructed if required.

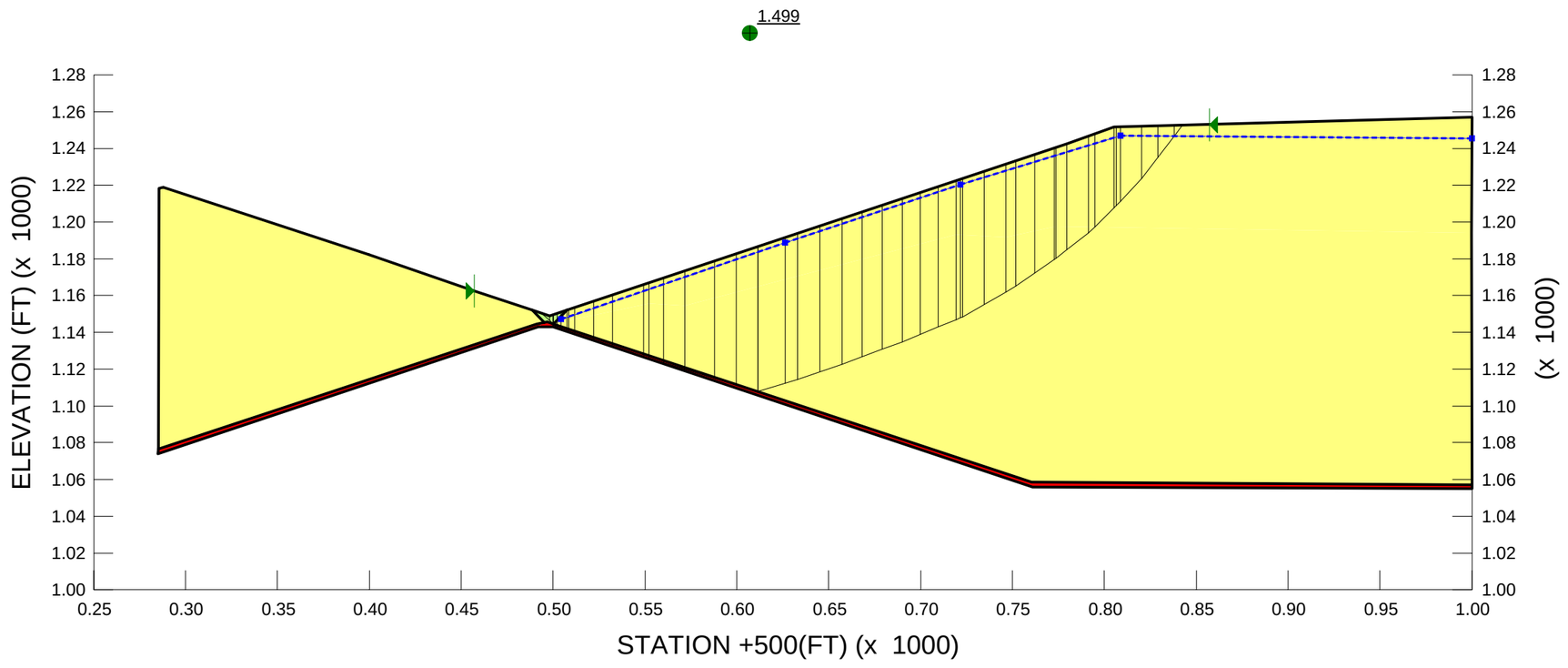
Description: Cell 5-7 Isolation Cut
Comments:
Name: Base Analysis - Auto Search
File Name: N:\Countywide\F&O Confidential\IB\IB-1_rev1.gsz
Last Saved Date: 10/26/2007
Analysis Method: Morgenstern-Price
Optimization: Yes
Horz Seismic Load: {SlopeItems.Seismic.Horizontal.Value}
Ignore seismic load in strength: No
PWP Conditions Source: Piezometric Line

Unit Weight of Water: 29 pcf
Simulating a downward gradient of .54, heads not applied to liner

Sensitivity to Waste Strenght

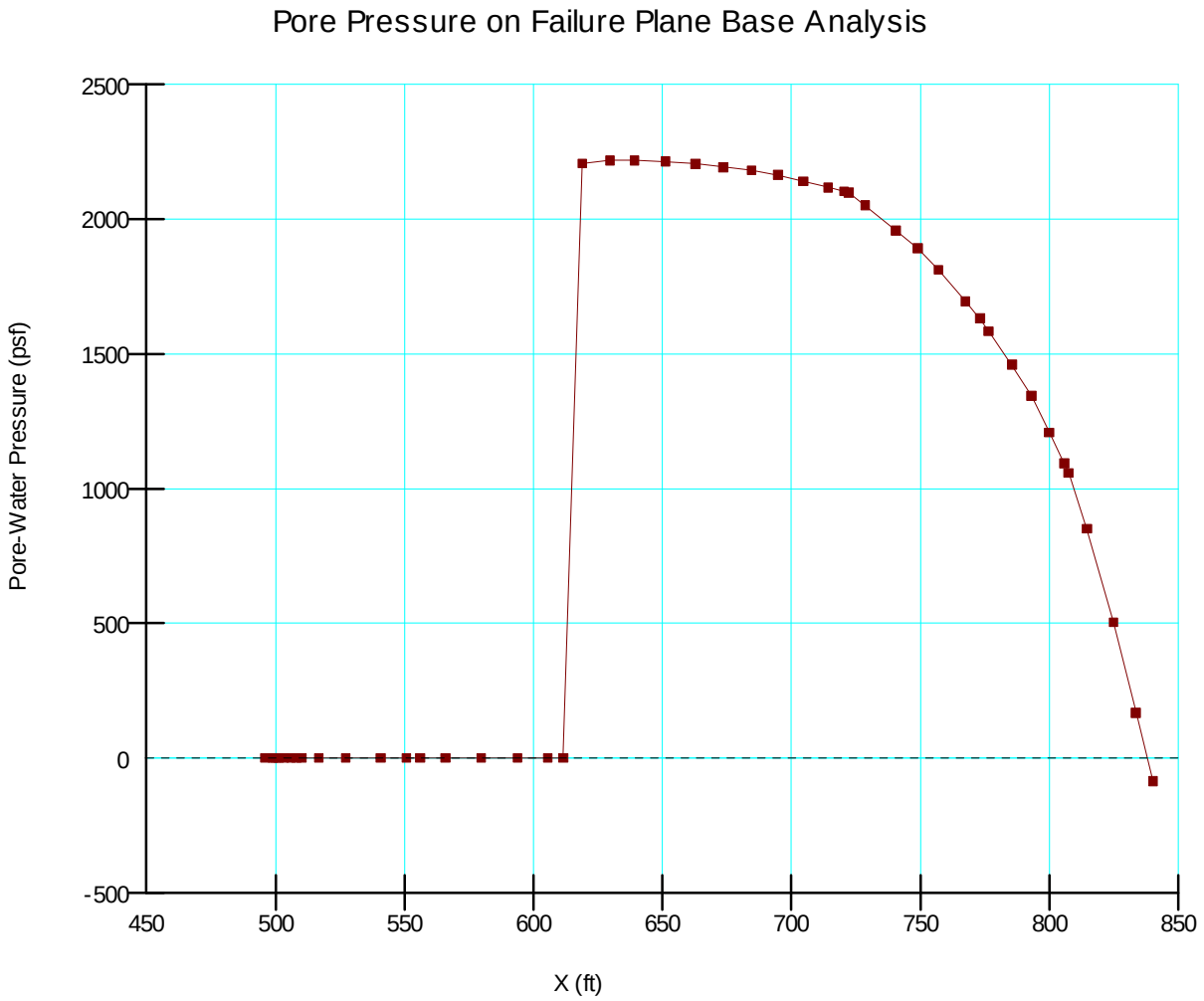
phi waste	Factor of Safety
20.0000	1.1874052
21.0000	1.2159148
22.0000	1.2448292
23.0000	1.2779417
24.0000	1.3079169
25.0000	1.3383734
26.0000	1.3693408
27.0000	1.4008507
28.0000	1.4329363
29.0000	1.4656330
30.0000	1.4989781

Name: SOLID WASTE Model: Mohr-Coulomb Unit Weight: 70 pcf Cohesion: 400 psf Phi: Multiple Trial: 30 ° Phi-B: 0 ° C-Phi Correlation Coef.: 0 Anisotropic Strength Fn: (none) Piezometric Line: 1
Name: FB Soil Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion: 0 psf Phi: 30 ° Phi-B: 0 ° C-Phi Correlation Coef.: 0 Anisotropic Strength Fn: (none) Piezometric Line: 1
Name: Interface Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion: 0 psf Phi: 12 ° Phi-B: 0 ° C-Phi Correlation Coef.: 0 Anisotropic Strength Fn: (none)



PERFORMED BY
P.J. CAREY & ASSOCIATES, PC

PORE PRESSURES ON THE FAILURE PLANE – FOR STABILITY ANALYSIS



Note pore pressure at x=625 corresponds to Station 125 in C Section and is approximately 37 ft of head of water.

P. J. Carey & Associates, P.C.

5878 Valine Way, Sugar Hill, Georgia 30518
Telephone (678) 482-5193
Fax (866) 845-3898
Email pjcarey@pjcarey.com

Memorandum

To: Michael Beaudoin, PE

From: Peter Carey

CC:

Date: 11/13/2008

Re: Response to Comments by Ohio Environmental Protection Agency (EPA)
Isolation Break Work Excavation Plan
Section 4.3/Appendix C

The Ohio Environmental Protection Agency (EPA) provided comments to the October 2008 submittal regarding the slope stability as part of the Isolation Break Work Excavation Plan for Countywide Recycling and Disposal Facility. The comments and our response to the comments are as follows.

1. The unit weight of water is 64 lb/ft3. Provide more detail and justification for the 29 lb/ft3 utilized.

   Response: As we stated in the report, the unit weight of water assigned in the SLOPE/W analysis is not meant to represent the actual unit weight of water, which is 62.4 pcf. In this case, defining the "unit weight of water" to be 29 pcf simulates a pore pressure field that is less than hydrostatic. This is a way of "tricking" the program to apply a pore pressure that is more in keeping with what is found in the field. In this instance, a pore pressures can be modeled up to an elevation that they might be found in the field without overestimating it at depth. In short, this is a way to model a Ru pore pressure field SLOPE/W.

   This pore pressure condition is only assigned to the waste. No pore pressures were assigned to the geocomposite/baseliner system, to simulate a generally free draining condition.

   The simulated pore pressure field was iterated by varying the "unit weight of water" until the factor of safety was approximately 1.5 given the selected material properties (discussed below). The pore pressure field is very conservative given that there is no supporting data that suggests that the pore pressures are as high as those assigned in the stability analysis. On the contrary, the field data suggests a lower pore pressure field.

2. Provide an explanation of the values for waste strength, densities, piezometric heads, and pore pressures assigned in the model.

Response: Shear strength of solid waste has been presented extensively in the literature. Landva and Clark (1990) reported values of cohesion intercepts and friction angles greater than 330 psf and 34°, respectively, for the shear strength of waste. Eid, Stark, Evans and Sherry (2000) presented the results of large scale shear tests by others that yielded an average shear strength envelope described by a φ′ of 35° and a c′ of 25 kn/m2 (522 psf). A shear strength for use in static analysis described by a φ′ of 33 ° and a c′ of 400 psf was adopted for use in stability analysis for the zones of solid waste,

As in Stark et al (2000), am average unit weight of municipal solid waste of 11.8 kN/m^3 (approximately 70 pcf) is acceptable. Therefore, 70 pcf was assigned to all the waste to reflect the high moisture content of the waste materials.

The material properties of the waste were assigned as $\varphi=30^o$ (initial) c=400 psf and γ=70 pcf. SLOPE/W has the capability to do sensitivity analysis for various parameters. Because the actual φ is unknown, a best was initially set as 30^o and then using the resulting critical slip surface, the φ was varied from 29^o, 28^o, etc, to 20^o. The φ in waste and the respective factors of safety were presented on the submitted figure, but repeated below:

φ in Waste	Factor of Safety
20.00	1.18
21.00	1.21
22.00	1.24
23.00	1.27
24.00	1.30
25.00	1.33
26.00	1.36
27.00	1.39
28.00	1.42
29.00	1.46
30.00	1.49

In the SLOPE/W analysis, piezometric heads were not applied to the geocomposite/baseliner system, to simulate a generally free draining condition.

Pore pressures were assigned to the waste and are discussed in detail above.

3. The FS for a permanent slope should be 1.5.

Response: The geometry and the strengths are modeled as of current condition. Pore pressures have been generated to show what level of average pore pressures

would need to be present to reduce the factor of safety to 1.5. There is no intent to suggest long term pore pressures would be elevated above atmospheric. The intent is show how the slope would respond to increases in pore pressures should the reaction behavior become present in the slope.

In the case of a long-term, permanent slope pore pressures would be limited to a few feet of head on average, the geometry will have settled, making it flatter than 3:1 (h:v). In the event that the reaction related behavior became present in the slope, significant settlement, similar to that experienced on the north and south slopes is likely to occur along with some non-uniform increases in pore pressure. The final geometry that would occur under these conditions is unknown and cannot be reasonably analyzed at this time. However, once pore pressures associated with the reaction dissipated, the factor of safety would be above 1.5 even using the current cut slope 3:1 geometry as long as the waste shear strength is greater than that described by a □′ of 26° (See attached Figure) Even under these conditions critical failure surfaces are shallow, and do not involve the baseliner. It is clear that if the waste became degraded due to reaction related activity that the slope geometry would be significantly flatter than the 3:1 cut slopes proposed. Clearly the long term slopes will remain stable.

4. - The analysis appears to be for a deep slide. Is there a possible scenario for a shallow slide which slumps into the V?

It is possible that shallow slumps could occur in the event that significant elevation of pore pressure would occur over areas large enough to cause localized failures. This type of condition occurred or is thought to have occurred within the sliver fill area of the south slope. However the conditions at the south slope appear unique on site and the instability experienced there has not be observed elsewhere on site even where the reaction associated behavior has been evident. Specifically, elevated pore pressures, seepage and venting have occurred on the north slope in several locations under the membrane above the haul road without exhibit any slumping or signs of instability. Similar reaction associated behavior is and has been present just west of the stabilizing berm on the south slope, again with no signs of instability. There is no reason to conclude the behavior in this location will be any different. Modeling for the performance of shallow failure surface is not useful because the results are wholly dependent on assumed pore pressures and cohesion like strengths at low effective stresses. These assumptions have no means of being checked and should not take precedence over the observations made over the past few years at the site.

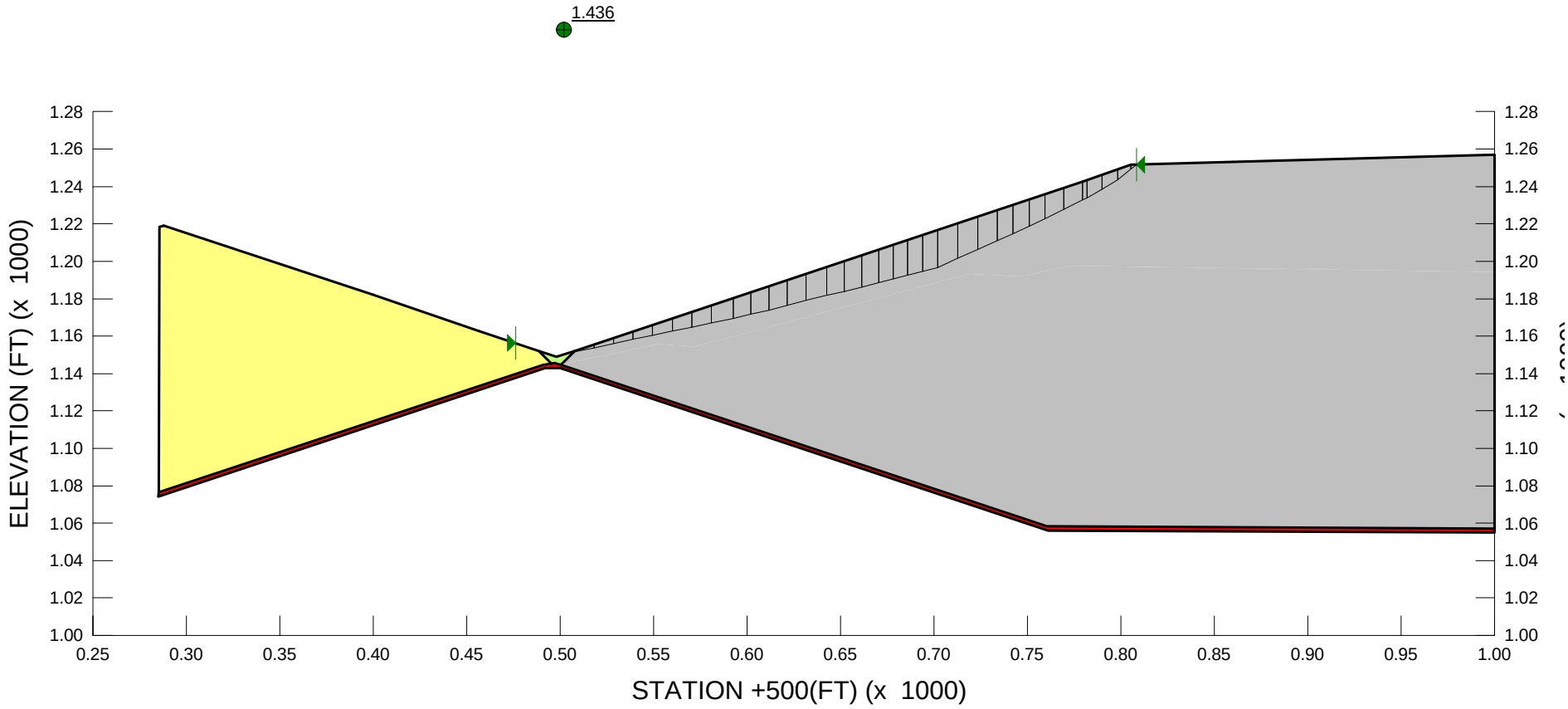
5. The stability analysis should account for the potential effects of leachate outbreaks.

Please see the response in item 4.

phi waste	Factor of Safety
20.0000	1.7285873
21.0000	1.7790486
22.0000	1.8302054
23.0000	1.8821022
24.0000	1.9347861
25.0000	1.9883066
26.0000	2.0427160
27.0000	2.0980696
28.0000	2.1544258
29.0000	2.2118465
30.0000	2.2703975

Description: Cell 5-7 Isolation Cut
Description: drained with no settlment
Name: Long Term No Pore Pressure
File Name: N:\Countywide\F&O Confidential\IB\IB-1_rev1.gsz
Last Saved Date: 11/13/2008
Analysis Method: Spencer
Optimization: Yes
PWP Conditions Source: (none)

Name: SOLID WASTE Model: Mohr-Coulomb Unit Weight: 70 pcf Cohesion: 400 psf Phi: Multiple Trial: 30 ° Phi-B: 0 °
Name: FB Soil Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion: 0 psf Phi: 30 ° Phi-B: 0 °
Name: Interface Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion: 0 psf Phi: 12 ° Phi-B: 0 °
Name: Degraded Waste Model: Mohr-Coulomb Unit Weight: 70 pcf Cohesion: 0 psf Phi: Multiple Trial: 25 ° Phi-B: 0 °



PERFORMED BY
P.J. CAREY & ASSOCIATES, PC

APPENDIX D

Alternate Daily Cover Product Information

To start maximizing your landfill's potential call 1-800-800-7671

LSC Landfill Service CORPORATION

Join Our Newsletter For The Latest Innovations In Waste Management

email

home | products | about LSC | con

Posi-Shell®

- Description
- Testimonials
- Applications
- Airspace Savings
- Technical Info
- FAQ
- Options/Accessories
- Equipment
- Consumable Materials

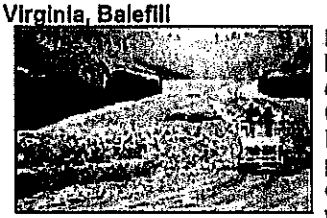
" This is a total daily cover system, which from start to finish will only take about an hour to apply. The other uses within the landfill are endless including storm water management and erosion control applications. Landfill operators will achieve huge air-space savings year-in and year-out, with the use of this system. "

View all Testimonials

Posi-Shell Applications:
Vertical Faces & Balefills

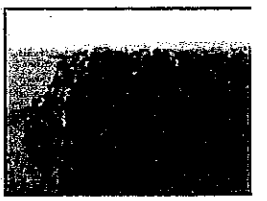
The Posi-Shell Cover formulation provides excellent adhesion to vertical faces, such as th found in balefills or solid waste excavations. The continuous coating provided by Posi-She together with its long-term durability make it ideal for this application.

Virginia, Balefill



Posi-Shell Cover works to control odors and wind-blown li landfill operations of all sizes, including balefills and landfi excavations. "The City of Bristol has been using the Posi-S Cover System at its Integrated Solid Waste Management Facility since March 2001 and is quite pleased with the performance of the product. We use the system in our cov operations for both solid waste disposal and landfill mining well as some erosion control applications. We have been particularly impressed with how well it works when applied to the vertical faces of the balef operation as a fire control measure, and with the added benefit of odor control. Your produ works well, is easy to use and is an integral part of our daily operation."

Wyoming, Balefill



"We needed a cost-effective approach for using the awesome Posi-Shell product on our small, 250-ton per day landfill, and you responded with excellent customer service, providing a solution allowing use of our own hydroseeding unit and silo; thereby, saving us thousands of dollars each year. Our regulator loves the Posi-Shell product for covering our Balefill face--it's the best product that we have found. Not only does it help with litter, it is a great fire retardant. I can't thank you enough for being sensitive to our unique budget constrain and for finding a workable solution for us. "

Website

To start maximizing your landfill's potential call 1-800-800-7671

LSC
Landfill Service
CORPORATION

Join Our Newsletter For The Latest Innovations In Waste Management

email

Posi-Shell®

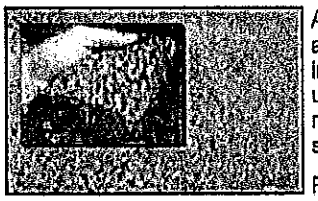
" We needed a cost-effective approach for using the awesome Posi -Shell product on our small, 250-ton per day landfill, and Landfill Service Corporation responded with excellent customer service, providing a solution allowing use of our own hydro-seeder and silo; thereby saving us thousands of dollars each year. "

View all Testimonials

Posi-Shell Applications:
Daily, Intermediate, and Long-Term Cover

Posi-Shell has been approved for daily cover, intermediate and long-term cover for landfills, stockpiles, and hazardous waste sites. The primary component of the formulation is a cementitious mineral binder reinforced with structural composite fibers, which results in excellent resistance to erosion and cracking and provides long-term durability in various weather conditions.

Applying Posi-Shell cover is a simple one-person operation using either the specialized Posi-Shell equipment or a standard hydroseeding unit. One load of F requires just one hour for mixing, application, and rinse-out. Landfill operators realize a hu savings in airspace, labor, machinery, and fuel costs through use of the Posi-Shell Cover S over traditional soil cover.



After application, the Posi-Shell slurry hardens to a non-fla and highly impermeable coating that easily conforms to the irregular contours of a landfill. Its color and texture provide uniform appearance that is aesthetically appealing to near residents; and because of its inherent alkalinity, Posi-Shell suppresses typical landfill odors as well.

Posi-Shell is highly effective in preventing wind-blown litter fires, scavenging, and vector problems. Posi-Shell has met the rigorous standards require approval by numerous state regulatory agencies and has been favorably evaluated for Su use by the USEPA. Made of non-flammable, non-toxic materials, Posi-Shell is an environm compatible, multi-purpose landfill cover solution.

Posi-Shell Cover System:

- Conserves airspace
- Mitigates odors
- Reduces airborne debris
- Controls vector populations
- Enhances safety through non-flammability
- Discourages scavenging
- Cuts operating expenses
- Extends landfill life
- Increases profits

Contact Landfill Service Corporation to schedule your free Posi-Shell Demonstration.

Website

To start maximizing your landfill's potential call 1-800-800-7671

LSC Landfill Service CORPORATION

Join Our Newsletter For The Latest Innovations In Waste Management

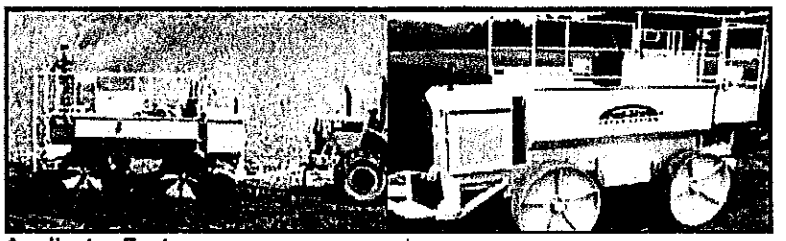
email

Posi-Shell®

" Posi-Shell has met and exceeded all expectations we had for a daily cover. Additionally, we are disposing of waste latex paint and leachate daily with Posi-Shell while extending the life of our landfill. Posi-Shell has made my job easier and the landfill more profitable. "

View all Testimonials

Posi-Shell Equipment:
PSA 2000



Applicator Features:

- 2,000 gallon mixing tank
- Per Load Coverage to 20,000 sq. ft.
- On-board reserve water tank
- Full-width clean-out hatch
- Large working deck

Applicator Data:

Coverage Guidelines: (Per Load)	
Long Term Coverage	8,000 - 12,000 sq. ft. (per load)
Medium Term Coverage	12,000 - 16,000 sq. ft. (per load)
Short Term Coverage	16,000 - 20,000 sq. ft. (per load)
Application Time: (Per Load)	
1-man crew	60-90 minutes
2 man crew	50-70 minutes

Specifications:

Capacity	2,000 gal.
Width	9' 2"
Height	11' 4"
Length (including draw bar)	24' 4"
Weight (empty)	15,000 lbs
Weight (full)	38,000 lbs
Engine	4 cyl Diesel 45 hp.

Website

To start maximizing your landfill's potential call 1-800-800-7671

LSC Landfill Service CORPORATION

Join Our Newsletter For The Latest Innovations In Waste Management

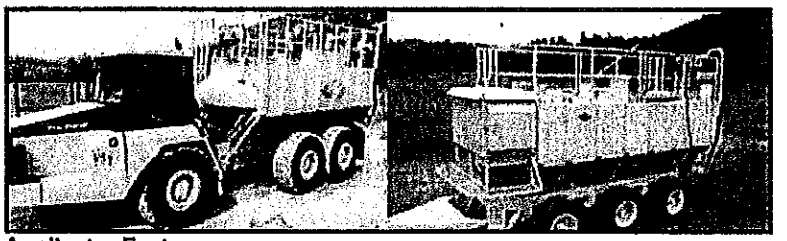
email

Posi-Shell®

" We needed a cost-effective approach for using the awesome Posi -Shell product on our small, 250-ton per day landfill, and Landfill Service Corporation responded with excellent customer service, providing a solution allowing use of our own hydro-seeder and silo; thereby saving us thousands of dollars each year. "

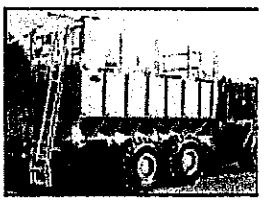
View all Testimonials

Posi-Shell Equipment:
PSA 3500



Applicator Features:

- 3,800 gallon mixing tank
- Per load coverage to 38,000 sq. ft.
- Self-Contained mobile unit
- Tow-Behind or Truck-Mounted Models
- Leachate Recirculation Capability
- Self-contained clean out system



Applicator Data:

Coverage Guidelines: (Per Load)	
Long Term Coverage	15,000 - 22,800 sq. ft. (per load)
Medium Term Coverage	22,800 - 30,400 sq. ft. (per load)
Short Term Coverage	30,400 - 38,000 sq. ft. (per load)
Application Time: (Per Load)	
1-man crew	60-90 minutes
2 man crew	50-70 minutes

Specifications:

Capacity	3,800 gal.
Width	8' 9"
Height	11' 0"
Length (including draw bar)	32' 10"
Weight (empty)	47,628 lbs
Weight (full)	91,788 lbs
Engine	6 cyl Diesel

Website

To start maximizing your landfill's potential call 1-800-800-7671

LSC Landfill Service CORPORATION

Join Our Newsletter For The Latest Innovations In Waste Management

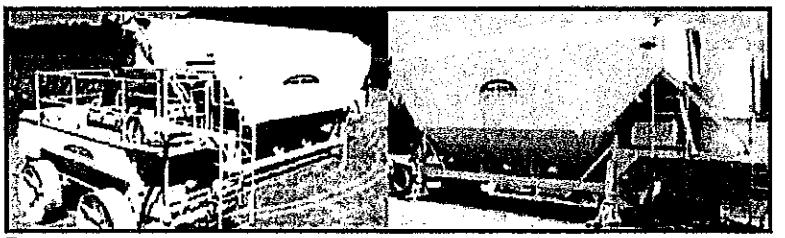
email

Posi-Shell®

" This is a total daily cover system, which from start to finish will only take about an hour to apply. The other uses within the landfill are endless including storm water management and erosion control applications. Landfill operators will achieve huge air-space savings year-in and year-out, with the use of this system. "

View all Testimonials

Posi-Shell Equipment:
HS 50T Silo



Features:

- Stores mineral binder (50 Tons)
- Easy towing via 5th wheel
- Filter baghouse for dust free loading
- Dispenses 1 ton per minute

Specifications:

Capacity	50 Tons
Width	8' 6"
Height	13' 4"
Length (including draw bar)	36' overall
Weight (empty)	18,000 lbs
Weight (full)	118,000 lbs

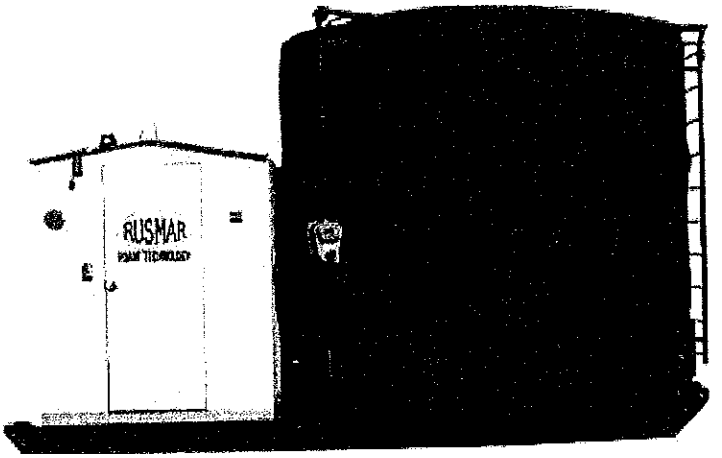
Contact Landfill Service Corporation to schedule your free Posi-Shell Demonstration.

Website

RUSMAR FOAM TECHNOLOGY

PRODUCT DATA SHEET

BULK FOAM STORAGE UNIT BSD7000



A bulk storage and dilution system designed for tank load quantities of Long Duration and Soil Equivalent Foam. The system allows for foam concentrate to be automatically diluted, metered and transferred into the on-board solution storage tank of a Pneumatic Foam Unit.

The BSD7000 is recommended for sanitary landfills and large remediation projects. Storage system includes microprocessor controlled transfer pumps and metering devices. Heat pads and freeze protection system maintain optimal temperatures of all Rusmar foam products and allow for outdoor storage year-round.

FEATURES

- Simple to operate
- Quick and easy product transfer
- Totalizes dispensed volume
- Automatic system does not require monitoring
- Eliminates drum handling
- Indicator light signals time to re-order
- Eliminates worker contact with product

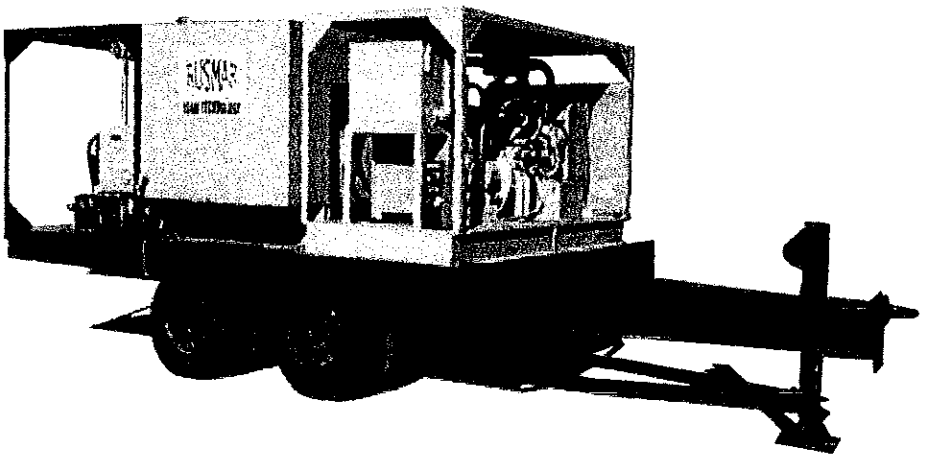
SPECIFICATIONS

Capacity	7,000 Gallons
Transfer Rate	0-120 Gal./Min.
Products	All Long Duration and Soil Equivalent Foam Products
Uses	Sanitary Landfills / Large Remediation Sites
Electrical System	240V, 100 amp, single phase
Water	60 Gal./Min.

RUSMAR INCORPORATED • 216 Garfield Avenue • West Chester, PA 19380
Toll Free: 1.800.SEE.FOAM • P: 610.436.4314 • F: 610.436.8436 • www.rusmarinc.com

LANDFILL PRODUCT DATA SHEET

PNEUMATIC FOAM UNIT 1600/40



A completely self-contained foam generating system recommended for applying daily cover on medium to large landfills with working faces up to 10,000 ft². Exceptionally durable and reliable all-weather design uses easy to replace modular components to maximize your uptime. Can be towed around site with any large equipment such as a compactor or dozer. Foam is applied using a hand-line or with an optional bi-directional manifold.

System includes air compressor, pump, hoses, nozzles, solution storage tank and proprietary foam generating technology. Unit has freeze protection for outdoor storage year-round.

FEATURES

- Simple to operate
- Durable, rugged construction
- No clean-up necessary
- Can be filled and placed aside until needed

SPECIFICATIONS

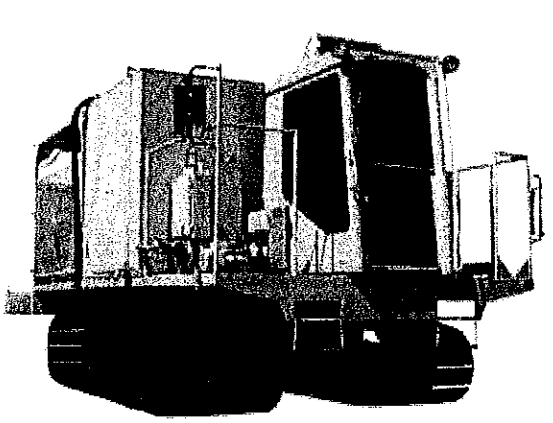
Solution Storage Tank.....1600 Gallons
Coverage Rate.....430 Sq. Ft./Min. @3" depth
Coverage Area.....9,000 - 18,000 Sq. Ft. of working face per fill
Size.....24' L x 8' W x 8'6" H
Weight.....17,000 Pounds
Hose.....200 Feet of 1-1/2" Diameter
Products.....AC-667SE Soil Equivalent Foam or AC-900 Series
Freeze Protection System.....120V or 230V, 30 amp, single phase

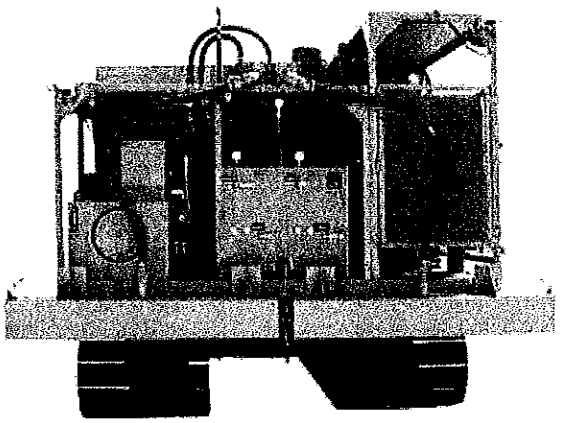
RUSMAR INCORPORATED • 216 Garfield Avenue • West Chester, PA 19380
Toll Free: 1.800.SEE.FOAM • P: 610.436.4314 • F: 610.436.8436 • www.rusmarinc.com

RUSMAR FOAM TECHNOLOGY

LANDFILL PRODUCT DATA SHEET

PNEUMATIC FOAM UNIT 2500/40





A self-propelled foam generating system engineered and configured to apply daily cover on larger landfills with working faces greater than 10,000ft². Exceptionally durable and reliable all-weather design uses easy to replace modular components to maximize your uptime. Climate controlled cab provides superb operator safety and turns the task of daily cover into a quick, one-person operation. Foam is applied using our patented bi-directional manifold.

The unit includes diesel driven hydraulics, air compressor, Caterpillar® tracks and drive assemblies, pump, hoses, solution storage tank, freeze protection and proprietary foam generating technology.

FEATURES

- Caterpillar diesel power
- Requires one person to operate
- Reliable Caterpillar undercarriage
- Equipped with freeze protection system
- Foam applied via manifold
- No clean up required
- Durable, rugged construction
- Hydrostatic drive

SPECIFICATIONS

Solution Storage Tank	2,500 Gallons
Coverage Rate	400 – 800 Sq. Ft./Min.
Coverage Area per fill	14,000 – 28,000 Sq. Ft.
Size	19'7" L x 10'2" W x 11'7" H
Dry Weight	40,000 Pounds
Products	Soil Equivalent Foam or AC-900 Series

RUSMAR INCORPORATED • 216 Garfield Avenue • West Chester, PA 19380
Toll Free: 1.800.SEE.FOAM • P: 610.436.4314 • F: 610.436.8436 • www.rusmarinc.com

RUSMAR FOAM TECHNOLOGY

PRODUCT DATA SHEET

SOIL EQUIVALENT FOAM AC-667SE

GENERAL DESCRIPTION

AC-667SE Soil Equivalent Foam is a patented product which produces a thick, long-lasting, viscous foam barrier for immediate control of foul odors, blowing litter, disease vectors and scavengers when applied to landfills as a daily cover material. AC-667-SE is also an excellent choice for emission control at remediation sites where dust, odors and volatile organic compounds (VOCs) are a concern. AC-667SE maintains its integrity for up to 72 hours and is designed for use with Rusmar Pneumatic Foam Units.

FEATURES

- Biodegradable
- Will not add to treatment costs
- No ambient temperature limitations
- Easy to use
- More effective than tarps
- Can withstand moderate rainfall
- Non-hazardous
- Safe for workers and the environment
- Requires only water dilution
- No clean up necessary
- Non-combustible
- Maintains integrity for up to 72 hrs

APPLICATIONS

The primary application for AC-667SE is to replace soil for the daily cover of landfills. However it also effectively controls odors, VOCs and dust during active excavation and provides multi-day coverage of contaminated soils at hazardous waste sites. AC-667SE will adhere to vertical surfaces such as balefill landfills and can also be applied on top of liquid surfaces.

SPECIAL ODOR CONTROL PROBLEMS

The remediation of hazardous waste sites often includes excavation of soil contaminated with odorous compounds. AC-667SE forms a barrier between contaminants and the atmosphere and can be applied during active excavation to provide a continuous and effective barrier to minimize odors. It is completely biodegradable and poses no threat to workers, neighboring residents or ground water. AC-667SE will not add to soil treatment costs.

RUSMAR INCORPORATED • 216 Garfield Avenue • West Chester, PA 19380
Toll Free: 1.800.SEE.FOAM • P: 610.436.4314 • F: 610.436.8436 • www.rusmarinc.com

AC-667SE can also be applied on top of trucks for emission control during transport of materials such as contaminated soils or sewage sludge.

- Minimizes worker exposure
- Maintains fence-line odor and VOC emission limits
- Works on lagoon and pond closures
- Can be applied to liquid surfaces

FUGITIVE DUST

At hazardous waste sites, fugitive dust can present a health hazard. AC-667SE can be applied on top of the dusty material to prevent any wind-borne emissions. There is no need to mobilize equipment to immediately cover with soil or tarps. The Pneumatic Foam Unit can be filled and placed at the site to be used at a moment's notice.

EMERGENCY SPILL CLEAN UP

In emergency spills, odor and VOC control is often difficult because of the terrain and accident conditions. AC-667SE foam can be applied to any shaped object, as well as vertical slopes, water, mud, snow and ice. It is non-flammable and non-reactive - difficult spill problems can be accommodated.

METHOD OF APPLICATION

AC-667SE is supplied in either 450-pound (55 gal.) drums or by bulk load (approximately 46,000 pounds). Bulk shipments can be stored outside in a Rusmar Bulk Storage-Dilution System. The Bulk Storage and Dilution system is comprised of a 7000 gallon heated and mixed chemical storage tank and a microprocessor controlled dispensing system to accurately dilute and transfer the chemical.

AC-667SE is designed to be applied with a Rusmar Pneumatic Foam Unit. The Pneumatic Foam Units are available in a variety of sizes to accommodate a range of site conditions and application needs.

RUSMAR INCORPORATED • 216 Garfield Avenue • West Chester, PA 19380
Toll Free: 1.800.SEE.FOAM • P: 610.436.4314 • F: 610.436.8436 • www.rusmarinc.com

RUSMAR FOAM TECHNOLOGY

MATERIAL SAFETY DATA SHEET

SOIL EQUIVALENT FOAM AC-667SE

SECTION I: GENERAL INFORMATION

- Manufacturer's Name: RUSMAR INCORPORATED
- Manufacturer's Address: 216 Garfield Avenue • West Chester, PA 19380
- Manufacturer's Phone No.: 610-436-4314
- Chemical Family: Starch modified hydrolyzed protein surfactant
- Trade Name: RUSMAR AC-667SE

SECTION II: HAZARDOUS INGREDIENTS

- Paints, Preservatives, and Solvents - None
- Alloys and Metallic Coatings - None
- Hazardous Mixtures and Other Materials - None

SECTION III: PHYSICAL DATA

- Boiling Point: 100° C
- Vapor Pressure: 25mm Hg at 25° C
- Vapor Density (Air = 1): N/A
- Specific Gravity: 0.99 to 1.01
- % Volatile, By Volume: None
- Evaporation Rate: N/A
- Water Solubility: Complete
- Appearance/Odor: Opaque, dark viscous gel, cinnamon scented

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

- Flash Point (Method): Nonflammable – water based
- Derived Foam – nonflammable – ASTM E1354, see below
- Flammable Limits: N/A
- Extinguishing Media: N/A
- Special Fire Fighting Procedures: None
- Unusual Fire and/or Explosion Hazards: None

RUSMAR INCORPORATED • 216 Garfield Avenue • West Chester, PA 19380
Toll Free: 1.800.SEE.FOAM • P: 610.436.4314 • F: 610.436.8436 • www.rusmarinc.com

SECTION V: HEALTH HAZARD DATA

- Threshold Limit Value: Not Determined; material is non-hazardous. Refer to Section X.
- Effects of Overexposure: This material is not expected to present an inhalation or ingestion hazard. It may cause an eye or skin irritation upon direct contact in concentrate form.
- Emergency and First Aid Procedures: Wash thoroughly with clean water.

SECTION VI: REACTIVITY DATA

- Material is stable: No material incompatibility
- Hazardous Decomposition Products: Low levels of sulfur oxides and ammonia on exposure to high temperatures
- Derived foam is noncombustible, see below
- Polymerization will not occur

SECTION VII: SPILL OR LEAK PROCEDURES

- Steps to be taken in case material is released or spilled: If spilled indoors on a hard surface, the spill area may be slippery and should be thoroughly washed with water. Contain spill and absorb material with dirt or other appropriate absorbent.
- Waste Disposal Method: This material is completely biodegradable and can be disposed of in a sanitary landfill according to local regulations.

SECTION VIII: SPECIAL PROTECTION INFORMATION

- Respiratory Protection: None required for normal operations
- Ventilation: No special requirements
- Protective Gloves: Not required, but recommended
- Eye Protection: Not required, but recommended
- Other Protective Equipment: None

RUSMAR INCORPORATED • 216 Garfield Avenue • West Chester, PA 19380
Toll Free: 1.800.SEE.FOAM • P: 610.436.4314 • F: 610.436.8436 • www.rusmarinc.com

SECTION IX: SPECIAL PRECAUTIONS

- Storing/Handling Precautions: Avoid excessive heat. Material will freeze, but thawing will not cause changes in the product.
- Other Precautions: None

SECTION X: ENVIRONMENTAL TEST RESULTS

A. TCLP – NOVEMBER 1995;

- Results, all negative:

  Non-Volatile extraction

  - Metals
  - Pesticides
  - Herbicides
  - Acid, Base, Neutrals

  Zero headspace extraction

  - Volatiles

B. BIOAQUATIC ASSAY – DECEMBER 1995;

- Static acute bioassay procedure for hazardous waste
- California Department of Fish and Game
- Water pollution control laboratory
- Results, LD_{50} > 750PPM = Non-hazardous material

C. FLAMMABILITY – ASTM E1354, CONE CALORIMETER – DEC. 1995

- Results:
  - No ignition
  - Heat of combustion = 0.0
  - Non-flammable

D. BIODEGRADATION EVALUATION – JANUARY 1996; OECD METHOD 301

- Results: Material is completely biodegradable.

RUSMAR INCORPORATED • 216 Garfield Avenue • West Chester, PA 19380
Toll Free: 1.800.SEE.FOAM • P: 610.436.4314 • F: 610.436.8436 • www.rusmarinc.com

APPENDIX E

Gas Extraction System SOP

Gas Extraction System Operation and Sampling SOPs

Field Measurements at the LFG Wellhead

These measurements include temperature, pressure/vacuum, flow (if the wellhead is fitted for flow measurement), methane, oxygen, and carbon dioxide. Countywide will take these measurements for two reasons: 1) to document the conditions at the wellhead for evaluating and assessing the gas environment in the landfill at that location and time, and 2) to make adjustments to the wellhead to enhance the performance of the well. Results from these field measurements will also be used to identify wells that have oxygen content over 1.5%.

Measurements will be taken at LFG wells with a GEM 2000 device distributed by CES Landtec, or equivalent. Calibration of this device will be made in accordance with the manufacturer's recommendations. The GEM 2000 has the following accuracies:

- Temperature at 14 to 167 degrees F range with + or - 0.4% accuracy,
- CH4 at 0 to 70% range by dual wavelength infrared cell with + or – 3% accuracy,
- CO2 at 0 to 40% range by dual wavelength infrared cell with + or – 3% accuracy,
- O2 at 0 to 40% range by electrochemical cell at + or - 1% accuracy.
- Pressure at maximum - 70 inches water column vacuum and + or - 250 mbar from calibration pressure, and,
- Ambient air temperature operating range is 32 to 104 degrees F.

If gas temperatures exceed the GEM 2000 range (approx. 167° F) an analog temperature gauge will be inserted into the sample port and the temperature will be manually input into the GEM 2000 data screen. At the end of each day of monitoring the GEM 2000 data will be downloaded to a computer for data storage.

The primary equipment needed for measurements at the LFG wellhead is the CES Landtec GEM 2000. This instrument provides the temperature, pressure/vacuum, flow, methane, oxygen, and carbon dioxide readings. In addition hoses, fittings to connect to the wellhead sample ports, inline carbon filters and water / particulate traps, GEM 2000 temperature probes, analog pocket thermometer, computers with internet access, and a GEM 2000 download cable will be needed.

Approach to Adjusting LFG Wellheads

Adjusting the wellhead is necessary to maximize LFG collection while at the same time maintaining compliance with Countywide's air permits. Adjustments to the wellhead are made after careful consideration of gas chemistry, temperature, pressure and flow. Adjustments to the wellhead are done by throttling the position of a wellhead valve.

Temperature Adjustments

If the gas temperature is found in a LFG wellhead to be greater than 131° F (or alternative temperature if a higher operating temperature is granted by OEPA) and the well is flowing gas and is under vacuum, Countywide may make nominal reductions to the vacuum applied at the wellhead if the oxygen concentration is greater than 1.5%. If instead, the same scenario exists but the oxygen is less than 1.5% Countywide may not

reduce the applied vacuum but instead allow the reaction gas to exit the landfill into the collection and control system.

If the gas temperature is found in a LFG wellhead to be greater than 131° F (or alternative temperature if a higher operating temperature is granted by OEPA) and the well is flowing gas but the well is under pressure, Countywide may allow this gas well to continue to flow under positive pressure if the gas is suspected to be emanating from the aluminum waste reaction. This process of allowing reaction gases to be collected from the landfill is important to maintain slope stability, to maintain odor control, and to prevent the temporary geomembrane cover from having gas bubbles form under it.

Pressure Adjustments

If zero or positive pressure is found in a LFG wellhead, Countywide will review the wells gas chemistry, gas wellhead temperature, and gas flow rate (at LFG wells fitted for flow rate determination) with the GEM 2000 field instrument. If this review shows typical LFG is present, wellhead temperature is under 131 F, and vacuum is available in the header; Countywide will open the wellhead valve thereby increasing the applied vacuum to the well. Typical LFG is defined for this section as: 40 to 55% methane concentrations, less than 20% balance gas, less than 1.5% oxygen, and CO2 concentrations that are less than the methane concentrations. If typical LFG is not found, it maybe a sign of the reaction gas and the well may be allowed to continue to operate under pressure.

Oxygen Adjustments

If the oxygen concentration is found in a LFG wellhead to be greater than 1.5%, Countywide will take steps to seal the cap and well casing as much as possible. If this sealing does not reduce the oxygen concentration below 1.5% within 7 days, Countywide will make nominal reductions to the vacuum applied at the wellhead. Nominal reductions in vacuum are considered to be any reduction that is less than 50% of the original vacuum, and will be made at least once every week.

Flow Rate Adjustments

If zero LFG flow is being extracted at LFG wells fitted for flow rate determination, Countywide will review the wells gas chemistry, gas wellhead temperature, and down hole liquid level. If this review shows typical LFG is present, gas wellhead temperature is less than 131 F, more than 75% of the installed perforations are free of liquids, and vacuum is available in the header; Countywide will open the wellhead valve thereby increasing the applied vacuum to the well thus potentially allowing LFG to flow.

If zero LFG flow is being extracted at LFG wells fitted for flow rate determination and the LFG well has less than 75% of its casing perforations available for free gas collection, then the well may be decommissioned and/or replaced or the well may be a candidate for installation of a leachate pump to remove liquids.

Carbon Monoxide at the LFG Wellhead by Laboratory Analyses

Procedures to collect the CO sample are as follows:

> Samples will be collected using a ridged air sample box that allows tedlar bags to be filled directly by using negative pressure provided by a personal air pump. A one (1) liter tedlar bag will be labeled with the well number, date, and requested analysis with a permanent marker. The pre-marked bag will be connected to the

sample inlet, inside the ridged sample box. The valve on the bag will be opened (no more than one turn) to allow gas to flow. One end of tygon tubing will be connected to the rigid sample box and the other end of the tygon tubing will be connected to the pump inlet. Then another tygon tube will be attached to the sample box and to the well sample port.

Next we will close the sample box and activate the sample pump and observe the tedlar bag filling, watching not to overfill. Once the bag is inflated, deactivate the sample pump and open the ridged sample box. The difference in pressure will allow the vacuum applied to the landfill gas extraction well location (sample location) to evacuate and purge the tedlar bag back into the well casing. Once the tedlar bag has been completely evacuated we will reseal the box and reactivate the pump. Once the bag and sample line has been purged the procedure is repeated and the bag is filled for final sample collection.

Next the sample line will be crimped and the sample box opened so the valve of the tedlar bag can be closed and the bag removed. Care will be taken as to not overfill (>50% full) the tedlar bags. CO samples will collected from wells which are actively collecting LFG, so the release of odors is minimized by purging the tedlar bag back into the well casing vs. into ambient air.

CO samples will be sent to a laboratory and analyzed via modified ASTM method D1946/EPA 3C with a 100 ppmv practical quantitation limit. Field blanks and trip blanks are not necessary for CO, however the tedlar bags will be kept cool and dark during shipping from the field to the laboratory. Maximum laboratory sample hold times for CO are 7 days.

The equipment needed for carbon monoxide measurements are: ridged sample box, hoses (tygon tubing), and fittings for connect to the wellhead, tedlar bags, sample pump, pen, and clipboard.

VOC, Methane, Hydrogen, and Acetylene Gas Analyses

Samples for this analysis will be collected using tedlar bags and sent to the laboratory for analysis, except for ammonia. Ammonia samples will be collected by first filling a 1 to 5 liter tedlar bag with LFG and then extracting a gas sample out of the tedlar bag using a Dräger tube via modified ASTM method D4490-90and having a 0.25 to 100,000 ppmv standard measurement range. This approach is superior to Dräger tube sampling from the wellhead because moisture from the wellhead can disrupt the accuracy of the Dräger.

After samples are collected, the chain of custody forms will be filled out, and all tedlar bag samples will be sent to the laboratory and analyzed for:

- VOC's via modified EPA method TO-15 with a 1.0 ppmv practical quantitation limit;
- Methane via modified ASTM method D1946 with a 1000 ppmv practical quantitation limit;
- Hydrogen via modified ASTM method D1946 with a 1000 ppmv practical quantitation limit; and
- Acetylene via modified ASTM method 1946/EPA 3C with a 1000 ppmv practical quantitation limit.

Field blanks and trip blanks are not necessary for these compounds; however, samples will be kept cool and dark during shipping from the field to the laboratory. The maximum sample hold times for VOC and acetylene in the laboratory are 7 days.

Maximum sample hold times for methane and hydrogen in the laboratory are 48 hours. The equipment needed for these gas measurements are: ridged sample box, hoses (tygon tubing), and fittings for connect to the wellhead, tedlar bags, sample pump, Dräger tubes, Dräger pump, pen, and clipboard.

APPENDIX F

Daily Construction Observation and Discrepancy Logs

Isolation Break ***Daily Field Report***

Owner: Republic Waste Services of Ohio, II Report No.: _____ Shift: _____

Location: East Sparta, Ohio Date: _____ Page ___ of ____

Project: CWRDF Isolation Break Weather: A.M. _____ P.M. _____

Excavation Contractor: _____ Temp.(^{o}F): High _____ Low _____ Rain _____

Excavation Contractor Supt.: _____ Wind Direction: _____

PHSO: _____ _____

Ambient Air Monitoring Tech: _____ _____

Number and Function of Contractors' Personnel, Hours Worked (Identify Subcontractors Separately)

Contractor	No. of People

Major Constr. Equip. Description	Size/Capacity	No.	No. in Use

Observer(s)	Representing	Visitors	Representing

Volume of Waste Relocated: _____ Relocation Area/Cell:_____

General Location Within Area/Cell:_____

Aluminum Containing Waste Encountered: _____ If yes, Approximate Quantity and Condition:_____

_____

Waste Impacted by Reaction Encountered:_____ If yes, Approximate Quantity and Condition:_____

_____

Highest VOC Reading (downwind station): _____ Time: _____

Highest VOC Reading (breathing zone): _____ Time: _____

Signature: _____

Owner: Republic Waste Services of Ohio, II Report No.: _____ Shift: _____

Project: CWRDF Isolation Break Date: _____ Page _____ of _____

Problems Encountered and Remedies: _____

Additional Comments: _____

Signature _____

CWRDF Isolation Break Construction
Discrepancy Identification Log

Date:	Discrepancy:	Parties:	Resolution:
_____	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
_____	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
_____	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
_____	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

APPENDIX G

Odor Monitoring Forms and Reports

DAILY ODOR MONITORING DATA SHEET
COUNTYWIDE RECYCLING AND DISPOSAL FACILITY

DATE: 10/1/08

TIME	LOCATION	60	30	15	7	4	2	<2	ND	DESCRIPTORS & HT	COMMENTS
6:59am	CP-100								X		
7:01am	CP-120								X		
7:02am	CP-140								X		
7:03am	CP-160								X		
7:05am	CP-180								X		
6:29am	AP-190								X		
6:32am	CP-200								X		
6:34am	CP-220 0								X		
6:35am	CP-240								X		
6:36am	CP-260								X		
6:38am	CP-280								X		
6:40am	AP-290								X		
6:39am	CP-300								X		
6:42am	CP-320							X		RLFG/Neutralizer	(1.5)
6:48am	CP-340								X		
6:50am	CP-360								X		
6:51am	CP-380								X		
6:52am	CP-400								X		
6:53am	CP-420								X		
6:54am	CP-440								X		
6:55am	CP-460								X		
6:57am	CP-480								X		
6:08am	AP-490								X		
6:17am	AP-500								X		

Check Point Descriptions
CP: Locations designated "CP" are located on the four roads surrounding CWRDF (Sherman Church, Haut/Downing, Dueber, and Gracemont)
AP-190: Includes Haut St west of Sherman Church to Beth Ave, north to Seeman, then East to Sherman Church and back to Haut.
AP-290: North on Dueber Ave to Haut St.
AP-490: South on Gracemont to Bolivar Elementary School
Ap-500: I-77 between Bolivar Exit and Fohl Rd Exit

Weather Conditions
Mostly Sunny
Partly Cloudy
(Mostly Cloudy)
~~Overcast~~
Hazy

Precipitation
(None)
Fog
Rain
Sleet
Snow

Wind Direction
N
~~NW~~
NE
W
E
SW
SE
S

Wind Speed
Calm
1-5 mph
(5-15 mph)
15-higher

Temperature: 48.9 F
Relative Humidity: 90 %
Barometric Pressure: 29.783

Neutralizer System In Service:
X Yes _____ No

Did an investigation of the source of odors occur? Yes (No)
If no investigation occurred explain why: ¢2 NRR
Results of the investigation: —
Summarize corrective actions planned or taken by Countywide: —

Notes:

10/1/08
DATE

Joshua McDonald
NAME

SIGNATURE

Daily Odor Monitoring Summary
Date: 10/28/08

Daily Odor Monitoring

Time	8:45 AM	10:30 AM	12:05 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	9:30 PM	6:30 AM	Investigated Complaints (See details below)	Total	Percentage
Intensity												
ND	23	23	24	24	21	22	22	22	23	0	204	94%
<2	1	1	0	0	1	2	2	2	1	0	10	5%
2	0	0	0	0	2	0	0	0	0	0	2	1%
4	0	0	0	0	0	0	0	0	0	0	0	0%
7	0	0	0	0	0	0	0	0	0	0	0	0%
15	0	0	0	0	0	0	0	0	0	0	0	0%
30	0	0	0	0	0	0	0	0	0	0	0	0%
60	0	0	0	0	0	0	0	0	0	0	0	0%
Type of Odor	RLFG	RLFG			RLFG	RLFG	RLFG	RLFG	RLFG	RLFG	216	100%

Weather Condition:

Mean Temperature	**38** °F / **4** °C
Max Temperature	**42** °F / **5** °C
Min Temperature	**35** °F / **1** °C
Average Humidity	79
Maximum Humidity	93
Minimum Humidity	58
Precipitation	**0.09** in / **0.2** cm
Sea Level Pressure	**30.09** in / **1018.74** hPa
Wind Speed	**9** mph / **14** km/h (NW)
Max Wind Speed	**16** mph / **26** km/h
Max Gust Speed	**32** mph / **52** km/h
Events	Rain

Complaints:
No complaints during this time period.

Possible Odor Causing Activities and Events:
- Flare startup – B
- Pump maintenance – B

Total Nasal Ranger Readings 4 and Greater

Compiled from Investigated Complaints and Monitoring Rounds

Nasal Reading of 4 is defined as "Distinct"

(Total of 92,130 Readings)