CONSTRUCTION RECORD DOCUMENTATION REPORT 2015 GAS COLLECTION AND CONTROL SYSTEM EXPANSION

J.E.D. Solid Waste Management Facility

Osceola County, Florida

Submitted to: Florida Department of Environmental Protection
Waste Management Program, Central District
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Orlando, FL 32803-3767 USA

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Certificate of Authorization Number 1670

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Mr. F. Thomas Lubozynski, PE
Florida Department of Environmental Protection
Environmental Administrator, Permitting and WCU
Waste, Air, & Stormwater Permitting
3319 Maguire Boulevard, Suite 232
Orlando, FL 32803-3767

RE: CONSTRUCTION RECORD DOCUMENTATION REPORT
2015 GAS COLLECTION AND CONTROL SYSTEM EXPANSION
J.E.D. SOLID WASTE MANAGEMENT FACILITY
OSCEOLA COUNTY, FLORIDA
PERMIT NUMBERS: SC49-0199726-017 AND SO49-0199726-022

Dear Mr. Lubozynski:

On behalf of the Omni Waste of Osceola County, LLC (Omni), Golder Associates Inc. (Golder) is pleased to submit the enclosed report documenting the construction quality assurance (CQA) monitoring for construction of the 2015 gas collection and control system (GCCS) expansion at the J.E.D. Solid Waste Management Facility located in Osceola County, Florida.

The enclosed report contains a narrative describing the construction procedures employed by the contractors and the CQA monitoring of the construction activities performed by Golder. The report also includes a summary of changes with respect to the construction drawings, a CQA certification, an as-built survey for the GCCS expansion, an as-built well schedule, well boring logs, photographic documentation of construction activities, gravel laboratory results, the CQA engineer field monitoring reports, and the Florida Department of Environmental Protection (FDEP) Certification of Construction Completion of a Solid Waste Management Facility. An electronic copy of the report has been included on CD as well.

If there are any questions on any of the information presented herein, please feel free to call Mr. Mike Kaiser of Progressive Waste Solutions at (904) 673-0446 or the undersigned.

Sincerely,

GOLDER ASSOCIATES INC.

Don E. Grigg, PE (Pennsylvania)
Senior Project Engineer

KEVIN S. BROWN LICENSE No. 57819 STATE OF FLORIDA PROFESSIONAL ENGINEER

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5/20/2016
Date

cc: Mr. Mike Kaiser – Omni Waste of Osceola County, LLC.

Enclosure: Construction Record Documentation Report

DEG/KSB/ams

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1.0 INTRODUCTION

The J.E.D. Solid Waste Management Facility (JED Facility) is owned and operated by Omni Waste of Osceola County, LLC, a subsidiary of Progressive Waste Solutions, Ltd. The facility is located southeast of St. Cloud, Florida, in Osceola County. The JED Facility is required under its Solid Waste Permits (SC49-0199726-017 and SO49-0199726-022, issued September 22, 2011 and July 12, 2012, respectfully by the Florida Department of Environmental Protection (FDEP)), to install and operate a gas collection and control system (GCCS) at the facility. The GCCS must meet the design drawings and specifications provided in the lateral expansion permit application approved under permit modification SC49-0199726-017. Additionally, the facility's Title V Air Permit, 0970079-012-AV, issued on April 8, 2015 by the FDEP, also requires installation of a GCCS meeting the requirements 40 CFR 60, Subpart WWW Standards of Performance for Municipal Solid Waste Landfills (New Source Performance Standards [NSPS]). The JED Facility became subject to the GCCS requirements of Subpart WWW on December 23, 2008. The GCCS is required to be operational in all waste that is in place for two years or more for areas at final grade, and five years or more for areas at interim grade.

1.1 Background

Golder Associates Inc. (Golder) was retained by Omni Waste of Osceola County, LLC (Omni) to provide full time construction quality assurance (CQA) services during the 2015 GCCS expansion at the JED Facility. Previous GCCS installation at the facility (Phase I, II) included approximately 95 vertical gas extraction wells, 14 horizontal collectors, one skid mounted flare system, and header and lateral piping in the Cells 1-9 disposal areas.

The main components of this GCCS expansion monitored by Golder were:

- Installation of 30 gas extraction wells;
- Installation of 2 horizontal collectors (HGC-14 and HGC-15);
- Installation of approximately 2,650 feet of header, lateral gas conveyance pipe, and various appurtenances;
- Installation of interconnect piping at the landfill gas to energy project location;
- Removal of Flare #1 LFG header line and installation of condensate trap in Cell 1; and,
- Repair of geosynthetics in Cell 1 due to Flare #1 relocation, and closure cap of Cells 1-4 due to abandoned and redrilled vertical gas extraction wells.

This report includes a description of the project and the activities observed by Golder during the construction of the GCCS described above. Section 2 provides a summary of the changes in the design that were necessitated by field conditions. Descriptions of the construction activities and the CQA services provided by Golder are presented in Sections 3 and 4, respectively. Section 5 presents the CQA certification by a Florida registered professional engineer.

1.2 Project Description

Construction activities for the 2015 GCCS expansion were performed in accordance with the Phase III Construction Drawings prepared by Golder and Technical Specifications prepared by Geosyntec which were submitted to the FDEP. A copy of the drawings and specifications are provided in Appendices A and B, respectively.

Gas wells were installed in the area of the landfill with intermediate cover. Header and lateral gas conveyance piping was installed below ground. The lateral gas conveyance piping connects the gas extraction wells to the main header system that directs gas to the existing flare system. Construction oversight activities for the vertical gas extraction wells and piping commenced on Jun 29, 2015 and were completed on July 23, 2015. A second construction event commenced on August 3, 2015 and was completed on August 10, 2015. A third construction event for the vertical gas extraction wells commenced on December 4, 2015 and was completed on December 31, 2015. The interconnect piping construction event was observed from August 17, 2015 through August 28, 2015. Geosynthetic repairs were made in the Cells 1-4 closure cap area in two separate events. The first event commenced on December 1, 2015 and was completed on December 3, 2015. The second event commenced on February 8, 2016 and was completed on February 16, 2016.

1.3 Scope of Services

The services Golder provided included observation and documentation of the installation of the gas extraction wells, horizontal collectors, header and lateral gas conveyance piping, and tie-ins of the header and laterals to the existing GCCS. This report documents the CQA services provided during the observation of the above-listed components.

Golder conducted its services during this project in accordance with the following documents:

- Proposal titled “Proposal for Construction Quality Assurance Services April 2015 Horizontal Collector Installation (P83-82743O1),” prepared by Golder dated April 7, 2015.
- Proposal titled “Proposal for Construction Quality Assurance Services 2015 Vertical Wellfield Expansion and GCCS Piping Installation (P83-82743S1),” prepared by Golder dated June 10, 2015.
- Construction drawings titled “J.E.D. Solid Waste Management Facility Gas Collection and Control System (GCCS) Phase III Disposal Area,” prepared by Golder, dated September 2012, and provided in Appendix A of this report.
- Specifications titled “Technical Specifications” prepared by Geosyntec, and provided in Appendix B of this report.
- GRI Test Method GM19, Geosynthetic Institute – 2/12/15.

Omni retained Peavey & Associates Surveying and Mapping, PA (Peavey & Associates) to fulfill the surveying needs associated with the 2015 GCCS expansion, including development and certification of the

as-built survey. As part of its services, Golder reviewed the as-built survey to check that the major components of the construction were shown.

2.0 SUMMARY OF CHANGES

The construction was conducted in general accordance with the documents described in Section 1.2 with minor modifications necessitated by field conditions as described below. These modifications did not alter the design intent of the system.

2.1 Extraction Well Locations

The temporary vertical extraction wells installed in Cells 7 and 8 were located to address odors and assist in gas extraction at the facility. Note that these wells were installed prior to the timelines set forth under the NSPS in 40 CFR60.755(b) (2 year/5 year rule); as such, these wells were located to best control potential landfill gas odors. The as-built well schedule presented in Appendix D provides the northing and easting for the extraction wells. Well boring logs for all installed extraction wells are presented in Appendix E.

2.2 Extraction Well Construction

Appendix H documents the laboratory test results of the aggregate backfill placed at the annulus of the borehole around the slotted pipe of the gas extraction wells. Two gravel samples were tested for gradation and showed the gravel sample gradation yielded results in between No. 2 and No. 3 stone. Golder believes that no performance impacts of the gas extraction wells will occur due to the use of this larger than typical (No. 4 or No. 57 stone) aggregate. The carbonate content of the gravel samples were 0.02% and 0.03%, which meets construction specifications.

During the setting of well GW-T100 (after drilling to an apparent depth of 128 ft. bgs), the well screen was unable to be installed to the apparent drill depth. This left the well screen too close to the ground surface. No attempt at removing the installed screen (to shorten it) was made due to concerns over damaging the well screen, which could cause the borehole to be abandoned. The decision was made to install a 16-ft long piece of encasement pipe to act as the solid portion of the well (4-ft above ground and 12-ft bgs). This encasement pipe was then sealed using reducing a rubber fernco type coupling.

Additionally, there were two wells (GW-T80 and GW-68R1) which encountered mud-like conditions near the bottom of the borehole. For each of these wells, the well screens were installed several feet above the noted bottom of the borehole due to the mud-like conditions.

Solid lengths of wells installed on the cap area varied based on the actual depths to the existing top liner.

2.3 Extraction Well Depths

The design depths of the wells were based upon preconstruction survey elevations obtained by JED Facility and the bottom liner system elevations provided by Golder. The extraction wells were designed to terminate approximately 15 feet from the top of protective cover of the base liner system. The as-built well schedule is provided in Appendix D. The following table summarizes the differences in design versus as-built well

depths for wells that were not installed to the design depth. As noted in the well boring logs presented in Appendix E, wet subsurface conditions were encountered which prevented drilling depth advancement using the bucket auger for a few extraction wells. Additionally, unstable sub-surface conditions caused some partial sloughing/caving of boreholes, thus reducing the overall depth that some wells were set at.

Table 1: Extraction Well Design Depth to Actual Depth Comparison

Well ID	Design Well Depth (ft. bgs)	Actual Well Depth (ft. bgs)	Difference Between Design and Actual Well Depth (ft.)
GW-T80	132	89.5	42.5
GW-T100	136	128	8
GW-T103	101	101	0
GW-T104	86	86	0
GW-T109	95	95	0
GW-T110	64	64	0
GW-T113	64	65	-1
GW-65R1	118	72	46
GW-67R1	73	36	37
GW-68R1	123	109	14
GW-4R2	141	105	36
GW-15R3	92	92	0
GW-18R1	137	110	27
GW-21R1	136	100.5	35.5
GW-22R1	136	107	29
GW-27R1	139	116	23
GW-37	128	105	23
GW-45R1	137	107	30
GW-50R1	139	100	39
GW-51R1	105	105	0
GW-54R1	139	111	28
GW-72	151	103	48
GW-73	144	108	36
GW-75	134	95	39
GW-76	126	101	25
GW-77	127	127	0
GW-78	131	131	0
GW-79	135	135	0
GW-81	124	124	0
GW-83	80	75	5

2.4 Header/Lateral Gas Conveyance Pipe Installation

There were no significant modifications to the details specified in the GCCS Phase III Disposal Area drawings (Appendix A) with respect to the lateral gas conveyance pipe installation; however the location of the piping was modified to accommodate actual field conditions encountered. Deviations from the GCCS Phase III Disposal Area drawings can be found on the as-built survey in Appendix C. Note that the temporary wells were supplied with a common lateral pipe and were not surveyed in due to its temporary nature. Once the landfill reaches elevations near the final design elevations and/or needs permanent gas extraction in accordance with 40 CFR 60, Subpart WWW, new wells and associated piping will be installed.

2.5 Horizontal Gas Collectors Installation

Due to interim waste grades the profiles of each horizontal collector were field modified. The horizontal collectors slope up and down at a 4 percent minimum slope below ground at 100 foot intervals with drainage sumps at every low point. This pattern continues for the entire length of each horizontal gas collector and promotes improved drainage of condensate.

During the installation of HGC-14 and HGC-15, the 8-ounce geotextile was wrapped completely around the tire chip backfill and the horizontal collector as opposed to laying a strip of geotextile above the tire chip backfilled trench in an attempt to minimize siltation of the HGCs.

3.0 CONSTRUCTION ACTIVITIES

3.1 Project Participants

The parties involved in the 2015 GCCS expansion included:

- Omni, as the owner;
- Golder, as the design engineer;
- Golder, as the CQA engineer;
- CB&I, as a construction contractor;
- SCS Field Services, as a construction contractor;
- RCS Excavation, as a construction contractor;
- Comanco Environmental Services, as a geosynthetic contractor;
- Peavey & Associates, as the surveyor.

3.2 Gas Extraction Well Installation

CB&I performed the drilling and installation of 30 gas extraction wells during the 2015 GCCS expansion. The first installation of the gas wells commenced on July 8, 2015 and was completed on July 20, 2015. A second drilling program initiated on August 4, 2015 and finished on August 6, 2015. A third drilling program started on December 04, 2015 and completed on December 31, 2015. The drill rig utilized was a Soilmec SR-30, with a 3-foot-diameter bucket auger. CB&I used an air-monitoring device during all drilling activities to monitor breathing zones. Peavey & Associates surveyed the locations of the completed gas wells; the certified as-built survey is provided in Appendix C.

Gas extraction well installation depths were field-adjusted to the existing ground elevation of the landfill based on the ground surface survey conducted prior to drilling. Waste material excavated during drilling was hauled to the active working face of the landfill for disposal each day drilling occurred. The wells were constructed using 8-inch SCH 80 PVC slotted and solid pipe. The as-built well schedule, found in Appendix D, provides the well depths along with the screen and solid pipe lengths. The well pipes were bell and spigot type, and each joint was glued and three lag bolts installed to provide additional support at each joint.

The procedure used for the installation of the extraction wells is summarized below:

- Set the bottom of the slotted pipe approximately ½-foot above the bottom of the borehole;
- Backfill borehole to approximately ½-foot above top of slotted pipe with approved stone;
- Place geocomposite ring (georing) above stone backfill;
- Install 2-foot-thick granular hydrated bentonite plug #1;
- Above bentonite plug #1, backfill borehole with clean cover soil to within approximately 4 feet of existing ground surface or existing final cover geomembrane;

- Install 2-foot-thick granular hydrated bentonite plug #2; and
- Backfill remaining borehole with clean cover soil and slope at the surface to promote surface water runoff.

Appendix E includes well boring logs that show the well construction details, including the materials placed in the borehole annulus. As construction of the lateral pipe system progressed, wellheads were installed and connected to laterals. Appendix G provides representative photographs of the drilling of the extraction wells, the installation of the extraction wells, the installation of the laterals to provide a vacuum source to the extraction wells, and the installation of the wellheads at the extraction wells.

3.3 Header/Lateral Gas Conveyance Pipe Installation

CB&I performed the installation of the header and lateral gas conveyance piping associated with the 2015 GCCS expansion. Two excavators (Deere 270D and Komatsu PC 290 LC) were utilized for trench excavation for the header and lateral gas conveyance pipe installation. Lateral gas conveyance pipe was 6-inch and 8-inch high-density polyethylene (HDPE) standard dimension ratio (SDR) 17 and installed at a minimum 5 percent slope below ground. The lateral gas conveyance piping connects the extraction wells to the main header system that directs gas to the existing flare system. Header gas conveyance piping was 18-inch HDPE SDR 17 and installed at a minimum 5 percent slope below ground.

At the completion of the trench the HDPE SDR 17 pipe (varying diameter) was placed in the trench, marked with gas caution tape, and covered with clean fill. Survey risers were placed every 50 feet and at points of interest for the as-built survey and excavated waste material was disposed of at the active working face. The surface was then reworked to existing grades and slopes using a John Deer 650K dozer.

3.4 Horizontal Gas Collectors Installation

SCS Field Services performed the installation of two horizontal gas collectors, HGC-14 and HGC-15 from April 9, 2015 to April 17, 2015. Two excavators (Doosan DX225LC and John Deere 130G) were utilized for trench excavation for the horizontal gas collector pipe installation. Horizontal gas collector piping was 10-inch HDPE SDR 11. The solid pipe portion of the horizontal gas collectors were installed at a minimum 5 percent slope below ground, and the perforated pipe portion of the horizontal gas collectors were installed at a minimum 4 percent slope below ground. The horizontal gas collector piping was capped at the side slope until the piping was completed during the June construction event discussed above. JED Facility operations surveyed the top of pipe of the horizontal gas collectors; the as-built survey data points with associated pipe profiles are provided in Appendix C. Appendix G provides photographs of the horizontal gas collector pipe installation.

The procedure for the installation of the horizontal gas collectors is summarized below:

- Install 8-ounce geotextile in the trench;

- Backfill approximate 3-ft wide trench with a 1.5-foot thick layer of tire chips;
- Place 10-inch HDPE SDR 11 pipe above top of tire chips;
  - First 150 feet of pipe from tie-in to be solid 10-inch HDPE SDR 11;
  - Remaining pipe to be perforated 10-inch HDPE SDR 11;
- Backfill trench approximately 1.5 feet about top of 10-inch HDPE SDR 11 pipe with tire chips;
- Wrap (overlap) 8-ounce geotextile around tire chip backfill; and backfill remaining trench with surrounding waste.

3.5 Interconnect Piping

RCS Excavation performed the construction of the interconnect piping at the landfill gas to energy facility project. The construction included the main gas header conveyance piping (both treated and untreated gas), piping to the individual flare stations, condensate piping, pressurized air supply piping, sumps, and associated appurtenances.

3.6 Flare #1 Relocation Piping Modifications

In support of the relocation of Flare #1 (formerly located northwest of the disposal footprint), RCS Excavation modified the piping arrangement near the 24-in. diameter flare header in Cell 1. The work commenced on November 16, 2015 and was completed on November 19, 2015. The 24-in header line was cut and removed. This required that a condensate drain be installed at the location. A condensate trap was construction in general accordance with the details provided in the Phase 3 GCCS Construction Drawings and installed where the 24-in. flare header was removed. The final geosynthetic cover was required to be exposed and cut to allow for the work to proceed. Once the new condensate trap was installed, a drain line running to the north was tied into a 6-in. diameter leachate cleanout riser at the Cell 1 sump area.

3.7 Geosynthetic Cap Repairs

Once the installation of the condensate trap and drain line were completed, the area was backfilled to match the existing grades. Comanco Environmental Services (Comanco) was contracted to complete repairs to the geosynthetic components; work commenced on December 1, 2015 and were completed on December 4, 2015. 40-mil LDPE geomembrane was utilized to complete the repairs. All seaming of the geomembrane was completed utilizing extrusion welding. Installation of the drainage geocomposite above the geoemembrane was also completed by Comanco. Seaming of the drainage geocomposite utilized a two-step process, nylon straps (zip-ties) were used to connect the geonet; sewing and lystering of the geotextile was used to seam the rolls together.

Additional geosynthetic repairs were made for the new (or replacement) wells and associated piping located in the Cells 1 – 4 closure cap. Golder also observed repairs associated with the 18-inch header repair in

Cell Old wells (to be abandoned) were cut several feet below grade and capped. The area was then backfilled with clean soil fill and graded uniformly with adjacent areas. Once all wells were abandoned and all new (or replacement) well and pipe construction was complete, Comanco was contracted to complete repairs to the geosynthetic components. Work commenced on February 8, 2016 and was completed on February 16, 2016. All seaming of the geomembrane was completed utilizing extrusion welding. Installation of the drainage geocomposite above the geoemembrane was also completed by Comanco. Seaming of the drainage geocomposite utilized a two-step process, nylon straps (zip-ties) were used to connect the geonet; sewing and lystering of the geotextile was used to seam the rolls together.

4.0 CONSTRUCTION MONITORING

Construction monitoring was documented by the CQA engineer in daily field monitoring reports, as provided in Appendix I. The field monitoring reports document the overall construction activities and the specific issues encountered during construction on a day-to-day basis.

4.1 Technical Specifications

The construction of the 2015 GCCS expansion was performed in general accordance with the technical specifications prepared by Geosyntec and provided in Appendix B. Materials utilized in the 2015 GCCS expansion were reviewed for compliance with the requirements of the technical specifications.

4.2 Gas Extraction Well Installation

Golder monitored the drilling and the well construction of all gas extraction wells. Logs showing the installation details for each well are included in Appendix E, and a summary of the well construction details is found in the as-built well schedule included in Appendix D.

4.3 Header/Lateral Gas Conveyance Pipe Installation

Golder monitored the welding and the installation of the header and lateral pipes during the 2015 GCCS expansion. The CQA engineer observed pipe welding to ensure that the interior of the pipe was generally clean, that pipe shavings from the cutting process were removed, and that the manufacturer's recommended iron temperature and gauge pressure were followed. Golder also monitored the trench construction and pipe integrity during placement for compliance with the requirements of the technical specifications. Header gas conveyance pipe was pressure tested at 10 psi for an hour to ensure there were no leaks in the newly installed GCCS.

4.4 Horizontal Gas Collectors Installation

Golder monitored the installation of four horizontal gas collectors during the 2015 GCCS expansion. The CQA engineer observed the excavation and installation of all horizontal gas collectors to ensure that the construction drawings and field changes were properly followed. As-built logs of the horizontal gas collectors are located in Appendix C.

4.5 Interconnect Piping

Golder provided full time construction quality oversight services during the installation of below-ground interconnect piping associated with the landfill gas to energy facility. Golder was onsite for a period of approximately two weeks during which the construction events were associated with sump installation and below-ground piping. Golder documented the as-built condition and noted variations from the design drawings (completed by Blue Flame Crew, July 2015) with "red-line" copies of the drawings included in

Appendix F. Also attached are the as-built survey drawings (by Peavey & Associates Surveying & Mapping PA), photographic documentation which are located in Appendix C.

4.6 Flare #1 Relocation Piping Modifications

Golder monitored the removal of old components, the welding and the installation of the new condensate trap and associated drain line. Golder observed the excavation of materials, exposure, cutting and removal of the geosynthetic cap in the work area, and the backfilling operations. The CQA technician observed pipe welding to ensure that the interior of the pipe was generally clean, that pipe shavings from the cutting process were removed, and that the manufacturer's recommended iron temperature and gauge pressure were followed.

4.7 Geosynthetic Repairs

Golder also monitored the repairs to the geosynthetic cover system in the work areas. Golder monitored Comanco raking and preparing surfaces to further prepare for geomembrane installation. Golder checked areas for trash, roots, and other deleterious material which may compromise the integrity of the geomembrane. Comanco measured each area, cut sections of geomembrane and transported them to the repair areas. The geomembrane was placed on top of the prepared subgrade manually and it overlapped the existing geomembrane. Comanco cleaned the existing geomembrane tie-in. Golder checked the deployed panels for defects; Comanco was notified of any defects found so that the area could be repaired.

4.7.1.1 Seaming

Comanco utilized extrusion welding for all seams in the repair area. Golder field personnel observed and documented seaming operations on a full-time basis. Monitoring during seaming included the observation of the seam area for cleanliness and absence of moisture and the monitoring of welding machine temperatures. All seams were observed for visual quality and seam completion. Seaming information recorded by Golder included seam number, seam section, ambient temperature, approximate start time, seaming device, seaming technician, pre-heat set, digital set and indicator temperatures of the wedge or barrel nozzle, and approximate welding length. Monitoring of the seaming procedures also included observation and testing of trial welds. Summaries of the seam monitoring data are presented in Appendix I.

Geomembrane trial seams were prepared by Comanco technicians prior to each seaming period for each technician and each machine. Trial seams were prepared for every type of material weld that would be encountered within that seaming period (i.e. smooth/textured, textured/textured). The following procedure was used to field evaluate trial seams:

- At least three test specimens were cut across the trial seam sample, each approximately 1-inch wide by 6 inches long;

- At least two specimens were tested in peel and one for shear strength using a field tensiometer;
- Hot wedge (fusion) seams were tested in peel on each track (inside/outside);
- The passing criteria for the peel test was a visual observation of a proper break and a tensile strength greater than or equal to the specified strength;
- If any of the specimens failed, adjustments were made to the welding equipment and a new trial seam was fabricated, and the test procedure was repeated; and
- Once a trial seam passed, the technician could proceed with the field seaming operations.

Golder personnel observed the trial seam testing. The criteria for strength utilized was taken from the most recent version of GRI GM19 (dated 2/15/2015), stipulated that specimens shall yield at a shear strength equal to or greater than 60 pounds per inch (ppi) for extrusion seams. The strength criteria for peel adhesion stipulated by the project specifications is that specimens shall yield at a strength equal to or greater than 44 ppi for extrusion welds. The geomembrane trial seam results are presented on the Geomembrane Trial Seams Logs provided in Appendix I. A copy of GRI GM19 is included in Appendix B.

4.7.1.2 Non-destructive Seam Testing

Field geomembrane seams, patches, and repairs were tested by Comanco for continuity using vacuum box test procedures. Golder personnel observed and documented the non-destructive seam testing.

The vacuum test was used to nondestructively test extrusion-welded seams. The procedure was as follows:

- Connect the hose and vacuum box assembly to the vacuum pump;
- Wet a strip of seam approximately 4 inches wide by 2 feet long with soapy solution;
- Place the box over the wetted area;
- Close the bleed valve/open the vacuum valve;
- Force the box onto the sheet until a vacuum is established, as evidenced by a negative box pressure of approximately 5 psi;
- Examine the seam through the viewing window for a period of approximately 15 seconds for the occurrence of air bubbles;
- Record and mark the location of any leaks to be repaired;
- Close the vacuum valve/open the bleed valve; and

Remove the box and continue the process.

4.7.1.3 Defects and Repairs

The seams and non-seam areas of the geomembrane were examined for identification of defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. When a defect was observed or detected, the following repair procedures were conducted:

- The seaming equipment used in the repair procedure had field trial seams approved prior to use;

- The surfaces were clean and dry at the time of the repair;
- Patches and caps extended at least 6 inches beyond the edge of the defect and the corners were rounded; and
- The repairs were vacuum tested and visually observed for continuity.

Defects in the geomembrane were repaired by Comanco. Golder personnel observed the repairs either during the repair procedure or after the repairs were made. Golder assigned each observed defect a unique alphanumeric code to ensure tracking of both the repair and the subsequent non-destructive test performed by Comanco. The alphanumeric codes are used throughout the CQA logs to reference defect or seam locations. Summaries of defect/repair logs prepared by Golder field personnel are included in Appendix I.

4.7.1.4 Boots and Penetrations

Any location that required a penetration of the geomembrane required a boot to be installed (e.g., a landfill gas well or pipe). The boots were installed in a two part system. The first part consisted of a bottom sleeve of 40-mil LLDPE textured geomembrane that was customized to fit around the diameter of the penetration. The bottom of the sleeve (apron) was then extrusion welded to the geomembrane surrounding the penetration. Then the second part of the system included sleeve 40-mil LLDPE wrap around the penetrating pipe, inserted within the annulus of the apron and then secured with a stainless steel batten strip. The sleeve was then extrusion welded to the apron.

4.7.1.5 Drainage Geocomposite

The drainage geocomposite was placed directly over the geomembrane by manually deploying the rolls. Drainage geocomposite rolls were overlapped a minimum of 4 inches. Adjacent panels were connected with nylon fasteners through the geonet component at a maximum spacing of 2 feet. Cross seams of the geonet component were connected with nylon fasteners with a maximum spacing of 6 inches. Seams in the anchor trenches were also fastened at 6-inch intervals. Once the geonet components were fastened together, the top geotextile components were sewn together. The cross seams were covered with a piece of geotextile that were lystered in place.

5.0 SUMMARY AND CERTIFICATION

Omni retained Golder to provide CQA services during the construction of the 2015 GCCS expansion at the JED Facility. These services included the quality assurance monitoring, documentation, and/or testing of the items listed below:

- Installation of 30 gas extraction wells (7 temporary, 10 new, and 13 redrills) including geosynthetic repairs to the Cells 1-4 closure cap for abandoned wells and new well and pipe booting;
- Installation of 2 horizontal collectors;
- Installation of approximately 2,650 feet of header, lateral gas conveyance pipe and subheader and appurtenances;
- Installation of the interconnect piping and associated appurtenances;
- Flare #1 relocation piping modifications; and,
- Geosynthetic repairs.

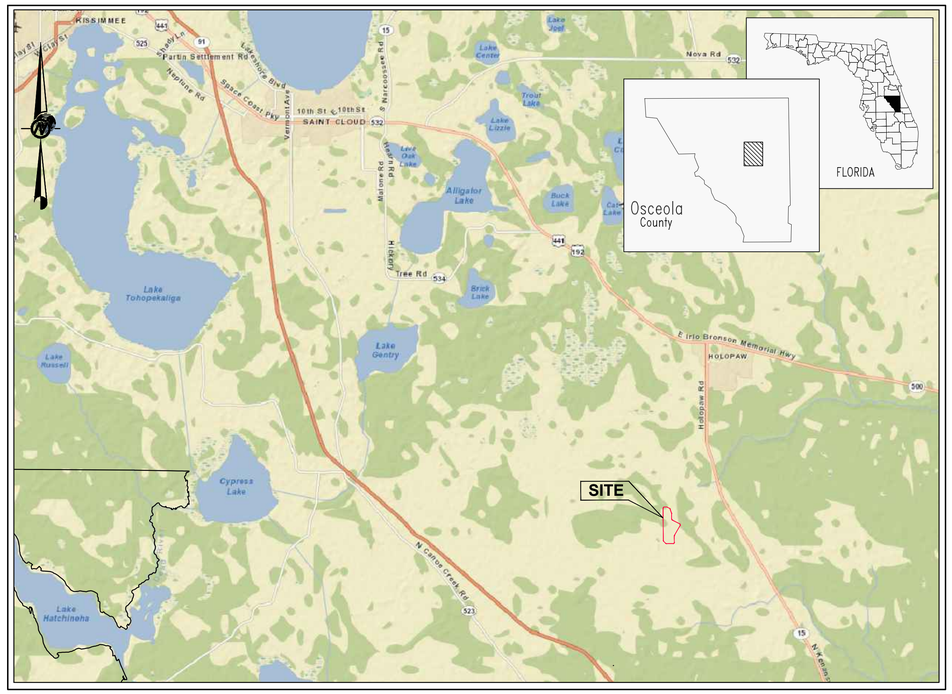
Based on the field observations, submittal information from the contractor, field testing results, and the data presented herein, it is Golder's professional opinion that the 2015 GCCS expansion at the JED Facility was installed in substantial conformance with the FDEP-approved design/construction drawings and technical specifications as referenced herein. Modifications and deviations from the technical specifications are discussed in Section 2. These modifications did not alter the design intent of the GCCS. Appendix J provides the signed and sealed FDEP Certification of Construction Completion of a Solid Waste Management Facility form, 62-701.900(2).

APPENDIX A

CONSTRUCTION DRAWINGS

J.E.D. SOLID WASTE MANAGEMENT FACILITY
GAS COLLECTION AND CONTROL SYSTEM (GCCS)
PHASE III DISPOSAL AREA

ST. CLOUD, OSCEOLA COUNTY, FLORIDA



SITE LOCATION MAP

LIST OF DRAWINGS		
SHEET	TITLE	REVISION
1	TITLE SHEET	
2	TOPOGRAPHIC MAP	
3	PLAN LAYOUT OF GCCS IN PHASE 3 (CELLS 8 THROUGH 10)	
4	PLAN LAYOUT OF GCCS IN PHASE 3 (SEQUENCE 1)	
5	PLAN LAYOUT OF GCCS IN PHASE 3 (SEQUENCE 2)	
6	PLAN LAYOUT OF GCCS IN PHASE 3 (SEQUENCE 3)	
7	GAS SYSTEM CONTROL POINTS	
8	VERTICAL GAS EXTRACTION WELL DETAILS	
9	GCCS DETAILS (1 OF 2)	
10	GCCS DETAILS (2 OF 2)	
11	HORIZONTAL GAS COLLECTOR DETAILS	
12	HORIZONTAL GAS COLLECTOR CROSS SECTIONS	

Prepared for:

WSI Waste Services, Inc.

OMNI WASTE OF OSCEOLA COUNTY, LLC

1501 OMNI WAY
ST. CLOUD, FLORIDA 34773
TEL: 407-891-3720 FAX: 407-891-3730

Prepared by:

Golder Associates
Jacksonville, Florida

September 2012

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

J.E.D. SOLID WASTE MANAGEMENT FACILITY
OSCEOLA COUNTY
FLORIDA

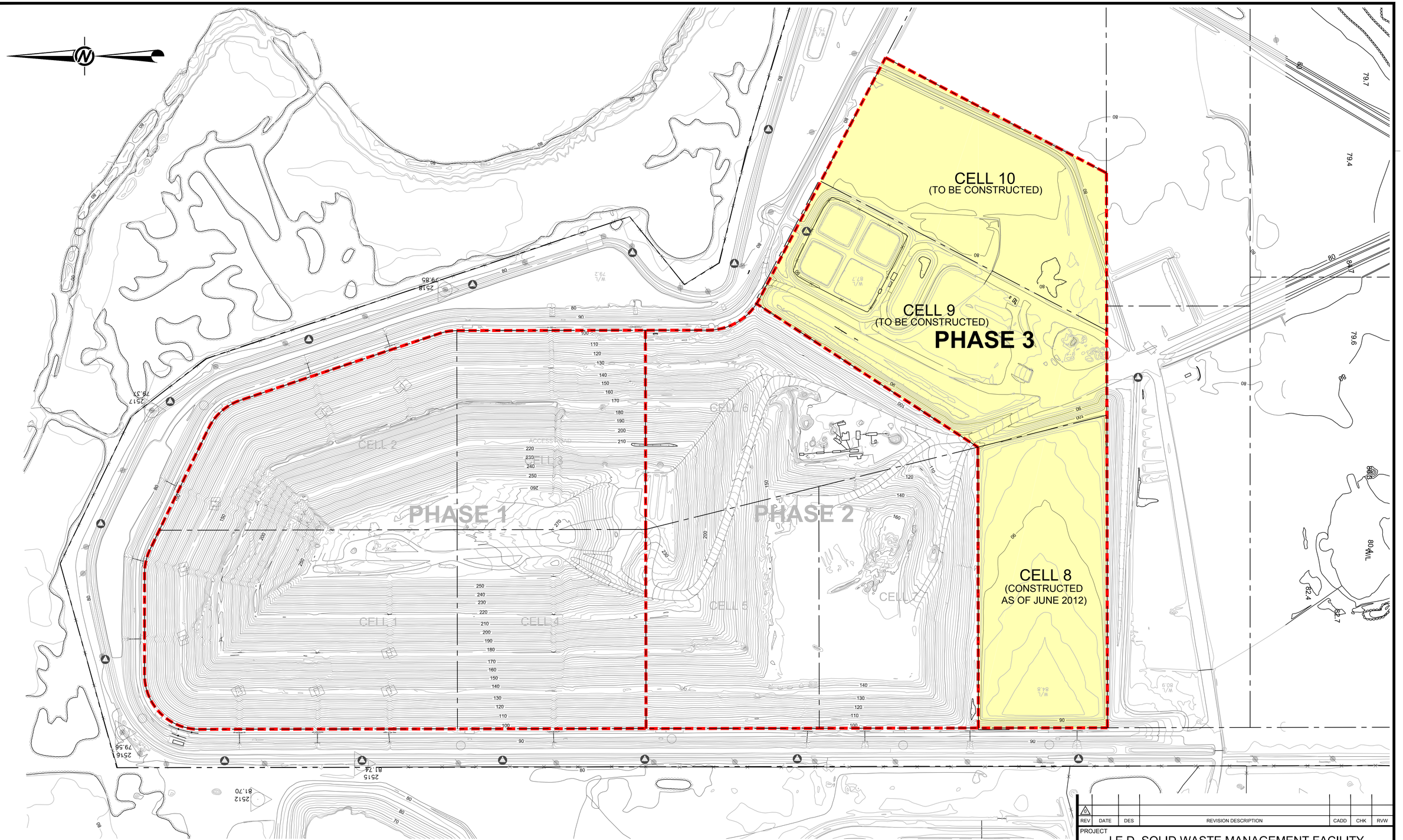
TITLE SHEET/LIST OF DRAWINGS

Kevin S. Brown, P.E.
Florida Registration No. 57819

SHEET 1

PROJECT No083-82734 FILE No.08382734G001 CADD BCL DATE 09/07/12

Drawing file: 08382734G001.dwg Oct 18, 2012 - 6:17pm



LEGEND

- PROPERTY BOUNDARY
- PHASE BOUNDARY
- PHASE 3 DISPOSAL AREA

NOTES

1. NORTHING AND EASTING COORDINATES SHOWN REPRESENT FLORIDA STATE PLANE EAST ZONE NORTH AMERICAN DATUM OF 1983 (NAD83).
2. THE ELEVATIONS SHOWN REPRESENT NATIONAL GEODETIC VERTICAL DATUM OF1929 (NGVD29)(FEET).
3. TOPOGRAPHIC INFORMATION SHOWN ON THIS DRAWING WAS PROVIDED BY BASE MAPPING CO. LTD BASED ON AN AERIAL PHOTOGRAPH TAKEN ON 18 MAY 2012.

150 0 150 300
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1						

PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE
TOPOGRAPHIC MAP

Kevin S. Brown, P.E.
Florida Registration No. 57819

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

PROJECT No.		083-82734.22
DESIGN	DEG	05/18/12
CADD	BCL	05/18/12
CHECK	.	.
REVIEW	.	.

FILE No. 08382734G002
SCALE AS SHOWN

SHEET 2

LEGEND

- PROPERTY BOUNDARY
- 80 — EXISTING GROUND ELEVATION (FEET)
- EXISTING FENCE
- 280 — FINAL COVER ELEVATION (FEET)
- GW-53 — EXISTING VERTICAL GAS EXTRACTION WELL
- EXISTING HDPE HEADER PIPE
- EXISTING HDPE LATERAL PIPE
- APPROXIMATE LIMITS OF ASBESTOS (SEE NOTE 1)
- GW-419 — PROPOSED VERTICAL GAS EXTRACTION WELL
- PROPOSED HDPE HEADER PIPE
- PROPOSED HDPE LATERAL PIPE
- GW-415 — FUTURE VERTICAL GAS EXTRACTION WELL
- FUTURE HDPE LATERAL PIPE
- REDUCER
- BLIND FLANGE (DIAMETER VARIES)
- CONDENSATE DRAIN AT LOW POINT
- ISOLATION VALVE
- PROPOSED UPPER TIER HGC (10" SDR-11)
- PROPOSED LOWER TIER HGC (10" SDR-11)
- 6" — LATERAL PIPE SIZE
- GW-91 — PREVIOUS PHASE PROPOSED VERTICAL GAS EXTRACTION WELL
- PREVIOUS PHASE PROPOSED HDPE LATERAL PIPE
- PREVIOUS PHASE PROPOSED HDPE HEADER PIPE

NOTES

1. NORTHING AND EASTING COORDINATES SHOWN REPRESENT FLORIDA STATE PLANE EAST ZONE NORTH AMERICAN DATUM OF 1983 (NAD83).
2. THE ELEVATIONS SHOWN REPRESENT NATIONAL GEODETIC VERTICAL DATUM OF1929 (NGVD29)(FEET).
3. THE PROPERTY BOUNDARY BASED ON A COMPOSITE BOUNDARY SURVEY PROVIDED BY JOHNSTON SURVEYING INC., KISSIMMEE FLORIDA, DATED AUGUST 12, 1999.
4. TOPOGRAPHIC INFORMATION SHOWN ON THIS DRAWING (OUTSIDE OF THE WASTE LIMITS) WAS PROVIDED BY BASE MAPPING CO. LTD BASED ON AN AERIAL PHOTOGRAPH TAKEN ON 18 MAY 2012.
5. THE TOPOGRAPHIC INFORMATION PROVIDED DOES NOT NECESSARILY REPRESENT CURRENT CONDITIONS. THE CONTRACTOR SHALL UNDERSTAND CURRENT CONDITIONS BASED ON FIELD RECONNAISSANCE AND/OR ADDITIONAL TOPOGRAPHIC SURVEYS AT THEIR EXPENSE.

GCCS NOTES

1. APPROXIMATE LIMITS OF ASBESTOS SHOWN WERE BASED ON GRID AND GPS TRACKING BY SITE OPERATIONS. THE LIMITS OF ASBESTOS WERE ASSUMED TO BE WITHIN 20-FT RADIUS OF THE COORDINATES PROVIDED BY OMNI. CONTRACTOR SHALL MARK THE INDICATED AREAS IN FIELD TO PREVENT INSTALLATION OF GAS EXTRACTION WELLS IN AREAS WHERE ASBESTOS WAS DISPOSED.
2. LATERAL PIPES SHALL BE 4", 6" OR 8" DIA. SDR-17 HDPE PIPES AS SHOWN ON THIS SHEET.
3. GRADES INDICATED ON THIS SHEET WITHIN THE WASTE DISPOSAL BOUNDARY ARE TOP OF FINAL COVER SYSTEM GRADES.
4. A 15-FT WIDE BENCH WILL BE PROVIDED ON THE SIDE SLOPE OF THE LANDFILL EVERY 40 VERTICAL FEET. GAS EXTRACTION WELLS ADJACENT TO THESE BENCHES SHALL BE OFFSET FROM THE EDGE OF THE BENCH AS INDICATED ON SHEET 10, DETAIL 3.
5. THE BOTTOM LINER SYSTEM IS AT A RELATIVELY HIGHER ELEVATION ADJACENT TO THE INTERCELL BERMS. CONTRACTOR SHALL PROVIDE ADDITIONAL ATTENTION DURING INSTALLATION OF GAS EXTRACTION WELLS ADJACENT TO THE INTERCELL BERMS.
6. A HEADER ACCESS RISER SHALL BE PROVIDED AT EACH HIGH POINT ALONG HEADER (I.E., AT EACH HPH) AS NOTED ON SHEET 11.
7. A CONDENSATE DRAIN SHALL BE PROVIDED AT EACH LOW POINT ALONG HEADER (I.E., AT EACH LPH).
8. FUTURE GAS EXTRACTION WELLS SHOWN IN GREEN LOCATED WITHIN CELLS 8-10, WILL NOT BE INSTALLED UNTIL WASTE IS IN CELLS 11, 12, AND CELL 13 AND IS SUFFICIENT TO ALLOW INSTALLATION AT OR NEAR FINAL GRADES.
9. ALL PIPING WITHIN THE LIMITS OF WASTE TO BE INSTALLED WITH A MINIMUM OF 5% SLOPE.
10. THE EXACT LOCATIONS AND NUMBERING OF GCCS FEATURES MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS AT THE TIME OF INSTALLATION.
11. EXCESS EXCAVATED WASTE (INCLUDING DRILL CUTTINGS) WILL BE HAULED TO THE ACTIVE WORKING FACE FOR DISPOSAL. SHOULD WASTE BE UTILIZED AS BACKFILL, DAILY COVER WILL BE UTILIZED IN ACCORDANCE WITH PERMIT AND REGULATORY REQUIREMENTS.

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1						

PROJECT

J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE

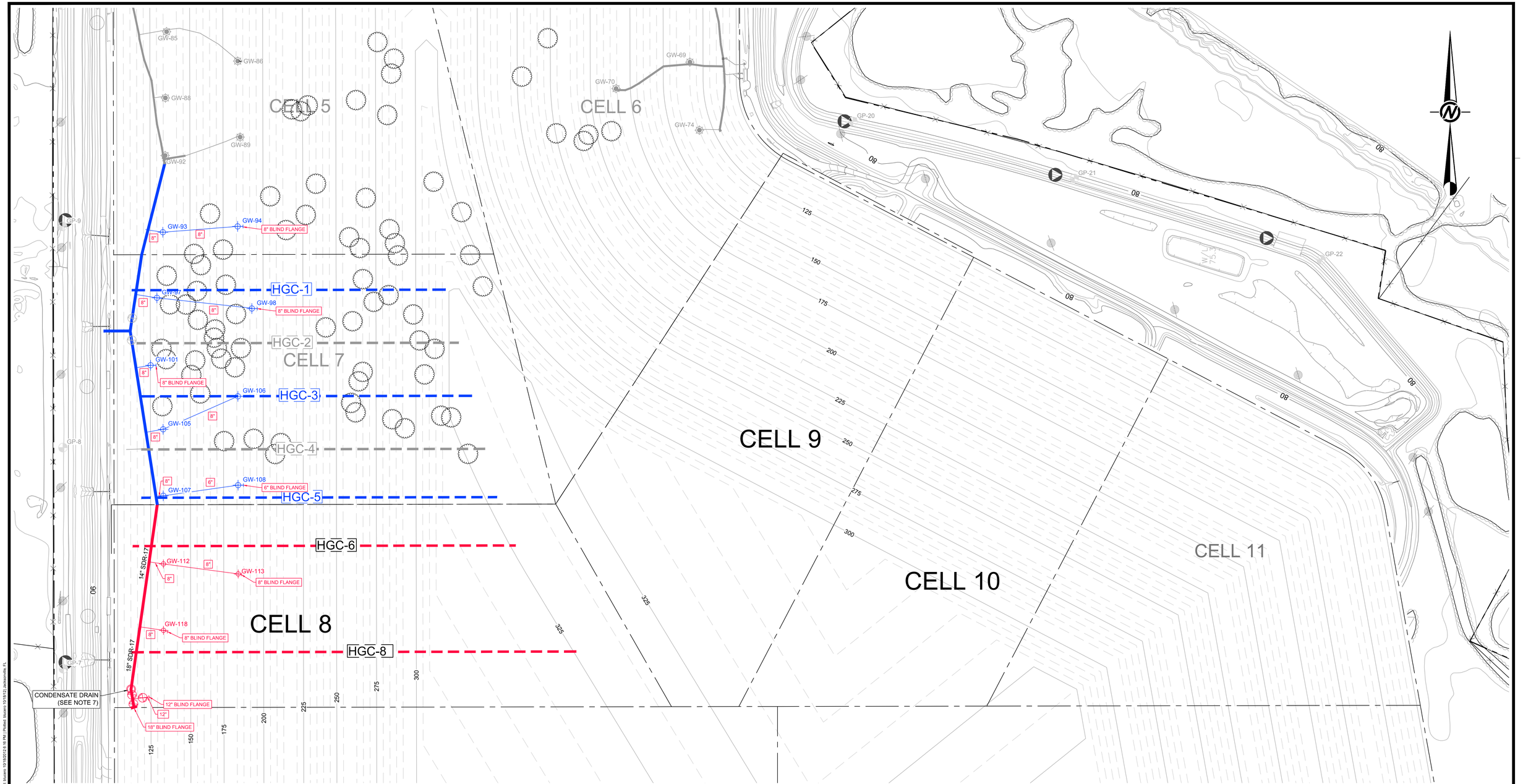
PLAN LAYOUT OF GCCS IN PHASE 3 (CELLS 8 THROUGH 10)

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

PROJECT No.	083-82734.22		FILE No.	08382734G003	
DESIGN	DEG	05/18/12	SCALE	AS SHOWN	
CADD	BCL	05/18/12			
CHECK	.	.	SHEET 3		
REVIEW	.	.			

Kevin S. Brown, P.E.
Florida Registration No. 57819

SCALE 160 0 160 320 FEET



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF INTERMITTENT STREAM
- INTERCELL BERM LOCATION
- 80 — EXISTING GROUND ELEVATION (FEET)
- EXISTING FENCE
- 280 — FINAL COVER ELEVATION (FEET)
- GP-18 — EXISTING GAS MONITORING PROBE
- GW-35 — EXISTING VERTICAL GAS EXTRACTION WELL
- EXISTING HDPE HEADER PIPE
- EXISTING HDPE LATERAL PIPE
- GW-419 — PROPOSED VERTICAL GAS EXTRACTION WELL
- PROPOSED HDPE HEADER PIPE
- PROPOSED HDPE LATERAL PIPE
- BLIND FLANGE (DIAMETER VARIES)
- APPROXIMATE LIMITS OF ASBESTOS (SEE GCCS NOTE 1)
- CONDENSATE DRAIN AT LOW POINT
- ISOLATION VALVE
- CONDENSATE KNOCKOUT POT
- PROPOSED UPPER TIER HGC (10" SDR-11)
- PROPOSED LOWER TIER HGC (10" SDR-11)
- EXISTING LOWER/UPPER TIER HGC
- 6" — LATERAL PIPE SIZE
- GW-91 — PREVIOUS PHASE PROPOSED VERTICAL GAS EXTRACTION WELL
- PREVIOUS PHASE PROPOSED HDPE LATERAL PIPE
- PREVIOUS PHASE PROPOSED HDPE HEADER PIPE
- PREVIOUS PHASE UPPER TIER HGC (10" SDR-11)

GCCS NOTES

1. APPROXIMATE LIMITS OF ASBESTOS SHOWN WERE BASED ON GRID AND GPS TRACKING BY SITE OPERATIONS. THE LIMITS OF ASBESTOS WERE ASSUMED TO BE WITHIN 20-FT RADIUS OF THE COORDINATES PROVIDED BY OMNI. CONTRACTOR SHALL MARK THE INDICATED AREAS IN FIELD TO PREVENT INSTALLATION OF GAS EXTRACTION WELLS IN AREAS WHERE ASBESTOS WAS DISPOSED.
2. LATERAL PIPES SHALL BE 4", 6" OR 8" DIA. SDR-17 HDPE PIPES AS SHOWN ON THIS SHEET.
3. GRADES INDICATED ON THIS SHEET WITHIN THE LANDFILL ARE TOP OF FINAL COVER SYSTEM GRADES.
4. A 15-FT WIDE BENCH WILL BE PROVIDED ON THE SIDE SLOPE OF THE LANDFILL EVERY 40 VERTICAL FEET. GAS EXTRACTION WELLS ADJACENT TO THESE BENCHES SHALL BE OFFSET FROM THE EDGE OF THE BENCH AS INDICATED IN SHEET 11.
5. THE BOTTOM LINER SYSTEM IS AT A RELATIVELY HIGHER ELEVATION ADJACENT TO THE INTERCELL BERMS. CONTRACTOR SHALL PROVIDE ADDITIONAL ATTENTION DURING INSTALLATION OF GAS EXTRACTION WELLS ADJACENT TO THE INTERCELL BERMS.
6. A HEADER ACCESS RISER SHALL BE PROVIDED AT EACH HIGH POINT ALONG HEADER (I.E., AT EACH HPH) AS NOTED ON SHEET 11.
7. A CONDENSATE DRAIN SHALL BE PROVIDED AT EACH LOW POINT ALONG HEADER (I.E., AT EACH LPH).
8. ALL PIPING WITHIN THE LIMITS OF WASTE TO BE INSTALLED WITH A MINIMUM OF 5% SLOPE.
9. PROPOSED GCCS COMPONENTS BASED UPON BULLSEYE DESIGN SERVICES, INC., DWG # 2.
10. THE EXACT LOCATIONS AND NUMBERING OF GCCS FEATURES MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS AT THE TIME OF INSTALLATION.
11. EXCESS EXCAVATED WASTE (INCLUDING DRILL CUTTINGS) WILL BE HAULED TO THE ACTIVE WORKING FACE FOR DISPOSAL. SHOULD WASTE BE UTILIZED AS BACKFILL, DAILY COVER WILL BE UTILIZED IN ACCORDANCE WITH PERMIT AND REGULATORY REQUIREMENTS.

NOTES

1. NORTHING AND EASTING COORDINATES SHOWN REPRESENT FLORIDA STATE PLANE EAST ZONE NORTH AMERICAN DATUM OF 1983 (NAD83).
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5. THE TOPOGRAPHIC INFORMATION PROVIDED DOES NOT REPRESENT CURRENT CONDITIONS. THE CONTRACTOR SHALL UNDERSTAND CURRENT CONDITIONS BASED ON FIELD RECONNAISSANCE AND/OR ADDITIONAL TOPOGRAPHIC SURVEYS AT THEIR EXPENSE.

100 0 100 200
SCALE FEET

Kevin S. Brown, P.E.
Florida Registration No. 57819

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1						

PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

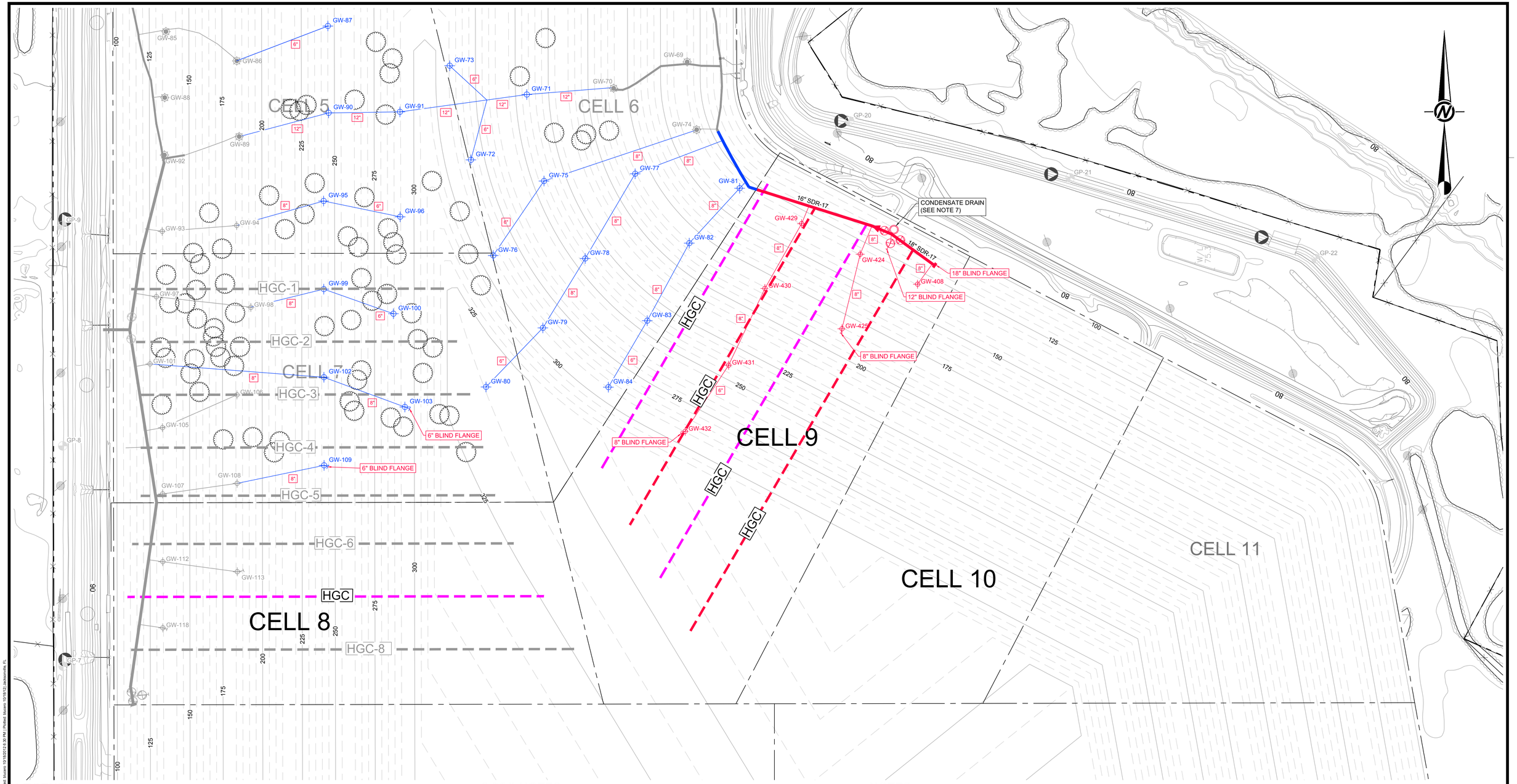
TITLE
PLAN LAYOUT OF GCCS IN PHASE 3 (SEQUENCE 1)

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

PROJECT No.		083-82734.22	FILE No.		08382734G004
DESIGN	DEG	05/18/12	SCALE		AS SHOWN
CADD	BCL	05/18/12			
CHECK	.	.			
REVIEW	.	.			

SHEET 4

N:\PROJ\083823\CAD\Sheets\ GCCS Phase 3 Disposal Area Plans\Gccs Phase3 Drawings\083823GP3G004.dwg | SHEET 4 | Modified: tkocsmi 10/19/2012 4:16 PM | Printed: tkocsmi 10/19/12 Jacksonville, FL



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF INTERMITTENT STREAM
- 80 — EXISTING GROUND ELEVATION (FEET)
- EXISTING FENCE
- 280 — FINAL COVER ELEVATION (FEET)
- GP-18 — EXISTING GAS MONITORING PROBE
- GW-35 — EXISTING VERTICAL GAS EXTRACTION WELL
- EXISTING HDPE HEADER PIPE
- EXISTING HDPE LATERAL PIPE
- GW-114 — PROPOSED VERTICAL GAS EXTRACTION WELL (CURRENT SEQUENCE)
- PROPOSED HDPE HEADER PIPE (CURRENT SEQUENCE)
- PROPOSED HDPE LATERAL PIPE (CURRENT SEQUENCE)
- REDUCER
- BLIND FLANGE (DIAMETER VARIES)
- INTERCELL BERM LOCATION
- APPROXIMATE LIMITS OF ASBESTOS (SEE GCCS NOTE 1)
- CONDENSATE DRAIN AT LOW POINT
- ISOLATION VALVE
- CONDENSATE KNOCKOUT POT
- PROPOSED UPPER TIER HGC (10" SDR-11)
- PROPOSED LOWER TIER HGC (10" SDR-11)
- EXISTING LOWER & UPPER HGC
- 8" — LATERAL PIPE SIZE
- GW-112 — EXISTING VERTICAL GAS EXTRACTION WELL (PREVIOUS SEQUENCE)
- GW-91 — PREVIOUS PHASE PROPOSED VERTICAL GAS EXTRACTION WELL
- PREVIOUS PHASE PROPOSED HDPE LATERAL PIPE
- PREVIOUS PHASE PROPOSED HDPE HEADER PIPE
- PREVIOUS PHASE UPPER TIER HGC (10" SDR-11)

GCCS NOTES

1. APPROXIMATE LIMITS OF ASBESTOS SHOWN WERE BASED ON GRID AND GPS TRACKING BY SITE OPERATIONS. THE LIMITS OF ASBESTOS WERE ASSUMED TO BE WITHIN 20-FT RADIUS OF THE COORDINATES PROVIDED BY OMNI. CONTRACTOR SHALL MARK THE INDICATED AREAS IN FIELD TO PREVENT INSTALLATION OF GAS EXTRACTION WELLS IN AREAS WHERE ASBESTOS WAS DISPOSED.
2. LATERAL PIPES SHALL BE 4", 6" OR 8" DIA. SDR-17 HDPE PIPES AS SHOWN ON THIS SHEET.
3. GRADES INDICATED ON THIS SHEET WITHIN THE LANDFILL ARE TOP OF FINAL COVER SYSTEM GRADES.
4. A 15-FT WIDE BENCH WILL BE PROVIDED ON THE SIDE SLOPE OF THE LANDFILL EVERY 40 VERTICAL FEET. GAS EXTRACTION WELLS ADJACENT TO THESE BENCHES SHALL BE OFFSET FROM THE EDGE OF THE BENCH AS INDICATED ON SHEET 10.
5. THE BOTTOM LINER SYSTEM IS AT A RELATIVELY HIGHER ELEVATION ADJACENT TO THE INTERCELL BERMS. CONTRACTOR SHALL PROVIDE ADDITIONAL ATTENTION DURING INSTALLATION OF GAS EXTRACTION WELLS ADJACENT TO THE INTERCELL BERMS.
6. A HEADER ACCESS RISER SHALL BE PROVIDED AT EACH HIGH POINT ALONG HEADER (I.E., AT EACH HPH) AS NOTED ON SHEET 11.
7. A CONDENSATE DRAIN SHALL BE PROVIDED AT EACH LOW POINT ALONG HEADER (I.E., AT EACH LPH).
8. ALL PIPING WITHIN THE LIMITS OF WASTE TO BE INSTALLED WITH A MINIMUM OF 5% SLOPE.
9. PROPOSED GCCS COMPONENTS BASED UPON BULLSEYE DESIGN SERVICES, INC., DWG # 5.
10. THE EXACT LOCATIONS AND NUMBERING OF GCCS FEATURES MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS AT THE TIME OF INSTALLATION.
11. EXCESS EXCAVATED WASTE (INCLUDING DRILL CUTTINGS) WILL BE HAULED TO THE ACTIVE WORKING FACE FOR DISPOSAL. SHOULD WASTE BE UTILIZED AS BACKFILL, DAILY COVER WILL BE UTILIZED IN ACCORDANCE WITH PERMIT AND REGULATORY REQUIREMENTS.

NOTES

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100 0 100 200
SCALE FEET

Kevin S. Brown, P.E.
Florida Registration No. 57819

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1						

PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE
PLAN LAYOUT OF GCCS IN PHASE 3 (SEQUENCE 2)

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

PROJECT No.		083-82734.22	FILE No.		08382734G005
DESIGN	DEG	05/18/12	SCALE		AS SHOWN
CADD	BCL	05/18/12			
CHECK	.	.			
REVIEW	.	.			

SHEET 5

LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF INTERMITTENT STREAM
- EXISTING GROUND ELEVATION (FEET)
- EXISTING FENCE
- FINAL COVER ELEVATION (FEET)
- GP-18 EXISTING GAS MONITORING PROBE
- GW-35 EXISTING VERTICAL GAS EXTRACTION WELL
- EXISTING HDPE HEADER PIPE
- EXISTING HDPE LATERAL PIPE
- GW-409 PROPOSED VERTICAL GAS EXTRACTION WELL (CURRENT SEQUENCE)
- PROPOSED HDPE HEADER PIPE (CURRENT SEQUENCE)
- PROPOSED HDPE LATERAL PIPE (CURRENT SEQUENCE)
- BLIND FLANGE (DIAMETER VARIES)
- INTERCELL BERM LOCATION
- APPROXIMATE LIMITS OF ASBESTOS (SEE GCCS NOTE 1)
- CONDENSATE DRAIN AT LOW POINT
- ISOLATION VALVE
- CONDENSATE KNOCKOUT POT
- PROPOSED UPPER TIER HGC (10" SDR-11)
- PROPOSED LOWER TIER HGC (10" SDR-11)
- EXISTING LOWER & UPPER HGC
- 8" LATERAL PIPE SIZE
- GW-112 EXISTING VERTICAL GAS EXTRACTION WELL (PREVIOUS SEQUENCE)
- GW-91 PREVIOUS PHASE PROPOSED VERTICAL GAS EXTRACTION WELL
- PREVIOUS PHASE PROPOSED HDPE LATERAL PIPE
- PREVIOUS PHASE PROPOSED HDPE HEADER PIPE
- PREVIOUS PHASE UPPER TIER HGC (10" SDR-11)

GCCS NOTES

1. APPROXIMATE LIMITS OF ASBESTOS SHOWN WERE BASED ON GRID AND GPS TRACKING BY SITE OPERATIONS. THE LIMITS OF ASBESTOS WERE ASSUMED TO BE WITHIN 20-FT RADIUS OF THE COORDINATES PROVIDED BY OMNI. CONTRACTOR SHALL MARK THE INDICATED AREAS IN FIELD TO PREVENT INSTALLATION OF GAS EXTRACTION WELLS IN AREAS WHERE ASBESTOS WAS DISPOSED.
2. LATERAL PIPES SHALL BE 4", 6" OR 8" DIA. SDR-17 HDPE PIPES AS SHOWN ON THIS SHEET.
3. GRADES INDICATED ON THIS SHEET WITHIN THE LANDFILL ARE TOP OF FINAL COVER SYSTEM GRADES.
4. A 15-FT WIDE BENCH WILL BE PROVIDED ON THE SIDE SLOPE OF THE LANDFILL EVERY 40 VERTICAL FEET. GAS EXTRACTION WELLS ADJACENT TO THESE BENCHES SHALL BE OFFSET FROM THE EDGE OF THE BENCH AS INDICATED ON SHEET 10.
5. THE BOTTOM LINER SYSTEM IS AT A RELATIVELY HIGHER ELEVATION ADJACENT TO THE INTERCELL BERMS. CONTRACTOR SHALL PROVIDE ADDITIONAL ATTENTION DURING INSTALLATION OF GAS EXTRACTION WELLS ADJACENT TO THE INTERCELL BERMS.
6. A HEADER ACCESS RISER SHALL BE PROVIDED AT EACH HIGH POINT ALONG HEADER (I.E., AT EACH HPH) AS NOTED ON SHEET 11.
7. A CONDENSATE DRAIN SHALL BE PROVIDED AT EACH LOW POINT ALONG HEADER (I.E., AT EACH LPH).
8. ALL PIPING WITHIN THE LIMITS OF WASTE TO BE INSTALLED WITH A MINIMUM OF 5% SLOPE.
9. PROPOSED GCCS COMPONENTS BASED UPON BULLSEYE DESIGN SERVICES, INC., DWG # 6.
10. THE EXACT LOCATIONS AND NUMBERING OF GCCS FEATURES MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS AT THE TIME OF INSTALLATION.
11. EXCESS EXCAVATED WASTE (INCLUDING DRILL CUTTINGS) WILL BE HAULED TO THE ACTIVE WORKING FACE FOR DISPOSAL. SHOULD WASTE BE UTILIZED AS BACKFILL, DAILY COVER WILL BE UTILIZED IN ACCORDANCE WITH PERMIT AND REGULATORY REQUIREMENTS.

NOTES

1. NORTHING AND EASTING COORDINATES SHOWN REPRESENT FLORIDA STATE PLANE EAST ZONE NORTH AMERICAN DATUM OF 1983 (NAD83).
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4. TOPOGRAPHIC INFORMATION SHOWN ON THIS DRAWING WAS PROVIDED BY BASE MAPPING CO. LTD BASED ON AN AERIAL PHOTOGRAPH TAKEN ON 18 MAY 2012.
5. THE TOPOGRAPHIC INFORMATION PROVIDED DOES NOT NECESSARILY REPRESENT CURRENT CONDITIONS. THE CONTRACTOR SHALL UNDERSTAND CURRENT CONDITIONS BASED ON FIELD RECONNAISSANCE AND/OR ADDITIONAL TOPOGRAPHIC SURVEYS AT THEIR EXPENSE.

SCALE 100 0 100 200 FEET

Kevin S. Brown, P.E.
Florida Registration No. 57819

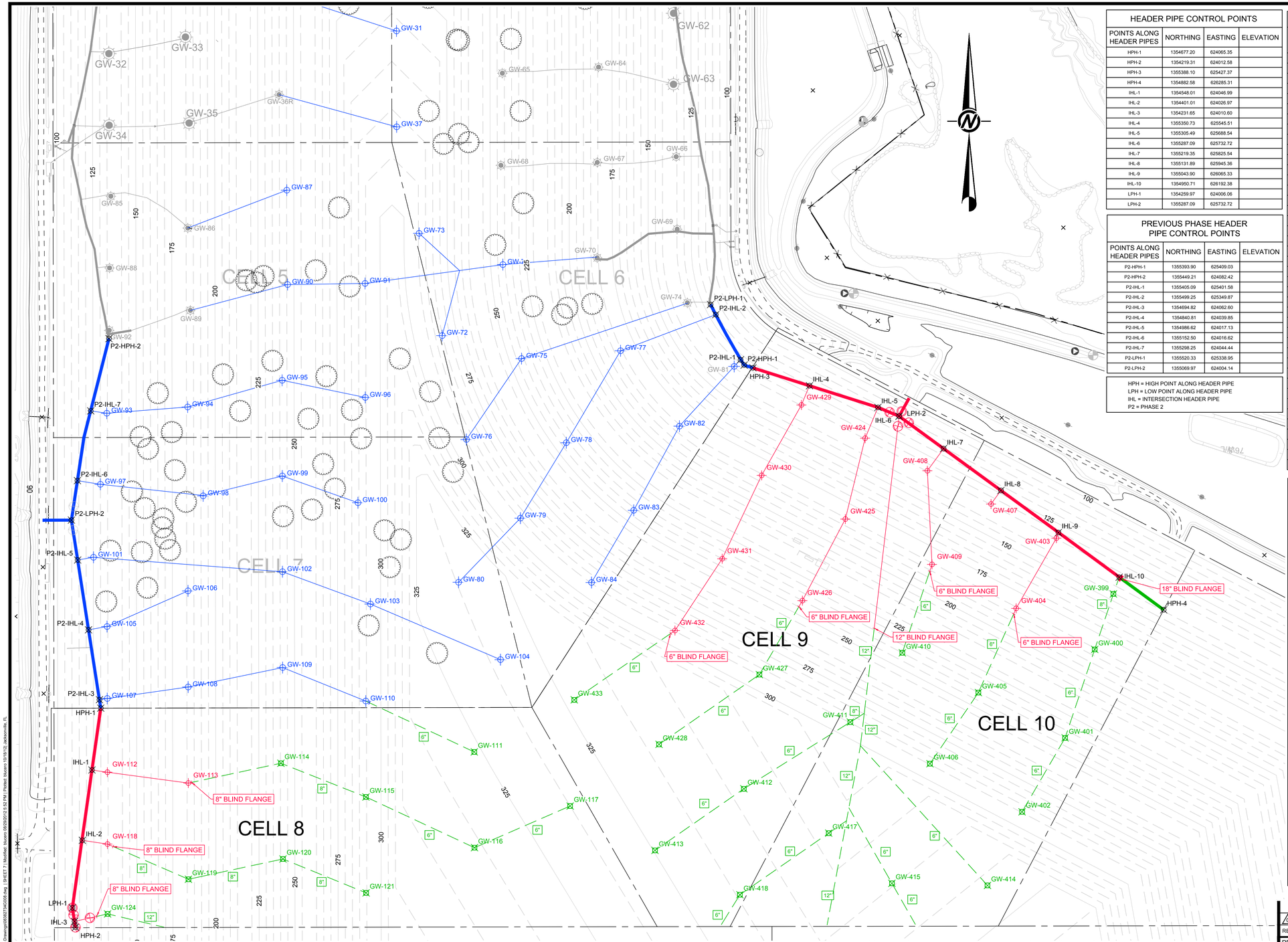
REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
0						

PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE
PLAN LAYOUT OF GCCS IN PHASE 3 (SEQUENCE 3)

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

PROJECT No.		083-82734.22	FILE No. 08382734G006
DESIGN	DEG	05/18/12	SCALE AS SHOWN
CADD	BCL	05/18/12	**SHEET 6**
CHECK	.	.	
REVIEW	.	.	



HEADER PIPE CONTROL POINTS

POINTS ALONG HEADER PIPES	NORTHING	EASTING	ELEVATION
HPH-1	1354677.20	624065.35	
HPH-2	1354219.31	624012.58	
HPH-3	1355388.10	625427.37	
HPH-4	1354882.58	626285.31	
IHL-1	1354548.01	624046.99	
IHL-2	1354401.01	624026.97	
IHL-3	1354231.65	624010.60	
IHL-4	1355350.73	625545.51	
IHL-5	1355305.49	625688.54	
IHL-6	1355287.09	625732.72	
IHL-7	1355219.35	625825.54	
IHL-8	1355131.89	625945.36	
IHL-9	1355043.90	626065.33	
IHL-10	1354950.71	626192.38	
LPH-1	1354259.97	624006.06	
LPH-2	1355287.09	625732.72	

PREVIOUS PHASE HEADER PIPE CONTROL POINTS

POINTS ALONG HEADER PIPES	NORTHING	EASTING	ELEVATION
P2-HPH-1	1355393.90	625409.03	
P2-HPH-2	1355449.21	624082.42	
P2-IHL-1	1355405.09	625401.58	
P2-IHL-2	1355499.25	625349.87	
P2-IHL-3	1354694.82	624062.60	
P2-IHL-4	1354840.81	624039.85	
P2-IHL-5	1354986.62	624017.13	
P2-IHL-6	1355152.50	624016.62	
P2-IHL-7	1355298.25	624044.44	
P2-LPH-1	1355520.33	625338.95	
P2-LPH-2	1355069.97	624004.14	

HPH = HIGH POINT ALONG HEADER PIPE
LPH = LOW POINT ALONG HEADER PIPE
IHL = INTERSECTION HEADER PIPE
P2 = PHASE 2

GAS EXTRACTION WELLS

GAS WELL	NORTHING	EASTING	TOP OF FINAL COVER ELEVATION	TOP OF LINER PROTECTIVE LAYER ELEVATION	BOTTOM OF GAS WELL ELEVATION	TOTAL WELL DEPTH	SCREEN LENGTH (SLOTTED PIPE)
GW-111	1354585.70	624845.51	324.3	90.6	105.6	218.6	203.6
GW-112	1354543.42	624079.15	134.5	82.3	97.3	37.3	22.3
GW-113	1354520.60	624248.16	180.8	83.6	98.6	82.3	67.3
GW-114	1354562.06	624441.62	240.4	86.2	101.2	139.2	124.2
GW-115	1354491.65	624619.24	294.5	86.8	101.8	192.8	177.8
GW-116	1354385.70	624845.85	319.2	89.4	104.4	214.8	199.8
GW-117	1354472.67	625045.71	330.0	90.7	105.7	224.3	209.3
GW-118	1354393.24	624079.41	134.5	81.6	96.6	38.0	23.0
GW-119	1354319.75	624248.50	180.8	84.5	99.5	81.3	66.3
GW-120	1354362.06	624445.89	241.7	85.8	100.8	140.9	125.9
GW-121	1354291.24	624619.58	294.5	88.7	103.7	190.8	175.8
GW-124	1354247.31	624079.66	134.5	84.1	99.1	35.4	20.4
GW-399	1354915.72	626180.29	145.6	83.5	98.5	47.1	32.1
GW-400	1354799.88	626141.27	180.9	85.1	100.1	80.8	65.8
GW-401	1354615.03	626079.49	240.0	87.5	102.5	137.5	122.5
GW-402	1354460.54	625989.53	294.5	89.2	104.2	190.4	175.4
GW-403	1355032.32	626061.33	134.5	81.0	96.0	38.6	23.6
GW-404	1354885.60	625977.26	180.8	82.8	97.8	83.1	68.1
GW-405	1354709.71	625898.32	240.0	84.5	99.5	140.5	125.5
GW-406	1354561.10	625797.13	294.5	86.6	101.6	192.9	177.9
GW-407	1355103.69	625924.78	134.5	83.6	98.6	35.9	20.9
GW-408	1355173.17	625791.84	134.5	83.6	98.6	36.0	21.0
GW-409	1354977.46	625801.51	180.9	86.2	101.2	79.7	64.7
GW-410	1354792.74	625739.46	240.0	87.6	102.6	137.4	122.4
GW-411	1354648.04	625630.78	294.5	90.0	105.0	189.6	174.6
GW-412	1354508.74	625408.50	313.6	91.3	106.3	207.3	192.3
GW-413	1354380.03	625222.96	324.8	91.7	106.7	218.1	203.1
GW-414	1354306.83	625917.31	321.1	91.0	106.0	215.2	200.2
GW-415	1354311.26	625717.71	314.7	88.8	103.8	210.9	195.9
GW-417	1354416.09	625585.74	308.4	91.0	106.0	202.4	187.4
GW-418	1354287.39	625400.21	319.7	96.8	111.8	207.9	192.9
GW-424	1355241.16	625661.75	134.5	81.1	96.1	38.4	23.4
GW-425	1355072.12	625620.38	180.8	83.6	98.6	82.2	67.2
GW-426	1354901.82	625530.75	240.0	85.7	100.7	139.3	124.3
GW-427	1354747.27	625440.92	294.5	87.5	102.5	192.0	177.0
GW-428	1354601.51	625231.32	318.7	88.7	103.7	215.1	200.1
GW-429	1355310.64	625528.81	134.5	82.8	97.8	36.8	21.8
GW-430	1355163.50	625445.55	180.8	84.4	99.4	81.4	66.4
GW-431	1354989.37	625363.24	240.0	86.1	101.1	138.9	123.9
GW-432	1354839.37	625264.70	294.5	88.0	103.0	191.5	176.5
GW-433	1354694.52	625054.26	324.0	92.2	107.2	216.8	201.8

PREVIOUS PHASE GAS EXTRACTION WELLS

GAS WELL	NORTHING	EASTING	TOP OF FINAL COVER ELEVATION	TOP OF LINER PROTECTIVE LAYER ELEVATION	BOTTOM OF GAS WELL ELEVATION	TOTAL WELL DEPTH	SCREEN LENGTH (SLOTTED PIPE)
GW-31	1356091.81	624683.01	281.3	100.8	115.8	165.5	150.5
GW-37	1355891.59	624683.36	291.3	101.0	116.0	175.3	160.3
GW-71	1355603.72	624905.14	241.6	84.8	99.8	141.7	126.7
GW-72	1355455.45	624778.32	285.3	103.7	118.7	166.6	151.6
GW-73	1355669.04	624730.24	294.5	101.7	116.7	177.9	162.9
GW-75	1355407.44	624944.22	241.6	87.1	102.1	139.4	124.4
GW-76	1355238.42	624829.07	294.5	104.2	119.2	175.3	160.3
GW-77	1355423.80	625151.00	180.9	83.4	98.4	82.5	67.5
GW-78	1355231.61	625037.69	241.7	85.7	100.7	141.0	126.0
GW-79	1355074.09	624941.79	294.5	87.6	102.6	191.9	176.9
GW-80	1354940.06	624812.75	329.8	88.3	103.3	226.5	211.5
GW-81	1355391.09	625388.23	134.5	85.4	100.4	34.2	19.2
GW-82	1355266.32	625273.96	180.9	86.4	101.4	79.5	64.5
GW-83	1355090.43	625178.54	241.6	88.5	103.5	138.1	123.1
GW-84	1354939.60	625090.30	294.6	90.2	105.2	189.4	174.4
GW-87	1355759.20	624453.91	245.1	87.9	102.9	142.3	127.3
GW-90	1355562.08	624455.51	245.6	90.5	105.5	140.0	125.0
GW-91	1355564.43	624617.41	294.5	92.9	107.9	186.6	171.6
GW-93	1355293.20	624077.87	134.5	88.4	103.4	31.1	16.1
GW-94	1355306.32	624246.82	180.8	90.8	105.8	75.1	60.1
GW-95	1355362.06	624444.19	241.7	93.0	108.0	133.7	118.7
GW-96	1355326.21	624617.82	294.5	96.1	111.1	183.5	168.5
GW-97	1355144.79	624064.55	130.0	83.7	98.7	31.3	16.3
GW-98	1355120.63	624279.13	191.5	85.4	100.4	91.1	76.1
GW-99	1355162.06	624444.53	241.7	87.8	102.8	138.9	123.9
GW-100	1355106.20	624602.56	289.3	88.4	103.4	185.9	170.9
GW-101	1354992.32	624050.17	125.1	80.9	95.9	29.2	14.2
GW-102	1354962.06	624444.87	241.7	84.3	99.3	142.4	127.4
GW-103	1354894.59	624628.54	297.9	87.3	102.3	195.6	180.6
GW-104	1354778.55	624900.09	328.9	92.0	107.0	221.9	206.9
GW-105	1354847.64	624078.63	134.5	82.6	97.6	37.0	22.0
GW-106	1354922.13	624247.48	180.8	83.0	98.0	82.9	67.9
GW-107	1354697.36	624078.89	134.5	85.2	100.2	34.4	19.4
GW-108	1354721.29	624247.82	180.8	86.5	101.5	79.4	64.4
GW-109	1354762.06	624445.21	241.7	87.7	102.7	139.0	124.0
GW-110	1354691.92	624618.90	294.5	91.6	106.6	187.9	172.9

LEGEND

- PROPERTY BOUNDARY
- 250 — FINAL COVER ELEVATION
- GP-18 — EXISTING GAS MONITORING PROBE
- GW-53 — EXISTING VERTICAL GAS EXTRACTION WELL
- EXISTING HDPE HEADER PIPE
- EXISTING HDPE LATERAL PIPE
- APPROXIMATE LIMITS OF ASBESTOS (SEE NOTE 4)
- INTERCELL BERM LOCATION
- GW-409 — PROPOSED VERTICAL GAS EXTRACTION WELL
- GW-413 — FUTURE VERTICAL GAS EXTRACTION WELL
- PROPOSED HDPE HEADER PIPE
- PROPOSED HDPE LATERAL PIPE
- UPPER TIER HGC
- LOWER TIER HGC
- FUTURE HDPE LATERAL PIPE
- LATERAL PIPE SIZE
- 6" — PREVIOUS PHASE PROPOSED VERTICAL GAS EXTRACTION WELL
- GW-91 — PREVIOUS PHASE PROPOSED HDPE LATERAL PIPE
- PREVIOUS PHASE PROPOSED HDPE HEADER PIPE

NOTES

1. NORTHING AND EASTING COORDINATES SHOWN REPRESENT FLORIDA STATE PLANE EAST ZONE NORTH AMERICAN DATUM OF 1983 (NAD83).
2. THE ELEVATIONS SHOWN REPRESENT NATIONAL GEODETIC VERTICAL DATUM OF1929 (NGVD29)(FEET).
3. TOPOGRAPHIC INFORMATION SHOWN ON THIS DRAWING (OUTSIDE OF THE WASTE LIMITS) WAS PROVIDED BY BASE MAPPING CO. LTD BASED ON AN AERIAL PHOTOGRAPH TAKEN ON 18 MAY 2012.
4. APPROXIMATE LIMITS OF ASBESTOS SHOWN WERE BASED ON GRID AND GPS TRACKING BY SITE OPERATIONS. THE LIMITS OF ASBESTOS WERE ASSUMED TO BE WITHIN 20-FT RADIUS OF THE COORDINATES PROVIDED BY WSI. CONTRACTOR SHALL MARK THE INDICATED AREAS IN FIELD TO PREVENT INSTALLATION OF GAS EXTRACTION WELLS IN AREAS WHERE ASBESTOS WAS DISPOSED.
5. PROPOSED GAS EXTRACTION WELLS GW-402, GW-412 TO GW-415, AND GW-417 TO GW-418 WHICH ARE ALL LOCATED WITHIN CELLS 8-10, WILL NOT BE INSTALLED UNTIL CELLS 11, 12, AND CELL 13 HAVE BEEN BUILT-UP ENOUGH TO ALLOW INSTALLATION NEAR FINAL GRADES.

100 0 100 200
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1						

PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE
GAS SYSTEM CONTROL POINTS

Kevin S. Brown, P.E.
Florida Registration No. 57819

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9428 Baymeadows Way, Suite 400
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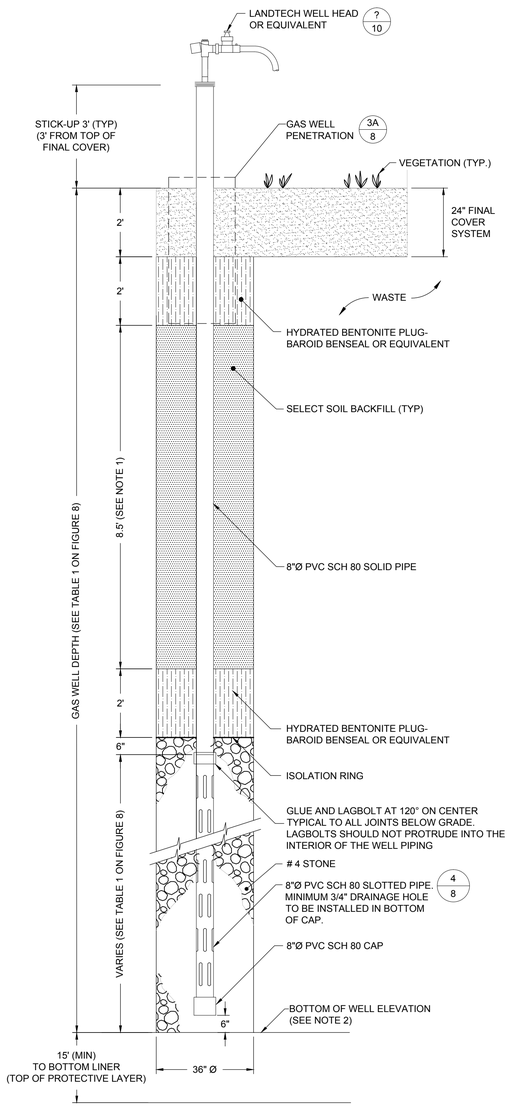
COA No. 1670

PROJECT No.	083-82734.22		FILE No.	08382734G008	
DESIGN	DEG	05/18/12	SCALE	AS SHOWN	
CADD	BCL	05/18/12			
CHECK	.	.			
REVIEW	.	.			

SHEET 7

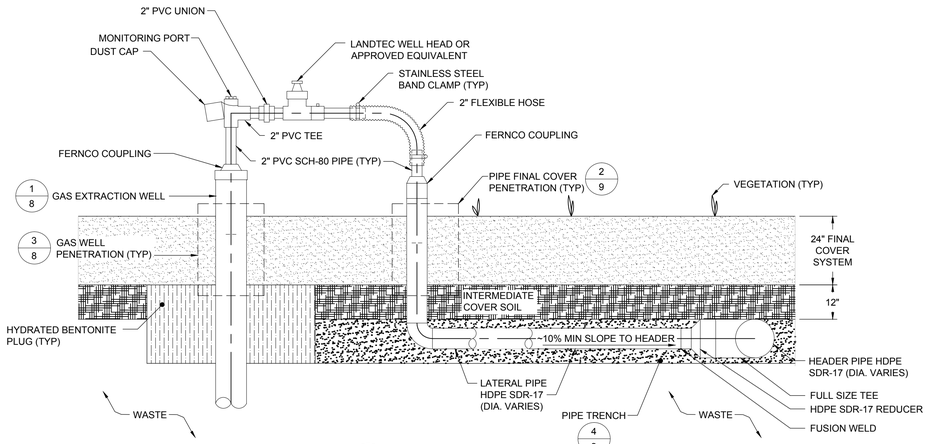
N:\FNC08\08382734_WSI Omni Waste\5 - GCCS Phase 3 Disposal Area Plan\Active Drawings\08382734G008.dwg, | SHEET 7 | Modified: Monday, 08/20/2012 8:52 PM | Printed: Monday, 10/15/12 | Jacksonville, FL



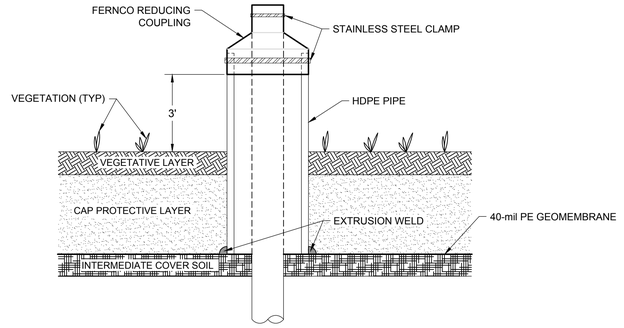
1/8 DETAIL
GAS EXTRACTION WELL
SCALE: N.T.S.
XREF: FL1452.03X021

NOTES:

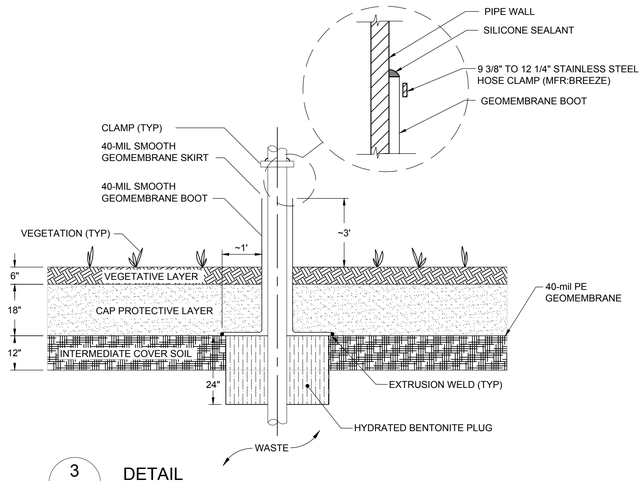
1. THE LENGTH OF SOLID PIPE EXTENDING BELOW THE FINAL COVER GEOMEMBRANE SHALL BE NO LESS THAN 13 FEET.
2. BOTTOM ELEVATION OF ALL GAS EXTRACTION WELLS SHALL BE MINIMUN 15' FROM THE BOTTOM LINER (TOP OF PROTECTIVE COVER LAYER).



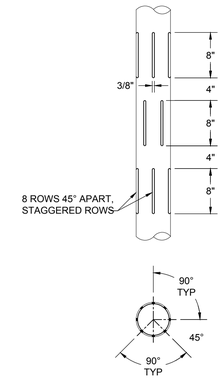
2/8 DETAIL
WELLHEAD TO LATERAL
SCALE: N.T.S.



3A/8 DETAIL
GAS WELL/PIPE FINAL COVER PENETRATION (OPTIONAL)
SCALE: N.T.S.



3/8 DETAIL
GAS WELL FINAL COVER PENETRATION
SCALE: N.T.S.
XREF: FL1832B.01X022



4/8 DETAIL
PIPE SLOTS
SCALE: N.T.S.
XREF: 1452.03X020

NOTES

1. EXACT CONSTRUCTION DETAILS MAY VARY ACCORDING TO FIELD CONDITIONS AND MANUFACTURER SPECIFIC DETAILS WHILE KEEPING THE GENERAL CONCEPTS OF THE DETAILS PRESENTED ON THIS DRAWING.
2. DETAILS 1,2,3, AND 4 BASED UPON PREVIOUS CONSTRUCTION LEVEL DRAWINGS FOR PHASES 1 AND 2 (DATED 04/10 AND 12/10 RESPECTIVELY) PREPARED BY GEOSYNTEC CONSULTANTS.

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1						

PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE
VERTICAL GAS EXTRACTION WELL DETAILS

Kevin S. Brown, P.E.
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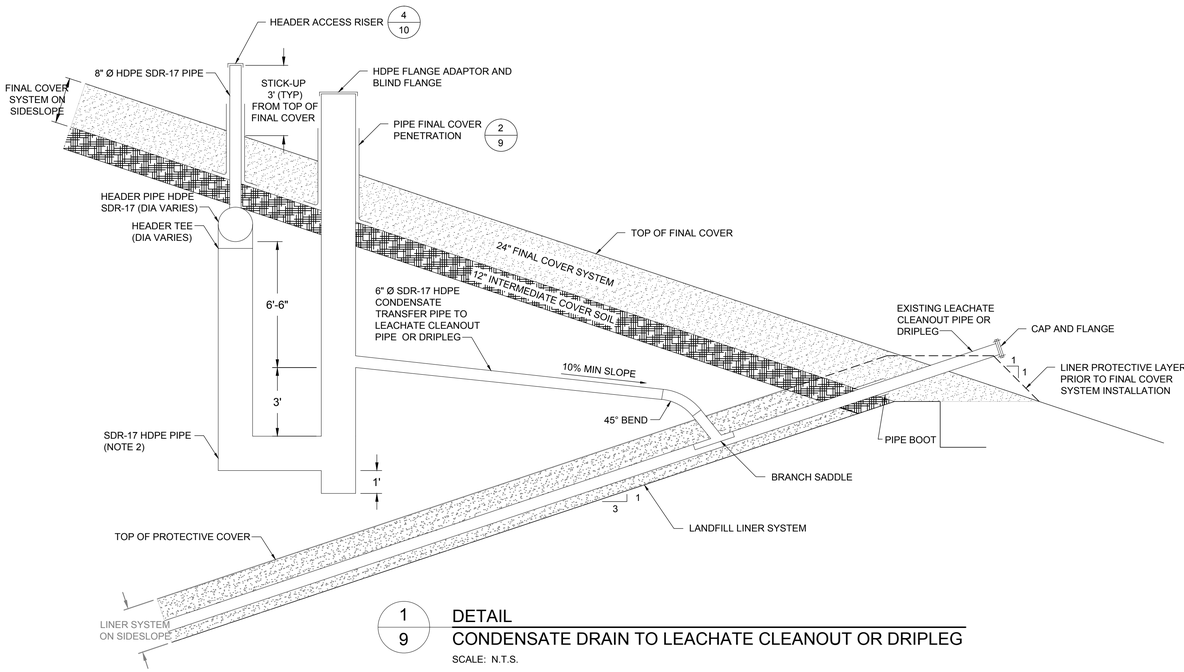
COA No. 1670

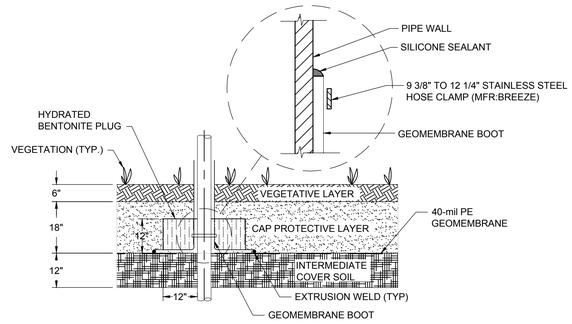
PROJECT No.		083-82734.22	FILE No. 08382734G009
DESIGN	DEG	05/18/12	SCALE NOT TO SCALE
CADD	BCL	05/18/12	
CHECK	.	.	SHEET 8
REVIEW	.	.	



1/9 DETAIL
CONDENSATE DRAIN TO LEACHATE CLEANOUT OR DRIPLEG

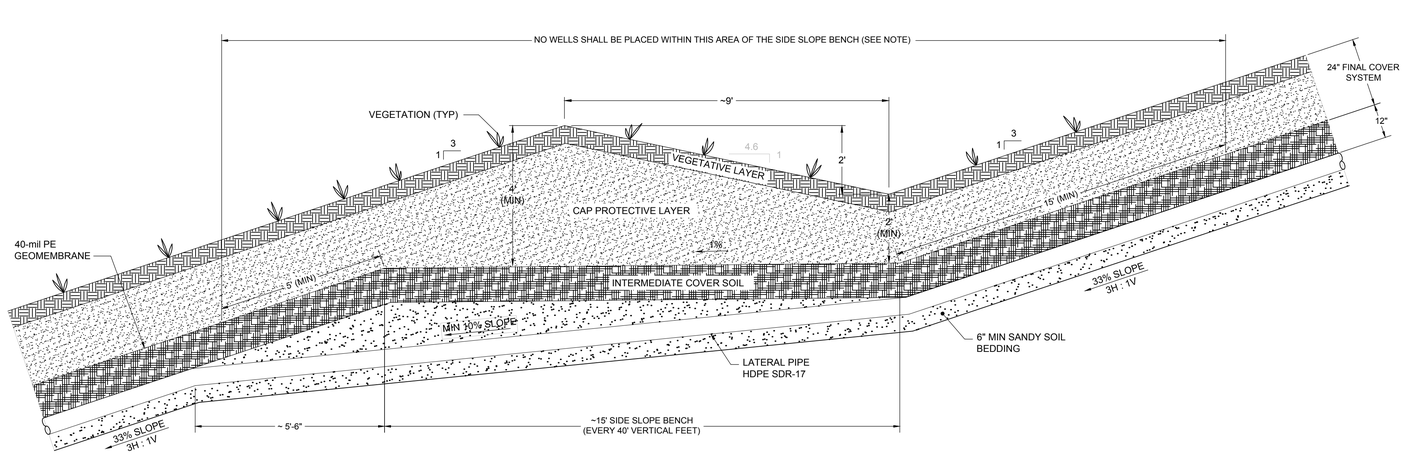
SCALE: N.T.S.

NOTE: DRAIN DEPTH MAY VARY BASED UPON FINAL BUILD-OUT CONDITIONS



2/9 DETAIL
PIPE FINAL COVER PENETRATION

SCALE: N.T.S.

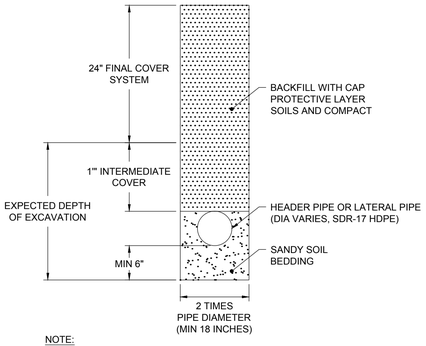


NOTE:

GAS EXTRACTION WELLS ADJACENT TO THE SIDE SLOPE BENCHES SHALL BE OFFSET FROM THE EDGE OF THE 15-FT WIDE BENCH AS INDICATED.

3/9 DETAIL
LATERAL PIPE TRENCH AT BENCH CROSSING

SCALE: N.T.S.



NOTE:

HEADER AND LATERAL PIPES SHALL TYPICALLY BE INSTALLED 3-FT BELOW THE TOP OF FINAL COVER AS INDICATED. HOWEVER, ALL PIPES SHALL BE INSTALLED AT CONSTANT SLOPE BETWEEN THE END POINTS.

4/9 DETAIL
PIPE TRENCH

SCALE: N.T.S.

NOTES

1. EXACT CONSTRUCTION DETAILS MAY VARY ACCORDING TO FIELD CONDITIONS AND MANUFACTURER SPECIFIC DETAILS WHILE KEEPING THE GENERAL CONCEPTS OF THE DETAILS PRESENTED ON THIS DRAWING.
2. DETAILS 1,2,3, AND 4 BASED UPON PREVIOUS CONSTRUCTION LEVEL DRAWINGS FOR PHASES 1 AND 2 (DATED 04/10 AND 12/10 RESPECTIVELY) PREPARED BY GEOSYNTEC CONSULTANTS.

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1						

PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE
GCCS DETAILS (1 OF 2)

Kevin S. Brown, P.E.
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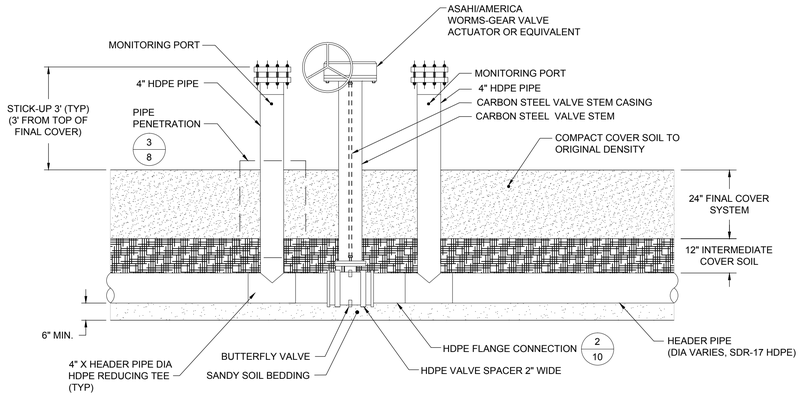
COA No. 1670

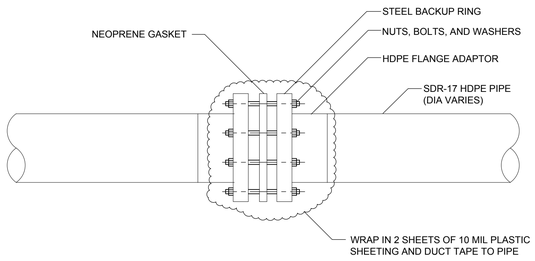
PROJECT No.		083-82734.22	FILE No.	08382734G010
DESIGN	DEG	05/18/12	SCALE	NOT TO SCALE
CADD	BCL	05/18/12		
CHECK	.	.		
REVIEW	.	.		

SHEET 9

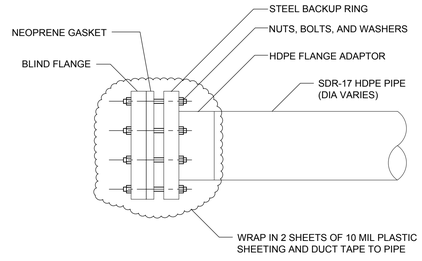
N:\Proj\083827342\CAD\Drawings\Phase 3 Disposal Area Plan\Active Drawings\083827342G010.dwg, [SHEET 9 Modified Wednesday, 05/23/2012 2:48 PM] Plotted: Wednesday, 05/23/2012 2:48 PM



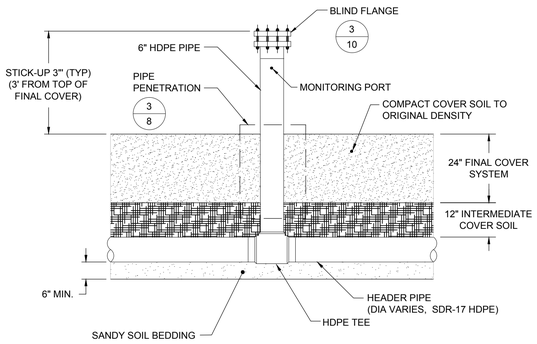
1/10 DETAIL
ISOLATION VALVE
SCALE: N.T.S.



2/10 DETAIL
FLANGE CONNECTION (TYP.)
SCALE: N.T.S.

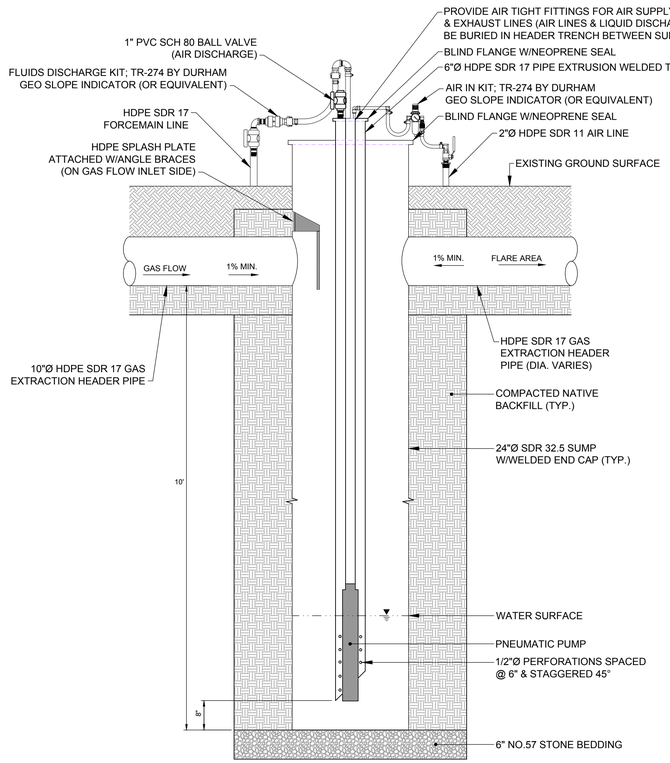


3/10 DETAIL
BLIND FLANGE (TYP)
SCALE: N.T.S.

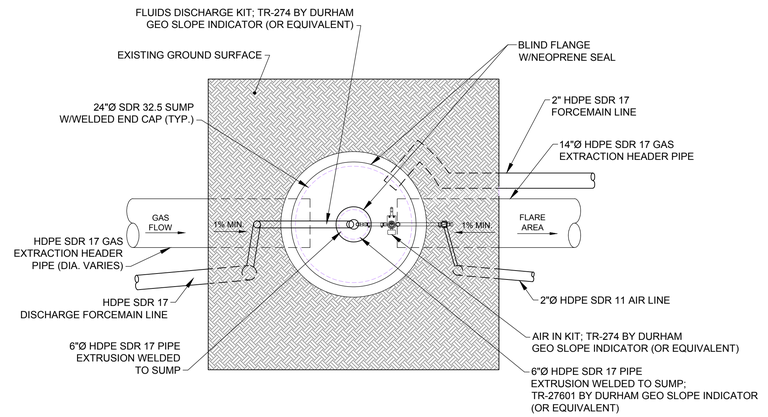


4/10 DETAIL
HEADER ACCESS RISER
SCALE: NTS

NOTE: HEADER ACCESS RISER SHALL BE PROVIDED AT EACH HIGH POINT ALONG HEADER PIPE



SECTION



PLAN

5/10 DETAIL
CONDENSATE SUMP (OPTIONAL)
SCALE: NTS

NOTES

1. EXACT CONSTRUCTION DETAILS MAY VARY ACCORDING TO FIELD CONDITIONS AND MANUFACTURER SPECIFIC DETAILS WHILE KEEPING THE GENERAL CONCEPTS OF THE DETAILS PRESENTED ON THIS DRAWING.

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1						

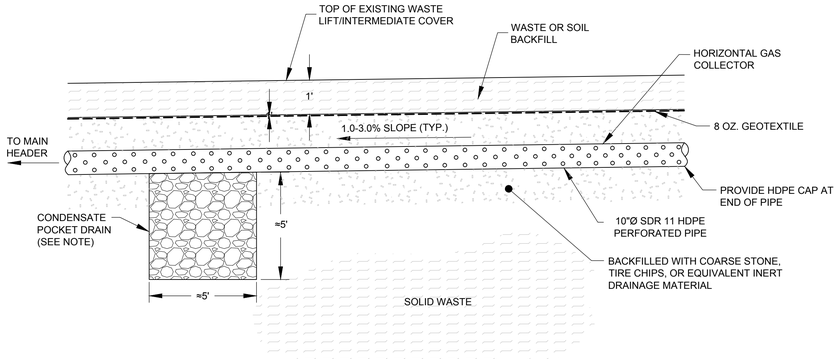
PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE
GCCS DETAILS (2 OF 2)

Kevin S. Brown, P.E.
Florida Registration No. 57819

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

PROJECT No.		083-82734.22	FILE No.		08382734G010
DESIGN	DEG	05/18/12	SCALE		NOT TO SCALE
CADD	BCL	05/18/12	SHEET		10
CHECK	.	.			
REVIEW	.	.			

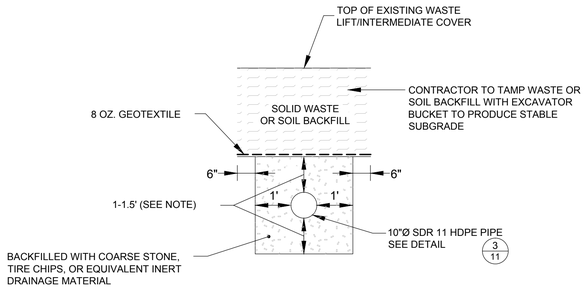


NOTES:
1. CONDENSATE POCKET DRAIN TO BE INSTALLED APPROXIMATELY EVERY 150 LINEAR FEET ALONG HORIZONTAL GAS COLLECTOR. DRAINS TO BE APPROXIMATELY 5'x5'x5' AND BACKFILLED WITH COARSE STONE, TIRE CHIPS, OR EQUIVALENT INERT DRAINAGE MATERIAL.

2. TO ALLOW FOR INCREASED SETTLEMENT AND COMPRESSIBILITY WHEN USING TIRE CHIPS AS BACKFILL MEDIA, INCREASE DEPTHS TO 1.5' ABOVE AND BELOW PIPE. DIMENSIONS OF TRENCH ARE MINIMUM. OWNER MAY INCREASE SIZE OF TRENCH BASED ON MATERIAL USED.

1/11 TYPICAL PROFILE OF HORIZONTAL GAS COLLECTOR

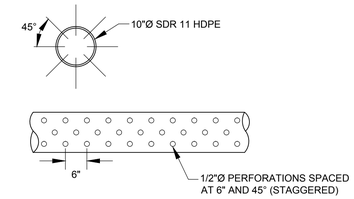
NTS



NOTE: TO ALLOW FOR INCREASED SETTLEMENT AND COMPRESSIBILITY WHEN USING TIRE CHIPS AS BACKFILL MEDIA, INCREASE DEPTHS TO 1.5' ABOVE AND BELOW PIPE. DIMENSIONS OF TRENCH ARE MINIMUM. OWNER MAY INCREASE SIZE OF TRENCH BASED ON MATERIAL USED.

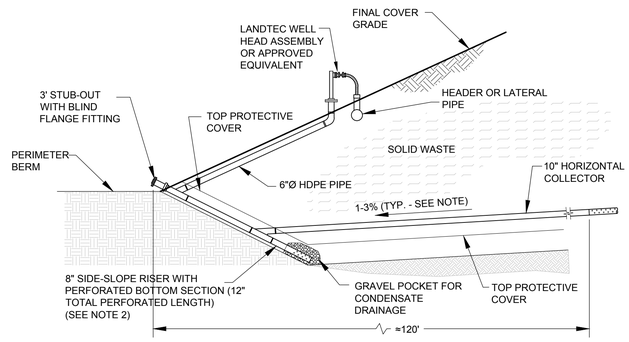
2/11 TYPICAL SECTION OF 10"Ø HDPE HORIZONTAL GAS COLLECTOR

NTS



3/11 HDPE PERFORATED PIPE DETAIL

NTS

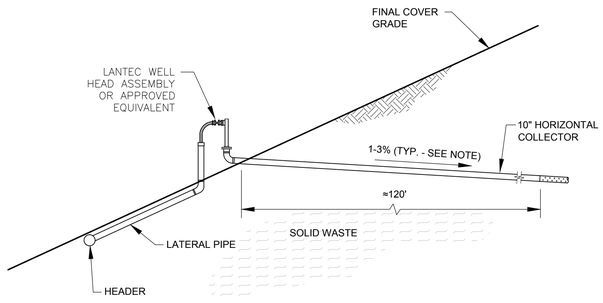


NOTES:
1. SLOPE DIRECTION AND GRADE OF HORIZONTAL GAS COLLECTOR WILL BE BASED ON SLOPE DIRECTION AND GRADE OF FILL OPERATIONS.

2. 8" SIDESLOPE RISER TO BE INSTALLED DIRECTLY ON UNDERLYING BASE OF GEOCOMPOSITE LINER DURING CELL CONSTRUCTION. PLACE ADDITIONAL STRIP OF GEOCOMPOSITE BENEATH PIPE FOR ADDITIONAL CUSHION.

4/11 CONNECTION DETAIL HORIZONTAL GAS COLLECTOR 1ST LEVEL

NTS



NOTE: SLOPE DIRECTION AND GRADE OF HORIZONTAL GAS COLLECTOR WILL BE BASED ON SLOPE DIRECTION AND GRADE OF FILL OPERATIONS.

5/11 CONNECTION DETAIL HORIZONTAL GAS COLLECTOR 2ND LEVEL

NTS

NOTES

1. EXACT CONSTRUCTION DETAILS MAY VARY ACCORDING TO FIELD CONDITIONS AND MANUFACTURER SPECIFIC DETAILS WHILE KEEPING THE GENERAL CONCEPTS OF THE DETAILS PRESENTED ON THIS DRAWING.

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1						

PROJECT

J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE

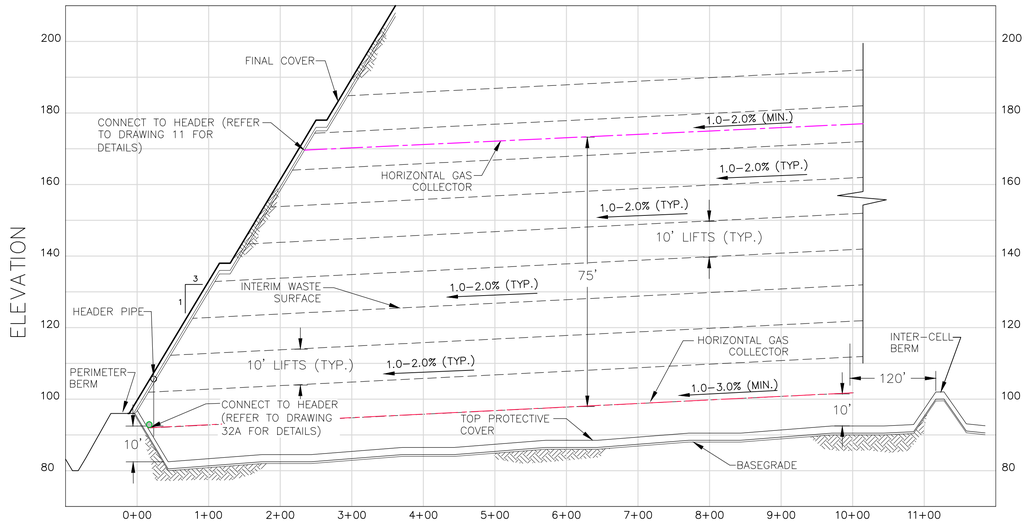
HORIZONTAL GAS COLLECTOR DETAILS

Kevin S. Brown, P.E.
Florida Registration No. 57819

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

PROJECT No.		083-82734.22	FILE No.	08382734G011
DESIGN	DEG	05/18/12	SCALE	NOT TO SCALE
CADD	BCL	05/18/12		
CHECK	.	.		
REVIEW	.	.		

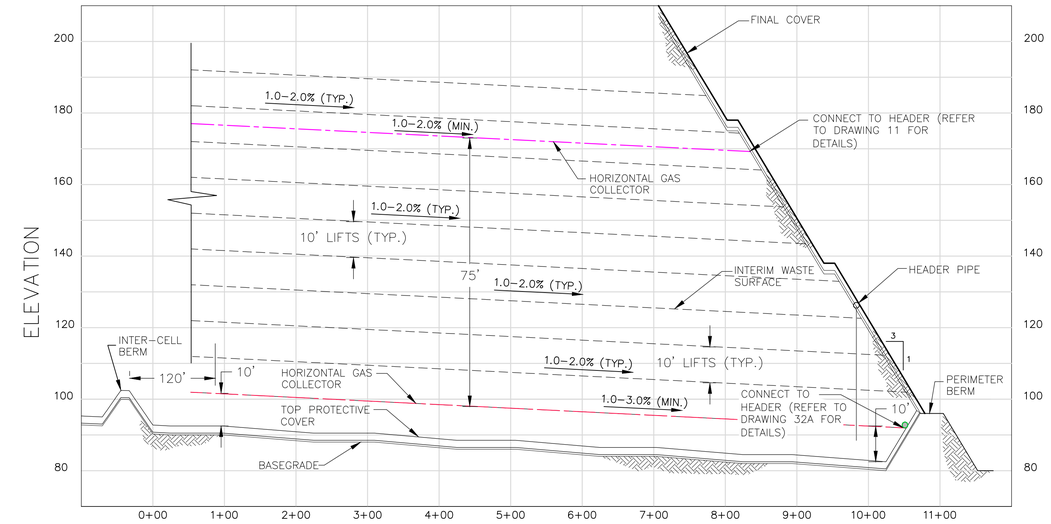
SHEET 11



NOTE: ACTUAL SLOPE DIRECTION MAY VARY BASED ON FILL OPERATIONS.

A 12 CELLS 7 & 8 TYPICAL CROSS SECTION

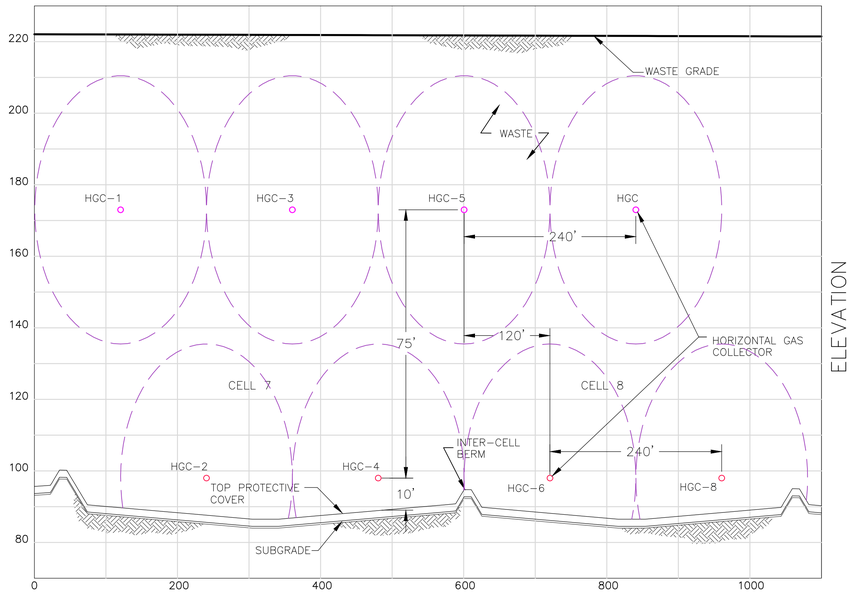
20 0 20 VERTICAL SCALE FEET
100 0 100 HORIZONTAL SCALE FEET



NOTE: ACTUAL SLOPE DIRECTION MAY VARY BASED ON FILL OPERATIONS.

B 12 CELLS 9 & 10 TYPICAL CROSS SECTION

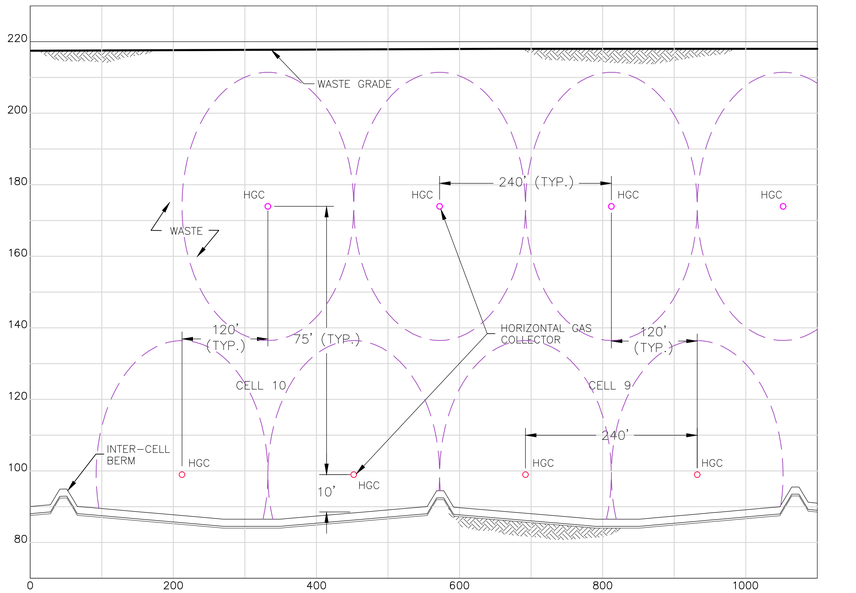
20 0 20 VERTICAL SCALE FEET
100 0 100 HORIZONTAL SCALE FEET



NOTES:
1. ACTUAL SLOPE DIRECTION MAY VARY BASED ON FILL OPERATIONS.
2. NUMBER SEQUENCE OF HORIZONTAL COLLECTORS MAY VARY DEPENDING ON ORDER OF INSTALLATION. NUMBERING WILL BE CONSECUTIVE AS INSTALLATION OCCURS.

C 12 SECTION THRU CELLS 7 AND 8

20 0 20 VERTICAL SCALE FEET
100 0 100 HORIZONTAL SCALE FEET



NOTES:
1. ACTUAL SLOPE DIRECTION MAY VARY BASED ON FILL OPERATIONS.
2. NUMBER SEQUENCE OF HORIZONTAL COLLECTORS MAY VARY DEPENDING ON ORDER OF INSTALLATION. NUMBERING WILL BE CONSECUTIVE AS INSTALLATION OCCURS.

D 12 SECTION THRU CELLS 9 AND 10

20 0 20 VERTICAL SCALE FEET
100 0 100 HORIZONTAL SCALE FEET

PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE
HORIZONTAL GAS COLLECTOR CROSS SECTIONS

Kevin S. Brown, P.E.
Florida Registration No. 57819

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

PROJECT No.		083-82734.22
DESIGN	DEG	05/18/12
CADD	BCL	05/18/12
CHECK	.	.
REVIEW	.	.

FILE No. 08382734G012
SCALE AS SHOWN

SHEET 12

APPENDIX B
TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

SECTION 02221

TRENCHING AND BACKFILLING INSIDE THE LIMITS OF WASTE

PART 1. GENERAL

1.01 SCOPE OF APPLICATION

A. Furnish all labor, material, tools, equipment and incidentals required to perform trench excavation and backfill operations necessary to achieve the specified grades and elevations shown on the Drawings. Review with the Owner's Representative the location, limits, and methods to be used prior to commencing work under this section. Provide support for as-built survey work by installing and removing survey markers.

1.02 REFERENCES

A. ASTM D2488 - Standard Practice for Description of Soils (Visual-Manual Procedure).

1.03 SUBMITALS (RESERVED)

PART 2- PRODUCTS

2.01 PIPE BEDDING

A. Clean sandy soils or equivalent material approved by the Owner's Representative.

2.02 GENERAL FILL

A. Mineral soil, substantially free from organic materials, loam, wood, trash and other objectionable materials that may be compressible or that cannot be properly compacted. Common fill shall not contain stones larger than 4 in. in the largest diameter, broken concrete, masonry rubble, or other similar materials. Natural soils visually classified as SP-SM, SW-SM, SM, ML, SP-SC, SW-SC, SC, and CL or as mixtures of these soil types in Unified Soil Classification System (USCS) are acceptable soil types. Soils classifying as SW and SP can be used if they are mixed with adequate quantities of SM, ML, SC, and CL or amendments such as bentonite to facilitate tight compaction as approved by the Owner's Representative.

B. The soil shall be visually inspected and approved by the Owner's Representative before use. Contractor shall notify the Owner's Representative of any changes in the soil borrow source and submit new soil samples for inspection and approval.

2.03 STOCKPILES

A. All pipe bedding and other material purchased by the Contractor can be stockpiled on site as directed by the Owner's Representative.

B. General fill material soils are available onsite or in a borrow area adjacent to the site. The Contractor shall load and haul this material as directed by the Owner.

PART 3- EXECUTION

3.01 EXCAVATION

A. Trench excavation is anticipated to be through daily or intermediate soil cover and refuse.

B. Safety precautions must be taken during these construction activities that conform to all OSHA regulations, safety requirements of these specifications, and project Health and Safety Plan.

C. Contours of existing ground elevations are approximate and are based on aerial topographic mapping. The contours of the final cover are design future grades and may not represent conditions at the time of construction. The Contractor shall satisfy himself as to the existing contours and elevations at the time of construction.

D. Trenches shall be excavated to the alignments shown on the Drawings. Contractor shall be responsible for reviewing the field stakeouts along proposed trench alignments in the field before starting trenching work. Minimum bottom trench width shall be 2 times the pipe diameter but not less than 18 inches. If more than one pipe is to be installed in a common trench, pipes shall be separated by a horizontal distance of at least 1/4 times the larger pipe diameter.

E. Excavated cover material shall be separated from excavated refuse wherever possible and any cover material free of refuse shall be used as backfill material. Any material not suitable for backfill will be loaded and hauled to the working face by the Contractor for disposal as directed by the Owner.

F. The work area shall be cleared of refuse and litter at the end of each work day. The excavated refuse and collected litter are to be loaded and hauled by the Contractor to the operating portion of the landfill for disposal.

G. If waste disposal operations at the working face are not going on at a particular day or time, the Contractor shall store the excavated materials in stockpiles on the landfill

surface. These stock piles shall either be covered with: (i) temporary plastic covers that are anchored firmly by use of weights to prevent uplift by winds; or (ii) a minimum of 12 in of soil cover. The contractor shall haul and dispose the stored materials as soon as the waste disposal operations at the working face commence. The Contractor shall also clean the storage location of all excavated materials.

H. To the extent possible, the trench invert shall slope uniformly in accordance with the Drawings. Minimum trench slope will be 5 percent for all gas collection pipe trenches within waste footprint.

I. The Contractor may not excavate more trench than can be completely backfilled after installation of the pipe. Excavations shall not be left open overnight.

J. All excavation shall be open cut unless otherwise permitted by the Owner's Representative.

3.02 LIQUIDS & WATER

A. Perched pockets of leachate may be encountered during trenching operations. The Contractor shall notify the Owner's Representative immediately if leachate is encountered. The Owner's Representative will furnish revised construction plans which may include backfilling the affected area, realignment of the trench, sump installation, or placement of a gravel French drain (or some combination of these alternatives).

B. The Contractor shall take every precaution to prevent water from entering an open trench. Should water enter the trench the water shall be removed so as to return the trench bottom to a firm, dry condition.

3.03 ROAD CROSSING

A. Schedule all road crossings with Owner's Representative to minimize disruption to waste disposal operations and traffic.

B. Corrugated metal pipe or an equivalent approved by the Owner's Representative shall be used as a casing to protect pipes along the road crossing. The annulus between the pipes and casing shall be filled with cement grout. Owner's Representative may approve construction of road crossing without a sleeve depending on the nature of traffic expected on the road, size and strength of pipe, pipe cover, etc.

3.04 BLASTING

A. Blasting will not be permitted for purposes of excavation.

3.05 BACKFILL

A. Pipe bedding shall be placed and compacted (maximum of 9 inch lifts) using hand compaction tools, as required. The depth of bedding shall be a minimum of 6 inches below and above the pipe. This bedding material shall provide continuous support for the pipe and be well-compacted and free of rocks and other debris.

B. Next, the trench shall, be backfilled with general fill, placed and compacted in 8-12 inch layers using mechanical compaction equipment. The compaction of this material shall conform to the surrounding material and to the satisfaction of the Owner's Representative. During common fill placement all roots, debris and stones larger than 4 inches in largest dimension shall be completely removed from the backfill material.

3.06 FINISH GRADING

A. All areas covered by the work, including excavated and filled sections, shall be uniformly back-bladed to the finished ground elevations. The finish surface shall be reasonably smooth and free of irregularities and shall provide a presentable and well-drained area.

B. Excess backfill material shall be stockpiled onsite as directed by the Owner's Representative.

C. The work area shall be cleaned and restored by the Contractor to a condition ready for re-vegetation or final cover construction by the Owner.

3.07 COMPACTION

A. Compaction of backfill material shall be by tracking over the fill material with Contractor's onsite pipeline equipment to be consistent with the surrounding daily or intermediate cover material.

3.08 PROTECTION OF UNDERGROUND PIPING AND UTILITIES

A. The Contractor shall take all necessary precautions to protect underground piping during the course of the construction. The Owner's Representative/Owner shall make available information pertaining to the location and existence of underground piping and utilities. Contractor shall be responsible for field verification of the locations. Contractor shall perform excavation using hand tools close to the anticipated pipe locations.

3.09 FIELD SURVEYING SUPPORT

A. Proposed trench routes shall be marked on the ground using stakes by the surveyor. The Contractor shall review the staked out route and discuss with the Owner's Representative and obtain approval before commencing work.

B. The Contractor shall provide markers to perform as-built survey along the trench location to survey the pipe line route and elevations generally at 100 feet intervals and more frequently if the alignment of the route changes. The markers shall be 6-in diameter PVC pipes or equivalent installed to stand vertically while touching the buried pipes. As an alternative, the contractor may choose to leave the top of pipe exposed at similar intervals, to be backfilled with soil following completion of the as-built survey. All marker pipes shall be removed by the Contractor after the as-built survey to be performed by the Owner. The marker pipe locations shall be backfilled with soil by the Contractor.

3.10 FIELD QUALITY CONTROL AND QUALITY ASSURANCE

A. Field quality control shall be the responsibility of the Contractor. Field quality assurance shall be the responsibility of the Owner's Representative.

B. Visual soil classification and approval of soil by the Owner's Representative.

C. Field inspection of all construction materials and approval by the Owner's Representative.

D. Field inspection of trenching and backfilling work and approval by the Owner's Representative.

END OF SECTION

SECTION 02222

TRENCHING AND BACKFILL OUTSIDE THE LIMITS OF WASTE

PART 1. GENERAL

1.01 SCOPE OF APPLICATION

A. Furnish all labor, material, tools, equipment and incidentals required to perform trench excavation and backfill operations necessary to achieve the specified grades and elevations shown on the Drawings. Review with the Owner's Representative the location, limits and methods to be used prior to commencing work under this section. Provide support for as-built survey work by installing and removing survey markers.

1.02 REFERENCES

A. ASTM D2488 - Standard Practice for Description of Soils (Visual-Manual Procedure).

1.03 SUBMITALS (RESERVED)

PART 2- PRODUCTS

2.01 PIPE BEDDING

A. Clean sandy soils or equivalent material approved by the Owner's Representative.

2.02 GENERAL FILL

A. Mineral soil, substantially free from organic materials, loam, wood, trash and other objectionable materials that may be compressible or that cannot be properly compacted. Common fill shall not contain stones larger than 4 in. in the largest diameter, broken concrete, masonry rubble, or other similar materials. Natural soils visually classified as SP-SM, SW-SM, SM, ML, SP-SC, SW-SC, SC, and CL or as mixtures of these soil types in Unified Soil Classification System (USCS) are acceptable soil types. Soils classifying as SW and SP can be used if they are mixed with adequate quantities of SM, ML, SC, and CL or amendments such as bentonite to facilitate tight compaction as approved by the Owner's Representative.

B. The soil shall be visually inspected and approved by the Owner's Representative before use. Contractor shall notify the Owner's Representative of any changes in the soil borrow source and submit new soil samples for inspection and approval.

2.03 STOCKPILES

A. All pipe bedding and other material purchased by the Contractor can be stockpiled on site as directed by the Owner's Representative.

B. General fill material soils are available onsite at the designated borrow area. The Contractor shall load and haul this material as directed by the Owner.

PART 3- EXECUTION

3.01 EXCAVATION

A. Trench excavation is anticipated to be in the berms constructed on-site and/or in the native soils.

B. Safety precautions must be taken during these construction activities that conform to all OSHA regulations, safety requirements of these specifications, and project Health and Safety Plan. If refuse is encountered, inform the Owner's Representative immediately.

C. Contours of existing ground elevations are approximate and are based on aerial topographic mapping. The contours and elevations of the present ground are believed to be reasonably correct, and are presented only as an approximation. However, the Contractor shall satisfy himself as to the existing contours and elevations.

D. Trenches shall be excavated to the alignments shown on the Drawings. Contractor shall be responsible for reviewing the field stakeouts along proposed trench alignments in the field before starting trenching work. Minimum bottom trench width shall be 2 times the pipe diameter but not less than 18 inches. If more than one pipe is to be installed in a common trench, pipes shall be separated by a horizontal distance of at least 1/4 times the larger pipe diameter.

E. Excavated material shall be reused as backfill material. Any material not suitable for backfill will be loaded and hauled to the working face by the Contractor for disposal as directed by the Owner.

F. The Contractor may not excavate more trench than can be completely backfilled after installation of the pipe. Excavations shall not be left open overnight.

G. If waste disposal operations at the working face are not going on at a particular day or time, the Contractor shall store the excavated materials in stockpiles near the excavation without obstruction to traffic and other landfill operations. These stock piles shall be covered with temporary plastic covers and anchored firmly by use of weights to prevent uplift by winds. The contractor shall haul and dispose the stored materials as soon as the

waste disposal operations at the working face commence. The Contractor shall also clean the storage location of all excavated materials.

H. To the extent possible, the trench invert shall slope uniformly in accordance with the Drawings. Minimum trench slope will be 1 percent for gas pipe trenches. Slight adjustments in the depths and alignments may be necessary to maintain a minimum cover of 2 feet. Decrease in pipe slope is not acceptable. There are no minimum slope requirements for trenches that will not have gas collection pipes installed in them (i.e. no minimum slope requirements for compressed air, condensate forcemain, and leachate forcemain pipe trenches).

I. All excavation shall be open cut or ditch witched unless otherwise permitted by the Owner's Representative.

3.02 LIQUIDS & WATER

A. The Contractor will be responsible for the furnishing, operation, and maintaining of dry excavations, and shall pump out or otherwise remove and dispose of as fast as it may collect, any water, other liquids, which may be found or may accumulate in the excavations, regardless of whether it be water or liquid from groundwater, storm water runoff, or from existing conduits and works. If such water be muddy or carrying settleable solids, it shall be disposed of in a proper manner.

B. There shall be at the work site, at all times during construction, proper and approved machinery of sufficient capacity to meet the maximum requirements for the removal and disposal of water or other liquids, in such manner as not to interfere with the proper laying of pipeline or other work under this or other contract, nor endanger existing structures.

C. The Contractor shall take every precaution to prevent water from entering an open trench. Should water enter the trench the water shall be removed so as to return the trench bottom to a firm, dry condition.

3.03 ROAD CROSSING

A. Schedule all road crossings with Owner's Representative to minimize disruption to waste disposal operations and traffic.

B. Corrugated metal pipe or an equivalent approved by the Owner's Representative shall be used as a casing to protect pipes along the road crossing. The annulus between the pipes and casing shall be filled with cement grout. Owner's Representative may approve construction of road crossing without a sleeve depending on the nature of traffic expected on the road, size and strength of pipe, pipe cover, etc.

3.04 BLASTING

A. Blasting will not be permitted for purposes of excavation without approval of the Owner's Representative and obtaining all relevant permits.

3.05 BACKFILL

A. Pipe bedding shall be placed and compacted (maximum of 9 inch lifts) using hand compaction tools, as required. The depth of bedding shall be a minimum of 6 inches below and above the pipe. This bedding material shall provide continuous support for the pipe and be well-compacted and free of rocks and other debris.

B. Next, the trench shall be backfilled with general fill, placed and compacted in 8-12 inch layers using mechanical compaction equipment. The compaction of this material shall conform to Part 3, Section 3.07 of this specification. During common fill placement all roots, debris and stones larger than 4 inches in largest dimension shall be completely removed from the backfill material.

C. Remove excessively wet soil before placement or additional lifts.

3.06 FINISH GRADING

A. All areas covered by the work, including excavated and filled sections, shall be uniformly back-bladed to the finished ground elevations. The finish surface shall be reasonably smooth and free of irregularities and shall provide a presentable and well-drained area.

B. Excess backfill material shall be stockpiled onsite as directed by the Owner's Representative.

C. The work area shall be cleaned and restored to a condition ready for revegetation by the Owner.

3.07 COMPACTION

A. Compaction of backfill material within the waste footprint shall be accomplished by tracking with construction equipment (e.g. bulldozer) to match the grades of the surrounding cover material.

B. For compaction of backfill outside the waste boundary, backfill shall be compacted to at least 95 percent of the maximum standard Proctor dry unit weight at a moisture content generally within ±3 percent of the optimum moisture content as determined by ASTM D 698, or as directed by the Owner's Representative.

C. After completion of the work, or when so ordered by the Owner's Representative, the material remaining in stockpile areas and not needed for other works, shall be rough graded to the grades and elevations directed by the Owner's Representative.

3.08 PROTECTION OF UNDERGROUND PIPING AND UTILITIES

A. The Contractor shall take all necessary precautions to protect underground piping during the course of the construction. The Owner's Representative/Owner shall make available information pertaining to the location and existence of underground piping and utilities. Contractor shall be responsible for field verification of the locations. Contractor shall perform excavation using hand tools close to the anticipated pipe locations.

3.09 FIELD SURVEYING SUPPORT

A. Proposed trench routes shall be marked on the ground using stakes by the surveyor. The Contractor shall review the staked out route and discuss with the Owner's Representative and obtain approval before commencing work.

B. The Contractor shall provide markers to perform as-built survey along the trench location to survey the pipe line route and elevations generally at 100 feet intervals and more frequently if the alignment of the route changes. The markers shall be 2-in diameter PVC pipes or equivalent installed to stand vertically while touching the buried pipes. All marker pipes shall be removed by the Contractor after the as-built survey to be performed by the Owner. The marker pipe locations shall be backfilled with bentonite by the Contractor.

3.10 FIELD QUALITY CONTROL AND QUALITY ASSURANCE

A. Field quality control shall be the responsibility of the Contractor. Field quality assurance shall be the responsibility of the Owner's Representative.

B. Visual soil classification and approval of soil by the Owner's Representative.

C. Field inspection of all construction materials and approval by the Owner's Representative.

D. Field inspection of trenching and backfilling work and approval by the Owner's Representative.

END OF SECTION

SECTION 02610

LANDFILL GAS WELL

PART 1 - GENERAL

1.01 SCOPE OF APPLICATION

A. Supply all equipment, materials, and labor needed to install landfill gas (LFG) extraction wells, wellheads, well hoses, and connections to lateral gas collection pipes as specified herein and as indicated on the Drawings.

1.02 REFERENCES

A. ASTM D2488 - Standard Practice for Description of Soils (Visual-Manual Procedure).

1.03 SUBMITTALS

A. Submit to the Owner's Representative Certificates of Compliance on materials furnished, and manufacturer's brochures containing complete information and instructions pertaining to the storage, handling, installation, and inspection of pipe and appurtenances furnished.

B. The Contractor shall submit to the Owner's Representative samples of all well backfill materials furnished.

C. The Contractor shall keep detailed well logs and construction diagrams for all wells drilled, including the total depth of the well, the static water level, the temperature of spoils, depth, thickness, and description of soil or waste strata, (including dates from any readable material), and the occurrence of any water bearing zones. Well logs shall be submitted to the Owner's Representative.

D. The Contractor shall obtain the ground surface elevation and location survey data from the Owner after the as-built survey and include them on the well construction logs.

1.04 SITE CONDITIONS

A. Obstructions and saturated conditions such as sludge, and foundry sands are sometimes encountered when drilling in a landfill, many of which can be drilled through. Contractor is expected to make reasonable effort to drill through obstructions and saturated conditions and will be paid for offset re-drilling and boring abandonment only if approval is given by the Owner's Representative. Contractor will be paid for abandonment of abandoned hole and for well installation at new location. Wells shall not be relocated under any circumstances without the permission of the Owner's Representative.

PART 2- PRODUCTS

2.01 AGGREGATE

A. The aggregate shall be classified as GP in accordance with the Unified Soil Classification System (per ASTM D 2487), and shall meet the AASHTO M43 gradation requirements for No. 57 coarse aggregate. Sieve analysis for this coarse aggregate shall be performed in accordance with ASTM C 136. The gradation for #57 coarse aggregate, by AASHTO standards, is as follows:

- 100% passing a 1.5 inch sieve;
- 95-100% passing a 1 inch sieve;
- 25-60% passing a ½ inch sieve;
- 0-10% passing the #4 sieve; and
- 0-5% passing the #8 sieve.

B. The aggregate shall have less than 2 percent by weight passing the No. 200 sieve when tested in accordance with ASTM C 136.

C. The aggregate shall be tested for carbonate content by means of ASTM D 3042 – "Standard Test Method for Insoluble Residue in Carbonate Aggregates" with the following revision to the method: the aggregate shall have less than 5 percent loss of weight when tested at a pH of 4 instead of the pH specified in ASTM D 3042.

2.02 BENTONITE SLURRY MIX

A. Coarse-ground, granualized bentonite from an approved source is to be mixed thoroughly with potable water at a ratio of 5 gallons of water to every 50 lbs. of bentonite.

B. "Soil/bentonite plug," if used, shall refer to a mixture consisting of four parts soil backfill to one part bentonite.

2.03 GENERAL FILL

A. Mineral soil that is substantially free from organic materials, loam, wood, trash, and other objectionable materials that may be compressible or that cannot be properly compacted. Common fill shall not contain stones larger than 4 in. in the largest diameter, broken concrete, masonry rubble, or other similar materials. Natural soils visually classified as SP-SM, SW-SM, SM, ML, SP-SC, SW-SC, SC, and CL or as mixtures of these soil types in Unified Soil Classification System (USCS) are acceptable soil types. Soils classifying as SW and SP can be used if they are mixed with adequate quantities of bentonite to facilitate construction of low permeability backfill around the wells as approved by the Owner's Representative.

B. The soil shall be visually inspected and approved by the Owner's Representative before use. Contractor shall notify the Owner's Representative of any changes in the soil borrow source and submit new soil samples for inspection and approval.

2.04 FILTER FABRIC

A. 8 oz/yd^2 Non-woven Geotextile donut shaped filter fabric isolation ring with a 36-in diameter and 8-in opening.

2.05 SOLID WALL PIPE

A. All pipe and fittings shall be rigid PVC Schedule 80. Refer to Section 15061 for PVC pipe.

2.06 SLOTTED PIPE

A. Slots in PVC extraction well piping shall be 8 inch long by 3/8 inch wide, spaced 90° around the circumference of pipe and 4 inch along the length of the pipe. Contractor shall present other configuration types to the Owner's Representative for approval. Slotting may be done in the factory, or in the field. If slotting is performed in the field, the slotting must be completed per the specs and approved by the Owner's Representative on site.

2.07 WELLHEAD

A. All wellheads shall be 2-in LandTec Accu-Flo wellheads or equivalent approved by the Owner's Representative and consistent with the Drawings.

2.08 WELLHOSE

A. All well hoses shall be standard 2-in LandTec well hoses or equivalent approved by the Owner's Representative and consistent with the Drawings.

PART 3- EXECUTION

3.01 DRILLING

A. Extraction wells shall be drilled at the locations marked on the field by the Owner's Representative. Contractor shall verify all field markings with the Owner's Representative before starting drilling work. Wells shall not be relocated under any circumstances without the permission of the Owner's Representative.

B. Extraction wells are to be 36 inch diameter, drilled to the depth shown on the Drawings. Contractor must use dry drilling equipment; wet rotary drilling equipment may not be used. All borings shall be made with bucket type augers.

C. The boring depths shall be evaluated based on the information presented on the Drawings. The boring depths may be adjusted in the field by the Owner's Representative. Three reasons limiting depth might be as follows:

1. If water is encountered in a boring, the Contractor may be directed to drill beyond the point at which it was encountered. If wet conditions remain, the boring may be terminated and the length of perforated pipe adjusted by the Owner's Representative, or the well may be relocated. If wet conditions cease (e.g. due to trapped water layer), then drilling will continue to the design depth.

2. If a no-progress obstruction is encountered, the Contractor shall make a conscious effort to drill through the obstruction. If drilling through is not possible, the Contractor shall immediately contact the Owner's Representative and as directed by the Owner's Representative install a shorter well or relocate the well and abandon the drill hole. If the drill rates drop below 2 linear feet of drilling per hour due to the presence of any obstructions, the Contractor shall immediately contact the Owner's Representative/Owner to inform them of the situation. If the Owner's Representative/Owner asks the Contractor to continue drilling through the obstruction, the Contractor can charge the Owner at the hourly drilling rate provided in the bid form until the drilling rate increases above 2 linear feet of drilling per hour or the Owner's Representative/Owner instructs the Contractor to stop the drilling.

3. If for any reason the Contractor suspects that drilling may have advanced to or beyond the liner system. The Contractor shall immediately notify the Owner and the Owner's Representative in this case.

E. As soon as drilling is completed, a safety screen shall be placed over the top of the bore. This screen shall stay in place until backfilling is within 4 feet of the surface. Safety screen size should be large enough to accommodate all backfill materials and any tools used during backfill yet not large enough for any human to accidentally fall through.

F. The bore for the well shall be both vertical and straight and the well pipe shall be installed in the center of the bore hole. The Contractor will take all tension off of the pipe by mechanical means and center the pipe in the middle of the borehole before starting to backfill. Contractor shall use clamping devices, or other method approved by Owner's Representative, to aid in centering of the pipe. Wells that are leaning more than 5 degrees from the vertical shall be replaced by the Contractor at his own expense.

G. PVC well pipe shall be solvent cemented and lag bolted.

H. Contractor shall leave a minimum 5 feet stickup of the solid well casing above the existing landfill grades (daily or intermediate cover) at the well location.

I. Contractor shall remove all working platforms constructed for the drill rig after the installation of the well. Hauling, construction, removal and other work tasks related to well installation shall be carried out with minimal disturbance to the vegetation on the landfill.

3.02 BACKFILLING

A. Backfilling of the well shall commence immediately after well drilling is completed and the well piping has been installed in the borehole. Backfill materials shall be installed as indicated on the Drawings and as approved by the Owner's Representative.

B. Gravel pack shall be poured or scooped through the screen at a rate that will not endanger the integrity of the well casing. Care shall be taken during backfilling to prevent bridging.

C. The filter fabric shall be installed after the gravel backfill reached the level shown on the Drawings.

D. The well seal will be formed by evenly distributing two 50 lb. bags of bentonite material around the annulus of the well and then adding 10 gallons of fresh water in a manner that will allow for a thorough saturation of the bentonite material. This process will be continued until a minimum plug thickness of 2 feet has been achieved. Alternatively, well seal can be formed by mixing bentonite with water in a surface mixer and then pouring the slurry down hole.

E. Soil backfill shall be rodded in the boring to provide even distribution and compaction. Finished grade at the well location shall prevent any water accumulation near the well location by promoting drainage away from the well.

F. All material layer thicknesses shall be verified by taking measurements before, during, and after installation of each layer.

3.03 WELLHEAD AND HOSE INSTALLATION

A. Wellheads and hoses shall be installed per the manufacturer specifications.

B. Wellhead and hose installations shall provide the flexibility to make adjustments to accommodate differential settlements. Installation shall be at 1 feet above minimum wellhead adjustment.

C. Well hose connection shall be about 4 feet length and shall be fitted in a manner that prevents the accumulation of condensate.

D. The well pipe and lateral pipe vertical extension shall be spaced at 2 feet ± 6 inches. The lateral pipe vertical extension shall be sticking up about 4 feet from the existing grades (daily or intermediate cover) of the landfill. This would result in the well casing pipe being 1 feet above the lateral pipe vertical extension.

3.04 DISPOSAL

A. Excavated refuse is to be loaded and hauled by the Contractor to the operating portion of the landfill for disposal as directed by the Owner.

B. If waste disposal operations at the working face are not going on at a particular day or time, the Contractor shall store the excavated materials in stockpiles on the landfill surface. These stock piles shall either be covered with: (i) temporary plastic covers that are anchored firmly by use of weights to prevent uplift by winds; or (ii) a minimum of 12 in of soil cover. The contractor shall haul and dispose the stored materials as soon as the waste disposal operations at the working face commence. The Contractor shall also clean the storage location of all excavated materials.

3.05 INITIAL DEWATERING

A. The Contractor shall dewater the wells after the installation if needed. The Contractor shall provide all materials required to dewater and shall also dispose of the pumped liquid as directed by the Owner/Owner's Representative.

3.06 FIELD QUALITY CONTROL AND QUALITY ASSURANCE

A. Field quality control shall be the responsibility of the Contractor. Field quality assurance shall be the responsibility of the Owner's Representative.

B. Visual soil classification and approval of soil by the Owner's Representative.

C. Field inspection of all construction materials and approval by the Owner's Representative.

D. Field inspection of well installation work and approval by the Owner's Representative.

E. All wells shall be inspected by the Owner's Representative after setting the well casing in the borehole and backfilling with gravel, but before placement of bentonite, unless as directed otherwise by the Owner's Representative on a case by case basis. The Contractor shall inform the Owner's Representative before backfilling with bentonite for each well.

END OF SECTION

SECTION 15051
HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

PART I GENERAL

1.01 SCOPE OF APPLICATION

A. Supply and installation of SDR 17 High Density Polyethylene (HDPE) single contained gas collection pipe and fittings in nominal pipe sizes of 2, 4, 6, 8, 12, 14, 18, 20, and 26 inches.

B. Supply and installation of SDR 17 High Density Polyethylene (HDPE) single contained condensate gravity drain or transfer pipe and fittings in nominal pipe size of 4 and 6 inches.

1.02 REFERENCES (Reserved)

1.03 SUBMITTALS

A. The Contractor shall submit all manufacturer quality assurance certificates to the Owner's Representative and obtain approval before using the materials in construction.

B. The Contractor shall submit all field pressure testing results to the Owner's Representative for approval.

1.04 MANUFACTURER'S QUALITY ASSURANCE

A. The pipe and fittings manufacturer shall have an established quality assurance program responsible for inspecting incoming and outgoing materials.

B. The pipe and fittings manufacturer shall have an established quality assurance program responsible for assuring the long term performance of materials and products.

C. The pipe and fitting manufacturer shall maintain permanent QC and QA records.

1.05 PACKAGING DELIVERY AND HANDLING

A. The pipe and fitting manufacturer shall package products for shipment in a manner suitable for safe transport by commercial carrier. When delivered, a receiving inspection shall be performed by the Contractor, and any shipping damage reported to the pipe and fittings manufacturer. Pipe and fittings shall be handled, installed,

and tested in accordance with manufacturer's recommendations, and the requirements of this specification.

PART 2- PRODUCTS

2.01 PHYSICAL PROPERTIES:

A. Materials used for the manufacture of polyethylene pipe and fittings shall meet all industry standards.

B. The pipe and fittings shall be homogenous throughout and free from visible cracks, holes, foreign inclusions or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density and other physical properties.

2.02 PIPE AND FITTINGS:

A. DIMENSIONS:

1. Pipe Dimensions: The nominal inside diameter of the pipe shall be true to the specified pipe size in accordance with ASTM D 2513. Standard laying lengths shall be 40 feet ±2". Exceptions may be made for 2 inch diameter pipes in coils if suitable strengthening devices are used.

2. Fitting Dimensions: Fittings such as coupling, flanges, wyes, tees, adaptors, etc. for use in laying pipe shall have standard dimensions that conform to ASTM.

B. Where possible, pipe and fittings should be produced by the same manufacturer from identical materials meeting the requirements of this specification. Special or custom fittings may be exempted from this requirement.

C. Pipe and fittings shall be pressure rated to meet the service pressure requirements specified by the Owner's Representative. Whether molded or fabricated, fittings shall be fully pressure rated to at least the same service pressure rating as the pipe to which joining is intended.

D. Marking:

A. Each standard and random length of pipe and fitting in compliance with this standard shall be clearly marked with the following information:

1. ASTM Standard Designation

2. Pipe Size

3. Class & Profile Number

4. Production Code

5. Standard Dimension Ratio

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Field quality control is the responsibility of the Contractor. The Owner's Representative shall inspect and approve the Contractor's field quality control measures.

B. Pipe shall be rejected for failure to conform to Specifications or the following:

1. Fractures or cracks passing through pipe wall, except single crack not exceeding 2 in. in length at either end of pipe which could be cut off and discarded. Pipes within one shipment shall be rejected if defects exist in more than 5% of shipment or delivery.

2. Cracks sufficient to impair strength, durability or serviceability of pipe.

3. Defects indicating improper proportioning, mixing, and molding.

4. Damaged ends, where such damage prevents making satisfactory joint.

C. Acceptance of fittings, stubs or other specifically fabricated pipe sections shall be based on visual inspection at job site and documentation of conformance to these Specifications.

3.02 INSTALLATION

A. Trench, backfill, and compact in accordance with Sections 02221 and 02222.

B. Heat Fusion of Pipe:

1. Weld in accordance with manufacturer's recommendation for butt fusion methods. Provide at least one fusion operator certified by the pipe manufacturer and with prior field experience in at least 3 projects to manage the fusing operations for the project.

2. Butt fusion equipment for joining procedures shall be capable of meeting conditions recommended by pipe manufacturer including, but not limited to, temperature requirements, alignment, and fusion pressures.

3. For cleaning pipe ends, solutions such as detergents and solvents, when required, shall be used in accordance with manufacturer's recommendations.

4. Do not bend pipe to greater degree than minimum radius recommended by manufacturer for type and grade.

5. Do not subject pipe to strains that will overstress or buckle piping or impose excessive stress on joints.

6. Branch saddle fusions shall be joined in accordance with manufacturer's recommendations and procedures. Branch saddle fusion equipment shall be of size to facilitate saddle fusion within trench.

7. Before butt fusing pipe, inspect each length for presence of dirt, sand, mud, shavings, and other debris or animals. Remove debris from pipe.

8. Cover at end of each working day open ends of fused pipe. Cap to prevent entry by animals or debris.

9. Use compatible fusion techniques when polyethylenes of different melt indexes are fused together. Refer to manufacturer's specifications for compatible fusion.

C. Flange Jointing:

1. Use on flanged pipe connection sections.

2. Connect slip-on carbon steel backup flanges with stainless steel nuts and bolts.

3. Butt fuse fabricated flange adapters to pipe.

4. Observe following precautions in connection of flange joints.

a. Align flanges or flange valve connections to provide tight seal. Require nitrile-butadiene gaskets if needed to achieve seal. Gaskets are required for flange/valve connections.

b. Place U.S. Standard round washers as may be required on some flanges in accordance with manufacturer's recommendations. Bolts shall be lubricated in accordance with manufacturers recommendations.

c. Tighten flange bolts in sequence and accordance with manufacturer's recommendations. Do not over-torque bolts.

5. Pull bolt down by degrees to uniform torque in accordance with manufacturer's recommendation.

6. Protect below grade bolts and flanges by covering with a polyethylene wrap. Duct tape warp to HDPE pipe.

7. Electrofusion couplers, where used, installed per manufacturer's specifications.

D. Pipe Placement:

1. Grade control equipment shall be of type to accurately maintain design grades and slopes during installation of pipe.

2. Dewatering: Remove standing water in trench before pipe installation.

3. Unless otherwise specifically stated, install pipe in accordance with manufacturer's recommendations.

4. Maximum lengths of fused pipe to be handled as one section shall be placed according to manufacturer's recommendations as to pipe size, pipe SDR, and topography so as not to cause excessive gouging or surface abrasion; but not to exceed 500 ft.

5. Cap pipe sections longer than single joining (usually 40 ft.) on both ends during placement except during fusing operations.

6. Notify Owner's Representative prior to installing pipe into trench and allow time for Owner's Representative's inspection. Correct irregularities found during inspection.

7. Complete tie-ins within trench whenever possible to prevent overstressed connections.

8. Allow pipe sufficient time to adjust to trench temperature prior to testing, segment tie-ins or backfilling activity.

9. Install reducers adjacent to laterals and tees.

10. To reduce branch saddle stress, install saddles at slope equal to and continuous with lateral piping.

11. Place in trench by allowing minimum 12 inch/100 ft for thermal contraction and expansion.

12. Coordinate construction of pipes near access roads with OWNER to limit impediment of landfill operations or operations of other Contractors.

3.03 PIPE TESTING

A. Air Test all pipe sections and fittings after placement in trench, in accordance with manufacturer's recommendations. Wells and other system openings should be blocked off for testing. Pressure test below ground systems (only). Special precautions are required for this type of testing. It is not recommended that above ground systems be pressure tested.

B. Keep all persons at a safe distance during pressure testing.

C. Disconnect the test section from all GCCS components that are not being tested. Failure of a section should result in compressed air being released to atmosphere.

D. Completely backfill extraction pipes before pressure testing to provide adequate restraint.

E. Heat fusion joints most be properly cooled before pressure testing. Mechanical connections should be installed and tightened per manufacturer instructions.

F. Repair work should be carried out only after release of pressure. Release pressure gradually.

3.04 VALVES

A. Valves shall be provided at the locations specified on the Drawings.

B. Valves shall be provided in accordance with the details provided on the project construction drawings. All valves shall meet the industry standard requirements.

C. Valves shall include monitoring ports at either side in accordance with the details provided by the Owner's Representative.

END OF SECTION

SECTION 15061

POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

PART 1 GENERAL

1.01 SCOPE OF APPLICATION

A. Supply 8 inch diameter polyvinyl chloride (PVC) Schedule 80 pipe and fittings for well casings. Both solid and slotted pipes are required to be provided.

1.02 REFERENCES

A. ASTM D-2855: Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and fittings

B. ASTM D-402: Standard Practice for Safe Handling of Solvent Cements Primers, and Cleaners used for Joining Thermoplastic Pipe and Fittings

1.03 SUBMITTALS

A. The Contractor shall submit all manufacturer quality assurance certificates to the Owner's Representative and obtain approval before using the materials in construction.

PART 2 PRODUCTS

2.01 PIPE & FITTINGS

A. Materials used for the manufacture of polyethylene pipe and fittings shall meet all industry standards.

B. The pipe and fittings shall be homogenous throughout and free from visible cracks, holes, foreign inclusions or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density and other physical properties.

2.02 SLOTTED PIPE

A. Refer to Section 02610 for Gas Well slotting requirements.

PART 3 EXECUTION

3.01 PVC PIPE HANDLING

A. PVC pipe and pipe fittings shall be handled carefully in loading and unloading. They shall be lifted by hoists and lowered on skidways in such a manner as to avoid shock. Derricks, ropes, or other suitable equipment shall be used for lowering the pipe into the extraction well borings. Pipe and pipe fittings shall not be dropped or dumped.

3.02 PVC PIPE INSTALLATION

A. PVC pipe installation shall conform to these specifications and manufacturer's recommendations.

3.03 JOINING OF PVC PIPES

A. Joining of pipes shall be in accordance with ASTM D-2855.

B. All pipe shall be inspected for cuts, scratches, or other damages prior to installation. Pipe with imperfections shall not be used.

C. All burrs, chips, etc., shall be removed from pipe interior and exterior.

D. All loose dirt and moisture shall be wiped from the interior and exterior of the pipe end and the interior of the fitting.

E. All pipe cuts shall be square, perpendicular to the center line of pipe.

F. Pipe ends shall be beveled prior to applying primer and solvent cement so that the cement does not get wiped off during insertion into the fitting socket.

G. A coating of CPS primer as recommended by pipe supplier shall be applied to the entire interior surface of the fitting socket, and to an equivalent area on the exterior of the pipe prior to applying solvent cement.

H. The solvent cement shall be applied in strict accordance with manufacturer's specifications.

I. Pipe shall not be primed or solvent welded when it is raining or when atmospheric temperature is below 40°F or above 90°F when under direct exposure to the sun. This requirement may be waived by the Owner's Representative for extraction well pipe joining vertically by utilizing lag screws as specified in Section 02610.

J. After solvent welding, the pipe shall remain undisturbed until cement has thoroughly set. As a guideline for joint settling time, use 1 hour for ambient temperatures 60-100°F, or 2 hours when ambient temperature is 40-60°F. This requirement may be waived for extraction well piping utilizing lag screws as specified in Section 02610.

K. Pipe and pipe fittings shall be selected so that there will be as small a deviation as possible at the joints, and so that inverts present a smooth surface. Pipe and fittings which do not fit together to form a tight fitting will be rejected.

END OF SECTION

SECTION 11315

CONDENSATE MANAGEMENT SYSTEM

PART 1 GENERAL

1.01 SCOPE OF APPLICATION

A. This section covers the minimum requirements for the supply, installation, and startup of: (i) six condensate "U tube" drains installed at all low points along the header (i.e., at all LPHs except LPH-3) with gravity drain connections to existing leachate cleanouts; (ii) one 36 inch diameter condensate knockout pot with gravity drain connection to the proposed condensate sump tank; (iii) one condensate "U tube" drain with connections to condensate drains from flare and blower on the pressure side stub and the two knockout pots near the flare station on the vacuum side stub, and a condensate gravity drain connection to the proposed condensate sump tank; and (iv) one 36 inch diameter condensate sump tank with an electrical pump and force main line connection to Cell 1 leachate sump/cleanout.

B. Equipment supplied under this section shall have a proven performance of not less than two years in actual landfill condensate liquid collection and pump service.

1.02 SITE CONDITIONS

A. Condensate liquid from the gas collected from several wells will flow through a section of the gas collection pipe to an engineered low point within the gas piping system. Condensate liquid shall freely drain to a sealed condensate "U tube" drain to be installed at this engineered low point within waste limits. Liquid collected in the condensate "U tube" drain shall gravity drain through a 6 inch diameter pipe to an existing cleanout as shown on the Drawings.

B. A 36-inch diameter condensate knockout pot with gravity drain connection to the proposed condensate sump tank will be installed outside the waste limits as shown on the Drawings to remove condensate before the gas enters the knockout pot (provided by the Manufacturer) located on the flare skid.

C. A condensate "U tube" drain is installed near the flare station to provide separation of drain pipes under positive pressure (flare and blower condensate connections) and vacuum (two knockout pots) before connecting the drain to the proposed condensate sump tank.

D. A 36-inch diameter condensate sump tank with an electrical pump and force main line connection to Cell 1 leachate sump/cleanout is installed to provide adequate storage for condensate in case of pump failure.

1.03 GENERAL PRODUCT DESCRIPTION

A. The condensate “U tube” drain shall be 6 inch diameter HDPE SDR 17 with dimensions as shown on the Drawings.

B. The condensate knockout pot shall be 36-inch diameter HDPE SDR 17 with dimensions as shown on the Drawings.

C. The condensate sump tank shall be 36 inch diameter HDPE SDR 17 with dimensions as shown on the Drawings.

D. Integral to the condensate sump shall be an automatic electrical pump that meets the requirements set forth in Part 2, Section 2.06 of this specification.

C. The equipment shall be rated for service in harsh and potentially explosive environments.

1.04 CONDENSATE SYSTEM DIMENSIONS

A. The condensate system dimensions shall be as shown on the drawings.

1.05 SUBMITTALS

A. The condensate knockout pot, sump tank, and pump manufacturer’s specifications.

B. A piping and instrumentation diagram showing the workings of the automatic electrical pump system.

1.06 REFERENCES

A. Pipe Material

1. The sump used as part of the condensate liquid sump shall meet the following ASTM specifications:
   HDPE Pipe 03350 standard specifications for polyethylene plastic pipe and fittings materials.

PART 2 PRODUCTS

2.01 CONDENSATE “U TUBE” DRAIN

A. The condensate “U tube” drain shall be 6 inch diameter HDPE SDR 17 with dimensions as shown on the Drawings.

B. The condensate “U tube” drain shall have 6 inch diameter HDPE SDR 17 gravity drain connections to existing leachate cleanouts as shown on the Drawings.

2.02 CONDENSATE KNOCKOUT POT

A. The condensate knockout pot shall be 36-inch diameter HDPE SDR 17 with dimensions as shown on the Drawings. The knockout pot shall be liquid and gas tight and shall be designed to withstand vacuum of 100 inches of water and pressure of 5 psig.

B. The condensate knockout pot shall have 4 inch diameter HDPE SDR 17 gravity drain connection to the proposed condensate sump tank as shown on the Drawings.

2.03 CONDENSATE SUMP TANK AND "U TUBE"

A. The condensate sump tank shall be 36-inch diameter HDPE SDR 17 with dimensions as shown on the Drawings. A 6-inch HDPE "U tube" connection shall be used to drain liquid into the sump. The sump shall be liquid and gas tight and shall be designed to withstand vacuum of 100 inches of water and pressure of 5 psig.

B. The condensate "U tube" drain shall have connections to condensate drains from flare and blower on the pressure side stub and the two knockout pots near the flare station on the vacuum side stub, and a condensate gravity drain connection to the proposed condensate sump tank. Isolation valves shall be installed on drain lines as shown on the Drawings.

C. The sump shall be designed to have an 8 inch deep solids settling area. Further, the design shall be such that solids will not affect the pump or control system operation.

2.04 EQUIPMENT ENCLOSURE HOUSING (VAULT)

A. All operable components of the condensate pump and control assembly shall be located in a polyethylene vault assembly that is integrally mounted to the top of the condensate liquid sump. The vault shall be able to withstand continuous high temperatures near the flare station.

B. All equipment in the vault shall be arranged to be easily accessible for operation and maintenance.

C. Service connections including the liquid discharge and electrical lines shall be bulkhead mounted on a common wall of the vault.

2.05 PIPING

A. Piping requirements are addressed in HDPE specifications Section 15051.

2.06 LIQUID PUMP

A. The pump installed in the condensate sump shall be an EPG Companies SurePump Vertical Sump Drainer. The specific model selected must use 3-phase

power and be capable of pumping rates of 20 to 30 gallons per minute with 20 feet of head. Equivalent pumps must be approved by the Owner's Representative.

2.07 LEVEL CONTROL AND ALARM

A. An adjustable level control shall be provided for the pump. Peak head levels that determine initiation of pumping shall be decided upon when actual field conditions are known. The upper limit shall not exceed 1 foot below the height of the equalization line or condensate inlet pipe (whichever is lower), as installed on the condensate sump. The lower limit should not exceed the point at which air will be pulled into the pump as installed.

B. An alarm display shall be provided for high level alarm conditions.

2.08 CONNECTIONS

A. All materials used in the high pressure liquid discharge line shall be rated for 100 psig pressure with a safety factor of 3.

B. The pressure equalizing line which runs between the landfill condensate liquid pump system and the top of the LFG header shall be PVC hose, PVC or PE pipe, or other non-corrosive material with 1 inch diameter or larger.

2.09 SEALS

A. A PVC flexible membrane seal shall be used to seal the excavation as part of the backfill operations.

2.10 BACKFILL MATERIAL

A. Soil backfill shall not have any large stones or other foreign materials present and should be suitable for adequate compaction as approved by the Owner's Representative. Care shall be taken that the materials adjacent to the condensate sump are fine graded and that no objects are present that could cause damage to the sump.

PART 3 EXECUTION

3.01 HANDLING AND SETTING THE CONDENSATE SUMP UNIT

A. The condensate sump unit and the knockout pot unit shall be lifted and handled according to written procedures supplied by the manufacturer.

B. The units are to be set within 1/4 percent of vertical.

C. The units shall be set so that it is concentrically located in the prepared hole.

D. The units shall be installed in an area that does not allow accumulation or ponding of water. The vault assembly shall be at least 6 inches higher than surrounding grade unless installed in a water tight vault

3.02 CONDENSATE SUMP AND PUMP CONNECTIONS

A. Prior to making connections, all lines shall be purged of debris and thoroughly cleaned.

C. Condensate liquid discharge: The condensate liquid discharge line shall be connected to the condensate sump using good engineering practices. Materials and installation shall be as indicated on the Drawings.

D. Equalizing line: A pressure equalizing line shall be connected between the condensate sump and the top of the LFG header. The equalizing line shall be free draining to either the landfill gas collection pipe or the sump and shall be free of kinks or other obstructions to liquid or air flow.

3.03 TESTING

A. Check sump storage tank, lines and block valve positions prior to operation.

B. Testing shall include the minimum operations:

1. Pressure test to verify that all connections are tight.
2. Leak test connections prior to setting and backfill.
3. Dry operation of the pump for two minutes.

3.04 ACCEPTANCE

A. Prior to acceptance the following verifications shall be made:

1. Verify units are installed vertically.
2 Verify units have been installed per manufacturer's recommendations.
3. Verify all connections have been: pressure tested per the manufacturer's recommendations.
4. Verify the pipes and connections are clean and free of debris.
5. Verify the level switch displacers are installed at elevations appropriate for the installation. As-built displacer elevations shall be recorded and submitted to the Owner's Representative by the Contractor prior to project acceptance.
6. Verify all required functional testing has been completed.

END OF SECTION

SECTION 11910

LANDFILL GAS FLARE/BLOWER SKID

PART 1 - GENERAL

1.01 SCOPE OF APPLICATION

A. Provide all materials, equipment, and labor needed to install the blower/flare skid assemblies and appurtenances in accordance with the Drawings.

1.02 REFERENCES (RESERVED)

1.03 SUBMITTALS

A. Submit to the Owner's Representative for approval manufacturer's literature, shop drawings, or other information pertaining to the assembly, operation, lubrication, adjustments, and other maintenance and repairs of equipment installed under this Section, together with detailed parts lists, drawings, and/or photographs. The Contractor shall also prepare and submit shop drawings showing the layout, orientation and dimensions of the flare, blower/motor assembly, condensate knockout pot, piping, valves and fittings to be installed. All electrical and mechanical drawings for the flare control system shall be submitted.

B. Submit blower characteristic curves indicating capacity for flow versus pressure head and efficiency as tested at the factory for approval prior to shipment.

C. Submit signage layout drawings.

D. Submit operation and maintenance manual.

E. Submit all applicable warranty documents.

F. Submit additional field services rate information for a year.

PART 2- PRODUCTS

2.01 FLARE

A. A utility flare manufactured by John Zink, LFG Specialties, Perennial Energy, or equivalent approved by the Owner's Representative can be used. The flare shall be designed in accordance with the United States of Environmental Protection Agency (USEPA) established criteria for open flares, 40 CFR 60.18. The flare shall be capable of burning low Btu gas and shall include a burner; automatic pilot ignition; electric igniter; pilot gas automatic valves and pilot gas pressure

regulator; stack; automatic gas safety shut-off valve; high and low pressure switches; control panel; flame arrester; piping and all other necessary appurtenances to have a complete operational system. The flare shall be capable of combusting LFG with the following composition:

1. Btu Content - 300 to 600 Btu/scf

2. LFG Flow Rate – 360 to 3600 scfm

3. Carbon Dioxide - 20 to 45 percent

4. Hydrogen Sulfide - up to 1,500 ppm

5. Moisture Content - saturated

6. LFG Supply Pressure - 1 to 15 in. w.c.

The flare shall have a minimum destruction efficiency of 98%. The emission factors for the flare shall not exceed the following:

1. CO: 0.37 lb/MMbtu or 374 lb/million dscf of methane (using conversion factor of 1012 Btu/scf)

2. NOx: 0.07 lb/MMbtu or 71 lb/million dscf of methane (using conversion factor of 1012 Btu/scf)

B. Stack: The flare stack shall be carbon steel with rust preventive coating, fitted with necessary connections. The portion of the stack exposed to flame and high temperatures shall be stainless steel. The flare shall be designed for 110 mph wind loading.

C. The electrical connections shall be 480 volts, 60 Hz, and 3 phase.

2.02 FLAME ARRESTER

A. Supply a flame arrester compatible with the required LFG flow rates. Flame arrester shall be sized to match the blower discharge pipe or flare inlet pipe, whichever is larger, with 125 lb. rating ANSI flanged connections. The housing construction shall be cast aluminum. Maximum head loss through the flame arrester shall not exceed 5 in. w.c. at 3,600 cfm as supplied by Varec, Groth, Protectoseal, or other manufacturer approved by Owner’s Representative.

2.03 PILOT PROPANE (LPG) TANK AND PIPING

A. The propane tank shall be a standard 200 lb tank equipped with fuel gauges. The pressure of the gas shall meet the requirements of the flare pilot system. Mechanical force shall be provided to boost the gas pressure as required.

2.04 CONDENSATE DRAIN PIPES FOR FLARE COMPONENTS

A. The flame arrester, flare stack, and other parts of the system recommended by the flare manufacturer shall be equipped with condensate drain piping. Pipes shall be sized in accordance with the manufacturer's recommendations.

B. Condensate drains on the pressure side of the blower shall include an automatic drip trap as supplied by Varec, Groth, Protectoseal, or other manufacturer approved by the Owner's Representative.

2.05 AUTOMATIC GAS INLET (SHUTOFF) VALVE

A. Supply electrically operated automatic inlet (shutoff) valve at the discharge of the blower. Automatic valve shall also include a mechanism to close upon loss of power.

2.06 CONTROLS

A. The controls shall provide for automatic and manual operation and ignition of the flare unit, and shall include a weatherproof control panel, trouble light contacts, automatic start/stop for pilot ignition, controllers, spark plugs, orifices, ultraviolet (UV) scanners, thermocouplers, timers, and all other necessary components for a complete operational, automatic system. The controls shall include an automatic dialer with capacity to store and dial up to 6 phone numbers in a hierarchical order, with the provision to stop dialing other receivers as soon as the call is acknowledged as accepted by one receiver.

2.07 IGNITION PROCEDURE AND CONTROL SEQUENCE

A. Remote spark ignition of propane gas/air mixture creates pilot flame that ignites LFG main flame.

B. Once pilot is proven, blower turns on and electric gas inlet valve is opened.

C. When main flame is successfully ignited (as detected by an UV scanner), pilot gas is automatically shut off.

D. If pilot is not ignited within the preselected time interval (as set on the timer), pilot gas is shut off and "Pilot Ignition Failure" is signalled with trouble light.

E. If main flame is not ignited within the preselected time interval, pilot gas is shut off and "Flare Ignition Failure" is signaled with trouble light.

F. If main flame is extinguished after successful ignition, pilot is automatically turned on and reignition attempted for a designated time interval. The waiting time before starting reignition procedures after a main flame failure should be programmable by the operator.

G. If the main flame is not successfully reignited in the designated time interval after being extinguished during normal operation or upon initial ignition, the automatic shutoff valve is closed, the blower(s) shut down, and the telephone dialer and alarm is activated to notify the locations stored in memory.

2.08 BLOWER ASSEMBLIES

A. The blower assemblies shall be, variable frequency drive (VFD), multistage centrifugal-type blowers capable of delivering 3,600 cubic feet per minute (cfm) of landfill gas at 55 inches of water column (in-w.c.) total pressure head. Blowers manufactured by Gardener Denver, New York Blower, Aerovent, Hoffman, Hauck or equivalent approved by the Owner's Representative can be used. The assembly shall be factory mounted on the flare steel skid and delivered to the site as a complete unit. A total of two blowers (to be used alternatively with one serving as a backup) shall be supplied and installed.

B. The motor and blower housings shall each be provided with a nameplate which states the manufacturer, model number, serial number, and the pertinent information regarding electrical requirements, size, capacity, etc.

C. Each blower motor shall be 25 HP, or as recommended by the blower manufacturer to be compatible with electrical service of 480-volt, 3-phase, and 60-hertz. The blower motors shall be high efficiency, non-sparking, totally enclosed, fan cooled (TEFC), explosion proof motor.

D. Motor starter shall be equipped with ammeter (meter relay), Hand-Off Automatic switch, red run light, time switch, and hour meter. Combination controller shall incorporate I-T-E Type ETI, or equal, motor circuit protector and full-voltage, non-reversible starter, in NEMA 1 enclosure with acrylic window for viewing indicators.

E. The blowers shall be supplied with a factory applied phenolic coating or other coating to protect all internal parts that will be in contact with landfill gas and to provide resistance to corrosion. Impellers, if constructed of aluminum or stainless steel, shall not require coating.

F. The blower controls shall include a thermal protection package to monitor the blower inlet and outlet bearing temperatures. Sufficient wiring shall be provided by the Contractor to span the distance between the control panel and the blower bearings.

2.09 EXPANSION JOINTS

A. Expansion joints between the blower inlet and outlet and connected piping shall be supplied by the blower manufacturer and shall be manufactured by Lamson or equivalent approved by the Owner's Representative.

2.10 VALVES

A. Butterfly valves located on the inlet of each blower shall be supplied by the blower manufacturer and shall be a Lamson, wafer-type with a lever or equivalent approved by the Owner's Representative.

B. Flanged butterfly valves may require spacers between the flange adapters and the valve body in order to allow full travel of the internal disk. If spacers are necessary for any butterfly valve, the Contractor will install valve spacers subject to approval by the Owner's Representative.

C. Butterfly control valves shall be provided upstream and downstream side of the blower as shown on the Drawings. These valves shall have wheel-type controls.

2.11 CONDENSATE KNOCKOUT POT

A. A 36-in diameter and 72-inch high condensate knockout pot shall be provided with flanged inlet and outlet connectors.

B. The knockout pot shall include a stainless steel demister pad with a 98% filtration efficiency for free liquid and solid particles of 20 micron or larger.

C. The knockout pot shall have an appropriate internal coating to resist acidic condensate. The external finish shall be rust resistant.

D. The knockout pot shall have a removable lid for inspection and repair.

E. The knockout pot shall have a heavy duty gage glass liquid level indicator, a liquid level switch for high condensate level alarm/shutdown, and a 2-in gravity drain connection with a manual valve.

2.12 SIGNAGE

A. Gas direction arrows shall be placed on all piping in the blower pad area. The moisture trap shall be marked "MOISTURE TRAP". Letters and numerals shall be at least 3 inches high. Numerals identifying Blower Nos. 1 and 2 shall be mounted on the blower coupling guard.

B. "Danger - No Smoking" signs shall be prominently displayed on all tour sides of the fenced enclosure. Signs shall be metal or approved equivalent construction with 2" high lettering. The Contractor shall submit signage layout Drawings for the Owner's Representative's approval.

2.13 SPARE PARTS

A. The Contractor shall provide the following spare parts:
   1. 20 ounces of approved grease, or equivalent
   2. One each vacuum and pressure gauge
   3. Parts recommended by the blower manufacturer.

2.14 INTRUMENTATION

A. Provide a pressure gauge on the outlet and a vacuum gauge on the inlet side of each blower. Pressure and vacuum gauges shall be capable of measuring 0 to 20 and 0 to 70 in w.c., respectively, with the smallest measurement unit of at least 1 in. w.c. Gauges shall have at least a 2.5-inch-diameter dial as supplied by the blower manufacturer.

B. Instrumentation for the flare such as thermocouples as specified in Section 2.06 shall be provided.

C. Provide a digital flow meter manufactured by Fluid Components, Thermal Instruments, or equivalent approved by the Owner's Representative. The flow meter shall be capable of measuring 0 to 4,000 scfm landfill gas flow rate, with the smallest measurement unit of at least 1 scfm. The flow meter shall be capable of directly reading the flow rate in standard cubic feet per minute (scfm). The flow meter shall be installed in a straight section of the gas pipe away from installations such as valves and reducers that may cause flow disturbances.

D. Provide a temperature gage capable of measuring from 0 to 200°F with the smallest measurement unit of at least 1°F at the upstream side of the blower.

2.15 DATA RECORDER

A. Provide an electronic data recorder manufactured by Yokogawa or equivalent manufacturer approved by the Owner's Representative capable of recording data from all electronic gages on the flare/blower skid. Flare temperature and gas flow rate are required by regulations to be recorded. Some other gages that should be recorded are vacuum (inlet side of blower), pressure (out let side of blower), landfill gas temperature etc.

2.16 SKID

A. Provide a heavy duty structural steel sub-base with non-skid floor plate welded over all open areas. The skid shall be constructed to withstand all loads and hauling forces. All necessary bracing, mounting pads, and piping supports shall be provided for proper equipment installation and alignment.

B. The skid shall have adequate grounding and lightening protection.

PART 3- EXECUTION

3.01 INSTALLATION

A. Installation shall be in accordance with the Drawings and Specifications.

B. Install the blower assemblies in compliance with the manufacturer's recommendations, the referenced codes, the Drawings, and as specified below. The flare and controls shall be installed in accordance with manufacturer's recommendations. All necessary support angles and anchor bolts shall be furnished and installed per the flare manufacturer's recommendations. The connection requirements and stack sizes vary from one manufacturer to another. The Contractor shall prepare the installation surfaces only after the flare unit is approved by the Owner's Representative and stack sizes and piping connections are determined.

C. The blower assemblies shall be mounted on neoprene isolation pads provided with the blower. Do not bolt down the blower motor assemblies directly to the skid without isolation pads.

D. The Contractor shall check and, if necessary, adjust the alignment of the motor coupling in accordance with the instructions of the blower manufacturer.

E. Equipment shall be field-tested to verify proper alignment and operation, including: freedom from binding, scraping, vibration, shaft runout, or other defects.

F. Shop-painted items which have damage to the shop coatings shall be touched up to match the basic color of the equipment, as approved by the Owner's Representative.

3.02 STARTUP AND TESTS

A. Furnish all equipment, materials, and labor necessary for testing the operation of the complete system, valves and appurtenances, upon completion of the installation. The blowers shall be tested to assure proper operation and delivery of specified flow rates and vacuums.

B. Adequate startup training shall be provided. Training schedule shall be submitted and approved by the Owner.

END OF SECTION

Geosynthetic Institute
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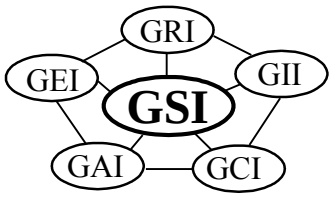

Original: February 28, 2002
Revision 8: February 12, 2015
Revision schedule is on pg. 13

GRI Test Method GM19*

Standard Specification for

Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes

This specification was developed by the Geosynthetic Research Institute (GRI), with the cooperation of the member organizations for general use by the public. It is completely optional in this regard and can be superseded by other existing or new specifications on the subject matter in whole or in part. Neither GRI, the Geosynthetic Institute, nor any of its related institutes, warrant or indemnifies any materials produced according to this specification either at this time or in the future.

1. Scope

1.1 This specification addresses the required seam strength and related properties of thermally bonded polyolefin geomembranes; in particular, high density polyethylene (HDPE), linear low density polyethylene both nonreinforced (LLDPE) and scrim reinforced (LLDPE-R) and flexible polypropylene both nonreinforced (fPP) and scrim reinforced (fPP-R).

1.2 Numeric values of seam strength and related properties are specified in both shear and peel modes.

Note 1: This specification does not address the test method details or specific testing procedures. It refers to the relevant ASTM test methods where applicable.

1.3 The thermal bonding methods focused upon are hot wedge (single and dual track) and extrusion fillet.

*This GRI standard is developed by the Geosynthetic Research Institute through consultation and review by the member organizations. This specification will be reviewed at least every 5-years, or on an as-required basis. In this regard it is subject to change at any time. The most recent revision date is the effective version.

Note 2: Other acceptable, but less frequently used, methods of seaming are hot air and ultrasonic methods. They are inferred as being a subcategory of hot wedge seaming.

1.4 This specification does not suggest a specific distance between destructive seam samples to be taken in the field, i.e., the sampling interval. A separate GRI Standard Practice is focused on this issue, see GRI-GM29.

1.5 This specification is only applicable to laboratory testing.

1.6 This specification does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 ASTM Standards

D6392 Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods

D7747 Standard Test Method for Determining Integrity of Seams Produced Using Thermo-Fusion Methods for Reinforced Geomembranes by the Strip Tensile Method

2.2 EPA Standards

EPA 600/2.88/052 (NTIS PB-89-129670)
Lining of Waste Containment and Other Containment Facilities

2.3 GRI Standards

GM13 Test Properties and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes

GM14 Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes

GM17 Test Properties and Testing Frequency for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes

GM18 Test Properties and Testing Frequency for Flexible Polypropylene (fPP and fPP-R) Geomembranes

GM20 Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using Control Charts

GM25 Test Property and Testing Frequency for Scrim Reinforced Linear Low Density Polyethylene Geomembranes

GM29 Practice for Field Integrity Evaluation of Geomembrane Seams (and Sheet) Using Destructive and Nondestructive Testing

3. Definition

3.1 Geomembrane, n – An essentially impermeable geosynthetic composed of one or more synthetic sheets used for the purpose of liquid, gas or solid containment.

3.2 Hot Wedge Seaming – A thermal technique which melts the two opposing geomembrane surfaces to be seamed by running a hot metal wedge or knife between them. Pressure is applied to the top or bottom geomembrane, or both, to form a continuous bond. Seams of this type can be made with dual bond tracks separated by a nonbonded gap. These seams are referred to as dual hot wedge seams or double-track seams.

3.3 Hot Air Seaming – This seaming technique introduces high-temperature air or gas between two geomembrane surfaces to facilitate localized surface melting. Pressure is applied to the top or bottom geomembrane, forcing together the two surfaces to form a continuous bond.

3.4 Ultrasonic Seaming - A thermal technique which melts the two opposing geomembrane surfaces to be seamed by running a ultrasonically vibrated metal wedge or knife between them. Pressure is applied to the top or bottom geomembrane, or both, to form a continuous bond. Some seams of this type are made with dual bond tracks separated by a nonbonded gap. These seams are referred to as dual-track seams or double-track seams.

3.5 Extrusion Fillet Seaming – This seaming technique involves extruding molten resin at the edge of an overlapped geomembrane on another to form a continuous bond. A depreciated method called “extrusion flat” seaming extrudes the molten resin between the two overlapped sheets. In all types of extrusion seaming the surfaces upon which the molten resin is applied must be suitably prepared, usually by a slight grinding or buffing.

4. Significance and Use

4.1 The various methods of field fabrication of seams in polyolefin geomembranes are covered in existing ASTM standards mentioned in the referenced document section. What is not covered in those documents is the numeric values of strength and related properties that the completed seam must meet, or exceed. This specification provides this information insofar as minimum, or maximum, property values are concerned when the field fabricated seams are sampled and laboratory tested in shear and peel. A separate GRI standard, GRI-GM29 (DRAFT), provides guidance as to the spacing that destructive samples should be taken in typical field installation projects.

5. Sample and Specimen Preparation

5.1 The spacing for taking field seam samples for destructive testing is provided in GRI-GM29 (DRAFT), a standard-of-practice. The process describes a progression from the most restrictive interval of 1 per 500 feet (1 per 150 m) to the complete use and reliance of the electrical leak location survey (ELLS) method. Intermediate between these extremes are variations depending upon the installers experience and performance.

5.2 The size of field seam samples is to be according to the referenced test method, e.g., ASTM D6392 or site-specific CQA plan.

5.3 The individual test specimens taken from the field seam samples are to be tested according to the referenced test method, i.e., ASTM D6392 for HDPE, LLDPE and fPP, and ASTM D751 (modified to a 150 mm + seam width gage length) for fPP-R. The specimens are to be conditioned prior to testing according to these same test methods and evaluated accordingly.

6. Assessment of Seam Test Results

6.1 HDPE seams – For HDPE seams (both smooth and textured), the strength of four out of five 1.0 inch (25 mm) wide strip specimens in shear should meet or exceed the values given in Tables 1(a) and 1(b). The fifth must meet or exceed 80% of the given values. In addition, five out five specimens should meet the shear percent elongation, calculated as follows, and exceed the values given in Tables 1(a) and 1(b):

$$E = \frac{L}{L_o}(100) \quad (1)$$

where

E = elongation (%)
L = extension at end of test (in. or mm)
L_o = original average length (usually 1.0 in. or 25 mm)

Note 3: The assumed gage length is considered to be the unseamed sheet material on either side of the welded area. It generally will be 1.0 in. (25 mm) from the edge of the seam to the grip face.

For HDPE seams (both smooth and textured), the strength of four out of five 1.0 in. (25 mm) wide strip specimens tested in peel should meet or exceed the values given in Tables 1(a) and 1(b). The fifth must meet or exceed 80% of the given values.

In addition, the peel separation (or incursion) should not exceed the values given in Tables 1(a) and 1(b) for all five out of five specimens. The value shall be based on

the proportion of area of separated bond to the area of the original bonding as follows:

$$S = \frac{A}{A_o}(100) \qquad (2)$$

where

S = separation (%)
A = average area of separation, or incursion (in^2 or mm^2)
A_0 = original bonding area (in^2 or mm^2)

Note 4: The area of peel separation can occur in a number of nonuniform patterns across the seam width. The estimated dimensions of this separated area is visual and must be done with care and concern. The area must not include squeeze-out which is part of the welding process.

Regarding the locus-of-break patterns of the different seaming methods in shear and peel, the following are unacceptable break codes per their description in ASTM D6392 (in this regard, SIP is an acceptable break code);

Hot Wedge: AD and AD-Brk > 25%
Extrusion Fillet: AD1, AD2
Exception: AD-WLD (unless strength is achieved)

Note 5: Separation-in-plane (SIP) is a locus-of-break where the failure surface propagates within one of the seamed sheets during destructive testing (usually in the peel mode). It is not merely a surface skin effect producing a few ductile fibrils (sometimes called ductile drawdown). SIP is acceptable if the required strength, shear elongation and peel separation criteria are met.

In this regard, five out of five specimens shall result in acceptable break patterns.

6.2 LLDPE seams – For LLDPE seams (smooth, textured and scrim reinforced), the strength of four out of five 1.0 in. (25 mm) wide strip specimens in shear should meet or exceed the values given in Tables 2(a) through 2(d). The fifth must meet or exceed 80% of the given values. Note that the unreinforced specimens are 1.0 in. (25 mm) wide strips and the scrim reinforced specimens are 4.0 in. (100 mm) wide grab tests. In addition, the shear percent elongation, calculated as follows, should exceed the values given in Tables 2(a) through 2(d). All five out of five should meet the shear elongation requirement.

$$E = \frac{L}{L_o}(100) \qquad (1)$$

where
E = elongation (%)
L = extension at end of test (in. or mm)
L_o = original average length (usually 1.0 in. or 25 mm)

Note 3 (Repeated): The assumed gage length is considered to be the unseamed sheet material on either side of the welded area. It generally will be 1.0 in. (25 mm) from the edge of the seam to the grip face.

Shear elongation is not relevant to scrim reinforced geomembranes and as such is listed as "not applicable" in Tables 2 (c) and (d).

For LLDPE seams (smooth, textured and scrim reinforced), the strength of four out of five 1.0 in. (25 mm) wide strip specimens tested in peel should meet or exceed the values given in Tables 2(a) through 2(d). The fifth must meet or exceed 80% of the given values.

In addition, the peel separation (or incursion) should not exceed the values given in Tables 2(a) through 2(d). All five out of five specimens shall meet the peel separation value. The value shall be based on the proportion of area of separated bond to the area of the original bonding as follows:

$$S = \frac{A}{A_o}(100) \qquad (2)$$

where

S = separation (%)
A = average depth of separation, or incursion ($in.^2$ or mm^2)
A_0 = original bonding distance ($in.^2$ or mm^2)

Note 4 (Repeated): The area of peel separation can occur in a number of nonuniform patterns across the seam width. The estimated dimensions of this separated area is visual and must be done with care and concern. The area must not include squeeze-out which is part of the welding process.

Regarding the locus-of-break patterns of the different seaming methods in shear and peel, the following are unacceptable break codes per their description in ASTM D6392 (in this regard, SIP is an acceptable break code);

Hot Wedge: AD and AD-Brk > 25%
Extrusion Fillet: AD1, AD2
Exception: AD-WLD (unless strength is achieved)

Note 5 (Repeated): Separation-in-plane (SIP) is a locus-of-break where the failure surface propagates within one of the seamed sheets during destructive testing (usually in the peel mode). It is not merely a surface skin effect producing a few ductile fibrils (sometimes called ductile drawdown). SIP is acceptable if the required strength, shear elongation and peel separation criteria are met.

In this regard, five out of five specimens shall result in acceptable break patterns.

6.3 fPP Seams – For fPP seams (both nonreinforced and scrim reinforced), the strength of four out of five specimens in shear should meet or exceed the values given in Tables 3(a) and 3(b). The fifth must meet or exceed 80% of the given values. Note that the unreinforced specimens are 1.0 in. (25 mm) wide strips and the scrim reinforced specimens are 4.0 in. (100 mm) wide grab tests. In addition, the shear percent elongation on the unreinforced specimens, calculated as follows, should exceed the values given in Tables 3(a) and 3(b). All five out of five specimens should meet the shear elongation requirement.

$$E = \frac{L}{L_o}(100) \quad (1)$$

where
E = elongation (%)
L = extension at end of test (in. or mm)
L_o = original gauge length (usually 1.0 in. or 25 mm)

Note 3 (Repeated): The assumed gage length is considered to be the unseamed sheet material on either side of the welded area. It generally will be 1.0 in. (25 mm) from the edge of the seam to the grip face.

Shear elongation is not relevant to scrim reinforced geomembranes and as such is listed as "not applicable" in Tables 3(a) and 3(b).

For fPP seams (both nonreinforced and scrim reinforced), the strength of four out of five specimens in peel should meet or exceed the values given in Tables 3(a) and 3(b). The fifth must meet or exceed 80% of the given values. Note that the unreinforced specimens are 1.0 in. (25 mm) wide strips and the scrim reinforced specimens are grab tests. In addition, the peel percent separation (or incursion) should not exceed the values given in Tables 3(a) and 3(b). All five out of five specimens should meet the peel separation value. The values should be based on the proportion of area of separated bond to the area of the original bonding as follows.

$$S = \frac{A}{A_o}(100) \quad (2)$$

where

S = separation in (%)
A = average depth of separation, or incursion (in.^{2} or mm^2)
A_o = original bonding distance (in.^{2} or mm^2)

Note 4 (Repeated): The area of peel separation can occur in a number of nonuniform patterns across the seam width. The estimated dimensions of this separated area is visual and must be done with care and concern. The area must not include squeeze-out which is part of the welding process.

Regarding the locus-of-break patterns of the different seaming methods in shear and peel, the following are unacceptable break codes per their description in ASTM D6392 (in this regard, SIP is an acceptable break code);

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Note 5 (Repeated): Separation-in-plane (SIP) is a locus-of-break where the failure surface propagates within one of the seamed sheets during destructive testing (usually in the peel mode). It is not merely a surface skin effect producing a few ductile fibrils (sometimes called ductile drawdown). SIP is acceptable if the required strength, shear elongation and peel separation criteria are met.

In this regard, five out of five specimens shall result in acceptable break patterns.

7. Retest and Rejection

7.1 If the results of the testing of a sample do not conform to the requirements of this specification, retesting to determine conformance or rejection should be done in accordance with the construction quality control or construction quality assurance plan for the particular site under construction.

8. Certification

8.1 Upon request of the construction quality assurance officer or certification engineer, an installer's certification that the geomembrane was installed and tested in accordance with this specification, together with a report of the test results, shall be furnished at the completion of the installation.

Table 1(a) – Seam Strength and Related Properties of Thermally Bonded **Smooth and Textured** High Density Polyethylene (HDPE) Geomembranes **(English Units)**

Geomembrane Nominal Thickness	30 mils	40 mils	50 mils	60 mils	80 mils	100 mils	120 mils
Hot Wedge Seams[1]							
shear strength[2], lb/in.	57	80	100	120	160	200	240
shear elongation at break[3], %	50	50	50	50	50	50	50
peel strength[2], lb/in.	45	60	76	91	121	151	181
peel separation, %	25	25	25	25	25	25	25
Extrusion Fillet Seams							
shear strength[2], lb/in.	57	80	100	120	160	200	240
shear elongation at break[3], %	50	50	50	50	50	50	50
peel strength[2], lb/in.	39	52	65	78	104	130	156
peel separation, %	25	25	25	25	25	25	25

Notes for Tables 1(a) and 1(b):

1. Also for hot air and ultrasonic seaming methods
2. Value listed for shear and peel strengths are for 4 out of 5 test specimens; the 5th specimen can be as low as 80% of the listed values
3. Elongation measurements should be omitted for field testing

Table 1(b) – Seam Strength and Related Properties of Thermally Bonded **Smooth and Textured** High Density Polyethylene (HDPE) Geomembranes **(S.I. Units)**

Geomembrane Nominal Thickness	0.75 mm	1.0 mm	1.25 mm	1.5 mm	2.0 mm	2.5 mm	3.0 mm
Hot Wedge Seams[1]							
shear strength[2], N/25 mm.	250	350	438	525	701	876	1050
shear elongation at break[3], %	50	50	50	50	50	50	50
peel strength[2], N/25 mm	197	263	333	398	530	661	793
peel separation, %	25	25	25	25	25	25	25
Extrusion Fillet Seams							
shear strength[2], N/25 mm	250	350	438	525	701	876	1050
shear elongation at break[3], %	50	50	50	50	50	50	50
peel strength[2], N/25 mm	170	225	285	340	455	570	680
peel separation, %	25	25	25	25	25	25	25

Table 2(a) – Seam Strength and Related Properties of Thermally Bonded **Smooth and Textured** Linear Low Density Polyethylene (LLDPE) Geomembranes (English Units)

Geomembrane Nominal Thickness	20 mils	30 mils	40 mils	50 mils	60 mils	80 mils	100 mils	120 mils
Hot Wedge Seams[1]								
shear strength[2], lb/in.	30	45	60	75	90	120	150	180
shear elongation[3], %	50	50	50	50	50	50	50	50
peel strength[2], lb/in.	25	38	50	63	75	100	125	150
peel separation, %	25	25	25	25	25	25	25	25
Extrusion Fillet Seams								
shear strength[2], lb/in.	30	45	60	75	90	120	150	180
shear elongation[3], %	50	50	50	50	50	50	50	50
peel strength[2], lb/in.	22	34	44	57	66	88	114	136
peel separation, %	25	25	25	25	25	25	25	25

Notes for Tables 2(a) and 2(b):
1. Also for hot air and ultrasonic seaming methods
2. Values listed for shear and peel strengths are for 4 out of 5 test specimens; the 5th specimen can be as low as 80% of the listed values
3. Elongation measurements should be omitted for field testing

Table 2(b) – Seam Strength and Related Properties of Thermally Bonded **Smooth and Textured** Linear Low Density Polyethylene (LLDPE) Geomembranes (S.I. Units)

Geomembrane Nominal Thickness	0.50 mm	0.75 mm	1.0 mm	1.25 mm	1.5 mm	2.0 mm	2.5 mm	3.0 mm
Hot Wedge Seams[1]								
shear strength[2], N/25 mm	131	197	263	328	394	525	657	788
shear elongation[3], %	50	50	50	50	50	50	50	50
peel strength[2], N/25 mm	109	166	219	276	328	438	547	657
peel separation, %	25	25	25	25	25	25	25	25
Extrusion Fillet Seams								
shear strength[2], N/25 mm	131	197	263	328	394	525	657	788
shear elongation[3], %	50	50	50	50	50	50	50	50
peel strength[2], N/25 mm	95	150	190	250	290	385	500	595
peel separation, %	25	25	25	25	25	25	25	25

Table 2(c) – Seam Strength and Related Properties of Thermally Bonded **Scrim Reinforced** Linear Low Density Polyethylene (LLDPE-R) Geomembranes (English Units)

Geomembrane Nominal Thickness	36 mil[4]	45 mil[4]
Hot Wedge Seams[1]		
shear strength[2], lb	200	200
shear elongation[3], %	n/a	n/a
peel strength[2], lb	20	20
peel separation, %	n/a	n/a
Extrusion Fillet Seams		
shear strength[2], lb	200	200
shear elongation[3], %	n/a	n/a
peel strength[2], lb	20	20
peel separation, %	n/a	n/a

1. Also for hot air and ultrasonic seaming methods
2. Values listed for shear and peel strengths are for 4 out of 5 test specimens; the 5th specimen can be as low as 80% of the listed values
3. Elongation measurements should be omitted for field testing
4. Values are based on grab tensile strength and elongation per D7747 for laboratory tested specimens

Table 2(d) – Seam Strength and Related Properties of Thermally Bonded **Scrim Reinforced** Linear Low Density Polyethylene (LLDPE-R) Geomembranes (S.I. Units)

Geomembrane Nominal Thickness	36 mil[4]	45 mil[4]
Hot Wedge Seams[1]		
shear strength[2], N	890	890
shear elongation[3], %	n/a	n/a
peel strength[2], N	90	90
peel separation, %	n/a	n/a
Extrusion Fillet Seams		
shear strength[2], N	890	890
shear elongation[3], %	n/a	n/a
peel strength[2], N	90	90
peel separation, %	n/a	n/a

1. Also for hot air and ultrasonic seaming methods
2. Values listed for shear and peel strengths are for 4 out of 5 test specimens; the 5th specimen can be as low as 80% of the listed values
3. Elongation measurements should be omitted for field testing
4. Values are based on grab tensile strength and elongation per D7747 for laboratory tested specimens

Table 3(a) – Seam Strength and Related Properties of Thermally Bonded **Nonreinforced and Scrim Reinforced** Flexible Polypropylene (fPP) Geomembranes (English Units)

Geomembrane Nominal Thickness	30 mil-NR	40 mil-NR	36 mil-R[4]	45 mil-R[4]
Hot Wedge Seams[1]				
shear strength[2], lb/in. (NR); lb (R)	25	30	200	200
shear elongation[3], %	50	50	n/a	n/a
peel strength[2], lb/in. (NR); lb (R)	20	25	20	20
peel separation, %	25	25	n/a	n/a
Extrusion Fillet Seams				
shear strength[2], lb/in. (NR); lb (R)	25	30	200	200
shear elongation[3], %	50	50	n/a	n/a
peel strength[2], lb/in. (NR); lb (R)	20	25	20	20
peel separation, %	25	25	n/a	n/a

1. Also for hot air and ultrasonic seaming methods
2. Values listed for shear and peel strengths are for 4 out of 5 test specimens; the 5th specimen can be as low as 80% of the listed values
3. Elongation measurements should be omitted for field testing
4. Values are based on grab tensile strength and elongation per D7747 for laboratory tested specimens

Table 3(b) – Seam Strength and Related Properties of Thermally Bonded **Nonreinforced and Scrim Reinforced** Flexible Polypropylene (fPP) Geomembranes (S.I. Units)

Geomembrane Nominal Thickness	0.75 mm-NR	1.0 mm-NR	0.91 mm-R[4]	1.14 mm-R[4]
Hot Wedge Seams[1]				
shear strength[2], N/25 mm (NR); N (R)	110	130	890	890
shear elongation[3], %	50	50	n/a	n/a
peel strength[2], N/25 mm (NR); N (R)	85	110	90	90
peel separation, %	25	25	n/a	n/a
Extrusion Fillet Seams				
shear strength[2], N/25 mm (NR); N (R)	110	130	890	890
shear elongation[3], %	50	50	n/a	n/a
peel strength[2], N/25 mm (NR); N (R)	85	110	90	90
peel separation, %	25	25	n/a	n/a

1. Also for hot air and ultrasonic seaming methods
2. Values listed for shear and peel strengths are for 4 out of 5 test specimens; the 5th specimen can be as low as 80% of the listed values
3. Elongation measurements should be omitted for field testing
4. Values are based on grab tensile strength and elongation per D7747 for laboratory tested specimens

Adoption and Revision Schedule
for
Seam Specification per GRI-GM19

"Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes"

Adopted: February 18, 2002

Revision 1: May 15, 2003; Increased selected shear and peel test requirements, per the following:

Material	Test	Seam Type	Current GM19	Proposed GM19	Difference
HDPE	Shear	Hot Wedge	95% yield	95% yield	no change
		Extrusion	95% yield	95% yield	no change
	Peel	Hot Wedge	62% yield	72% yield	16% increase
		Extrusion	62% yield	62% yield	no change
LLDPE	Shear	Hot Wedge	1300 psi break	1500 psi break	15% increase
		Extrusion	1300 psi break	1500 psi break	15% increase
	Peel	Hot Wedge	1100 psi break	1250 psi break	14% increase
		Extrusion	1100 psi break	1100 psi break	no change

Revision 2: January 28, 2005; added Note 6 (in three locations) stating that incursion is measured on an area basis and not depth as in ASTM D6392.

Revision 3: June 4, 2010; Removed Note 6 on peel incursion since ASTM D6392 (2008) now uses area of incursion whereas previously they used linear length of incursion. Thus ASTM is now in agreement with GM19 in this regard.

Revision 4: November 15, 2010; Added Note 6 (in three locations) stating what separation-in-plane (SIP) is, and is not, and that it is acceptable if the required strength, shear elongation and peel separation criteria are met.

Revision 5: July 12, 2011; AD1 and AD2 breaks are now unacceptable even if strength is achieved.

Revision 6: October 3, 2011; Added LLDPE-R to the various geomembrane types, in particular, Tables 2(c) and 2(d) and made editorial changes.

Revision 7: November 3, 2013; clarified issues of 4 out of 5 passing strength and 5 out of 5 passing locus-of-break, shear elongation and peel separation.

Revision 8: February 12, 2015; upgraded standards and terminology

APPENDIX C

AS-BUILT SURVEY

MAGNETIC

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

SURVEYOR's NOTES:

1.) North and coordinate basis is the East Zone of the Florida State Plane Coordinate System. The published values used for this survey are NAD 83 2007 adjustment

2.) Vertical information depicted on this report are GPS derived elevations based on the National Geodetic Vertical Datum of 1929 (NGVD29).

3.) All PVC well casings are 8" diameter schedule 80.

4.) All Lateral and Header piping are HDPE SDR17

5.) All elevations shown are top of pipe unless otherwise noted.

SEE SHEET 2 FOR PIPE TABLE INFORMATION

LEGEND:

NO. NUMBER
ELEV. ELEVATION
x6516 ASBULT POINT NUMBER
LB LICENSE BUSINESS

CELL 1
CELL 2
CELL 3
CELL 4
CELL 5
CELL 6
CELL 7
CELL 8
CELL 9
CELL 10
CELL 11
CELL 12
CELL 13

W/L 80.1

CELL 3 SUMP PAD
CELL 6 SUMP PAD

66661 6"45 BEND-TIE-IN TO LOWER TIER HORIZONTAL DRIP LEGS
18"BLIND FLANGE FUTURE PIPE TO LFGTE PROJECT 66670
18"BLIND FLANGE FUTURE PIPE TO LFGTE PROJECT 66671
HCC 15 66660
66667 6"VALVE
66669 18"valve
66672 18"tee
66649 18"x8"TEE
66653
66654
66668 18"tee
66659 6" HIGH POINT RISER
66641 18"x6"TEE
66662 6"45 BEND-TIE-IN TO LOWER TIER HORIZONTAL DRIP LEGS
66657 6"RISER
66658 18"x6"tee
66656 18"x6"tee
66639
66640
66651 8"WYE WITH BLIND FLANGES FOR FUTURE CONNECTION
66629 8"WYE WITH BLIND FLANGES FOR FUTURE CONNECTION
66628 18"x8"TEE
66627
HCC 14 66636
66637 LATERAL RISER
18"PIPE
66624
66673 18"TEE (TIE-IN)
66621 18"FLANGE

7071 TIE-IN TO EXISTING 16"HEADER
8"FUTURE CONNECTION ⊠7070
7066
⊠7064 8"FUTURE CONNECTION
7063
12"PIPE
8"PIPE
7067 GW-83
7068 LATERAL RISER
7001
7002
7003
8"HDPE
7004
7005
8"PIPE
GW-78 7006
7007 LATERAL RISER
7010 GW-77
7011 LATERAL RISER
7012
7013 LATERAL RISER
7014 GW-76
8"HDPE
GW-T80 80483
80485
6"HDPE
80484 LATERAL RISER
80486
GW-T104 80490
80489 LATERAL RISER
LATERAL RISER 80492
80491 GW-T110
GW-T103 80497
8"HDPE
8"TEE 6563
GW-T100 80504
8"HDPE
80500
80498 LATERAL RISER
LATERAL RISER 7018
80503 LATERAL RISER
GW-75 7017
8"PIPE
7024
7019
7020 TIE-IN TO EXISTING LATERAL
LATERAL RISER 80505
80506 GW-T109
8"HDPE
LATERAL RISER 80511
80512 GW-T113
340HDPE
8"TEE 6564
TIE-IN TO EXISTING GW-118 LATERAL RISER WITH 8"TEE ELEV=124.8 6562

80521 TIE-IN TO EXISTING GW-66 LATERAL RISER
80519 GW-67R1
80520 LATERAL RISER
6"PIPE
GW-68R1 80514
80513 LATERAL RISER

6557 TIE-IN TO EXISTING LATERAL
80535 GW-65R1
6"PIPE
6556
80534 LATERAL RISER
6555
6553 GW-37
6554 LATERAL RISER

TIE-IN TO EXISTING 12" CROSS-OVER HEADER
7032
8"PIPE
7033
LATERAL RISER 7034
7035 GW-81
7031 TIE-IN TO EXISTING 12" CROSS-OVER HEADER
7028
7025 GW-79
7026 LATERAL RISER

7047 TIE-IN TO EXISTING GW-54 6" LATERAL
7041 TIE-IN TO EXISTING GW-58 LATERAL
7048
7049 LATERAL RISER
6"PIPE
7040
7050 GW-54R1
7039 LATERAL RISER
GW-73 7038
TIE-IN TO EXISTING GW-50 6" LATERAL
7056
7055
LATERAL RISER 7054
GW-50R1 7053
6"PIPE
TIE-IN TO EXISTING LATERAL 6545
7062
GW-22R1 7060
7061 LATERAL RISER
TIE-IN TO EXISTING GW-45 6" LATERAL 6537
6534
6531 GW-45R1
6532 LATERAL RISER
6"PIPE
6547
6544
6543
6540 LATERAL RISER
6542 GW-51R1
6546 TIE-IN TO EXISTING LATERAL
6550 GW-15R3
6549 LATERAL RISER

GW-4R2 6525
6"PIPE
6527
6524 LATERAL RISER
6528
6530 TIE-IN TO EXISTING LATERAL
GW-18R1 6517
LATERAL RISER 6518
6520
6521
6523 TIE-IN TO EXISTING LATERAL
LATERAL RISER 6511
6513
GW-21R1 6510
6514
6516 TIE-IN TO EXISTING LATERAL
LATERAL RISER 6482
GW-27R1 6481
6"PIPE
6485
6486
6489 TIE-IN TO EXISTING LATERAL WITH 6"TEE
GW-72 6500
6"PIPE
6502
6501 LATERAL RISER
8505 TIE-IN TO EXISTING LATERAL WITH 6"TEE

Peavey & Associates
SURVEYING & MAPPING PA
9399 N LAKE BUFFUM RD
FORT MEADE, FL 33841
PHONE: 863-738-4960
FLORIDA BUSINESS NO.7779

CLIENT:
Omni Waste of Osceola County, LLC
Waste Services, Inc.
1501 Omni Way
St. Cloud, Fl 34773

ASBUILT SURVEY - GCCS 2015
CELLS 1,2,3,4,5,6,7,8,9&10 - J.E.D.
SOLID WASTE MANGEMENT FACILITY
1501 OMNI WAY ST. CLOUD, FL

REVISION | DATE | NO.

DEBORAH L. PEAVEY LICENSE NUMBER No. 6345 STATE OF FLORIDA PROFESSIONAL SURVEYOR & MAPPER

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND SEAL OF SURVEYOR

Drawn By: DLP | Party Chief: SP | Field Book: 51 | FILE NAME: 1009 csbuilt gcs 12-16-2015.dwg

DEBORAH L. PEAVEY, P.S.M.
FLORIDA REGISTRATION NUMBER 6345
FLORIDA BUSINESS NUMBER 7779
12/16/2015
SURVEY DATE

SCALE	DRAWING NO.
1"=60'	304
PROJECT NO.	SHEET
1009	1

GCCS 2015 TABLE – CELL 7&8

DESCRIPTION	POINT NUMBER	NORTHING	EASTING	TOP OF PIPE ELEVATION
TIE-IN 8"TEE GA118 LATERAL RISER	6562	1354397.3	624083.5	124.8
8"TEE	6564	1354493.2	624345.4	138.1
GW-T113 (TOP OF 6" LATERAL RISER)	80511	1354607.4	624357.0	170.9
GW-T113 (TOP OF PVC CASING)	80512	1354609.2	624352.3	171.1
GW-T109 (TOP OF 6" LATERAL RISER)	80505	1354763.6	624440.7	200.9
GW-T109 (TOP OF PVC CASING)	80506	1354763.3	624444.2	201.6
GW-T80 (TOP OF PVC CASING)	80483	1354967.5	624811.3	236.6
GW-T80 (TOP OF 6" LATERAL RISER)	80484	1354966.0	624814.1	235.9
8"PIPE	80485	1354870.8	624831.2	213.3
8"PIPE	80486	1354774.2	624851.6	195.0
GW-T104 (TOP OF 6" LATERAL RISER)	80489	1354747.0	624845.8	195.2
GW-T104 (TOP OF PVC CASING)	80490	1354750.3	624844.6	197.3
GW-T110 (TOP OF PVC CASING)	80491	1354625.5	624706.9	169.7
GW-T110 (TOP OF 6" LATERAL RISER)	80492	1354622.6	624708.8	168.3
8"TEE	6563	1354601.1	624640.2	157.8
GW-T103 (TOP OF PVC CASING)	80497	1354822.8	624644.7	206.7
GW-T103 (TOP OF 6" LATERAL RISER)	80498	1354821.2	624641.3	205.5
8"PIPE	80500	1354892.6	624632.1	215.4
GW-T100 (TOP OF 6" LATERAL RISER)	80503	1354996.8	624622.9	240.7
GW-T100 (TOP OF PVC CASING)	80504	1354998.0	624626.2	240.8

GCCS 2015 TABLE

DESCRIPTION	POINT NUMBER	NORTHING	EASTING	TOP OF PIPE ELEVATION
GW-68R1 (TOP OF 6" LATERAL RISER)	80513	1355799.3	624901.3	229.3
GW-68R1 (TOP OF PVC CASING)	80514	1355795.6	624902.3	231.9
GW-67R1 (TOP OF PVC CASING)	80519	1355803.5	625104.2	179.0
GW-67R1 (TOP OF 6"LATERAL RISER)	80520	1355806.4	625101.1	177.3
TIE-IN TO GW-66R EXISTING 6" LATERAL RISER	80521	1355826.0	625270.5	133.2
GW-65R1 (TOP OF 6" LATERAL RISER)	80534	1355994.7	624901.0	230.5
GW-65R1 (TOP OF PVC CASING)	80535	1355990.9	624899.6	231.3
GW-27R1 (TOP OF PVC CASING)	6481	1356368.2	624489.0	249.9
GW-27R1 (TOP OF 6" LATERAL RISER)	6482	1356370.9	624486.1	249.2
6"PIPE	6485	1356368.9	624480.4	242.5
6"PIPE	6486	1356362.5	624463.9	237.7
TIE-IN TO EXISTING LATERAL WITH 6"TEE	6489	1356353.5	624447.0	233.0
GW-72 (TOP OF PVC CASING)	6500	1356159.7	624558.8	260.5
GW-72 (TOP OF 6" LATERAL RISER)	6501	1356156.6	624557.6	259.6
6"PIPE	6502	1356164.0	624490.2	242.1
TIE-IN TO EXISTING LATERAL WITH 6"TEE	6505	1356165.8	624440.6	230.3
GW-21R1 (TOP OF PVC CASING)	6510	1356557.5	624487.1	250.5
GW-21R1 (TOP OF 6" LATERAL RISER)	6511	1356560.2	624485.4	250.1
6"PIPE	6513	1356561.6	624478.6	242.4
6"PIPE	6514	1356563.5	624459.6	237.4
TIE-IN TO EXISTING LATERAL	6516	1356564.0	624448.0	233.4
GW-18R1 (TOP OF PVC CASING)	6517	1356749.5	624491.7	251.2
GW-18R1 (TOP OF 6" LATERAL RISER)	6518	1356746.2	624491.1	250.5
6"PIPE	6520	1356746.3	624487.8	244.8
6"PIPE	6521	1356750.5	624458.0	236.6
TIE-IN TO EXISTING LATERAL	6523	1356758.2	624427.0	227.5
GW-4R2 (TOP OF 6" LATERAL RISER)	6524	1357072.2	624490.7	251.1
GW-4R2 (TOP OF PVC CASING)	6525	1357069.8	624489.0	251.2
6"PIPE	6527	1357116.9	624463.1	238.7
6"PIPE	6528	1357161.7	624437.8	230.7
TIE-IN TO EXISTING LATERAL	6530	1357180.4	624424.2	225.1
GW-45R1 (TOP OF PVC CASING)	6531	1356967.1	624687.9	250.3
GW-45R1 (TOP OF 6" LATERAL CASING)	6532	1356970.8	624688.1	249.5
6"PIPE	6534	1356971.5	624694.1	243.7
6" 45-BEND	6536	1356970.7	624715.7	238.3
TIE-IN TO EXISTING 6" LATERAL WITH 6"TEE	6537	1356969.9	624716.2	238.2
GW-51R1 (TOP OF 6" LATERAL RISER)	6540	1356700.0	624667.7	254.7
GW-51R1 (TOP OF PVC CASING)	6542	1356697.3	624670.7	254.8
6"PIPE	6543	1356700.2	624668.5	250.7
6"PIPE	6544	1356708.0	624672.4	249.9
TIE-IN TO EXISTING LATERAL	6545	1356720.2	624679.9	248.8
TIE-IN TO EXISTING LATERAL	6546	1356895.1	624610.7	249.1
6"PIPE	6547	1356891.5	624605.1	249.4
GW-15R3 (TOP OF 6" LATERAL CASING)	6549	1356887.6	624599.3	253.8
GW-15R3 (TOP OF PVC CASING)	6550	1356890.0	624598.3	253.9
GW-37 (TOP OF PVC CASING)	6553	1356106.2	624799.6	249.6
GW-37 (TOP OF 6" LATERAL RISER)	6554	1356103.2	624798.5	249.0
6"PIPE	6555	1356079.6	624814.6	239.9
6"PIPE	6556	1356037.9	624843.8	234.9
TIE-IN TO EXISTING LATERAL WITH 6"TEE	6557	1356006.0	624903.6	222.5

GCCS 2015 TABLE–CONTINUED

DESCRIPTION	POINT NUMBER	NORTHING	EASTING	TOP OF PIPE ELEVATION
8"x12"REDUCER	7001	1355193.0	625100.5	193.5
8"x8"TEE	7002	1355191.6	625097.7	193.5
8" 45BEND	7003	1355151.8	625102.2	200.2
8"PIPE	7004	1355163.1	625028.1	206.1
8"PIPE	7005	1355047.3	625002.4	226.6
GW-78 (TOP OF CASING)	7006	1354990.0	624948.1	237.2
GW-78 (TOP OF 6"LATERAL RISER)	7007	1354993.7	624949.2	236.4
GW-77 (TOP OF PVC CASING)	7010	1355141.2	624922.7	231.6
GW-77 (TOP OF 6"LATERAL RISER)	7011	1355137.7	624922.1	231.9
8"PIPE	7012	1355117.2	624834.1	220.4
GW-76 (TOP OF 6"LATERAL RISER)	7013	1355097.8	624730.3	233.8
GW-76 (TOP OF PVC CASING)	7014	1355102.4	624729.6	233.9
GW-75 (TOP OF PVC CASING)	7017	1355097.0	624542.2	241.0
GW-75 (TOP OF 6"LATERAL RISER)	7018	1355100.0	624544.0	239.6
8"PIPE	7019	1355142.9	624482.4	224.0
TIE-IN TO EXISTING LATERAL	7020	1355148.6	624449.8	219.3
8"PIPE	7024	1355100.6	624543.4	235.7
GW-79 (TOP OF PVC CASING)	7025	1355520.3	624613.7	249.0
GW-79 (TO POF 6" LATERAL RISER)	7026	1355523.2	624619.0	246.9
8"PIPE	7028	1355537.1	624643.9	239.9
TIE-IN TO EXISTING 12" CROSS-OVER HEADER	7031	1355559.7	624679.2	236.7
TIE-IN TO EXISTING 12" CROSS-OVER HEADER	7032	1355582.7	624805.4	215.3
8"PIPE	7033	1355652.6	624755.8	233.4
GW-81 (TOP OF 6"LATERAL RISER)	7034	1355709.4	624712.7	247.6
GW-81 (TOP OF PVC CASING)	7035	1355706.3	624708.3	247.9
GW-73 (TOP OF PVC CASING)	7038	1356368.9	624779.7	254.6
GW-73 (TOP 6" LATERAL RISER)	7039	1356372.0	624780.4	254.1
6"PIPE	7040	1356382.7	624840.3	245.9
TIE-IN TO EXISTING GW-58 LATERAL	7041	1356403.2	624909.3	234.5
TIE-IN TO EXISTING GW-54 6" LATERAL	7047	1356597.9	624880.9	230.9
6"PIPE	7048	1356589.3	624845.8	237.7
GW-54R1 (TOP OF 6" LATERAL RISER)	7049	1356569.7	624825.2	251.1
GW-54R1 (TOP OF PVC CASING)	7050	1356571.2	624822.6	251.7
GW-50R1 (TOP OF PVC CASING)	7053	1356749.1	624760.6	252.5
GW-50R1 (TOP OF 6" LATERAL RISER)	7054	1356752.5	624760.0	251.4
6"PIPE	7055	1356781.6	624784.1	237.0
TIE-IN TO EXISTING GW-50 6" LATERAL	7056	1356789.7	624809.8	235.6
GW-22R1 (TOP OF PVC CASING)	7060	1356484.9	624683.0	255.9
GW-22R1 (TOP OF 6" LATERAL RISER)	7061	1356487.9	624680.8	255.6
6"PIPE	7062	1356497.2	624692.0	250.2
12"PIPE	7063	1355239.5	625188.7	190.0
8"FUTURE CONNECTION	7064	1355280.2	625239.0	174.2
12"x8"TEE	7066	1355327.9	625231.7	168.3
GW-83 (TOP OF CASING)	7067	1355331.5	625159.6	184.6
GW-83 (TOP OF 6"LATERAL RISER)	7068	1355329.1	625161.5	184.1
8"FUTURE CONNECTION	7070	1355354.3	625320.5	144.9
TIE-IN TO EXISTING 16"HEADER	7071	1355411.9	625377.9	128.3

GCCS 2015 TABLE – CELL 9&10

DESCRIPTION	POINT NUMBER	NORTHING	EASTING	TOP OF PIPE ELEVATION
18"EXISTING FLANGE (TIE-IN)	66621	1355235.9	625798.2	108.99
18"PIPE	66624	1355205.7	625841.6	110.44
18"PIPE	66627	1355145.7	625923.3	116.98
18"x8"TEE	66628	1355132.0	625941.9	118.23
8"WYE WITH BLIND FLANGES FOR FUTURE CONNECTION	66629	1355130.8	625939.4	119.31
HGC 14 (TOP OF PVC CASING)	66636	1355131.3	625927.4	123.38
HGC 14 (TOP OF 6"LATERAL RISER)	66637	1355132.3	625927.6	124.62
6"PIPE	66639	1355111.7	625972.3	127.08
4"RISER PIPE	66640	1355113.1	625970.2	125.64
18"x6"TEE	66641	1355112.8	625970.2	119.98
18"x6"TEE	66649	1355042.2	626066.7	126.30
8"WYE WITH BLIND FLANGES FOR FUTURE CONNECTION	66651	1355040.1	626063.5	126.85
6"PIPE	66653	1355040.6	626070.1	132.28
4"RISER PIPE	66654	1355037.4	626072.0	131.87
18"x6"TEE	66656	1355003.0	626110.0	128.87
6"RISER	66657	1355003.5	626109.5	137.47
18"x6"TEE	66658	1355000.7	626111.9	128.72
6" HIGH POINT RISER	66659	1355000.9	626111.7	134.35
HGC 15 (TOP OF PVC CASING)	66660	1355005.1	626116.6	134.88
6"45 BEND-TIE-IN TO LOWER TIER HORIZONTAL DRIP LEGS	66661	1355078.9	626187.7	95.32
6"45 BEND-TIE-IN TO LOWER TIER HORIZONTAL DRIP LEGS	66662	1355173.1	626014.6	95.13
8"VALVE	66667	1355128.4	626124.7	97.46
18"TEE	66668	1354995.9	626117.6	129.66
18"VALVE	66669	1354999.6	626121.2	129.63
18"BLIND FLANGE FUTURE PIPE TO LFGTE PROJECT	66670	1355005.5	626126.3	127.62
18"BLIND FLANGE FUTURE PIPE TO LFGTE PROJECT	66671	1354990.7	626123.5	130.53
18"TEE	66672	1354993.4	626120.4	130.51
18"TEE (TIE-IN)	66673	1355238.6	625800.7	106.70

SURVEYOR's NOTES:

1.) North and coordinate basis is the East Zone of the Florida State Plane Coordinate System. The published values used for this survey are NAD 83 2007 adjustment

2.) Vertical information depicted on this report are GPS derived elevations based on the National Geodetic Vertical Datum of 1929 (NGVD29).

3.) All PVC well casings are 8" diameter schedule 80.

4.) All Lateral and Header piping are HDPE SDR17

5.) All elevations shown are top of pipe unless otherwise noted.

LEGEND:

NO. NUMBER
ELEV. ELEVATION
×6516 ASBULT POINT NUMBER
LB LICENSE BUSINESS

REVISION | DATE | NO.

DEBORAH L. PEAVEY LICENSE NUMBER No. 6345 STATE OF FLORIDA PROFESSIONAL SURVEYOR & MAPPER

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND SEAL OF SURVEYOR

Drawn By: DLP | Party Chief: SP | Field Book: 51 | FILE NAME: 1009 asbuilt gcs 12-16-2015.dwg

Peavey & Associates
SURVEYING & MAPPING PA
9399 N LAKE BUFFUM RD
FORT MEADE, FL 33841
PHONE: 863-738-4960
FLORIDA BUSINESS NO.7779

CLIENT: Omni Waste of Osceola County, LLC
Waste Services, Inc.
1501 Omni Way
St. Cloud, Fl 34773

ASBUILT SURVEY - GCCS 2015
CELLS 1,2,3,4,5,6,7,8,9&10 - J.E.D.
SOLID WASTE MANGEMENT FACILITY
1501 OMNI WAY ST. CLOUD, FL

DEBORAH L. PEAVEY, P.S.M.
FLORIDA REGISTRATION NUMBER 6345
FLORIDA BUSINESS NUMBER 7779
12/16/2015
SURVEY DATE

SCALE	DRAWING NO.
1"=60'	304
PROJECT NO.	SHEET
1009	2

END OF TOP OF 4"CONDENSATE FORCEMAIN & 2"AIRLINE

CONC. CATCH BASIN TOP ELEV.=85.47 BOTTOM ELEV.=82.47

EXISTING CHAIN LINK FENCE

EXISTING MES

GRAPHIC SCALE

1 inch = 30 ft.

SCALE 1"=30'

GUY ANCHOR

POWER POLE

ELECTRIC TRANSFORMER DUKE ENERGY & METER

CONC. BLOCK BUILDING-MCC

CONC. PAD FOR H2S TREATMENT TANKS

CONC. PAD FOR FAN COOLER

KNOCK OUT PAD

CONC. PAD FOR BLOWER SKID

WOOD LIGHT POLE

TIE-DOWN STRAPS FOR 30"PIPE

EXISTING STORM DRAINAGE STRUCTURE

16"-90°BEND

CONTROL PANEL ON CONC. PADS

2'DIA. CONC. COLUMNS

BASE SYSTEM FOR LFG FLARE #1

BASE SYSTEM FOR LFG FLARE #2

12"METAL PIPE

CATWALK FOR PIPE

16"SDR17 HDPE

30"SDR17 HDPE

12"GAS RISER

2"AIR SUPPLY LINE

20'x8'METAL BUILDING ON CONC. PAD (AIR COMPRESSOR BLDG)

SUMP

CONNECTS TO CONDITIONING SKID OF PLANT

30"TEE

12"x30"TEE

24"SDR17 HDPE

24"PIPE

24"x14"TEE

30"x24"x12""REDUCER

2"PVC WATER LINE

5"WELL AND TANK

20'GATE

14"SDR17 HDPE

14"x6"TEE

ROAD 12" DEPT OF ROCK

ROAD 4" DEPT OF ROCK

2"PIPE

2"PVC WATER LINE

26.0'
C-FILTER
22.7'

105.1'

METAL BUILDING FINISH FLOOR ELEV.=87.00

46.4'

LADDER

CATCH BASIN TOP ELEV.=86.50
E 10"SDR35 INV. ELEV.=83.90
W 12"RCP INV. ELEV.=82.80

106.0'

19.7'

25.5'

960'

LIMEROCK DRIVE

SEPTIC TANK AREA

8"TEE & VALVE

8"x12"REDUCER

4"VALVE

FIRE WATER SUPPLY TANK

8"VALVE

6"METAL AIR RELEASE PIPE

8"PVC FD LINE DEPTH VARIES MINIUM OF 4'

2"SANITARY FORCEMAIN

ELECTRICAL BOX

CONC. ELECTRICAL POLE

3-GA

8"TEE WATER LINE

FIRE DEPARTMENT CONNECTION & VALVE

CATCH BASIN TOP ELEV.=83.75
W 12"RCP INV. ELEV.=81.40

8"PVC FD LINE DEPTH VARIES MINIUM OF 4'

CONC. MES 24" RCP INV. ELEV.=79.93

CENTER OF SHALLOW DRAINAGE SWALE

39.7'OF 24" RCP @0.25%

CONC. MES 24" RCP INV. ELEV.=79.10

107.8' OF 24"RCP @0.77%

STORM WATER MANHOLE TOP ELEV.=85.30 W INV. ELEV.=79.10 NE INV. ELEV.=79.20

CONC. CATCH BASIN TOP ELEV.=84.54 BOTTOM ELEV.=79.14 E INV. ELEV.=79.55

81.2' OF 24"RCP @0.27%

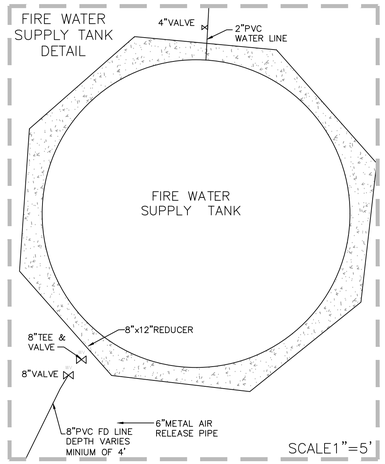
CONC. CATCH BASIN TOP ELEV.=83.86 BOTTOM ELEV.=78.46 W INV. ELEV.=79.33 E INV. ELEV.=79.15

EXISTING CATCH BASIN
NE 12"RCP INV. ELEV.=81.00
SE 12"RCP INV. ELEV.=81.00
EXISTING W INV. ELEV.=81.00

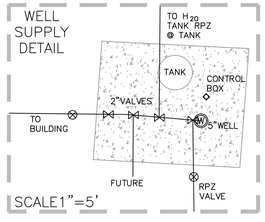
EXISTING POND

POWER POLE

FIRE WATER SUPPLY TANK DETAIL



WELL SUPPLY DETAIL



SEE AS-BUILT SURVEY OF OFFICE BUILDING & ACCESS DRIVE FOR ADDITIONAL INFORMATION

SEE SHEETS 2-4 FOR PIPE DETAILS

LEGEND

- CONCRETE
- ROCK 12"DEPTH
- ROCK 4"DEPTH
- EXISTING PAVEMENT
- ASBUILT PAVEMENT
- HO — OVERHEAD WIRE
- CHAIN LINK FENCE
- SAN — SANITARY 2"PVC FORCEMAIN
- FIRE — FIRE LINE
- 85.54 — ASBUILT ELEVATION
- POWER POLE
- E — ELECTRIC GROUND BOX
- E — ELECTRIC MANHOLE
- E — UNDERGROUND ELECTRIC LINE
- GUY ANCHOR
- BOLLARD
- W — UNDERGROUND WATER LINE
- UNDERGROUND LF GAS LINE
- UNDERGROUND CONDENSATE FORCEMAIN
- UNDERGROUND AIR SUPPLY LINE

SURVEYOR's NOTES:

1.) North and coordinate basis is the East Zone of the Florida State Plane Coordinate System.

2.) Vertical information depicted on this report are GPS derived elevations based on the National Geodetic Vertical Datum of 1929 (NGVD29).

NO.	DATE	REVISION
1	4/1/16	REVISED PER COMMENTS

DEBORAH L. PEAVEY LICENSE NUMBER No. 6345 STATE OF FLORIDA PROFESSIONAL SURVEYOR & MAPPER

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND SEAL OF SURVEYOR

Job #: 1009 osb tanks
FILE NAME: pod energy all-rev 4-1-2016

Drawn By: DLP
Party Chief: DP
Field Book: 51

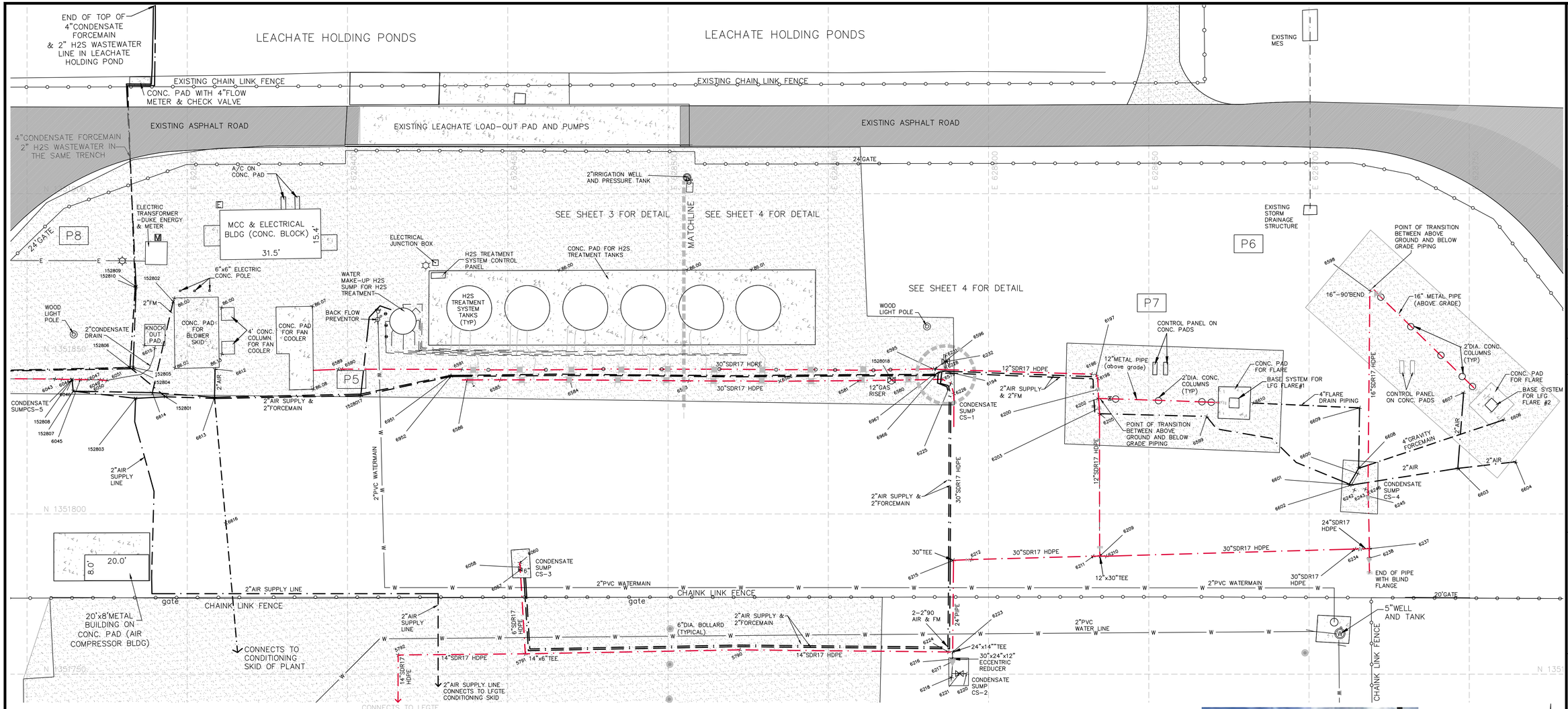
PEAVEY
& ASSOCIATES SURVEYING & MAPPING PA
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER LB 7779
9391 N. LAKE BUFFUM RD
FT MEADE, FL 33841
PHONE:863-738-4960

CLIENT:
Omni Waste of Osceola County, LLC
Waste Services, Inc.
1501 Omni Way
St. Cloud, Fl 34773

ASBUILT SURVEY
LANDFILL GAS ENERGY FACILITY
J.E.D. SOLID WASTE MANGEMENT FACILITY
1501 OMNI WAY ST. CLOUD, FL

DEBORAH L. PEAVEY, P.S.M.
FLORIDA REGISTRATION NUMBER 6345
FLORIDA BUSINESS NUMBER 7779
10/13/2015
SURVEY DATE

SCALE	DRAWING NO.
1"=30'	302
PROJECT NO.	SHEET
1009	1



SEE SHEET 3 & 4 FOR POINT DATA IF NOT PROVIDED ON THIS SHEET.

Number	Northing	Easting	Elevation	Description
5790	1351757.57	628522.36	83.87	14"HDPE pipe - highpoint
5791	1351756.33	628455.46	82.66	14"x6"HDEP tee
5792	1351755.97	628415.79	83.58	14"HDPE-90bend
6042	1351842.30	628282.00	82.51	36"HDPE pipe
6043	1351842.16	628308.68	81.96	36"HDPE pipe
6044	1351842.07	628310.82	81.96	36"tee sump
6045	1351841.96	628316.62	82.00	36"tee sump
6046	1351842.01	628314.04	86.68	36"tee sump top
6047	1351841.96	628318.86	81.88	36"HDPE pipe
6049	1351841.88	628322.68	82.07	36"HDPE bend
6050	1351841.83	628323.65	82.10	36"HDPE bend
6051	1351841.68	628324.79	82.67	36"HDPE bend
6053	1351844.55	628286.36	82.70	4"HDPE pipe
6054	1351844.72	628286.28	82.52	2"HDPE pipe
6057	1351782.55	628453.90	80.08	6" valve
6058	1351783.37	628453.88	79.39	6"HDPE pipe
6060	1351784.71	628453.73	79.42	6"HDPE sump connection
6194	1351845.28	628583.61	82.26	12"HDPE pipe
6196	1351843.66	628632.19	83.88	12"HDPE pipe
6197	1351843.47	628633.60	83.96	12"HDPE-22bend
6198	1351842.08	628634.14	84.04	12"HDPE pipe
6200	1351837.89	628634.20	84.20	12"HDPE butterfly valve
6202	1351834.08	628634.50	84.24	12"HDPE tee
6203	1351833.94	628634.50	84.26	12"HDPE butterfly valve
6205	1351831.33	628634.62	84.14	12"HDPE pipe
6209	1351786.88	628634.75	82.83	12"x30"HDPE tee
6210	1351786.83	628636.73	82.75	30"HDPE pipe
6211	1351786.79	628632.68	82.78	30"HDPE pipe
6212	1351785.76	628594.60	83.04	30"HDPE pipe
6215	1351785.55	628589.08	83.23	30"HDPE tee
6216	1351754.67	628588.73	82.69	30"x24"x12" HDPE reducer

Number	Northing	Easting	Elevation	Description
6217	1351753.93	628588.81	81.87	12"HDPE pipe
6218	1351749.02	628588.48	81.80	12"HDPE pipe
6220	1351750.06	628593.12	78.86	6"HDPE pipe
6221	1351750.16	628590.93	79.42	6"valve
6223	1351756.90	628588.82	82.62	24"x14"HDPE tee
6224	1351756.93	628587.48	82.34	14"HDPE pipe
6225	1351840.78	628588.25	83.51	30"HDPE -90bend
6226	1351837.43	628589.18	83.51	30"HDPE pipe
6228	1351845.72	628586.69	79.11	6"HDPE pipe
6231	1351849.56	628586.60	78.79	6"HDPE pipe
6232	1351847.56	628586.66	79.79	6" ball valve
6233	1351789.07	628714.39	82.47	30"HDPE pipe
6234	1351789.08	628715.65	82.45	30"x24"HDPE reducer
6235	1351789.01	628715.92	81.98	24"HDPE pipe
6236	1351789.15	628716.52	82.03	24"HDPE pipe
6237	1351789.17	628718.84	81.95	24"HDPE tee
6238	1351786.21	628718.78	82.02	24"x12"HDPE reducer
6239	1351785.92	628718.81	81.38	12"HDPE pipe
6240	1351781.82	628718.87	81.70	blind flange
6242	1351807.45	628714.13	78.10	6"HDPE pipe
6243	1351807.72	628717.61	78.30	6"HDPE pipe
6245	1351805.59	628718.49	81.94	16"x24"HDPE reducer
6246	1351806.64	628718.56	81.33	16"HDPE pipe
6579	1351842.05	628585.64	83.59	30"HDPE pipe
6580	1351841.85	628574.99	83.65	30"HDPE pipe
6581	1351841.66	628559.77	83.70	30"HDPE pipe
6582	1351841.46	628534.91	83.88	30"HDPE pipe
6583	1351841.58	628506.38	84.14	30"HDPE pipe
6584	1351841.89	628469.34	84.26	30"HDPE pipe
6585	1351841.89	628447.63	84.35	30"HDPE pipe
6586	1351841.85	628437.30	84.31	30"HDPE pipe
6589	1351845.18	628397.09	85.11	30"HDPE -22 bend
6590	1351845.23	628398.30	85.05	30"HDPE pipe

Number	Northing	Easting	Elevation	Description
6591	1351845.15	628435.63	84.36	30"HDPE pipe
6595	1351845.31	628582.67	83.67	30"HDPE pipe
6596	1351845.36	628583.43	82.16	30"x12" Eccentric reducer
6598	1351869.62	628719.15	82.68	16"HDPE-90bend
6599	1351830.46	628668.04	82.59	2"HDPE-90bend
6600	1351812.64	628715.29	81.68	2"HDPE-90bend
6601	1351809.20	628712.50	81.97	2"HDPE-90bend
6602	1351809.06	628713.25	81.46	2"HDPE-90bend
6603	1351814.25	628746.43	82.34	2"HDPE-90bend
6604	1351816.29	628764.43	82.30	2"HDPE-90bend
6606	1351829.41	628760.78	82.67	4"HDPE flare drain
6607	1351837.85	628748.25	81.92	2"HDPE-90bend
6608	1351814.27	628715.48	81.51	4"HDPE tee
6609	1351833.14	628715.78	81.96	4"HDPE-90bend
6610	1351834.64	628682.61	82.49	4"HDPE drain
6612	1351845.23	628358.66	84.09	2"HDPE-90bend
6613	1351836.44	628358.49	82.44	2"HDPE - 45bend
6614	1351837.91	628339.10	82.59	2"HDPE tee
6615	1351851.85	628339.81	83.25	2"HDPE - 90bend
6616	1351797.05	628362.05	83.30	2"HDPE pipe
6951	1351843.25	628432.10	84.31	2"HDPE pipe
6952	1351842.92	628432.21	84.35	2"HDPE pipe
6966	1351843.24	628583.46	83.71	2"HDPE pipe
6967	1351843.60	628582.94	83.56	2"HDPE pipe
152801	1351836.61	628343.20	83.12	2"HDPE tee
152802	1351866.32	628345.58	83.62	2"HDPE 90bend
152803	1351836.12	628333.88	83.42	2"tee & 2"HDPE 90bend
152804	1351845.36	628333.23	83.22	4"x2"HDPE reducer
152805	1351845.78	628333.09	83.37	4"HDPE tee
152806	1351845.76	628332.12	83.52	2"HDPE 90bend
152807	1351838.35	628314.38	81.77	2"HDPE 90bend
152808	1351841.96	628313.94	86.68	top HDPE sump CS-5
152809	1351870.99	628334.02	83.58	4"HDPE pipe
152810	1351870.67	628333.88	83.79	2"HDPE pipe
1528017	1351836.95	628404.12	85.28	2"HDPE 90bend
1528018	1351841.86	628569.73	87.68	12"HDPE riser treated gas

P6 *LF GAS FLARE #2*

P7 *LF GAS FLARE #1*

P8

36" TEE FROM LFG CONVEYANCE PIPELINE, CONDENSATE KNOCK-OUT POT PAD, BLOWERS & FAN COOLER LOOKING SOUTHWEST

P5 *FAN COOLER & EXIT PIPING TO H2S TREATMENT SYSTEM – LOOKING WEST*

SCALE: 1"=15'

SURVEYOR's NOTES:

1.) *North and coordinate basis is the East Zone of the Florida State Plane Coordinate System. The published values used for this survey are NAD 83 2007 adjustment.*

2.) *Vertical information depicted on this report are GPS derived elevations based on the National Geodetic Vertical Datum of 1929 (NGVD29).*

3.) *ELEVATIONS REPRESENT TOP OF PIPE.*

4.) *ALL PIPE AND FITTINGS ARE HDPE UNLESS OTHERWISE NOTED.*

5.) *SEE ELECTRICAL ASBUILTS BY DONNELLY ENGINEERING FOR ALL UNDERGROUND ELECTRICAL.*

6.) *SEE SHEET 1 FOR LEGEND.*

GRAPHIC SCALE

1 inch = 15 ft.

NO.	DATE	REVISION
1	4/5/16	REVISED TO SHOW ADDITIONAL PAVEMENT

DEBORAH L. PEAVEY LICENSE NUMBER No. 6345 STATE OF FLORIDA PROFESSIONAL SURVEYOR & MAPPER

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND SEAL OF SURVEYOR

Drawn By: DLP | Party Chief: DP | Field Book: 51 | FILE NAME: 1009 asb tanks overall.dwg

PEAVEY & ASSOCIATES SURVEYING & MAPPING PA
FLORIDA BUSINESS NUMBER 7779
9339 N. LAKE BUFFUM RD
FT MEADE, FL 33841
PHONE:863-738-4960

CLIENT: Omni Waste of Osceola County, LLC Waste Services, Inc. 1501 Omni Way St. Cloud, Fl 34773

ASBUILT LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS) LFGTE FACILITY
J.E.D. SOLID WASTE MANGEMENT FACILITY
1501 OMNI WAY ST. CLOUD, FL

DEBORAH L. PEAVEY, P.S.M.
FLORIDA REGISTRATION NUMBER 6345
FLORIDA BUSINESS NUMBER 7779

6/20-7/3/2014
SURVEY DATE

SCALE 1"=15' | DRAWING NO. 302
PROJECT NO. 1009 | SHEET 2

SCALE 1"=3'

H2S TREATMENT SYSTEM CONTROL PANEL

TANK-1 FIBERGLASS TANK

TANK-2 FIBERGLASS TANK

TANK-3 FIBERGLASS TANK

TANK-4 FIBERGLASS TANK

P1

P2

P3

WATER SPICKET

BACK FLOW PREVENTOR

1 1/2" WATERLINE

2"PVC WATERMAIN

TIE-DOWN STRAPS FOR 30"PIPE

above grade – point of transition between above and below grade)

Number	Northing	Easting	Elevation	Description
5390	1351849.50	628452.66	84.97	4"PVC tee
5395	1351849.42	628434.64	85.00	4"PVC tee
5400	1351852.38	628412.05	84.61	4"PVC pipe
5401	1351850.20	628414.60	84.71	4"PVC pipe
5402	1351850.41	628411.99	84.63	4"PVC-90bend
5405	1351852.80	628411.86	84.72	4"pipe-metal (vaccum break vessel)
5406	1351854.38	628411.93	84.73	4"pipe-metal (vaccum break vessel)
5407	1351855.42	628411.94	84.18	4"bladder-metal (vaccum break vessel)
5408	1351856.93	628411.92	82.85	4"pipe-metal (vaccum break vessel)
5413	1351858.46	628411.84	82.88	4"PVC pipe
5414	1351859.01	628411.84	83.15	4"actuater valve
5415	1351859.53	628411.84	82.81	4"PVC pipe
5419	1351860.16	628412.97	82.83	4"PVC pipe (connection flange)
5422	1351860.10	628411.85	82.84	4"PVC-90bend
5423	1351857.16	628414.09	83.70	2"PVC pipe (connection flange)
5426	1351856.77	628413.83	83.68	2"PVC-45bend
5427	1351856.44	628413.79	83.70	2"PVC pipe
5430	1351850.64	628413.72	84.32	2"PVC-90bend
5431	1351850.32	628422.09	84.62	2"PVC pipe
5436	1351849.79	628442.64	84.73	2"PVC pipe
5438	1351849.88	628462.64	84.79	2"PVC pipe
5442	1351849.94	628482.31	84.90	2"PVC pipe
5451	1351850.18	628484.55	84.92	2"PVC pipe
5455	1351850.27	628464.47	84.76	2"PVC pipe
5457	1351850.18	628444.46	84.69	2"PVC pipe
5462	1351850.55	628424.28	84.70	2"PVC pipe
5465	1351855.47	628417.45	83.84	2"PVC pipe
5466	1351855.90	628417.42	83.82	2"PVC pipe (connection flange)
5469	1351851.03	628417.35	84.45	2"PVC-90bend
5470	1351851.07	628420.77	84.71	2"PVC-90bend
5471	1351851.25	628422.22	84.75	2"PVC-90bend
5472	1351851.55	628422.75	84.70	2"PVC-90bend
5473	1351851.90	628423.12	84.73	2"PVC-90bend
5474	1351851.41	628432.19	84.70	2"PVC-90bend

Number	Northing	Easting	Elevation	Description
5475	1351860.38	628422.42	84.10	2"PVC-90bend
5476	1351864.35	628421.29	84.15	2"PVC-90bend
5477	1351865.53	628423.28	84.21	2"PVC-90bend
5478	1351865.44	628417.27	84.03	2"PVC-90bend
5479	1351862.96	628422.68	84.07	2"PVC-45bend
5481	1351856.81	628420.93	83.96	2"PVC-45bend
5491	1351850.89	628426.04	84.73	2"PVC pipe
5495	1351851.09	628427.97	84.83	2"PVC pipe
5498	1351851.25	628430.38	84.83	2"PVC pipe
5505	1351857.18	628420.40	83.96	2"PVC pipe (connection flange)
5506	1351860.37	628421.65	84.08	2"PVC pipe (connection flange)
5507	1351863.41	628420.30	84.07	2"PVC pipe (connection flange)
5508	1351864.84	628417.36	84.00	2"PVC pipe (connection flange)
5520	1351850.48	628446.40	84.67	2"PVC pipe
5522	1351850.84	628448.47	84.73	2"PVC pipe
5524	1351851.18	628450.64	84.71	2"PVC-90bend
5530	1351850.94	628468.29	84.81	2"PVC-90bend
5532	1351850.62	628466.45	84.72	2"PVC pipe
5543	1351850.95	628486.13	85.01	2"PVC-90bend
6189	1351841.86	628435.83	84.76	30"HDPE pipe (END)
6584	1351841.89	628469.34	84.26	30"HDPE pipe
6585	1351841.89	628447.63	84.35	30"HDPE pipe
6586	1351841.85	628437.30	84.31	30"HDPE pipe
6591	1351845.15	628435.63	84.36	30"HDPE pipe
6951	1351843.25	628432.10	84.31	2"HDPE pipe
6952	1351842.92	628432.21	84.35	2"HDPE pipe
6953	1351843.24	628465.31	83.99	2"HDPE pipe
6954	1351843.68	628465.27	83.96	2"HDPE pipe
6955	1351843.15	628493.50	83.86	2"HDPE pipe
6956	1351843.41	628493.41	84.00	2"HDPE pipe

Number	Northing	Easting	Elevation	Description
152811	1351861.43	628406.77	83.45	2"HDPE pipe
152812	1351865.00	628410.13	83.53	2"HDPE pipe
152813	1351863.83	628413.51	83.89	2"HDPE pipe
152814	1351861.94	628412.73	83.87	1 1/2" PVC waterline (connection flange)
152815	1351862.49	628411.81	83.86	1 1/2"PVC 90bend
152816	1351862.34	628411.58	83.39	1 1/2"PVC 90bend
525385	1351849.57	628488.43	85.06	4"PVC pipe
525388	1351849.44	628470.54	85.01	4"PVC pipe
525545	1351850.35	628504.00	85.14	4"PVC pipe

P1

H2S TREATMENT SYSTEM AND PIPING LOOKING NORTHEAST

GRAPHIC SCALE

0 3 4.5 6 9

1 inch = 3 ft.

SURVEYOR's NOTES:

1.) North and coordinate basis is the East Zone of the Florida State Plane Coordinate System. The published values used for this survey are NAD 83 2007 adjustment

2.) Vertical information depicted on this report are GPS derived elevations based on the National Geodetic Vertical Datum of 1929 (NGVD29).

3.) All PVC pipe is schedule 80. All 2" & 4" HDPE is SDR11. All other HDPE pipe is SDR17.

P2

H2S TREATMENT SYSTEM AND PIPING LOOKING EAST

LEGEND:

- TIE-DOWN STRAPS FOR 30"PIPE (TYPICAL) (UNDERGROUND)
- Above ground – point of transition between above and below ground)
- x86.06 AS-BUILT ELEVATION
- x6981 AS-BUILT POINT NUMBER SEE CORRESPONDING TABLE
- UNDERGROUND LF GAS LINE
- UNDERGROUND CONDENSATE FORCEMAIN
- UNDERGROUND AIR SUPPLY LINE
- AS-BUILT CONCRETE
- AS-BUILT STONE
- TOP OF RISER 87.82 AS-BUILT RISER PIPE ELEVATION ON TOP OF FLANGE
- AS-BUILT VALVE ABOVE GROUND

P3

H2S TREATMENT SYSTEM AND PIPING LOOKING NORTH (TANK1)

MATCHLINE SEE SHEET 4

NO.	DATE	REVISION
1	4/5/16	REVISED TO SHOW ADDITIONAL PAVEMENT

DEBORAH L. PEAVEY LICENSE NUMBER No. 6345 STATE OF FLORIDA PROFESSIONAL SURVEYOR & MAPPER

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND SEAL OF SURVEYOR

FILE NAME: 1009 asb tanks detail-revised-4-1-2016

Drawn By: DLP | Party Chief: DP | Field Book: 51

PEAVEY & ASSOCIATES SURVEYING & MAPPING PA
FLORIDA BUSINESS NUMBER 7779
9398 N LAKE BUFFUM RD
FT MEADE, FL 33841
PHONE:863-738-4960

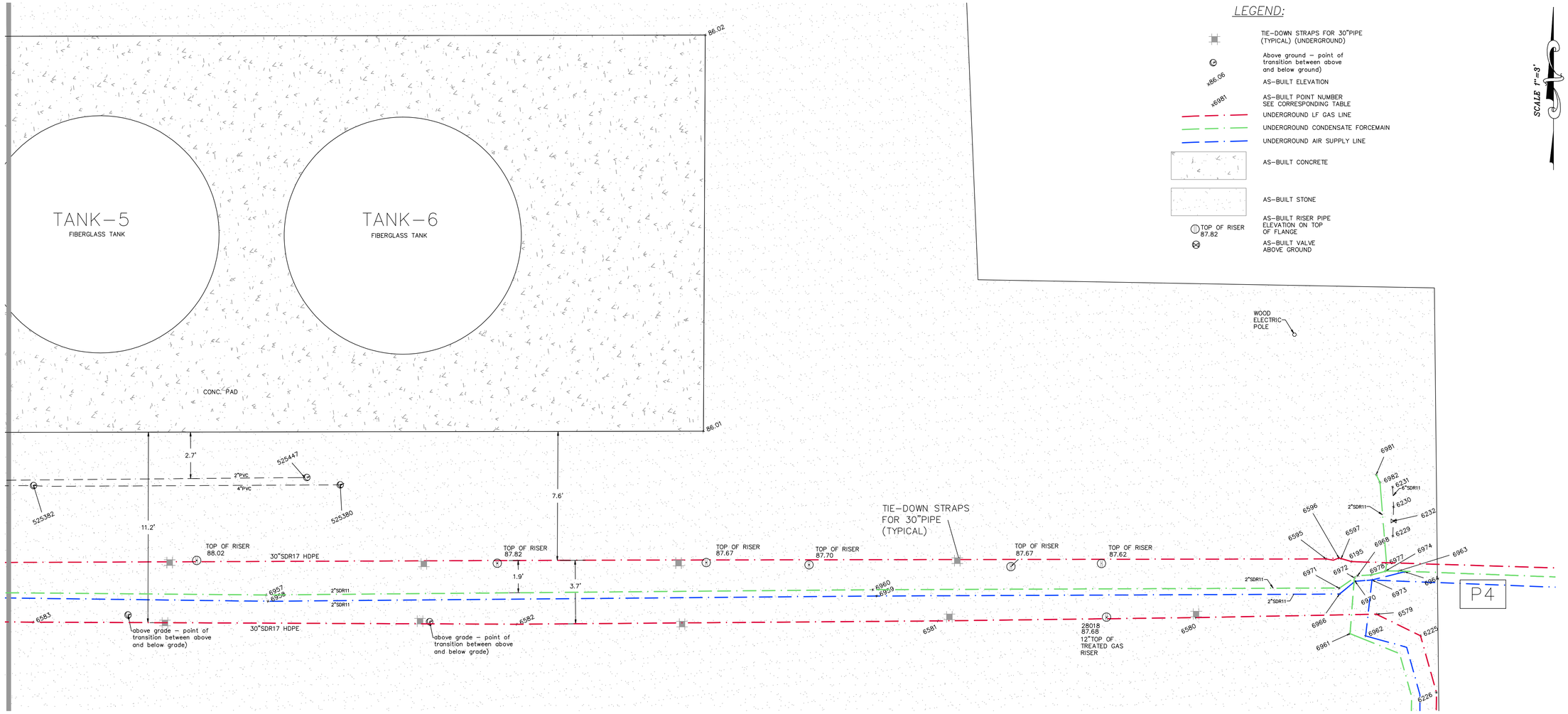
CLIENT: Omni Waste of Osceola County, LLC
Waste Services, Inc.
1501 Omni Way
St. Cloud, Fl 34773

ASBUILT LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS) LFGTE FACILITY
J.E.D. SOLID WASTE MANGEMENT FACILITY
1501 OMNI WAY ST. CLOUD, FL

DEBORAH L. PEAVEY, P.S.M.
FLORIDA REGISTRATION NUMBER 6345
FLORIDA BUSINESS NUMBER 7779

9/11/2015
SURVEY DATE

SCALE	DRAWING NO.
1"=3'	302
PROJECT NO.	SHEET
1009	3



MATCHLINE SEE SHEET 2

LEGEND:

- TIE–DOWN STRAPS FOR 30"PIPE (TYPICAL) (UNDERGROUND)
- Above ground – point of transition between above and below ground)
- x86.06 — AS–BUILT ELEVATION
- x6981 — AS–BUILT POINT NUMBER SEE CORRESPONDING TABLE
- UNDERGROUND LF GAS LINE
- UNDERGROUND CONDENSATE FORCEMAIN
- UNDERGROUND AIR SUPPLY LINE
- AS–BUILT CONCRETE
- AS–BUILT STONE
- TOP OF RISER 87.82 — AS–BUILT RISER PIPE ELEVATION ON TOP OF FLANGE
- AS–BUILT VALVE ABOVE GROUND

SCALE 1"=3'

Number	Northing	Easting	Elevation	Description
6195	1351845.16	628584.17	82.31	12"HDPE pipe
6225	1351840.78	628588.25	83.51	30"HDPE -90bend
6226	1351837.43	628589.18	83.51	30"HDPE pipe
6229	1351846.66	628586.61	79.09	6"HDPE pipe
6230	1351848.39	628586.65	79.01	6"HDPE pipe
6231	1351849.56	628586.60	78.79	6"HDPE pipe
6232	1351847.56	628586.66	79.79	6"HDPE ball valve
6579	1351842.05	628585.64	83.59	30"HDPE pipe
6580	1351841.85	628574.99	83.65	30"HDPE pipe
6581	1351841.66	628559.77	83.70	30"HDPE pipe
6582	1351841.46	628534.91	83.88	30"HDPE pipe
6583	1351841.58	628506.38	84.14	30"HDPE pipe
6595	1351845.31	628582.67	83.67	30"HDPE pipe
6596	1351845.36	628583.43	82.30	30"x12"eccentric HDPE reducer (top12")
6597	1351845.34	628583.57	82.26	12"HDPE pipe
6957	1351843.19	628520.13	83.75	2"HDPE pipe
6958	1351842.81	628520.23	83.74	2"HDPE pipe
6959	1351843.12	628556.15	83.47	2"HDPE pipe
6960	1351843.50	628555.92	83.40	2"HDPE pipe
6961	1351840.91	628584.08	84.08	2"HDPE pipe
6962	1351840.77	628585.01	84.14	2"HDPE pipe
6963	1351844.60	628586.95	83.47	2"HDPE pipe
6964	1351844.56	628587.30	83.23	2"HDPE pipe
6966	1351843.24	628583.46	83.71	2"HDPE pipe

Number	Northing	Easting	Elevation	Description
6968	1351844.33	628584.54	83.11	2"HDPE pipe
6970	1351844.00	628584.38	83.29	2"HDPE pipe
6971	1351843.58	628583.45	83.63	2"HDPE pipe
6972	1351844.20	628584.34	83.17	2"HDPE tee
6973	1351844.07	628585.38	83.46	2"HDPE tee
6974	1351844.60	628586.19	83.33	2"HDPE tee
6977	1351845.01	628586.24	83.28	2"HDPE pipe
6978	1351844.37	628585.34	83.45	2"HDPE pipe
6981	1351850.29	628585.63	83.77	2"HDPE-90bend
6982	1351849.83	628585.85	83.19	2"HDPE-90bend
28018	1351841.86	628569.73	87.68	12"HDPE Riser for treated gas (typical)
525380	1351849.69	628524.50	85.30	4"PVC pipe
525382	1351849.64	628506.40	85.10	4"PVC pipe
525447	1351850.12	628522.41	85.08	4"PVC pipe

P4

H2S TREATMENT SYSTEM AND PIPING LOOKING WEST

SURVEYOR's NOTES:

1.) North and coordinate basis is the East Zone of the Florida State Plane Coordinate System. The published values used for this survey are NAD 83 2007 adjustment

2.) Vertical information depicted on this report are GPS derived elevations based on the National Geodetic Vertical Datum of 1929 (NGVD29).

3.) All PVC pipe is schedule 80. All 2" & 4" HDPE is SDR11. All other HDPE pipe is SDR17.

GRAPHIC SCALE
0 3 4.5 6 9
1 inch = 3 ft.

NO.	DATE	REVISION
1	4/5/16	REVISED TO SHOW ADDITIONAL PAVEMENT

DEBORAH L. PEAVEY LICENSE NUMBER No. 6345 STATE OF FLORIDA PROFESSIONAL SURVEYOR & MAPPER

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND SEAL OF SURVEYOR

FILE NAME: 1009 asb tanks detail–revised–4–1–2016

Drawn By: DLP | Party Chief: DP | Field Book: 51

PEAVEY & ASSOCIATES SURVEYING & MAPPING PA
FLORIDA BUSINESS NUMBER 7779
9398 N LAKE BUFFUM RD
FT MEADE, FL 33841
PHONE:863–738–4960

CLIENT: Omni Waste of Osceola County, LLC
Waste Services, Inc.
1501 Omni Way
St. Cloud, Fl 34773

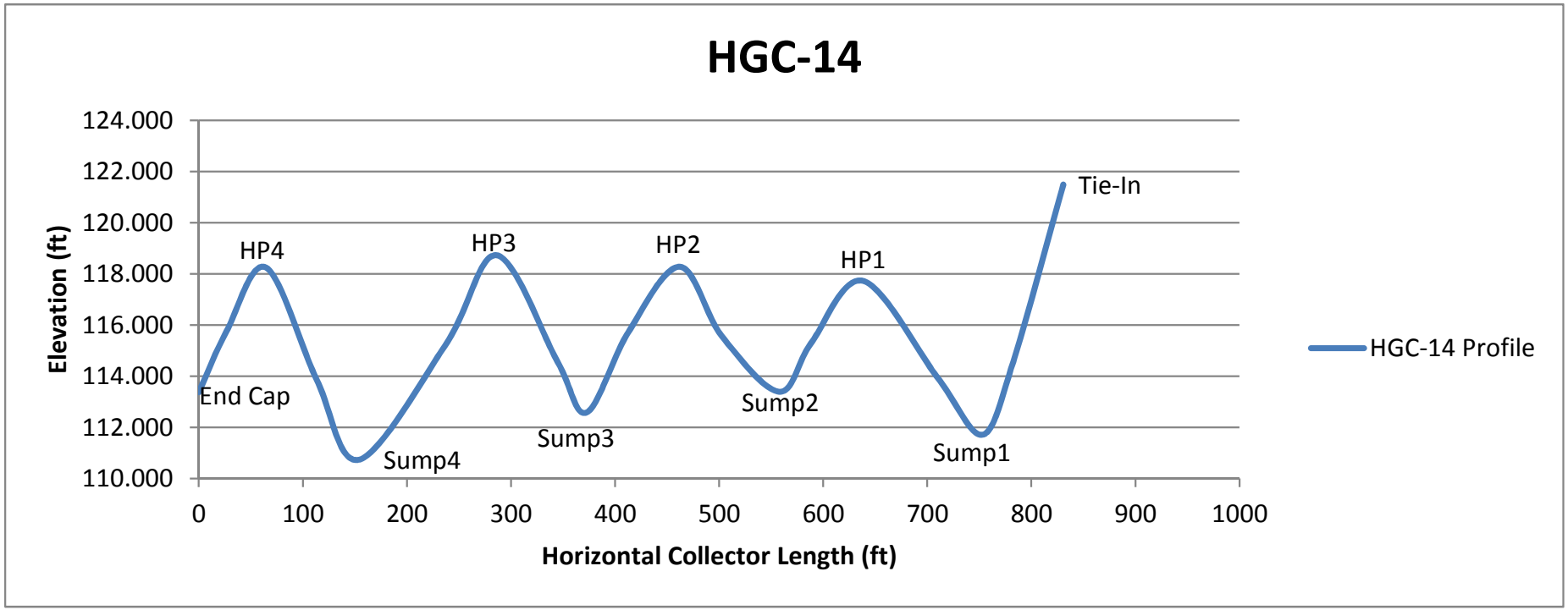
ASBUILT LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS) LFGTE FACILITY
J.E.D. SOLID WASTE MANGEMENT FACILITY
1501 OMNI WAY ST. CLOUD, FL

DEBORAH L. PEAVEY, P.S.M.
FLORIDA REGISTRATION NUMBER 6345
FLORIDA BUSINESS NUMBER 7779

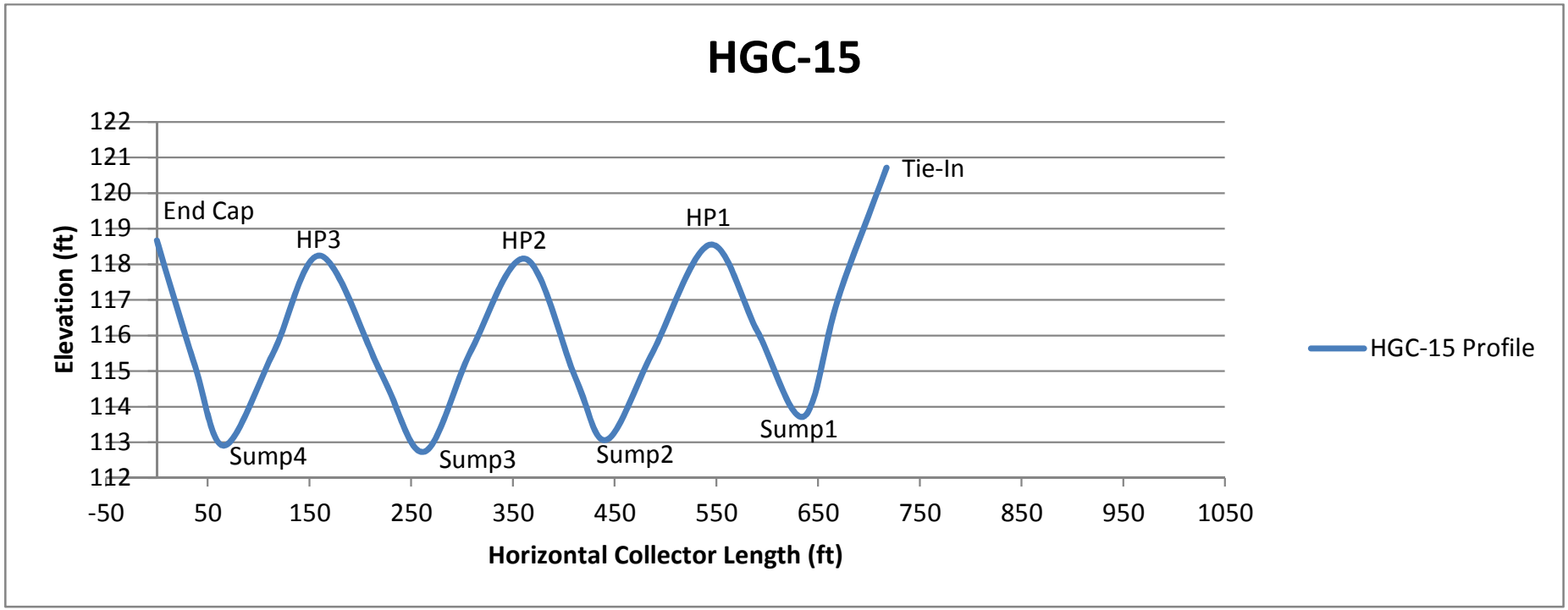
9/11/2015
SURVEY DATE

SCALE	DRAWING NO.
1"=3'	302
PROJECT NO.	SHEET
1009	4

HGC-14 As-Built Survey					
Survey Performed by JED Facility Operations					
Point Name	**Measured Northing**	**Measured Easting**	**Measured Elevation**	**Slope (%)**	**Calculated Slope (%)**
hgc-14start	1355121.57	625921.38	121.494		
				14	-14
hgc-14 50	1355080.02	625896.87	114.564		
				10	-10
hgc-14 lp1	1355054.67	625882.4	111.713		
				5	5
hgc-14 150	1355017.62	625860.58	113.909		
				5	5
hgc-14 hp1	1354955	625825.24	117.725		
				5	-5
hgc-14 250	1354910.43	625801.88	115.294		
				6	-6
hgc-14 lp 2	1354883.42	625787.02	113.391		
				4	4
hgc-14 350	1354835.23	625759.9	115.584		
				7	7
hgc-14 hp2	1354800.03	625740.22	118.282		
				5	-5
hgc-14 450	1354756.42	625716.88	115.713		
				8	-8
hgc-14 lp33	1354720.36	625699.47	112.58		
				7	7
hgc-14 550	1354695.3	625687.21	114.571		
				7	7
hgc-14 hp3	1354643.25	625661.8	118.728		
				7	-7
hgc-14 650	1354599.14	625642.42	115.325		
				5	-5
hgc-14 lp4	1354522.33	625608.42	110.743		
				8	8
hgc-14 750	1354485.24	625590.66	113.839		
				9	9
hgc-14 hp4	1354441.35	625569.01	118.25		
				7	-7
hgc-14 850	1354407.44	625552.32	115.771		
				9	-9
hgc-14 end	1354384.18	625538.79	113.372		


HGC-14
124.000
122.000
120.000
118.000
116.000
114.000
112.000
110.000
Elevation (ft)
0
100
200
300
400
500
600
700
800
900
1000
Horizontal Collector Length (ft)
End Cap
HP4
Sump4
HP3
Sump3
HP2
Sump2
HP1
Sump1
Tie-In
HGC-14 Profile

HGC-15 As-Built Survey					
Survey Performed by JED Facility Operations					
Point Name	**Measured Northing**	**Measured Easting**	**Measured Elevation**	**Slope (%)**	**Calculated Slope (%)**
hgc-15 start	1355017.27	626124.3	120.714		
				8	-8
hgc-15 50	1354974.98	626102.7	117.057		
				10	-10
hgc-15 lp1	1354944.83	626086.5	113.72		
				5	5
hgc-15 150	1354904.5	626065.56	116.121		
				5	5
hgc-15 hp1	1354863.63	626043.33	118.55		
				5	-5
hgc-15 250	1354812.79	626018.56	115.516		
				5	-5
hgc-15 lp22	1354772.19	625999.1	113.07		
				6	6
hgc-15 350	1354745.39	625985.46	114.768		
				7	7
hgc-15 hp2	1354700.86	625963.31	118.153		
				5	-5
hgc-15 450	1354653.63	625938.82	115.591		
				6	-6
hgc-15 lp3	1354612.74	625917.03	112.734		
				5	5
hgc-15 550	1354576.45	625896.97	114.884		
				6	6
hgc-15 hp3	1354522.37	625870.17	118.241		
				6	-6
hgc-15 650	1354480.36	625850.13	115.52		
				5	-5
hgc-15 lp4	1354437.68	625827.62	112.908		
				8	8
hgc-15 750	1354411.91	625812.77	115.226		
				9	9
hgc-15 end	1354380.68	625793.5	118.669		


HGC-15
Elevation (ft)
122
121
120
119
118
117
116
115
114
113
112
-50
50
150
250
350
450
550
650
750
850
950
1050
Horizontal Collector Length (ft)
End Cap
HP3
HP2
HP1
Tie-In
Sump4
Sump3
Sump2
Sump1
HGC-15 Profile

APPENDIX D
AS-BUILT WELL SCHEDULE

AS-BUILT WELL SCHEDULE - 2015 GCCS EXPANSION
J.E.D. Solid Waste Management Facility

Well ID[1]	Northing[2]	Easting[2]	Ground Elevation[3] (ft)	Total Drill Depth (ft)	Slotted Length (ft)	BGS[4] Solid Length (ft)	AGS[5] Solid Length (ft)	Total PVC Pipe Length (ft)
GW-T80	1,354,986.10	624,811.75	235.2	89.5	64.0	12.0	4.0	80.0
GW-T100	1,354,997.75	624,624.74	238.5	128.0	116.5	12.0	5.0	133.5
GW-T103	1,354,823.60	624,644.50	204.9	102.0	89.0	12.0	4.0	105.0
GW-T104	1,354,750.35	624,845.15	193.7	86.0	74.0	11.0	5.0	90.0
GW-T109	1,354,762.00	624,845.15	198.6	95.0	83.0	11.0	4.0	98.0
GW-T110	1,354,622.20	624,707.40	169.0	64.0	52.0	12.0	4.0	68.0
GW-T113	1,354,606.70	624,358.50	166.1	65.0	52.0	12.0	3.0	67.0
GW-65R1	1,355,993.52	624,904.08	226.7	72.0	60.0	11.0	4.0	75.0
GW-67R1	1,355,807.21	625,102.30	174.2	36.0	24.0	12.0	4.0	40.0
GW-68R1	1,355,801.21	624,900.99	226.0	109.0	100.0	9.5	4.0	113.5
GW-4R2	1,357,069.20	624,489.50	247.9	105.0	80.0	24.0	4.0	108.0
GW-15R3	1,356,889.50	624,598.30	250.6	92.0	64.0	24.0	4.0	92.0
GW-18R1	1,356,749.80	624,492.00	248.1	110.0	85.5	22.0	6.0	113.5
GW-21R1	1,356,557.10	624,487.70	247.2	100.5	80.0	18.5	5.0	103.5
GW-22R1	1,356,486.50	324,683.80	251.9	107.0	82.0	24.0	4.0	110.0
GW-27R1	1,356,367.80	624,489.50	246.7	116.0	95.0	20.0	5.0	120.0
GW-37	1,356,106.10	624,800.10	246.8	105.0	80.0	20.0	4.0	104.0
GW-45R1	1,356,966.40	624,657.90	247.2	107.0	81.0	23.5	5.5	110.0
GW-50R1	1,356,746.80	624,726.80	247.7	100.0	74.0	25.0	4.0	103.0
GW-51R1	1,356,696.70	624,671.50	251.4	105.0	80.0	24.0	4.0	108.0
GW-54R1	1,356,570.70	624,822.50	247.3	111.0	80.0	30.0	4.0	114.0
GW-72	1,356,159.80	624,558.40	257.2	103.0	80.0	20.0	8.0	108.0
GW-73	1,356,368.90	624,779.10	250.8	108.0	84.0	22.0	4.0	110.0
GW-75	1,355,096.00	624,542.40	239.5	91.0	65.0	20.0	4.0	89.0
GW-76	1,355,102.30	624,729.60	233.5	101.0	80.0	20.0	4.0	104.0
GW-77	1,355,141.90	624,924.60	232.0	127.0	106.0	16.0	6.0	128.0
GW-78	1,354,990.00	624,948.10	234.2	131.0	110.0	20.0	4.0	134.0
GW-79	1,355,520.09	624,615.24	245.5	135.0	114.0	20.0	4.0	138.0
GW-81	1,355,706.57	624,708.57	244.3	124.0	103.0	20.0	4.0	127.0
GW-83	1,355,331.60	625,156.90	181.5	70.0	55.0	15.0	8.0	78.0
Totals	---	---	---	**2,995**	**2,393**	**543**	**137**	3,072

Made by: DEG
Checked by: HH
Approved by: KSB

Notes:

[1] GW-TXX indicates a temporary gas extraction well.

[2] Northing and easting taken from 2015 topographic files provided by Omni Waste of Osceola County, LLC or field survey.

[3] Ground elevations were provided by JED operations prior to drilling of borehole.

[4] BGS - Below ground surface

[5] AGS - Above ground surface

Golder Associates

APPENDIX E
WELL BORING LOGS

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-68R1 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: L. Steel

Date/Time Began Drilling:	8/4/15 7:53
Date/Time Complete Drilling:	8/4/15 15:40
Northing:	1,355,801.21
Date/Time Began Well Install:	8/4/15 16:00
Date/Time Complete Well Install:	8/5/15 9:00
Easting:	624,900.99
Ground Elevation:	226.0

		Design	Actual
A	Total Depth:	123	109
B	Screen Length:	110.5	100
C	Solid Pipe Length:	12'+4'=16'	8.5'+4'=16'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	8.5
	(◉) #4 Stone?	☑	
E	(○) #89 Stone?		9
F	GeoDisc?	☑	8.5
G	1st Bentonite Seal?	☑	5.5
H	Soil Fill to X' BGS?	☑	3
I	2nd Bentonite Seal?	☑	1

Depth to Top Liner: >15'

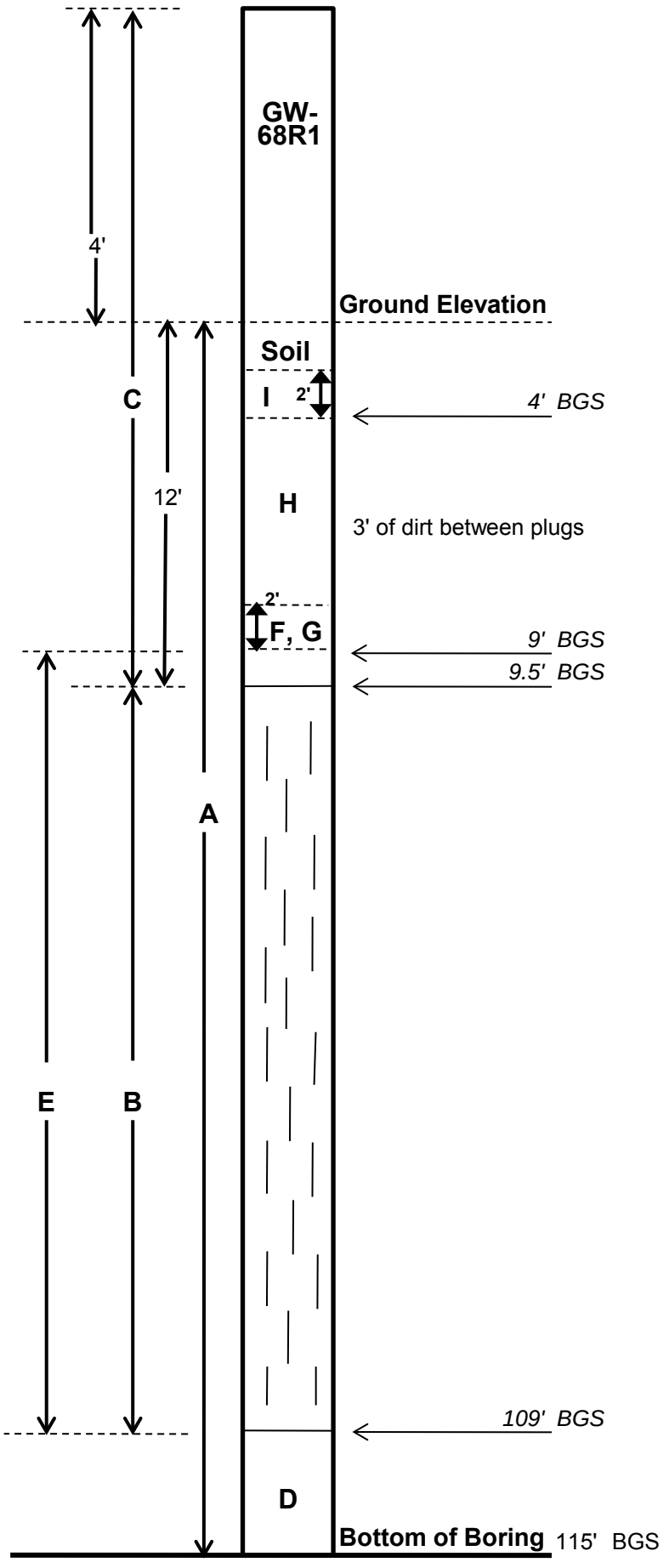
Depth to Waste: ~7'

Depth (bgs)	Description*	Temp (F)	Time
0-10	Cover soil Dry to moist	98	7:57
10-20	M= moist MSW D= moderate	110	8:22
20-30	M= moist MSW D= moderate	116	8:47
30-40	M= moist MSW D= moderate	122	9:15
40-50	M= moist MSW D= moderate	128	9:50
50-60	M= moist MSW D= moderate	124	10:33
60-70	M= moist MSW D= heavy	128	11:05
70-80	M= wet MSW D= heavy	141	11:51
80-90	M= wet MSW D= heavy	132	12:32
90-100	M= wet MSW D= heavy	127	13:30
100-110	M= wet MSW D= heavy	124	14:13

*Key: M=Moisture Content, D=Decomposition

Notes: Bottom of well very thick soupy mix of soil & waste. Tape measured depth of 115' bgs, but well set at 109' bgs after bottom of borehole filled in.

110-115: MSW&soil, heavy degradation and wet; T=122°F, time 15:40



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-T80 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: S. Casey

Date/Time Began Drilling: 7/20/15 7:42
Date/Time Complete Drilling: 7/20/15 13:44
Northing: 1,354,967.10

Date/Time Began Well Install: 7/20/15 13:53
Date/Time Complete Well Install: 7/20/15 15:10
Easting: 624,811.75
Ground Elevation: 235.2

		Design	Actual
A	Total Depth:	132	89.5
B	Screen Length:	119.5	64
C	Solid Pipe Length:	12'+4'=16'	12'+4'=14'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	76
	(◉) #4 Stone?	☑	
E	(○) #89 Stone?		11
F	GeoDisc?	☑	11
G	1st Bentonite Seal?	☑	9
H	Soil Fill to X' BGS?	☑	5
I	2nd Bentonite Seal?	☑	3

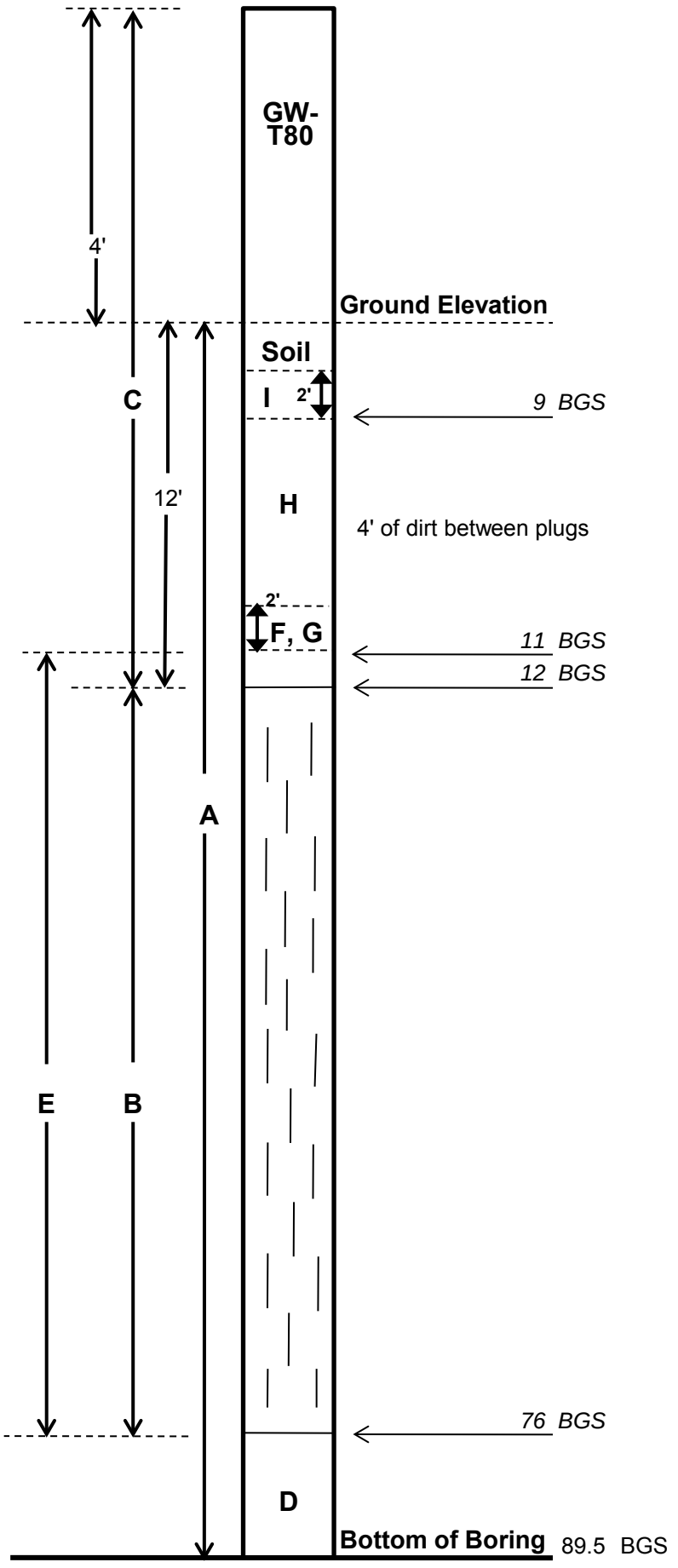
Depth to Top Liner: >15'

Depth to Waste: 2

Depth (bgs)	Description*	Temp (F)	Time
0-10	M= dry MSW/soil D= minimal	109	8:05
10-20	M= dry MSW/soil D= minimal	117	8:25
20-30	M= dry MSW/soil D= minimal	117	8:46
30-40	M= dry MSW/soil D= minimal	124	9:07
40-50	M= dry MSW/soil D= minimal	119	9:32
50-60	M= dry MSW/soil D= moderate	121	9:58
60-70	M= moist MSW/soil D= moderate	124	10:27
70-80	M= moist MSW/soil D= moderate	128	11:06
80-90	M= wet soil/MSW D= severe		
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Bottom of well very thick soup. Tape measure stopping at 76' bgs When tape measure attached to rig, bottom of hole showing 89.5'. Well set at 76' bgs because of mud encountered in bottom of borehole.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-T100 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: S.Casey

Date/Time Began Drilling:	7/10/15 7:25
Date/Time Complete Drilling:	7/10/15 7:25
Northing:	1,354,997.75
Date/Time Began Well Install:	7/10/15 7:25
Date/Time Complete Well Install:	7/10/15 7:25
Easting:	624,624.74
Ground Elevation:	238.5

		Design	Actual
A	Total Depth:	136	128
B	Screen Length:	119.5	116.5
C	Solid Pipe Length:	12'+4'=16'	5'+4'=9'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	Unknown, see notes
	◉ #4 Stone?	☑	
E	○ #89 Stone?		10'
F	GeoDisc?	☑	10'
G	1st Bentonite Seal?	☑	8'
H	Soil Fill to X' BGS?	☑	5'
I	2nd Bentonite Seal?	☑	3'

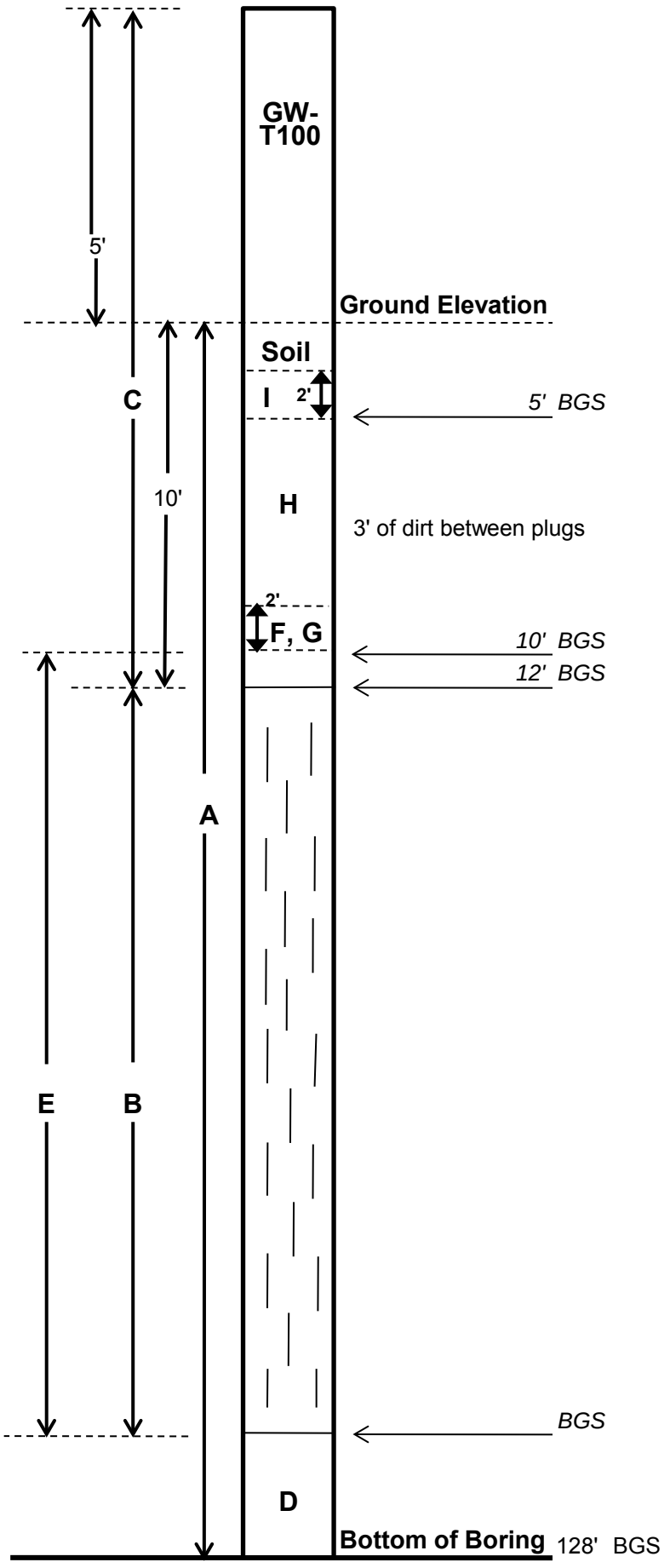
Depth to Top Liner: >15'

Depth to Waste: 2.5'

Depth (bgs)	Description*	Temp (F)	Time
0-10	M= dry MSW/soil D= minimal	100	7:46
10-20	M= dry MSW/soil D= minimal	108	8:10
20-30	M= dry MSW/soil D= minimal	112	8:34
30-40	M= dry MSW/soil D= minimal	115	9:00
40-50	M= moist MSW/soil D= moderate	112	9:56
50-60	M= moist MSW/soil D= moderate	114	10:18
60-70	M= moist MSW/soil D= severe	120	10:52
70-80	M= wet MSW/soil D= severe	115	12:10
80-90	M= wet MSW/soil D= severe	119	13:20
90-100	M= wet MSW/soil D= severe	118	14:27
100-110	M= wet MSW/soil D= severe	120	15:44

*Key: M=Moisture Content, D=Decomposition

Notes: Well would not set to drilled depth. Larger casing pipe installed to act as solid portion of the screen to a depth of 12' BGS. Casing to be sealed using a flexible coupling (Fernco or similar). See next page for boring data from 110' bgs to full depth.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-T100 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: S.Casey

Date/Time Began Drilling: 7/10/15 7:25
Date/Time Complete Drilling: 7/10/15 7:25
Northing: 1,354,997.75

Date/Time Began Well Install: 7/10/15 7:25
Date/Time Complete Well Install: 7/10/15 7:25
Easting: 624,624.74
Ground Elevation: 238.5

		Design	Actual
A	Total Depth:		
B	Screen Length:		
C	Solid Pipe Length:		
	# of Centralizers:		

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☐	
	◉ #4 Stone?	☐	
E	○ #89 Stone?		
F	GeoDisc?	☐	
G	1st Bentonite Seal?	☐	
H	Soil Fill to X' BGS?	☐	
I	2nd Bentonite Seal?	☐	

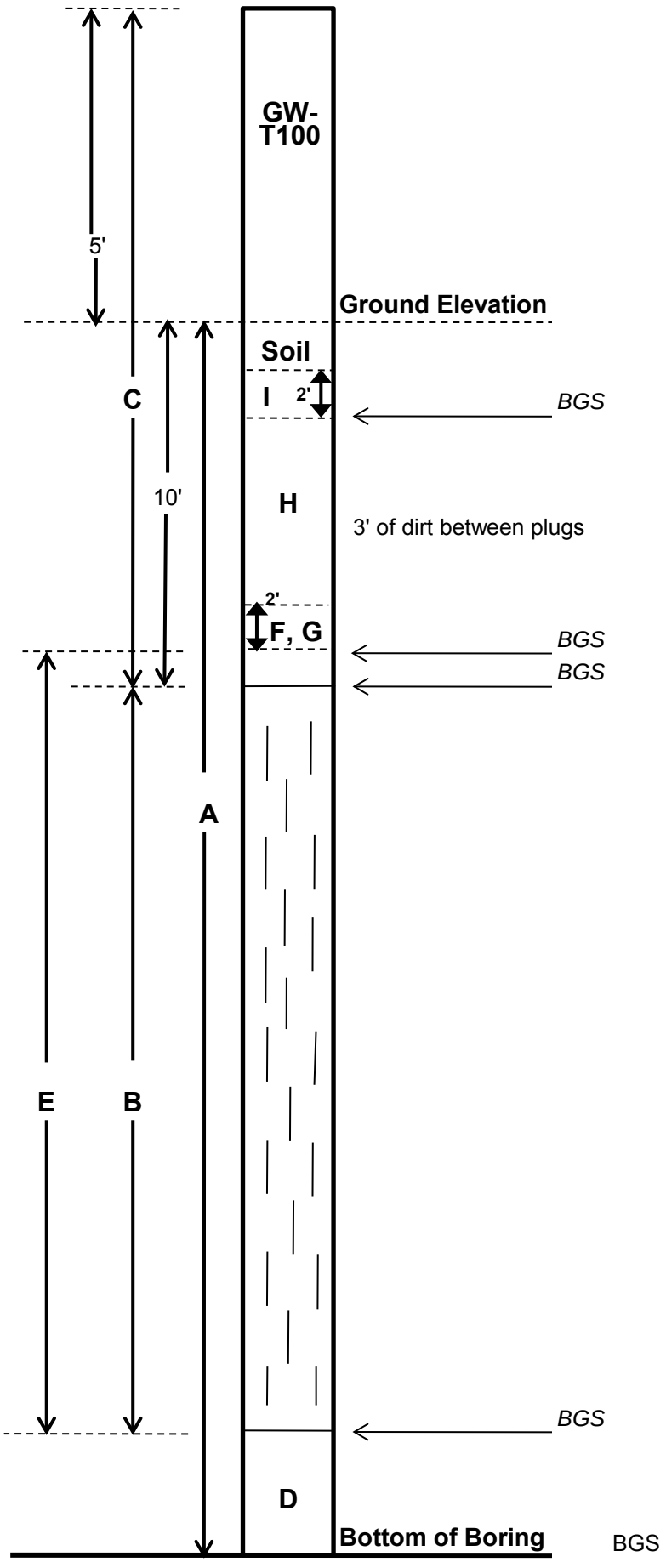
Depth to Top Liner:

Depth to Waste:

Depth (bgs)	Description*	Temp (F)	Time
110-120	M= wet MSW/soil D= severe	117	16:22
120-130	M= wet MSW/soil D= severe	119	8:54
	M= dry D= minimal		
	M= dry D= minimal		
	M= moist D= moderate		
	M= moist D= minimal		
	M= moist D= severe		
	M= wet D= severe		
	M= wet D= severe		
	M= wet D= severe		
	M= wet D= severe		

*Key: M=Moisture Content, D=Decomposition

Notes:



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-T103 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: S.Casey

Date/Time Began Drilling: 7/14/15 7:33
Date/Time Complete Drilling: 7/14/15 14:00
Northing: 1,354,823.60

Date/Time Began Well Install: 7/14/15 14:05
Date/Time Complete Well Install:
Easting: 624,644.50
Ground Elevation: 204.9

		Design	Actual
A	Total Depth:	101	101
B	Screen Length:	88.5	89
C	Solid Pipe Length:	12'+4'=16'	12'+4'=16'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	101
	(◉) #4 Stone?	☑	
E	(○) #89 Stone?		11
F	GeoDisc?	☑	11
G	1st Bentonite Seal?	☑	9
H	Soil Fill to X' BGS?	☑	4
I	2nd Bentonite Seal?	☑	2

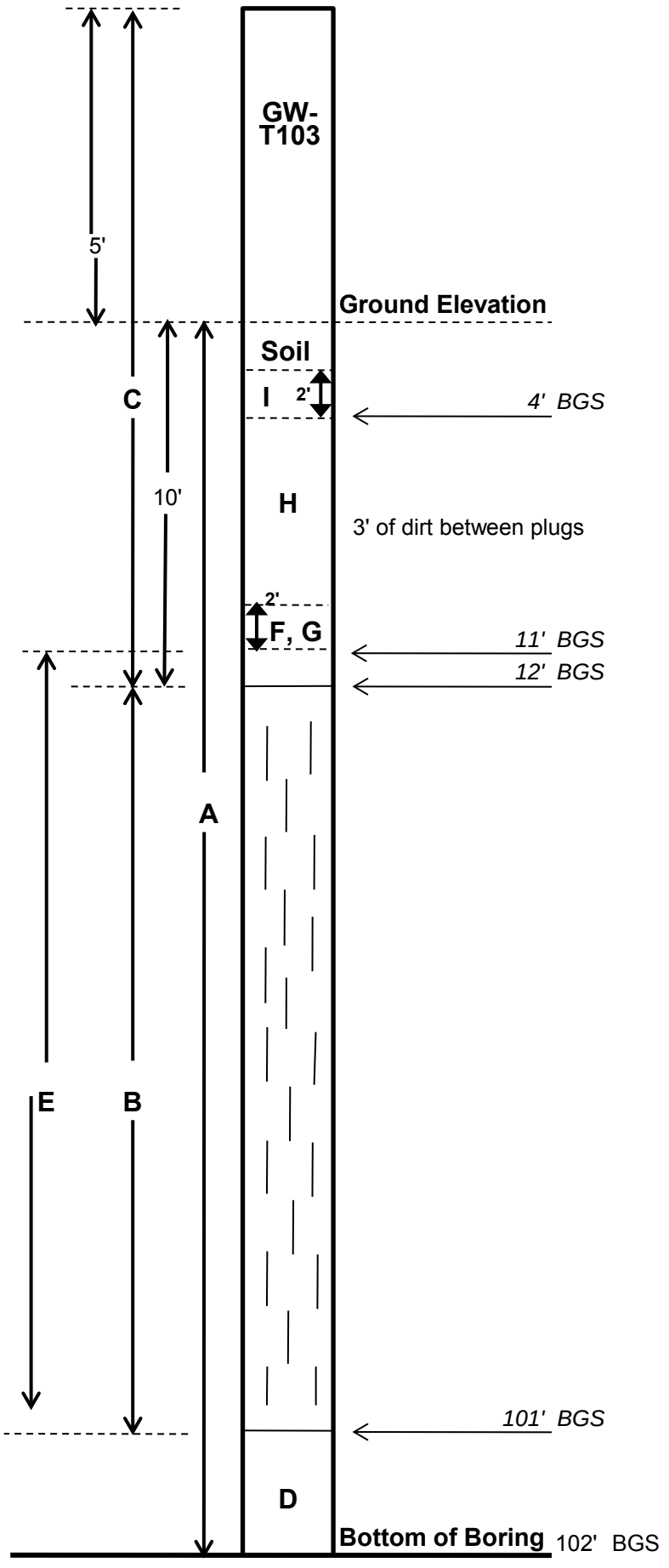
Depth to Top Liner: >15'

Depth to Waste: 2.5'

Depth (bgs)	Description*	Temp (F)	Time
0-10	M= dry MSW/soil D= minimal	97	7:45
10-20	M= dry MSW/soil D= minimal	108	7:57
20-30	M= moist MSW/soil D= minimal	113	8:16
30-40	M= moist MSW/soil D= moderate	118	8:34
40-50	M= moist to wet D= moderate MSW/soil	114	9:02
50-60	M= wet MSW/soil D= severe	113	10:00
60-70	M= wet MSW/soil D= severe	114	10:49
70-80	M= wet MSW/soil D= severe	118	11:51
80-90	M= wet MSW/soil D= severe	116	12:41
90-102	M= wet MSW/soil D= severe	111	14:00
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Note operators clock in rig varies from Golder's. 45' bgs conditions got wet; condition remained to bottom of boring. When measured tape shown 101' bgs, but when pipe installed, only 3 ft stick-up. Pulled pipe up 1 ft to adjust stick-up.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-T104 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: S.Casey

Date/Time Began Drilling: 7/15/15 7:40
Date/Time Complete Drilling: 7/15/15 12:09
Northing: 1,354,750.35

Date/Time Began Well Install: 7/15/15 12:13
Date/Time Complete Well Install: 7/15/15 14:15
Easting: 624,845.15
Ground Elevation: 193.7

		Design	Actual
A	Total Depth:	86	86
B	Screen Length:	73.4	74
C	Solid Pipe Length:	12'+4'=16'	12'+4'=16'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	85
E	◉ #4 Stone? ○ #89 Stone?	☑	10
F	GeoDisc?	☑	10
G	1st Bentonite Seal?	☑	8
H	Soil Fill to X' BGS?	☑	5
I	2nd Bentonite Seal?	☑	3

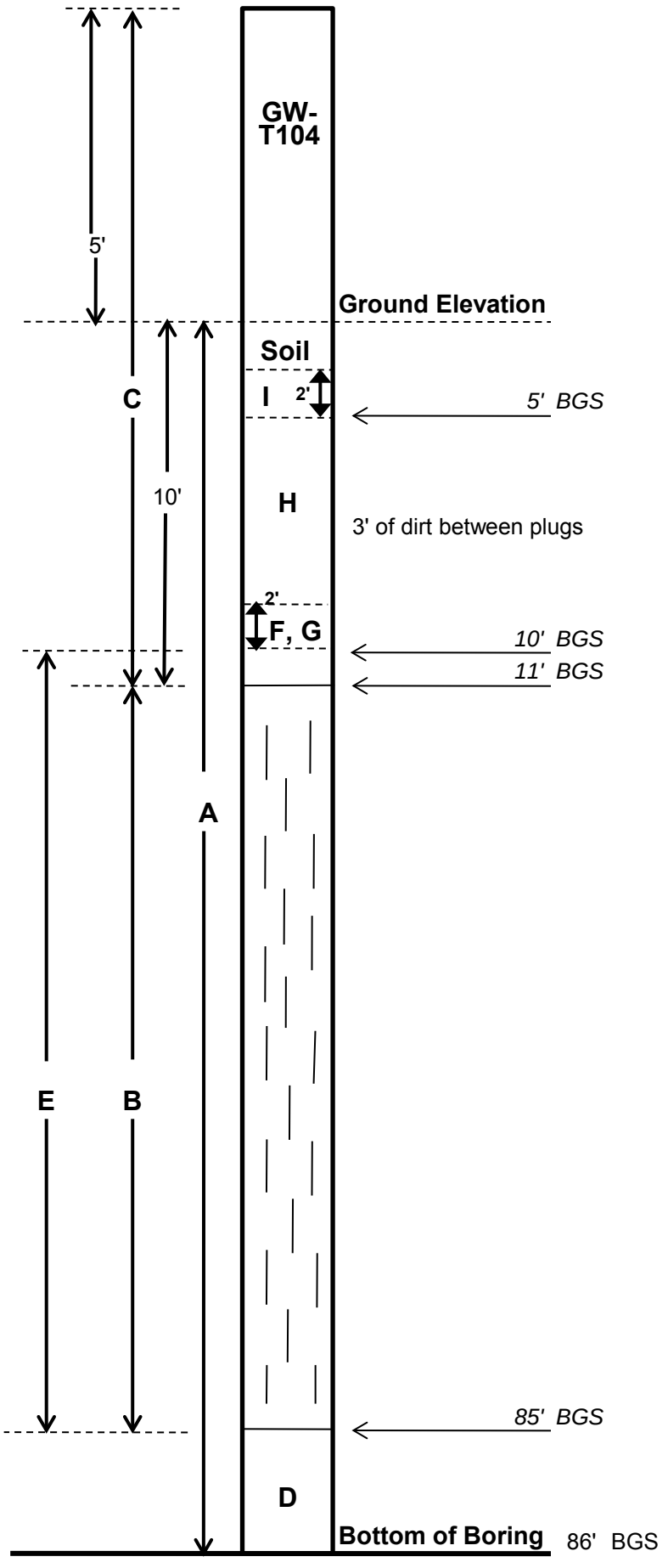
Depth to Top Liner: >15'

Depth to Waste: 2.5'

Depth (bgs)	Description*	Temp (F)	Time
0-10	M= dry MSW/soil D= minimal	107	7:58
10-20	M= dry MSW/soil D= minimal	111	8:17
20-30	M= moist MSW/soil D= moderate	118	8:35
30-40	M= moist MSW/soil D= moderate	120	9:02
40-50	M= moist to wet D= moderate MSW/soil	118	9:26
50-60	M= wet MSW/soil D= severe	119	9:57
60-70	M= wet MSW/soil D= severe	112	10:26
70-80	M= wet MSW/soil D= severe	110	11:29
80-90	M= wet MSW/soil D= severe	109	12:09
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: 47' bgs boring getting wet. 70-86' bgs conditions were very wet.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-T109 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: S.Casey

Date/Time Began Drilling: 7/13/15 8:05
Date/Time Complete Drilling: 7/13/15 12:25
Northing: 1,354,762.00

Date/Time Began Well Install: 7/13/15 12:28
Date/Time Complete Well Install: 7/13/15 14:30
Easting: 624,845.15
Ground Elevation: 198.6

		Design	Actual
A	Total Depth:	95	95
B	Screen Length:	82.5	83
C	Solid Pipe Length:	12'+4'=16'	11'+5'=16'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	96
	◉ #4 Stone?	☑	
E	○ #89 Stone?		10
F	GeoDisc?	☑	10
G	1st Bentonite Seal?	☑	8
H	Soil Fill to X' BGS?	☑	4
I	2nd Bentonite Seal?	☑	2

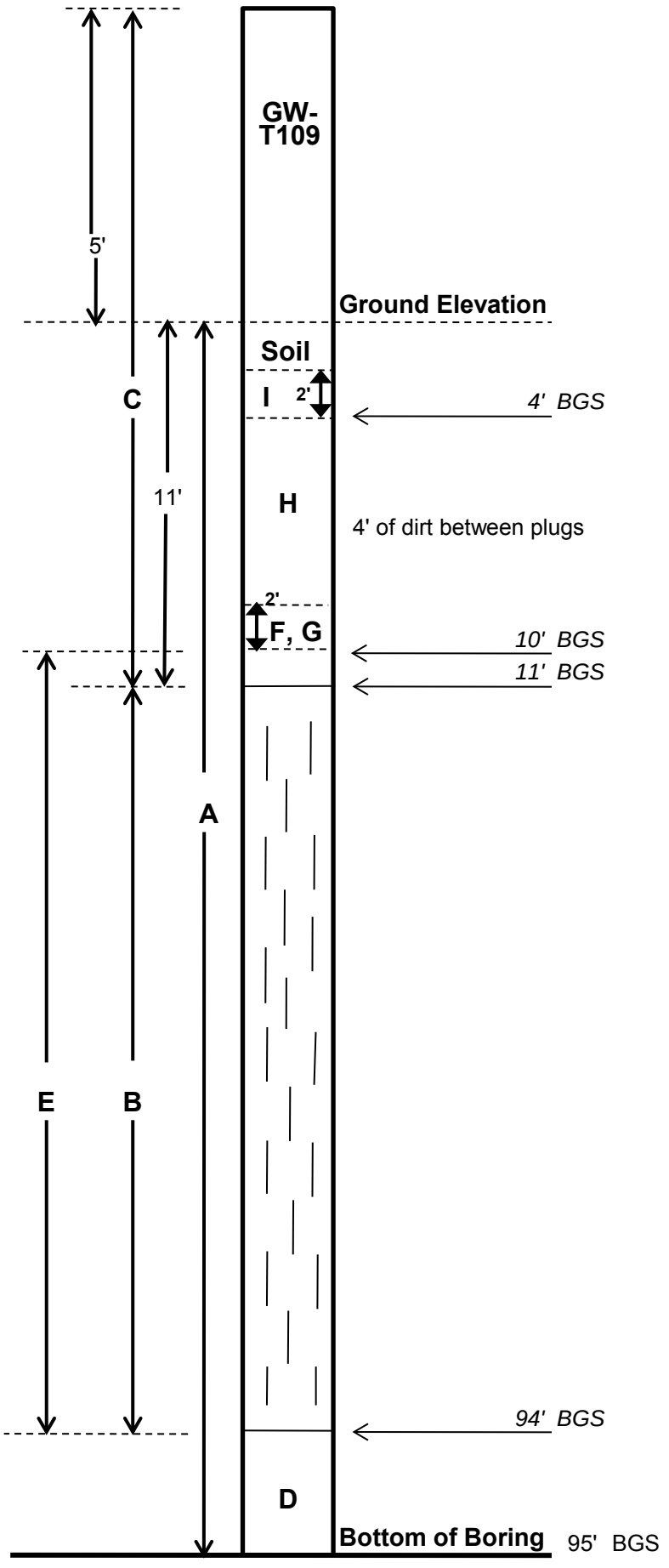
Depth to Top Liner: >15'

Depth to Waste: 2.5'

Depth (bgs)	Description*	Temp (F)	Time
0-10	M= dry MSW/soil D= minimal	111	8:18
10-20	M= dry MSW/soil D= minimal	110	8:32
20-30	M= dry MSW/soil D= minimal	120	8:48
30-40	M= moist MSW/soil D= moderate	115	9:12
40-50	M= moist MSW/soil D= moderate	123	9:37
50-60	M= moist MSW/soil D= moderate	123	10:06
60-70	M= moist MSW/soil D= severe	125	10:38
70-80	M= moist MSW/soil D= severe	124	11:18
80-90	M= moist MSW/soil D= severe	122	11:59
90-100	M= moist MSW/soil D= severe	124	12:25
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: 12 bags of bentonite per seal.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-T110 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: S.Casey

Date/Time Began Drilling: 7/9/15 7:52
Date/Time Complete Drilling: 7/9/15 9:45
Northing: 1,354,622.20

Date/Time Began Well Install: 7/9/15 9:50
Date/Time Complete Well Install: 7/9/15 13:25
Easting: 624,707.40
Ground Elevation: 169.0

		Design	Actual
A	Total Depth:	64	64
B	Screen Length:	51.5	52
C	Solid Pipe Length:	12'+4'=16'	11'+5'=16'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	64
E	◉ #4 Stone? ○ #89 Stone?	☑	10
F	GeoDisc?	☑	10
G	1st Bentonite Seal?	☑	8
H	Soil Fill to X' BGS?	☑	5
I	2nd Bentonite Seal?	☑	3

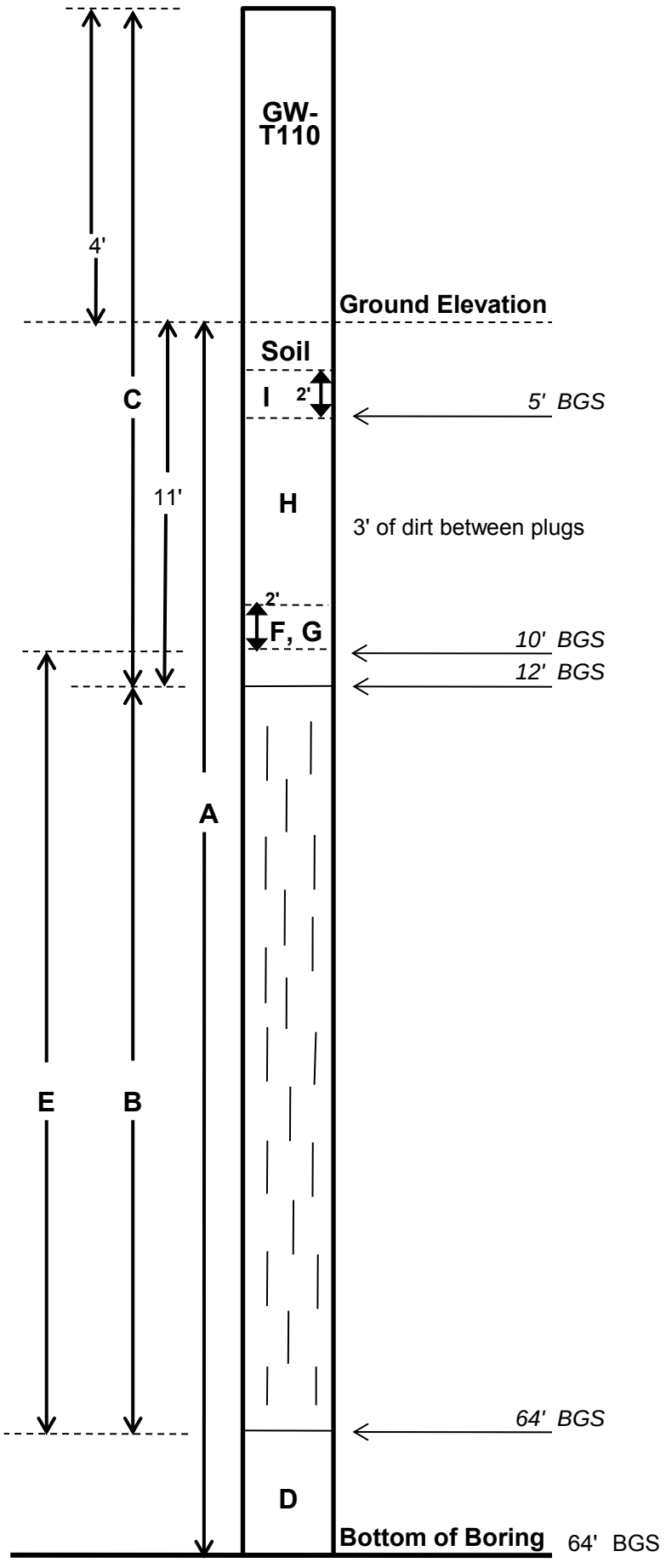
Depth to Top Liner: >15'

Depth to Waste: 2.5'

Depth (bgs)	Description*	Temp (F)	Time
0-10	M= dry MSW/soil D= minimal	102	8:11
10-20	M= moist MSW/soil D= minimal	112	8:20
20-30	M= dry/moist D= minimal MSW/soil	115	9:04
30-40	M= moist MSW/soil D= moderate	112	9:22
40-50	M= moist MSW/soil D= moderate	120	9:59
50-60	M= wet MSW/soil D= severe	118	10:25
60-70	M= wet MSW/soil D= severe	117	10:45
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: 20-30' bgs one bucket dry, one moist. 12 bags of bentonite per seal.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-T113 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: S.Casey

Date/Time Began Drilling: 7/8/15 11:36
Date/Time Complete Drilling: 7/8/15 13:50
Northing: 1,354,606.70

Date/Time Began Well Install: 7/8/15 15:00
Date/Time Complete Well Install: 7/8/15 16:45
Easting: 624,358.50
Ground Elevation: 166.1

		Design	Actual
A	Total Depth:	64	65
B	Screen Length:	51.5	52
C	Solid Pipe Length:	12'+4'=16'	13'+3'=16'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	65
	(◉) #4 Stone?	☑	
E	(○) #89 Stone?		12
F	GeoDisc?	☑	12
G	1st Bentonite Seal?	☑	10
H	Soil Fill to X' BGS?	☑	7
I	2nd Bentonite Seal?	☑	5

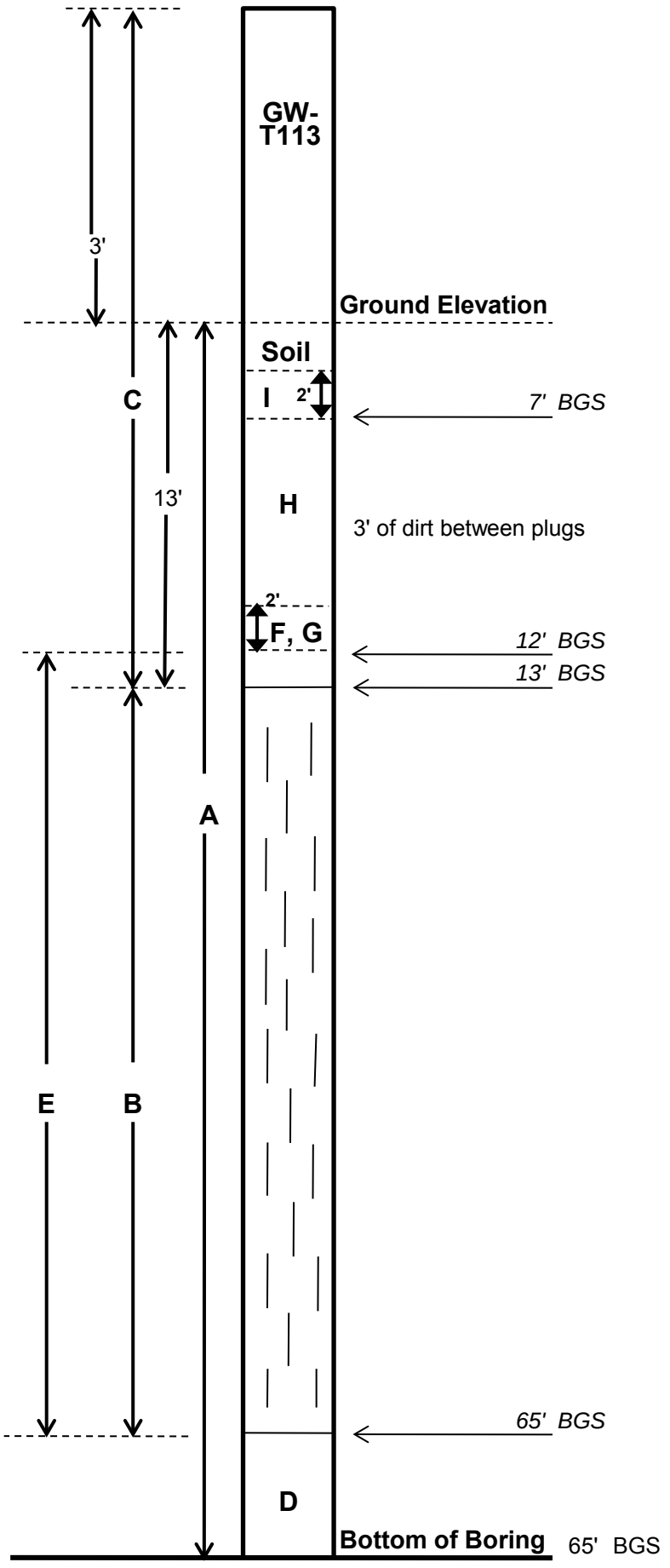
Depth to Top Liner: >15'

Depth to Waste: 2.5'

Depth (bgs)	Description*	Temp (F)	Time
0-10	M= dry MSW/soil D= minimal	106	11:45
10-20	M= dry MSW/soil D= minimal	109	12:04
20-30	M= dry MSW/soil D= minimal	115	12:20
30-40	M= dry MSW/soil D= minimal	128	12:44
40-50	M= dry MSW/soil D= minimal	118	13:08
50-60	M= dry MSW/soil D= minimal	127	13:35
60-70	M= dry MSW/soil D= minimal	123	13:50
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: 24 (50lb) bags total for bentonite seals.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-65R1 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: L. Steel

Date/Time Began Drilling: 8/6/15 8:20
Date/Time Complete Drilling: 8/6/15 12:25
Northing: 1,355,493.52

Date/Time Began Well Install: 8/6/15 14:10
Date/Time Complete Well Install: 8/6/15 16:00
Easting: 624,904.08
Ground Elevation: 226.7

		Design	Actual
A	Total Depth:	118	72
B	Screen Length:	105.5	60
C	Solid Pipe Length:	12'+4'=16'	12'+4'=16'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	72
	(◉) #4 Stone?	☑	
E	(○) #89 Stone?		11
F	GeoDisc?	☑	11
G	1st Bentonite Seal?	☑	9
H	Soil Fill to X' BGS?	☑	4
I	2nd Bentonite Seal?	☑	2

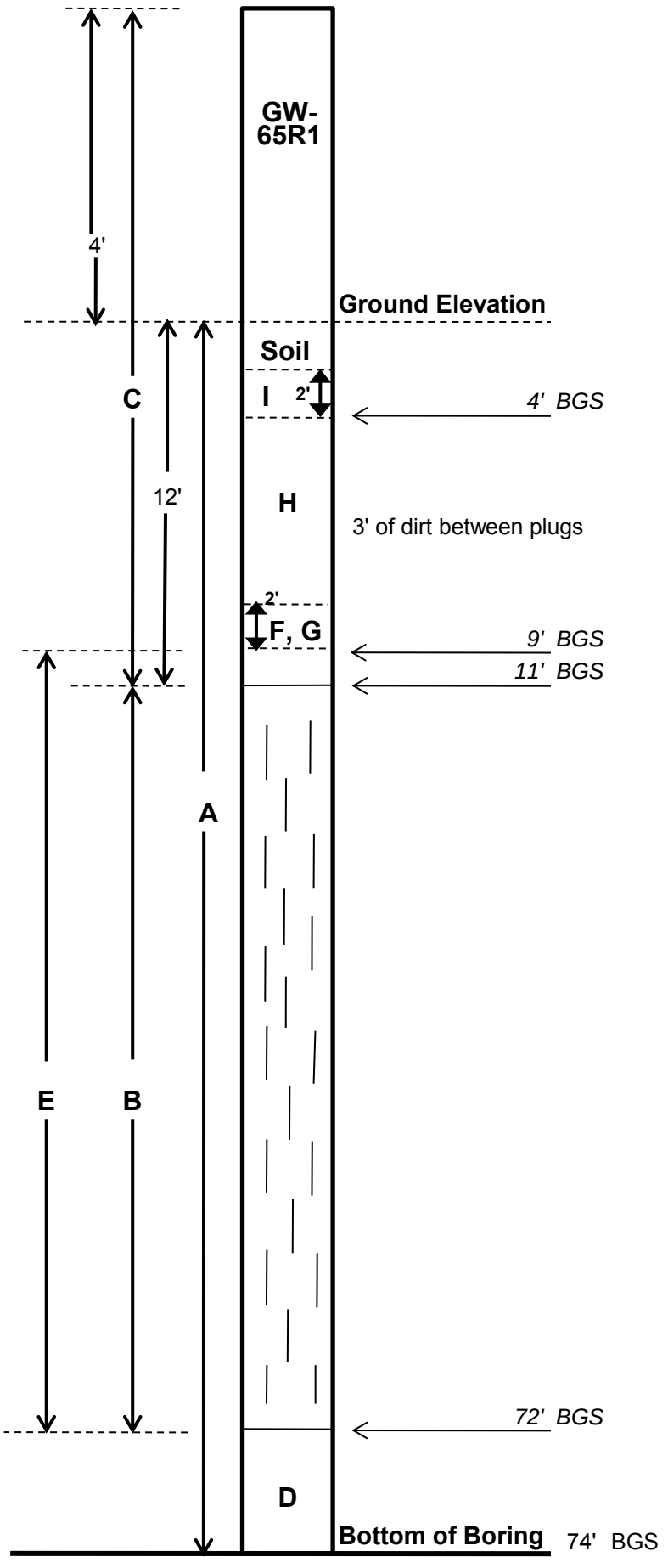
Depth to Top Liner: >15'

Depth to Waste: ~7'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW at 7' bgs D= moderate	110	8:35
10-20	MSA D= moderate	119	8:56
20-30	MSA D= moderate	126	9:23
30-40	Dirt/ash	127	10:18
40-50	Dirt/ash	125	10:45
50-60	MSW/dirt D= heavy	123	11:20
60-70	MSW D= heavy	131	12:14
70-80	MSW, wet waste	---	12:14
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: very wet waste found at 74' bgs, set well at 72' bgs.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-67R1 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: L. Steel

Date/Time Began Drilling: 8/5/15 12:42
Date/Time Complete Drilling: 8/5/15 15:17
Northing: 1,355,807.21

Date/Time Began Well Install: 8/5/15 15:20
Date/Time Complete Well Install: 8/5/15 17:35
Easting: 625,102.30
Ground Elevation: 174.2

		Design	Actual
A	Total Depth:	73	36
B	Screen Length:	60.5	24
C	Solid Pipe Length:	12'+4'=16'	12'+4'=16'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	36
	(◉) #4 Stone?	☑	
E	(○) #89 Stone?		11.5
F	GeoDisc?	☑	11.5
G	1st Bentonite Seal?	☑	9.5
H	Soil Fill to X' BGS?	☑	4
I	2nd Bentonite Seal?	☑	2

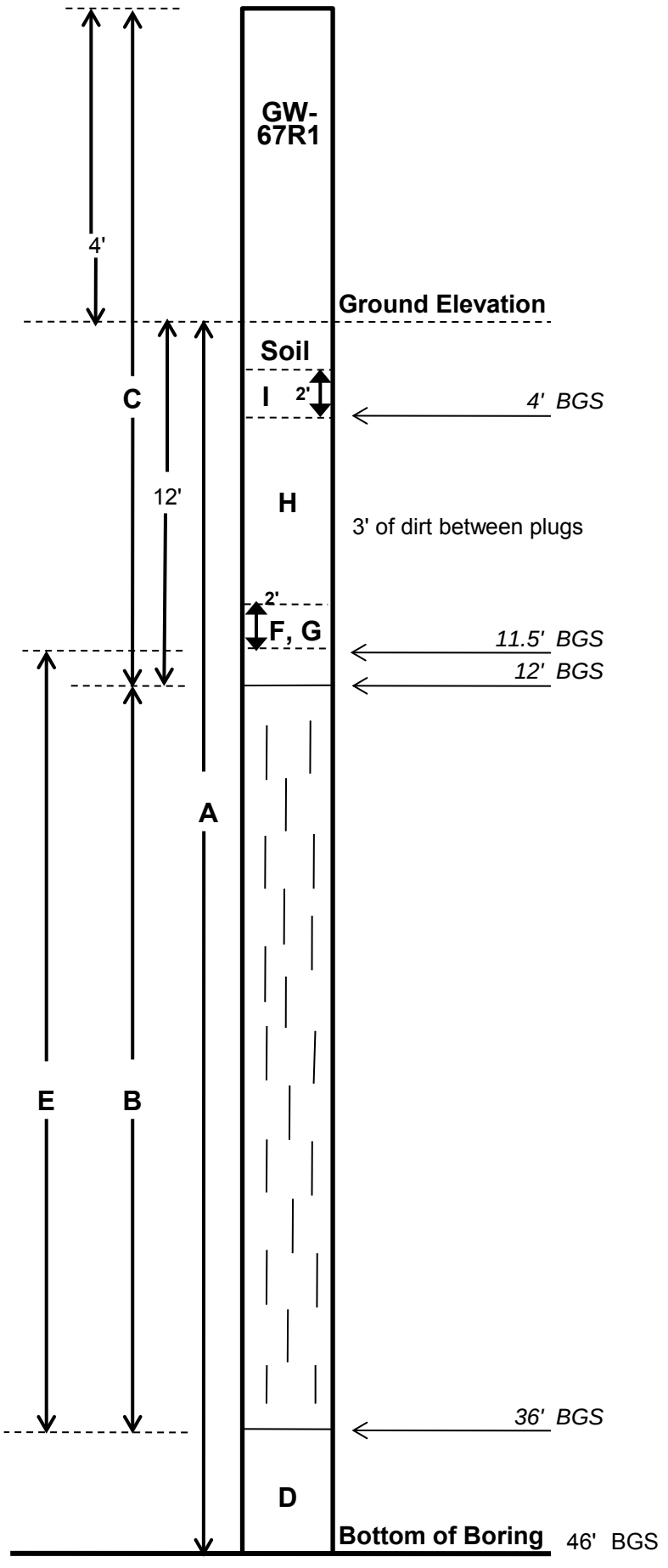
Depth to Top Liner: >15'

Depth to Waste: ~6.5'

Depth (bgs)	Description*	Temp (F)	Time
0-10	M= moist MSW D= moderate	103	12:42
10-20	M= moist MSW D= moderate	122	13:16
20-30	M= moist dirt/ash D= moderate	123	13:40
30-40	M= wet dirt/ash D= heavy	122	14:58
40-50			
50-60			
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: ash was found in majority of well. ~20-40' bgs wet material. Set well at 36' bgs after borehole started to caving and liquids filling borehole as per M. Kaiser.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-4R2 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/11/15 12:35
Date/Time Complete Drilling: 12/11/15 16:11
Northing: 1,357,069.20

Date/Time Began Well Install: 12/11/15 16:11
Date/Time Complete Well Install: 12/12/15 7:30
Easting: 624,489.50
Ground Elevation: 247.9

		Design	Actual
A	Total Depth:	141'	105'
B	Screen Length:	120.5'	80'
C	Solid Pipe Length:	20'+4'=24'	24'+4'=28'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	104'
E	◉ #57 Stone? ○ #89 Stone?	☑	23'
F	GeoDisc?	☑	23'
G	1st Bentonite Seal?	☑	21'
H	Soil Fill to 3' BGS?	☑	8'
I	2nd Bentonite Seal?	☑	6'

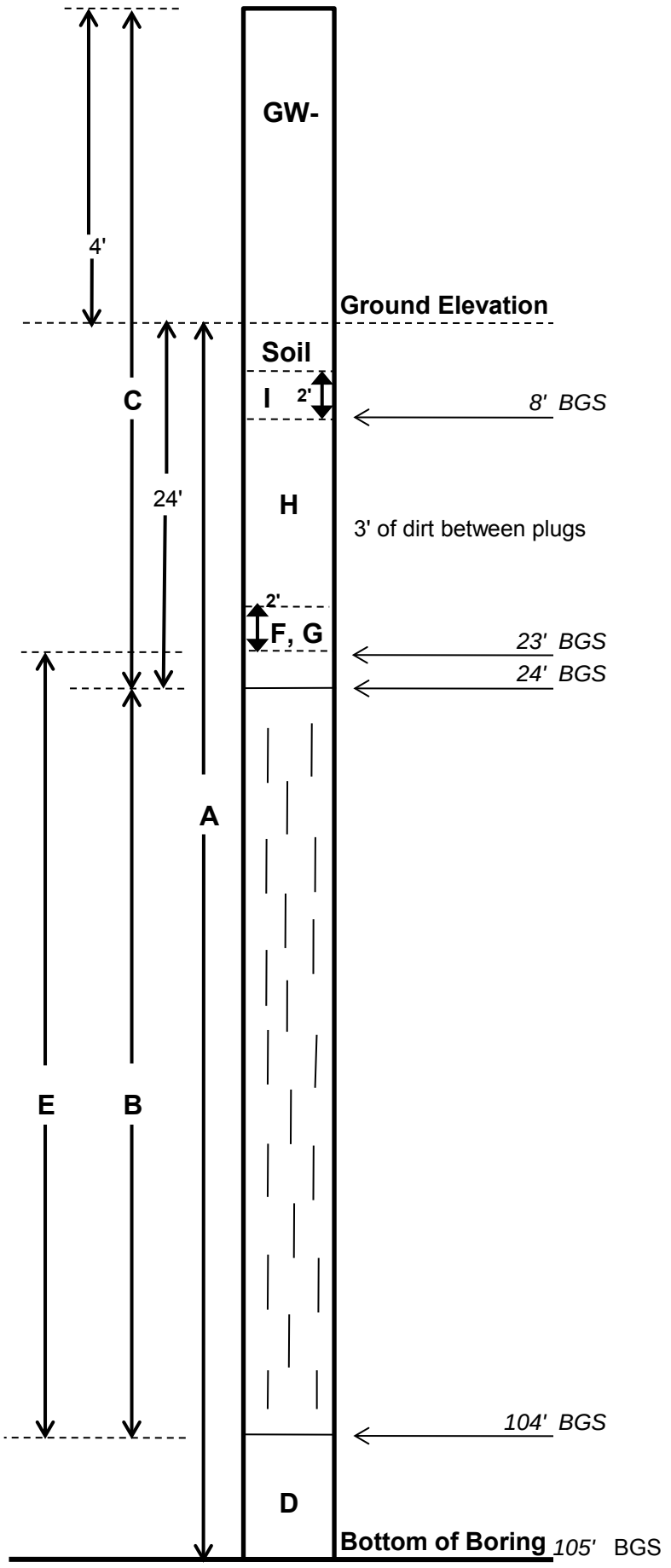
Depth to Top Liner: 4'

Depth to Waste: 14'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=100% M=5% D=Minimal	88	12:50
10-20	MSW Soil=50% M=10% D=Minimal	99	13:085
20-30	MSW Soil=20% M=10% D=Moderate	111	13:20
30-40	MSW Soil=20% M=10% D=Moderate	118	13:33
40-50	MSW Soil=15% M=10% D=Moderate	119	13:52
50-60	MSW Soil=10% M=15% D=Moderate/Severe	125	14:12
60-70	MSW Soil=10% M=15% D=Severe	129	14:29
70-80	MSW Soil=10% M=20% D=Severe	125	14:54
80-90	MSW Soil=10% M=20% D=Severe	118	15:27
90-100	MSW Soil=5% M=25% D=Severe	122	15:55
100-110	MSW Soil=5% M=35% D=Severe	Final Depth 105' @ 16:11	

*Key: M=Moisture Content, D=Decomposition

Notes: Waste became very muddy at 105' BGS.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-15R3 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling:	12/12/15 7:44	Date/Time Began Well Install:	12/12/15 10:35
Date/Time Complete Drilling:	12/12/15 10:28	Date/Time Complete Well Install:	12/12/15 12:17
Northing:	1,356,889.50	Easting:	624,598.30
		Ground Elevation:	250.6

		Design	Actual
A	Total Depth:	NA	92'
B	Screen Length:	NA	64'
C	Solid Pipe Length:	NA	24'+4'=28'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	88'
	◉ #57 Stone?		
E	○ #89 Stone?	☑	23'
F	GeoDisc?	☑	23'
G	1st Bentonite Seal?	☑	21'
H	Soil Fill to 3' BGS?	☑	8'
I	2nd Bentonite Seal?	☑	6'

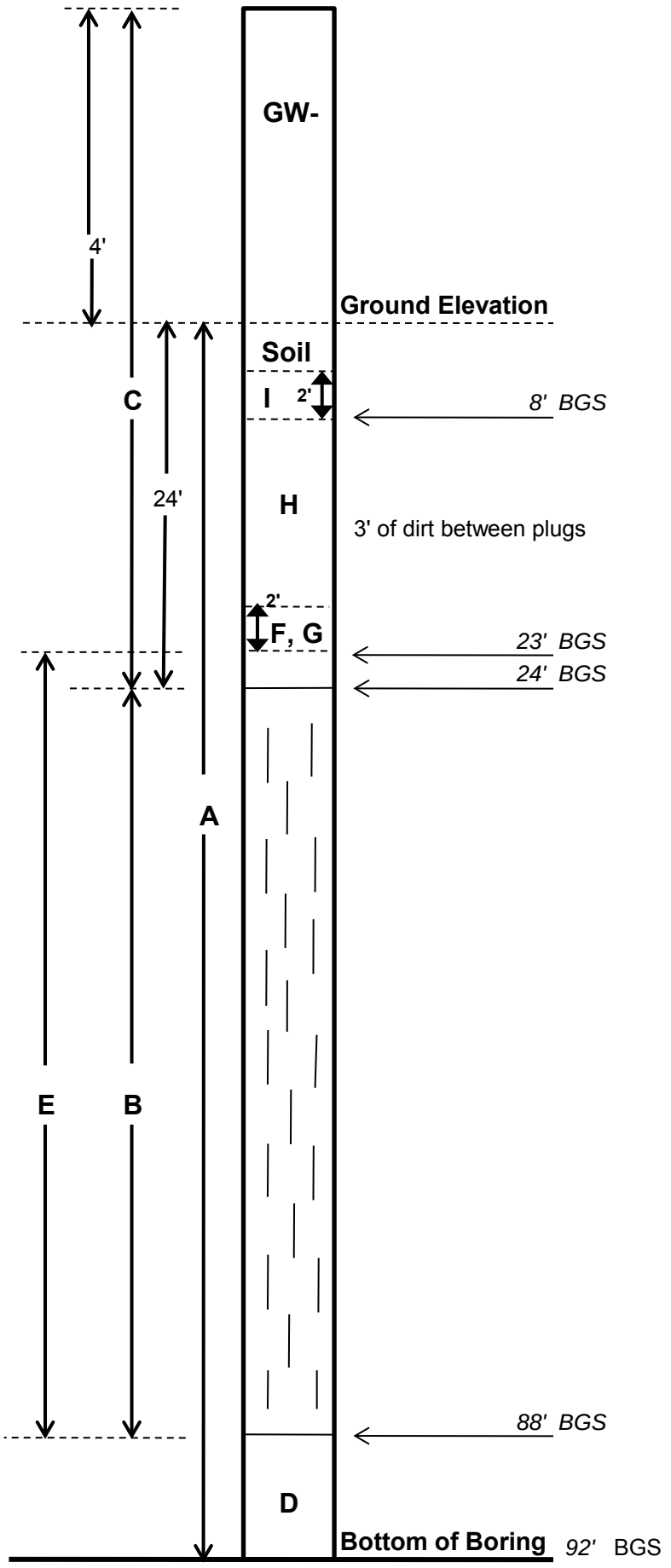
Depth to Top Liner: 4'

Depth to Waste: 21'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=100% M=5% D=Minimal	79	7:53
10-20	MSW Soil=100% M=5% D=Minimal	86	8:04
20-30	MSW Soil=30% M=10% D=Minimal/Moderate	96	8:18
30-40	MSW Soil=20% M=15% D=Moderate	109	8:35
40-50	MSW Soil=15% M=15% D=Moderate	115	8:49
50-60	MSW Soil=15% M=15% D=Moderate	116	9:04
60-70	MSW Soil=15% M=15% D=Moderate/Severe	122	9:23
70-80	MSW Soil=20% M=25% D=Severe	118	9:37
80-90	MSW Soil=30% M=30% D=Severe	117	10:10
90-100	MSW Soil=30% M=30% D=Severe	Final Depth 92' @ 10:28	
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Waste became very muddy at 92' BGS. Dirt layers were observed between 70' and 92' BGS. Borehole caved in. Bottom of well was set at 88' BGS Borehole caved in. Bottom of well was set at 88' BGS.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-18R1 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling:	12/11/15 17:21		Date/Time Began Well Install:	12/11/15 11:19
Date/Time Complete Drilling:	12/11/15 11:02		Date/Time Complete Well Install:	12/11/15 13:36
Northing:	1,356,749.80		Easting:	624,492.00
			Ground Elevation:	248.1

		Design	Actual
A	Total Depth:	137'	110'
B	Screen Length:	116.5'	85.5'
C	Solid Pipe Length:	20'+4'=24'	22'+6'=28'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	107.5'
E	◉ #57 Stone? ○ #89 Stone?	☑	21'
F	GeoDisc?	☑	21'
G	1st Bentonite Seal?	☑	19'
H	Soil Fill to 3' BGS?	☑	8'
I	2nd Bentonite Seal?	☑	6'

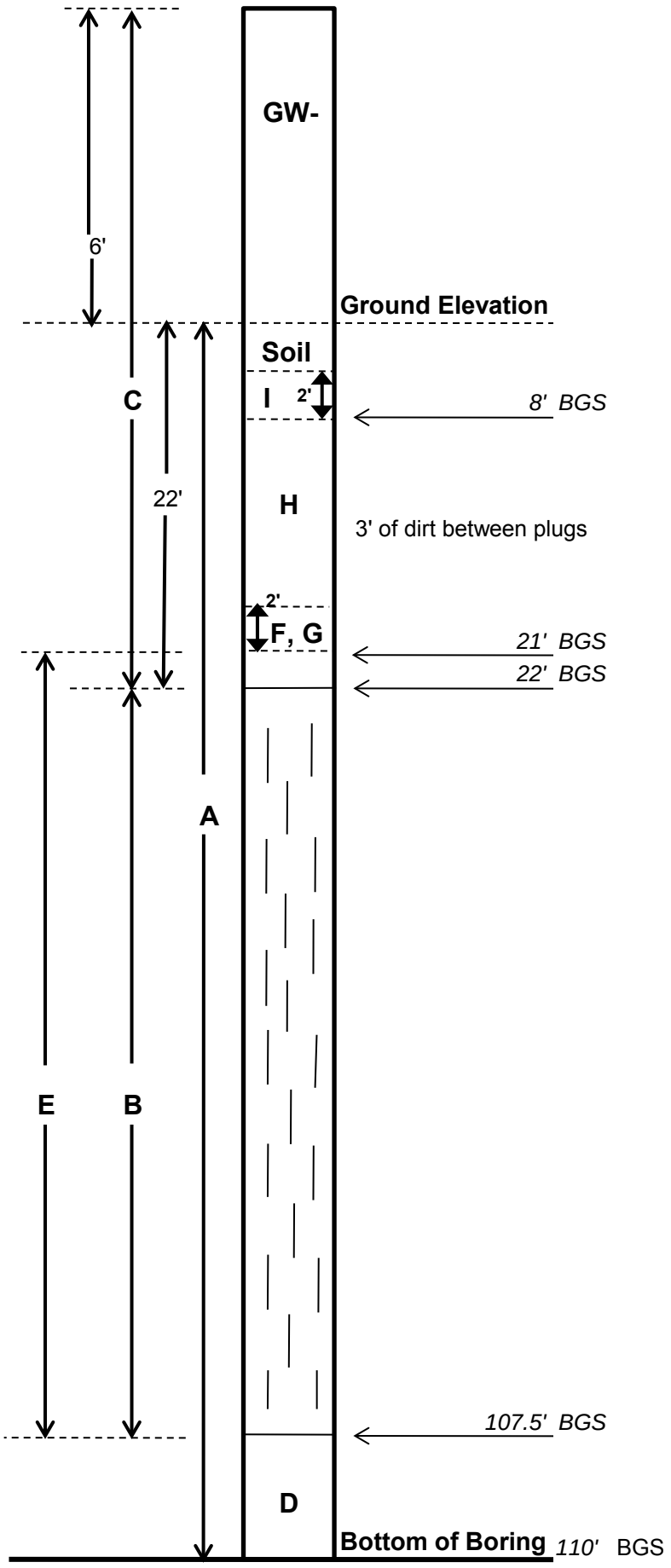
Depth to Top Liner: 4'

Depth to Waste: 14'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=100% M=5% D=Minimal	77	7:30
10-20	MSW Soil=50% M=10% D=Minimal	95	7:48
20-30	MSW Soil=30% M=10% D=Minimal/Moderate	107	8:01
30-40	MSW Soil=20% M=10% D=Moderate	110	8:14
40-50	MSW Soil=15% M=15% D=Moderate	111	8:30
50-60	MSW Soil=15% M=15% D=Moderate	113	8:45
60-70	MSW Soil=30% M=20% D=Moderate/Severe	124	9:03
70-80	MSW Soil=30% M=25% D=Severe	119	9:21
80-90	MSW Soil=15% M=25% D=Severe	121	9:46
90-100	MSW Soil=10% M=30% D=Severe	115	10:20
100-110	MSW Soil=10% M=35% D=Severe	118	11:02

*Key: M=Moisture Content, D=Decomposition

Notes: Waste became very muddy at 110' BGS. Borehole caved in. Bottom of well was set at 107.5' BGS. Dirt layers were observed at about 65' and 77' BGS.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-21R1 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/10/15 7:40
Date/Time Complete Drilling: 12/10/15 10:48
Northing: 1,356,557.10

Date/Time Began Well Install: 12/10/15 11:18
Date/Time Complete Well Install: 12/10/15 14:06
Easting: 624,487.70
Ground Elevation: 247.2

		Design	Actual
A	Total Depth:	136'	100.5'
B	Screen Length:	115.5'	80'
C	Solid Pipe Length:	20'+4'=24'	18.5'+5'=23.5'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	98.5'
	(◉) #57 Stone?	☑	
E	(○) #89 Stone?		17.5'
F	GeoDisc?	☑	17.5'
G	1st Bentonite Seal?	☑	15.5'
H	Soil Fill to 3' BGS?	☑	8'
I	2nd Bentonite Seal?	☑	6'

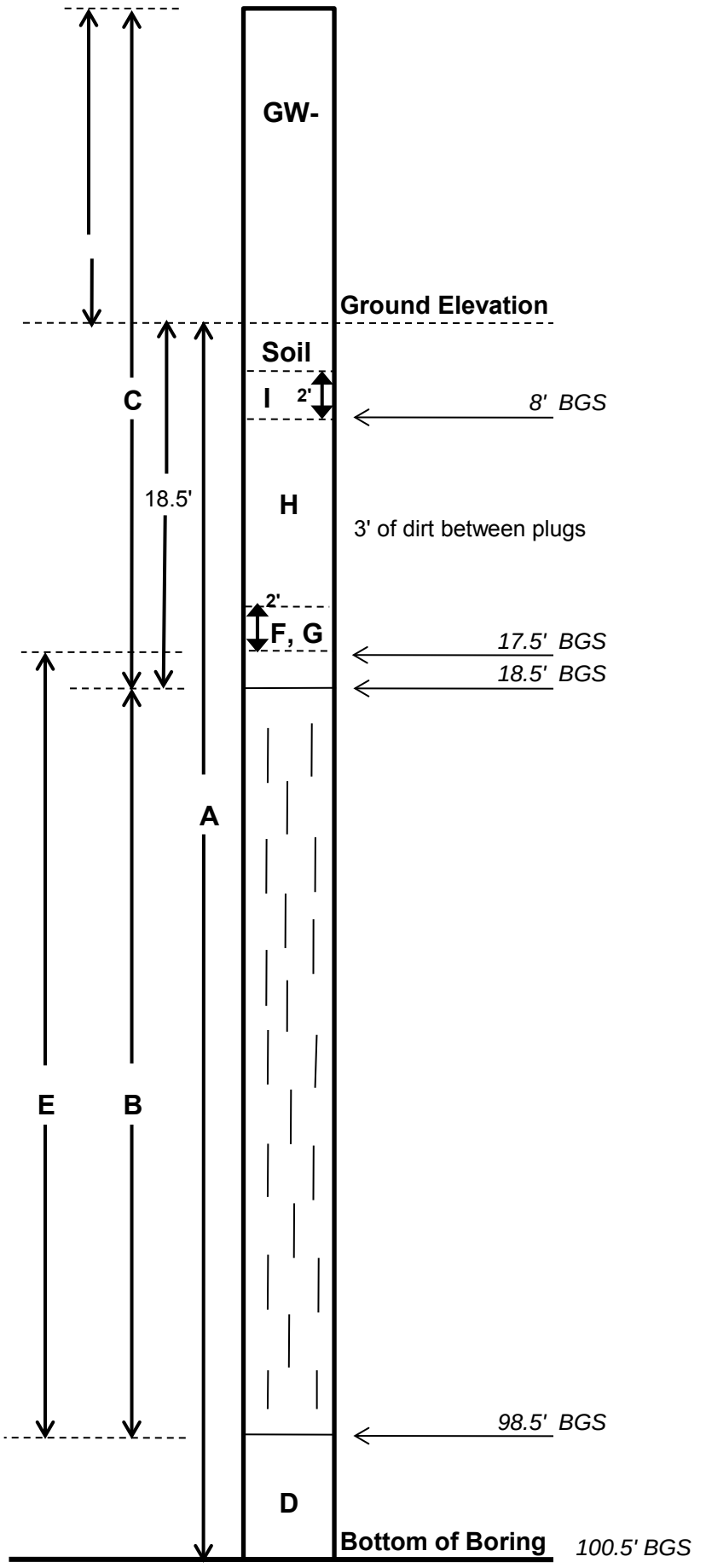
Depth to Top Liner: 4.5'

Depth to Waste: 16'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=100% M=5% D=Minimal	81	7:50
10-20	MSW Soil=70% M=5% D=Minimal	89	8:08
20-30	MSW Soil=30% M=10% D=Minimal	104	8:24
30-40	MSW Soil=20% M=10% D=Moderate	110	8:40
40-50	MSW Soil=15% M=15% D=Moderate	115	8:56
50-60	MSW Soil=10% M=15% D=Moderate	117	9:13
60-70	MSW Soil=10% M=15% D=Moderate	114	9:35
70-80	MSW Soil=10% M=20% D=Severe	114	9:56
80-90	MSW Soil=5% M=25% D=Severe	118	10:22
90-100	MSW Soil=5% M=30% D=Severe	113	10:46
100-110	MSW Soil=5% M=35% D=Severe	Final Depth 100.5' @ 10:48	

*Key: M=Moisture Content, D=Decomposition

Notes: Waste became very muddy at 100.5' BGS. Borehole caved in. Bottom of well was set at 98.5' BGS.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-22R1 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling:	12/17/15 11:30		Date/Time Began Well Install:	12/17/15 14:35
Date/Time Complete Drilling:	12/17/15 14:32		Date/Time Complete Well Install:	12/17/15 16:30
Northing:	1,356,486.50		Easting:	624,683.80
			Ground Elevation:	251.9

		Design	Actual
A	Total Depth:	136'	107'
B	Screen Length:	115.5'	82'
C	Solid Pipe Length:	20'+4'=24'	24'+4'=28'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	106'
E	◉ #57 Stone? ○ #89 Stone?	☑	23'
F	GeoDisc?	☑	23'
G	1st Bentonite Seal?	☑	21'
H	Soil Fill to 3' BGS?	☑	8'
I	2nd Bentonite Seal?	☑	6'

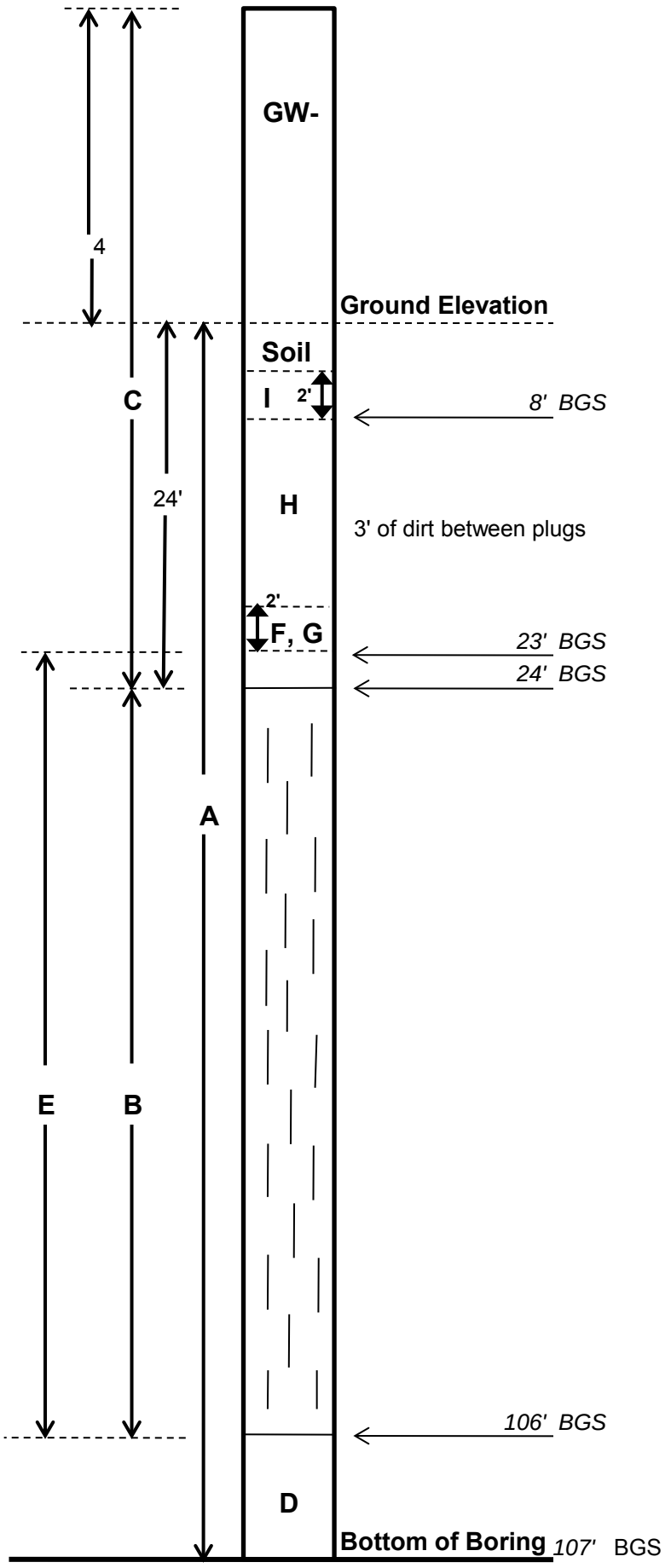
Depth to Top Liner: 4'

Depth to Waste: 15'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=100% M=5% D=Minimal	91	11:40
10-20	MSW Soil=60% M=5% D=Minimal	100	11:50
20-30	MSW Soil=20% M=10% D=Moderate	108	12:00
30-40	MSW Soil=15% M=10% D=Moderate	117	12:16
40-50	MSW Soil=15% M=15% D=Moderate	124	12:33
50-60	MSW Soil=10% M=15% D=Moderate	127	12:53
60-70	MSW Soil=15% M=15% D=Moderate/Severe	130	13:11
70-80	MSW Soil=20% M=20% D=Severe	129	13:29
80-90	MSW Soil=20% M=25% D=Severe	131	13:51
90-100	MSW Soil=10% M=25-30% D=Severe	125	14:14
100-110	MSW Soil=10% M=30% D=Severe	Final Depth 107' @ 14:32	

*Key: M=Moisture Content, D=Decomposition

Notes: Dirt layers were observed at 70'-90' BGS. Waste became very muddy at 107' BGS.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-27R1 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/9/15 7:48
Date/Time Complete Drilling: 12/9/15 13:10
Northing: 1,356,367.80

Date/Time Began Well Install: 12/9/15 13:33
Date/Time Complete Well Install: 12/9/15 16:28
Easting: 624,489.50
Ground Elevation: 246.7

		Design	Actual
A	Total Depth:	139'	116'
B	Screen Length:	118.5'	95'
C	Solid Pipe Length:	20'+4'=24'	20'+5'=25'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	115'
	◉ #57 Stone?	☑	
E	○ #89 Stone?		19'
F	GeoDisc?	☑	19'
G	1st Bentonite Seal?	☑	17'
H	Soil Fill to 3' BGS?	☑	7.5'
I	2nd Bentonite Seal?	☑	5.5'

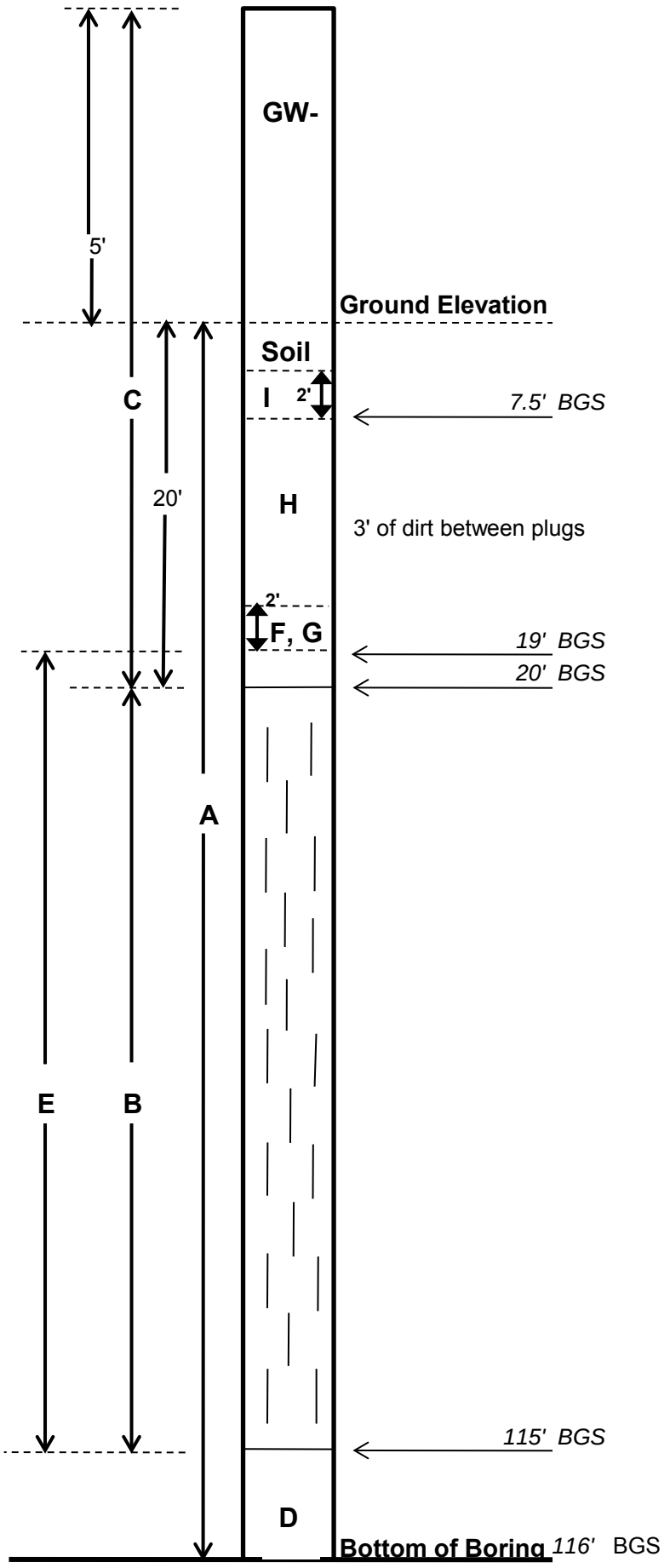
Depth to Top Liner: 4'

Depth to Waste: 15'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=100% M=5% D=Minimal	81	8:01
10-20	MSW Soil=60% M=5% D=Minimal	93	8:31
20-30	MSW Soil=30% M=5% D=Moderate	99	8:46
30-40	MSW Soil=20% M=10% D=Moderate	119	9:02
40-50	MSW Soil=15% M=10% D=Moderate	121	9:20
50-60	MSW Soil=10% M=15% D=Moderate	121	9:40
60-70	MSW Soil=10% M=15% D=Severe	128	9:57
70-80	MSW Soil=10% M=20% D=Severe	129	10:27
80-90	MSW Soil=10% M=20% D=Severe	124	10:55
90-100	MSW Soil=5% M=25% D=Severe	129	11:23
100-110	MSW Soil=5% M=30% D=Severe	119	12:25
110-120	MSW Soil=5% M=35% D=Severe	Final Depth 116' @ 13:10	

*Key: M=Moisture Content, D=Decomposition

Notes: Waste became very muddy at 116' BGS.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-37 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/7/15 9:08
Date/Time Complete Drilling: 12/7/15 12:28
Northing: 1,356,106.10

Date/Time Began Well Install: 12/7/15 12:45
Date/Time Complete Well Install: 12/7/15 14:34
Easting: 624,800.10
Ground Elevation: 246.8

		Design	Actual
A	Total Depth:	128'	105'
B	Screen Length:	107.5'	80
C	Solid Pipe Length:	20'+4'=24'	20'+4'=24'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	100'
E	◉ #57 Stone? ○ #89 Stone?	☑	19'
F	GeoDisc?	☑	19'
G	1st Bentonite Seal?	☑	17'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

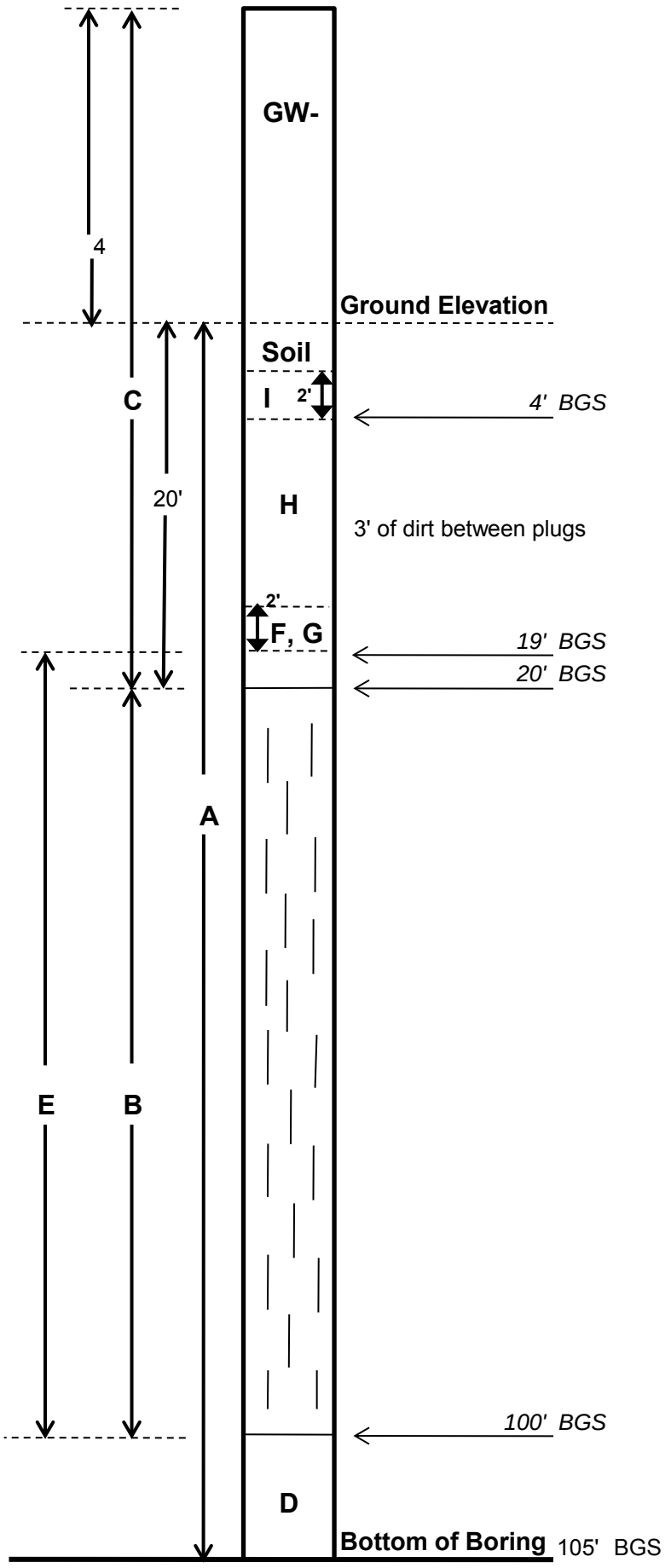
Depth to Top Liner: NA

Depth to Waste: 1'-2'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	91	9:20
10-20	MSW Soil=20% M=10% D=Minimal	109	9:33
20-30	MSW Soil=15% M=10% D=Moderate	115	9:55
30-40	MSW Soil=10% M=10% D=Moderate	118	10:12
40-50	MSW Soil=10% M=15% D=Moderate	125	10:33
50-60	MSW Soil=10% M=15% D=Severe	132	10:50
60-70	MSW Soil=5% M=15% D=Severe	135	11:09
70-80	MSW Soil=5% M=20% D=Severe	135	11:27
80-90	MSW Soil=5% M=20% D=Severe	130	11:53
90-100	MSW Soil=5% M=25% D=Severe	127	12:15
100-110	MSW Soil=5% M=30% D=Severe	Final Depth 105' @ 12:28	

*Key: M=Moisture Content, D=Decomposition

Notes: Waste became very muddy at 105' BGS. Bottom of well was set above the top of approximate saturated zone (100' bgs).



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-45R1 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling:	12/15/15 7:47	Date/Time Began Well Install:	12/15/15 11:38
Date/Time Complete Drilling:	12/15/15 11:34	Date/Time Complete Well Install:	12/15/15 13:52
Northing:	1,356,966.40	Easting:	624,657.90
		Ground Elevation:	247.2

		Design	Actual
A	Total Depth:	137'	107'
B	Screen Length:	116.5'	81'
C	Solid Pipe Length:	20'+4'=24'	23.5'+5.5'=29'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	104.5'
E	◉ #57 Stone? ○ #89 Stone?	☑	22.5'
F	GeoDisc?	☑	22.5'
G	1st Bentonite Seal?	☑	20.5'
H	Soil Fill to 3' BGS?	☑	9.5'
I	2nd Bentonite Seal?	☑	5.5'

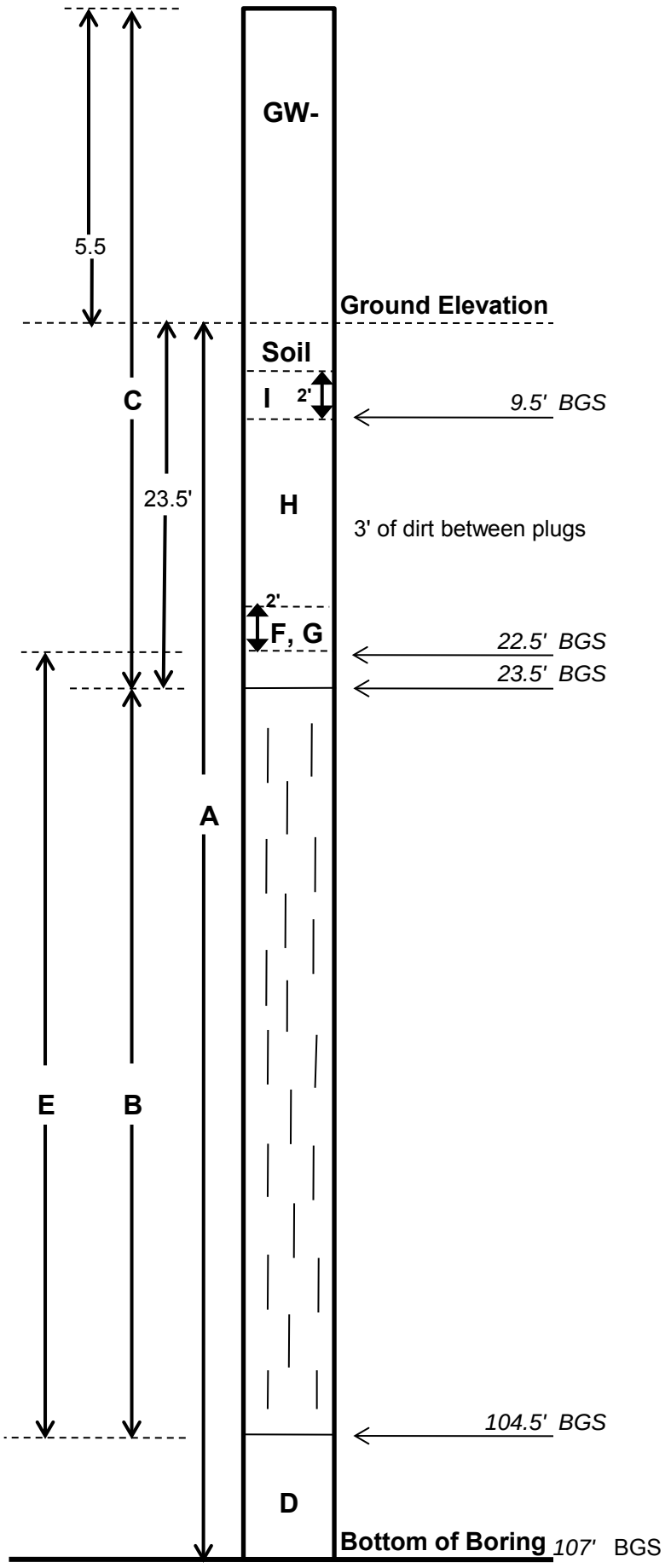
Depth to Top Liner: 5.5'

Depth to Waste: 18'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=100% M=5% D=Minimal	81	7:55
10-20	MSW Soil=80% M=5% D=Minimal	88	8:09
20-30	MSW Soil=30% M=10% D=Moderate	109	8:23
30-40	MSW Soil=20% M=10% D=Moderate	112	8:45
40-50	MSW Soil=20% M=10% D=Moderate	117	8:59
50-60	MSW Soil=50% M=15% D=Moderate	126	9:18
60-70	MSW Soil=20% M=15% D=Moderate/Severe	119	19:37
70-80	MSW Soil=50% M=20% D=Severe	128	10:07
80-90	MSW Soil=30% M=20% D=Severe	124	10:33
90-100	MSW Soil=15% M=25% D=Severe	122	11:04
100-110	MSW Soil=10% M=30% D=Severe	Final Depth 107' at 11:34	

*Key: M=Moisture Content, D=Decomposition

Notes: Dirt layers were observed at 50'-60' BGS and 70'-80' BGS. Waste became very muddy at 107' BGS. Borehole caved in. Bottom of well was set at 104.5' bgs.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-50R1 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/16/15 7:48
Date/Time Complete Drilling: 12/16/15 11:07
Northing: 1,356,746.80

Date/Time Began Well Install: 12/16/15 11:30
Date/Time Complete Well Install: 12/16/15 13:36
Easting: 624,762.80
Ground Elevation: 247.7

		Design	Actual
A	Total Depth:	139'	100'
B	Screen Length:	118.5'	74'
C	Solid Pipe Length:	20'+4'=24'	25'+4'=29'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	99'
E	◉ #57 Stone? ○ #89 Stone?	☑	24'
F	GeoDisc?	☑	24'
G	1st Bentonite Seal?	☑	22'
H	Soil Fill to 3' BGS?	☑	9'
I	2nd Bentonite Seal?	☑	7'

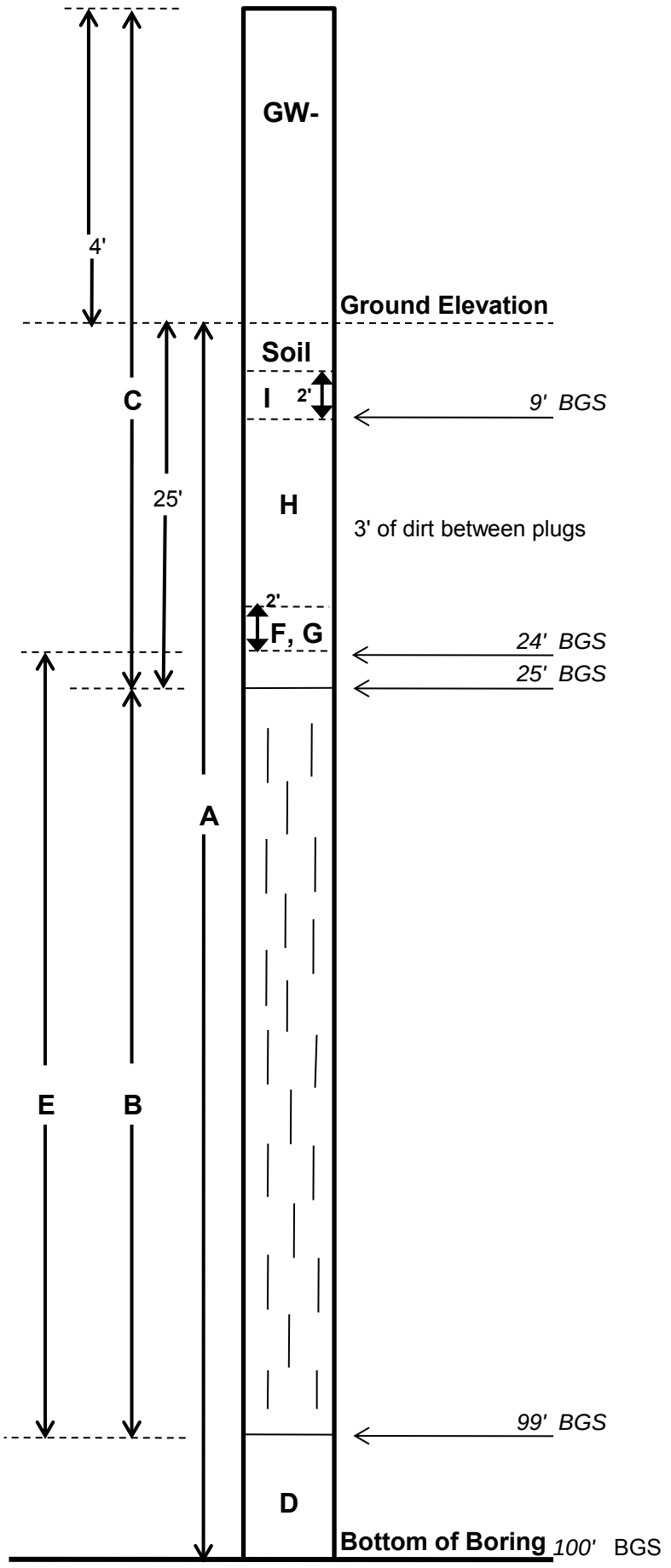
Depth to Top Liner: 5'

Depth to Waste: 15'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=100% M=5% D=Minimal	79	7:58
10-20	MSW Soil=60% M=5% D=Minimal	93	8:11
20-30	MSW Soil=30% M=10% D=Minimal/Moderate	98	8:29
30-40	MSW Soil=20% M=10% D=Moderate	113	8:43
40-50	MSW Soil=20% M=15% D=Moderate	118	9:00
50-60	MSW Soil=20% M=15% D=Moderate	124	9:20
60-70	MSW Soil=15% M=15% D=Moderate	124	9:39
70-80	MSW Soil=10% M=20% D=Moderate/Severe	122	10:20
80-90	MSW Soil=15% M=25% D=Severe	123	10:46
90-100	MSW Soil=50% M=30% D=Severe	122	11:07
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: A dirt layer was observed at 90'-100' BGS. Waste became very muddy at 100' BGS.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-51R1 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/14/15 7:53
Date/Time Complete Drilling: 12/14/15 11:23
Northing: 1,356,696.70

Date/Time Began Well Install: 12/14/15 11:30
Date/Time Complete Well Install: 12/14/15 13:38
Easting: 624,671.50
Ground Elevation: 251.4

		Design	Actual
A	Total Depth:	NA	105'
B	Screen Length:	NA	80'
C	Solid Pipe Length:	NA	24'+4'=28'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	104'
E	◉ #57 Stone? ○ #89 Stone?	☑	23'
F	GeoDisc?	☑	23'
G	1st Bentonite Seal?	☑	21'
H	Soil Fill to 3' BGS?	☑	7'
I	2nd Bentonite Seal?	☑	5'

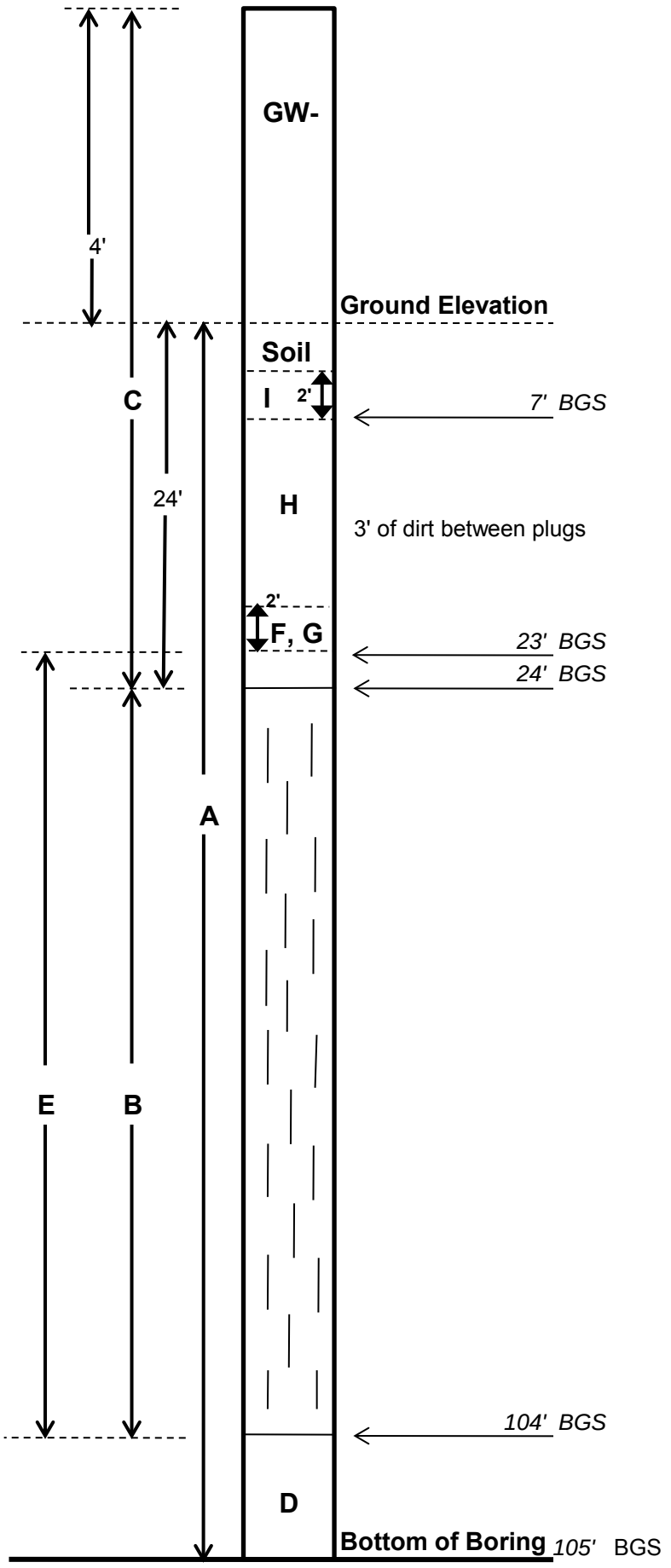
Depth to Top Liner: 3'

Depth to Waste: 18'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=100% M=5% D=Minimal	81	8:23
10-20	MSW Soil=80% M=5% D=Minimal	90	8:37
20-30	MSW Soil=30% M=10% D=Minimal	99	8:46
30-40	MSW Soil=20% M=10% D=Moderate	105	8:56
40-50	MSW Soil=20% M=10% D=Moderate	110	9:19
50-60	MSW Soil=15% M=15% D=Moderate/Severe	113	9:34
60-70	MSW Soil=15% M=15% D=Severe	117	9:49
70-80	MSW Soil=10% M=20% D=Severe	121	10:12
80-90	MSW Soil=10% M=25% D=Severe	116	10:31
90-100	MSW Soil=5% M=30% D=Severe	121	10:52
100-110	MSW Soil=5% M=35% D=Severe	Final Depth 105' at 11:23	

*Key: M=Moisture Content, D=Decomposition

Notes: Waste became very muddy at 105' BGS.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-54R1 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling:	12/17/15 7:00		Date/Time Began Well Install:	12/17/15 10:28
Date/Time Complete Drilling:	12/17/15 10:20		Date/Time Complete Well Install:	12/17/15 12:43
Northing:	1,356,570.70		Easting:	624,822.50
			Ground Elevation:	247.3

		Design	Actual
A	Total Depth:	139'	111'
B	Screen Length:	118.5'	80'
C	Solid Pipe Length:	20'+4'=24'	30'+4'=34'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	110'
	◉ #57 Stone?		
E	○ #89 Stone?	☑	29'
F	GeoDisc?	☑	29'
G	1st Bentonite Seal?	☑	27'
H	Soil Fill to 3' BGS?	☑	10'
I	2nd Bentonite Seal?	☑	8'

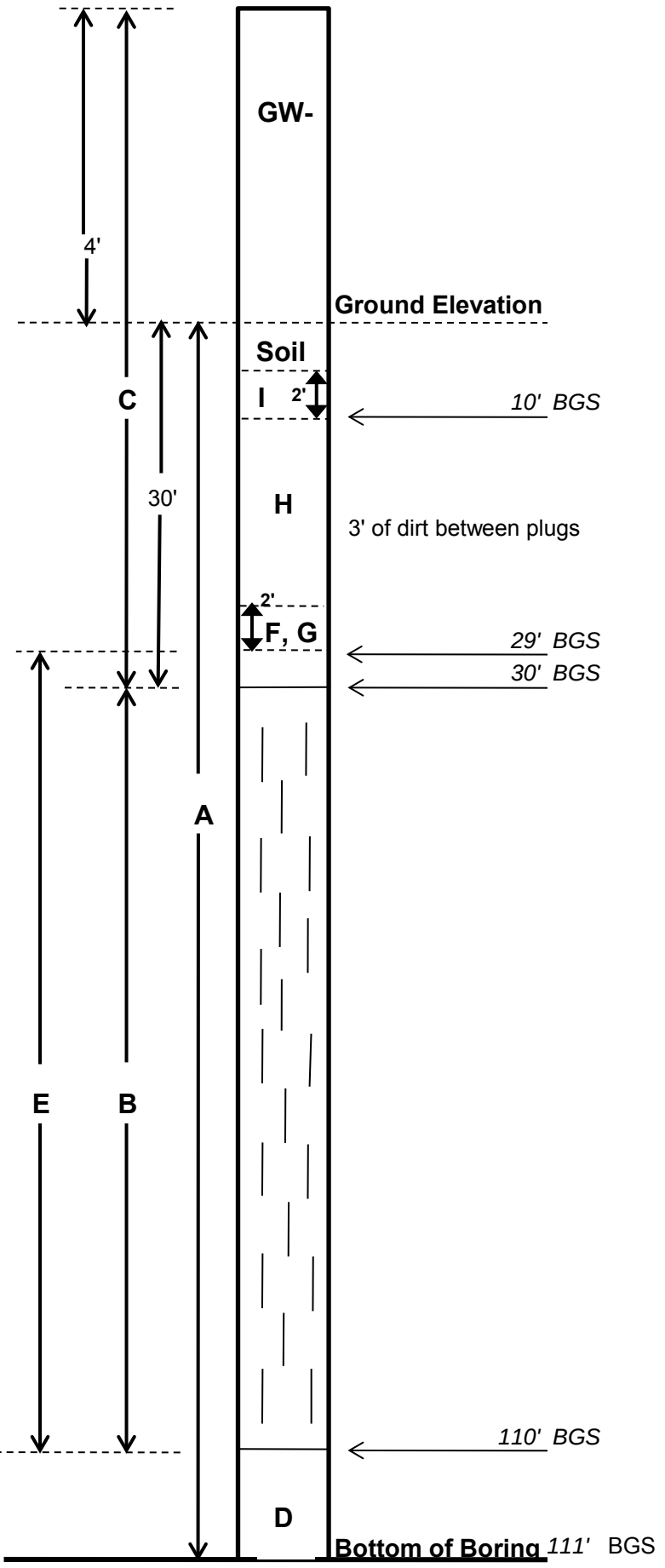
Depth to Top Liner: 6'

Depth to Waste: 18'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=100% M=5% D=Minimal	82	7:10
10-20	MSW Soil=80% M=5% D=Minimal	93	7:19
20-30	MSW Soil=30% M=10% D=Minimal/Moderate	109	7:30
30-40	MSW Soil=25% M=10% D=Moderate	116	7:43
40-50	MSW Soil=20% M=10% D=Moderate	116	7:56
50-60	MSW Soil=20% M=15% D=Moderate	123	8:14
60-70	MSW Soil=20% M=20% D=Moderate	120	8:32
70-80	MSW Soil=20% M=20% D=Severe	115	9:05
80-90	MSW Soil=15% M=25% D=Severe	120	9:27
90-100	MSW Soil=15% M=25% D=Severe	116	9:52
100-110	MSW Soil=15% M=30% D=Severe	118	10:15
100-111	MSW Soil=15% M=35% D=Severe	Final Depth 111' @ 10:20	

*Key: M=Moisture Content, D=Decomposition

Notes: Waste became very muddy at 111' BGS.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-72 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/8/15 8:01
Date/Time Complete Drilling: 12/8/15 11:08
Northing: 1,356,159.80

Date/Time Began Well Install: 12/8/15 11:39
Date/Time Complete Well Install: 12/8/15 13:20
Easting: 624,558.40
Ground Elevation: 257.2

		Design	Actual
A	Total Depth:	151'	103'
B	Screen Length:	130.5'	80'
C	Solid Pipe Length:	20'+4'=24'	20'+8'=28'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	100'
	◉ #57 Stone?		
E	○ #89 Stone?	☑	19'
F	GeoDisc?	☑	19'
G	1st Bentonite Seal?	☑	17'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

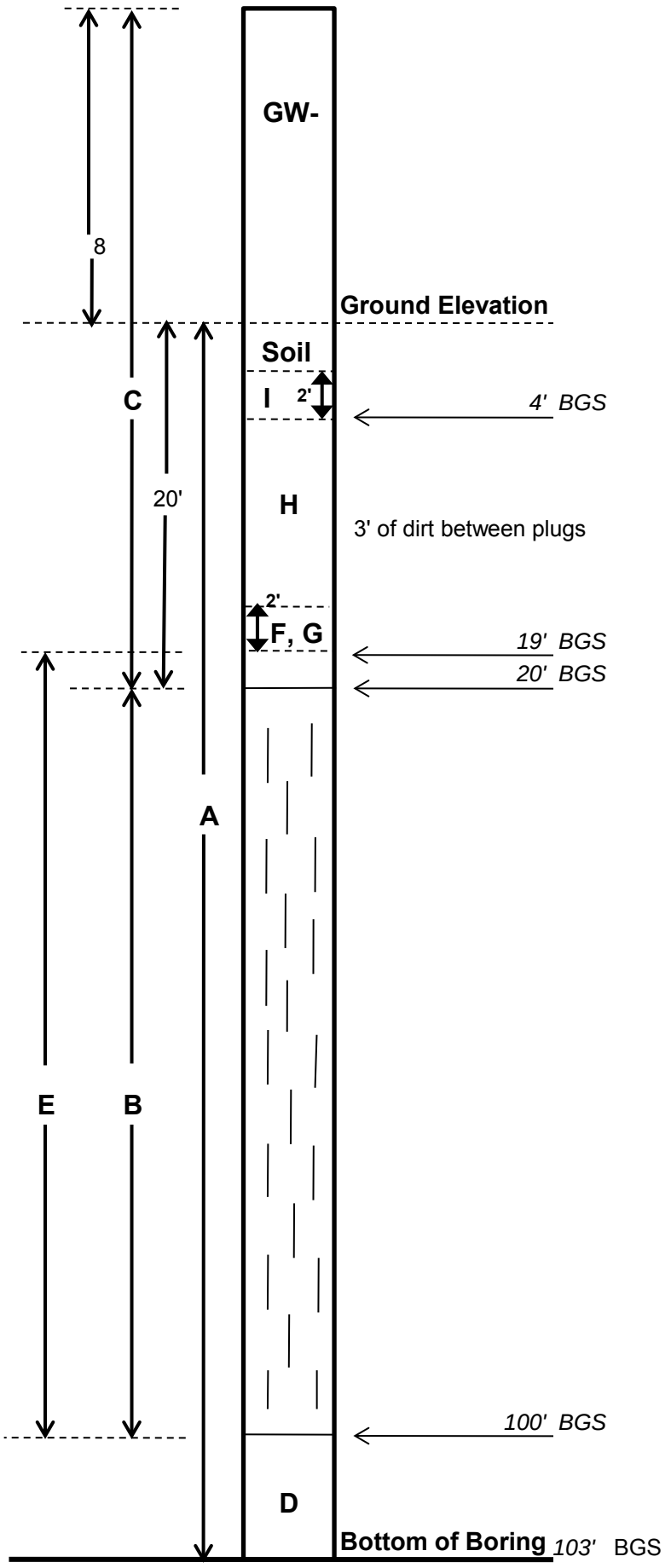
Depth to Top Liner: NA

Depth to Waste: 9'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	75	8:10
10-20	MSW Soil=20% M=10% D=Minimal/Moderate	90	8:31
20-30	MSW Soil=15% M=10% D=Moderate	98	8:44
30-40	MSW Soil=15% M=10% D=Moderate/Severe	109	8:59
40-50	MSW Soil=10% M=15% D=Severe	111	9:15
50-60	MSW Soil=10% M=20% D=Severe	127	9:31
60-70	MSW Soil=5% M=30% D=Severe	127	9:50
70-80	MSW Soil=5% M=30% D=Severe	121	10:13
80-90	MSW Soil=5% M=25% D=Severe	128	10:35
90-100	MSW Soil=5% M=25% D=Severe	123	11:02
100-110	MSW Soil=5% M=35% D=Severe	Final Depth 103' @ 11:08	

*Key: M=Moisture Content, D=Decomposition

Notes: Waste became very muddy at 103' BGS. Bottom of well was set above the approximate saturated zone (100' bgs).



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-73 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/18/15 7:20
Date/Time Complete Drilling: 12/18/15 10:54
Northing: 1,356,368.90

Date/Time Began Well Install: 12/18/15 11:00
Date/Time Complete Well Install: 12/18/15 12:48
Easting: 624,779.10
Ground Elevation: 250.8

		Design	Actual
A	Total Depth:	144'	108'
B	Screen Length:	123.5'	84'
C	Solid Pipe Length:	20'+4'=24'	22'+4'=26'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	106'
	(◉) #57 Stone?	☑	
E	(○) #89 Stone?		21'
F	GeoDisc?	☑	21'
G	1st Bentonite Seal?	☑	19'
H	Soil Fill to 3' BGS?	☑	7'
I	2nd Bentonite Seal?	☑	5'

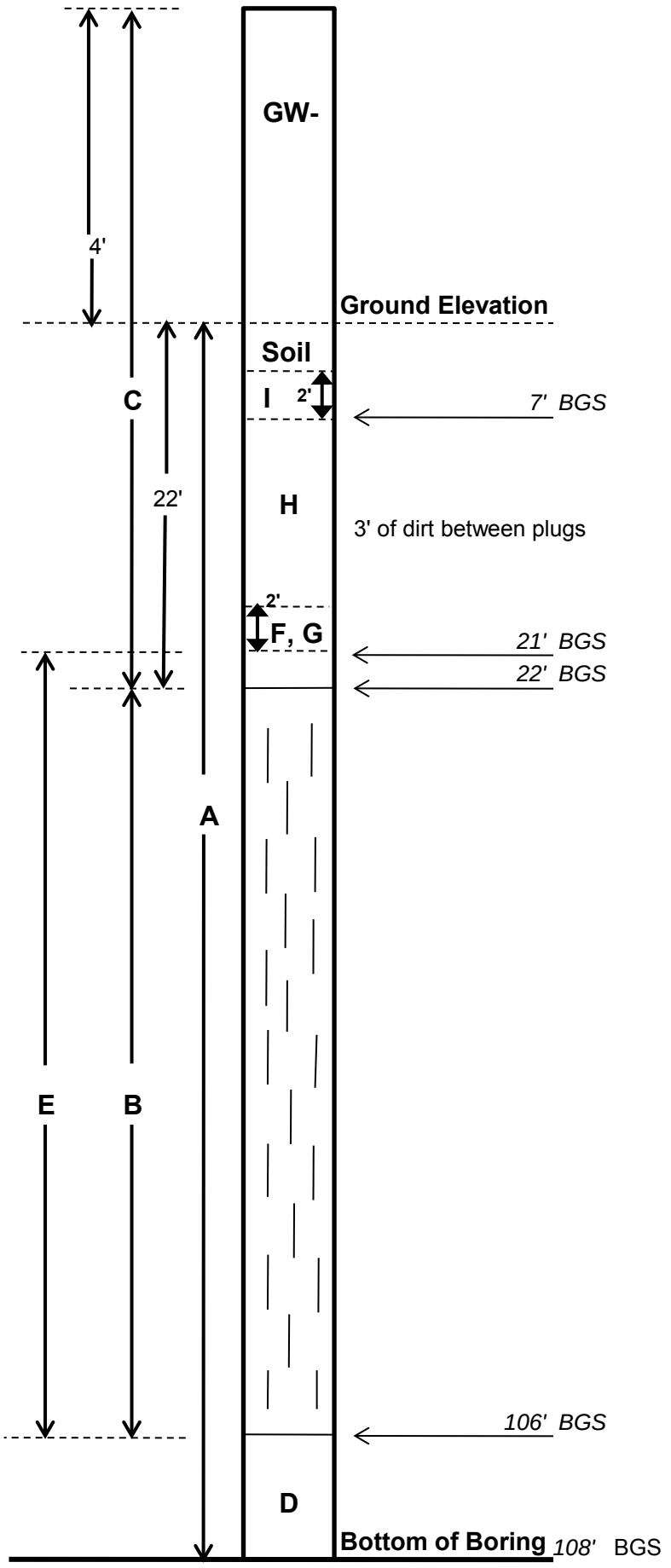
Depth to Top Liner: 3'

Depth to Waste: 11'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=100% M=5% D=Minimal	77	7:32
10-20	MSW Soil=30% M=5% D=Minimal	95	7:46
20-30	MSW Soil=20% M=10% D=Minimal/Moderate	99	8:00
30-40	MSW Soil=15% M=10% D=Moderate	111	8:17
40-50	MSW Soil=15% M=15% D=Moderate/Severe	112	8:33
50-60	MSW Soil=15% M=15% D=Severe	113	8:51
60-70	MSW Soil=15% M=15-20% D=Severe	118	9:09
70-80	MSW Soil=15% M=20% D=Severe	123	9:38
80-90	MSW Soil=10% M=25% D=Severe	116	10:02
90-100	MSW Soil=10% M=30% D=Severe	119	10:24
100-110	MSW Soil=10% M=35% D=Severe	Final Depth 108' @ 10:54	

*Key: M=Moisture Content, D=Decomposition

Notes: Waste became very muddy at 108' BGS. Borehole caved in.
Bottom of well was set at 106' BGS.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-75 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/19/15 8:44
Date/Time Complete Drilling: 12/19/15 12:28
Northing: 1,355,096.00

Date/Time Began Well Install: 12/19/15 12:38
Date/Time Complete Well Install: 12/19/15 14:25
Easting: 624,542.40
Ground Elevation: 239.5

		Design	Actual
A	Total Depth:	134'	95'
B	Screen Length:	113.5'	65'
C	Solid Pipe Length:	20'+4'=24'	20'+4'=24'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	85'
E	◉ #57 Stone? ○ #89 Stone?	☑	19'
F	GeoDisc?	☑	19'
G	1st Bentonite Seal?	☑	17'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

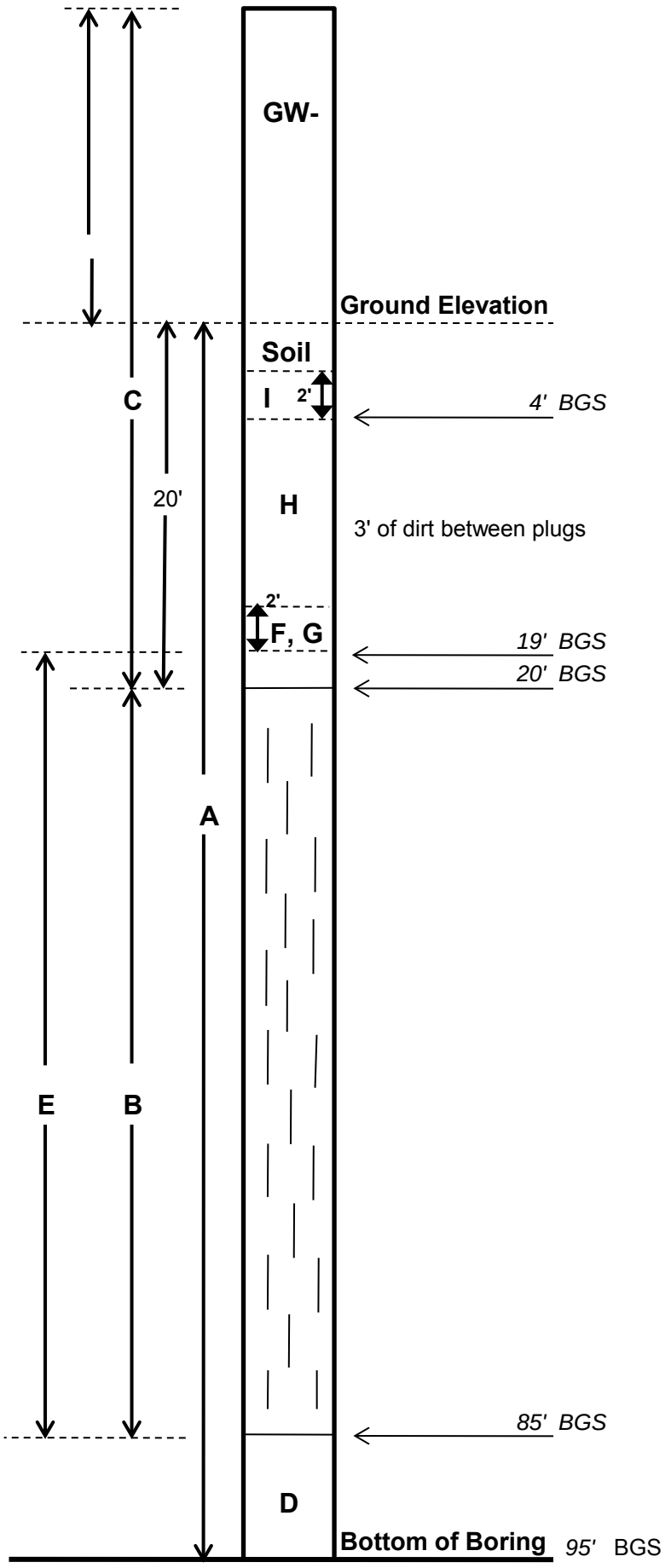
Depth to Top Liner: NA

Depth to Waste: 1'-2'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	86	8:52
10-20	MSW Soil=20% M=5% D=Minimal	96	09"08
20-30	MSW Soil=20% M=10% D=Moderate	103	9:21
30-40	MSW Soil=15% M=10% D=Moderate/Severe	108	9:44
40-50	MSW Soil=15% M=15% D=Severe	114	10:01
50-60	MSW Soil=15% M=20% D=Severe	119	10:17
60-70	MSW Soil=30% M=20-25% D=Severe	118	10:31
70-80	MSW Soil=100% M=25% D=Severe	116	11:02
80-90	MSW Soil=100% M=30% D=Severe	115	11:20
90-100	MSW Soil=100% M=35% D=Severe	Final Depth 95' @ 12:28	
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: A thick dirt layer (70'-95' BGS) was observed. Dirt was too saturated to drill beyond 95'. Depth was not increased over a 40-minute period. Borehole was backfilled with tire chips from the bottom to 84' BGS. Bottom of well was set at 85' BGS. Original nomenclature was W-1.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-76 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/21/15 8:15
Date/Time Complete Drilling: 12/21/15 13:15
Northing: 1,355,102.30

Date/Time Began Well Install: 12/21/15 13:25
Date/Time Complete Well Install: 12/21/15 14:48
Easting: 624,729.60
Ground Elevation: 233.5

		Design	Actual
A	Total Depth:	126'	101'
B	Screen Length:	105.5'	80'
C	Solid Pipe Length:	20'+4'=24'	20'+4'=24'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	100'
	◉ #57 Stone?		
E	○ #89 Stone?	☑	19'
F	GeoDisc?	☑	19'
G	1st Bentonite Seal?	☑	17'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

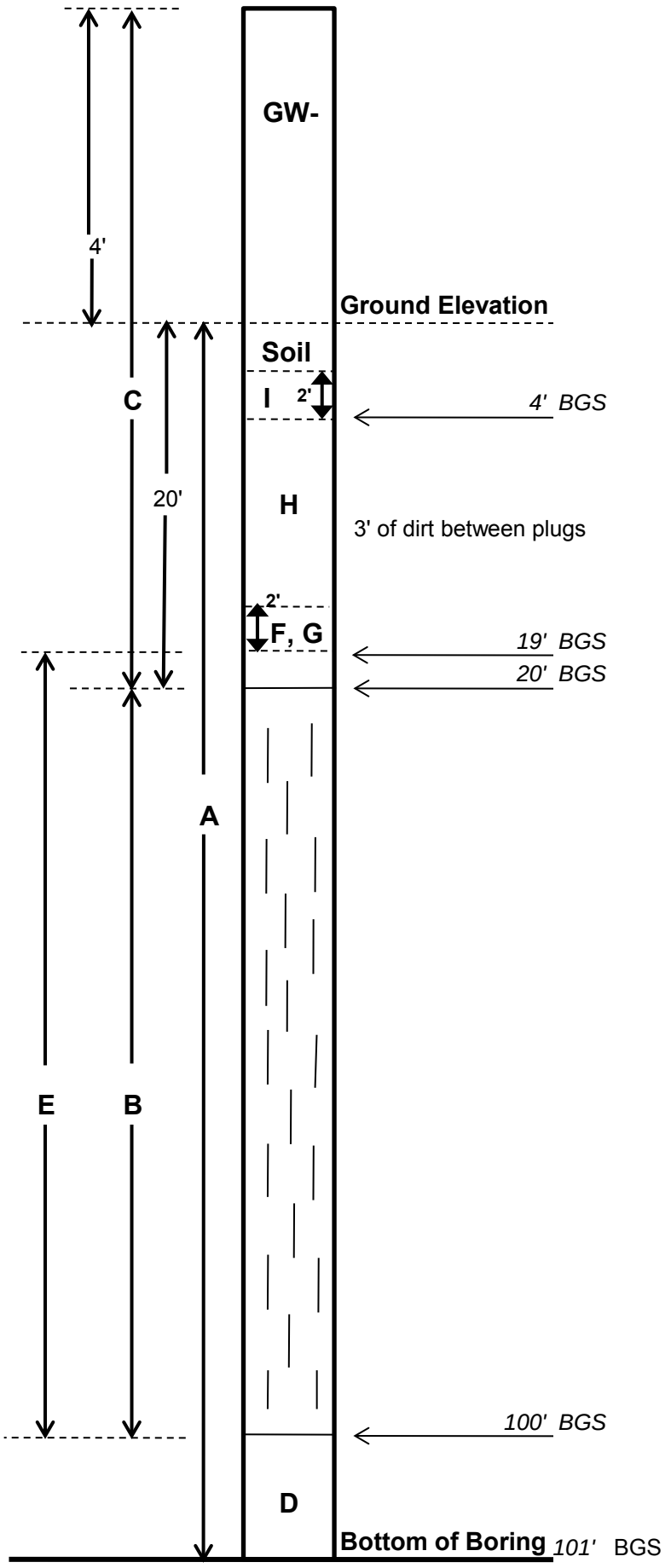
Depth to Top Liner:

Depth to Waste:

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	95	8:25
10-20	MSW Soil=20% M=5% D=Minimal	98	8:42
20-30	MSW Soil=20% M=10% D=Minimal/Moderate	102	8:53
30-40	MSW Soil=15% M=10% D=Moderate	106	9:10
40-50	MSW Soil=15% M=15% D=Moderate	106	9:27
50-60	MSW Soil=30% M=15-30% D=Moderate	111	9:54
60-70	MSW Soil=15% M=20% D=Severe	115	10:24
70-80	MSW Soil=15% M=25% D=Severe	112	10:50
80-90	MSW Soil=10% M=30-40% D=Severe	113	11:20
90-100	MSW Soil=10% M=40% D=Severe	115	12:53
100-110	MSW Soil=10% M=50% D=Severe	Final Depth 101' @ 13:15	

*Key: M=Moisture Content, D=Decomposition

Notes: A dirt layer was observed at about 55' BGS. Waste was too saturated to drill beyond 101' bgs. During 20-minute period, depth increased by only 1'. Original nomencalture was W-2.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-77 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/22/15 7:53
Date/Time Complete Drilling: 12/22/15 12:34
Northing: 1,355,141.90

Date/Time Began Well Install: 12/22/15 12:40
Date/Time Complete Well Install: 12/22/15 14.15
Easting: 624,924.60
Ground Elevation: 232

		Design	Actual
A	Total Depth:	127'	127'
B	Screen Length:	106.5'	106'
C	Solid Pipe Length:	20'+4'=24'	18'+6'=24'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	104'
E	◉ #57 Stone? ○ #89 Stone?	☑	17'
F	GeoDisc?	☑	17'
G	1st Bentonite Seal?	☑	15'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

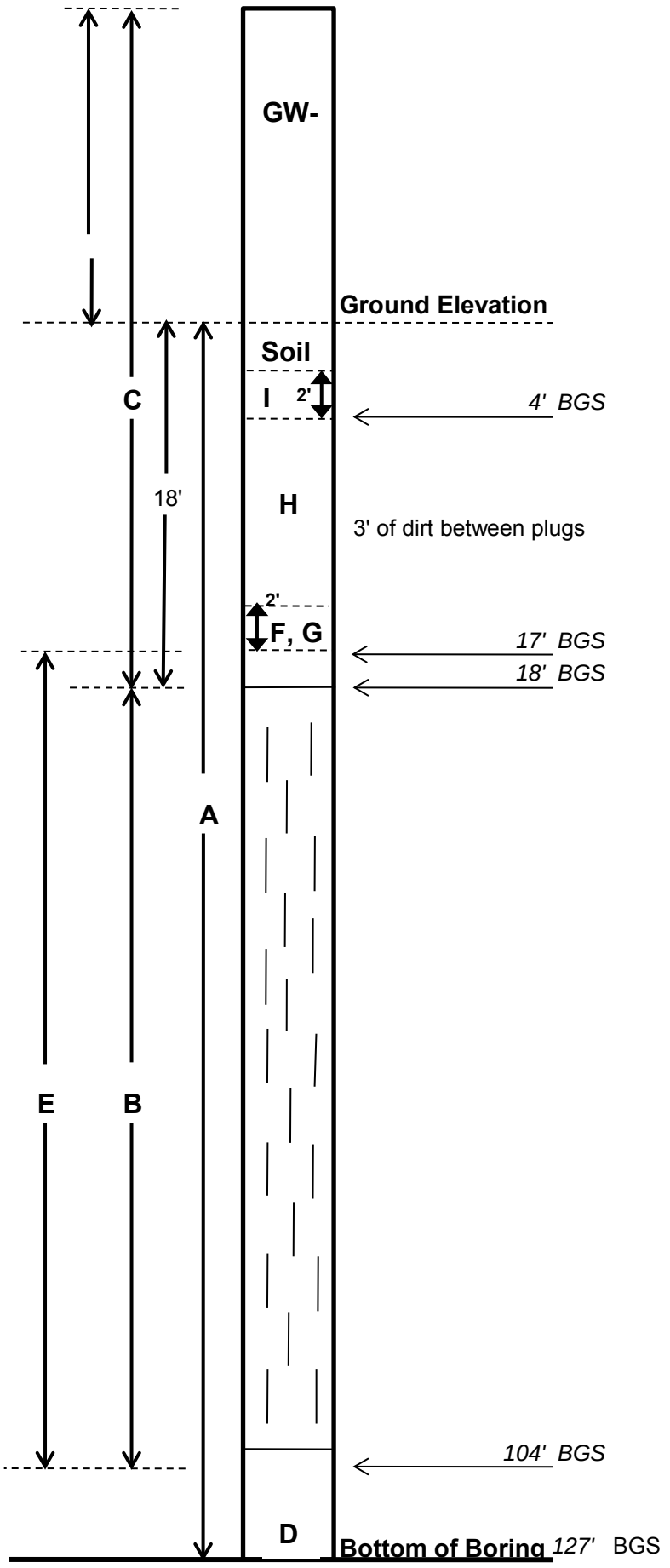
Depth to Top Liner: NA

Depth to Waste: 1'-2'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	94	8:02
10-20	MSW Soil=20% M=5% D=Minimal	105	8:19
20-30	MSW Soil=20% M=10% D=Minimal/Moderate	109	8:32
30-40	MSW Soil=15% M=10% D=Moderate	109	8:48
40-50	MSW Soil=10% M=15-20% D=Moderate	110	9:03
50-60	MSW Soil=30% M=20% D=Moderate/Severe	105	9:28
60-70	MSW Soil=30% M=20-25% D=Severe	111	9:47
70-80	MSW Soil=30% M=20-25% D=Severe	112	10:15
80-90	MSW Soil=10% M=25% D=Severe	113	10:47
90-100	MSW Soil=10% M=25% D=Severe	116	11:12
100-110	MSW Soil=10% M=25-30% D=Severe	115	11:43
100-111	MSW Soil=10% M=25-30% D=Severe	113	12:08
100-112	MSW Soil=10% M=30% D=Severe	Final Depth 127' @ 12:34	

*Key: M=Moisture Content, D=Decomposition

Notes: Dirt layers were observed at 50'-80' BGS. Borehole caved in. Bottom of well was set at 104' BGS. Original nomenclature was W-3.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-78 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling:	12/29/15 7:33
Date/Time Complete Drilling:	12/29/15 12:15
Northing:	1,354,990.00
Date/Time Began Well Install:	12/29/15 12:20
Date/Time Complete Well Install:	12/29/15 13:50
Easting:	624,948.10
Ground Elevation:	234.2

		Design	Actual
A	Total Depth:	131'	131'
B	Screen Length:	110.5'	110'
C	Solid Pipe Length:	20'+4'=24'	20'+4'=24'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	130'
E	(◉) #57 Stone? ( ) #89 Stone?	☑	19'
F	GeoDisc?	☑	19'
G	1st Bentonite Seal?	☑	17'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

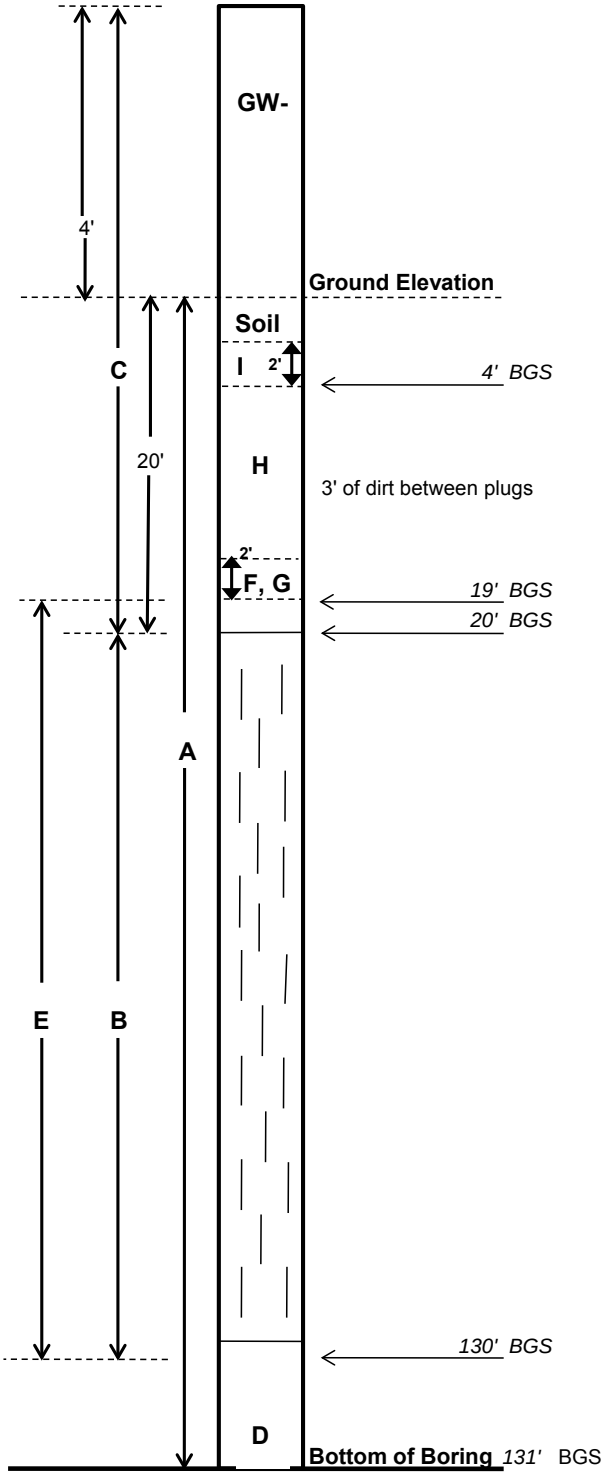
Depth to Top Liner: NA

Depth to Waste: 1'-2'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	91	7:47
10-20	MSW Soil=15% M=5% D=Minimal	94	8:00
20-30	MSW Soil=15% M=10% D=Minimal	95	8:14
30-40	MSW Soil=10% M=10% D=Minimal	102	8:36
40-50	MSW Soil=10% M=10% D=Moderate	104	8:51
50-60	MSW Soil=10% M=15% D=Moderate	107	9:08
60-70	MSW Soil=10% M=15% D=Moderate/Severe	108	9:26
70-80	MSW Soil=10% M=20% D=Severe	108	9:43
80-90	MSW Soil=10% M=20% D=Severe	109	10:13
90-100	MSW Soil=10% M=25% D=Severe	111	10:36
100-110	MSW Soil=5% M=30% D=Severe	109	11:00
110-120	MSW Soil=5% M=30% D=Severe	114	11:35
120-130	MSW Soil=5% M=30% D=Severe	112	12:10
130-131	MSW Soil=5% M=30% D=Severe	Final Depth 131' @ 12:15	

*Key: M=Moisture Content, D=Decomposition

Notes: Significant amout of water came in at about 102 feet BGS.
Original nomenclature was W-4.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-79 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/30/15 7:35
Date/Time Complete Drilling: 12/30/15 12:00
Northing: 1,355,520.09

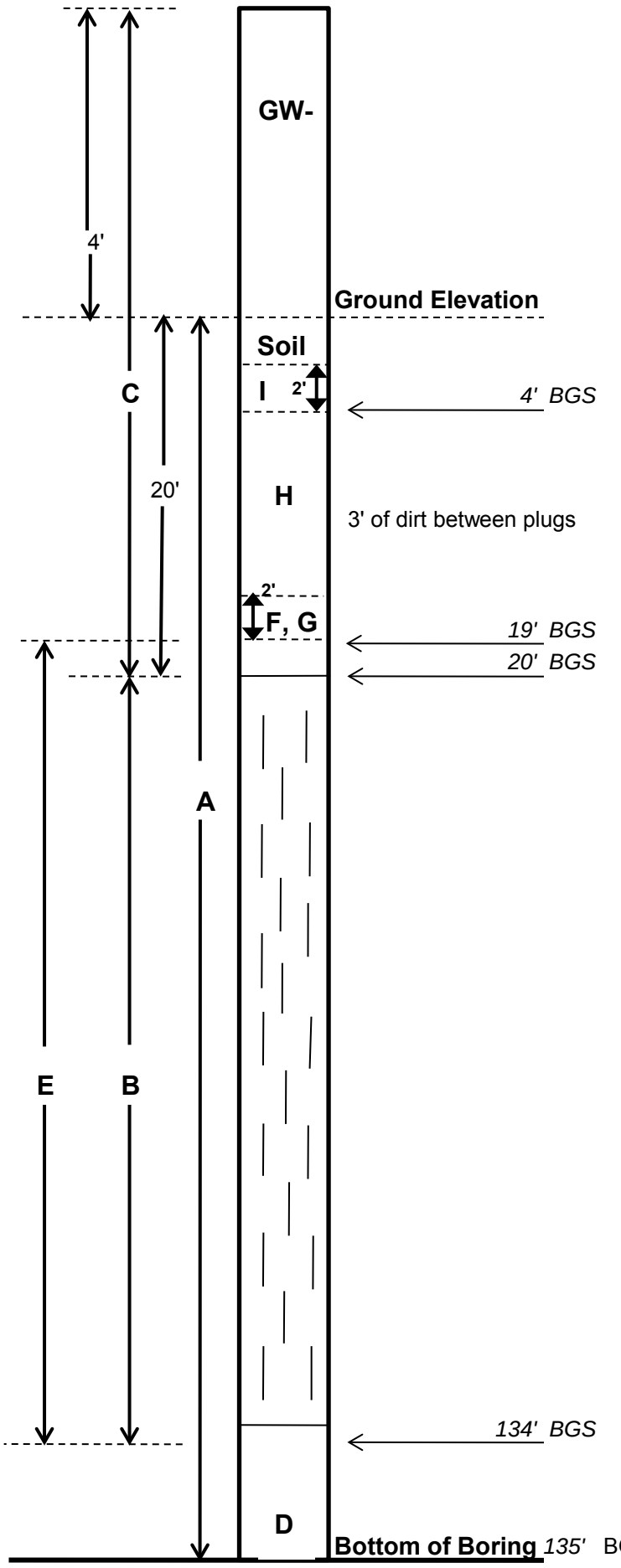
Date/Time Began Well Install: 12/30/15 12:04
Date/Time Complete Well Install: 12/30/15 13:35
Easting: 624,615.24
Ground Elevation: 245.5

		Design	Actual
A	Total Depth:	135'	135'
B	Screen Length:	114.5'	114'
C	Solid Pipe Length:	20'+4'=24'	20'+4'=24'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	134'
	◉ #57 Stone?		
E	○ #89 Stone?	☑	19'
F	GeoDisc?	☑	19'
G	1st Bentonite Seal?	☑	17'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

Depth to Top Liner: NA

Depth to Waste: 3'-4'



Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=50% M=5% D=Minimal	92	7:45
10-20	MSW Soil=20% M=5% D=Minimal	105	8:00
20-30	MSW Soil=15% M=10% D=Minimal/Moderate	108	8:11
30-40	MSW Soil=10% M=10% D=Moderate	112	8:25
40-50	MSW Soil=15% M=10% D=Moderate	114	8:42
50-60	MSW Soil=30% M=15% D=Moderate/Severe	114	8:58
60-70	MSW Soil=15% M=15% D=Moderate/Severe	118	9:14
70-80	MSW Soil=30% M=15% D=Severe	115	9:41
80-90	MSW Soil=30% M=20% D=Severe	115	9:59
90-100	MSW Soil=10% M=25% D=Severe	118	10:20
100-110	MSW Soil=10% M=30% D=Severe	115	10:45
110-120	MSW Soil=10% M=30% D=Severe	112	11:15
120-130	MSW Soil=5% M=30% D=Severe	115	11:44
130-135	MSW Soil=5% M=30% D=Severe	Final Depth 135' @ 12:00	

*Key: M=Moisture Content, D=Decomposition

Notes: Significant amout of water came in at about 97 feet BGS.
Original nomenclature was W-6.

CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-81 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/31/15 7:15
Date/Time Complete Drilling: 12/31/15 11:08
Northing: 1,355,706.57

Date/Time Began Well Install: 12/31/15 11:17
Date/Time Complete Well Install: 12/31/15 12:40
Easting: 624,708.57
Ground Elevation: 244.3

		Design	Actual
A	Total Depth:	124'	124'
B	Screen Length:	103.5'	103'
C	Solid Pipe Length:	20'+4'=24'	20'+4'=24'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	123'
	◉ #57 Stone?		
E	○ #89 Stone?	☑	19'
F	GeoDisc?	☑	19'
G	1st Bentonite Seal?	☑	17'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

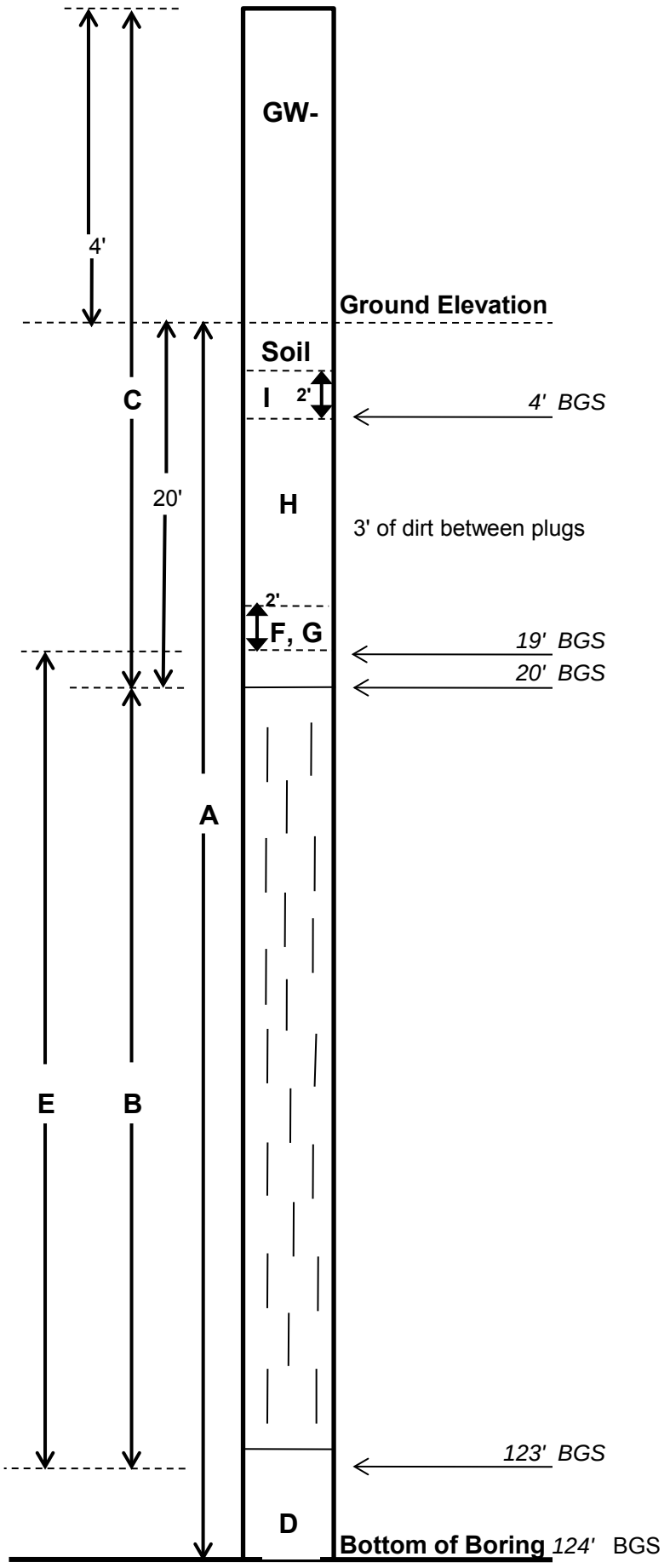
Depth to Top Liner: NA

Depth to Waste: 3'-4'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=50% M=5% D=Minimal	95	7:25
10-20	MSW Soil=20% M=5% D=Minimal	98	7:38
20-30	MSW Soil=15% M=10% D=Minimal	102	7:46
30-40	MSW Soil=15% M=10% D=Moderate	109	8:03
40-50	MSW Soil=50% M=10% D=Moderate	116	8:19
50-60	MSW Soil=50% M=15% D=Moderate	112	8:38
60-70	MSW Soil=50% M=15% D=Moderate	118	8:55
70-80	MSW Soil=40% M=15% D=Moderate	117	9:12
80-90	MSW Soil=90% M=20% D=Moderate	123	9:27
90-100	MSW Soil=40% M=20% D=Moderate	121	10:04
100-110	MSW Soil=10% M=20% D=Severe	128	10:46
110-120	MSW Soil=10% M=25% D=Severe	120	11:00
120-124	MSW Soil=10% M=30% D=Severe	Final Depth 124' @ 11:08	

*Key: M=Moisture Content, D=Decomposition

Notes: Water came in at about 124 feet BGS. Several dirt layers were observed at 40'-100' bgs. Original nomenclature was W-7.



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-83 **Site:** JED Landfill

Project #: 083-82734.43
Onsite Rep: H. Huang

Date/Time Began Drilling: 12/5/15 8:35
Date/Time Complete Drilling: 12/5/15 11:11
Northing: 1,355,331.60

Date/Time Began Well Install: 12/5/15 12:39
Date/Time Complete Well Install: 12/5/15 13:59
Easting: 625,156.90
Ground Elevation: 181.5

		Design	Actual
A	Total Depth:	80'	75
B	Screen Length:	59.5'	55
C	Solid Pipe Length:	20'+4'=24'	15'+8'=23'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	70'
	◉ #57 Stone?		
E	○ #89 Stone?	☑	14'
F	GeoDisc?	☑	14'
G	1st Bentonite Seal?	☑	12'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

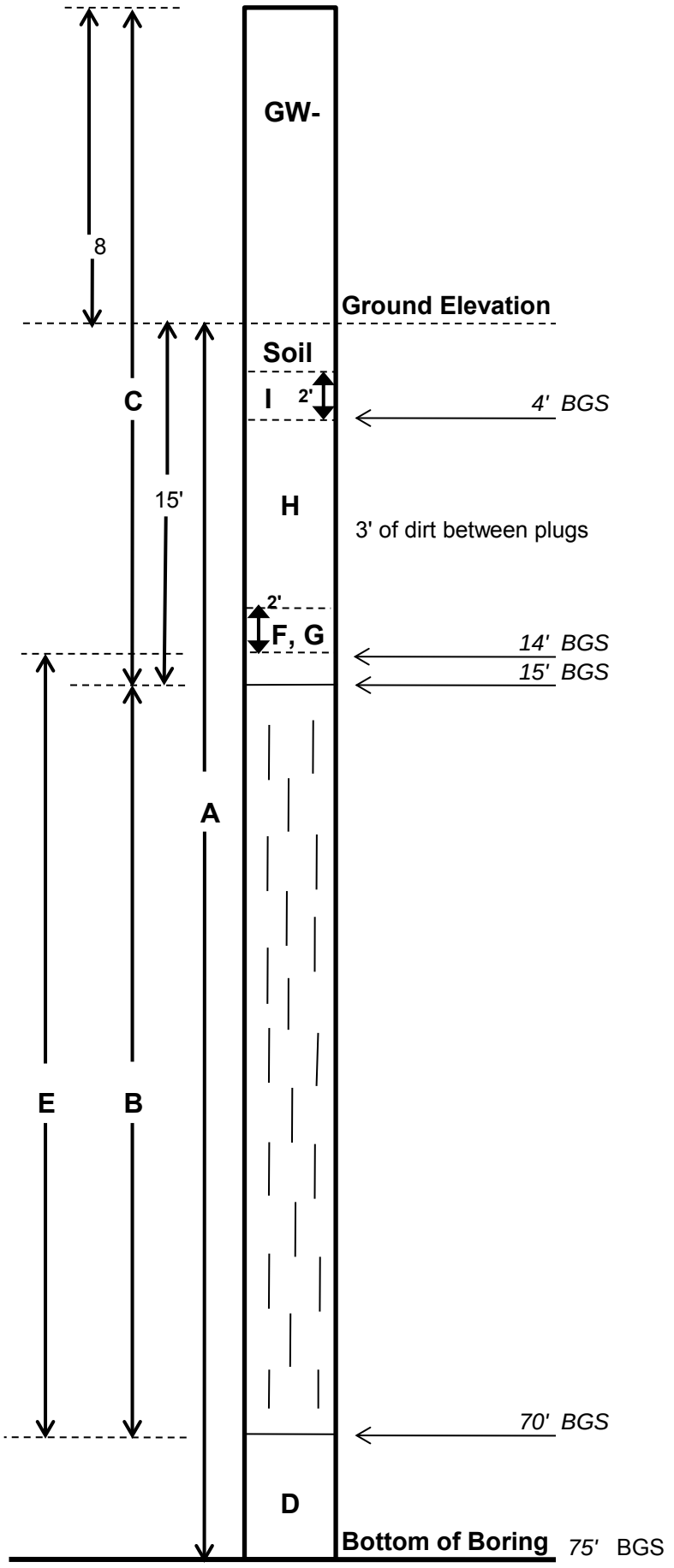
Depth to Top Liner: NA

Depth to Waste: 1'-2'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	94	8:52
10-20	MSW Soil=20% M=10% D=Minimal	106	9:08
20-30	MSW Soil=10% M=15% D=Moderate	110	9:22
30-40	MSW Soil=30% M=20% D=Moderate	110	9:44
40-50	MSW Soil=10% M=25% D=Severe	104	10:10
50-60	MSW Soil=10% M=30% D=Severe	108	10:32
60-70	MSW Soil=5% M=30% D=Severe	106	10:58
70-80	MSW Soil=5% M=30% D=Severe	Final Depth 75' @ 11:15	
80-90			
90-100			
100-110			

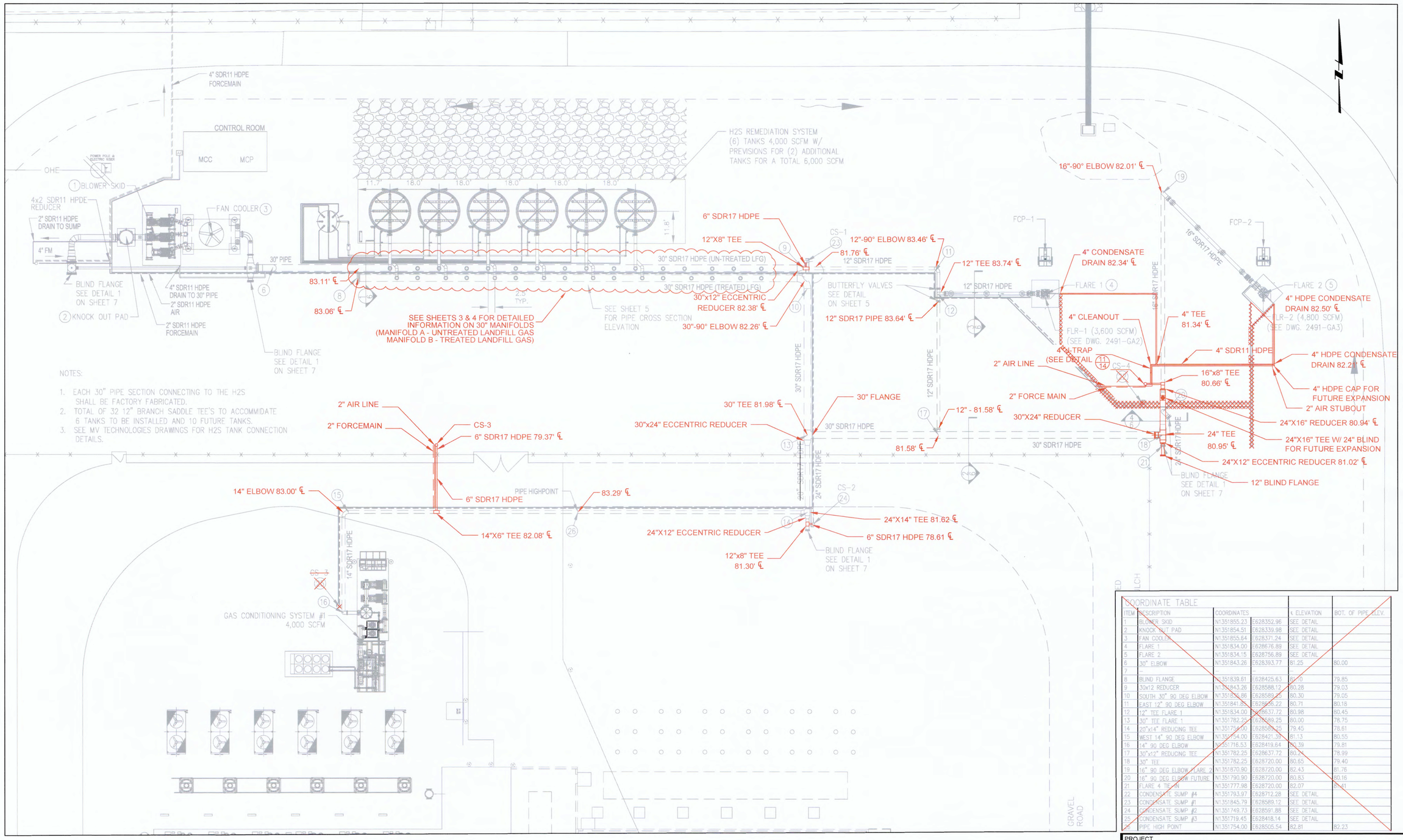
*Key: M=Moisture Content, D=Decomposition

Notes: Borehole caved in. Bottom of well was set at 70' BGS. An approximate 3' dirt layer was observed at about 35' BGS.



CQA Tech Signature: Date:

APPENDIX F
INTERCONNECT PIPING “REDLINES”



COORDINATE TABLE					
ITEM	DESCRIPTION	COORDINATES		℄ ELEVATION	BOT. OF PIPE ELEV.
1	BLOWER SKID	N1351855.23	E628352.96	SEE DETAIL	
2	KNOCK OUT PAD	N1351854.51	E628339.98	SEE DETAIL	
3	FAN COOLER	N1351855.64	E628371.24	SEE DETAIL	
4	FLARE 1	N1351834.00	E628676.89	SEE DETAIL	
5	FLARE 2	N1351834.15	E628756.89	SEE DETAIL	
6	30" ELBOW	N1351843.26	E628393.77	81.25	80.00
7					
8	BLIND FLANGE	N1351839.61	E628425.63	81.00	79.85
9	30x12 REDUCER	N1351843.26	E628586.12	80.26	79.03
10	SOUTH 30" 90 DEG ELBOW	N1351843.86	E628589.12	80.30	79.05
11	EAST 12" 90 DEG ELBOW	N1351841.05	E628636.22	80.71	80.16
12	12" TEE FLARE 1	N1351834.00	E628637.72	80.98	80.45
13	30" TEE FLARE 1	N1351782.25	E628589.25	80.00	78.75
14	20"x14" REDUCING TEE	N1351754.00	E628589.25	79.45	78.61
15	WEST 14" 90 DEG ELBOW	N1351754.00	E628421.39	81.13	80.55
16	14" 90 DEG ELBOW	N1351716.53	E628419.64	80.39	79.81
17	30"x12" REDUCING TEE	N1351782.25	E628637.72	80.23	78.99
18	30" TEE	N1351782.25	E628720.00	80.65	79.40
19	16" 90 DEG ELBOW FLARE 2	N1351870.90	E628720.00	82.43	81.76
20	16" 90 DEG ELBOW FUTURE	N1351790.90	E628720.00	80.83	80.16
21	FLARE 4 TIE-IN	N1351777.98	E628720.00	82.07	81.41
22	CONDENSATE SUMP #4	N1351793.97	E628712.28	SEE DETAIL	
23	CONDENSATE SUMP #1	N1351845.79	E628589.12	SEE DETAIL	
24	CONDENSATE SUMP #2	N1351749.73	E628591.88	SEE DETAIL	
25	CONDENSATE SUMP #3	N1351719.45	E628418.14	SEE DETAIL	
26	PIPE HIGH POINT	N1351754.00	E628505.54	82.81	82.23

NOTES

1. THIS IS A GOLDER AS-BUILT MARKUP OF "CONSTRUCTION DRAWINGS SITE PLAN" FROM BLUE FLAME CREW, LLC, FILE No. PWS004 062915 (SHEET 2), PROJECT No. PWS004-002, DATED 7/07/15.
2. REFER TO AS-BUILT SURVEY BY PEAVEY FOR DETAILED SURVEY INFORMATION INCLUDING COORDINATES AND ACTUAL PIPE FEATURE LENGTHS & LOCATIONS.
3. ELEVATIONS SHOWN ONLY FOR BELOW GRADE PIPING.

KEVIN S. BROWN LICENSE No. 57819 STATE OF FLORIDA PROFESSIONAL ENGINEER
5/20/2016

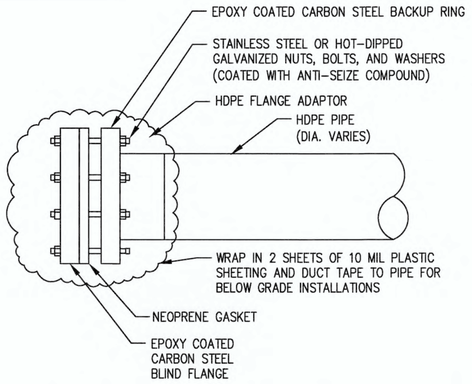
Kevin S. Brown, P.E.
Florida Registration No. 57819

PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

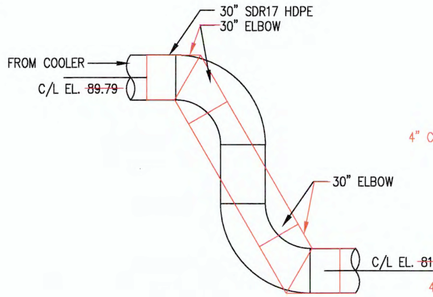
TITLE
AS-BUILT CONSTRUCTION DRAWING SITE PLAN

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

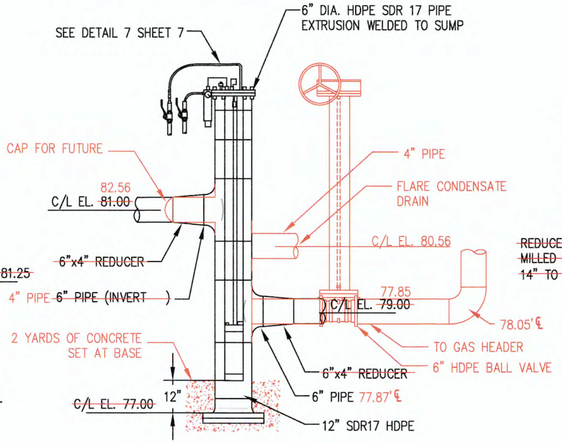
PROJECT No.		083-82734.45	FILE No.	08382734-ASB001	
DESIGN	BKP	10/06/15	SCALE	NOT TO SCALE	
CADD	BCL	10/09/15	SHEET 1		
CHECK	.	.			
REVIEW	.	.			



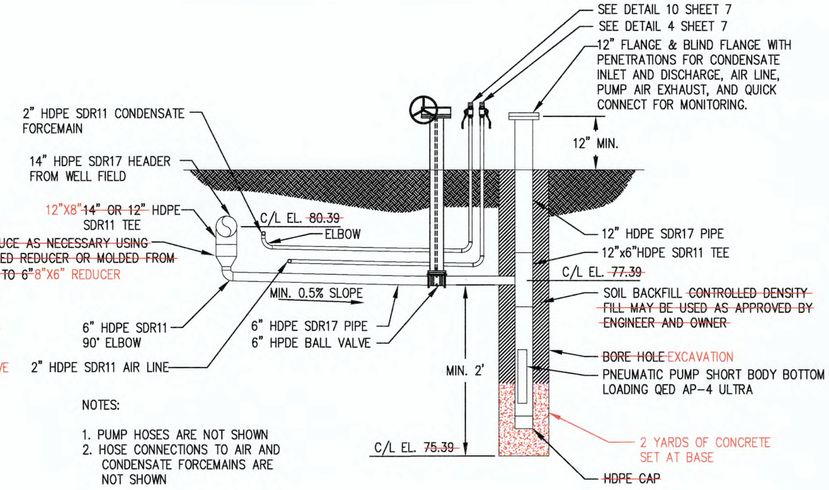
1 / 14 BLIND FLANGE ASSEMBLY DETAIL
NOT TO SCALE



2 / 14 30" BELOW GROUND PIPE CONNECTION
SCALE: 1/4" = 1'-0"



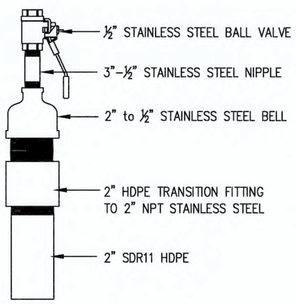
3 / 14 CS-4 FLARE SUMP DETAIL
SCALE: 1" = 1'-0" NOT TO SCALE



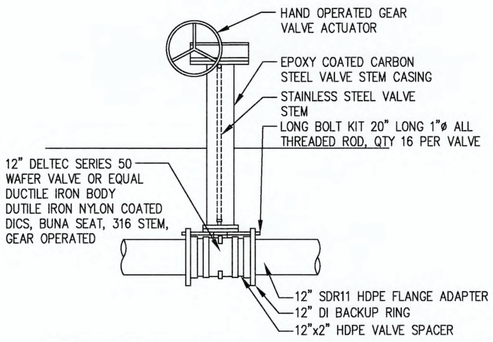
NOTES:

1. PUMP HOSES ARE NOT SHOWN
2. HOSE CONNECTIONS TO AIR AND CONDENSATE FORCEMAINS ARE NOT SHOWN

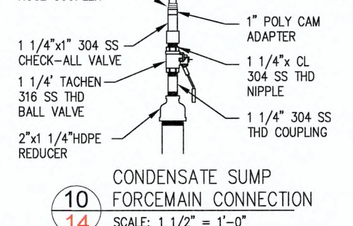
6 / 14 CS-3 OUT OF LINE CONDENSATE SUMP DETAIL
SCALE: 1/4" = 1'-0" NOT TO SCALE



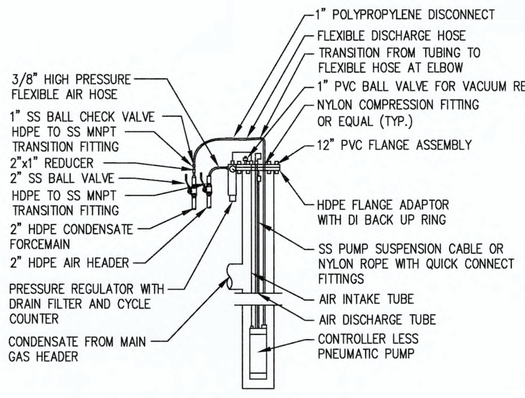
4 / 14 AIR PIPE CAP DETAIL
SCALE: 3" = 1'-0"



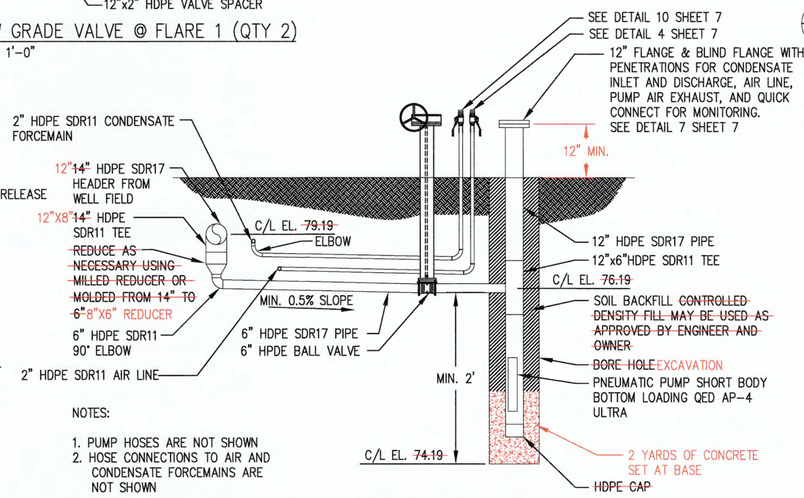
5 / 14 12" BELOW GRADE VALVE @ FLARE 1 (QTY 2)
SCALE: 1/2" = 1'-0"



10 / 14 CONDENSATE SUMP FORCEMAIN CONNECTION
SCALE: 1 1/2" = 1'-0"



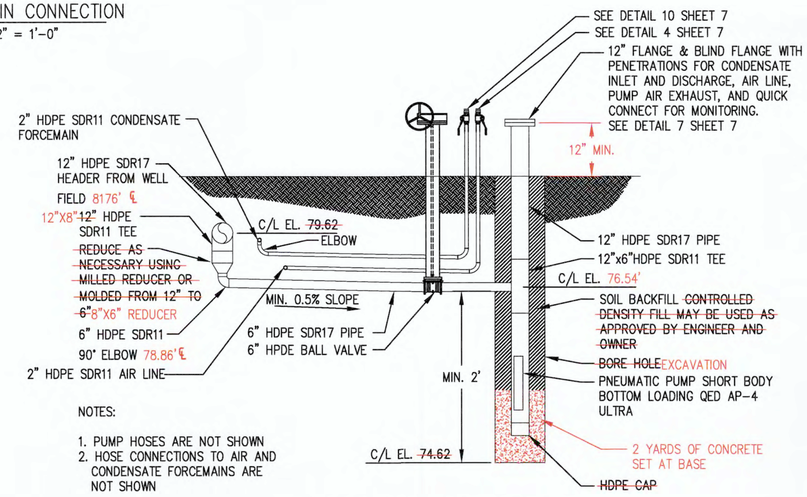
7 / 14 TYP. PUMP ASSEMBLY
SCALE: 1/4" = 1'-0"



NOTES:

1. PUMP HOSES ARE NOT SHOWN
2. HOSE CONNECTIONS TO AIR AND CONDENSATE FORCEMAINS ARE NOT SHOWN

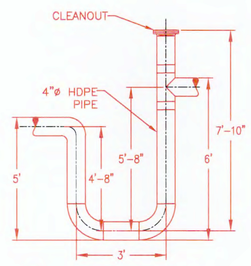
8 / 14 CS-2 14" SUMP DETAIL
SCALE: 1/2" = 1'-0" NOT TO SCALE



NOTES:

1. PUMP HOSES ARE NOT SHOWN
2. HOSE CONNECTIONS TO AIR AND CONDENSATE FORCEMAINS ARE NOT SHOWN

9 / 14 CS-1 12" SUMP DETAIL
SCALE: 1/2" = 1'-0" NOT TO SCALE



11 / 14 J-TRAP DETAIL
NOT TO SCALE

NOTES

1. THIS IS A GOLDER AS-BUILT MARKUP OF "CONSTRUCTION DRAWINGS DETAILS" FROM BLUE FLAME CREW, LLC, FILE No. PWS004 062915 (SHEET 7), PROJECT No. PWS004-002, DATED 7/07/15.

KEVIN S. BROWN LICENSE No. 57819 STATE OF FLORIDA PROFESSIONAL ENGINEER
Kevin S. Brown, P.E.
Florida Registration No. 57819

PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

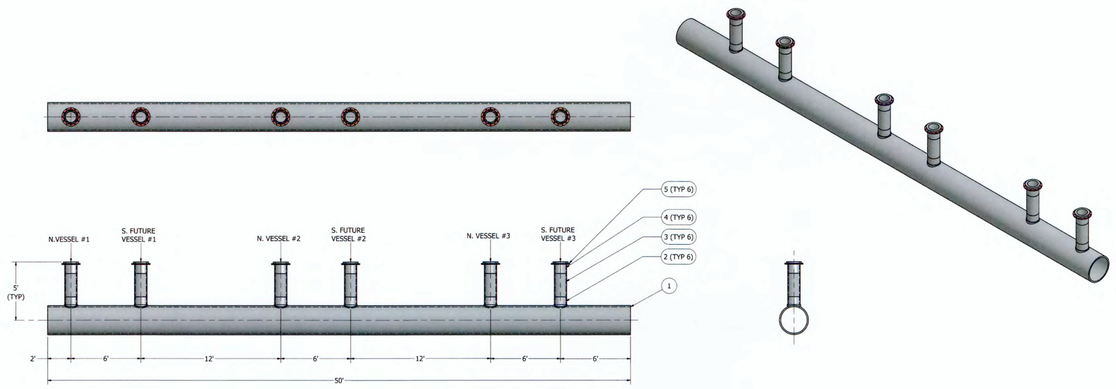
TITLE
AS-BUILT CONSTRUCTION DRAWING DETAILS

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

PROJECT No.		083-82734.45	FILE No.	08382734-ASB002
DESIGN	BKP	10/06/15	SCALE	NOT TO SCALE
CADD	BCL	10/09/15		
CHECK	.	.		
REVIEW	.	.		

SHEET 2

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	50.0 ft	10302199	30" IPS DR 21 HDPE PIPE
2	6	40121799	30" X 12" DR 17 BRANCH SADDLE
3	12.0 ft	10121714	12" IPS DR 17 HDPE PIPE
4	6	50121711	12" DR 17 FLANGE ADAPTER
5	6	53120030	12" D.I. BACKUP RING



TOLERANCE STANDARDS AS MEASURED AT AMBIENT TEMPERATURE:
-ISCO shall maintain a fabrication tolerance of ± 1/2" for all dimension shown on fabricated item(s).
-ISCO shall maintain a fabrication tolerance of ± 2° for fabricated elbows.
-(NC) marks a dimension that is not critical and requires no notification of deviation from dimension by fabricator.
*Specific tolerances may be provided by customer but must be approved by ISCO Industries prior to fabrication.
*Machined item tolerance will vary between size and part.
Contact ISCO for available tolerance.

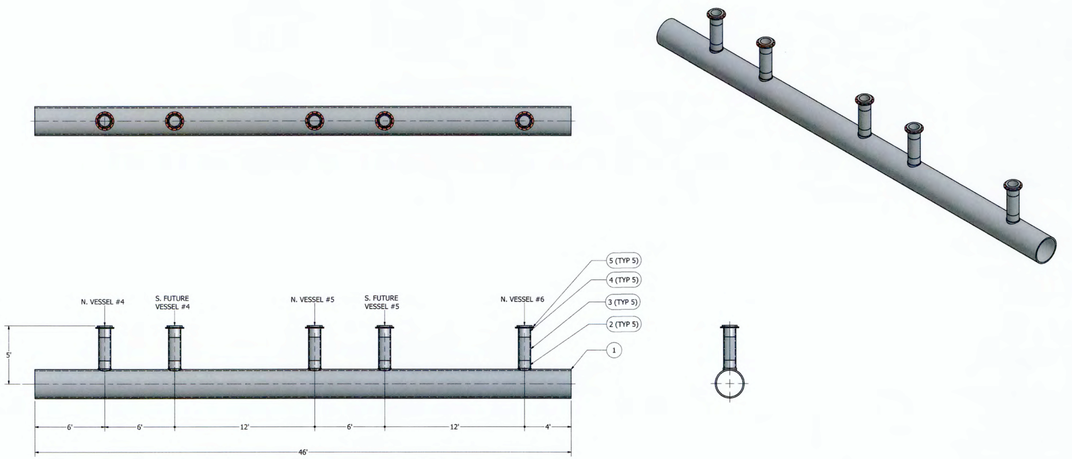
REVISION HISTORY		
REV	DESCRIPTION	DATE

DRAWN BY: WESLEY WELLS 7/2/2015
REVIEWED BY: KEVIN KOCH 7/2/2015
APPROVED BY:

ISCO INDUSTRIES www.isco-pipe.com 1-800-345-4726
NO 1" N/A NO 2" N/A
PROJECT SITE LOCATION: N/A

CUSTOMER NAME: PROGRESSIVE WASTE SOLUTIONS (JED LF)
DRAWING TITLE: MANIFOLD A4 - NO. 1
SIZE: D DWG FILE LOCATION: DF/SH/JED LF-30in MANIFOLD-063015
SHEET 1 OF 1
TERRITORY REPRESENTATIVE: STEVE HERP

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	46.0 ft	10302199	30" IPS DR 21 HDPE PIPE
2	5	40121799	30" X 12" DR 17 BRANCH SADDLE
3	10.0 ft	10121714	12" IPS DR 17 HDPE PIPE
4	5	50121711	12" DR 17 FLANGE ADAPTER
5	5	53120030	12" D.I. BACKUP RING



TOLERANCE STANDARDS AS MEASURED AT AMBIENT TEMPERATURE:
-ISCO shall maintain a fabrication tolerance of ± 1/2" for all dimension shown on fabricated item(s).
-ISCO shall maintain a fabrication tolerance of ± 2° for fabricated elbows.
-(NC) marks a dimension that is not critical and requires no notification of deviation from dimension by fabricator.
*Specific tolerances may be provided by customer but must be approved by ISCO Industries prior to fabrication.
*Machined item tolerance will vary between size and part.
Contact ISCO for available tolerance.

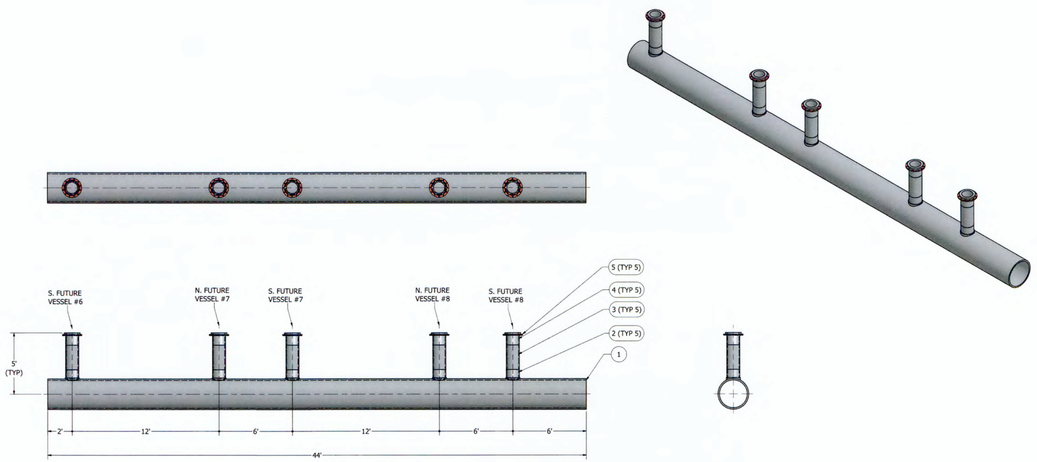
REVISION HISTORY		
REV	DESCRIPTION	DATE

DRAWN BY: WESLEY WELLS 7/2/2015
REVIEWED BY: KEVIN KOCH 7/2/2015
APPROVED BY:

ISCO INDUSTRIES www.isco-pipe.com 1-800-345-4726
NO 1" N/A NO 2" N/A
PROJECT SITE LOCATION: N/A

CUSTOMER NAME: PROGRESSIVE WASTE SOLUTIONS (JED LF)
DRAWING TITLE: MANIFOLD A4 - NO. 2
SIZE: D DWG FILE LOCATION: DF/SH/JED LF-30in MANIFOLD-063015
SHEET 1 OF 1
TERRITORY REPRESENTATIVE: STEVE HERP

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	44.0 ft.	10302199	30" IPS DR 21 HDPE PIPE
2	5	40121799	30" X 12" DR 17 BRANCH SADDLE
3	10.0 ft.	10121799	12" IPS DR 17 HDPE PIPE
4	5	50121711	12" DR 17 FLANGE ADAPTER
5	5	53120030	12" D.I. BACKUP RING



TOLERANCE STANDARDS AS MEASURED AT AMBIENT TEMPERATURE:
-ISCO shall maintain a fabrication tolerance of ± 1/2" for all dimension shown on fabricated item(s).
-ISCO shall maintain a fabrication tolerance of ± 2° for fabricated elbows.
-(NC) marks a dimension that is not critical and requires no notification of deviation from dimension by fabricator.
*Specific tolerances may be provided by customer but must be approved by ISCO Industries prior to fabrication.
*Machined item tolerance will vary between size and part.
Contact ISCO for available tolerance.

REVISION HISTORY		
REV	DESCRIPTION	DATE

DRAWN BY: WESLEY WELLS 7/2/2015
REVIEWED BY: KEVIN KOCH 7/2/2015
APPROVED BY:

ISCO INDUSTRIES www.isco-pipe.com 1-800-345-4726
NO 1" N/A NO 2" N/A
PROJECT SITE LOCATION: N/A

CUSTOMER NAME: PROGRESSIVE WASTE SOLUTIONS (JED LF)
DRAWING TITLE: MANIFOLD A4 - NO. 3
SIZE: D DWG FILE LOCATION: DF/SH/JED LF-30in MANIFOLD-063015
SHEET 1 OF 1
TERRITORY REPRESENTATIVE: STEVE HERP

PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE
MANIFOLD A4 (UNTREATED LANDFILL GAS) DETAILS

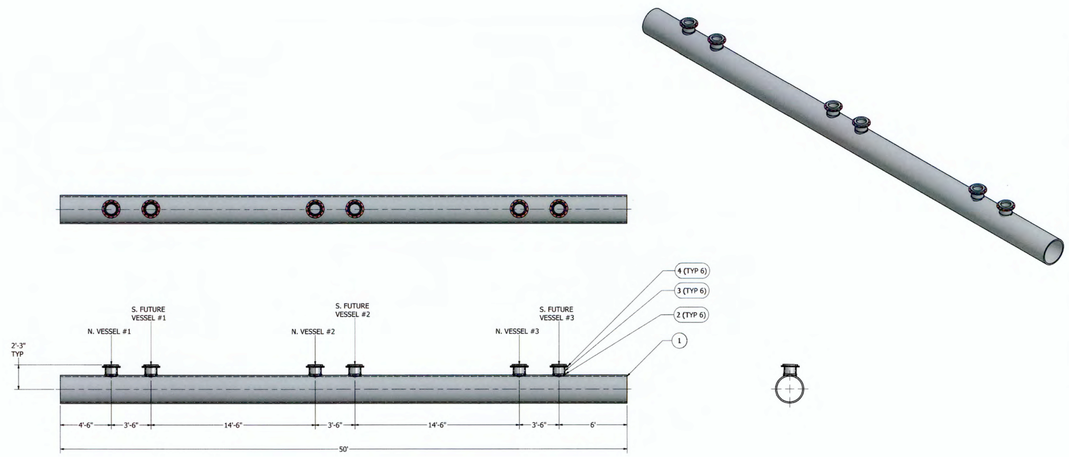
KEVIN S. BROWN LICENSE No. 57819 STATE OF FLORIDA PROFESSIONAL ENGINEER

Kevin S. Brown, P.E.
Florida Registration No. 57819

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

PROJECT No.		083-82734.45	FILE No.		08382734-ASB003
DESIGN	DEG	08/26/15	SCALE		NOT TO SCALE
CADD	BCL	08/26/15			
CHECK	.	.			SHEET 3
REVIEW	.	.			

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	50.0 ft.	10302199	30" IPS DR 21 HDPE PIPE
2	6	40121799	30" X 12" DR 17 BRANCH SADDLE
3	6	50121711	12" DR 17 FLANGE ADAPTER
4	6	53120030	12" D.I. BACKUP RING



TOLERANCE STANDARDS AS MEASURED AT AMBIENT TEMPERATURE:
-ISCO shall maintain a fabrication tolerance of ± 1/2" for all dimension shown on fabricated item(s).
-ISCO shall maintain a fabrication tolerance of ± 2° for fabricated elbows.
-(NC) marks a dimension that is not critical and requires no notification of deviation from dimension by fabricator.
*Specific tolerances may be provided by customer but must be approved by ISCO Industries prior to fabrication.
*Machined item tolerance will vary between size and part.
Contact ISCO for available tolerance.

REVISION HISTORY

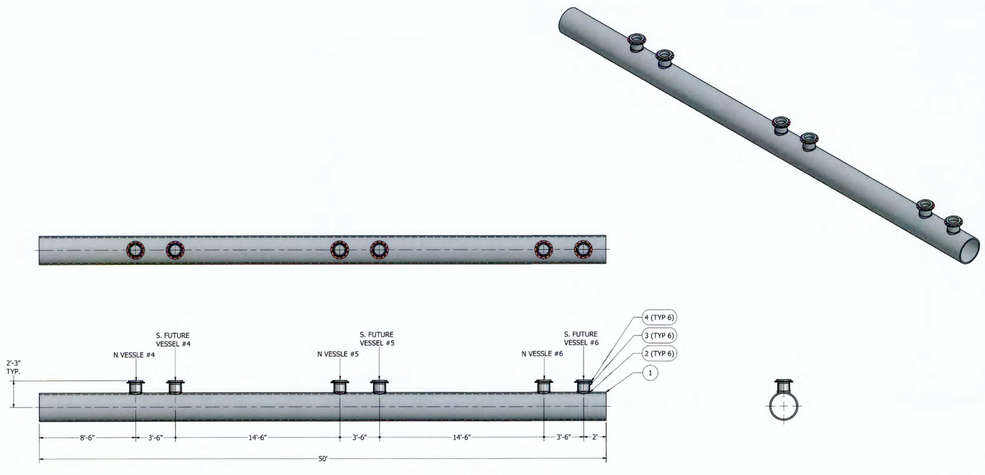
REV	DESCRIPTION	DATE

DRAWN BY: WESLEY WELLS DATE 7/7/2015
REVIEWED BY: KEVIN KOCH DATE 7/7/2015
APPROVED BY: DATE

ISCO INDUSTRIES www.isco-pipe.com 1-800-345-4726
SIZE D | DWG FILE LOCATION: DF/SH/JED LF-30in MANIFOLD-063015
SCI #: N/A | ISO #: N/A
PROJECT SITE LOCATION: N/A
SHEET 1 OF 1
TERRITORY REPRESENTATIVE: STEVE HERP

CUSTOMER NAME: PROGRESSIVE WASTE SOLUTIONS (JED LF)
DRAWING TITLE: MANIFOLD B4 - NO. 1

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	50 ft.	10302199	30" IPS DR 21 HDPE PIPE
2	6	40121799	30" X 12" DR 17 BRANCH SADDLE
3	6	50121711	12" DR 17 FLANGE ADAPTER
4	6	53120030	12" D.I. BACKUP RING



TOLERANCE STANDARDS AS MEASURED AT AMBIENT TEMPERATURE:
-ISCO shall maintain a fabrication tolerance of ± 1/2" for all dimension shown on fabricated item(s).
-ISCO shall maintain a fabrication tolerance of ± 2° for fabricated elbows.
-(NC) marks a dimension that is not critical and requires no notification of deviation from dimension by fabricator.
*Specific tolerances may be provided by customer but must be approved by ISCO Industries prior to fabrication.
*Machined item tolerance will vary between size and part.
Contact ISCO for available tolerance.

REVISION HISTORY

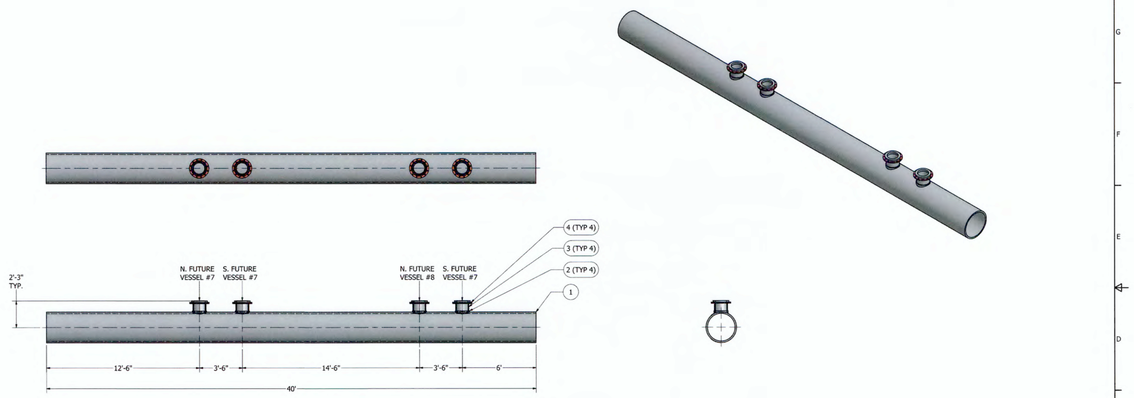
REV	DESCRIPTION	DATE

DRAWN BY: WESLEY WELLS DATE 7/7/2015
REVIEWED BY: KEVIN KOCH DATE 7/7/2015
APPROVED BY: DATE

ISCO INDUSTRIES www.isco-pipe.com 1-800-345-4726
SIZE D | DWG FILE LOCATION: DF/SH/JED LF-30in MANIFOLD-063015
SCI #: N/A | ISO #: N/A
PROJECT SITE LOCATION: N/A
SHEET 1 OF 1
TERRITORY REPRESENTATIVE: STEVE HERP

CUSTOMER NAME: PROGRESSIVE WASTE SOLUTIONS (JED LF)
DRAWING TITLE: MANIFOLD B4 - NO. 2

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	40 ft.	10302199	30" IPS DR 17 HDPE PIPE
2	4	40121799	30" X 12" DR 17 BRANCH SADDLE
3	4	50121711	12" DR 17 FLANGE ADAPTER
4	4	53120030	12" D.I. BACKUP RING



TOLERANCE STANDARDS AS MEASURED AT AMBIENT TEMPERATURE:
-ISCO shall maintain a fabrication tolerance of ± 1/2" for all dimension shown on fabricated item(s).
-ISCO shall maintain a fabrication tolerance of ± 2° for fabricated elbows.
-(NC) marks a dimension that is not critical and requires no notification of deviation from dimension by fabricator.
*Specific tolerances may be provided by customer but must be approved by ISCO Industries prior to fabrication.
*Machined item tolerance will vary between size and part.
Contact ISCO for available tolerance.

REVISION HISTORY

REV	DESCRIPTION	DATE

DRAWN BY: WESLEY WELLS DATE 7/7/2015
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SCI #: N/A | ISO #: N/A
PROJECT SITE LOCATION: N/A
SHEET 1 OF 1
TERRITORY REPRESENTATIVE: STEVE HERP

CUSTOMER NAME: PROGRESSIVE WASTE SOLUTIONS (JED LF)
DRAWING TITLE: MANIFOLD B4 - NO. 3

PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE
MANIFOLD B4 (TREATED LANDFILL GAS) DETAILS

KEVIN S. BROWN LICENSE No. 57819 STATE OF FLORIDA PROFESSIONAL ENGINEER
Kevin S. Brown, P.E.
Florida Registration No. 57819

Golder Associates
9428 Baymeadows Way, Suite 400
Jacksonville, Florida 32256
Tel: 904/363-3430 Fax: 904/363-3445
COA No. 1670

PROJECT No.		083-82734.45	FILE No.	08382734-ASB003
DESIGN	DEG	08/26/15	SCALE	NOT TO SCALE
CADD	BCL	08/26/15		
CHECK	.	.	SHEET 4	
REVIEW	.	.		

APPENDIX G

PHOTOGRAPHIC DOCUMENTATION OF CONSTRUCTION ACTIVITIES

PHOTOGRAPHS

Photograph 1: Gravel backfill for extraction wells.

Photograph 2: 8” SCH 80 slotted PVC pipe.

Photograph 3: 8” SCH 80 PVC 45° apart, staggered rows.

Photograph 4: 18” HDPE SDR 17 pipe.

Photograph 5: Drilling operations.

Photograph 6: Saturated waste at bottom of boreholes.

Photograph 7: Lag bolted joints to provide additional support (typical).

Photograph 8: Backfilling extraction well with approved stone (typical).

Photograph 9: Hydrating bentonite plug at extraction well (typical).

Photograph 10: Encasement pipe at well GW-T100.

Photograph 11: Setting has well screen (typical).

Photograph 12: Standard trench for lateral (typical).

Photograph 13: Welding HDPE lateral piping (typical).

Photograph 14: Installing new lateral assembly (typical).

Photograph 15: 18” Header pipe in trench.

Photograph 16: 18” Valve and blind flange assembly installation in Cell 10.

Photograph 17: Backfilling trench. Caution tape applied and survey posts every 50’ and at points of interest (typical).

Photograph 18: Regrading slopes with dozer (typical).

Photograph 19: Completed wellhead GW-65R1 (typical).

Photograph 20: 10-in. SDR 17 HDPE Pipe (used during horizontal collector construction).

Photograph 21: Fusing of perforated pipe for HGC (typical).

Photograph 22: Excavation of HGC trench (typical).

Photograph 23: Installation of 8-ounce geotextile (typical).

Photograph 24: Placement of tire chips (typical).

Photograph 25: Wrapping of tire chips and HGC pipe (typical).

Photograph 26: Removal of geosynthetics in Cell 1 for condensate trap drain line installation

Photograph 27: Installed condensate trap in Cell 1.

Photograph 28: View of excavation for condensate drain line installation (6” cleanout at bottom).

Photograph 29: Trenching for main 30” Headers.

Photograph 30: Checking trench slope while excavating.

Photograph 31: Installing 30” “Untreated Gas” Header.

Photograph 32: Installing 30” “Treated Gas” Header.

Photograph 33: 30” Flanged connection to Cooling Unit.

Photograph 34: Welding 30” pipe assembly to 30” elbow.

Photograph 35: Installed 30” to 24” pipe assembly.

Photograph 36: Confirming slopes of installed pipe.

Photograph 37: Installed 24” to 14” assembly.

Photograph 38: Welding 2” air and 2” forcemain.

Photograph 39: Prefabricated condensate sump assemblies.

Photograph 40: Installed flanged connection at 30” tee.

Photograph 41: Progressive staff confirming slopes and elevations of installed pipe.

Photograph 42: Installing CS-2.

Photograph 43: Installed CS-4.

Photograph 44: Concrete placed at base of CS-4 (typical).

Photograph 45: Welding air and forcemain lines adjacent to CS-2 (typical).

Photograph 46: Constructing J-trap assembly for flare condensate drains to CS-4.

Photograph 47: Welding J-trap to CS-4.

Photograph 48: Backfilling and compacting soil (typical).

Photograph 49: 4” flare condensate drain from Flare 1 to CS-4.

Photograph 50: CS-2 completely backfilled.

Photograph 51: J-trap cleanout and 4” drain from Flare 2.

Photograph 52: 16” connection to Flare 2.

Photograph 53: Flange bolts wrapped with 10 mil plastic and taped to pipe.

Photograph 54: Completed 12” connection to Flare 1.

Photograph 55: Raking of geomembrane subgrade in Cell 1.

Photograph 56: Geomembrane boot repair in Cell 1.

Photograph 57: Cleaning of geomembrane in Cell 1.

Photograph 58: Geomembrane boot repair prior to welding.

Photograph 59: GW-51R1 booting/repair of geomembrane.

Photograph 60: Welding of geomembrane repair (typical).

Photograph 61: Boot/repair in progress (typical).

Photograph 62: Vacuum box testing of completed weld (typical).

Photograph 63: GW-51R1 completed boot/repair with area regraded.

Photograph 64: Lateral tie-in boot/repair (typical).

Photograph 65: Abandoned well geomembrane repair (typical).

Photograph 66: Abandoned well geocomposite repair in progress (typical).

Photograph 67: 18-inch header repair/boot in progress.

Photograph 68: Banding of boot to 18-inch header.

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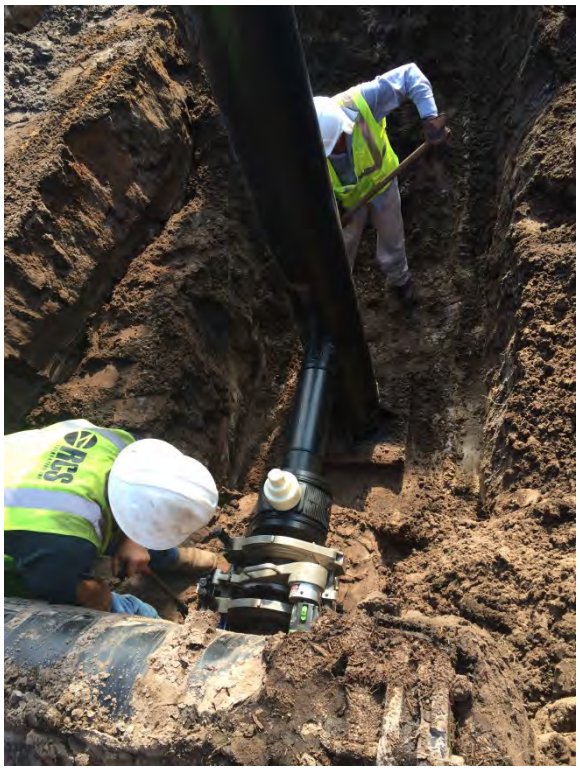

Photograph 42: Installing CS-2.

Photograph 43: Installed CS-4.

Photograph 44: Concrete placed at base of CS-4 (typical).

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Photograph 47: Welding J-trap to CS-4.

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Photograph 49: 4” flare condensate drain from Flare 1 to CS-4.

Photograph 50: CS-2 completely backfilled.

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Photograph 68: Banding of boot to 18-inch header.

APPENDIX H
AGGREGATE BACKFILL LABORATORY TEST RESULTS

JED/SOLID WASTE MANAGEMENT FACILITY/FL
SUMMARY OF SOIL DATA

Sample Identification	Sample Type	Sample Depth	Soil Classification	Natural Moisture %	Atterberg Limits				Grain Size Distribution			Compaction		Carbonate Content	Unit Weight		Permeability (cm/sec)	Additional Tests Conducted (See Notes)
					L.L.	P.L.	P.I.	L.I.	% Finer 3/4" Sieve	% Finer No. 4 Sieve	% Finer No. 200 Sieve	Maximum Dry Density (lb/cuft)	Optimum Moisture %	%	Moisture %	Dry (lb/cuft)		
JED ROCK- 1	Bulk	-	GP	-	-	-	-	-	5.3	0.8	0.2	-	-	0.02	-	-	-	-

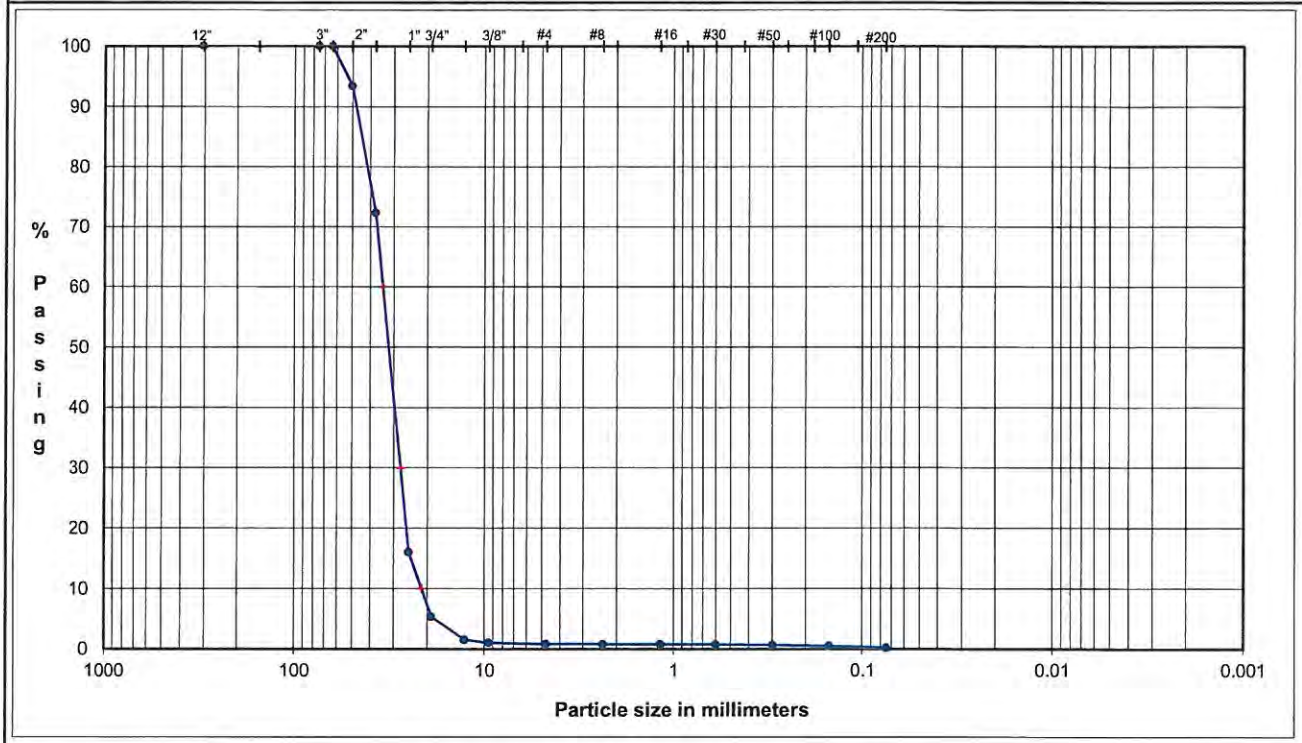
ABBREVIATIONS: LIQUID LIMIT (LL)
PLASTIC LIMIT (PL)
PLASTICITY INDEX (PI)
LIQUIDITY INDEX (LI)
SPECIFIC GRAVITY (Gs)
MOISTURE (Mc)

NOTES: T = TRIAXIAL TEST
U = UNCONFINED COMPRESSION TEST
C = CONSOLIDATION TEST
DS = DIRECT SHEAR TEST
O = ORGANIC CONTENT
P = pH

PARTICLE SIZE DISTRIBUTION

ASTM C117, C136

PROJECT NAME: **JED/SOLID WASTE MANAGEMENT FACILITY/FL**
SAMPLE ID: **JED ROCK-1** - Depth: -
TYPE: **Bulk**



	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50	**93.3**		
1.5"	37.5	**72.3**		
1.0"	25	**16.0**		
0.75"	19	**5.3**	Coarse Gravel	**94.7**
0.50"	12.7	**1.5**		
0.375"	9.5	**1.0**		
#4	4.75	**0.8**	Fine Gravel	**4.5**
#8	2.36	**0.8**	Coarse Sand	**0.0**
#16	1.18	**0.7**		
#30	0.60	**0.7**	Medium Sand	**0.1**
#50	0.30	**0.6**		
#100	0.15	**0.5**		
#200	0.075	**0.2**	Fine Sand	**0.5**
			Fines	**0.2**

D_{60}= 34.32	D_{30}= 27.65	D_{10}= 21.42
Cu = D60/D10 =	**1.6**	< 4
Cc = D30^2/(D10*D60) =	**1.0**	> 1

DESCRIPTION: GRAVEL, fine to coarse, trace fine to medium, trace fines; gray and brown.

USCS: GP M_c

TECH	TJ
DATE	7/7/15
CHECK	
REVIEW	
APPROVE	

CARBONATE CONTENT
ASTM D 3042 - MODIFIED

PROJECT TITLE	**JED/SOLID WASTE MANAGEMENT FACILITY/FL**
PROJECT NUMBER	**083-82734-43**
SAMPLE ID	**JED ROCK-1**

Residue +Tare weight (g)	601.36	601.48	602.15
Tare Weight (g)	81.70	83.35	81.88
Residue weight (g)	519.66	518.13	520.27

After Acid Application and Wash

Residue + Tare weight (g)	601.25	601.36	602.04
Residue weight (g)	519.55	518.01	520.16
Carbonate Content (%)	0.02	0.02	0.02

Average Carbonate Content (%) **0.02**

REMARKS Used pH 4 acid.

SAMPLE DESCRIPTION GRAVEL, fine to coarse, trace fine to medium, trace fines; gray and brown.

USCS GP

MODIFIED: Only the Plus No.200 Size material used in the test.

TECH	TJ
DATE	7/7/15
CHECK	
REVIEW	
APPROVE	

JED/SOLID WASTE MANAGEMENT FACILITY/FL
SUMMARY OF DATA

Sample Identification	Sample Type	Sample Depth	Soil Classi-fication	Natural Moisture %	Atterberg Limits				Grain Size Distribution			Carbonate Content %	Unit Weight		Permeability (cm/sec)	Additional Tests Conducted (See Notes)
					L.L.	P.L.	P.I.	L.I.	% Finer 3/4" Sieve	% Finer No. 4 Sieve	% Finer No. 200 Sieve		Moisture %	Dry (lb/cuft)		
JED ROCK- 1	Bulk	-	GP	-	-	-	-	-	5.3	0.8	0.2	0.02	-	-	-	-
JED ROCK-1 (December 2015)	Bulk	-	GP	-	-	-	-	-	0.7	0.6	0.1	0.03	-	-	-	-

ABBREVIATIONS: LIQUID LIMIT (LL)
PLASTIC LIMIT (PL)
PLASTICITY INDEX (PI)
LIQUIDITY INDEX (LI)
SPECIFIC GRAVITY (Gs)
MOISTURE (Mc)

NOTES: T = TRIAXIAL TEST
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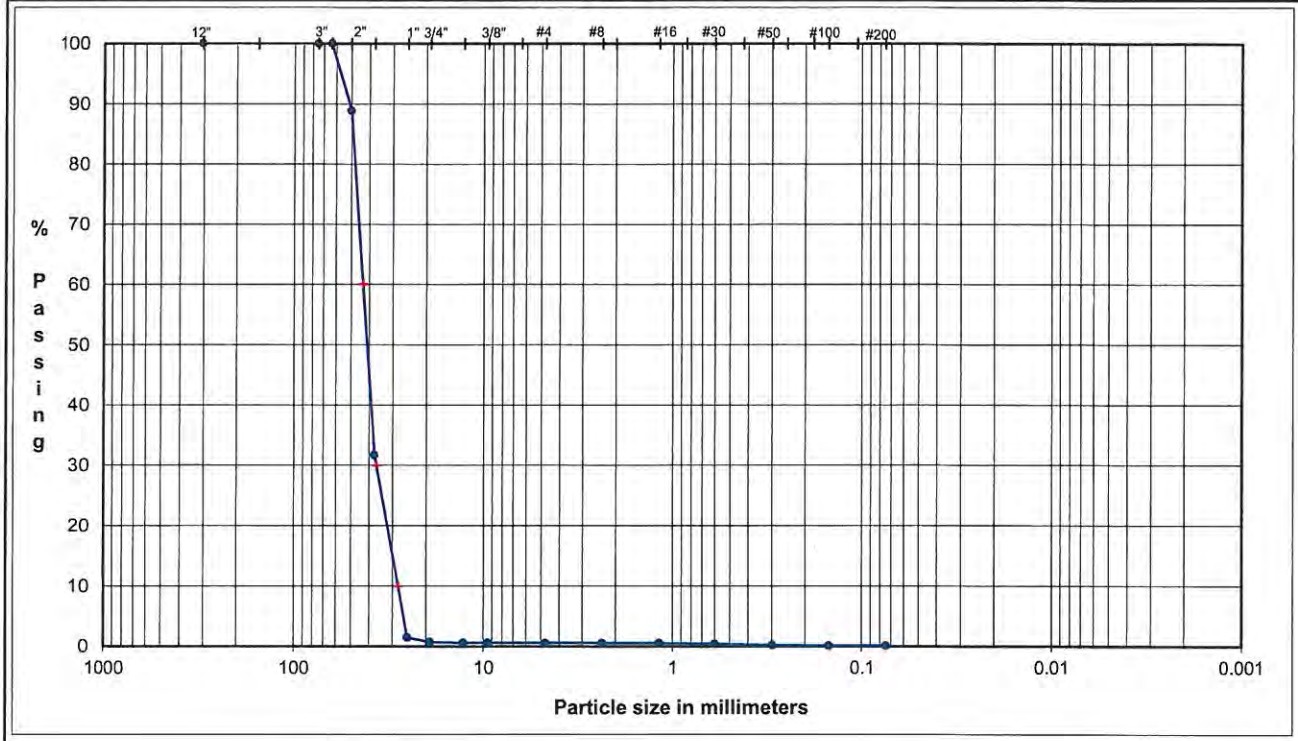
DS = DIRECT SHEAR TEST

PARTICLE SIZE DISTRIBUTION

ASTM C117, C136

PROJECT NAME: **JED/SOLID WASTE MANAGEMENT FACILITY/FL**
SAMPLE ID: **JED ROCK-1 (December 2015)** Depth: -
TYPE: **Bulk**



	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
3.0"	75	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50	**88.8**		
1.5"	37.5	**31.7**		
1.0"	25	**1.5**		
0.75"	19	**0.7**	Coarse Gravel	**99.3**
0.50"	12.7	**0.6**		
0.375"	9.5	**0.6**		
#4	4.75	**0.6**	Fine Gravel	**0.2**
#8	2.36	**0.6**	Coarse Sand	**0.0**
#16	1.18	**0.5**		
#30	0.60	**0.4**	Medium Sand	**0.2**
#50	0.30	**0.2**		
#100	0.15	**0.1**		
#200	0.075	**0.1**	Fine Sand	**0.2**
			Fines	**0.1**

D_{60}= 43.24	D_{30}= 36.64	D_{10}= 28.02
Cu = D60/D10 =	**1.5**	< 4
Cc = D30^2/(D10*D60) =	**1.1**	> 1

DESCRIPTION: GRAVEL, fine to coarse, trace fines; gray.

USCS: GP M_c

TECH	TJ
DATE	12/7/15
CHECK	
REVIEW	
APPROVE	

CARBONATE CONTENT
ASTM D 3042 - MODIFIED

PROJECT TITLE	**JED/SOLID WASTE MANAGEMENT FACILITY/FL**
PROJECT NUMBER	**083-82734-43**
SAMPLE ID	**JED ROCK-1 (December 2015)**

Residue +Tare weight (g)	586.70	589.25	587.28
Tare Weight (g)	81.68	83.25	81.72
Residue weight (g)	505.02	506.00	505.56

After Acid Application and Wash

Residue + Tare weight (g)	586.57	589.11	587.15
Residue weight (g)	504.89	505.86	505.43
Carbonate Content (%)	0.03	0.03	0.03

Average Carbonate Content (%) **0.03**

REMARKS used pH-4 acid.

SAMPLE DESCRIPTION GRAVEL, fine to coarse, trace fines; gray.

USCS GP

MODIFIED: Only the Plus No.200 Size material used in the test.

TECH	TJ
DATE	12/7/15
CHECK	
REVIEW	
APPROVE	

APPENDIX I

CONSTRUCTION QUALITY ASSURANCE ENGINEER FIELD MONITORING REPORTS AND FORMS

Location Jacksonville Beach, FL Date 3/25/15

Project / Client City Hall Cleaners

Cloudy 75°F BP/DP

1107 - %DO is high again for MW001. YSI passed PreCal but these wells are not historically high for %DO, Golder will cont sampling and ensure readings are stable DO will be checked again during Post Cal.

1308 - Begin air sparge of purge water.

1329 - Begin Post Cal of YSI & Turb.

1356 - Post Cal complete. YSI good/passed all cal checks including DO.

1408 - Air Sparge complete. Purge Water this spread over impervious surface away from storm drains.

1445 - Samples relinquished to ALS.

1510 - Demob at Golder Office, Jax, FL

End of Day

Location Hilopaw, FL Date 4/9/15

Project / Client JED LF Cell 10 HGL Install/Progressive

Clear, 80°F BKP

0650 - Golder on site. Health & Safety Review.

0710 - SCS on site.

0730 - SCS mobilizing to work area.
3 crew on site.
Equipment: Doosan DX225LC Excavator
JD 650K Dozer JD 524K Front Loader
Off road Dump Truck yet to be delivered
SCS welded lengths of Perf & Solid pipe together yesterday.
Brad Robbins w/ Progressive has staked most points

0750 - Golder check-in w/ M. Kaiser. These HGCs will not tie-in to leachate riser. These are being installed on 2nd lift and will daylight just as upper tier HGCs were designed.

0830 - Doosan D30 Offroad Dump Truck on site

0835 - Begin excavating HGC-14.
Excavation starting @ LP1 and working towards Stub Out @ ~7.0%.

1000 - JD 130G Excavator Delivered to site.

1541 - SCS evacuated to HP-1.

1613 - SCS digging Sump @ LP1. Also preparing to lay fabric.

Location Holopaw, FL Date 4/9/15

Project / Client JED LF Cell 10 HGL Install / Progressive

86°F PC BKP

1632- Sump 1 filled w/ tire chips. Approx depth = 5ft

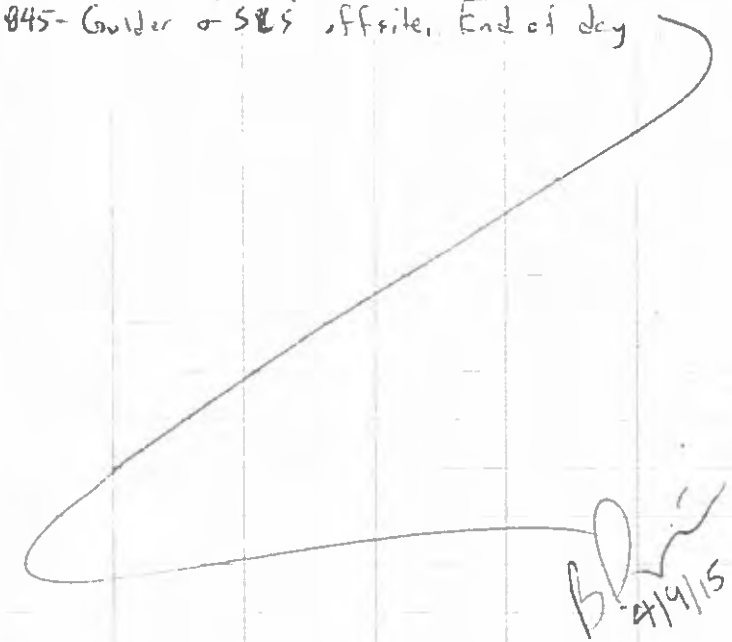
1640- SCS rolling out fabric to wrap around perf pipe.

1715- SCS moving tire chips near work area
Also placing clean fill in bottom of trench for solid pipe section.

1745- SCS laying tire chips into trench on top of fabric. 1ft then pipe then 2ft then wrap fabric.

1820- SCS dragging pipe into trench.

1845- Golder & SCS offsite. End of day



4/9/15

Location Holopaw, FL Date 4/10/15

Project / Client JED LF Cell 10 HGL Install / Progressive

64°F Clear BKP

0650 - Golder onsite Health & Safety review. BKP sign in @ LF office.

0740 - SCS on site. Cal Check Gas Meter.

0817 - Brad (Progressive) in work area to shoot as-built shots.

HGC-14-Start	14.3	
HGC-14-50	9.76	4.39%
HGC-14-LP1	5.10	
HGC-14-150		

2 more SCS reps on site for site visit.

0845 - SCS backfilling w/ tire chips.
SCS benching next run of excavation to LP2.

0907 - SCS Backfilling w/ trash from start to just past LP1.

1030 - Excavation resumes. Target slope = 5.3%
SCS cutting 3ft from surface for bench.

1310 - Excavation complete for LP2.

1430 - Excavation near HP2. SCS dragging pipe down.

1442 - SCS welding 2 lengths of pipe together.

1507 - Welding complete.
SCS resuming excavation towards HP2.

1627 - Excavation @ HP2. SCS spreading out fabric

Location Holopaw, FL Date 4/10/15

Project / Client JED LF Cell 10 HGL Install / Progressive

80°F, PC BKP

1649 - Placing tire chips on fabric

1743 - As Built Shots

HGL#150 > 5.3

HGL#HP1 > 4.8

HGL14-250 > 6.1

HGL-14-LP2

1800 - SCS Backfilling up to LP2 w/ tire chips then overlapping fabric then waste.

1900 - Golder & SCS offsite. Golder locked LF gate.

2130 - Golder arrive in Jacksonville, FL. End of day.

BKP 4/10/15

Location Holopaw, FL Date 4/13/15

Project / Client JED LF Cell 10 HGL Install / Progressive

Clear/68°F BKP

0705 - Golder onsite. Health & Safety Review

0715 - SCS on site.

0735 - SCS begin excavation for HGL-15 @ future well head location (HGL-15-start)

1400 - Excavation runs. SCS approaching LP2. 2 lengths of pipe getting dressed to work area.

1430 - LP2 excavated. Excavation complete today. SCS starting to weld 2 lengths of pipe together

1450 - SCS placing clean fill into trench for solid pipe bed.

1528 - SCS placing fabric in trench

1540 - SCS placing tire chips over fabric

1647 - Pipe in place. As-Built shots w/ Brad

HGL-15-Start > 7.7

HGL-15-50 > 9.7

HGL-15-LP1 > 5.2

HGL-15-150 > 5.2

HGL-15-HP1 > 5.2

1710 - Golder & SCS offsite. End of day

BKP 4/13/15

Location Holopaw, FL Date 4/14/15

Project / Client JED LF Cell 10 HGL Install / Progressive

Clear, 68°F BKP

0700 - Golder on site. Health & Safety Review.
0710 - SCS on site. Cal check Gas meter.
0734 - SCS backfilling w/ tire chips at pipe.
0755 - SCS backfilling w/ waste from HGC-15 - start to HP1.
0815 - Bread staking remaining points for HGC-15
Both HGCs have been shifted North by 75-ft due to existing grades not matching Construction Plans.
0912 - HGC-15 excavation resumes.
1215 - Excavation @ HP2 SCS placing fabric & tire chips into trench
The Doosan excavator is down. The rental company is en route to service it.
The excavator is parked in the path of the excavation and cannot be moved.
1358 - Synergy Equipment on site.
1444 - Doosan excavator back in service.
Excavation resume.
1622 - Excavation complete for the day.
SCS placing fabric into trench and tire chips
1645 - Golder & SCS off site. End of day

BKP 4/14/15

Location Holopaw, FL Date 4/15/15

Project / Client JED LF Cell 10 HGL Install / Progressive

PC 71°F BKP

0700 Golder on site. Health and Safety Review.
0710 SCS on site
0725 - SCS refueling equipment.
0745 - HGC-15 excavation resumed
0850 - SCS excavated and backfilled LP3.
↳ w/ tire chips
1030 - Excavation @ HP3.
1311 - SCS excavating LP4.
1505 - Excavation of HGC-15 complete.
SCS welding lengths of pipe
1700 - SCS placed pipe into trench
1720 - Golder off site. End of day.

BKP

Location Holopaw, FL Date 4/16/15

Project / Client JED LF Cell 10 HGC Install / Progressive

Clear 70°F BKP

0700 - Golder on site. Health + Safety review.

0720 - SCS on site. Golder cal check gas meter.

0753 - Brad on site for As-Built shots

HGC-15-HP1 > 5.3
HGC-15-250 > 4.7
~~HGC-15-LP2~~ > 4.1 LP22 > 5.4, 5.6
HGC-15-350 > 6.8
HGC-15-HP2 > 4.8
HGC-15-450 > 6.1
HGC-15-LP3 > 5.1
HGC-15-550 > 5.5
HGC-15-HP3 > 5.8
HGC-15-650 > 5.4
HGC-15-LP4 > 7.7
HGC-15-750 > 9.3
HGC-15-END

0840 - SCS backfilling w/ ~2ft of tire chips.

0850 - LF operations starting to move tippers.

1140 - Brad (Progressive) staking new points for HGC-14.

1200 - HGC-15 backfilled and complete.

1250 - Resume excavation at HGC-14.

1255 - LF operations removing road base from area of HGC-14. Excavation stopped until LF equipment out of the way.

Location Holopaw, FL Date 4/16/15

Project / Client JED LF Cell 10 HGC Install / Progressive

Cloudy 91°F BKP

1325 - Excavation resumes.

1500 - SCS excavating HGC-14-LP3

1539 - LP3 excavated. Placing tire chips into sump.

1645 - Excavation finished for the day at HP3

1650 - SCS spreading fabric.

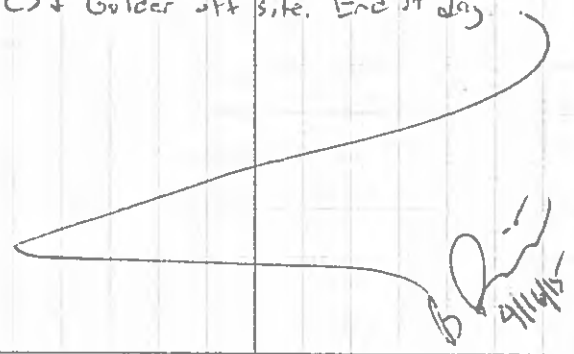
1756 - As-Builts

HGC-14-LP2 > 3.9
HGC-14-350 > 6.6
HGC-14-HP2 > 5.1
HGC-14-450 > ~~5.2~~
~~HGC-14-LP3~~ LP33 > 7.8
HGC-14-550 > ~~3.4~~ > 7.1

1815 - SCS backfilling 2ft tire chips over pipe + wrapping fabric over.

1850 - SCS backfilling w/ trash.

1930 - SCS + Golder off site. End of day.



Location: Holopaw, FL Date: 4/17/15

Project / Client: JED LF Cell 10 HGL Install / Progressive

Cloudy/Foggy 70°F BKP

0710 - Golder + SCS onsite. Health + Safety Review

0730 - SCS is backfilling a little more, appear to the 550 ft mark. Construction cannot can't right now Operations is still backing trucks into path of trench.

0815 - LF Operations starting to move out of the way of construction.

0913 - Excavation resumes.

1113 - SCS excavating LP4.

Brad (Progressive) informed Golder that there are no 10" caps on site to cap HGL stubouts. SCS will use duct tape

1128 - LP4 excavated

1255 - Excavation at HP4.

1335 - SCS excavating LP5.

1400 - Excavation for HGL-14 complete. SCS placing fabric.

1523 - SCS preparing to weld final length of pipe onto HGL-14

1616 - SCS placing pipe in trench.

1620 - As-Built shots

HGL-14-550 > 7.1

HGL-14-HP3 > 7.0

HGL-14 - 650 > 5.4

Location: Holopaw, FL Date: 4/17/15

Project / Client: JED LF Cell 10 HGL Install / Progressive

Cloudy/85°F BKP

1620 - As-Builts con't

HGL-14-LP4 > 7.5

HGL-14 - 750 > 9.0

HGL-14 - HP4 > 6.5

HGL-14 - 850 > 8.9

HGL-14 ~~LP5~~ END

1635 - SCS begin backfilling w/ tire chips + wrapping textile.

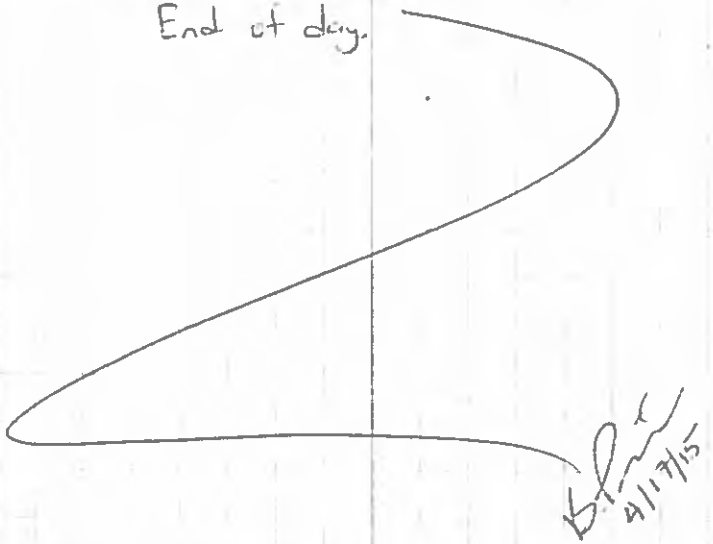
1730 - Textile wrap complete.

SCS placing some trash back into trench

1745 - Golder off site.

2100 - Arrive back in Jacksonville

End of day.



FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734. **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 6/29/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0700 leave for site
0740 arrive onsite contact Brad Robbins. Brad was onsite repairing the flare/fixing well heads
0830 spoke with Johnny Meier about what CB&I were currently working on. Golder was informed that they had approx. 200ft of 18in header pipe in the trench Cell 10 but had not covered the pipe
0950 CB&I begun to cover the header pipe approx. 150ft cell 10. Golder informed CB&I that this header pipe would need to be air tested at some point. CB&I agreed to test the pipe at a later time. Contractor could not cover all the 18in header because they still had bolts to be added to the 8in Y's that come off the header
1045 CBI stopped covering the 18in header pipe cell 10 because bolts still not onsite
1130 contractor went to lunch
1230 contractor back from lunch. Bolts had arrived onsite but the weather was taking a turn for the worse
1330 contractor decided to leave the site because of the weather. Weather was severe, a lot of lightning and heavy rain in the area.

Notes: 4 truck loads of stone arrived onsite by 1345. Golder to collect sample tomorrow and ship to Atlanta Lab.
CB&I Switched out haul truck
Golder was informed by contractor that it will likely be a couple more days before the drill rig arrives onsite. According to the contractor the truck driver fell ill and the rig is currently in Virginia waiting on another driver to deliver it to JED site

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734. **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 6/30/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0655 Golder arrives onsite speaks to CB&I about what they will be doing today
0810 Golder collects rock sample from pile to be used for the wells to be installed
0830 CB&I begins to work on the remainder of the trenching for the 18in header pipe cell 10 this takes the whole morning to complete. Also while trenching was being performed some T's were made up at the trailer
1100 CB&I have a weekly supervisor meeting then left site for lunch
1300 continue to build T's and place the 18in header pipe in the trench at cell 10
Golder Note: there will be more connections to the header pipe along cell 10 than the drawing shows as requested by Michael Kaiser. This according to Johnny with CB&I
1400-1700 CB&I cut 18in header in the locations where 8 inch Y connections are to welded. Contractor also welded two 6in attachments to the header where the final 8in tie in to the east is to be connected.
at this location the 8in horizontal pipe extends past the 18in header to the north. The horizontal pipe is also 5 to 6ft below the 18in header pipe

Note: approx. 280ft of trench for the 18in header was excavated today. Golder was also informed that the driller is leaving site tomorrow but was not informed as to when he will be coming back. There is still a delay for delivery of the drill rig.

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734. **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/1/2015 **S** M **T** **W** **T** **F** **S**

THE FOLLOWING WAS NOTED:

0700 Arrive onsite contractor gathering tools/equipment to be used today
0815 Contractor welding two 6in stick ups to 18in header east side of the header pipe
0830 Start to backfill trench/header pipe from the 150ft mark to the east side of the 18in header pipe. This was not completed because there are still two 8in Y's that need bolts for the blind flange and the 10in horizontal well on the west end of the new header needs to be tied in
0910 Started to connect the isolation valve to the 18in header pipe east side of the new header pipe install
1040 Excavating the trash above the 10in horizontal pipe east side of the site. The 10in line extended approx. 20 to 30 feet to the north and is approx. 8-10 feet below the new 18in header pipe. Cut pipe so it is closer to header
1330 Attach new 6in to the 10in horizontal on the east side of the site

1410 Contractor backfills area around 10in horizontal pipe
1500 Contractor adding extension to the isolation valve east side of the new header pipe
Contractor also placed and graded clean fill all day to grade/cover trash that was exposed during the new 18in header pipe install
1615 Contractor had a delivery truck arrive onsite. All men went to trailer to unload truck
1635 Golder left site

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/2/2015 **S** M **T** **W** **T** **F** **S**

THE FOLLOWING WAS NOTED:

I transferred trucks when I got back to the office and left my field book in the truck I moved everything into so I don't have exact times as of right now for the daily report

0655 Both Golder and CB&I arrived onsite

Morning CB&I did inventory on the parts that arrived yesterday from the delivery truck then proceeded up to cell 10 to continue work on the 18in header pipe/branch piping. Contractor spent the first couple of hours adding the second isolation valve to the 18in header that extends to the north on the far east end of the header pipe Once this was completed CB&I set up for an air test on the header and branch piping (8in Y's, 6in stickups etc.) Contractor also adding the bolts to the 8in blind flanges
1045 CB&I began to pressure up the installed piping which took an hour to get the pressure to 10psi. Both the contractor and Golder then went to lunch. Golder arrived back onsite at 1250 to check the gauge on the pressure test of the newly installed gas piping. Gauge showed 10psi after 1hr and 5min, no loss at all.

Approximately 1300 contractor began to tie into the 10in horizontal well on the western side of the 18in header. Contractor was having equipment issues with the iron to weld the pipe.

Golder contacted Progressive rep to inform that I would be leaving site and be back first thing 7/6/15. Contractor informed Golder they would only be grading the slope to cover trash that was exposed during the install on 7/3/15 so there would be no need for oversight.

Drill rig arrived onsite at 1100. Golder was informed driller should be back onsite 7/7/15

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/6/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0655 arrive onsite

0700-0730 CB&I arrive onsite 5 men

0840-1030 CB&I excavated out 8in T off the header pipe cell 9

1040 CB&I Welding pipe to connect from header cell 9 to horizontal pipe

1135 Air test the 169ft 8 inch pipe to be used for the connection from the header in cell 9 to the horizontal

1245 Pipe held pressure 10psi for the required hour

1330 CB&I pull 8in connector pipe to the trench to connect to an 8in T off the header

1350 Contractor adds an 8 inch Y to the existing 8 inch T off the header pipe cell 9

1455 finished the 8in Y to T connection and to 8 inch pipe

1510 placed survey stakes at the Y/T and mid point of the pipe from header to horizontal

1530 contractor backfilling the trench/pipe

1530 Got a call from Mike Kaiser to locate well locations at the top of LF. Mike marked out two locations and the coordinates were sent off to Don Grigg for GW T80 and T100. Brad will layout the remaining 5 GW's tomorrow morning

Note CB&I driller to be onsite Wednesday morning to start GW install

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/7/2015 **S** M **T** **W** **T** **F** **S**

THE FOLLOWING WAS NOTED:

0650 arrive onsite
0730 contractor waiting to speak to Brad about what Progressive wants completed today

0830 CB&I remove the cap that was on the horizontal well Cell9 to finish the well head connection to the pipe that was connect to the header yesterday. Once the cap was unscrewed it blew the cap approx. 100ft down the slope and then started blowing out leachate for approx. 5min(see pic)

1000 contractor finished connection the well head to the horizontal

1100 contractor moved equipment down to the area in Cell 6 where JED wants a sump install(sump2) contractor then went to lunch

1230 contractor back from lunch start excavating out sump 2 Northern 1355577.958 Eastern 625325.250 elevation 115.160
contractor loaded out trash and moved it to the existing LF

1350 Contractor had excavated down approx. 18ft and installed the 20ft sump. Contractor then backfilled the excavated area around the sump with old tire chips

1510 CB&I bolted lid to the sump and packed up equipment for the day

Note: Brad surveyed in the remaining 5 wells to be drilled and sent location/elevations to Don Grigg

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/8/2015 **S** M **T** **W** **T** **F** **S**

THE FOLLOWING WAS NOTED:

0650 arrive onsite

0730 Contractor having a H&S meeting and also discussing todays work

0810 Golder calculating the amount of well pipe onsite as requested by Mike Kaiser. Total pipe added up was solid= 200ft, perforated= 304ft, and slotted=360ft. It was also noted that the perforated was not spec'd pipe and slotted well pipe had visible deterioration from being exposed to sunlight for a long period of time.

0800 Contractor checking over the drill rig/greasing/fueling etc… Second crew went to cell 6 to install sump 1

0915 Hole excavated for the sump 1 install cell 6 to approx. 18ft BGS.
Contractor then preparing pie for install and begin to backfill with tire chips

1030 Drill rig moving from laydown area to GW T113
1125 Setting up Drill rig on GW T113
1146 start drilling GW T113. Excavator loading out trash as well is drilled.
1350 Finish drilling GW T113 to depth of 65ft. Gather rock/supplies to install well
1421 cont. to backfill sump1 cell6
1454 install screen over hole GW T113 and begin to install well.
1544 begin to add rock. Added two half buckets from the excavator tried to pull up well 1ft and it would not move. Driller tried moving the well side to side but still could not get the well to lift up 1ft. It was decided to fill the well with rock rather than break the well by trying to pull to hard.
1645 well completed GW T113

Note GW T113 was dry throughout well depth with minimal decomposition

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/9/2015 **S** M **T W** T **F S**

THE FOLLOWING WAS NOTED:

0645 arrived onsite

0710 CB&I having their H&S meeting and also discussing the agenda for the day
Contractor to rill GW T110 and Golder was informed that the other half of their crew would be dealing with the new gas system delivery/set up all day. 4 men at each location

0752 Start drilling GW T100

1038 At depth 64ft BGS. Last 14ft of drilling was wet. There was also a couple of feet b/w 10-20 ft. that was wet but was just layers.

1050 Start well install, connecting pipe to place down hole.

1121 well casing installed GW T110 contractor unloading trash from off road and then loading rock

1130 Drill rig moves to GW T109

1200 operator notices hydraulic leak on the drill rig. Hydraulic fitting broke operator leaves site to go get replacement part

1225 placing rock down hole GW T100. Once again cant pull up the well casing off the bottom of the hole cont. to install rock around screened casing

1330 GW T110 completed. Contractor dressing up the area

1500 contractor replaces bench that was removed to get the off road truck to GW t100

1530 Golder informed there will be no more drilling today. Contractor had to go further than first thought for replacement part for the drill rig.

1535 Golder informed Brad (JED) that I was leaving site. needed to go get a tire repaired from a flat that happen first thing in the morning near CB&I's laydown area

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/13/2015 **S** M **T W T F S**

THE FOLLOWING WAS NOTED:

0645 Arrive onsite

)720 CB&I conducting H&S meeting. 3man crew to work drill rig 5 men working at the new flare

0740 At drill rig GW T 109 setting up to drill well. Changed out teeth on the drilling tool

0805 Start GW T109

0912 at 40ft BGS

1225 At depth 95ft BGS GW T109. well was pretty dry. Moist at best from about 40ft to the desired depth never encountered much water

1228 Start installing well pipe

1300 well pipe install gone to get rock for the well

1322 start installing stone

1340 gone for more stone for the well and moving drill rig to next well

1400 completed stone to 10ft BGS install disc and 1st bentonite seal

1416 installed soil and 2nd bentonite seal

1430 well completed grading the area and also grading previous truck/offroad/ drill rig tracks

1530 Not going to start another well also 300ft of slotted well pipe delivered

1545 Golder leaves site

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/14/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0650 arrive onsite

0720 Fueling drill Rig

0733 start GW T 103

0848 At 45ft BGS spoils starting to get wet

0925 at 55ft added the water bucket drill spoils wet not getting much a of return of trash

0958 remove water bucket

1058 add water bucket at 71ft BGS removed at 1107

1200 Two loads of rock delivered to site

120 Change to water bucket at 87ft BGS remove bucket at 1237

1300 put water bucket back on at 94ft BGS and left it on till the final depth of 101ft BGS was reached at 1400
(Total time for water bucket on GW T103 was 1hr 39min)

1405 Start installing well pipe

1515 move drill rig to GW T104

1609 GW T103 well completed to surface and target depth was acquired

Note GW T103 was wet from 45ft BGS till final depth of 101ft BGS

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/16/2015 **S** M **T** **W** **T** **F** **S**

THE FOLLOWING WAS NOTED:

0655 arrive onsite

0725 Start drilling GW T100

0830 offroad umped two loads of soil for fill, one at GW100 and the other at GW 80

0915 operator left rig to check on something. At 0933 continue to drill GW

1000 50ft BGS

1040 truckload of rock delivered to site

1050 70ft BGS GW T100

1119 Hydraulic fitting on rig broke. Operator went to trailer found replacement part and resumed drilling @1149

1220 installed water bucket at 81ft BGS. Removed bucket at 1240

1340 switch to water bucket at 94ft BGS. At 1412 remove bucket

1447 install water bucket at 101ft BGS. At 1515 removed the bucket

1544 currently at 110ft BGS

1640 Stop drilling for the day at 121ft BGS will resume GW T100 in the morning

total time for water bucket today 1hr 10min

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/17/2015 **S** M **T W T** F **S**

THE FOLLOWING WAS NOTED:

0650 arrive onsite
0732 Cont.' to drill GW 100T depth is now at 116BGS was at 121BGS when we left site 7/16/15
0756 install water bucket
0854 at 130bgs
0907 switch out water bucket at 130bgs (1hr 11min)
0946 cant get past 103BGS rig screen depth. Tape measure depth is 126BGS
1000 Called Don he agreed to set the well at 128bgs
1010 installing well.
1045 well screen not going to depth too much slop on the bottom of the hole. Total pipe in the ground 119.5
1100 Spoke with Don he informed me to put 12in casing around the well to a depth of 12ft bgs. Will use Fernco to seal the well at the surface and also put 2 bentonite seals below surface. Also because the well is settle some it was decided to add rock to 15bgs and let is settle. Will comeback to the well to complete once we drill GW T80
1230 well had settled a foot. Total well pipe in hole from ground surface is 120.5. Contractor covered well(hole) with liner and placed bentonite bags around the hole
1310 Contractor not drilling anymore today
1330 left site

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/20/2015 **S** M **T W T F S**

THE FOLLOWING WAS NOTED:

0640 arrive onsite
0742 Start drilling GW T80
0825 @ 20BGS GW T80
0838 setting up to complete GWT100. Well has not settled out any since we left it on Friday. Still at 120.5 BGS
Cut 16ft long HDPE casing installed rock to 12ft BGS and then installed cast over well and then proceeded to bring rock up to 10ft BGS. Installed Bentonite seal at 10ft BGS and added sand to the next seal. Completed GW T100 at 0935
0932 @ 50ft BGS G T80 material still dry
1106 at 80ft BGS GW T100
1138 Operator says he is not getting anywhere drilling the hole. Brining up a lot of sand and hole keeps filling in on him. Operator says according to screen on rig he is at 87ft but when he goes back down hole he says he is getting into material at 75ft BGS.Installed water bucket at 1139.
1155 Driller informs Golder he cant get any further hole is filling in on him. Sent the weighted tape measure to the bottom of the hole it gets stops at 75ft BGS
1155 Called Don to inform him driller says he cant get any further and we should set the well. Driller concerned the well pipe getting stuck during install like GW T100
1240 Spoke with Mike Kaiser. He wants driller to try for another 45min
1335 Driller says he is still not getting anywhere material coming back is very wet and full of sand. Send the tape measure down it stops at 76ft BGS. Hook the tape measure to the rig and the bottom of the hole shows 89ft BGS. Basically 13ft of mud on the bottom of the hole
1340 Informed don/Mike setting the well at 76ft BGS. Total water bucket time 1hr
1353 installing screen
1500 install second bentonite plug
1510 well completed

1530 Johnny working on flare in the afternoon none of the laterals to the new wells have been installed as of yet

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/21/2015 **S** M **T** **W** **T** **F** **S**

THE FOLLOWING WAS NOTED:

0655 Arrive onsite

0800 CB&I start trenching for the lateral pipe to the new wells beginning at GW 118 working east

1010 207ft of trench excavated

1300 300ft of trench excavated with a 50ft branch excavated towards GW 113

1443 470ft of trench excavated towards GW T110

1450 setting up to weld pipe and add T for pipe branch to GW T113

1530 Pipe welded 500FT from GW 118 towards GW T110 and 80ftg welded toward GW T113. Place pipe in trench and start backfilling the trench. Add stakes for surveying and warning tape above the line

1645 left site

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS/Well Expansion
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 7/22/2015 **S** M **T** **W** **T** **F** **S**

THE FOLLOWING WAS NOTED:

0710 arrive onsite

0740 cont. to excavate toward GW T110

0850 Trench for pipe excavate to GW T100 con'ting on the GW T104

0941 trench excavated to GW T104 cont. to GW T80

1010 Trench excavated to GW T80 amount trenched today 613ft. Setting up to weld 8in pipe for trench to GW T104

1015 Adding 240ft of 8in pipe to the 500ft welded yesterday towards GW T104

1040 welding 8in to 6in reducers and then weld T to go to GW T103

1310 Cont. welding to GW T104 another 108ft for a total of 348ft of 8in welded today

1353 started raining very hard stop work started back to welding at 1445

1550 welding 8in to 6in reducer/stickup at GW T104 and 8in to 6in line to GW T80

1642 welding 6in 90 at GW T80 also begin to backfill trench/ install survey stakes/add gas line marking tape above pipe

1800 leave site

SUBMITTED BY GOLDER ASSOCIATES

S. Casey
MONITOR

Tuesday Aug 4, 2015 JED Landfill COA/LS

06:20 leave hotel
07:01 Arrive JED, sign in @ office, meet crew
75°F
Gene - driller
Sergio & Sergio
07:14 - 07:34 - drive around site perimeter to familiarize w/ site
07:48 Brandon showed LS 4 Gasmeter & Cal
07:53 Drill start time - CB&I
08:01 PP Review HASP & Field Sheets
09:15 ~ 30 ft deep GW-68R1 (123 ft total final)

Equipment - Soilmec SR-30 track auger
Komatsu PC 290 excavator
Off Road (articulated) dump truck Volvo A30D

10:05 AM - 53 ft down GW-68R1

10:35 - auger lost tooth removed all and reattached
58 ft down GW-68R1
↳ was a small piece of metal piping

083-82734.A3.Phase1

8/4/15 pg 2 JED Landfill GCCS 25

11:00 + Met w/ surveyor for new as built of header & laterals in cell 10
↳ left Reaven at 12:23

12:30 pm - 82 ft at GW-68R1
- Sergio & Inna on lunch break
- Grant continued drilling

1:15 - Sergio & Inna return

1:30 - 93' ft at well GW-98R1
~ moderate to heavy decomp

2:00 pm - Switch bucket to liquids bucket

2:05 pm - Begin drilling w/ liquids bucket

2:15 pm - 105 ft

2:25 pm - Switching back to standard bucket

2:35 pm - switch to liquids bucket

3:08 pm - Switch to standard bucket
↳ stuck @ 9 ft to go even w/ liquids bucket

3:25 - measure depth w/ tape top of wet material (muck)

100 ft

pg 3 | 8/4/15 | JED LF | GCCS Const | JS

3:30 pm - switch to liquids bucket again.

3:40 pm - Bottoming out at 115 ft with the liquids bucket and muck. Tape only gets to 102 ft b/c can't press through muck layer

3:45 pm - decision by BP (Golder) to set well at measured w/ tape, 114 ft
↳ measured by Sergio (CB-I)

4:00 pm - Begin well pipe install
100 ft slotted (instead of 101 to avoid (cut) 5ft)
12 ft solid under
1 ft off ground
113 ft
↳ adjust to 10 ft solid under; 0 off

6:00 pm - CB&I, Golder left site

6:30 pm - at motel

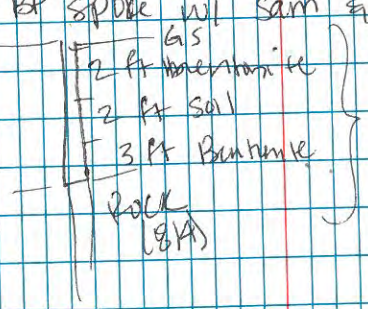
6:20 AM - 6:30 PM; 15 min lunch = 11.75 hrs

Wed Aug 5, 2015 — JED Landfill — GCCS Const — JS

0838273443

0620 - left hotel for site
0700 - Arrive at JED Landfill
75°F, overcast, sunshine in forecast
CB&I (Gene's crew) on site & prepping
LS calibrated Gas meter
0715 - check settlement (overnight) of GW-08R1
↳ Rock at 8.5 ft BGS,
meaning 8.5 ft solid
(rock at bell of slotted pipe)
• BP asked for rock at 12 ft BGS yesterday 8/4/15

0745 - CB&I Begin setting well
↳ BP spoke w/ Sam & Don (Golder)



top 2 ft bentonite plug to be wider than borehole

0800 - CB&I Began excavating for lateral tie in Cell 10 leachate cleanout Riser

pg 2 | 8/5/15 | JED Landfill | GCCS Const. | YS

0800 CB&I (Brandon) Began trench for lateral tie in excavation

↳ CB&I making repairs to the standard bucket on drilling due to damage while drilling yesterday 8/4

0915 - M. Kaiser instructed to not tie in the leachate cleanout pipe in cell 10.

↳ Now will cap & bury the connection

1005 - Welding of cap to the tie in instead of hooking up to system (Leachate cleanout riser)

↳ cap welding complete 1020

↳ Backfill w/ soil

1035 - Dump truck w/ soil stuck on LF slope on top of header in cell 10. After being pulled out, CB&I check header (excavated soil w/ hoe) to check header pipe.

pg 3 | 8/5/15 | YS | JED LF

1050 - Bolder dx's that pipe has no damage (header pipe)

↳ CB&I Backfilled to cover header pipe again

11:45 - CB&I completed burying ~~lateral~~ capped leachate riser

11:50 - Gene (CB&I) began mobilizing drilling to GW-16TR1 with repaired standard bucket

↳ sinking in pad, had to retrack pad at 1210

1242 - Began drilling GW-16TR1

1313 - Tire drilling wanted stuck in bucket of standard.

↳ cut out tire w/ chain

1325 - Resume drilling

1340 - Well at 30 ft -

↳ perched water/leachate layer at 7-10 ft, then dried again

1356 - Very wet muck at 38 ft depth

Pg 4 | 8/5/15 | JED Landfill | GCCS Const. | YS

14:15 – 36 ft to top of muck, drill goes to 43, to pushing 7 ft of muck
↳ hault drilling while we get response from Mike Kaiser

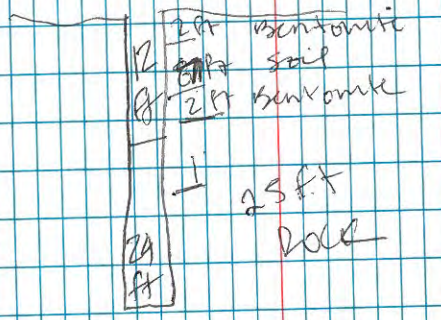
14:58 – Resume drilling to attent to get lower while waiting for response from MK

15:10 – Bucket depth at 46 ft
↳ going to attach 1 yards bucket

15:17 – Text from Mike Kaiser to set well at 36 ft depth (BGS)
↳ Brad Robbins (Progressive) indicated that the next well will be GW-65R1
↳ BP ~~not~~ texted Sam Stafford (Golder Jax) to start well schedule for GW-65R1

15:20 – CB&I begin setting GW-67R1

16:30 – BP left site, continuing with well setting



17:40 – Left site – CB&I last crew
↳ need to dress up GW-67R1 in the morning
↳ will confirm next well w/ M. Kaiser & get well schedule from Golder Jax

YS

Thursday August 6, 2015 JED Landfill 0 838273443

06:20 - left hotel, stopped for gas
07:05 - Golder arrive onsite
75°F, overcast
07:10 - CB&I onsite & begin prepping at trailer
07:23 - went over well schedule w/ Gene (CB&I)
↳ will take ~1 hr to prep slope & bench for drilling of GW-65R1

07:35 - calibrate gas meter. Golden
↳ reads high for CO_2, other parameters normal

08:20 - Begin drilling GW-65-R1

08:35 - 10 ft deep - 110°F
↳ began hitting waste at 9 ft

09:15 - 79°, Feels like 82°F, Sunny
09:30 - 37 ft deep at GW-65R1 - D- moderate
09:30 - CB&I regrading sideslope that was disturbed for GW-67R1 drilling

pg 2 | 8/16/15 | JED Landfill | GCCS Const | YS

09:50 - moderate/heavy waste decomposition (mainly heavy with a few more recognizable pieces)

10:20 - ~~Heavy decomposed~~
↳ pocket of dust or sand around 36-41 ft bgs
a knife to get through
↳ seemed like a hole down there (Gene w/ CB&I)

10:30 - 47 ft depth at GW-65R1
↳ moderate decomposition

10:45 - 50 feet depth GW-67R1 drilling
Note: only drilling occurring today
Gene's crew all here
Piping crew - Johnny in mtgs
Isaac & Sergio Jr. sick and not on site. (only Brandon from that crew on site).

11:10 - 58 ft deep
↳ heavily decomposed
↳ starting to look wet

0838273443

pg 3 | 8/16/15 | JED Landfill | 0838273443 | YS

12:00 - 67 ft deep at GW-65R1 drilling

12:34 - at 74 ft, began hitting wet waste

12:55 - Fitting on rig is broken & the rig is down - NO DRILLING
↳ Tee (silver) in rig
↳ extra fittings were used up in the last effort by Chris
(no drilling work until fixed)

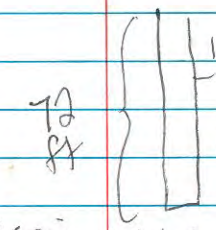
Piping work in cell 9b
16x24 electrofusion saddle, reducer to 4" riser, 4" riser top 2" tee, 45° off each side to 1" steel cap
transition fitting — Conboy will send pictures in cell 9

13:15 - measured 72 ft w/ tape to top of muck
↳ 77 with bucket

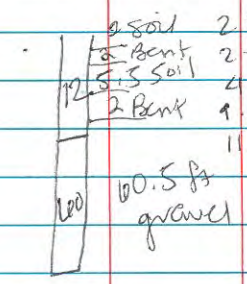
13:45 - Direction from M. Kaiser to set well
↳ Gene left at 13:40 to get new piece from Cocoa

pg 4 | 8/6/15 | JED Landfill | GCCS Construction | YS

14:10 - Begin setting GW-65R1 with excavator
↳ Johnny along w/ rest of Grenes crew



14:50 - Begin adding gravel to well
Rock to 11.5 ft



15:15 - Brad Robbins took me to see next wells to be installed
P6
P-7
GW-22R1

15:25 tie in of sumps to cleanout riser pipe - Brandon, 08382733443 has saddle & reducers installed

pg5 | 8/6/15 | JED | 08382733443 | YS

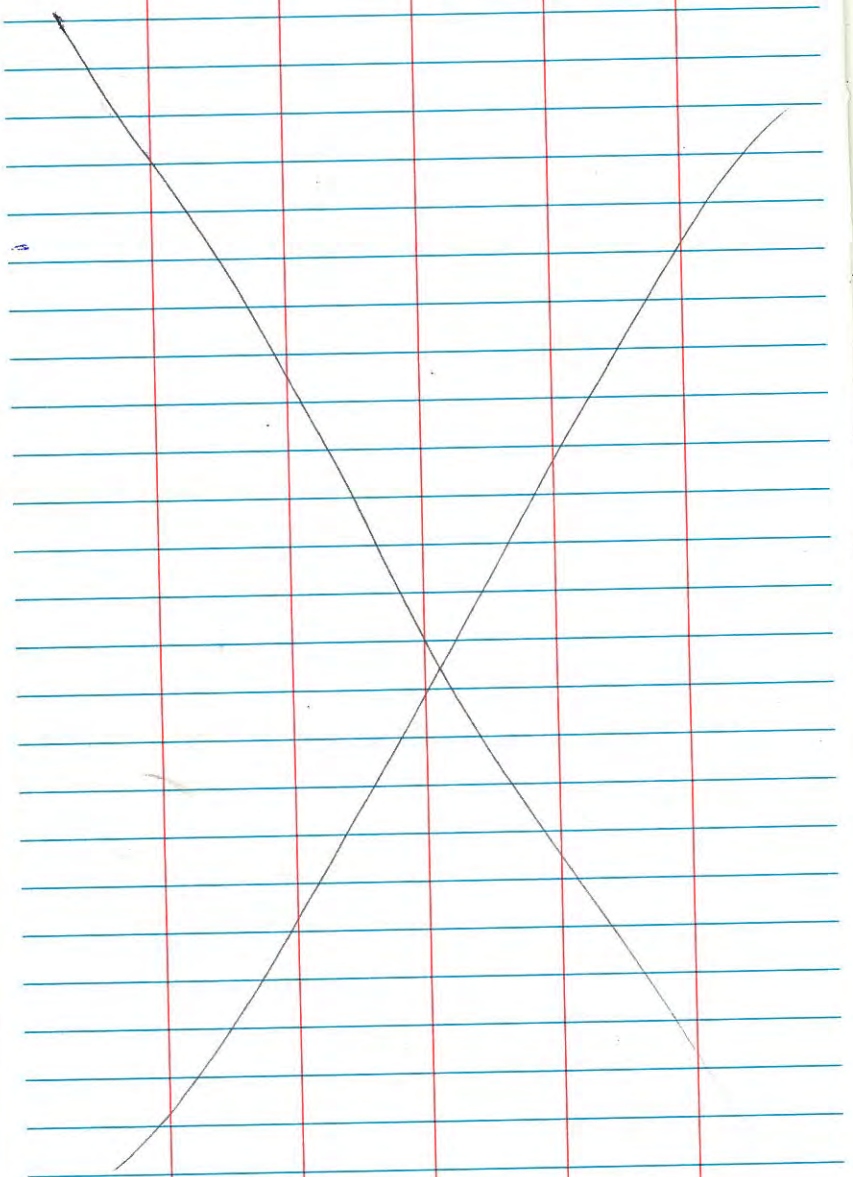
15:40 - Install Bentonite seal

15:46 - Add soil layer

15:50 - Add Bentonite seal 2
& soil to finish GW-65R1
↳ Strong thunderstorm with lightning as we were finishing rolled in at 16:00.

16:10 - Golder & CB&I leaving site
↳ We were not the last crews on site.

YS



Fri, Aug 07, 2015 JED LF hccs 08382 73443

07:00 - Grader arrived on site. CB&I prepping for day at trailer
↳ Replacement fitting was not found yesterday
↳ If replacement overnighted today, can resume drilling on Monday. Irene making calls to hydraulics shops to get fitting sent

07:30 Gene's crew will continue with sump tie in in cell 6. Johnny's crew will be at GAS plant as well as capping 2 horizontals.

08:00 - Calibrate gas meter - high reading CO 5ppm

08:20 - Johnny's crew begin continuing tie-in in cell 6
↳ 1" line prepped for install

0835 - Begin tire chips in drains at sump south of GW-69

0845 - Begin tie-in of 1" line down to sump
↳ Sump at bend of cell 6 above leachate pool

LS

pg 2 8/7/15 JEDLF GCCS YS 08382 73443

0930 – attaching steel cap transitions to the 1" 45° elbows
↳ 10:00 have not attached yet, issues w/ the threading on the steel transition & cap
• attempting to file & adjust fitting

10:35 – Begin cutting attached transition fitting
↳ need to weld new one on

10:50 – Facing LF, left (southern) elbow, transition, and hose connected.
↳ transition cap not in for right (north) elbow, using temporary steel elbow in its place

11:00 – attachment of 1" lines to tie in at sump line complete
↳ CB&I began running air compressor to bring down drains & fill w/ more chips later

11:09 – Began putting tire chips in drain N of GW-69

pg 3 8/7/15 JEP Landfill 08382 73443 YS

11:20 – CB&I crew to lunch

12:40 – CB&I (Brandon) return from lunch
↳ Check on how far leachate has gone down in the drains.

1300 – Checked level of leachate drains after 2 hours of pumping
↳ level has gone down approx 9"-1 ft on "shoreline" (can't tell down middle, too dark)
↳ CB&I going to the gas plant for pipe work

1330 – Johnny & crew will be at the Gas plant for the remainder of the day. Will not get to any additional landfill GCCS work today

15:55 – Golder leaving site.

Mon August 10, 2015 JED EXCS LF Const 0838273443

06:20 left Hotel (CB&I + 1 person crew)

07:00 - Golder & CB&I arrive on site
↳ Gene says fitting has not arrived - no drilling for today
↳ will try to locate fitting when shop opens up

07:10 - spoke to Mike Kaiser about demobilizing

07:45 - CB&I mobilizing to fill in (11) to backscale strains with fine chips

09:45 - Staked out new wells (PW, PT, GW-22R) with Gene to evaluate access to points

10:00 - Gene (CB&I) got call from his guy arrived in Melbourne, went to retrieve it.

10:10 - CB&I says drilling shut down after conversation w/ Mr. Kaiser

JS

Pg 2 8/10/15 JED LF GCCS const. 08382 73443

11:20 - Begin capping @ HGC-7 and HGC-1.

11:00 - Leachate draining out of HGC-7 to cap
↳ Leachate still draining out 11:15 (see pg 1 25)
↳ cut off 6" pipe
↳ cut HGC pipe

11:48 - Begin electrofusing cap to HGC-7 (prep)
↳ Sanding/cap grinding

12:35 - Finish fusing cap of HGC-7.

12:45 - Finish cap of HGC-7

12:55 - Begin capping @ HGC-1
↳ Knock down & open wellhead
(up slope from GW-92 (or 121)

1333 - Begin fusion of cap

AS

Pg 3 8/10/15 JED LF GCCS const 08382 73443 YS

13:50 - HGC-1 capped
- Begin capping 6" pipe directly below (on side slope)

14:10 - finish capping 6" line

14:15 - Gene has drilling Rxed w/ new part
↳ drilling still down @ site — direction from M. Kaiser

14:20 - 6" line covered back up

14:35 - working on laterals & 3 retrilled wells (GW8R1, GW7R1, GW5R1)

15:15 - GW-68R - Brad wants cut Golder advises (B&H) to mound dirt and have solid pipe 3 ft above mound

15:20 - cut and capped abandoned well 68. Placed plywood on top of capped well (per Brad).

16:00 - CBS 1 finished dressing GW-68R1 & connected to lateral
↳ will connect GW-67R1 and 65-R1 tmorrw

16:

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 Cell 1 Geomembrane Repair

OWNER: Omni Waste

LOCATION: JED Landfill **CONTRACTOR:** Comanco

DATE 12/1/2015

S M **T** **W** **T** **F** **S**

THE FOLLOWING WAS NOTED:

Golder arrived onsite at 07:00

Comanco arrived onsite at 09:00 with 3 crewmembers. Comanco began using a forklift at 10:00 to unroll the necessary amount of geomembrane to complete the repair. This length of geomembrane was taken from Roll # G14C332022, LDPE 40mil liner. Comanco transported material to repair area.

Comanco began raking the subgrade while Golder checked for trash, roots, or other debris that might compromise the integrity of the geomembrane when in place.

At 12:30, Comanco began deploying liner over the repair area. Two panels were set into place. The first panel (P1R) was 41-ft in length and the second panel (P2R) was 45-ft in length.

At 13:15, Comanco began leistering the seams together in preparation of extrusion welding. At this time Golder began marking defects and repairs. When the seams were all leistered, Comanco then began leistering all boots and skirts into place for three risers.

Comanco completed leistering the boots and skirts at 16:30 and started to clean up for the day. Golder left the site at 17:00.

SUBMITTED BY GOLDER ASSOCIATES

B. Poiencot/H. Huang

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 Cell 1 Geomembrane Repair
OWNER: Omni Waste
LOCATION: JED Landfill **CONTRACTOR:** Comanco

DATE 12/2/2015

S M **T** **W** **T** **F** **S**

THE FOLLOWING WAS NOTED:

Golder and Comanco arrived onsite at 07:00

Comanco began clearing liner of dirt and debris at 07:30 in preparation of welding.

Golder inspected the exposed existing liner for any damage that may need to be repaired.

Comanco completed their first trial seam at 08:10. Trial seams passed destructive testing at 08:40 and welding started at 08:51.

All seams and repairs were completed by 15:30.

Three very large wrinkles were observed in the existing liner. These wrinkles were cut and repaired. Also five areas of the existing liner were damaged during excavation. These areas were also repaired. Vacuum testing of all seams and repairs was completed by 16:25. One small "hole" was left open to prevent bubbles from forming.

Golder and Comanco were offsite at 17:00.

SUBMITTED BY GOLDER ASSOCIATES

B. Poiencot/H. Huang

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 Cell 1 Geomembrane Repair

OWNER: Omni Waste

LOCATION: JED Landfill **CONTRACTOR:** Comanco

DATE 12/3/2015

S M **T W** T **F S**

THE FOLLOWING WAS NOTED:

Golder arrived onsite at 07:10. Comanco arrived at repair area at 07:30.

At 08:00, Comanco began deploying geocomposite over the repair area using a forklift and cut the geocomposite into panels in proper sizes.

At 10:00, Comanco started zip tying geonet together, followed by sewing operations at 11:00.

At 13:00, RCS started unloading cover soil using a CAT 725C articulated dump truck.

At 13:15, RCS began using a CAT D6K dozer to push cover soil into repair area and spreading the soil.

At 14:25, rain occurred and fieldwork stopped. During this time, Comanco started their trial seam for the day. Trial seams passed destructive testing at 14:40.

At 15:00, Comanco repaired the open hole left (defect 1D) and completed vacuum testing of the seam.

At 15:16, Comanco finished repairing for the area and putting geocomposite in place.

RCS resumed spreading cover soil in the repair area. At 16:10, RCS finished spreading the cover soil and left the repair area.

Comanco will return tomorrow to clean the work area and install steel bands on risers.

Golder and Comanco were offsite at 16:30.

SUBMITTED BY GOLDER ASSOCIATES

H. Huang

MONITOR

GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: 083-82734 PROJECT TITLE: Cell 1 Liner Repair
OWNER: Progressive
LOCATION: J.E.D. Landfill CONTRACTOR: Commercial

☐ TF - # = FUSION DATE 12/2/15
☒ TX - # = EXTRUSION SHEET NUMBER 1

SAMPLE NUMBER	APPROX. TIME	WELDING MACHINE NUMBER	WELD TECH.	TEMPERATURES: AMBIENT AIR TEMP.	TEMPERATURES: PREHEAT OR MACHINE SPEED	TEMPERATURES: EXTRUDER	TEMPERATURES: NOZZLE OR WEDGE	TEST RESULTS: INSIDE PEEL MODE STRENGTH	TEST RESULTS: OUTSIDE PEEL MODE STRENGTH	TEST RESULTS: SHEAR MODE STRENGTH	PASS OR FAIL	MON.	REMARKS
TX-1	0810	ET-A061	HE	74°	475	400	400	63/72/61	~~35~~/74/	87/85	P	BP	
								~~75~~ 75/74	/ /	89/87			
TX-2	1340	ET-A061	HE	87°	475	400	400	71/68/71	/ /	78/78	P	BP	
								72/86/	/ /	82/86			
TX-3	1420	A061	HE	70°F	475	400	400	94/80/82	/ /	111/97	P	BP	12/3/15
								89 89/	/ /	103/98			
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REVIEWED BY: [illegible] DATE: 1/6/16

GCS FORM: G12
(JUNE 1992)

GOLDER ASSOCIATES

GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: 083-82739.43
PROJECT TITLE: Cell 1 Repair
OWNER: Progressive Waste
LOCATION: JED Landfill Holopaw, FL
CONTRACTOR: Comarco

GEOMEMBRANE: SECONDARY PRIMARY (CLOSURE) OTHER _____
SUBGRADE CONDITION (SURFACE COMPACTION, PROTRUSIONS, DESICCATION, EXCESSIVE MOISTURE):
REMARKS: _____

DATE: 12/1/15

TRANSPORT EQUIPMENT: Forklift
SHEET NUMBER: 1

DESCRIPTION	PANEL NUMBER P1R	PANEL NUMBER P2R	PANEL NUMBER
ROLL NUMBER	G14C332022	G14C332022	
DEPLOYED LENGTH	41'	45'	
AMBIENT AIR TEMP.	86°F	86°F	
VISUAL OBSERVATION	Y	Y	
OBSERVED OVERLAP	>6"	>6"	
MONITOR	BP	BP	
REMARKS	None	None	
SHEET THICKNESS	LEAD L SIDE R SIDE TRAIL	LEAD L SIDE R SIDE TRAIL	LEAD L SIDE R SIDE TRAIL
AVERAGE			

DESCRIPTION	PANEL NUMBER	PANEL NUMBER	PANEL NUMBER
ROLL NUMBER			
DEPLOYED LENGTH			
AMBIENT AIR TEMP.			
VISUAL OBSERVATION			
OBSERVED OVERLAP			
MONITOR			
REMARKS			
SHEET THICKNESS	LEAD L SIDE R SIDE TRAIL	LEAD L SIDE R SIDE TRAIL	LEAD L SIDE R SIDE TRAIL
AVERAGE			

REVIEWED BY _____ DATE _____

GCS FORM: G11
(JUNE 1992)

GOLDER ASSOCIATES

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: 083-82734.43
PROJECT TITLE: Cell 1 Liner Repair
OWNER: Progressive
CONTRACTOR: Cameco
LOCATION: J.E.D. Landfill

☐ FUSION
☒ EXTRUSION

MACHINE # AD61

PASSING TRIAL SEAMS

NO.	TIME	TECH ID
TX-1	0810	AL
TX-2	1340	AL

DESTRUCTIVE LENGTH CARRY-OVER FROM PREVIOUS LOG: —

DATE 12/2/15

SHEET NUMBER 1

	SEAM NUMBER	SEAM SECTION* START POINT	SEAM SECTION* FINISH POINT	APPROX. START TIME	AMB. AIR TEMP.	WELD TECH.	PREHEAT OR MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL	MACHINE TEMPERATURES DIGITAL SET NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL	MACHINE TEMPERATURES INDICATOR NOZZLE	APPROX. LENGTH WELDED	LENGTH FROM PREVIOUS DESTR.	DESTR. NUMBER	MON.	REMARKS	** NON-DESTRUCTIVE TEST DATE	** NON-DESTRUCTIVE MON.
1	P1R / WEDP Exit	WEDP	- EEDP	0851	75°F	HE	475	400	-	-		20'	—	—	BP	—	12/2/15	BP
2	P1R / WEDP Exit	SEDP	- NEDP	0858	75°F	HE	475	400	-	-		36'			BP	—	12/2/15	BP
3	P1R / SEDP Exit	EEDP	- WEDP	0913	78°F	HE	475	400	-	-		14'			BP	—	12/2/15	BP
4	P1R / P2R	NEDS	- SEDS	0921	78°F	HE	475	400	-	-		35'			BP	—	12/2/15	BP
5	P2R / SEDP Exit	EEDS	- WEDS	0956	80°F	HE	475	400	-	-		28'			BP	—	12/2/15	BP
6	P2R / EEDP Exit	SEDS	- NEDS	1015	82°F	HE	475	400	-	-		26'			BP	—	12/2/15	BP
7	P2R / SEDP Exit	NEDS	- EEDS	1025	82°F	HE	475	400	-	-		20'			BP	—	12/2/15	BP
8	/	-							-	-								
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16	/	-							-	-								
17	/	-							-	-								

DAILY TOTAL: 179

DESTRUCTIVE LENGTH CARRY-OVER: —

* REFERENCE SEAM ENDPOINTS FROM AN END OF SEAM (EOS), A REPAIR NUMBER, OR A POINT LOCATION ON THE SEAM.

** COLUMNS TO BE USED BY THE DATA REVIEWER ONLY

GCS FORM: G13
(JUNE 1992)

REVIEWED BY: [signature] DATE: 1/8/16

GOLDER ASSOCIATES

GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: 083-02739.43 **PROJECT TITLE:** Cell 1 Liner Repair
OWNER: Progressive
LOCATION: J.E.D. Landfill **CONTRACTOR:** Comanco

SHEET NUMBER 1

DEFECT CODE	DEFECT LOCATION: SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION: DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	** REPAIR DATE	** TEST DATE
A	P1R	24'N of SEOP	BS	12/1/15	BP		12/2/15	12/2/15
B	P2R	18'N of SEOP	BS	12/1/15	HH		12/2/15	12/2/15
C	P2R	15'N of SEOP	BS	12/1/15	HH		12/2/15	12/2/15
D	~~R183~~ R183	12'S of W. EV	D	12/1/15	HH		12/3/15	12/3/15
E	P22 West Seam	NW corner of Panel	CO	12/2/15	BP		12/2/15	12/2/15
F	Existing N. P1R	4'E of P1R/P2R NEOS	D	12/2/15	BP		12/2/15	12/2/15
G	Existing E. of P2R	3'E of P2R SEOP	D	12/2/15	BP		12/2/15	12/2/15
H	Existing N of P2R	~5'N of P2R SEOP	WR	12/2/15	BP		12/2/15	12/2/15
I	Existing N of P2R	~5'N of P2R SEOP	WR	12/2/15	BP		12/2/15	12/2/15
J								
K								
M								
N								
P								
Q								
R								
S								
T								
W								
X								

AD - ANIMAL RELATED DAMAGE
B - UNDISPERSED RESIN BEAD
BO - FUSION WELDER BURN
BS - BOOT/SKIRT FOR FML PENETRATION
CO - CHANGE OF OVERLAP
CR - CREASE
D - INSTALLATION DAMAGE
DS-# - DESTRUCTIVE TEST NUMBER
EE - EARTHWORK EQUIPMENT DAMAGE
EXT - EXTENSION
FM - FISHMOUTH
FS - FAILED SEAM LENGTH
FTS - FIELD TEST STRIP
HT - HEAT TACK BURN
IO - INSUFFICIENT OVERLAY (UNDER SPEC)
MD - MANUFACTURER/DELIVERY DAMAGE
PT - PRESSURE TEST CUT
SI - SOIL SURFACE IRREGULARITY
SL - SLAG ON TEXTURED SHEET
T - THREE PANEL INTERSECTION
VL - VACUUM TEST LEAK
WR - WRINKLE
WS - WELDER RESTART
OTHER

** COLUMNS TO BE USED BY THE DATA REVIEWER ONLY.

REVIEWED BY: [signature] **DATE:** 1/6/16

GCS FORM: G18
(JUNE 1992)

GOLDER ASSOCIATES

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: 083-82734.43 PROJECT TITLE: Cell 1 Liner Repair
OWNER: Progressive
LOCATION: J.E.D. Landfill CONTRACTOR: Comanco

PASSING TRIAL SEAMS

NO.	TIME	TECH. ID
TX-1	0810	AL
TX-2	1340	AL
~~TX-3~~		

MACHINE NUMBER A061 DATE 12/2/15

SHEET NO. 1

	DEFECT CODE	REPAIR DATE	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSION	WELD TECH.	MON.	REMARKS
1	1A	12/2/15	0945	B-S	25' weld	HE	BP	
2	1B	12/2/15	1045	B-S	20' weld	HE	BP	
3	1C	12/2/15	1105	B-S	25' weld	HE	BP	
4	1F	12/2/15	~~0810~~ 1142	P	2x2 = 8'	HE	BP	
5	1E	12/2/15	1015	C	14' Weld	HE	BP	
6	1G	12/2/15	1133	P	2x2 = 8'	HE	BP	
7	1H	12/2/15	1146	RS+P	60' weld	HE	BP	
8	1I	12/2/15	1245	P	~~40 ft 14~~	HE	BP	
9								
10				Total	174 ft			
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								

REPAIR TYPE: P - PATCH, C - CAP, RS - RECONSTRUCTED SEAM, G&W - GRIND WELD

REVIEWED BY: DGL DATE 1/5/16

GCS FORM: G19
(JUNE 1992)

GOLDER ASSOCIATES

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: 083-82734.43 PROJECT TITLE: Cell 1 Liner Repair
OWNER: Progressive
LOCATION: J.E.D. Landfill CONTRACTOR: Comarco

PASSING TRIAL SEAMS

NO.	TIME	TECH. ID
Tx-3	1420	AL

MACHINE NUMBER: APX1

DATE: 12/3/15

SHEET NO.: 1

	DEFECT CODE	REPAIR DATE	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSION	WELD TECH.	MON.	REMARKS
1	1D	12/3/15	1435	P	2x2 = 8A	HE	BP	
2								
3								
4								
5								
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8								
9								
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11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								

REPAIR TYPE: P - PATCH, C - CAP, RS - RECONSTRUCTED SEAM, G&W - GRIND WELD

REVIEWED BY: DSH DATE 1/6/16

GCS FORM: G19
(JUNE 1992)

GOLDER ASSOCIATES

GEOMEMBRANE VACUUM TEST LOG

PROJECT NUMBER: 083-82734.93
OWNER: Presidio
LOCATION: JFD Landfill

PROJECT TITLE: Cell 1 Liner Repair
CONTRACTOR: Cleanscape

	REPAIRS								REPAIRS							
	DEFECT CODE	TEST DATE	TECH ID	DEFECTS **	OBS. TEST	MON.	REMARKS		DEFECT CODE	TEST DATE	TECH ID	DEFECTS **	OBS TEST	MON.	REMARKS
1	P1R/WEDGE	12/2/15	LG	N	Y	BP		46							
2	P1R/WEDGE	12/2/15	LG					47							
3	P1R/P2R	12/2/15	LG					48							
4	1H	12/2/15						49							
5	P2R/WEDGE							50							
6	P2R/1E							51							
7	R2R/SEDGE							52							
8	1E							53							
9	1A							54							
10	1B							55							
11	1L							56							
12	1G							57							
13	P2R/WEDGE							58							
14	1F							59							
15	1I							60							
16								61							
17	1D	12/3/15	LG	N	Y	BP		62							
18								63							
19								64							
20								65							
21								66							
22								67							
23								68							
24								69							
25								70							
26								71							
27								72							
28								73							
29								74							
30								75							
31								76							
32								77							
33								78							
34								79							
35								80							
36								81							
37								82							
38								83							
39								84							
40								85							
41								86							
42								87							
43								88							
44								89							
45								90							

** RECORD QUANTITY OF LEAKS DETECTED AND REFERENCE NEW DEFECT CODE IN REMARKS

GOLDER FORM G174m
(January 2005)

REVIEWED BY: [signature] DATE 1/6/16

GOLDER ASSOCIATES INC.

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.43**	**PROJECT TITLE:**	**2015 GCCS Expansion**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**CB&I**

DATE **12/4/2015** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0705 - Golder arrived onsite Golder arrived onsite, reviewed HASP, and started check for drilling equipment.
A drill rig, an articulated dump truck, an excavator, a dozer, and a skid steer were onsite.

0840 - one CB&I crew member arrived onsite and began hauling bentonite to work area using a TL230 skid steer.

1000 - two more CB&I crew members arrived onsite.

1015 - Golder and CB&I surveyed the drilling points of GW-83 and GW-77.

1035 - CB&I began to transport equipment to work area.

1149 - CB&I began to mobilize drill rig (Soilmec SR-30) to work area.
Due to the rain in the morning, CB&I decided not to mobilize to the slope area until it dries out.

1400 - 242 tons rocks were delivered onsite.

1406 - CB&I left site.

1420 - Golder took a 5-gal bucket sample of rocks newly delivered.

1445 - Golder left site.

1530 - Golder shipped rock sample to the Golder's lab in Atlanta via Fedex.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.43**	**PROJECT TITLE:**	**2015 GCCS Expansion**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**CB&I**

DATE **12/5/2015** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0720 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.

07:30 - CB&I arrived onsite.

08:00 - CB&I began digging berm for drilling of GW-83 on the slope.

0835 - CB&I started drilling at point 2 (GW-83).

10:10 - CB&I hit wet conditions and began pulling out saturated waste.

11:11 - CB&I stopped drilling at 75 feet bgs.

1157 - CB&I began to set up for well installation.

13:00 - CB&I observed that borehole caved in. Bottom of well was set at 70 feet bgs

1310 - CB&I started backfilling borehole with rocks to 14 feet bgs.

1353 - CB&I finished well installation of GW-83.

1430 - CB&I left site.

1430 - Golder left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.43**	**PROJECT TITLE:**	**2015 GCCS Expansion**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**CB&I**

DATE **12/7/2015** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0700 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.

07:35 - One CB&I crew member arrived onsite.

08:00 - Mike Kaiser arrived at work area, and began to survey drilling point with Golder.

08:15 - Two other CB&I crew members arrived onsite.

0830 - Mike decided to drill at GW-37. Location of GW-37 was adjusted to N:1356106, E:624803, and El:246.

0908 - CB&I started drilling GW-37.

1215 - Water was observed in the waste pulled out from about 100 feet BGS.

1228 - CB&I pulled out sloppy saturated waste from 105 feet BGS and stopped drilling.

12:45 - CB&I started well installation. Bottom of the screen was set at 100 feet BGS.

1315 - CB&I began backfilling.

1434 - Installation of GW-37 was completed.

1440 - Mike Kaiser and Scott Fowler arrived at cap area and began to survey drilling locations with Golder.

1530 - Mike and Scott left cap area. CB&I left site. Golder continued surveying on cap area.

1600 - Golder left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.43**	**PROJECT TITLE:**	**2015 GCCS Expansion**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**CB&I**

DATE **12/8/2015** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0700 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.

0730 - One CB&I crew member arrived on site and started digging out berm for GW-72 (P6).

07:40 - Two other CB&I crew members arrived at work area.

0801 - CB&I started drilling GW-72. Driller hit waste at 9 feet bgs.

0935 - Driller pulled out sloppy waste from 60-65 feet BGS. Waste became back dry as drilled deeper.

1108 - Very muddy waste was pulled out from 103 feet BGS. CB&I stopped drilling.

11:39 - CB&I started installing GW-72. Bottom of the screen was set at 100 feet BGS.

1214 - CB&I began backfilling borehole.

1320 - CB&I finished installation of GW-72.

1415 - CB&I transported drill rig to GW-27R and set up for drilling

1500 -CB&I left site.

1515 - Golder left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.43**	**PROJECT TITLE:**	**2015 GCCS Expansion**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**CB&I**

DATE **12/9/2015** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0710 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter. CB&I onsite.

0732 - CB&I transported pipes and bentonite to drilling point GW-27R using a skid steer.

0748 - CB&I started drilling GW-27R.

0757 - Driller hit liner at 4 feet BGS.

0820 - Driller started pulling out waste from 15 feet BGS.

1300 - Driller pulled out muddy saturated waste from 116 feet BGS.

1310 - Driller stopped drilling at 121 feet BGS.

1333 - CB&I started well installation.
According to Mike's instructions, borehole was backfilled with dirt to 116 feet BGS.
Bottom of well was set at 115 feet bgs.

1540 - CB&I backfilled borehole to 19 feet bgs with rocks.

1628 - CB&I finished well installation of GW-27R.

1650 - CB&I left site.

1655 - Golder left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 12/10/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0710 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite.

0740 - CB&I began drilling GW-21R.

0746 - Driller hit liner at 4.5 feet BGS.

0814 - Driller started pulling out waste from 16 feet BGS.

1048 - Driller pulled out muddy waste at 100.5 feet BGS. Following Mike' instructions, drilling stopped.

1118 - CB&I started well installation.

1151 - CB&I observed that borehole caved in at the bottom. Bottom of screen was set at 98.5 feet bgs.

1256 - CB&I backfilled borehole to 17.5 feet BGS with rocks.

1425 - the excavator could not be started up. Backfilling paused.

1506 - CB&I repaired excavator and resumed backfilling borehole.

1516 - CB&I completed well installation.
CB&I began to set up for GW-18R and GW-4R2.

1630 - CB&I left site.

1639 - Golder left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.43**	**PROJECT TITLE:**	**2015 GCCS Expansion**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**CB&I**

DATE **12/11/2015** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0700 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.

CB&I crew of three onsite.

0721 - CB&I started drilling GW-18R.

Driller reached existing liner at 4 feet BGS. Driller stared pulling out waste from 14 feet BGS.

0921 - Driller pulled out water at about 75 feet BGS. Waste became back dry as driller drilled deeper.

1102 - Driller pulled out muddy saturated waste and stopped drilling at 110 feet BGS.

1156 - CB&I observed that borehole caved in. Bottom of screen was set at 107.5 feet BGS.

1336 - CB&I finished well installation of GW-18R.

1235 - CB&I started drilling GW-4R2.

Driller reached existing liner at 4 feet bgs and pulled out waste from 14 feet bgs.

16:11, driller pulled out muddy saturated waste at 105 feet bgs, and stopped drilling

1642 - CB&I began to backfill borehole.

1815 - CB&I finished installing the second bentonite seal at 6-8 feet bgs.

Since it was too dark for CB&I to continue fieldwork, CB&I paused well installation.

1845 - Golder and CB&I left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 12/12/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0710 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite.

0730 - CB&I backfilled GW-4R2 with soil to the ground surface. Well installation of GW-4R2 completed

0744 - CB&I started drilling on GW-15R3.
Driller hit liner at 4 feet bgs and hit waste at 21 feet bgs

1010 - Driller pulled out muddy waste at 90 feet bgs
Driller continued drilling to confirm waste condition and stopped drilling at 92 feet bgs.

1035 - CB&I started to install the well.
CB&I observed that well caved in. Bottom of screen was set at 88 feet bgs.

1138 - CB&I backfilled borehole with rocks to 23 feet bgs, 1 foot above the top of screen.

1217 - CB&I finished well installation of GW-15R3.

1300 - Golder and CB&I left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 12/14/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0720 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite.

0753 - CB&I started drilling GW-51R.

0810 - Driller hit liner at 3 feet BGS.

0833 - Driller hit waste at 18 feet BGS.

1028 - Driller hit wet conditions at 88 feet bgs. Waste became back dry as driller drilled deeper.

1123 - Driller pulled out muddy waste at 105 feet BGS and stopped drilling following Mike's instructions.

1130 - CB&I began to set the well. Bottom of screen was set at 104 feet bgs

1250 - CB&I backfilled borehole

1338 - CB&I finished well installation of GW-51R.

1400 - Mike arrived at cap area and started to survey the next drilling locations with Golder.
CB&I left site.

1430 - Mike left cap area. Golder continued to mark drilling locations.

1450 - Golder left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 12/15/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0710 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite.

0747 - CB&I started drilling at GW-45R

0751 - CB&I hit liner at 5.5 feet BGS.

0806 - CB&I hit waste at 18 feet bgs

1134 - Driller pulled out very muddy waste at 107 feet bgs and stopped drilling.

1138 - CB&I started well installation.

1208 - CB&I observed that borehole caved in at the bottom. Bottom of screen was set at 104.5 feet BGS.

1307 - CB&I were backfilling borehole

1352 - CB&I finished well installation of GW-45R.

1405 - Mike Kaiser surveyed the following drilling locations with Golder and CB&I.
CB&I began hauling rocks to the work area.

1530 - Golder and CB&I left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 12/16/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0715 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite.

0748 - CB&I started drilling GW-50R.

0753 - CB&I hit existing liner at 5 feet BGS.

0805 - CB&I hit waste at 15 feet BGS.

0910 - Mike arrived on cap area and surveyed drilling locations with Golder.

1107 - Driller pulled out very muddy waste from 100 feet BGS and stopped drilling.

1130 - CB&I began well installation of GW-50R. Bottom of screen was set at 99 feet bgs.

1253 - CB&I was backfilling borehole.

1336 - CB&I completed well installation.

1400 - CB&I set up for GW-54R.

1405 - CB&I left site.

1410 - Golder left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.43**	**PROJECT TITLE:**	**2015 GCCS Expansion**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**CB&I**

DATE **12//2015** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0700 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite. CB&I started drilling GW-54R.
0706 - Driller hit liner at 6 feet BGS.
0716 - Driller hit waste at 18 feet BGS.
0952 - Driller hit wet conditions at 100 feet bgs. Waste became back dry as driller drilled deeper.
1020 - Driller pulled out very muddy waste at 111 feet bgs and stopped drilling.
1028 - CB&I started well installation of GW-54R.

1130 - CB&I began drilling at GW-22R.
1135 - Driller reached liner at 4 feet bgs.
1143 - Driller hit waste at 15 feet BGS.

1201 - CB&I was backfilling GW-54R.
1243 - CB&I completed well installation of GW-54R.

1404 - Driller hit wet conditions at 95 feet bgs. Waste became back dry as driller drilled deeper.
1432 - Driller pulled out very muddy waste at 107 feet bgs and stopped drilling.
1435 - CB&I began to install GW-22R.
1630 - CB&I completed well installation of GW-22R.

1640 - CB&I set up for GW-73 and left site.
1645 - Goler left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.43**	**PROJECT TITLE:**	**2015 GCCS Expansion**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**CB&I**

DATE **12/18/2015** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0710 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite.

0720 - CB&I started drilling at GW-73.

0725 - Driller hit liner at 3 feet BGS.

0733 - Driller hit waste at 11 feet bgs.

0955 - Driller hit wet conditions at 89-90 feet bgs. Waste became back dry as drilled deeper.

1054 - Driller pulled out very muddy waste at 108 feet bgs and stopped drilling.

1100 - CB&I began well installation.

1130 - CB&I observed that borehole caved in. Bottom of screen was set at 106 feet bgs.

1214 - CB&I was backfilling borehole.

1248 - CB&I completed well installation of GW-73.

1325 - CB&I transported equipment off the cap area.

1330 - Golder and CB&I left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 12/19/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0715 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite.

0800 - CB&I started to transport equipment to W-1

0844 - CB&I started drilling.

1037 - Driller hit wet conditions at 71-73 feet BGS. Waste became back dry as drilled deeper.

1127 - CB&I pulled out muddy dirt from 92 feet BGS.

1145 - CB&I achieved 95 feet BGS.
CB&I kept drilling at 95 feet BGS for 45 minutes and could not drill deeper because borehole kept caving in.
A thick dirt layer was observed at 70 -95 feet bgs.

1228 - CB&I stopped drilling.

1238 - CB&I began well installation of W-1.
Following Mike's instructions, bottom of the screen was set at 85 feet BGS.

1325 - CB&I was backfilling borehole.
CB&I used tire chips to backfilled borehole from the bottom to 84 feet BGS.

1425 - CB&I completed well installation of W-1.

1448 - CB&I set up for W-2.

1455 - Golder and CB&I left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 12/21/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0700 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite.

0815 - CB&I began drilling W-2.

0936 - Driller hit wet conditions at 55 feet bgs. Waste became back dry as driller drilled deeper.

1051 - Driller started to pull out sloppy waste from 80 feet BGS.

1154 - Driller changed to water bucket at 90 feet bgs and continued drilling.

1315 - Driller had drilled at 101 feet bgs for 20 minutes and couldn not drill deeper. Drilling stopped.

1325 - CB&I started well installation. Bottom of screen was set at 100 feet BGS.

1419 - CB&I backfilled borehole

1448 - CB&I completed well installation.

1500 - Golder and CB&I left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 12/22/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0715 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite.

0753 - CB&I started drilling at W-3.

0957 - Driller hit wet conditions at around 75 feet. Waste became back dry as driller drilled deeper down.

1111 - Driller hit wet conditions at around 100 feet. Waste became back dry as driller drilled deeper down.

1229 - Driller pulled out muddy waste at 125 feet BGS.

1234 - Driller stopped drilling at 127 feet bgs, which was the designed depth of W-3.

1240 - CB&I began well installation.

1307 - CB&I observed that borehole caved in. Bottom of screen was set at 125 feet BGS.

1349 - CB&I was backfilling borehole.

1415 - CB&I completed well installation.

1435 - CB&I set up for W-4.

1445 - Golder and CB&I left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 12/29/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0710 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite.

0733 - CB&I started drilling W-4.

0940 - Driller hit wet conditions at 75 feet BGS. Waste became back dry as driller drilled deeper.

1036 - Driller observed that significant amount of water came into borehole at 100 feet BGS.

1215 - Driller drilled to designed depth, 131 feet BGS, and stopped drilling.

1220 - CB&I began well installation.

1240 - CB&I installed pipes.

1325 - CB&I was backfilling borehole.

1350 - CB&I completed well installation of W-4.

1445 - CB&I finished equipment maintenance and left site.

1450 - Golder received information of W-6 and W-7 from Brad Robbins.

1500 - Golder left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

GCS FORM R1
(JUNE 1992)

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 12/30/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0705 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite.

0730 - CB&I mobilized to W-6 and started drilling.

0955 - Driller hit water at 57 feet BGS. Waste became back dry as driller drilled deeper down.

1038 - Driller observed that significant amount of water came into borehole at 97 feet BGS.

1200 - Driller achieved 135 feet BGS, designed depth of W-6, and stopped drilling.

1205 - CB&I began well installation.

1225 - CB&I installed pipes.

1209 - CB&I were backfilling borehole.

1335 - CB&I completed well installation.

1350 - CB&I set up for W-7.

1355 - Golder and CB&I left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2015 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 12/31/2015 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0710 - Golder arrived onsite, reviewed Health and Safety Plan, and calibrated gas meter.
CB&I crew of three onsite.

0715 - CB&I started drilling W-7.

1100 - Driller hit water at 120 feet BGS.

1108 - Driller achieved designed depth of W-7, which was 124 feet BGS, and stopped drilling.

1117 - CB&I began well installation.

1132 - CB&I installed pipes.

1215 - CB&I were backfilling borehole.

1240 - CB&I completed well installation.

1255 - CB&I started to clean up the area.

1315 - Golder left site.

SUBMITTED BY GOLDER ASSOCIATES
H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2016 GCCS Expansion Liner Repair
OWNER: Progressive JED Landfill
LOCATION: St. Cloud, FL **CONTRACTOR:** COMANCO

DATE 2/8/2016 **S M T W T F S**

THE FOLLOWING WAS NOTED:

13:25 Golder arrived onsite. COMANCO crew of three members were onsite.

13:35 Golder reviewed Health and Safety Plan

13:55 COMANCO has deployed patches over the six repair areas at GW-15R3.
Geomembrane roll G14C333032 was used for the repairs.

14:35 COMANCO began to leister patches together with existing geosynthetics.

15:27 COMANCO started to grind and weld seams.

15:50 Welding completed. Vacuum test was initiated.

16:00 Vacuum test completed at GW-15R3. No defect was detected.

16:05 COMANCO began to deploy patches at the two repair areas at GW-51R1 and leister seams together.

16:30 COMANCO finished welding one repair area (abandoned well GW-51) and completed vacuum test.
One defect was detected and repaired.
RSI backfilled GW-51R1.

17:00 COMANCO loaded up equipment and left site. Golder continued to investigate areas to be repaired.

17:30 Golder left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2016 GCCS Expansion Liner Repair
OWNER: Progressive JED Landfill
LOCATION: St. Cloud, FL **CONTRACTOR:** COMANCO

DATE 2/9/2016 **S M T W T F S**

THE FOLLOWING WAS NOTED:

07:00 Golder arrived onsite.

07:05 COMANCO crew of three arrived onsite.

07:10 Golder reviewed Health and Safety Plan.

07:15 COMANCO picked up geomembrane needed for the day.

07:50 COMANCO mobilized to GW-51R1 and began to clean up the repair area.

08:35 COMANCO initiated trial seam destructive test.

08:40 COMANCO put boot and skirt over the repair area and began to leister seams.

08:55 Trial seams passed destructive test. COMANCO began to grind and weld seams.

10:40 COMANCO completed welding and initiated vacuum test.

10:50 Vacuum test completed. No defect was found.

11:10 COMANCO put boot, skirt and patch over repair areas at GW-22R1.

11:55 COMANCO finished welding seams at GW-22R1 following steps described above.

12:55 Vacuum box was broken.

13:22 COMANCO started 2nd trial seam destructive test for the day.

13:40 Trial seams pass destructive test.

13:42 RSI backfill GW-51R1.

13:45 COMANCO put boot and skirt over the repair area at GW-73 and began to leister seams together.

14:41 COMANCO completed repairing the defect at GW-73.

14:50 COMANCO left site to pick up new vacuum box.

15:50 COMANCO came back onsite with new vacuum box.

17:00 Vacuum tests at GW-22R1 and GW-73 were completed. One defect at GW-22R1 and 2 defects at GW-73 were detected and repaired.

17:25 Golder and COMANCO left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2016 GCCS Expansion Liner Repair
OWNER: Progressive JED Landfill
LOCATION: St. Cloud, FL **CONTRACTOR:** COMANCO

DATE 2/10/2016 **S M T W T F S**

THE FOLLOWING WAS NOTED:

07:10 Golder arrived onsite. COMANCO crew of three were onsite.
07:20 Golder reviewed Health and Safety Plan.
07:25 COMANCO began to pick up materials needed for the day.

08:15 At GW-4R2, COMANCO began to deploy a 6'x7' patch over one repair area (abandoned well GW-4R1).
08:35 COMANCO began to leister seams together.
08:55 COMANCO started 1st trial seam destructive test for the day.
09:05 Trial seams passed test. COMANCO began to grind and weld. RSI backfilled GW-22R1.
09:45 COMANCO finished welding at the former location of GW-4R1 and started vacuum test.
10:00 Vacuum test completed. One defect was found and fixed.
10:20 COMANCO began to work on the other repair area at GW-4R2.
11:45 COMANCO completed welding and initiated vacuum test.
11:55 Vacuum test completed. No defect was found. All liner repairs at GW-4R2 were finished.

13:00 COMANCO cleaned up repair areas at GW-18R1 and began repairing liner.
15:25 COMANCO initiated 2nd trial seam destructive test.
15:45 Trial seams passed test. COMANCO began to grind and weld seams at GW-18R1.
16:00 Welding was completed at GW-18R1. COMANCO started vacuum test.
16:15 Vacuum test completed. One defect was found and repaired.
16:20 COMANCO started to deploy geocomposite over the repair areas at GW-18R1 and zip tied geonet together.
16:45 COMANCO began to leister geotextile together.
17:10 Geocomposite was in place at GW-18R1.

17:30 COMANCO and Golder left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2016 GCCS Expansion Liner Repair
OWNER: Progressive JED Landfill
LOCATION: St. Cloud, FL **CONTRACTOR:** COMANCO

DATE 2/11/2016 **S M T W T F S**

THE FOLLOWING WAS NOTED:

07:10 Golder arrived onsite. COMANCO crew of three were onsite.
07:20 Golder reviewed Health and Safety Plan.

08:00 COMANCO set up at GW-21R1 and began to cut geosynthetics for the repair areas.
08:25 COMANCO started 1st trial seam destructive test for the day.
08:40 Trial seams passed test.
08:45 COMANCO put boot and skirt over the redrill area at GW-21R1 and began to leister seams together.
09:00 COMANCO started to grind and weld seams.
09:10 Welding was completed and Vacuum test was initiated.
09:20 Vacuum test was completed. No defect was found.
09:35 COMANCO began to repair the abandoned well area at GW-21R1.
10:45 Welding at the abandoned area was completed.
10:55 Vacuum test was completed. No defect was found.
11:05 COMANCO began to put geocomposite over repair areas at GW-21R1 and started to zip tie geonet.
11:20 COMANCO began to leister geotextile together.
11:45 Liner repairs at GW-21R1 were completed. Geocomposite was in place at GW-21R1.

12:45 COMANCO set up at GW-27R1.
13:20 COMANCO began 2nd trial seam destructive test for the day.
13:45 Trial seams passed test.
14:45 Geosynthetics at GW-27R1 were repaired. No defect was found during vacuum test.
15:00 COMANCO began to deploy geocomposite over repair areas at GW-27R1.
16:25 Geocomposite was in place. All repairs at GW-27R1 were finished.

16:40 COMANCO started to repair geocomposite at the redrill area GW-4R2.
17:25 Geocomposite was in place at the redrill area of GW-4R2.
Golder and COMANCO left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2016 GCCS Expansion Liner Repair
OWNER: Progressive JED Landfill
LOCATION: St. Cloud, FL **CONTRACTOR:** COMANCO

DATE 2/12/2016 **S M T W T F S**

THE FOLLOWING WAS NOTED:

07:10 Golder arrived onsite. COMANCO crew of three onsite.

07:20 Golder reviewed Health and Safety Plan.

07:45 COMANCO began to work at GW-45R1.

08:16 COMANCO started 1st trial seam destructive test.

08:36 Trial seams passed test.

09:50 COMANCO completed repairing geosynthetics at GW-45R1. Two defects were found at the abandoned well area during vacuum test and repaired.

10:00 COMANCO left cap area to pick up materials.

10:30 COMANCO came back on cap area and started to work at GW-50R1.

11:10 Beside the defects by well abandonment and redrill, one more defect was found at about 2' southeast of the redrill area of GW-50R1.

12:15 COMANCO repaired geosynthetics at GW50R1. One defect was found and repaired.

13:15 COMANCO started 2nd trial seam destructive test.

13:45 COMANCO started to repair geosynthetics at GW-54R1.

14:00 Trial seams passed test.

15:50 Geosynthetics at GW-54R1 were repaired. One defect was detected and repaired during vacuum test.

16:00 COMANCO started to repair geocomposite at GW-54R1.

16:30 Repairing was completed. Geocomposte was in place at GW-54R1.

16:35 COMANCO started to repair geocomposite at GW-50R1.

17:15 Repairing was completed. Geocomposte was in place at GW-50R1.

17:20 COMANCO began to repair geocomposite at GW-45R1.

17:45 COMANCO paused field work. Geocomposite repairing at GW-45R1 was yet to be completed.

18:10 Golder and COMANCO left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2016 GCCS Expansion Liner Repair
OWNER: Progressive JED Landfill
LOCATION: St. Cloud, FL **CONTRACTOR:** COMANCO

DATE 2/15/2016 **S M T W T F S**

THE FOLLOWING WAS NOTED:

07:20 Golder arrived onsite.
07:30 Golder reviewed Health and Safety Plan.

08:20 COMANCO arrived onsite.
08:30 COMANCO began to set up generator and equipment.

08:55 COMANCO began to leister geotextile together at GW-45R1.
09:05 Geocomposite was in place at all repair areas of GW-45R1.

09:15 COMANCO began to put geocomposite at GW-4R2.
09:40 COMANCO began to zip tie geonet together.
09:50 COMANCO began to leister geotextile together.
10:05 Geocomposite was in place at repair areas of GW-4R2.

10:20 COMANCO began to set up at the 18'' jumper.
13:00 COMANCO began to put boot and skirt over the repair area.
13:20 COMANCO started trial seam destructive test.
13:25 COMANCO began to leister seams together.
13:40 Trial seams passed test.
13:45 COMANCO started to grind and weld seams.
15:25 Welding completed.
15:30 Vacuum test was initiated.
15:45 Vacuum test was completed. One defect was detected and repaired.

15:55 COMANCO installed two steel bands on the boot.

16:05 RSI finished backfilling all repair areas on the cap.

16:20 COMANCO left site.
16:25 Golder left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** 2016 GCCS Expansion Liner Repair
OWNER: Progressive JED Landfill
LOCATION: St. Cloud, FL **CONTRACTOR:** COMANCO

DATE 2/16/2016 **S M T W T F S**

THE FOLLOWING WAS NOTED:

07:20 Golder arrived onsite.

07:30 Golder reviewed Health and Safety Plan.

07:35 Golder inspected repair area of 18'' jumper.

08:20 COMANCO picked up materials and arrived at work area.

08:35 COMANCO began to deploy geocomposite over the repair area.

08:55 COMANCO began to zip tie geonet together.

09:10 COMANCO started to leister geotextile together.

09:30 All repairs at the 18'' jumper were completed. Geocompoisite was in place.

09:35 COMANCO started to clean up site and load up equipment.

09:55 COMANCO left work area.

10:00 Golder reported to Mike Kaiser.

10:10 Golder left site.

SUBMITTED BY GOLDER ASSOCIATES

H.Huang
MONITOR

GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: 00 083-82734.43 **PROJECT TITLE:** JED Landfill Liner Repair
OWNER: Progressive
LOCATION: St. Cloud, FL **CONTRACTOR:** Comanco Inc.

SHEET NUMBER 1

DEFECT CODE	DEFECT LOCATION: SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION: DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	** REPAIR DATE	** TEST DATE
A	GW15R2	abandoned well	D	2/8/16	HH		2/8/16	2/8/16
B	GW15R3		D					
C	NO GW15R3	2' North of GW15R3	IE					
D	WO GW15R3	1' West of GW15R3						
E	SW o GW15R3	2' Southwest of GW15R3						
F	SOGW 15R3	1' South of GW15R3						
G	GW51	abandoned well	D					
H	GW51R1		D	2/9/16	HH		2/9/16	2/9/16
I	GW22 (HH)	abandoned well	D					
J	GW23R1		D					
K	GW73		D					
M	GW4R1	abandoned well	D	2/10/16	HH		2/10/16	2/10/16
N	GW4R2		D					
P	GW18	abandoned well	D					
Q	GW18R1		D					
R	GW21R1		D	2/11/16	HH		2/11/16	2/11/16
S	GW21	abandoned well	D					
T	GW27R1		D					
W	GW-27	abandoned well	D					
X								

AD - ANIMAL RELATED DAMAGE
B - UNDISPERSED RESIN BEAD
BO - FUSION WELDER BURN
BS - BOOT/SKIRT FOR FML PENETRATION
CO - CHANGE OF OVERLAP
CR - CREASE
D - INSTALLATION DAMAGE
DS-# - DESTRUCTIVE TEST NUMBER
EE - EARTHWORK EQUIPMENT DAMAGE
EXT - EXTENSION
FM - FISHMOUTH
FS - FAILED SEAM LENGTH
FTS - FIELD TEST STRIP
HT - HEAT TACK BURN
IO - INSUFFICIENT OVERLAY (UNDER SPEC.)
MD - MANUFACTURER/DELIVERY DAMAGE
PT - PRESSURE TEST CUT
SI - SOIL SURFACE IRREGULARITY
SL - SLAG ON TEXTURED SHEET
T - THREE PANEL INTERSECTION
VL - VACUUM TEST LEAK
WR - WRINKLE
WS - WELDER RESTART
OTHER _____

** COLUMNS TO BE USED BY THE DATA REVIEWER ONLY.

REVIEWED BY: [signature] **DATE:** 5/17/16

GCS FORM: G18
(JUNE 1992)

GOLDER ASSOCIATES

GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: 00 083-82734.43 **PROJECT TITLE:** JED Landfill Liner Repair
OWNER: Progressive
LOCATION: St. Cloud, FL **CONTRACTOR:** Comanco Inc.

SHEET NUMBER 2

DEFECT CODE	DEFECT LOCATION: SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION: DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	** REPAIR DATE	** TEST DATE
A	GW-45R1		D	2/12/16	HH		2/12/16	2/12/16
B	GW45	abandoned well	D	↓	↓		↓	↓
C	GW5021		D					
D	SW of GW5021	Southwest of GW5021	EE					
E	GW50	abandoned well	D					
F	GW5421		D					
G	GW54	abandoned well	D	↓	↓		↓	↓
H	18" Jumper		D	2/15/16	HH		2/15/16	2/15/16
I								
J								
K								
M								
N								
P								
Q								
R								
S								
T								
W								
X								

AD - ANIMAL RELATED DAMAGE
B - UNDISPERSED RESIN BEAD
BO - FUSION WELDER BURN
BS - BOOT/SKIRT FOR FML PENETRATION
CO - CHANGE OF OVERLAP
CR - CREASE
D - INSTALLATION DAMAGE
DS-# - DESTRUCTIVE TEST NUMBER
EE - EARTHWORK EQUIPMENT DAMAGE
EXT - EXTENSION
FM - FISHMOUTH
FS - FAILED SEAM LENGTH
FTS - FIELD TEST STRIP
HT - HEAT TACK BURN
IO - INSUFFICIENT OVERLAY (UNDER SPEC.)
MD - MANUFACTURER/DELIVERY DAMAGE
PT - PRESSURE TEST CUT
SI - SOIL SURFACE IRREGULARITY
SL - SLAG ON TEXTURED SHEET
T - THREE PANEL INTERSECTION
VL - VACUUM TEST LEAK
WR - WRINKLE
WS - WELDER RESTART
OTHER _____

** COLUMNS TO BE USED BY THE DATA REVIEWER ONLY.

REVIEWED BY: [signature] **DATE:** 5/17/16

GCS FORM: G18
(JUNE 1992)

GOLDER ASSOCIATES

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: 083-82734.43 **PROJECT TITLE:** JED Landfill Liner Repair
OWNER: Progressive
LOCATION: St. Cloud, FL **CONTRACTOR:** Comanco Inc

PASSING TRIAL SEAMS

NO.	TIME	TECH. ID
Tx-1	1030/2/8/16	JG
Tx-2	0835/2/9/16	↓
Tx-3	0840/2/9/16	
Tx-4	0855/2/10/16	
Tx-5	1525/2/10/16	
Tx-6	0825/2/11/16	JG
Tx-7	1320/2/11/16	JG

MACHINE NUMBER ET-A031 **DATE** 2/8/16 – 2/11/16
SHEET NO. 1

	DEFECT CODE	REPAIR DATE	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSION	WELD TECH.	MON.	REMARKS
1	1A	2/8/16	1529	P	6'x5'	MG	HH	
2	1B	↓	1535	BS	12'	↓	↓	
3	1C		1537	P	2'x3'			
4	1D		1542	P	6'x3'			
5	1E		1547	P	3'			
6	1F		1550	P	2'			
7	1G	↓	1630	P	6'x7'	↓	↓	
8	1H	2/9/16	0915	BS	18'	MG	HH	
9	1I	↓	1040	P	10'x5'	↓	↓	
10	1J		1155	BS	18'			
11	1K	↓	1441	BS	18'	↓	↓	
12	1M	2/10/16	0945	P	10'x6'	MG	HH	
13	1N	↓	1145	BS	20'	↓	↓	
14	1P		1428	P	7'x7'			
15	1Q	↓	1600	BS	17'	↓	↓	
16	1R	2/11/16	0910	BS	17'	MG	HH	
17	1S	↓	1145	P	6'x5'	↓	↓	
18	1T		1355	BS	20'			
19	1W	↓	1430	P	6'x7'	↓	↓	
20								
21								
22								
23								
24								
25								

REPAIR TYPE: P - PATCH, C - CAP, RS - RECONSTRUCTED SEAM, G&W - GRIND WELD

REVIEWED BY: DGI **DATE** 5/17/16

GCS FORM: G19
(JUNE 1992)

GOLDER ASSOCIATES

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: 083-82734.43 PROJECT TITLE: JED Landfill Liner Repair
OWNER: Progressive
LOCATION: St. Cloud, FL CONTRACTOR: Comanco Inc

PASSING TRIAL SEAMS

NO.	TIME	TECH. ID
Tx-8	0816/2/12/16	JG
Tx-9	1315/2/12/16	JG
Tx-10	1320/2/15/16	JG

MACHINE NUMBER ET-A031

DATE 2/12/16 2/15/16

SHEET NO. 2.

	DEFECT CODE	REPAIR DATE	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSION	WELD TECH.	MON.	REMARKS
1	2A	2/12/16	0905	BS	8'x8'	MG	HH	
2	2B	↓	0935	P	17'	↓	↓	
3	2C		1138	BS	18'			
4	2D		1130	P	6'			
5	2E		1205	P	5'x7'			
6	2F		1445	BS	18'			
7	2G	↓	1505	P	6'x7'	↓	↓	
8	2H.	2/15/16	1510	BS.	70' weld.	MG.	HH.	
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22								
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REPAIR TYPE: P - PATCH, C - CAP, RS - RECONSTRUCTED SEAM, G&W - GRIND WELD

REVIEWED BY: [signature] DATE 5/12/16

GCS FORM: G19
(JUNE 1992)

GOLDER ASSOCIATES

GEOMEMBRANE VACUUM TEST LOG

PROJECT NUMBER: 083-82734-43
OWNER: Progressive Waste Solutions
LOCATION: St. Cloud, FL

PROJECT TITLE: JBD Landfill Liner Replacement
CONTRACTOR: CANADA

REPAIRS

	DEFECT CODE	TEST DATE	TECH ID	DEFECTS **	OBS. TEST	MON.	REMARKS
1	1A, 1A1	2/8/16	MG	N	Y	GH	
2	1B, 1B2						
3	1C, 1C3						
4	1D, 1D4						
5	1G, 1G5			N			
6	1F, 1F1			1			repaired
7	1G			N			
8	1L1	2/9/16	MG	N	Y	GH	
9	1I						
10	1J			1			repeated
11	1K			2			repaired
12	1M	2/10/16		1			repairing
13	1N			N			
14	1P			1			repaired
15	1Q			1			
16	1R	2/11/16		N			(GH)
17	1S			N			
18	1T			N			
19	1W			N			
20							
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REPAIRS

	DEFECT CODE	TEST DATE	TECH ID	DEFECTS **	OBS. TEST	MON.	REMARKS
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** RECORD QUANTITY OF LEAKS DETECTED AND REFERENCE NEW DEFECT CODE IN REMARKS

GOLDER FORM: G17-tst
(January 2005)

REVIEWED BY: [signature] DATE 5/17/16

GOLDER ASSOCIATES INC.

GEOMEMBRANE VACUUM TEST LOG

PROJECT NUMBER: 083-827443
OWNER: Progressive
LOCATION: Bl. Island, PA

PROJECT TITLE: JBD Landfill Liner Repair
CONTRACTOR: Colmanco

	REPAIRS						
	DEFECT CODE	TEST DATE	TECH ID	DEFECTS **	OBS. TEST	MON.	REMARKS
1	2A	2/12/16	MG	0	Y	LH	
2	2B	↓	↓	2	↓	↓	repaired
3	2C			1			repaired
4	2D			0			
5	2E			0			
6	2F			0			
7	2G	↓	↓	1	↓	↓	repaired
8	2H	2/15/16	MG	0	Y	↓	
9							
10							
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	REPAIRS						
	DEFECT CODE	TEST DATE	TECH ID	DEFECTS **	OBS. TEST	MON.	REMARKS
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** RECORD QUANTITY OF LEAKS DETECTED AND REFERENCE NEW DEFECT CODE IN REMARKS

GOLDER FORM: G17-tst
(January 2005)

REVIEWED BY: [illegible] DATE 5/7/16

GOLDER ASSOCIATES INC.

GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: 083-82734.43 PROJECT TITLE: JED Landfill Liner Repair
OWNER: Progressive
LOCATION: St. Cloud, FL CONTRACTOR: Comanco Inc.

[ ] TF - # = FUSION
[X] TX - # = EXTRUSION

DATE ~~2/8/16~~ - 2/12/16 2/15/16
SHEET NUMBER 1

SAMPLE NUMBER	APPROX. TIME	WELDING MACHINE NUMBER	WELD TECH.	TEMPERATURES: AMBIENT AIR TEMP. °F	TEMPERATURES: PREHEAT OR MACHINE SPEED	TEMPERATURES: EXTRUDER	TEMPERATURES: NOZZLE OR WEDGE	TEST RESULTS: INSIDE PEEL MODE STRENGTH	TEST RESULTS: OUTSIDE PEEL MODE STRENGTH	TEST RESULTS: SHEAR MODE STRENGTH	PASS OR FAIL	MON.	REMARKS
Tx-1	1030	ET-A031	MG	60	480	450	450	91 / 93 / 95 95 / 97 /	/	102 / 106 106 / 103/108	P	HH	2/8/16
Tx-2	0835	ET-A031	MG	58	480	460	460	102 / 105 / 105 112 / 119 /	/	119 / 128 126 / 127/127	P	HH	2/9/16
Tx-3	1322	ET-A031	MG	60	480	460	460	102 / 102 / 94 102 / 103 /	/	117 / 117 111 / 115/124	P	HH	2/9/16
Tx-4	0855	ET-A031	MG	50	480	460	460	95 / 94 / 92 95 / 91 /	/	109 / 106 105 / 100/99	P	HH	2/10/16
Tx-5	1525	ET-A031	MG	75	460	440	440	81 / 82 / 81 88 / 88 /	/	102 / 102 122 / 108/104	P	HH	2/10/16
Tx-6	0825	ET-A031	MG	43	480	460	460	103 / 109 / 95 100 / 81 /	/	113 / 108 105 / 113/107	P	HH	2/11/16
Tx-7	1320	ET-A031	MG	64	450	420	420	101 / 87 / 88 83 / 90 /	/	100 / 97 91 / 92/106	P	HH	2/11/16
Tx-8	0816	ET-A031	MG	46	480	460	460	93 / 86 / 60 91 / 89 /	/	113 / 107 102 / 99/112	P	HH	2/12/16
Tx-9	1315	ET-A031	MG	72	460	420	420	86 / 79 / 76 76 / 75 /	/	80 / 85 80 / 85/75	P	HH	2/12/16
TX-10	1320	ET-A031	MG	73	460	400	400	76 / 79 / 75 76 / 79 /	/	89 / 86 87 / 88/89	P	HH	2/15/16
								/ /	/ /	/			
								/ /	/ /	/			
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								/ /	/ /	/			
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								/ /	/ /	/			

GCS FORM: G12
(JUNE 1992)

REVIEWED BY: [illegible] DATE: 5/17/16

GOLDER ASSOCIATES

QUALITY CONTROL DATA

PROGRESSIVE JED

LANDFILL CAP REPAIRS

JOB# 07157775

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QUALITY CONTROL TABLE OF CONTENTS

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PRE-WELD	B
SEAM INSTALLATION	C
REPAIR RECORDS	D
AS-BUILT	E
PHOTOS	F

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PANEL PLACEMENT
SECTION A

PROGRESSIVE JED
LANDFILL CAP REPAIRS

JOB# 07157775

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Comanco Environmental Corporation

Daily Panel Placement

Page 1

Project Name: Progressive JED LF. **Job #** 07157775 **Deployment Date** 12/02/15

Superintendent: Larry Graham **Material Type:** 40 Mil

☒ **Primary** **Secondary** ☐ **Cell** ☒ **Pond** ☐ **Pad** ☐ **Other:**

Description **(i.e. Phase #, Cell #, Pond # etc.)** **Roll Stock Width**

Panel # 1	Roll # 332022	
Final Length Avg.	36.00	LF
Final Width Avg.	20.00	LF
Initial Length Avg.		LF
Initial Width Avg.		LF

Notes:

Initial SF	-	Lineal Feet Trench
Final SF	720	

Panel # 2	Roll # 332022	
Final Length Avg.	27.00	LF
Final Width Avg.	22.00	LF
Initial Length Avg.		LF
Initial Width Avg.		LF

Notes:

Initial SF	-	Lineal Feet Trench
Final SF	594	

Panel # 3	Roll # 332022	
Final Length Avg.	14.00	LF
Final Width Avg.	4.00	LF
Initial Length Avg.		LF
Initial Width Avg.		LF

Notes:

Initial SF	-	Lineal Feet Trench
Final SF	56	

Panel #	Roll #	
Final Length Avg.		LF
Final Width Avg.		LF
Initial Length Avg.		LF
Initial Width Avg.		LF

Notes:

Initial SF	-	Lineal Feet Trench
Final SF	-	

Panel #	Roll #	
Final Length Avg.		LF
Final Width Avg.		LF
Initial Length Avg.		LF
Initial Width Avg.		LF

Notes:

Initial SF	-	Lineal Feet Trench
Final SF	-	

Panel #	Roll #	
Final Length Avg.		LF
Final Width Avg.		LF
Initial Length Avg.		LF
Initial Width Avg.		LF

Notes:

Initial SF	-	Lineal Feet Trench
Final SF	-	

Panel #	Roll #	
Final Length Avg.		LF
Final Width Avg.		LF
Initial Length Avg.		LF
Initial Width Avg.		LF

Notes:

Initial SF	-	Lineal Feet Trench
Final SF	-	

Panel #	Roll #	
Final Length Avg.		LF
Final Width Avg.		LF
Initial Length Avg.		LF
Initial Width Avg.		LF

Notes:

Initial SF	-	Lineal Feet Trench
Final SF	-	

Material in Anchor Trench

Total LF In Trench This Page	-	LF
Depth and Width Allowed in Trench		LF
Total SF Trench This Page	**-**	**SF**
Total Panel SF This Page	**1,370**	**SF**
Total Pay Area This Page	**1,370**	**SF**
LF In Trench Previous	-	LF
LF In Trench To Date	-	LF
SF In Trench Previous	-	SF
Total SF in Trench to Date	-	SF
Total Panel SF Previous	-	SF
Total Panel SF To Date	1,370	SF
Total Pay Area To Date Including Anchor Trench	**1,370**	
Initial Quantity Previous	-	SF
Initial Quantity This Page	-	SF
Initial Quantity To Date	-	SF

PRE-WELD TESTS
SECTION B

PROGRESSIVE JED
LANDFILL CAP REPAIRS

JOB# 07157775

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COMANCO ENVIRONMENTAL CORPORATION
Preweld Test Report

Project Name: Progressive JED LF **Job #** 07157775 **Superintendent:** Larry Graham

Material Type: 40 mil

Primary ☒ **Secondary** ☐

Pond ☐ **Cell** ☒ **Pad** ☐

Peel Test Extrusion Minimum 44 **PPI**

Peel Test Fusion Minimum **PPI**

Shear Test Minimum 60 **PPI**

Job Description:

Reported By : Alejandro Losa

Other :

Liner Types **S = Smooth** **T = Textured** **SG = Super Grip**

Weld Date Liner Type	Time AM | PM	Operator Name/ ID	Mach No.	Mach Speed	Mach Temp	Preheat Temp	Ambient Temp		Coupon 1		Coupon 2		Coupon 3		Coupon 4		Coupon 5		Test Results
									A	B	A	B	A	B	A	B	A	B	
12/2/15	8:20	Hector Elacio	ET_A061		400	400	78	Peel	63		72		61		75		74		Pass
T TO T	AM							Shear	87		85		89		87		86		
12/2/15	1:40	Hector Elacio	ET_A061		400	400	89	Peel	71		68		71		72		86		Pass
T TO T	AM							Shear	78		78		82		86		82		
12/3/15	2:20	Hector Elacio	ET_A061		400	400	88	Peel	94		80		82		80		89		Pass
T TO T	AM							Shear	111		97		103		98		93		
	:							Peel											
TO								Shear											
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SEAM INSTALLATION
SECTION C

PROGRESSIVE JED
LANDFILL CAP REPAIRS

JOB# 07157775

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COMANCO ENVIRONMENTAL CORPORATION
Seam Control Form

Project Name: Progressive JED LF **Job #** 07157775 **Superintendent:** Larry Graham

Material Type: 40 mil **Primary** x **Pond**

Job Description: **Secondary** **Cell** x

Reported By Alejandro Losa **Pad**

Other

Air Pressure Test PSI

Air Pressure Hold Time Minutes

Allowable Air Pressure Loss PSI

141	Total LF of Welding to Date Combined	Extrusion LF Weld Total To Date	141	Fusion LF Weld Total To Date:	-

Weld Date	Seam No.	Seam Length	Time Welded	Operator Name/ ID	Mach No.	Mach Speed	Mach Temp	Preheat Temp	Test Date	Test Type	AT Time In PSI IN	AT Time Out PSI OUT	PSI Loss	Test Results
12/2/15	1 / EXL	21	8:40 AM	Hector Elacio	ET-A061		400	400	12/2/15	Vacuum	:	:		Pass
12/2/15	1 / 2	36	9:20 AM	Hector Elacio	ET-A061		400	400	12/2/15	Vacuum	:	:		Pass
12/2/15	2 / EXL	12	10:15 AM	Hector Elacio	ET-A061		400	400	12/2/15	Vacuum	:	:		Pass
12/2/15	2 / EXL	5	10:25 AM	Hector Elacio	ET-A061		400	400	12/2/15	Vacuum	:	:		Pass
12/2/15	2 / EXL	7	10:40 AM	Hector Elacio	ET-A061		400	400	12/2/15	Vacuum	:	:		Pass
12/2/15	2 / 3	12	10:50 AM	Hector Elacio	ET-A061		400	400	12/2/15	Vacuum	:	:		Pass
12/2/15	3 / EXL	16	11:10 AM	Hector Elacio	ET-A061		400	400	12/2/15	Vacuum	:	:		Pass
12/2/15	2 / EXL	32	11:15 AM	Hector Elacio	ET-A061		400	400	12/2/15	Vacuum	:	:		Pass
	/		:								:	:		
	/		:								:	:		
	/		:								:	:		
	/		:								:	:		
	/		:								:	:		
	/		:								:	:		
	/		:								:	:		

REPAIR RECORDS
SECTION D

PROGRESSIVE JED
LANDFILL CAP REPAIRS

JOB# 07157775

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COMANCO EVIRONMENTAL CORPORATION

Hand Held GPS Repair Report

Page _____ of _____

Reported By: Aljandro Losa **Superintendent:** Larry Graham **Job # :** 07157775

Project Name: Progressive JED LF> **Cell** x **Pad** ____

Material Type: 40 mil **Pond** ____ **Other** ____

Job Description: **Primary**

Damage Codes

CR -- Creace; DS -- Destructive Sample; SI -- Subgrade Irregularty; SJ --Seam joint; FS --Failed Seam; WR --Wrinkle; AV --Airvent; AO --Add On; MatD --Material Defect; WS --Welder Restart; RW --Roller Wrinkle; FM --Fishmouth; LL --Lost Lap; MD --Mechanical Damage; DO --Damage By Others; AT --Air test; BO --Burn Out; PB --Pipe Boot; CF --Custom fit; EX --Existing liner

SF Patch Material

LF Welded

Test Type
VAC=Vacuum
AP=Air Pressure
SP=Spark
AL=Air Lance

Abbrv.
S=South
N=North
W=West
E=East

Repair Types
C--Cap Strip
P--Patch
B--Extrusion Bead

Repair Number	Damage Code	Point #(s)	Lat.-Long-Ele.	Repair Type	Patch (Feet)			Bead (Inches)	Date Welded	Operator Name	Machine Number	Test Type	Test Results	Date Complete
1	PB		28°04.093', 081°05.985',110	P	3	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
2	PB		28°04.094',081°05.984',111	P	4	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
3	PB		28°04.098',081°05.983',112	P	3	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
4	DO		28°04.098',081°05.985',107	P	1	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
5	WR		28°04.092',081°05.983',114	P	1	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
6	WR		28°04.090',081°05.983',113	P	1	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
7	WR		28°04.093',081°05.981',115	P	2	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
8	DO		28°04.090',081°05.980',118	P	2	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
9	PB		28°04.094',081°05.981',115	P	1	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
10	PB		28°04.094',081°05.979',120	P	1	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
11	DO		28°04.094',081°05.980',119	P	2	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
12	WR		6.5' east of R9	P	1	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
13	WR		28°04.092',081°05.982',114	P	2	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
14	WR		28°04.091',081°05.982',112	P	2	x			12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
15	WR		Extrusion between R7 and R12	B		x		36	12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
16	WR		Extrusion between R5 and R6	B		x		7	12/2/15	Hector Elacio	ET-A061	Vacuum	Pass	12/2/15
						x								
						x								
						x								
						x								

Rev 2-10-05

AS-BUILT
SECTION E

PROGRESSIVE JED
LANDFILL CAP REPAIRS

JOB# 07157775

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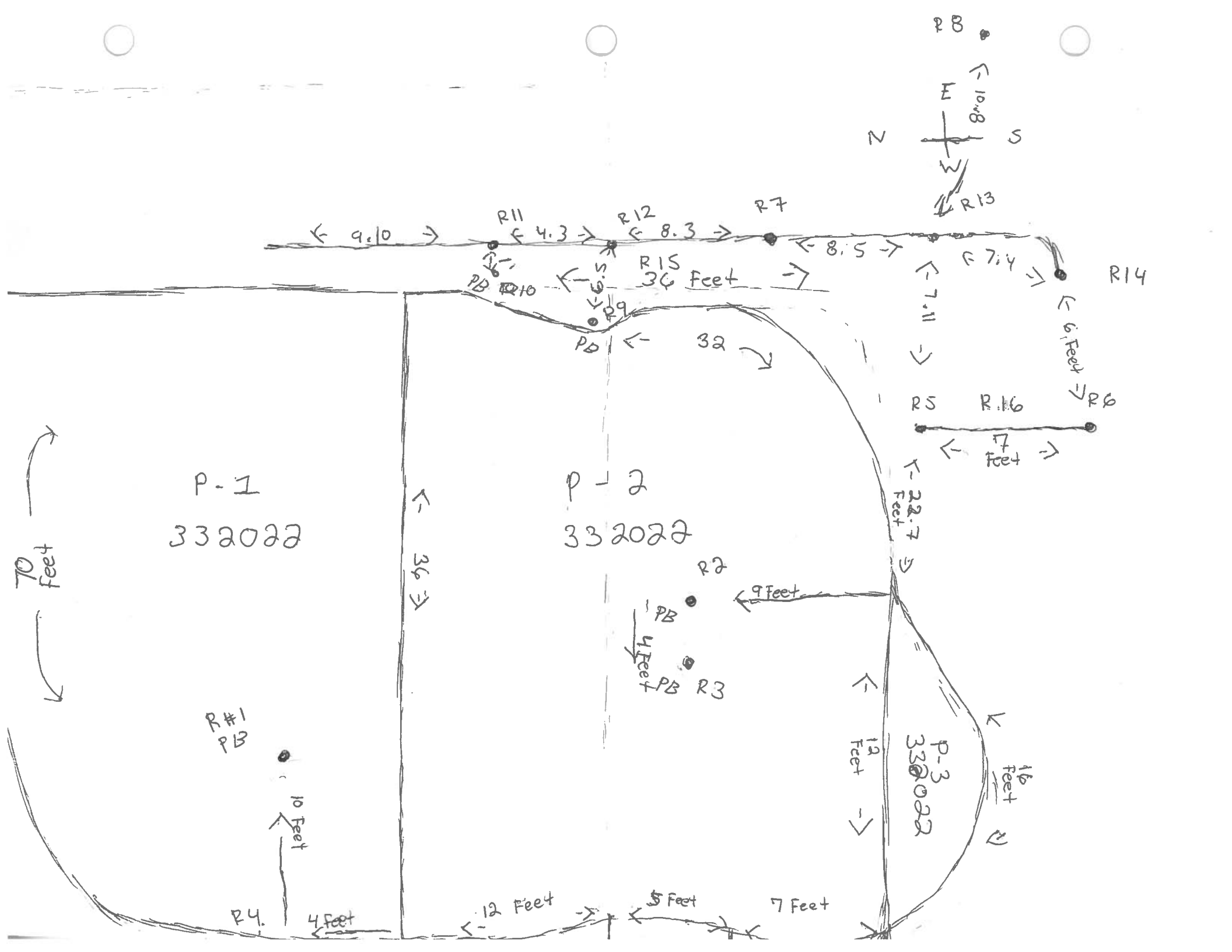
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5 Feet
7 Feet

PHOTOS
SECTION F

PROGRESSIVE JED
LANDFILL CAP REPAIRS

JOB# 07157775

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P1R


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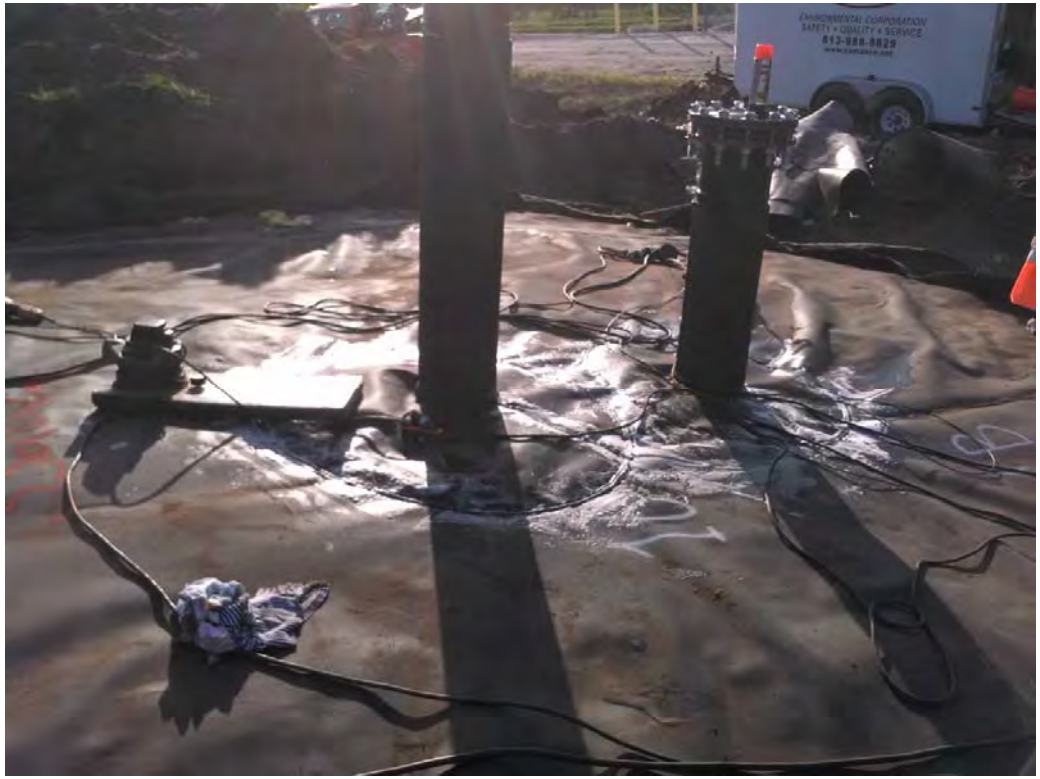
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QUALITY CONTROL DATA

PROGRESSIVE JED

LANDFILL CAP REPAIRS

JOB #07157775

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QUALITY CONTROL TABLE OF CONTENTS

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REPAIR RECORDS B

PHOTOS C

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PRE-WELD TESTS
SECTION A

PROGRESSIVE JED
LANDFILL CAP REPAIRS

JOB #07157775

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COMANCO ENVIRONMENTAL CORPORATION
Preweld Test Report

Project Name: PROGRESSIVE JED LANDFILL CAP REPAIRS **Job #** 07157775 **Superintendent:** Jorge Gomez

Material Type: 40 mil LLDPE **Primary** ☐ **Pond** ☐ **Peel Test Extrusion Minimum** 44 **PPI**

Job Description: Cap Repair / Pipe Boots **Secondary** ☐ **Cell** ☐ **Peel Test Fusion Minimum** **PPI**

Reported By : Jorge Gomez **Pad** ☐ **Shear Test Minimum** 60 **PPI**

Other :

Liner Types **S = Smooth** **T = Textured** **SG = Super Grip**

Weld Date Liner Type	Time AM │ PM	Operator Name/ ID	Mach No.	Mach Speed	Mach Temp	Preheat Temp	Ambient Temp		Coupon 1		Coupon 2		Coupon 3		Coupon 4		Coupon 5		Test Results
									A	B	A	B	A	B	A	B	A	B	
2/8/16	10:30	Miguel A. Garcia	ET-A031		450°	480°	60°	Peel		91		93		95		95		97	Pass
T TO T	AM							Shear	102		106		106		103		108		
2/9/16	8:35	Miguel A. Garcia	ET-A031		460°	480°	58°	Peel		102		105		105		112		119	Pass
T TO T	AM							Shear	119		128		126		127		127		
2/9/16	1:22	Miguel A. Garcia	ET-A031		460°	480°	58°	Peel		102		102		94		102		103	Pass
T TO T	PM							Shear	117		117		111		115		124		
2/10/16	8:55	Miguel A. Garcia	ET-A031		460°	480°	60°	Peel		95		94		92		95		91	Pass
T TO T	AM							Shear	109		106		105		100		99		
2/10/16	3:25	Miguel A. Garcia	ET-A031		440°	460°	75°	Peel		81		82		81		88		88	Pass
T TO T	PM							Shear	102		102		122		108		104		
2/11/16	8:25	Miguel A. Garcia	ET-A031		460°	480°	43°	Peel		103		109		95		100		81	Pass
T TO T	AM							Shear	113		108		105		113		109		
2/11/16	1:20	Miguel A. Garcia	ET-A031		450°	420°	64°	Peel		101		87		88		83		90	Pass
T TO T	PM							Shear	100		97		91		92		106		
2/12/16	8:16	Miguel A. Garcia	ET-A031		460°	480°	46°	Peel		93		86		100		91		89	Pass
T TO T	AM							Shear	113		107		102		99		112		
2/12/16	1:15	Miguel A. Garcia	ET-A031		420°	460°	75°	Peel		86		79		76		76		75	Pass
T TO T	PM							Shear	80		85		80		85		75		
2/15/16	1:20	Miguel A. Garcia	ET-A031		400°	460°	70°	Peel		76		79		75		76		79	Pass
T TO T	PM							Shear	89		86		87		88		89		
	:							Peel											
TO								Shear											
	:							Peel											
TO								Shear											
	:							Peel											
TO								Shear											
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TO								Shear											
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TO								Shear											
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REPAIR RECORDS
SECTION B

PROGRESSIVE JED
LANDFILL CAP REPAIRS

JOB #07157775

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Repair Report

Project Name PROGRESSIVE JED LANDFILL CAP REPAIRS **Job # :** 07157775 **Superintendent:** Jorge Gomez

Material Type: 40 mil LLDPE **Primary** **Pond**

Job Description: Cap Repair / Pipe Boots **Secondary** **Cell**

Reported by : Jorge Gomez **Pad**

Other:

Damage Codes						
CR --Crease	FS --Failed Seam	MatD --Material Defect	LL --Lost Lap		CF --Custom Fit	
DS --Destruct Sample	WR --Wrinkle	WS --Welder Restart	MD --Mechanical Damage		PB --Pipe Boot	
SI --Subgrade Irregularity	AV --Airvent	RW --Roller Wrinkle	DO --Damage By Others		BO --Burn Out	
SJ --Seam Joint	AO --Add On	CS --Concrete Structure			AT -Air Test	

SF Patch Material	Test Type	Abbrv.	Repair Types
989	Vacuum	*S=South	C--Cap Strip
	Air Pressure	*N=North	P--Patch
LF Welded	Spark	*W=West	B--Extrusion Bead
570.00	Air Lance	*E=East	

Repair Number	Damage Code	Point	Location	Repair Type	Patch (Feet)			Bead (Inches)	Date Welded	Operator Name	Machine Number	Test Type	Test Results	Date Complete
1	DO	POINT 01	N 28°03.992 W 081°05.874	P	6	x	5		2/8/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/8/16
2	DO	POINT 02	N 28°03.991 W 081°05.875	P	2	x	3		2/8/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/8/16
3	DO	POINT 03	N 28°03.990 W 081°05.874	P	6	x	3		2/8/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/8/16
4	DO	POINT 04	N 28°03.989 W 081°05.875	P	1	x	1		2/8/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/8/16
5	PB	POINT 05	N 28°03.990 W 081°05.875	P	4	x	4		2/8/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/8/16
6	DO	POINT 06	N 28°03.959 W 081°05.861	P	6	x	6		2/8/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/8/16
7	PB	POINT 07	N 28°03.959 W 081°05.861	P	4	x	4		2/9/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/9/16
8	DO	POINT 08	N 28°03.925 W 081°05.859	P	10	x	6		2/9/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/9/16
9	PB	POINT 09	N 28°03.924 W 081°05.860	P	5	x	5		2/9/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/9/16
10	PB	POINT 10	N 28°03.905 W 081°05.841	P	4	x	4		2/9/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/10/16
11	PB	POINT 11	N 28°04.037 W 081°05.905	P	10	x	6		2/10/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/10/16
12	PB	POINT 12	N 28°04.019 W 081°05.895	P	3	x	3		2/10/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/10/16
13	PB	POINT 13	N 28°03.968 W 081°15.906	P	7	x	7		2/10/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/10/16
14	PB	POINT 14	N 28°03.967 W 081°05.895	P	3	x	3		2/10/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/10/16
15	PB	POINT 15	N 28°03.936 W 081°05.896	P	4	x	4		2/11/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/11/16
16	PB	POINT 16	N 28°03.937 W 081°05.903	P	10	x	6		2/11/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/11/16
17	PB	POINT 17	N 28°03.902 W 081°05.903	P	4	x	4		2/11/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/11/16
18	DO	POINT 18	N 28°03.903 W 081°03.904	P	10	x	7		2/11/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/11/16
19	PB	POINT 19	N 28°04.001 W 081°05.859	P	4	x	4		2/12/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/12/16
20	DO	POINT 20	N 28°04.005 W 081°05.849	P	7	x	7		2/12/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/12/16

COMANCO ENVIRONMENTAL CORPORATION

Repair Report

Project Name PROGRESSIVE JED LANDFILL CAP REPAIRS **Job # :** 07157775 **Superintendent:** Jorge Gomez

Material Type: 40 mil LLDP **Primary** **Pond**

Job Description: Cap Repair / Pipe Boots **Secondary** **Cell**

Reported by : Jorge Gomez **Pad**

Other:

Damage Codes										SF Patch Material	Test Type	Abbrv.	Repair Types
CR --Crease	FS --Failed Seam	MatD --Material Defect	LL --Lost Lap	CF --Custom Fit						989	Vacuum	*S=South	C--Cap Strip
DS --Destruct Sample	WR --Wrinkle	WS --Welder Restart	MD --Mechanical Damage	PB --Pipe Boot							Air Pressure	*N=North	P--Patch
SI --Subgrade Irregularity	AV --Airvent	RW --Roller Wrinkle	DO --Damage By Others	BO --Burn Out						**LF Welded**	Spark	*W=West	B--Extrusion Bead
SJ --Seam Joint	AO --Add On	CS --Concrete Structure		AT -Air Test						570.00	Air Lance	*E=East	

Repair Number	Damage Code	Point	Location	Repair Type	Patch (Feet)			Bead (Inches)	Date Welded	Operator Name	Machine Number	Test Type	Test Results	Date Complete
21	PB	POINT 21	N 28°03.967 W 081°05.846	P	4	x	4		2/12/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/12/16
22	DO	POINT 22	N 28°03.966 W 081°05.847	P	2	x	2		2/12/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/12/16
23	DO	POINT 23	N 28° 03.973 W 081°05.835	P	8	x	7		2/12/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/12/16
24	PB	POINT 24	N 28°03.939 W 081°05.833	P	4	x	4		2/12/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/12/16
25	DO	POINT 25	N 28°03.941 W 081°05.822	P	8	x	8		2/12/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/12/16
26	PB	POINT 26	N 28°03.888 W 081°06.001	P	15	x	17		2/15/16	Miguel A. Garcia	ET-A031	VAC	PASS	2/15/16
27						x								
28						x								
29						x								
30						x								
31						x								
32						x								
33						x								
34						x								
35						x								
36						x								
37						x								
38						x								
39						x								
40						x								

PHOTOS
SECTION C

PROGRESSIVE JED
LANDFILL CAP REPAIRS

JOB #07157775

COMANCO ENVIRONMENTAL CORPORATION

PIPE BOOT REPAIR

CAP REPAIRS

APPENDIX J

CERTIFICATION OF CONSTRUCTION COMPLETION OF A SOLID WASTE FACILITY

DEP Form # 62-701.900(2)
Form Title Certification of Construction Completion
Effective Date May 19, 1994

DEP Application No _____ (Filled by DEP)

Florida Department of Environmental Protection
Twin Towers Office Bldg • 2600 Blair Stone Road • Tallahassee, FL 32399-2400

Certification of Construction Completion of a Solid Waste Management Facility

DEP Construction Permit No: SC49-0199726-017 County: Osceola

Name of Project: 2015 Gas Collection and Control System Expansion

Name of Owner: Omni Waste of Osceola County, LLC

Name of Engineer: Golder Associates Inc.

Type of Project: Gas Collection and Control System (GCCS) Expansion Construction

Cost: Estimate $ 650,000 Actual $ 700,000

Site Design: Quantity: 7,500 ton/day Site Acreage: Ph I: 54, Ph II: 35, Ph 3: 37 Acres

Deviations from Plans and Application Approved by DEP: The construction was conducted in general accordance with the submitted Phase III Construction Drawings and submitted Modification Permit application package associated with Permit No. SO40-0199726-015 with some Intermediate modifications as described in Section 2 of the Construction Record Documentation Report. These modifications didn't alter the performance or design intent of the system.

Address and Telephone No. of Site: 1501 Omni Way, St. Cloud, Florida 34773; (407) 891-3720

Name(s) of Site Supervisor: Mike Kaiser

Date Site inspection is requested: As soon as possible

This is to certify that, with the exception of any deviation noted above, the construction of the project has been completed in substantial accordance with the plans authorized by Construction

Permit No. SC49-0199726-017 :Dated: 9/22/2011

Date: 4/1/2015

KEVIN S. BROWN LICENSE No. 67619 STATE OF FLORIDA PROFESSIONAL ENGINEER

Signature of Professional Engineer

5/20/2016

Northwest District
160 Governmental Center
Pensacola, FL 32501-5794
850-595-8360

Northeast District
7825 Baymeadows Way, Ste. B200
Jacksonville, FL 32256-7590
904-448-4300

Central District
3319 Maguire Blvd., Ste. 232
Orlando, FL 32803-3767
407-894-7555

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619
813-744-6100

South District
2295 Victoria Ave., Ste. 364
Fort Myers, FL 33901-3881
941-332-6975

Southeast District
400 North Congress Ave.
West Palm Beach, FL 33401
561-681-6600