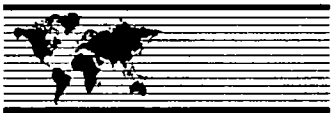

CONSTRUCTION RECORD DOCUMENTATION REPORT 2014 GAS COLLECTION AND CONTROL SYSTEM EXPANSION

J.E.D. Solid Waste Management Facility

Osceola County, Florida

Submitted to: Florida Department of Environmental Protection
Waste Management Program, Central District
3319 Maguire Boulevard, Suite 232
Orlando, FL 32803-3767 USA

Prepared for: Omni Waste of Osceola County, LLC
1501 Omni Way
St. Cloud, FL 34773 USA

Submitted by: Golder Associates Inc.
9428 Baymeadows Road, Suite 400
Jacksonville, FL 32256 USA

Florida Board of Professional Engineers
Certificate of Authorization Number 1670

Distribution:

1 Copy	Florida Department of Environmental Protection Waste & Air Resource Programs, Central District
2 Copies	Omni Waste of Osceola County, LLC
1 Copy	Golder Associates Inc.

April 2015

083-82734.35

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April 1, 2015 083.82734.35

Mr. F. Thomas Lubozynski, PE
Florida Department of Environmental Protection
Waste & Air Resource Programs, Central District
3319 Maguire Boulevard, Suite 232
Orlando, FL 32803-3767

RE: CONSTRUCTION RECORD DOCUMENTATION REPORT
2014 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 2014 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 or email Mr. Mike Kaiser at (904) 673-0446, michael.kaiser@progressivewaste.com or the undersigned.

Sincerely,

GOLDER ASSOCIATES INC.

Don E. Grigg, PE (Pennsylvania)
Senior Engineer

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

Kevin S. Brown, PE
Florida Professional Engineer No.57819
Certificate of Authorization No. 1670

Date: 3/31/15

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

Enclosure: Construction Record Documentation Report

DEG/KSB/ams

RECEIVED
APR 0 6 2015
DEP Central District

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Table of Contents

List of Tables

List of Appendices

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, 0970079-009-AV, issued on July 19, 2010 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 2014 GCCS expansion at the JED Facility. Previous GCCS installation at the facility (Phase I, II) included approximately 86 vertical gas extraction wells, 7 horizontal collectors, one skid mounted flare system, and header and lateral piping in the Cells 1-8 disposal areas.

The main components of the 2014 GCCS expansion monitored by Golder were:

- Installation of 11 vertical gas extraction wells;
- Installation of 4 horizontal collectors, totaling approximately 3,500 feet in length; and,
- Installation of approximately 2,200 feet of header, lateral gas conveyance pipe, and subheader.

In addition to the GCCS expansion, the installation of 8 soil vapor extraction wells near the vertical sumps in cells 1 through 4 were observed by Golder and have been documented within this report. Lastly, Golder was present during the installation of vertical sumps (not associated with the GCCS).

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 2014 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.

Soil vapor extraction (SVE) wells were installed behind the sump pads for Cells 1 through 4. The SVE wells were installed in clean soil (general fill) in an attempt to control landfill gas which may migrate beneath the ground surface from the waste disposal footprint. Gas wells were installed in the area of the landfill with final cover. Horizontal collectors were installed in the active filling area (waste) of Cell 6 and Cell 9. 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. Eight soil vapor extraction wells were installed from December 18, 2013 to December 19, 2013. Two horizontal collectors were installed in the lower tier of Cell 9 from January 6, 2014 to January 14, 2014. Two additional horizontal collectors were installed in the second tier of Cell 6 and Cell 9 from August 25, 2014 to September 3, 2014. Construction activities for the vertical gas extraction wells commenced on March 4, 2014 and were completed on March 22, 2014. One additional vertical gas extraction well (GW-90A) was installed in Cell 5 on December 17, 2014. The main header was expanded into Cell 9 from December 9, 2014 to December 22, 2014.

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 August 2012 GCCS Expansion (P83-82743S)," prepared by Golder dated August 31, 2012.
- Proposal titled "Proposal for Construction Quality Assurance Services November 2012 GCCS Expansion (P83-82743V)," prepared by Golder dated November 16, 2012.
- 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.

Omni retained Peavey & Associates Surveying and Mapping, PA (Peavey & Associates) to fulfill all surveying needs associated with the 2014 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. As done previously, the horizontal collectors were surveyed by Omni staff and are documented herein.

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

Vertical extraction wells GW-99 and GW-106 were relocated in the field due to proximity to existing horizontal gas collectors. Vertical extraction wells GW-107 and GW-112 were relocated in the field due to current waste grade. 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 G 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. A gravel sample was tested for gradation and showed the gravel sample to meet the specifications for No. 24 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 sample was 0.1% which meets construction specifications.

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 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. The wet material appeared to consist of MSW wastes. Extraction well GW-90A was drilled to its design depth, however the well was constructed with rock from the bottom of the borehole at 132 feet bgs to approximately 98 feet bgs, whereas the bottom of the PVC well was then set at 98 feet bgs. This well was installed during a leachate seep drilling program carried out by Omni in December 2014. Omni drilled several boreholes through the wet subsurface zones in Cells 5 and 6 using an auger and bottom closing type bucket. When the borehole was advanced to within 15 feet of the base liner, the boreholes were filled with tire chips in attempts to promote vertical drainage of leachate seeps in those areas. Well GW-90A was constructed to observe the performance of a well set above a rock conduit in hopes of colleting gas from deeper zones but also allowing leachate to seep downward.

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-71	116	47	69
GW-90	127	57	70
GW-95	122	86	36
GW-99	127	95	32
GW-102	124	76	48
GW-106	78	78	0
GW-107	26	26	0
GW-108	63	63	0
GW-112	30	30	0
GW-118	29	29	0
GW-90A - See Section 2.3	132	95	37

2.4 Header/Lateral Gas Conveyance Pipe Installation

There were no 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 lateral from GW-106 was modified to accommodate the new well location. Deviations from the GCCS Phase III Disposal Area drawings can be found on the as-built survey in Appendix C.

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 3 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-12 and HGC-13, 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 2014 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,
- Environmental Drilling Services as a construction contractor;
- Comanco Environmental Construction, as the geomembrane contractor and;
- Peavey & Associates, as the surveyor.

3.2 Gas Extraction Well Installation

CB&I performed the drilling and installation of 11 gas extraction wells during the 2014 GCCS expansion. The installation of the gas wells commenced on March 4, 2014 and was completed on March 20, 2014. The drill rig utilized was an IMT AF 100, or similar, 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 four 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;
- 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 F provides 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 2014 GCCS expansion. Lateral pipe installation for 10 vertical gas extraction wells commenced on March 10, 2014 and was completed on March 21, 2014. Cell 9 gas header expansion and additional lateral pipe installation commenced on December 9, 2014 and was completed on December 22, 2014. Two excavators (Deere 200D and Komatsu 210) were utilized for trench excavation for the header and lateral gas conveyance pipe installation. Lateral gas conveyance pipe was 6-inch high-density polyethylene (HDPE) standard dimension ratio (SDR) 17 and installed at a minimum 10 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 12-inch, 16 inch and 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 700J dozer.

3.4 Horizontal Gas Collectors Installation

CB&I performed the installation of two horizontal gas collectors, HGC-10 and HGC-11 in January of the 2014 GCCS expansion. SCS Field Services performed the installation of two horizontal gas collectors, HGC-12 and HGC-13 in August of the 2014 GCCS expansion. The installation of HGC-10 and HGC-11 occurred in Cell 9 from January 6, 2014 to January 14, 2014. The installation of HGC-12 and HGC-13 occurred in Cells 6 and 9 from August 25, 2014 to September 3, 2014. One excavator (Komatsu PC210) was 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 lower tier horizontal gas collector piping was connected to the side-slope risers. The upper tier horizontal gas collector piping was capped at the side slope until future tie-in work can be completed. 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 F provides photographs of the horizontal gas collector pipe installation.

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

- 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;
- Place 8-ounce geotextile above tire chip backfill; and backfill remaining trench with surrounding waste.

HGC installation was revised for the construction of HGC-12 and HGC-13. 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.

3.5 Soil Vapor Extraction Well Installation

Environmental Drilling Services performed the drilling and installation of 8 soil vapor extraction wells. The installation of the SVE wells commenced on December 18, 2013 and was completed on December 19, 2013. The drill rig utilized was a track based GeoProbe 7822DT auger. Comanco Environmental Construction performed the geomembrane cap-liner repairs at each borehole. Peavey & Associates surveyed the locations of the completed gas wells; the certified as-built survey is provided in Appendix C.

SVE well installation depths were field-adjusted to the existing ground elevation of the landfill based on the ground surface survey conducted prior to drilling and the existing elevation of the top of protective cover. Boreholes were drilled to within 1 to 2-feet of the top of protective cover. The wells were constructed using 4-inch SCH 80 PVC slotted and solid pipe. The as-built well logs, found in Appendix E, provide the well depths along with the screen and solid pipe lengths. The well pipes were bell and spigot type, and each joint was glued.

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 1-foot above top of slotted pipe with approved stone;
- Install 2-inch-thick granular hydrated bentonite plug from top of gravel to cap liner;
- Repair liner with boot and skirt; 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. SVE wells were connected to adjacent existing 6-inch gas laterals. Appendix F provides photographs of the drilling of the extraction wells and the installation of the extraction wells.

4.0 CONSTRUCTION MONITORING

Construction monitoring was documented by the CQA engineer in daily field monitoring reports, as provided in Appendix H. 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 2014 GCCS expansion was performed in general accordance with the technical specifications prepared by Geosyntec and provided in Appendix B. Materials utilized in the 2014 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 2014 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. All 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 Soil Vapor Extraction Well Installation

Golder monitored the drilling and the well construction of all soil vapor extraction wells. Logs showing the installation details for each well are included in Appendix E.

4.5 Horizontal Gas Collectors Installation

Golder monitored the installation of four horizontal gas collectors during the 2014 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 D.

5.0 SUMMARY AND CERTIFICATION

Omni retained Golder to provide CQA services during the construction of the 2014 GCCS expansion at the JED Facility. These services included the quality assurance monitoring, documentation, and/or testing of the items listed below:

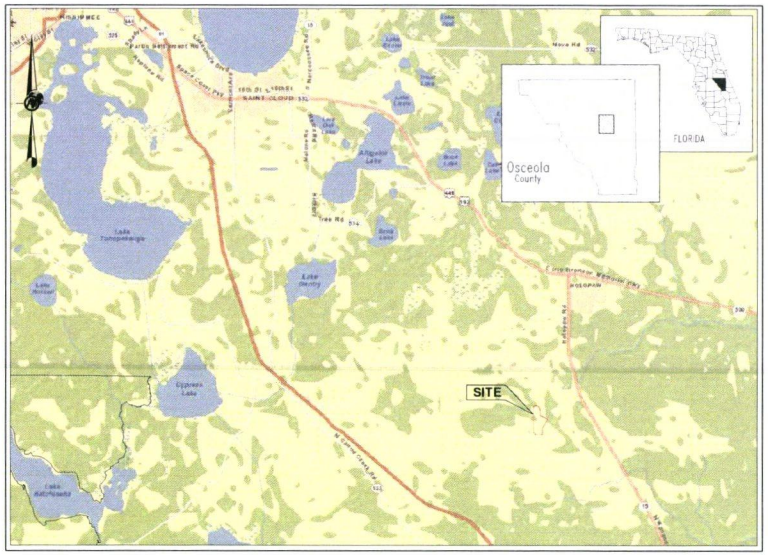
- Installation of 11 gas extraction wells;
- Installation of approximately 2,200 feet of header, lateral gas conveyance pipe and subheader;
- Installation of 4 horizontal gas collectors; and,
- Installation of 8 soil vapor extraction wells.

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 2014 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. Attachment I 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

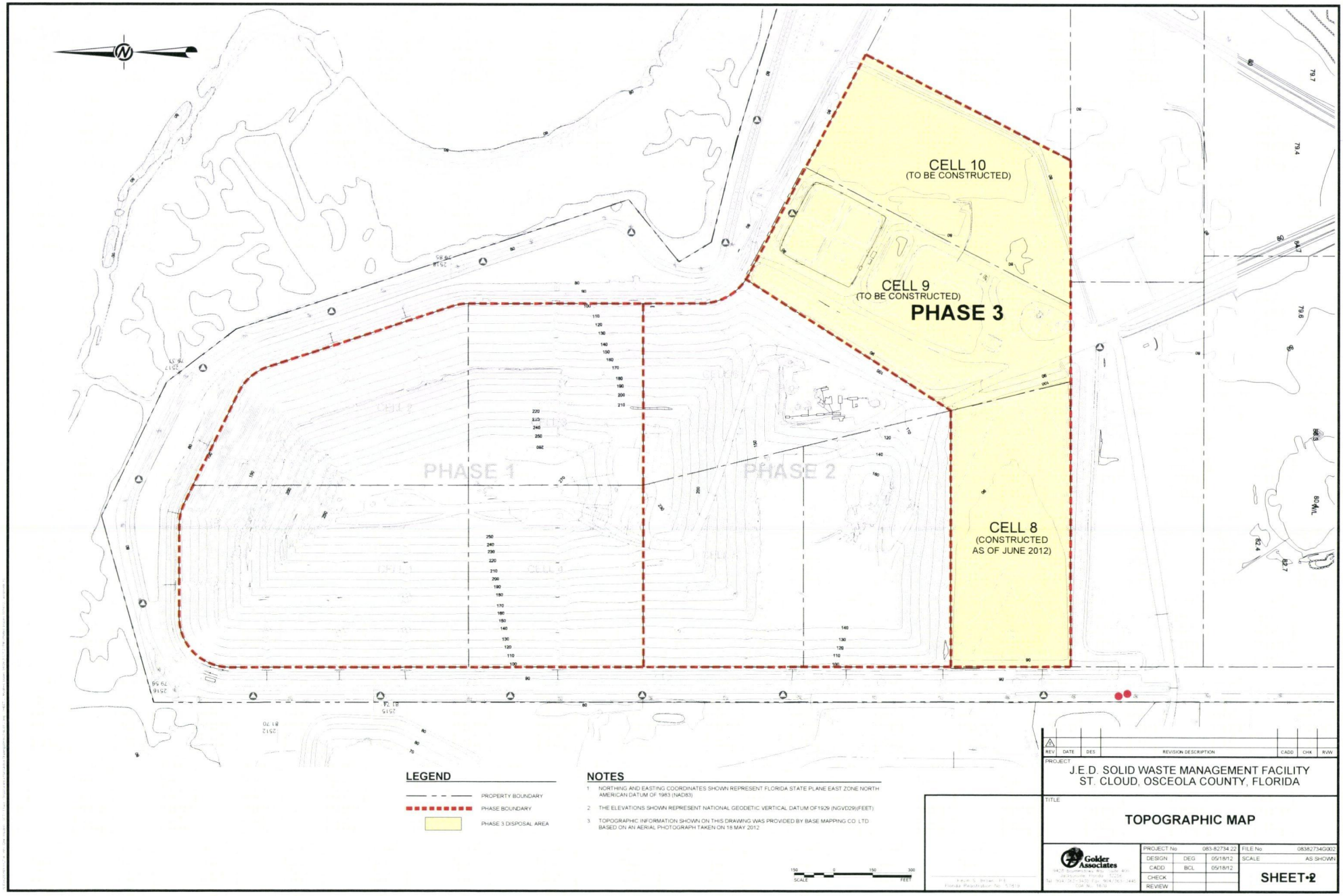
September 2012

Golder Associates

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

TITLE SHEET/LIST OF DRAWINGS

SHEET 1



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

SCALE 150 0 150 300 FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

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

TITLE
TOPOGRAPHIC MAP

Golder Associates

PROJECT No		083-82734.22	FILE No	08382734G002
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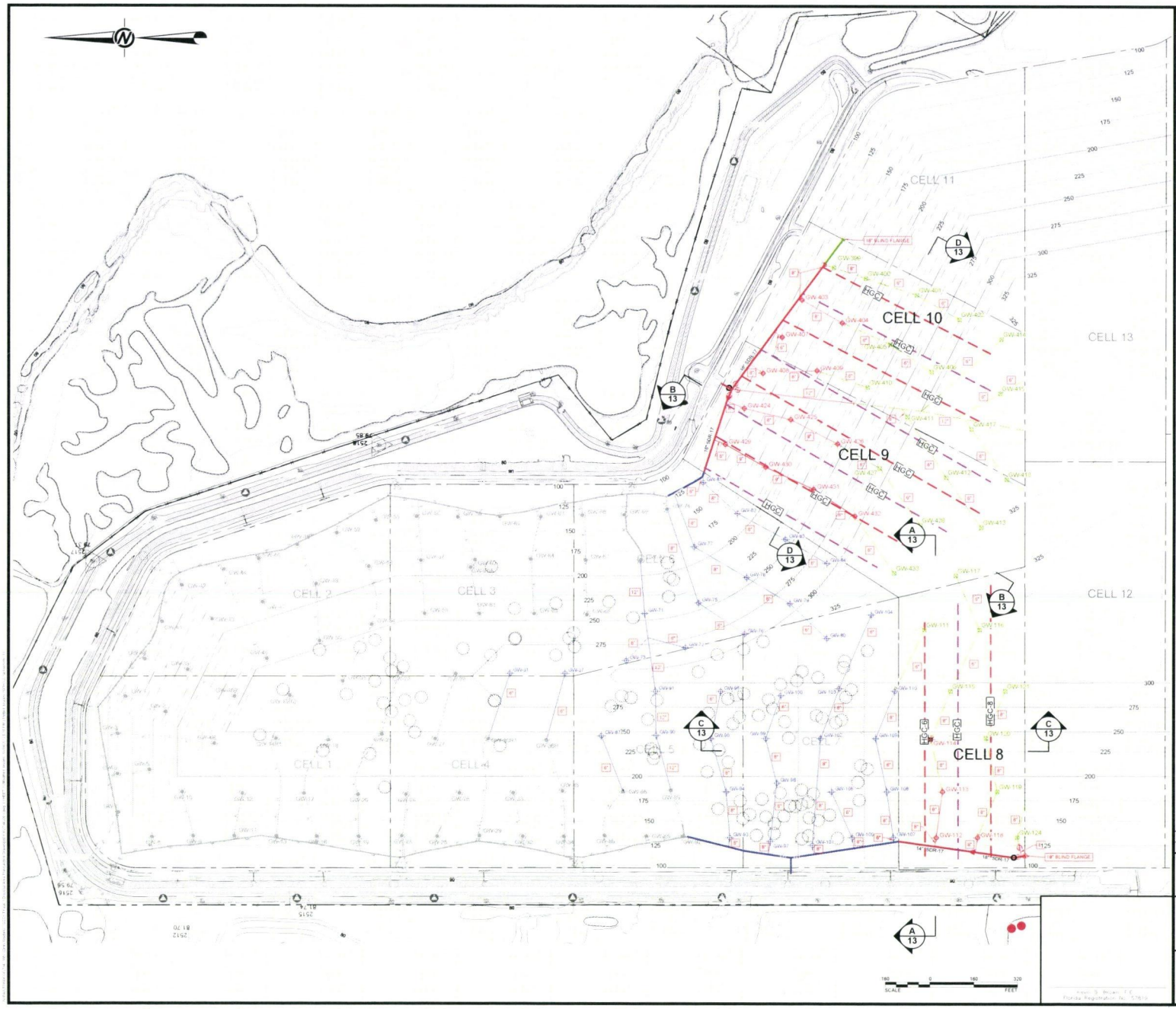
CADD	BCL	05/18/12		
CHECK			SHEET	2
REVIEW				



LEGEND

- PROPERTY BOUNDARY
- EXISTING GROUND ELEVATION (FEET)
- EXISTING FENCE
- 280 FINAL COVER ELEVATION (FEET)
- 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)
- 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 OF 1929 (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

PROJECT

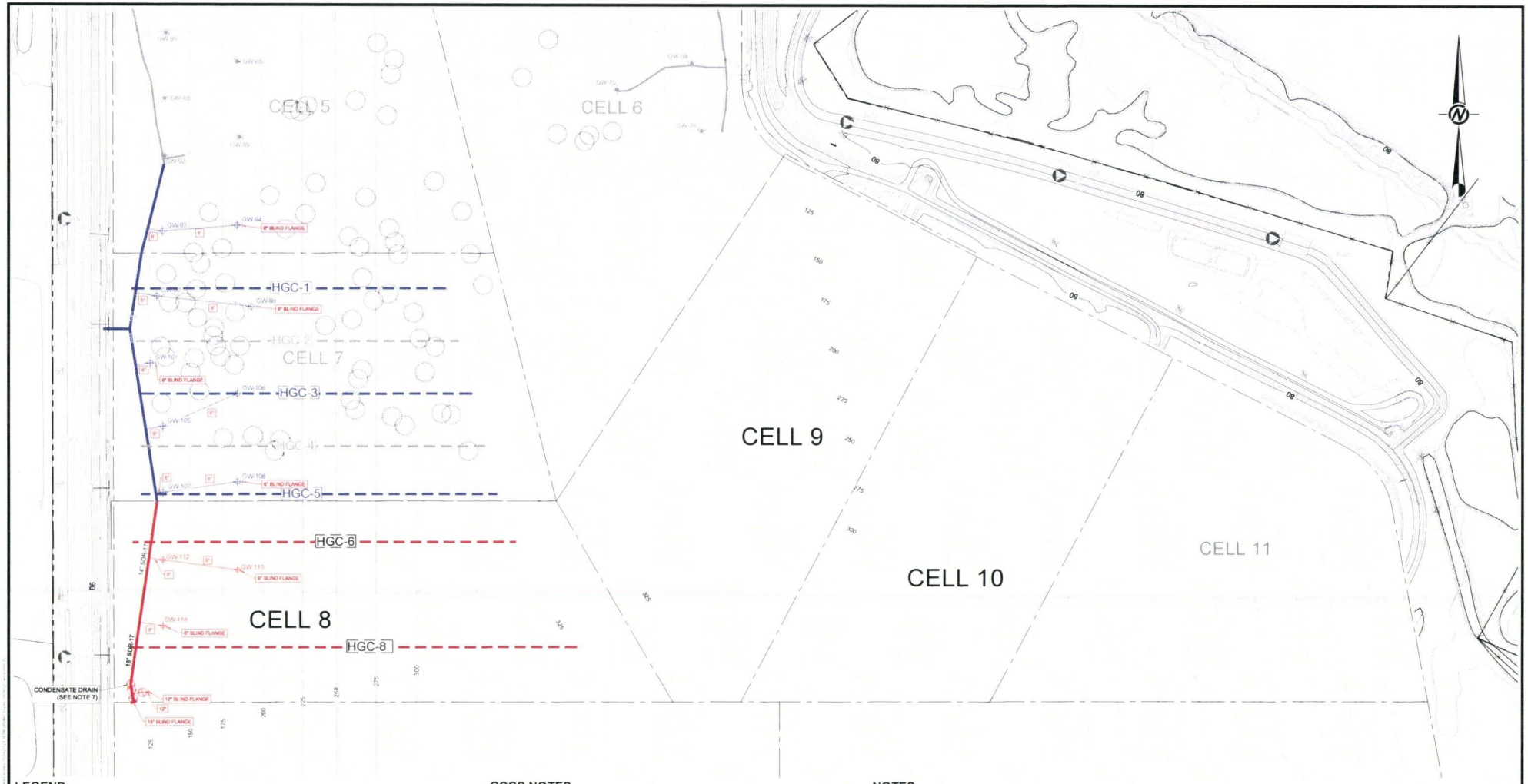
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE

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

Golder Associates

PROJECT No.		083-82734.22	FILE No.		083827340003
DESIGN	DEG	05/18/12	SCALE		AS SHOWN
CADD	BCL	05/18/12			
CHECK			SHEET		8
REVIEW					



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF INTERMITTENT STREAM
- INTERCELL BERM LOCATION
- EXISTING GROUND ELEVATION (FEET)
- EXISTING FENCE
- 280 FINAL COVER ELEVATION (FEET)
- EXISTING GAS MONITORING PROBE
- 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
- 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).
2. THE ELEVATIONS SHOWN REPRESENT NATIONAL GEODETIC VERTICAL DATUM OF 1929 (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 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. Dreyer, P.E.
Florida Registration No. 57819

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	KVW

PROJECT

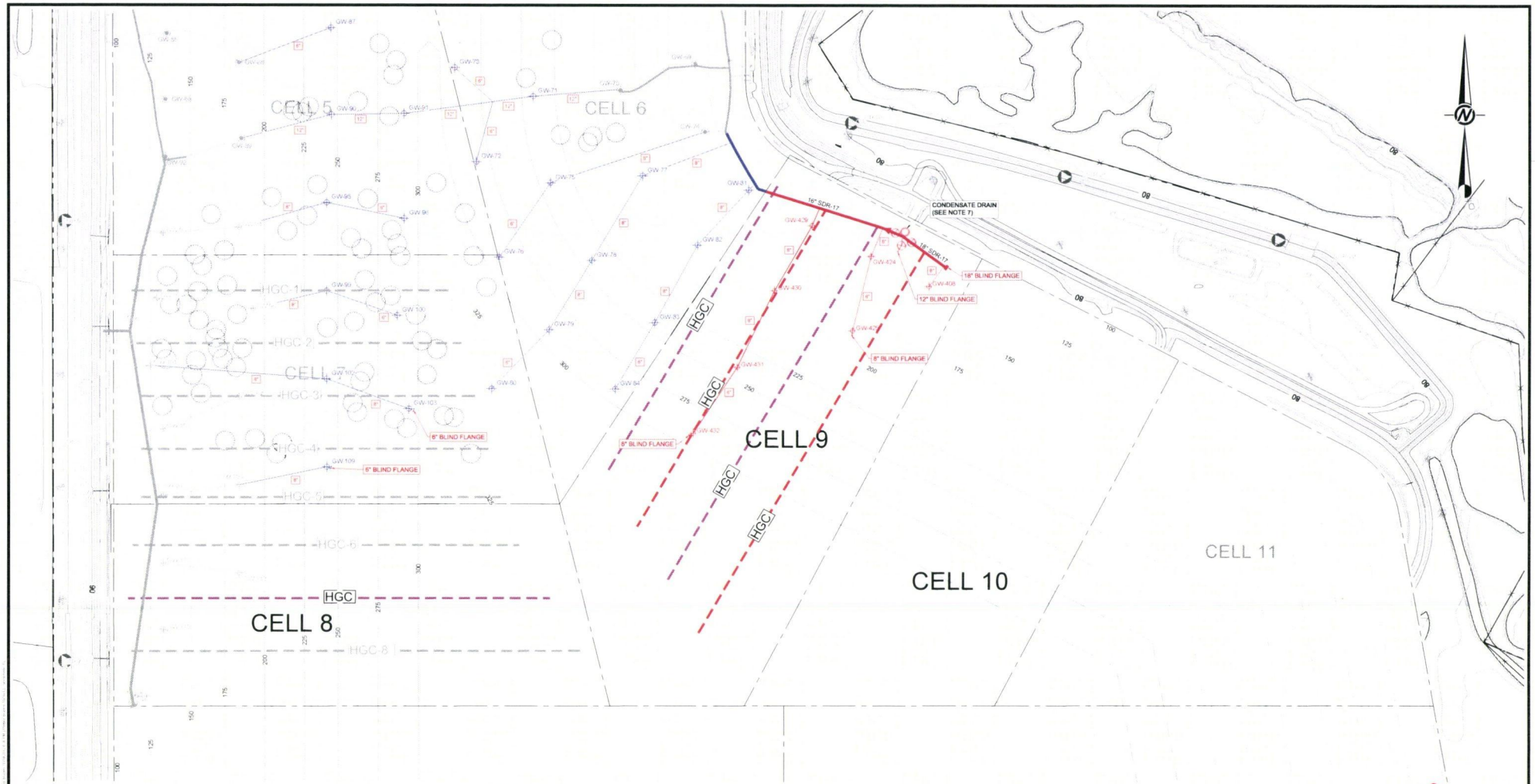
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE

PLAN LAYOUT OF GCCS IN PHASE 3 (SEQUENCE 1)

Golder Associates
1425 Bonnet Creek Resort Lane, Suite 400
Orlando, FL 32821
Tel: 407-851-1425 Fax: 407-851-1440
CA No. 1878

PROJECT No		083-82734.22	FILE No	083827340004
DESIGN	DEG	05/18/12	SCALE	AS SHOWN
CADD	BCL	05/18/12		
CHECK			SHEET	4
REVIEW				



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF INTERMITTENT STREAM
- EXISTING GROUND ELEVATION (FEET)
- EXISTING FENCE
- 280 FINAL COVER ELEVATION (FEET)
- EXISTING GAS MONITORING PROBE
- 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
- EXISTING VERTICAL GAS EXTRACTION WELL (PREVIOUS SEQUENCE)
- GW-XX 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

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 OF 1929 (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 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.

100 0 100 200
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1						

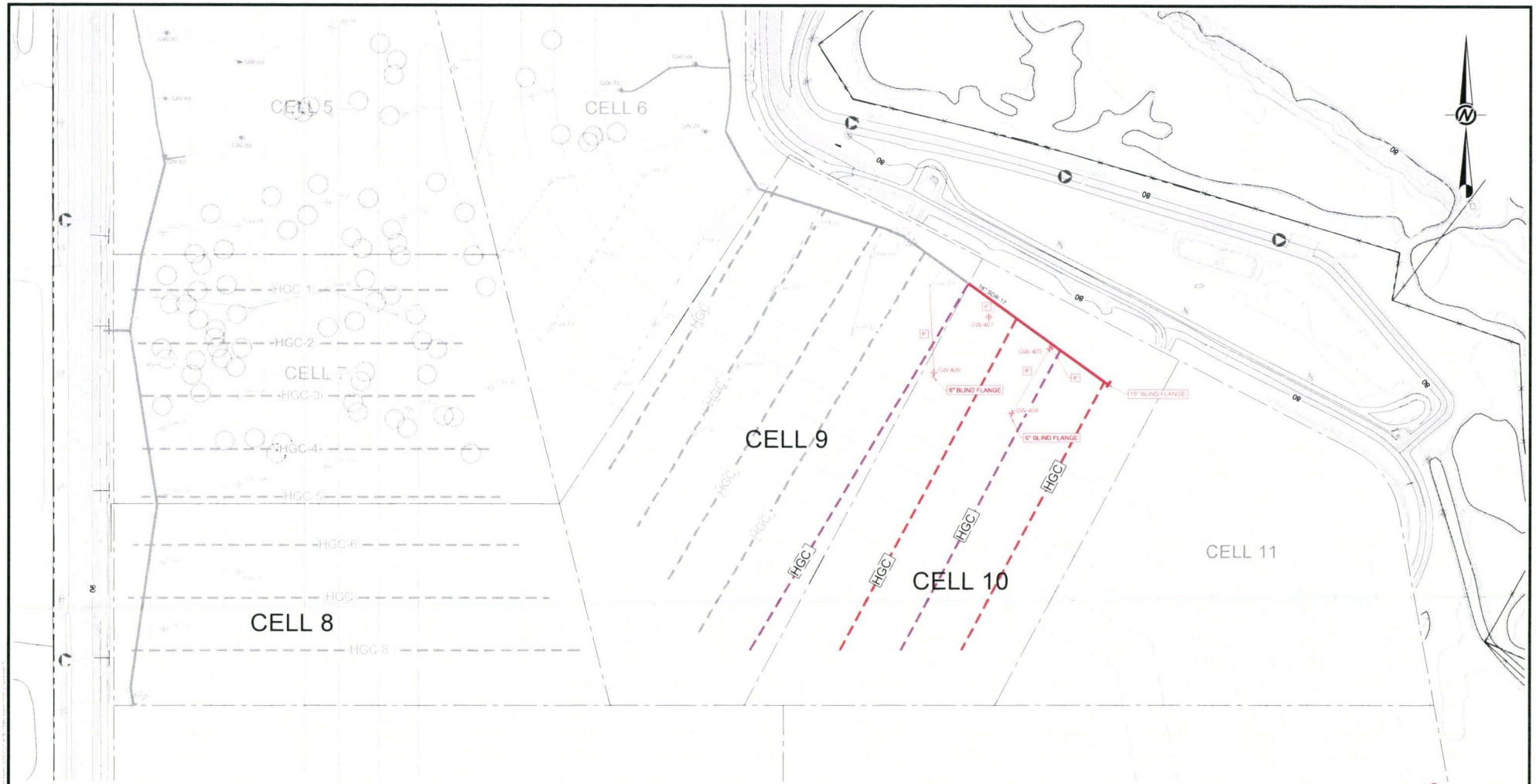
PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

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

Golder Associates

PROJECT No.		083-82734.22	FILE No.	083827340005
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
- 280 FINAL COVER ELEVATION (FEET)
- EXISTING GAS MONITORING PROBE
- EXISTING VERTICAL GAS EXTRACTION WELL
- EXISTING HDPE HEADER PIPE
- EXISTING HDPE LATERAL PIPE
- GW-405 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
- LATERAL PIPE SIZE
- 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)
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 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.

100 0 100 200 SCALE FEET

Kevin S. Brown, P.E.
Florida Registration No. 53810

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

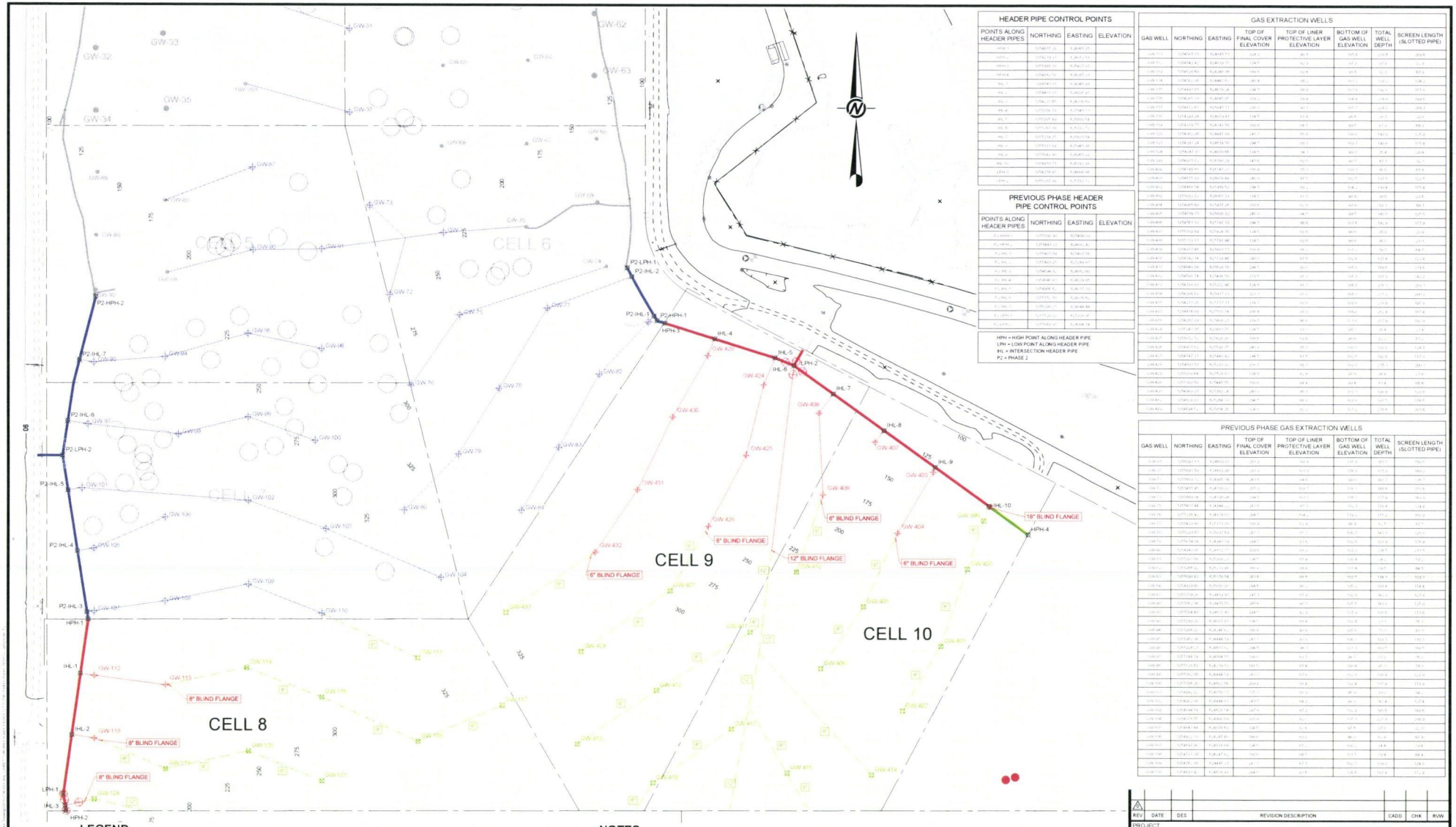
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE

PLAN LAYOUT OF GCCS IN PHASE 3 (SEQUENCE 3)

Golder Associates

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



HEADER PIPE CONTROL POINTS

POINTS ALONG HEADER PIPES	NORTHING	EASTING	ELEVATION
HPH-1			
IHL-1			
IHL-2			
HPH-2			
LPH-1			
IHL-3			
P2-IHL-3			
P2-IHL-4			
P2-IHL-5			
P2-IHL-6			
P2-IHL-7			
P2-HPH-2			
P2-LPH-2			
P2-IHL-8			
P2-IHL-9			
P2-IHL-10			
P2-HPH-4			
P2-LPH-3			
P2-IHL-11			
P2-IHL-12			
P2-HPH-3			
P2-LPH-4			
P2-IHL-13			
P2-IHL-14			
P2-HPH-5			

PREVIOUS PHASE HEADER PIPE CONTROL POINTS

POINTS ALONG HEADER PIPES	NORTHING	EASTING	ELEVATION
P1-HPH-1			
P1-IHL-1			
P1-IHL-2			
P1-IHL-3			
P1-IHL-4			
P1-IHL-5			
P1-IHL-6			
P1-IHL-7			
P1-IHL-8			
P1-IHL-9			
P1-IHL-10			
P1-HPH-4			
P1-LPH-1			
P1-LPH-2			
P1-LPH-3			
P1-LPH-4			

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							
GW-112							
GW-113							
GW-114							
GW-115							
GW-116							
GW-117							
GW-118							
GW-119							
GW-120							
GW-121							
GW-122							
GW-123							
GW-124							
GW-401							
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GW-424							
GW-425							
GW-426							
GW-427							
GW-428							
GW-429							
GW-430							
GW-431							
GW-432							

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-01							
GW-02							
GW-03							
GW-04							
GW-05							
GW-06							
GW-07							
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GW-108							
GW-109							
GW-110							

LEGEND

- PROPERTY BOUNDARY
- 250 FINAL COVER ELEVATION
- EXISTING GAS MONITORING PROBE
- EXISTING VERTICAL GAS EXTRACTION WELL
- EXISTING HDPE HEADER PIPE
- EXISTING HDPE LATERAL PIPE
- APPROXIMATE LIMITS OF ASBESTOS (SEE NOTE 4)
- INTERCELL BERM LOCATION
- GW-428 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
- 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

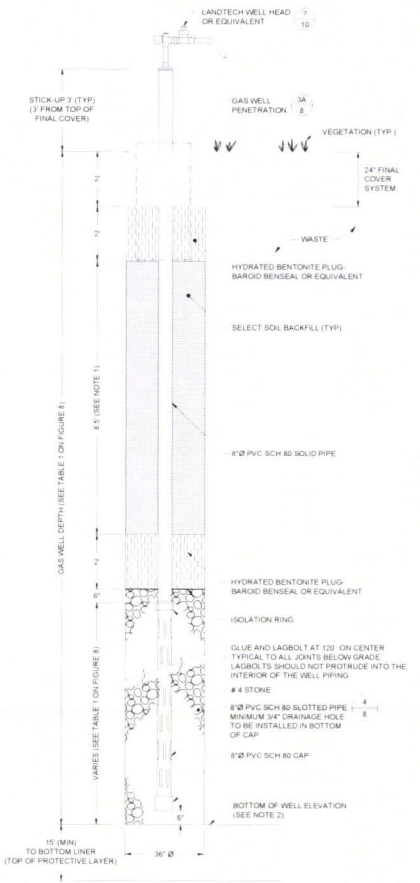
REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

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

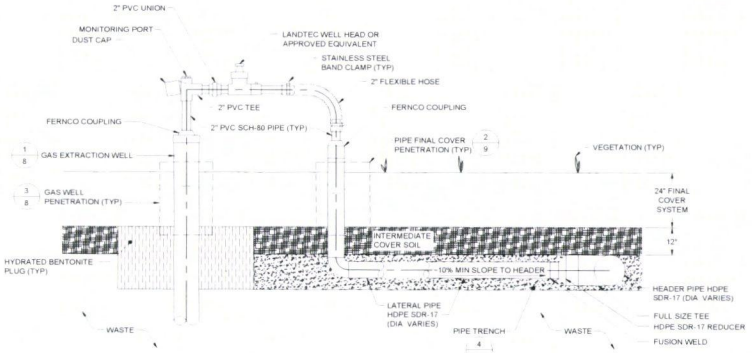
TITLE
GAS SYSTEM CONTROL POINTS

Golder Associates

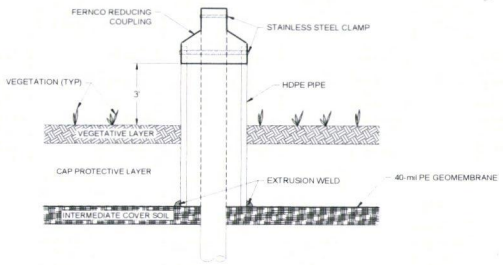
PROJECT No	083-82734.22	FILE No	08382734G008
DESIGN	DEG	05/18/12	SCALE AS SHOWN
CADD	BCL	05/18/12	
CHECK			SHEET 7
REVIEW			



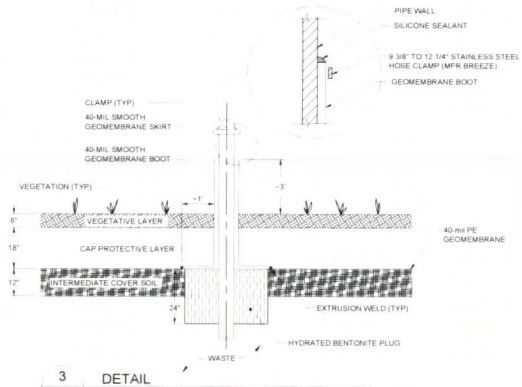
1/8 DETAIL
GAS EXTRACTION WELL
SCALE: N.T.S.



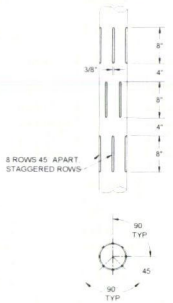
2/8 DETAIL
WELLHEAD TO LATERAL
SCALE: N.T.S.



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.



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

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)

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

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

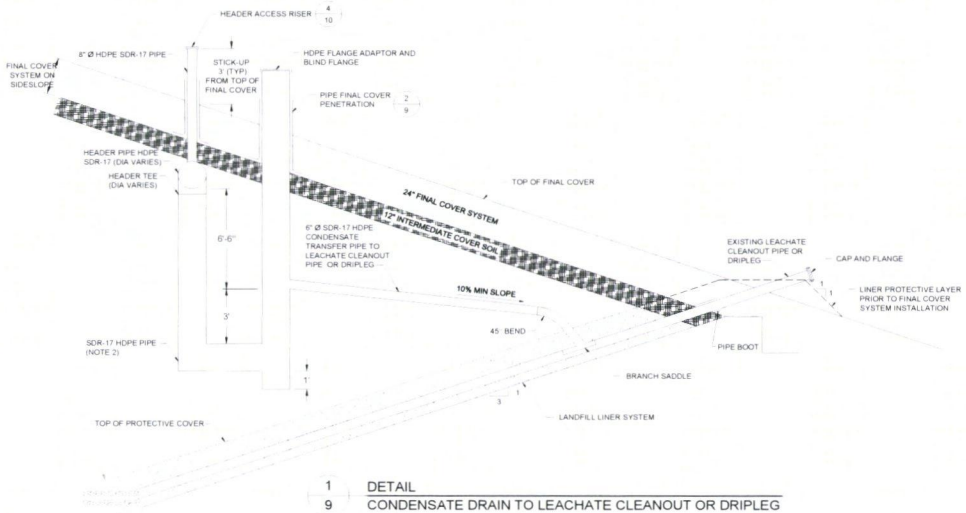
TITLE
VERTICAL GAS EXTRACTION WELL DETAILS

Leon S. Brown, P.E.
Florida Registration No. 57810

Golder Associates
14125 Gravenhurst Way, Suite 400
Jacksonville, Florida 32224
Tel: (904) 363-1453 Fax: (904) 363-1445

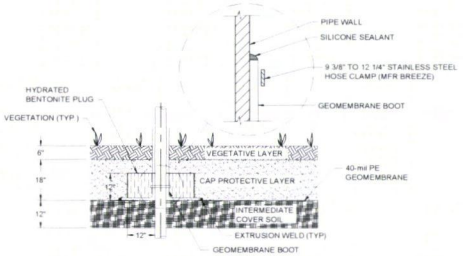
PROJECT No.	083-82734.22	FILE No.	08382734G009
DESIGN	DEG 05/18/12	SCALE	NOT TO SCALE
CADD	BCL 05/18/12		
CHECK			
REVIEW			

SHEET 8

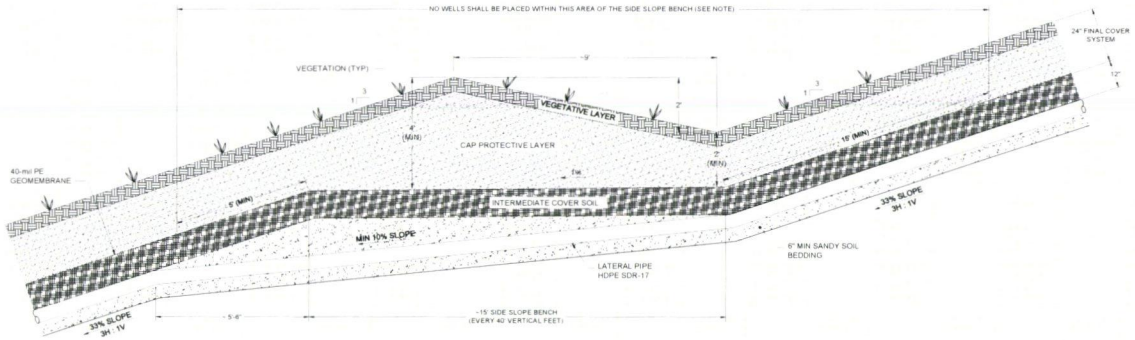


1 / 9 DETAIL
CONDENSATE DRAIN TO LEACHATE CLEANOUT OR DRIPLEG
SCALE: N.T.S.

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



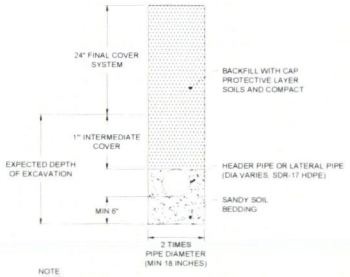
2 / 9 DETAIL
PIPE FINAL COVER PENETRATION
SCALE: N.T.S.



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

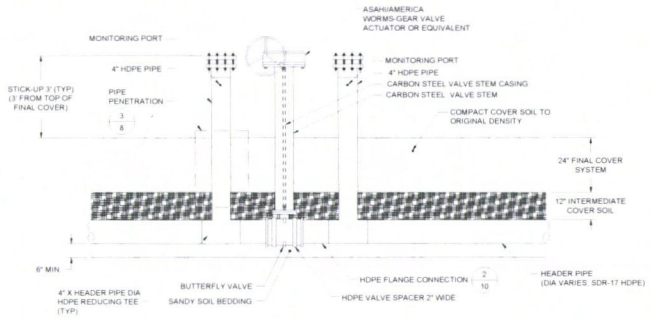
PROJECT:
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE:
GCCS DETAILS (1 OF 2)

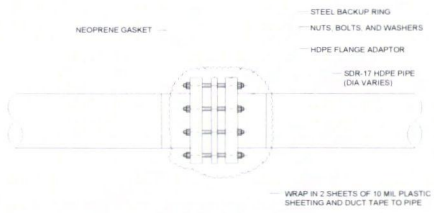
Golder Associates
1425 Sunday Dr., Suite 400
Jacksonville, Florida 32207
Tel: 904.363.3440 Fax: 904.363.3445
CA No. 1610

PROJECT No.		083-82734.22	FILE No.		083827340010
DESIGN	DEG	05/18/12	SCALE		NOT TO SCALE
CADD	BCL	05/18/12			
CHECK					
REVIEW					

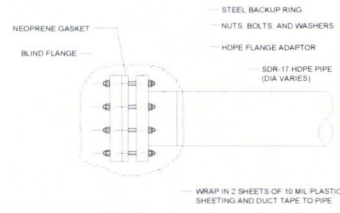
SHEET 9



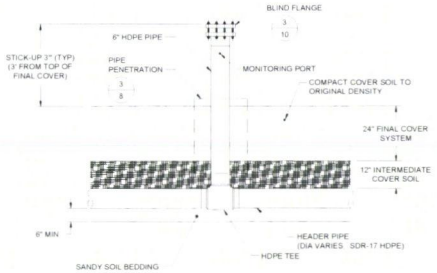
1/10 DETAIL
ISOLATION VALVE
SCALE N.T.S.



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

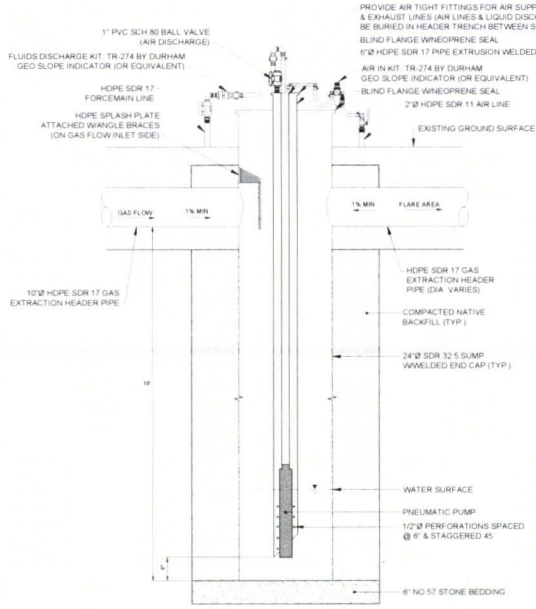


3/10 DETAIL
BLIND FLANGE (TYP)
SCALE N.T.S.

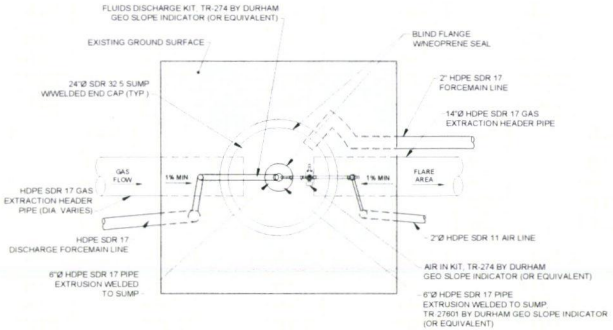


4/10 DETAIL
HEADER ACCESS RISER
SCALE NTS

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

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

TITLE
GCCS DETAILS (2 OF 2)

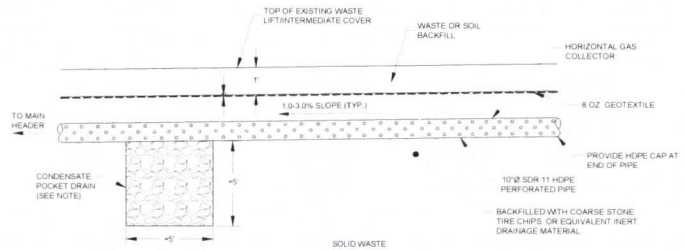
Golder Associates
3425 Bonnett Creek Road, Suite 400
Jacksonville, Florida 32224
Tel: 904.363.3400 Fax: 904.363.3449
GA No. 1678

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

FILE No 08382734G010
SCALE NOT TO SCALE

SHEET 10

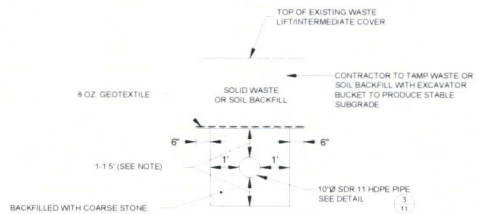
Kevin S. Bauer, P.E.
Florida Registration No. 57874



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.

TYPICAL PROFILE OF HORIZONTAL GAS COLLECTOR

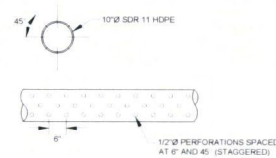
1/11 NTS



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.

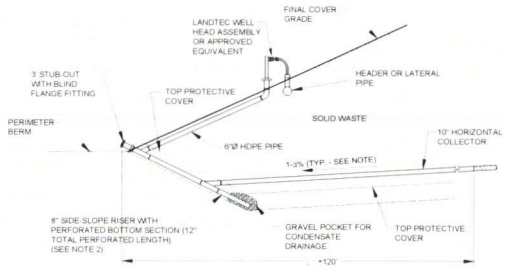
TYPICAL SECTION OF COLLECTOR

2/11 NTS



HDPE PERFORATED PIPE DETAIL

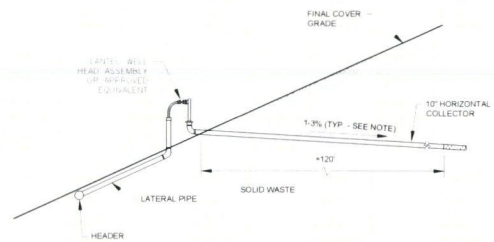
3/11 NTS



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.

CONNECTION DETAIL HORIZONTAL GAS COLLECTOR 1ST LEVEL

4/11 NTS



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

CONNECTION DETAIL HORIZONTAL GAS COLLECTOR 2ND LEVEL

5/11 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

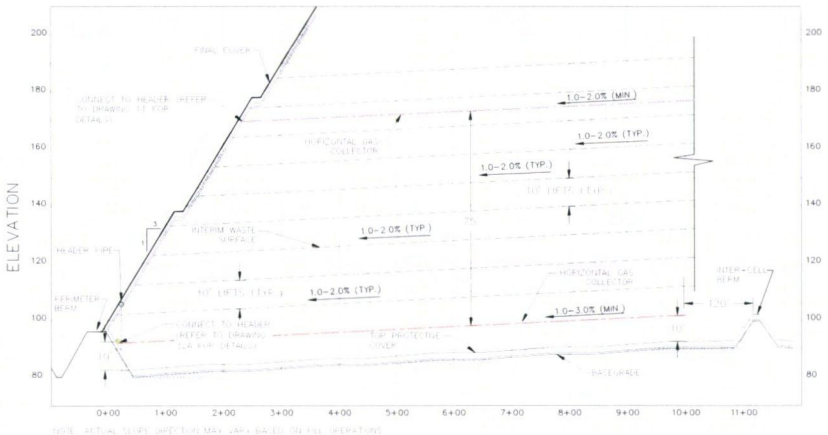
PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

TITLE
HORIZONTAL GAS COLLECTOR DETAILS

Golder Associates
9428 Baymeadows Rd., Suite 400
Jacksonville, Florida 32256
Tel: 904-363-3430 Fax: 904-363-3445
GA No. 1876

PROJECT No.		083-82734.22	FILE No. 08382734G011
DESIGN	DEG	05/18/12	SCALE NOT TO SCALE
CADD	BCL	05/18/12	
CHECK			SHEET 11
REVIEW			

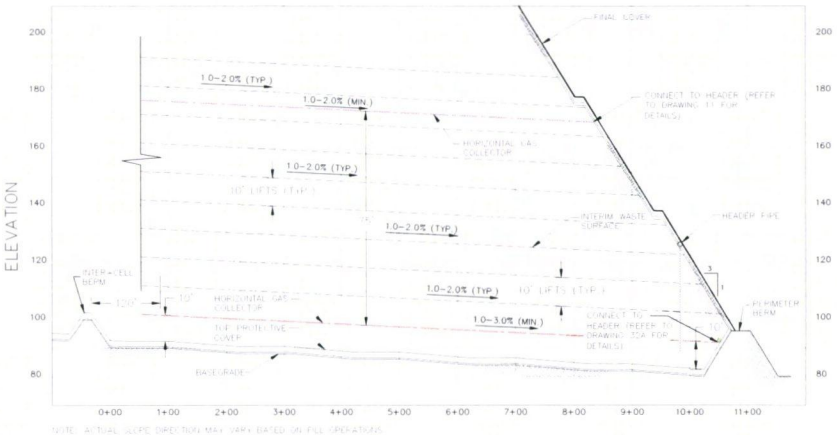
Kevin S. Bryan, P.E.
Florida Registration No. 57819



NOTE: ACTUAL SLOPE DIRECTION MAY VARY BASED ON FILL OPERATIONS

A 12 CELLS 7 & 8 TYPICAL CROSS SECTION

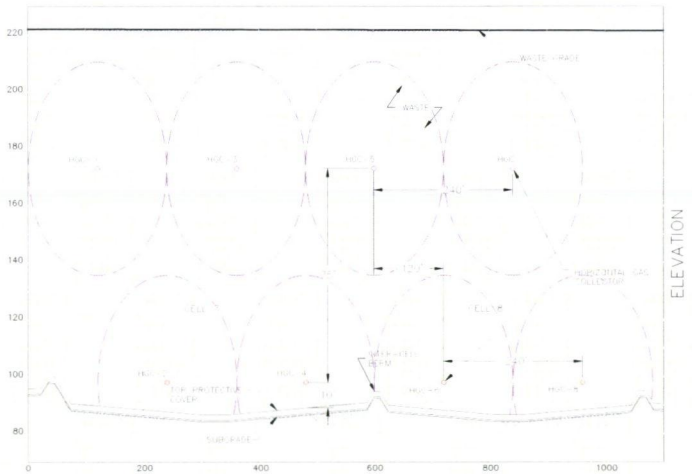
VERTICAL SCALE 20 0 20 FEET
HORIZONTAL SCALE 100 0 100 FEET



NOTE: ACTUAL SLOPE DIRECTION MAY VARY BASED ON FILL OPERATIONS

B 12 CELLS 9 & 10 TYPICAL CROSS SECTION

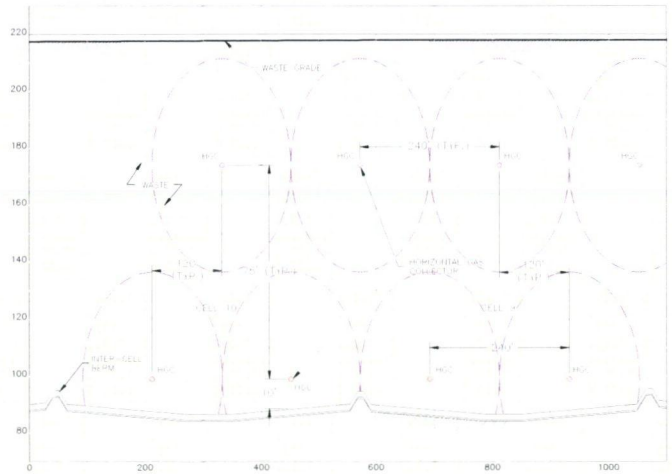
VERTICAL SCALE 20 0 20 FEET
HORIZONTAL SCALE 100 0 100 FEET



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

VERTICAL SCALE 20 0 20 FEET
HORIZONTAL SCALE 100 0 100 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

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

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

TITLE
HORIZONTAL GAS COLLECTOR CROSS SECTIONS

Golder Associates

PROJECT No		083-82734.22	FILE No	083827340012
DESIGN	DEG	05/18/12	SCALE	AS SHOWN
CADD	BCL	05/18/12		
CHECK				
REVIEW				

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

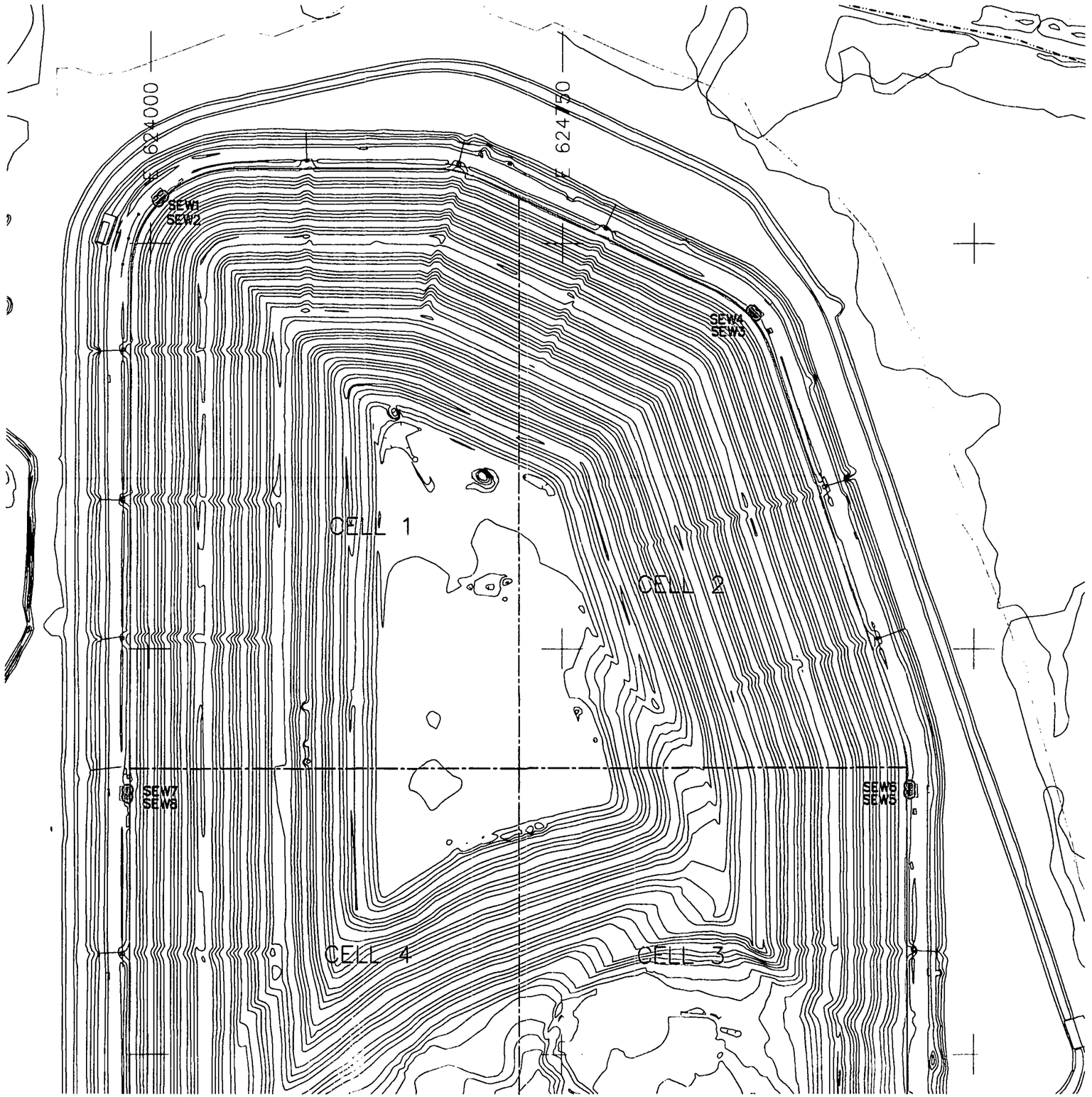
A. Furnish all equipment, materials, and labor necessary for testing the operation of the complete system, valves and appurtenances, upon completion of the installation. The blowers shall be tested to assure proper operation and delivery of specified flow rates and vacuums.

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

END OF SECTION

APPENDIX C

AS-BUILT SURVEY



GRAPHIC SCALE

200 0 100 200

(IN FEET)

1 inch = 200 ft.

LEGEND:

NO.	NUMBER
ELEV.	ELEVATION
CONC.	CONCRETE
GW	GAS WELL
x 20A1	POINT NUMBER ELEAVTION TAKEN ON TOP OF PIPE
⊗	TOP OF 4"PVC Gas WELL SEW1

POINT NUMBER	NORTHING	EASTING	DESCRIPTION	ELEVATION
3552	1357586.8	624022.6	SEW1 - 4"HDPE	102.3
3553	1357587.7	624020.8	6"LATERAL	99.9
3555	1357577.6	624014.3	SEW2 - 4"HDPE	101.8
3554	1357579.8	624012.4	6"LATERAL	100.5
3540	1357366.5	625101.7	SEW3 - 4"HDPE	101.5
3541	1357368.2	625103.7	6"LATERAL	100.6
3543	1357374.6	625094.3	SEW4 - 4"HDPE	101.7
3542	1357376.2	625096.2	6"LATERAL	100.0
3548	1356483.4	625383.5	SEW5 - 4"HDPE	102.4
3547	1356483.6	625387.8	6"LATERAL	101.0
3544	1356495.9	625383.7	SEW6 - 4"HDPE	102.3
3546	1356496.6	625387.2	6"LATERAL	100.1
3561	1356488.0	623962.9	SEW7 - 4"HDPE	102.7
3562	1356488.0	623960.1	6"LATERAL	101.3
3559	1356475.3	623962.2	SEW8 - 4"HDPE	102.1
3558	1356475.3	623959.7	6"LATERAL	100.4

SURVEYOR's NOTES:

1.) North and coordinate basis is the East Zone of the Florida State Plane Coordinate System, and are based on NGS Control Station Numbers AJ7660(J496) and verified Pickett & Associates Targets 1 and 2 from Topographic Survey dated 12/13/01 as provided. The published values used for this survey are NAD 83 2007 adjustment. The Mapping data shown hereon is based on Pickett & Associates Survey as provided by client.

2.) Vertical information depicted on this report are GPS derived elevations based on the National Geodetic Vertical Datum of 1929 (NGVD29) utilizing site control as provided PK#1 with an elevation of 92.92 and OC1406 with an elevation of 80.91.

NO.	DATE	REVISION

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.

FILE NAME: 616-jpd-asbuilt c1-4.dwg

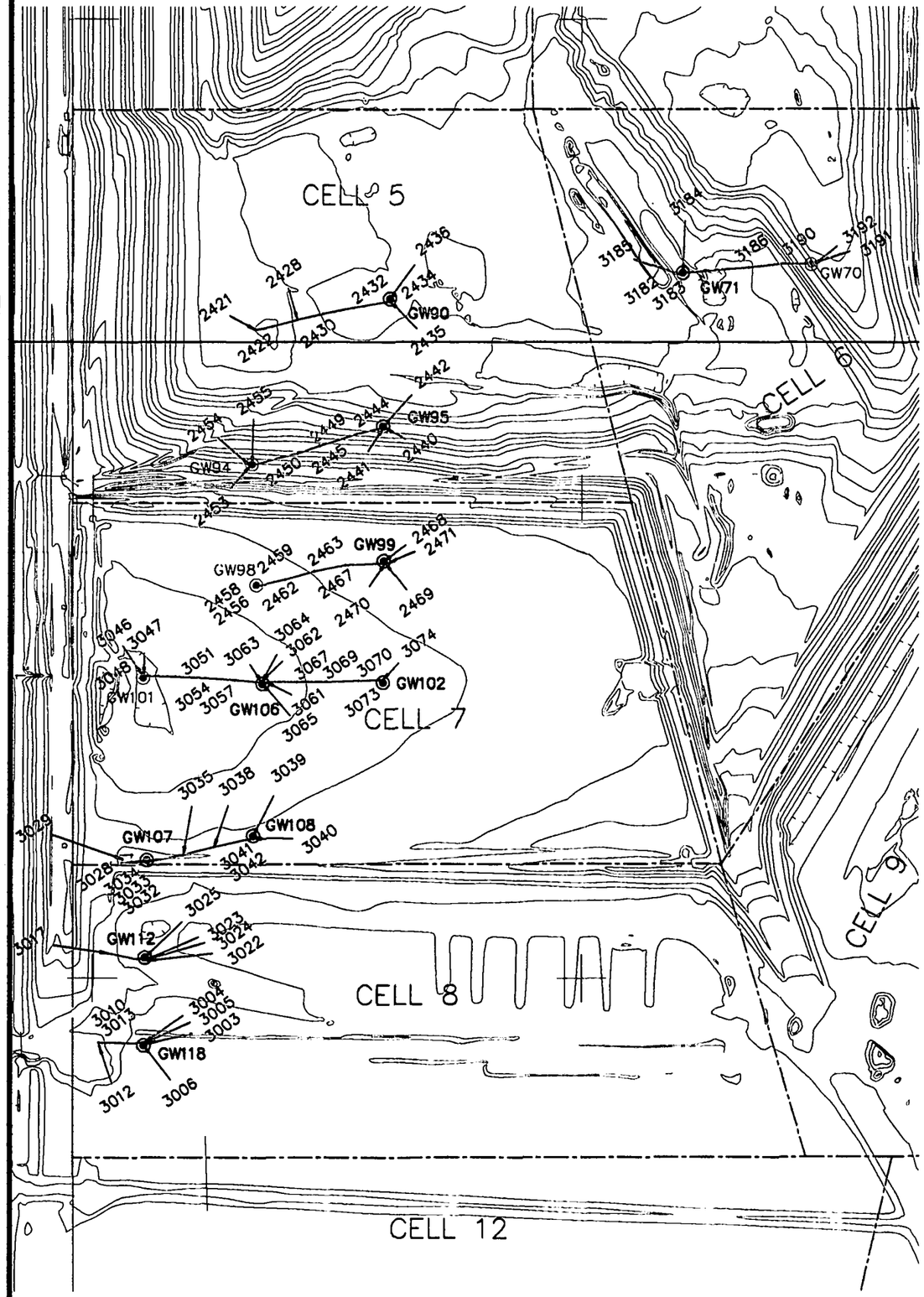
Peavey & Associates
SURVEYING & MAPPING PA
690 Alice Place
BARTOW, FL 33830
PHONE: 863-738-4980
FLORIDA BUSINESS NO.7779

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

ASBUILT SURVEY-GAS EXTRACTION WELLS AT LEACHATE SUMPS CELLS 1-4

SOLID WASTE MANAGEMENT FACILITY
1501 OMNI WAY ST. CLOUD, FLORIDA

PROJECT	DRAWING NO.	SHEET
617	282	1



POINT NUMBER	NORTHING	EASTING	DESCRIPTION	ELEVATION
2421	1355513.8	624247.5	12"TEE	177.5
2422	1355518.8	624274.3	12"HDPE	186.6
2428	1355529.3	624312.3	12"HDPE	198.3
2430	1355538.8	624352.1	12"HDPE	208.3
2432	1355548.0	624398.5	12"HDPE	219.0
2434	1355559.8	624462.4	12"STUB OUT	231.4
2435	1355558.8	624454.8	LATERAL	236.0
2436	1355562.5	624454.2	GW90 8"	237.4
2438	1355361.1	624448.7	8"STUB OUT	230.3
2440	1355360.2	624448.2	8"STUB OUT	229.1
2441	1355360.5	624444.3	LATERAL	233.1
2442	1355363.2	624443.6	GW95	233.8
2444	1355350.6	624403.2	8"HDPE	221.5
2445	1355341.4	624376.6	8"HDPE	215.0
2449	1355331.9	624347.2	8"HDPE	207.1
2450	1355319.9	624312.8	8"HDPE	196.2
2453	1355301.5	624239.6	8" TEE	171.1
2454	1355301.5	624239.5	LATERAL	176.1
2455	1355303.8	624242.6	GW94	178.8
2456	1355111.8	624246.3	8"TEE	170.5
2458	1355112.6	624246.4	LATERAL	175.9
2459	1355115.1	624249.8	GW98	179.3
2462	1355122.8	624294.0	8"HDPE	184.4
2463	1355135.5	624338.3	8"HDPE	200.3
2467	1355145.3	624386.3	8"HDPE	216.7
2468	1355152.1	624445.0	GW99	234.7
2469	1355148.8	624447.8	LATERAL	233.1
2470	1355148.9	624447.2	8"x6"TEE	227.3
2471	1355149.6	624452.5	8"STUB OUT	227.8
3003	1354397.3	624083.5	8"STUB OUT	124.8
3004	1354398.3	624078.7	8"TEE	123.9
3005	1354397.8	624078.3	LATERAL	131.3
3006	1354393.9	624077.6	GW118	131.7
3010	1354399.3	624009.6	18"x8"TEE	106.3
3012	1354394.0	624010.7	GW	112.5
3013	1354399.2	624009.7	LATERAL	108.0
3017	1354538.7	624023.5	18"x8"TEE	108.8
3022	1354526.8	624083.8	8"STUB OUT	126.8
3023	1354527.5	624079.7	8"x6"TEE	125.8
3024	1354527.5	624078.7	LATERAL	132.4
3025	1354531.3	624079.5	GW112	131.9
3028	1354680.6	624044.5	14"x8"TEE	115.2
3029	1354685.9	624045.5	8"BLIND FLANGE	123.1
3032	1354684.0	624082.4	GW107	130.4
3033	1354681.4	624081.7	LATERAL	134.5
3034	1354680.8	624081.8	8"x6"TEE	126.6
3035	1354692.2	624138.0	8"HDPE	138.3
3038	1354704.8	624185.9	8"HDPE	152.9
3039	1354722.5	624245.2	GW108	169.6
3040	1354718.6	624246.0	LATERAL	169.1
3041	1354718.9	624246.4	8"x6"TEE	162.5
3042	1354720.7	624252.6	8"STUB OUT	163.8

GRAPHIC SCALE

200 0 100 200

(IN FEET)

1 inch = 200 ft.

LEGEND:

NO.	NUMBER
ELEV.	ELEVATION
CONC.	CONCRETE
GW	GAS WELL
× 2041	POINT NUMBER ELEAVTION TAKEN ON TOP OF PIPE
◉	Top of PVC Gas well GW99

POINT NUMBER	NORTHING	EASTING	DESCRIPTION	ELEVATION
3047	1354972.4	624077.0	LATERAL	131.9
3048	1354970.1	624076.3	GW101	128.2
3051	1354971.1	624125.3	8"HDPE	139.2
3054	1354969.0	624172.4	8"HDPE	153.1
3057	1354965.7	624216.9	8"HDPE	166.1
3061	1354962.7	624264.0	8"STUB OUT	175.2
3062	1354964.1	624258.1	LATERAL	180.2
3064	1354963.0	624258.3	8"x6"TEE	174.0
3065	1354960.3	624259.0	GW106	181.8
3067	1354962.4	624311.5	8"HDPE	189.1
3069	1354963.2	624358.1	8"HDPE	201.9
3070	1354965.1	624406.4	8"HDPE	215.4
3073	1354962.5	624443.9	GW102	228.1
3074	1354967.0	624443.4	LATERAL	226.2
3182	1355599.6	624907.4	12"x6"TEE	214.3
3183	1355599.2	624907.1	LATERAL	219.5
3184	1355602.9	624905.4	GW71	221.0
3185	1355599.6	624902.6	12"STUB OUT	222.0
3186	1355611.0	625006.7	6"HDPE	197.5
3190	1355617.4	625053.6	6"HDPE	185.9
3191	1355617.0	625103.2	GW70	182.5
3192	1355613.3	624104.5	LATERAL	178.8

SURVEYOR's NOTES:

1.) North and coordinate basis is the East Zone of the Florida State Plane Coordinate System, and are based on NGS Control Station Numbers AJ7660(J496) and verified Pickett & Associates Targets 1 and 2 from Topographic Survey dated 12/13/2013 as provided. The published values used for this survey are NAD 83-2007 adjustment. The Mapping data shown hereon is based on Pickett & Associates Survey as provided by Client.

2.) Vertical information depicted on this report are GPS derived elevations based on the National Geodetic Vertical Datum of 1929 (NGVD29) utilizing site control as provided by Client with an elevation of 92.92 and OC1406 with an elevation of 80.91.

NO.	DATE	REVISION

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.

FILE NAME: 616-jad-gcs 3-27-2014.dwg

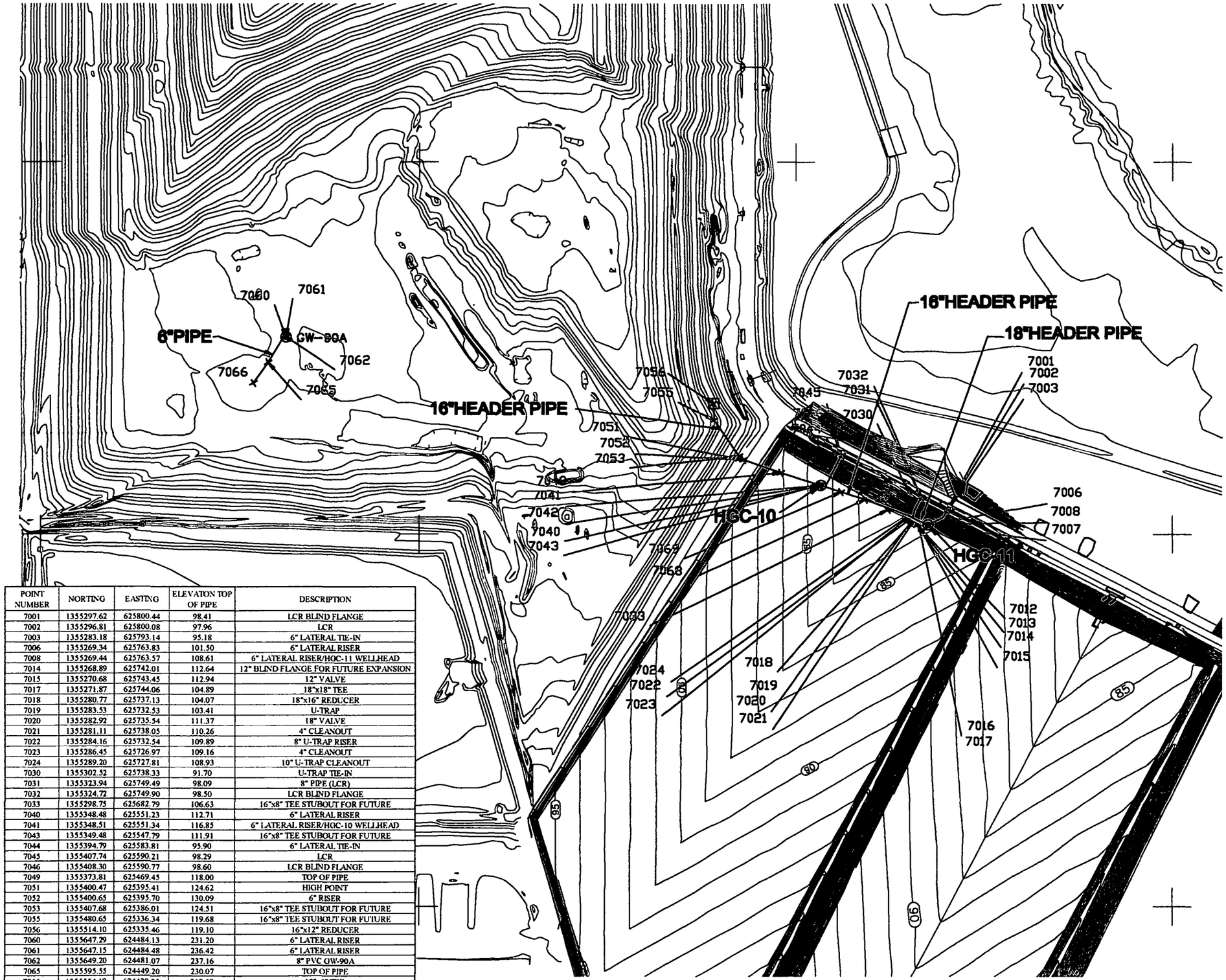
Peavey & Associates
SURVEYING & MAPPING PA
690 Alice Place
BARTOW, FL 33830
PHONE: 863-738-4960
FLORIDA BUSINESS NO.7779

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

ASBUILT SURVEY - GCCS 2014
CELLS 5 THROUGH 8 - J.E.D.
SOLID WASTE MANGEMENT FACILITY
1501 OMNI WAY ST. CLOUD, FLORIDA

DEBORAH E. PEAVEY, P.S.M.
FLORIDA REGISTRATION NUMBER 5346
FLORIDA BUSINESS NUMBER 7779
3/27/2014&5/8/2014
SURVEY DATES

PROJECT	DRAWING NO.	SHEET
617	282	1



POINT NUMBER	NORTING	EASTING	ELEVATION TOP OF PIPE	DESCRIPTION
7001	1355297.62	625800.44	98.41	LCR BLIND FLANGE
7002	1355296.81	625800.08	97.96	LCR
7003	1355283.18	625793.14	95.18	6" LATERAL TIE-IN
7006	1355269.34	625763.83	101.50	6" LATERAL RISER
7008	1355269.44	625763.57	108.61	6" LATERAL RISER/HGC-11 WELLHEAD
7014	1355268.89	625742.01	112.64	12" BLIND FLANGE FOR FUTURE EXPANSION
7015	1355270.68	625743.45	112.94	12" VALVE
7017	1355271.87	625744.06	104.89	18"x18" TEE
7018	1355280.77	625737.13	104.07	18"x16" REDUCER
7019	1355283.53	625732.53	103.41	U-TRAP
7020	1355282.92	625735.54	111.37	18" VALVE
7021	1355281.11	625738.05	110.26	4" CLEANOUT
7022	1355284.16	625732.54	109.89	8" U-TRAP RISER
7023	1355286.45	625726.97	109.16	4" CLEANOUT
7024	1355289.20	625727.81	108.93	10" U-TRAP CLEANOUT
7030	1355302.52	625738.33	91.70	U-TRAP TIE-IN
7031	1355323.94	625749.49	98.09	8" PIPE (LCR)
7032	1355324.72	625749.90	98.50	LCR BLIND FLANGE
7033	1355298.75	625682.79	106.63	16"x8" TEE STUBOUT FOR FUTURE
7040	1355348.48	625551.23	112.71	6" LATERAL RISER
7041	1355348.51	625551.34	116.85	6" LATERAL RISER/HGC-10 WELLHEAD
7043	1355349.48	625547.79	111.91	16"x8" TEE STUBOUT FOR FUTURE
7044	1355394.79	625583.81	95.90	6" LATERAL TIE-IN
7045	1355407.74	625590.21	98.29	LCR
7046	1355408.30	625590.77	98.60	LCR BLIND FLANGE
7049	1355373.81	625469.45	118.00	TOP OF PIPE
7051	1355400.47	625395.41	124.62	HIGH POINT
7052	1355400.65	625395.70	130.09	6" RISER
7053	1355407.68	625386.01	124.51	16"x8" TEE STUBOUT FOR FUTURE
7055	1355480.65	625336.34	119.68	16"x8" TEE STUBOUT FOR FUTURE
7056	1355514.10	625335.46	119.10	16"x12" REDUCER
7060	1355647.29	624484.13	231.20	6" LATERAL RISER
7061	1355647.15	624484.48	236.42	6" LATERAL RISER
7062	1355649.20	624481.07	237.16	8" PVC GW-90A
7065	1355595.55	624449.20	230.07	TOP OF PIPE
7066	1355554.18	624420.25	218.68	12"x6" TEE
7068	1355319.18	625637.88	107.45	TOP OF PIPE
7069	1355334.58	625590.25	110.99	TOP OF PIPE

GRAPHIC SCALE

200 0 100 200

(IN FEET)

1 inch = 200 ft.

LEGEND:

NO.	NUMBER
ELEV.	ELEVATION
CONC.	CONCRETE
GW	GAS WELL
x 7041	POINT NUMBER ELEAVTION TAKEN ON TOP OF PIPE
⊛	Top of PVC Gas well

SURVEYOR's NOTES:

1.) North and coordinate basis is the East Zone of the Florida State Plane Coordinate System, and are based on NGS Control Station Numbers AJ7660(J496) and verified Pickett & Associates Targets 1 and 2 from Topographic Survey dated 12/13/01 as provided. The published values used for this survey are NAD 83 2007 adjustment. The Mapping data shown hereon is based on Pickett & Associates Survey as provided by client.

2.) Vertical information depicted on this report are GPS derived elevations based on the National Geodetic Vertical Datum of 1929 (NGVD29) utilizing site control as provided [illegible] with an elevation of 92.92 and OC1406 with an elevation of 80.

NO. | DATE | REVISION

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.

FILE NAME: JED GMS 12-27-2014

Peavey & Associates
SURVEYING & MAPPING PA
690 Alice Place
BARTOW, FL 33830
PHONE: 863-738-4860
FLORIDA BUSINESS NO.7779

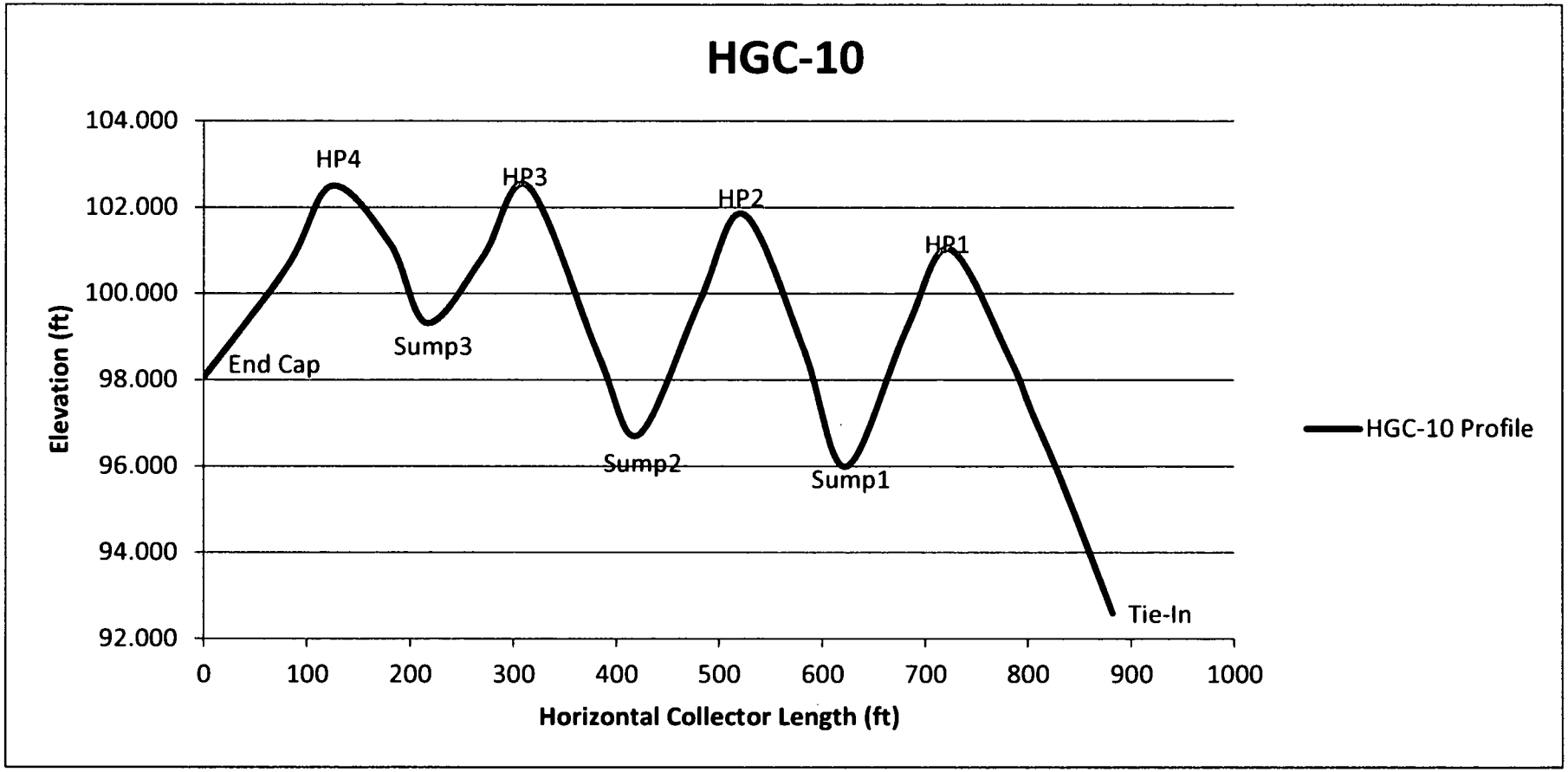
CLIENT:
Omni Waste of Osceola County, LLC
Waste Services, Inc.
1601 Omni Way
St. Cloud, Fl 34773

AS-BUILT SURVEY - GCCS 2014
CELLS 5 AND 9 - J.E.D.
SOLID WASTE MANGEMENT FACILITY
1601 OMNI WAY ST. CLOUD, FLORIDA

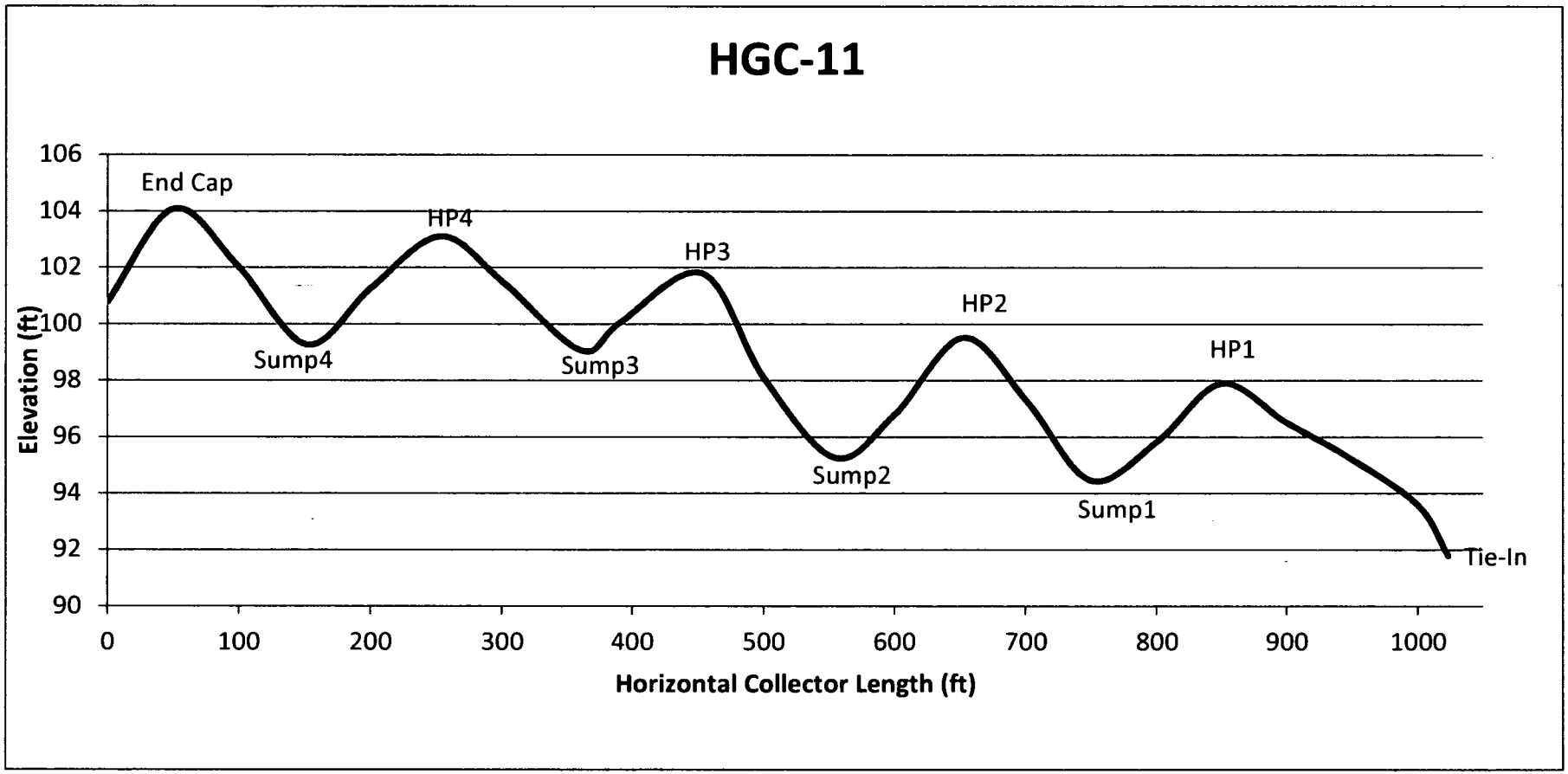
[illegible] PEAVEY, P.S.M.
FLORIDA REGISTRATION NUMBER [illegible]
DATE 12/27/2014
SURVEY DATES [illegible]

PROJECT	DRAWING NO.	SHEET
617	282	1

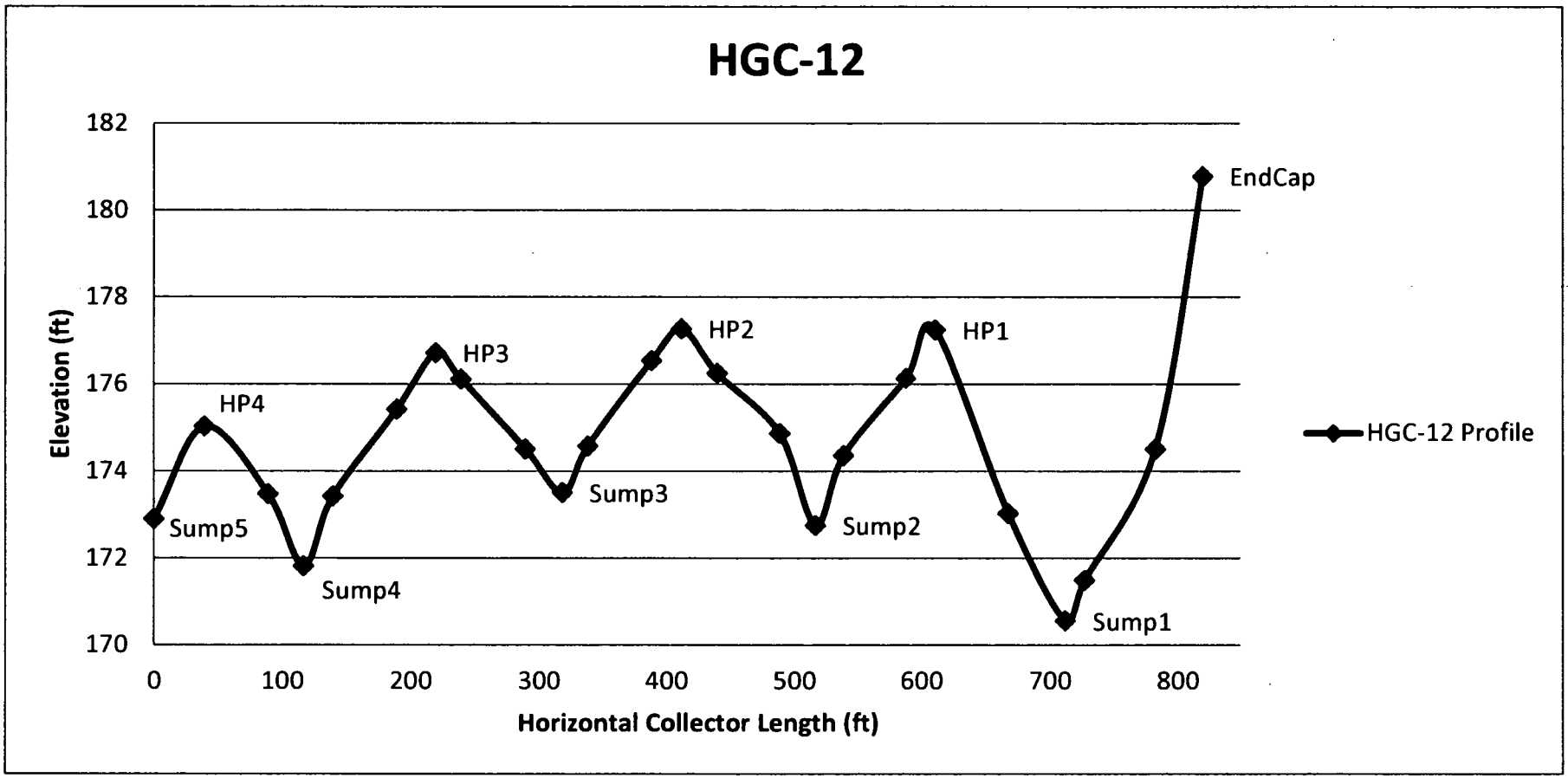
HGC-10 As-Built Survey					
Survey Performed by JED Facility Operations					
Point Name	Measured Northing	Measured Easting	Measured Elevation	Slope (%)	Calculated Slope (%)
HGC10-Tie	1355384.463	625580.581	92.591		
				6	6
HGC10-50	1355341.222	625555.522	95.701		
				6	6
hgc 10-solid	1355316.074	625541.300	97.306		
				4	6
hgc 10-100	1355297.378	625531.327	98.541		
				4	4
hgc 10-hp1	1355247.487	625500.634	101.035		
				4	-4
hgc 10-200	1355210.496	625480.572	99.154		
				5	-5
hgc 10-lp1	1355161.246	625449.042	95.990		
				7	7
hgc 10-300	1355124.766	625430.248	98.720		
				5	5
hgc 10-hp22	1355074.174	625401.515	101.846		
				5	-5
hgc 10-400	1355038.373	625380.040	99.853		
				5	-5
hgc 10-lp2	1354986.944	625348.269	96.723		
				5	5
hgc 10-500	1354953.359	625329.137	98.550		
				5	6
hgc 10-hp33	1354894.154	625294.148	102.487		
				4	-4
hgc 10-601	1354856.025	625272.205	100.843		
				3	-3
hgc 10-lp333	1354809.449	625245.240	99.313		
				5	5
hgc 10-700	1354777.544	625228.500	101.169		
				2	2
hgc 10-hp45	1354729.881	625199.132	102.497		
				4	-4
hgc 10-800	1354692.122	625177.790	100.628		
				3	-3
hgc 10-end3	1354620.867	625139.425	98.050		


HGC-10
104.000
102.000
100.000
98.000
96.000
94.000
92.000
Elevation (ft)
0
100
200
300
400
500
600
700
800
900
1000
Horizontal Collector Length (ft)
HP4
HP3
HP2
HP1
End Cap
Sump3
Sump2
Sump1
Tie-In
HGC-10 Profile

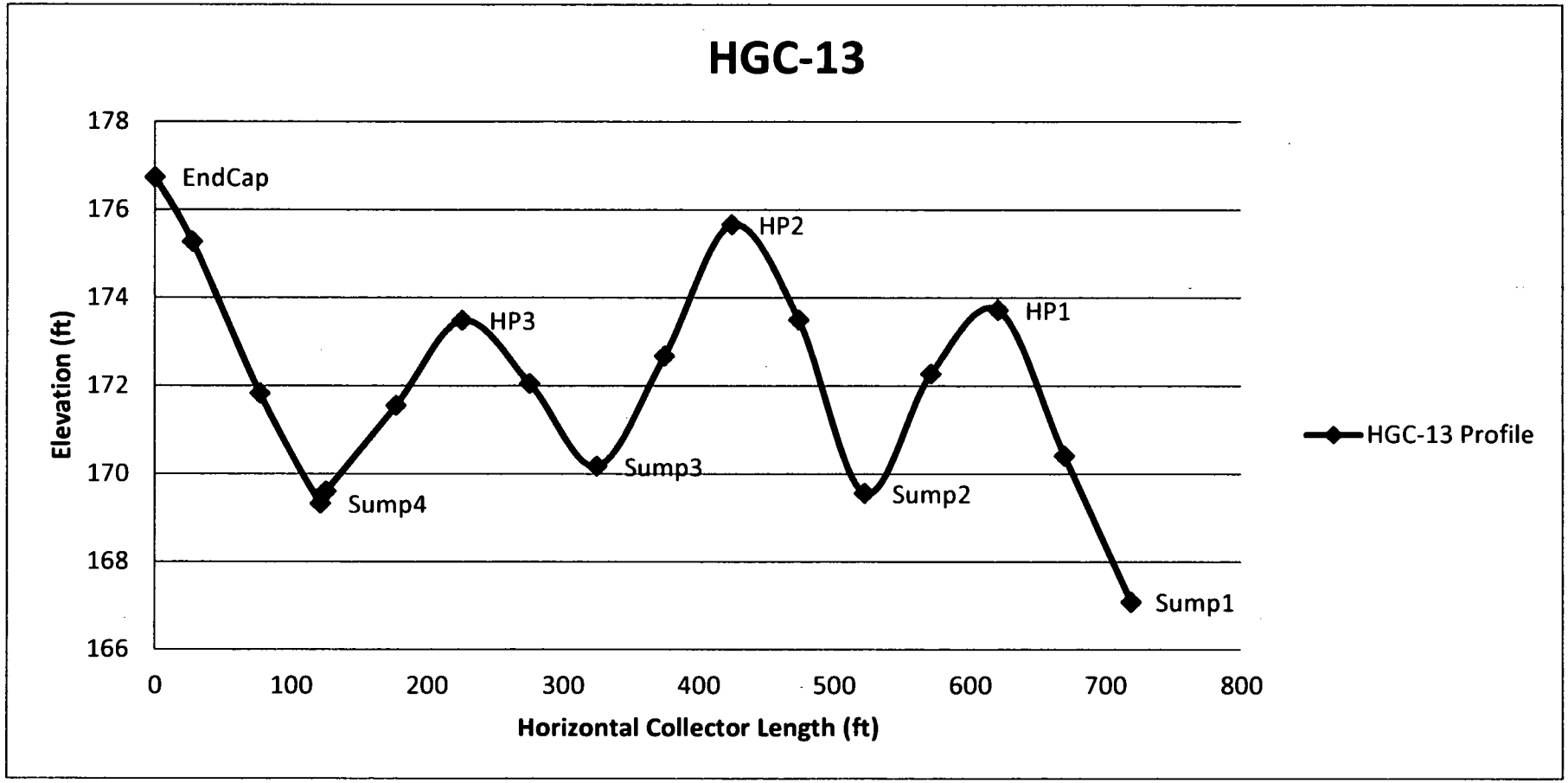
HGC-11 As-Built Survey					
Survey Performed by JED Facility Operations					
Point Name	Measured Northing	Measured Easting	Measured Elevation	Slope (%)	Calculated Slope (%)
hgc 11-tie	1355274.82	625789.57	91.785		
				8	8
hgc 11-1000	1355253.91	625777.23	93.629		
				3	3
hgc 11-solid1	1355204.2	625750.33	95.406		
				3	3
hgc 11-900	1355165.71	625730.76	96.524		
				4	3
hgc 11-hp1	1355122.17	625706.44	97.899		
				4	-4
hgc 11-800	1355080.02	625681.46	95.85		
				3	-3
hgc 11-LP1	1355034.98	625657.52	94.459		
				6	6
hgc 11-700	1354994.38	625630.51	97.26		
				5	5
hgc 11-hp2	1354952.72	625606.04	99.521		
				5	-5
hgc 11-600	1354907.41	625580.05	96.808		
				3	-3
hgc 11-lp22	1354867.3	625556.78	95.268		
				4	5
hgc 11-500	1354821.1	625529.13	98.084		
				8	8
hgc 11-hp333	1354780.73	625504.88	101.797		
				3	-3
hgc 11-401	1354726.43	625474.77	100.066		
				3	-3
hgc 11-lp3	1354699.98	625459.02	99.073		
				4	4
hgc 11-300	1354647.43	625428.21	101.532		
				3	3
hgc 11-hp4	1354606.72	625405.96	103.109		
				3	-3
hgc 11-200	1354562.03	625377.72	101.267		
				4	-4
hgc 11-lp44	1354519.74	625354.76	99.267		
				3	5
hgc 11-100	1354474.95	625327.65	102.017		
				4	4
hgc 11-hp55	1354432.13	625301.99	104.08		
				5	-7
hgc 11-end	1354389.31	625276.31	100.781		


HGC-11
106
104
102
100
98
96
94
92
90
Elevation (ft)
End Cap
HP4
HP3
HP2
HP1
Sump4
Sump3
Sump2
Sump1
Tie-In
0
100
200
300
400
500
600
700
800
900
1000
Horizontal Collector Length (ft)

HGC-12 As-Built Survey				
Survey Performed by JED Facility Operations				
Point Name	**Measured Northing**	**Measured Easting**	**Measured Elevation**	**Calculated Slope (%)**
hgc12cap	1355499.7	625098.5	180.782	
				-15
hgc12-50-1	1355457.4	625096.6	174.511	
				-5
hgc12-50-2	1355395.6	625090.6	171.49	
				-6
hgc12-lp-1	1355379.6	625087.4	170.557	
				5
hgc12-50-3	1355333.7	625075.2	173.028	
				7
hgc12-hp-1a	1355285.6	625045	177.248	
				-5
hgc12-50-4a	1355268.4	625029.4	176.137	
				-4
hgc12-50-5	1355231.4	624996.3	174.365	
				-7
hgc-12-lp-2a	1355214.2	624982.4	172.75	
				8
hgc-12-50-6	1355192.7	624964.5	174.868	
				3
hgc-12-50-7	1355154.4	624934.1	176.248	
				4
hgc-12-hp-2a	1355131.8	624916.9	177.275	
				-3
hgc-12-50-8	1355113.9	624902.5	176.54	
				-4
hgc-12-50-9	1355075	624871.2	174.58	
				-5
hgc-12-lp-3	1355058.8	624859.2	173.506	
				3
hgc-12-50-10	1355035.6	624841	174.511	
				3
hgc-12-50-11	1354994.4	624812.2	176.113	
				3
hgc-12-hp-3	1354977.8	624801.4	176.72	
				-4
hgc-12-50-12	1354952.3	624785.3	175.424	
				-4
hgc-12-50-13	1354910.2	624758.3	173.425	
				-7
hgc-12-lp-4	1354891.1	624746.2	171.813	
				6
hgc-12-50-14	1354868	624731.2	173.475	
				3
hgc-12-hp-4	1354825.1	624705.7	175.028	
				-5
hgc-12-end	1354790.7	624686.5	172.896	


HGC-12
182
180
178
176
174
172
170
Elevation (ft)
0
100
200
300
400
500
600
700
800
Horizontal Collector Length (ft)
EndCap
HP1
HP2
HP3
HP4
Sump1
Sump2
Sump3
Sump4
Sump5
HGC-12 Profile

HGC-13 As-Built Survey				
Survey Performed by JED Facility Operations				
Point Name	Measured Northing	Measured Easting	Measured Elevation	Calculated Slope (%)
hgc-13-end	1354691.9	624865.04	167.085	
				7
hgc-13-50-1	1354737.1	624887.06	170.408	
				7
hgc-13-hp-1	1354780.3	624911.27	173.72	
				-3
hgc-13-50-3	1354824.3	624935.13	172.273	
				-5
hgc-13-lp-1	1354869.8	624956.52	169.555	
				8
hgc-13-50-5	1354913.9	624979.18	173.5	
				4
hgc-13-hp-2	1354952.7	625010.49	175.66	
				-6
hgc-13-50-7	1354987.5	625045.89	172.673	
				-5
hgc-13-lp-3	1355021.2	625083.43	170.169	
				4
hgc-13-50-9	1355054.9	625120.12	172.047	
				3
hgc-13-hp-3	1355089.3	625156.63	173.483	
				-4
hgc-13-50-11	1355125.3	625190.62	171.541	
				-4
hgc-13-50-12	1355167.3	625220.54	169.594	
				-7
hgc-13-lp-4	1355170.3	625223.14	169.318	
				6
hgc-13-50-13	1355207	625248.33	171.82	
				7
hgc-13-50-14	1355248.8	625275.35	175.269	
				5
hgc-13-cap	1355271.4	625290.78	176.737	


HGC-13
178
176
174
172
170
168
166
Elevation (ft)
EndCap
HP2
HP3
HP1
Sump4
Sump3
Sump2
Sump1
0
100
200
300
400
500
600
700
800
Horizontal Collector Length (ft)
HGC-13 Profile

APPENDIX D

AS-BUILT WELL SCHEDULE

AS-BUILT WELL SCHEDULE - 2014 GCCS EXPANSION
J.E.D. Solid Waste Management Facility

Well ID	Northing [1]	Easting [1]	Ground Elevation [2] (ft)	Top of Protective Liner Elevation [3] (ft)	Total Well Depth (ft)	Slotted Length (ft)	BGS [4] Solid Length [5] (ft)	AGS [6] Solid Length (ft)
GW-71	1,355,602.9	624,905.4	215.8	84.80	47.0	36.0	10.0	5.0
GW-90	1,355,562.5	624,454.2	232.0	90.50	57.0	46.0	10.0	5.0
GW-90A	1,355,649.9	624,481.0	232.0	89.70	95.0	85.0	10.0	5.0
GW-95	1,355,363.2	624,443.6	230.4	93.00	86.0	75.0	10.0	5.0
GW-99	1,355,152.1	624,445.0	229.3	87.60	95.0	84.0	10.0	5.0
GW-102	1,354,962.5	624,443.9	223.3	84.30	76.0	65.0	10.0	5.0
GW-106	1,354,960.3	624,259.0	175.8	82.40	78.0	62.0	15.0	5.0
GW-107	1,354,684.0	624,082.4	129.6	88.60	26.0	10.0	15.0	5.0
GW-108	1,354,722.5	624,245.2	164.6	86.50	63.0	47.0	15.0	5.0
GW-112	1,354,531.3	624,079.5	127.5	82.10	30.0	14.0	15.0	5.0
GW-118	1,354,393.9	624,077.6	125.4	81.60	29.0	13.0	15.0	5.0
Totals	---	---	---	---	**682**	**537**	**135**	

Made by: BKP
Checked by: DEG
Approved by: KSB

Notes:

[1] Design and pre-construction northing and easting are the same EXCEPT for GW-106, GW-107 and GW-112 which were relocated in the field due to current waste grade. GW-99 was relocated due to proximity of a horizontal gas collector.

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

[3] Elevations provided by Geosyntec Consultants and Golder Associates.

[4] BGS - Below ground surface

[5] Original design slotted length provided by Geosyntec Consultants and Golder Associates.

[6] AGS - Above ground surface

Golder Associates

APPENDIX E
WELL BORING LOGS

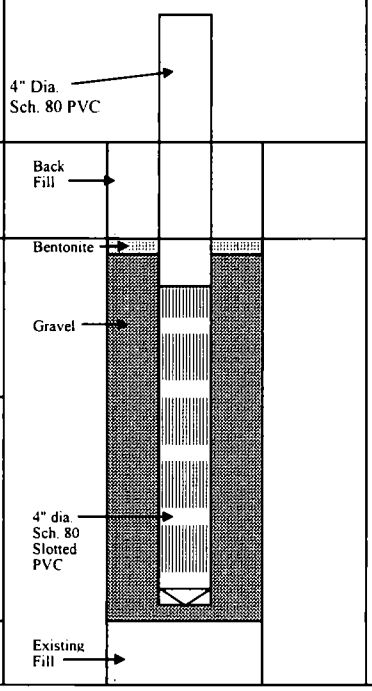
SOIL VAPOR EXTRACTION WELL INSTALLATION LOG

JOB NO.	083-8273.31	PROJECT	J.E.D. Landfill Gas System Improvements	WELL NO.	Cell 3 BH1	SHEET	1 OF 1
GAI INSP.	BKP	DRILLING METHOD	Track based auger	NORTHING	1356482.67	GROUND ELEV.	98.46
WEATHER	Clear	DRILLING COMPANY	Environmental Drilling Service	EASTING	625384.74	DATE/TIME	12/18/2013
TEMP.	55 °F	DRILL RIG	GeoProbe 7822DT	STARTED	0933 12/18/13 TIME/DATE	COMPLETED	1055 12/18/13 TIME/DATE

MATERIALS INVENTORY

WELL CASING	4 in. dia. 10 l.f.	WELL SCREEN	4 in. dia. 10 l.f.	BENTONITE SEAL	1"-2"
CASING TYPE	SCH 80 PVC	SCREEN TYPE	Slotted PVC	INSTALLATION METHOD	-
JOINT TYPE	Glued	SLOT SIZE	3/8" x 8"	FILTER PACK QTY.	11 ft
GROUT QUANTITY	NA	CENTRALIZERS	-	FILTER PACK TYPE	Gravel
GROUT TYPE	NA	DRILLING MUD TYPE	NA	INSTALLATION METHOD	-

ELEV./DEPTH	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
0.0	Ground Surface	4" Dia. Sch. 80 PVC	Drilling stopped at 15' BGS. Approximatelv 6" of gravel added to bottom of hole. Well set in place. Gravel added to approximatelv 1' above the slotted pipe. Bentonite added from gravel to upper liner surface. Liner repaired by Comanco, then backfilled up to existing ground surface.
2.0	Dk. Brown Damp Fine Sand Upper Liner Surface	Back Fill Bentonite	
4.0	Brown Damp Fine Sand w/ Trace Pale Brown Fine Sand	Gravel	
6.0			
8.0	Brown Damp Fine Sand		
10.0			
12.0		4" dia. Sch. 80 Slotted PVC	
14.0			
16.0	Boring Terminated at 15.0 feet	Existing Fill	



SOIL VAPOR EXTRACTION WELL INSTALLATION LOG

JOB NO.	083-8273.31	PROJECT	J.E.D. Landfill Gas System Improvements	WELL NO.	Cell 3 BH2	SHEET	1 OF 1
GAI INSP.	BKP	DRILLING METHOD	Track based auger	NORTHING	1356495.62	GROUND ELEV.	97.90
WEATHER	Clear	DRILLING COMPANY	Environmental Drilling Service	EASTING	625384.19	DATE/TIME	12/18/2013
TEMP.	72 °F	DRILL RIG	GeoProbe 7822DT	STARTED	1115 12/18/13 TIME/DATE	COMPLETED	1153 12/18/13 TIME/DATE

MATERIALS INVENTORY

WELL CASING	4 in. dia. 10 l.f.	WELL SCREEN	4 in. dia. 10 l.f.	BENTONITE SEAL	1"-2"
CASING TYPE	SCH 80 PVC	SCREEN TYPE	Slotted PVC	INSTALLATION METHOD	-
JOINT TYPE	Glued	SLOT SIZE	3/8" x 8"	FILTER PACK QTY.	11 ft
GROUT QUANTITY	NA	CENTRALIZERS	-	FILTER PACK TYPE	Gravel
GROUT TYPE	NA	DRILLING MUD TYPE	NA	INSTALLATION METHOD	-

ELEV./DEPTH	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
0.0	Ground Surface	4" Dia. Sch. 80 PVC	Drilling stopped at 15' BGS. Approximatelv 6" of gravel added to bottom of hole. Well set in place. Gravel added to approximately 1' above the slotted pipe. Bentonite added from gravel to upper liner surface. Liner repaired by Comanco, then backfilled up to existing ground surface.
2.0	Dk. Brown Damp Fine Sand Upper Liner Surface	Back Fill Bentonite	
4.0	Brown Damp Fine Sand w/ Trace Pale Brown Fine Sand	Gravel	
6.0			
8.0	Brown Damp Fine Sand		
10.0			
12.0		4" dia. Sch. 80 Slotted PVC	
14.0			
16.0	Boring Terminated at 15.0 feet	Existing Fill	

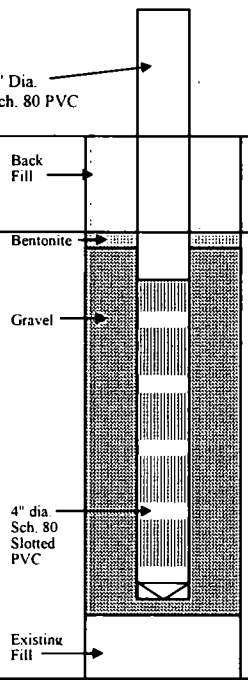
SOIL VAPOR EXTRACTION WELL INSTALLATION LOG

JOB NO.	083-8273.31	PROJECT	J.E.D. Landfill Gas System Improvements	WELL NO.	Cell 2 BH3	SHEET	1 OF 1
GAI INSP.	BKP	DRILLING METHOD	Track based auger	NORTHING	1357375.03	GROUND ELEV.	98.06
WEATHER	Clear	DRILLING COMPANY	Environmental Drilling Service:	EASTING	625093.99	DATE/TIME	12/18/2013
TEMP.	72 °F	DRILL RIG	GeoProbe 7822DT	STARTED	1420 12/18/13 TIME/DATE	COMPLETED	1550 12/18/13 TIME/DATE

MATERIALS INVENTORY

WELL CASING	4 in. dia. 10 l.f.	WELL SCREEN	4 in. dia. 10 l.f.	BENTONITE SEAL	1"-2"
CASING TYPE	SCH 80 PVC	SCREEN TYPE	Slotted PVC	INSTALLATION METHOD	-
JOINT TYPE	Glued	SLOT SIZE	3/8" x 8"	FILTER PACK QTY.	11 ft
GROUT QUANTITY	NA	CENTRALIZERS	-	FILTER PACK TYPE	Gravel
GROUT TYPE	NA	DRILLING MUD TYPE	NA	INSTALLATION METHOD	-

ELEV./DEPTH	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
0.0	Ground Surface	4" Dia. Sch. 80 PVC	Drilling stopped at 15' BGS. Approximately 6" of gravel added to bottom of hole. Well set in place. Gravel added to approximately 1' above the slotted pipe. Bentonite added from gravel to upper liner surface. Liner repaired by Comanco, then backfilled up to existing ground surface.
2.0	Dk. Brown Damp Fine Sand Upper Liner Surface	Back Fill Bentonite	
4.0	Brown Damp Fine Sand w/ Trace Pale Brown Fine Sand	Gravel	
6.0			
8.0	Brown Damp Fine Sand		
10.0			
12.0		4" dia Sch. 80 Slotted PVC	
14.0			
16.0	Boring Terminated at 15.0 feet	Existing Fill	



SOIL VAPOR EXTRACTION WELL INSTALLATION LOG

JOB NO.	083-8273.31	PROJECT	J.E.D. Landfill Gas System Improvements	WELL NO.	Cell 2 BH4	SHEET	1 OF 1
GAI INSP.	BKP	DRILLING METHOD	Track based auger	NORTHING	1357366.44	GROUND ELEV.	97.72
WEATHER	Clear	DRILLING COMPANY	Environmental Drilling Service	EASTING	625101.76	DATE/TIME	12/18/2013
TEMP.	72 °F	DRILL RIG	GeoProbe 7822DT	STARTED	1613 12/18/13 TIME/DATE	COMPLETED	1720 12/18/13 TIME/DATE

MATERIALS INVENTORY

WELL CASING	4 in. dia. 10 l.f.	WELL SCREEN	4 in. dia. 10 l.f.	BENTONITE SEAL	1"-2"
CASING TYPE	SCH 80 PVC	SCREEN TYPE	Slotted PVC	INSTALLATION METHOD	-
JOINT TYPE	Glued	SLOT SIZE	3/8" x 8"	FILTER PACK QTY.	11 ft
GROUT QUANTITY	NA	CENTRALIZERS	-	FILTER PACK TYPE	Gravel
GROUT TYPE	NA	DRILLING MUD TYPE	NA	INSTALLATION METHOD	-

ELEV./DEPTH	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
0.0	Ground Surface	4" Dia. Sch. 80 PVC	Drilling stopped at 15' BGS. Approximatelv 6" of gravel added to bottom of hole. Well set in place. Gravel added to approximatelv 1' above the slotted pipe. Bentonite added from gravel to upper liner surface. Liner repaired by Comanco, then backfilled up to existing ground surface.
2.0	Dk. Brown Damp Fine Sand Upper Liner Surface	Back Fill Bentonite	
4.0	Brown Damp Fine Sand w/ Trace Pale Brown Fine Sand	Gravel	
6.0			
8.0	Brown Damp Fine Sand		
10.0			
12.0		4" dia. Sch. 80 Slotted PVC	
14.0			
16.0	Boring Terminated at 15.0 feet	Existing Fill	

SOIL VAPOR EXTRACTION WELL INSTALLATION LOG

JOB NO. 083-8273.31	PROJECT J.E.D. Landfill Gas System Improvements	WELL NO. Cell 1 BH5	SHEET 1 OF 1
GAI INSP. BKP	DRILLING METHOD Track based auger	NORTHING 1357577.15	GROUND ELEV. 97.61
WEATHER Clear	DRILLING COMPANY Environmental Drilling Service	EASTING 624014.17	DATE/TIME 12/19/2013
TEMP. 55 °F	DRILL RIG GeoProbe 7822DT	STARTED 0901 12/19/13 TIME/DATE	COMPLETED 0950 12/19/13 TIME/DATE

MATERIALS INVENTORY

WELL CASING 4 in. dia. 10 l.f.	WELL SCREEN 4 in. dia. 10 l.f.	BENTONITE SEAL 1"-2"
CASING TYPE SCH 80 PVC	SCREEN TYPE Slotted PVC	INSTALLATION METHOD -
JOINT TYPE Glued	SLOT SIZE 3/8" x 8"	FILTER PACK QTY. 11 ft
GROUT QUANTITY NA	CENTRALIZERS -	FILTER PACK TYPE Gravel
GROUT TYPE NA	DRILLING MUD TYPE NA	INSTALLATION METHOD -

ELEV./DEPTH	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
0.0	Ground Surface	4" Dia. Sch. 80 PVC	Drilling stopped at 15' BGS. Approximately 6" of gravel added to bottom of hole. Well set in place. Gravel added to approximately 1' above the slotted pipe. Bentonite added from gravel to upper liner surface. Liner repaired by Comanco, then backfilled up to existing ground surface.
2.0	Dk. Brown Damp Fine Sand Upper Liner Surface	Back Fill	
4.0	Brown Damp Fine Sand w/ Trace Pale Brown Fine Sand	Bentonite	
6.0		Gravel	
8.0	Brown Damp Fine Sand		
10.0			
12.0		4" dia. Sch. 80 Slotted PVC	
14.0			
16.0	Boring Terminated at 15.0 feet	Existing Fill	

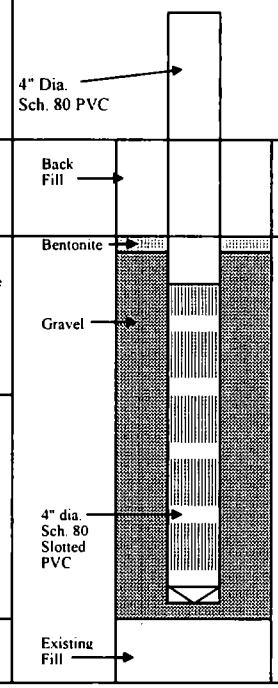
SOIL VAPOR EXTRACTION WELL INSTALLATION LOG

JOB NO.	083-8273.31	PROJECT	J.E.D. Landfill Gas System Improvements	WELL NO.	Cell 1 BH6	SHEET	1 OF 1
GAI INSP.	BKP	DRILLING METHOD	Track based auger	NORTHING	1357586.05	GROUND ELEV.	98.56
WEATHER	Clear	DRILLING COMPANY	Environmental Drilling Service:	EASTING	624022.86	DATE/TIME	12/19/2013
TEMP.	48 °F	DRILL RIG	GeoProbe 7822DT	STARTED	0810 12/19/13 TIME/DATE	COMPLETED	0855 12/19/13 TIME/DATE

MATERIALS INVENTORY

WELL CASING	4 in. dia. 10 l.f.	WELL SCREEN	4 in. dia. 10 l.f.	BENTONITE SEAL	1"-2"
CASING TYPE	SCH 80 PVC	SCREEN TYPE	Slotted PVC	INSTALLATION METHOD	-
JOINT TYPE	Glued	SLOT SIZE	3/8" x 8"	FILTER PACK QTY.	11 ft
GROUT QUANTITY	NA	CENTRALIZERS	-	FILTER PACK TYPE	Gravel
GROUT TYPE	NA	DRILLING MUD TYPE	NA	INSTALLATION METHOD	-

ELEV./DEPTH	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
0.0	Ground Surface	4" Dia. Sch. 80 PVC	Drilling stopped at 15' BGS. Approximately 6" of gravel added to bottom of hole. Well set in place. Gravel added to approximately 1' above the slotted pipe. Bentonite added from gravel to upper liner surface. Liner repaired by Comanco, then backfilled up to existing ground surface.
2.0	Dk. Brown Damp Fine Sand Upper Liner Surface	Back Fill	
4.0	Brown Damp Fine Sand w/ Trace Pale Brown Fine Sand	Bentonite Gravel	
8.0	Brown Damp Fine Sand	4" dia. Sch. 80 Slotted PVC	
14.0			
16.0	Boring Terminated at 15.0 feet	Existing Fill	



SOIL VAPOR EXTRACTION WELL INSTALLATION LOG

JOB NO.	083-8273.31	PROJECT	J.E.D. Landfill Gas System Improvements	WELL NO.	Cell 4 BH7	SHEET	1 OF 1
GAI INSP.	BKP	DRILLING METHOD	Track based auger	NORTHING	1356487.01	GROUND ELEV.	99.26
WEATHER	Clear	DRILLING COMPANY	Environmental Drilling Service:	EASTING	623962.23	DATE/TIME	12/19/2013
TEMP.	70 °F	DRILL RIG	GeoProbe 7822DT	STARTED	1001 12/19/13 TIME/DATE	COMPLETED	1039 12/19/13 TIME/DATE

MATERIALS INVENTORY

WELL CASING	4 in. dia. 10 l.f.	WELL SCREEN	4 in. dia. 10 l.f.	BENTONITE SEAL	1"-2"
CASING TYPE	SCH 80 PVC	SCREEN TYPE	Slotted PVC	INSTALLATION METHOD	-
JOINT TYPE	Glued	SLOT SIZE	3/8" x 8"	FILTER PACK QTY.	12 ft
GROUT QUANTITY	NA	CENTRALIZERS	-	FILTER PACK TYPE	Gravel
GROUT TYPE	NA	DRILLING MUD TYPE	NA	INSTALLATION METHOD	-

ELEV./DEPTH	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
0.0	Ground Surface	4" Dia. Sch. 80 PVC	Drilling stopped at 16' BGS. Approximatelv 6" of gravel added to bottom of hole. Well set in place. Gravel added to approximately 1' above the slotted pipe. Bentonite added from gravel to upper liner surface. Liner repaired by Comanco, then backfilled up to existing ground surface.
2.0	Dk. Brown Damp Fine Sand Upper Liner Surface	Back Fill Bentonite	
4.0	Brown Damp Fine Sand w/ Trace Pale Brown Fine Sand	Gravel	
6.0			
8.0	Brown Damp Fine Sand		
10.0			
12.0		4" dia. Sch. 80 Slotted PVC	
14.0			
16.0	Boring Terminated at 16.0 feet	Existing Fill	

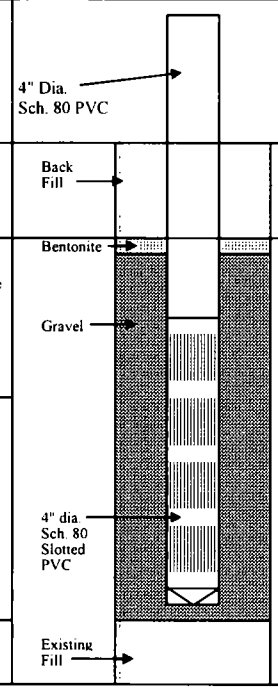
SOIL VAPOR EXTRACTION WELL INSTALLATION LOG

JOB NO.	083-8273.31	PROJECT	J.E.D. Landfill Gas System Improvements	WELL NO.	Cell 4 BH8	SHEET	1 OF 1
GAI INSP.	BKP	DRILLING METHOD	Track based auger	NORTHING	1356474.60	GROUND ELEV.	98.14
WEATHER	Clear	DRILLING COMPANY	Environmental Drilling Service	EASTING	623962.33	DATE/TIME	12/19/2013
TEMP.	70 °F	DRILL RIG	GeoProbe 7822DT	STARTED	1048 12/19/13 TIME/DATE	COMPLETED	1117 12/19/13 TIME/DATE

MATERIALS INVENTORY

WELL CASING	4 in. dia. 10 l.f.	WELL SCREEN	4 in. dia. 10 l.f.	BENTONITE SEAL	1"-2"
CASING TYPE	SCH 80 PVC	SCREEN TYPE	Slotted PVC	INSTALLATION METHOD	-
JOINT TYPE	Glued	SLOT SIZE	3/8" x 8"	FILTER PACK QTY.	11 ft
GROUT QUANTITY	NA	CENTRALIZERS	-	FILTER PACK TYPE	Gravel
GROUT TYPE	NA	DRILLING MUD TYPE	NA	INSTALLATION METHOD	-

ELEV./DEPTH	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
0.0	Ground Surface	4" Dia. Sch. 80 PVC	Drilling stopped at 15' BGS. Approximately 6" of gravel added to bottom of hole. Well set in place. Gravel added to approximately 1' above the slotted pipe. Bentonite added from gravel to upper liner surface. Liner repaired by Comanco, then backfilled up to existing ground surface.
2.0	Dk. Brown Damp Fine Sand Upper Liner Surface	Back Fill Bentonite	
4.0	Brown Damp Fine Sand w/ Trace Pale Brown Fine Sand		
6.0		Gravel	
8.0	Brown Damp Fine Sand		
10.0			
12.0		4" dia. Sch. 80 Slotted PVC	
14.0			
16.0	Boring Terminated at 15.0 feet	Existing Fill	



Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-71 **Site:** JED Landfill

Project #: 083-82734.35
Onsite Rep: B. Poiencot

Date/Time Began Drilling: 3/18/14 7:25
Date/Time Complete Drilling: 3/18/14 10:21
Northing: 1,355,602.90

Date/Time Began Well Install: 3/18/14 10:25
Date/Time Complete Well Install: 3/18/14 12:30
Easting: 624,905.40
Ground Elevation: 215.8

		Design	Actual
A	Total Depth:	116	47'
B	Screen Length:	105.5	36'
C	Solid Pipe Length:	10'+5'=15'	10'+5'=15'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	46'
	◉ #4 Stone?		
E	○ #89 Stone?	☑	9'
F	GeoDisc?	☑	9'
G	1st Bentonite Seal?	☑	7'
H	Soil Fill to 4' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

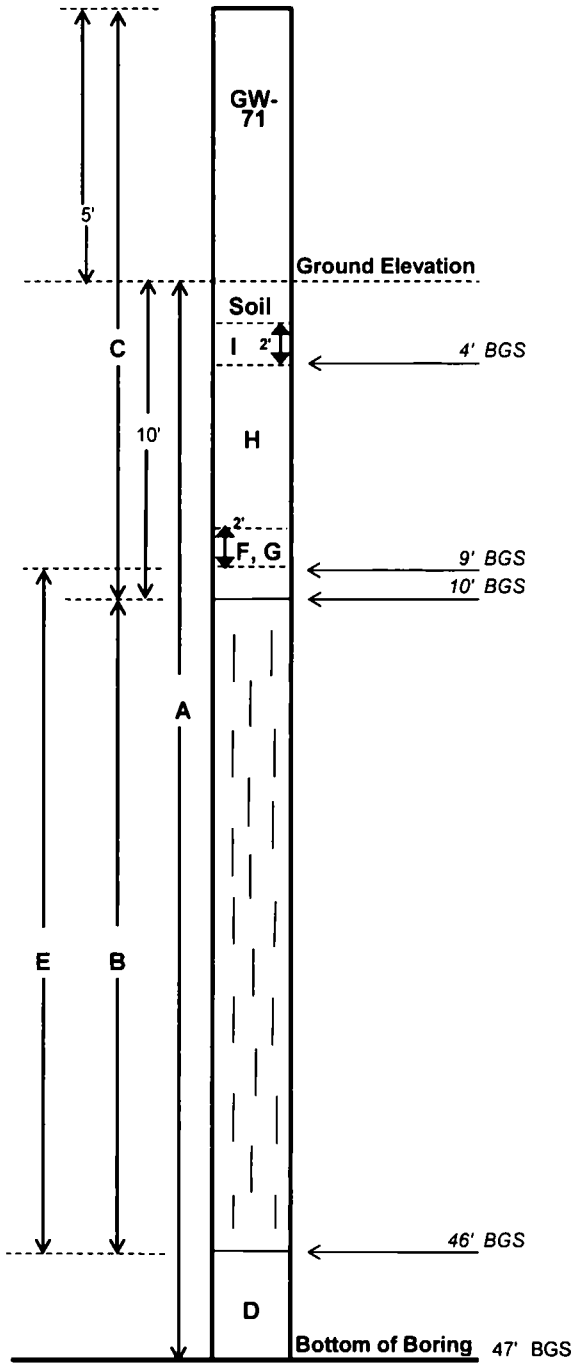
Depth to Top Liner: 15'

Depth to Waste: 3'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	93	7:50
10-20	MSW Soil=10% M=10% D=Minimal	107	8:20
20-30	MSW Soil=10% M=15% D=Moderate	96	8:50
30-40	MSW Soil=10% M=20% D=Moderate	105	9:25
40-50	MSW Soil=10% M=30% D=Severe		10:21
50-60			
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Waste was too saturated to drill beyond 47'
Over a 45 minute period depth increased by only 1'



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-90 **Site:** JED Landfill

Project #: 083-82734.35
Onsite Rep: B. Poiencot

Date/Time Began Drilling: 3/10/14 7:30
Date/Time Complete Drilling: 3/10/14 11:15
Northing: 1,355,562.50

Date/Time Began Well Install: 3/10/14 11:20
Date/Time Complete Well Install: 3/10/14 14:00
Easting: 624,454.20
Ground Elevation: 232.0

		Design	Actual
A	Total Depth:	127	57
B	Screen Length:	116.5	46'
C	Solid Pipe Length:	10'+5'=15'	10'+5'=15'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	56'
	◉ #4 Stone?	☑	
E	○ #89 Stone?		8'
F	GeoDisc?	☑	8'
G	1st Bentonite Seal?	☑	6'
H	Soil Fill to 3' BGS?	☑	3'
I	2nd Bentonite Seal?	☑	1'

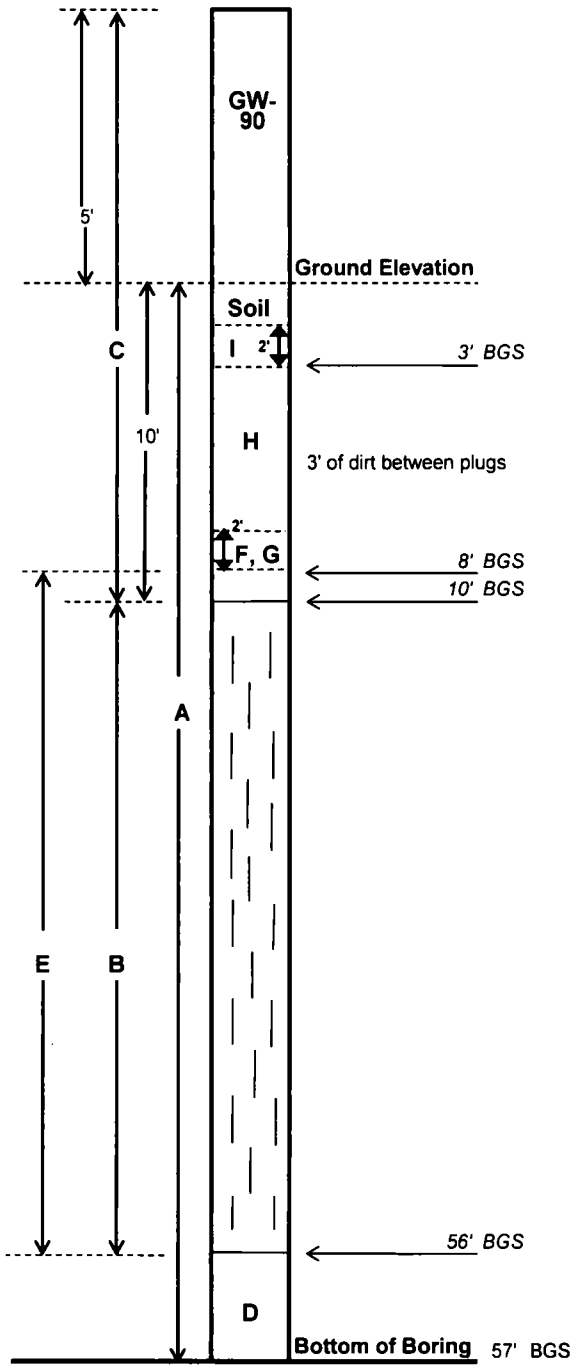
Depth to Top Liner: 15'

Depth to Waste: 3'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	103	7:50
10-20	MSW Soil=10% M=5% D=Minimal	101	8:19
20-30	MSW Soil=10% M=5% D=Moderate	105	8:58
30-40	MSW Soil=10% M=15% D=Moderate	106	9:35
40-50	MSW Soil=10% M=30% D=Severe	103	10:13
50-60	MSW Soil=10% M=30% D=Severe	Final Depth 57' @ 11:15	
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Waste was too saturated to drill beyond 57'
Over a 30 minute period depth increased by only 1'



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-95 **Site:** JED Landfill

Project #: 083-82734.35
Onsite Rep: B. Poiencot

Date/Time Began Drilling:	3/7/14 7:30	Date/Time Began Well Install:	3/7/14 14:03
Date/Time Complete Drilling:	3/7/14 14:00	Date/Time Complete Well Install:	3/7/14 15:50
Northing:	1,355,363.20	Easting:	624,443.60
		Ground Elevation:	230.4

		Design	Actual
A	Total Depth:	122.0'	86'
B	Screen Length:	111.5'	75'
C	Solid Pipe Length:	10'+5'=15'	10'+5'=15'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	85'
E	◉ #4 Stone? ○ #89 Stone?	☑	9'
F	GeoDisc?	☑	9'
G	1st Bentonite Seal?	☑	7'
H	Soil Fill to 4' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

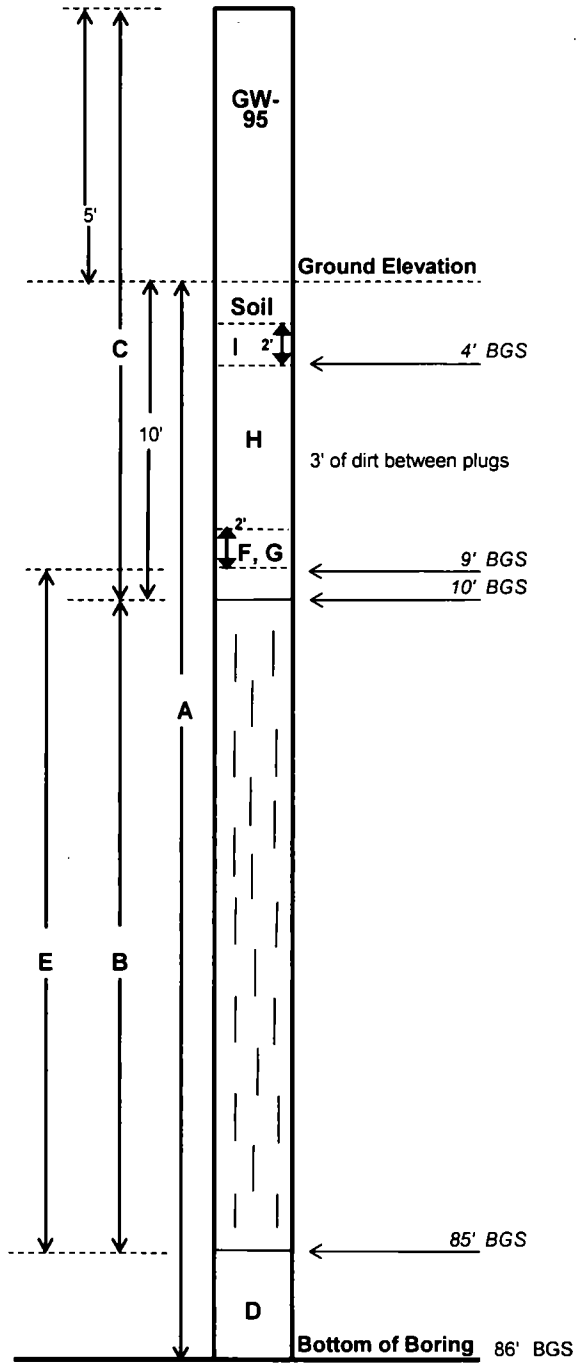
Depth to Top Liner: 15'

Depth to Waste: 3'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	92	7:47
10-20	MSW Soil=10% M=5% D=Minimal	87	8:15
20-30	MSW Soil=10% M=5% D=Moderate	89	8:53
30-40	MSW Soil=10% M=10% D=Moderate	104	9:27
40-50	MSW Soil=10% M=10% D=Moderate	102	10:31
50-60	MSW Soil=10% M=15% D=Moderate	100	11:33
60-70	MSW Soil=10% M=20% D=Moderate	102	12:45
70-80	MSW Soil=10% M=30% D=Severe	111	13:04
80-90	MSW Soil=10% M=30% D=Severe	Final Depth 86' @ 14:00	
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Waste was too saturated to drill beyond 86'
Over a 30 minute period depth increased by only 1'



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-99 **Site:** JED Landfill

Project #: 083-82734.35
Onsite Rep: B. Poiencot

Date/Time Began Drilling:	3/10/14 12:11
Date/Time Complete Drilling:	3/11/14 11:50
Northing:	1,355,152.10
Date/Time Began Well Install:	3/11/14 11:55
Date/Time Complete Well Install:	3/11/14 13:26
Easting:	624,443.60
Ground Elevation:	229.3

		Design	Actual
A	Total Depth:	127	95
B	Screen Length:	116.5	84'
C	Solid Pipe Length:	10'+5'=15'	10'+5'=15'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	94'
E	◉ #4 Stone? ○ #89 Stone?	☑	9'
F	GeoDisc?	☑	9'
G	1st Bentonite Seal?	☑	7'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

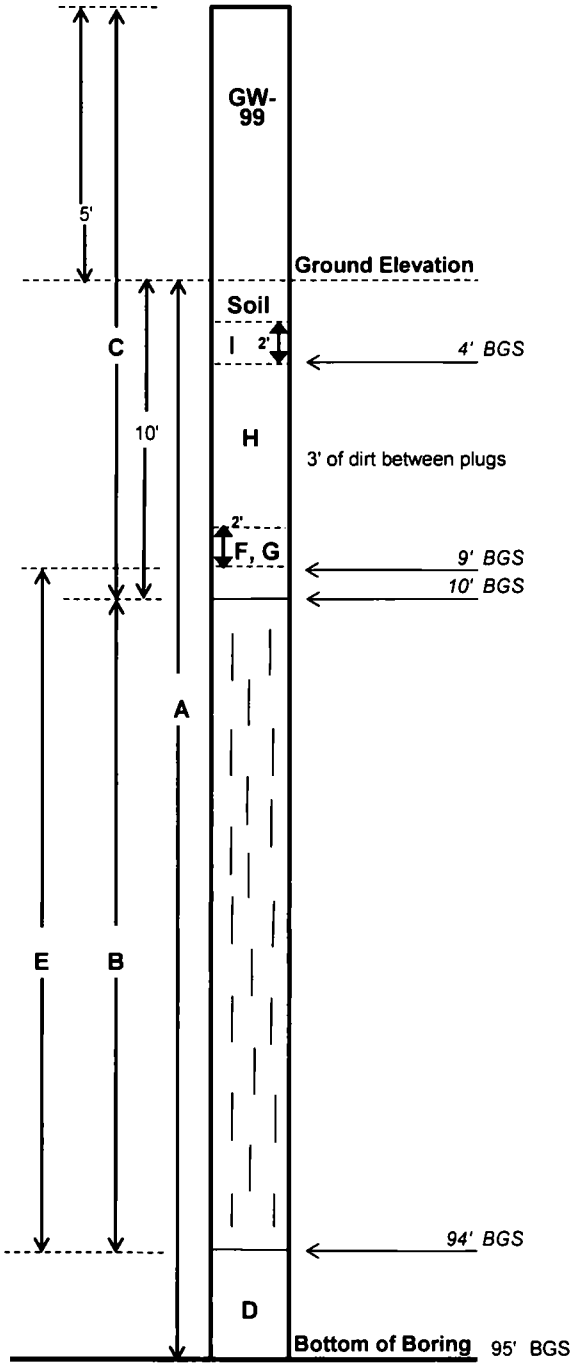
Depth to Top Liner: 15'

Depth to Waste: 3'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	92	12:50
10-20	MSW Soil=10% M=5% D=Minimal	87	13:12
20-30	MSW Soil=10% M=5% D=Moderate	89	13:55
30-40	MSW Soil=10% M=10% D=Moderate	104	14:38
40-50	MSW Soil=10% M=10% D=Moderate	102	15:40
50-60	MSW Soil=10% M=15% D=Moderate	100	16:50
60-70	MSW Soil=10% M=15% D=Moderate	102	7:20
70-80	MSW Soil=10% M=20% D=Severe	111	9:15
80-90	MSW Soil=10% M=30% D=Severe	112	10:45
90-100	MSW Soil=10% M=30% D=Severe	Final Depth 95' @ 11:50	
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Waste was too saturated to drill beyond 95'
Over a 45 minute period depth increased by only 1'



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-102 **Site:** JED Landfill

Project #: 083-82734.35
Onsite Rep: B. Poiencot

Date/Time Began Drilling:	3/12/14 7:30	Date/Time Began Well Install:	3/12/14 12:55
Date/Time Complete Drilling:	3/12/14 12:50	Date/Time Complete Well Install:	3/12/14 14:27
Northing:	1,354,962.50	Easting:	624,443.90
		Ground Elevation:	223.3

		Design	Actual
A	Total Depth:	124	76
B	Screen Length:	113.5	65'
C	Solid Pipe Length:	10'+5'=15'	10'+5'=15'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	75'
E	◉ #4 Stone? ○ #89 Stone?	☑	9'
F	GeoDisc?	☑	9'
G	1st Bentonite Seal?	☑	7'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

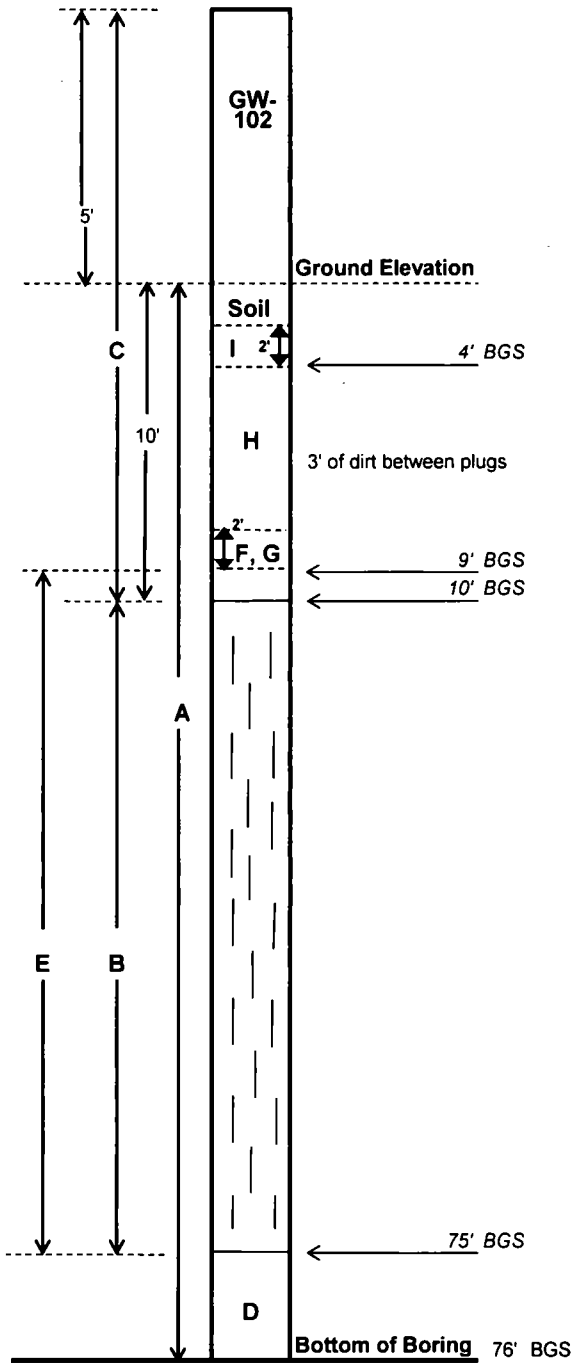
Depth to Top Liner: 15'

Depth to Waste: 3'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	100	7:51
10-20	MSW Soil=10% M=5% D=Minimal	103	8:15
20-30	MSW Soil=10% M=10% D=Moderate	101	8:52
30-40	MSW Soil=10% M=15% D=Moderate	119	9:17
40-50	MSW Soil=10% M=20% D=Moderate	118	9:58
50-60	MSW Soil=10% M=20% D=Severe	113	10:22
60-70	MSW Soil=10% M=30% D=Severe	114	11:45
70-80	MSW Soil=10% M=30% D=Severe	Final Depth 76' @ 12:50	
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Waste was too saturated to drill beyond 76'
Over a 30 minute period depth increased by only 1'



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-106 **Site:** JED Landfill

Project #: 083-82734.35
Onsite Rep: B. Poiencot

Date/Time Began Drilling: 3/14/14 7:50
Date/Time Complete Drilling: 3/14/14 12:48
Northing: 1,354,960.30

Date/Time Began Well Install: 3/14/14 12:50
Date/Time Complete Well Install: 3/14/14 14:54
Easting: 624,259.00
Ground Elevation: 175.8

		Design	Actual
A	Total Depth:	78	78
B	Screen Length:	62.5	62'
C	Solid Pipe Length:	15'+5'=20'	15'+5'=20'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	77'
	◉ #4 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'

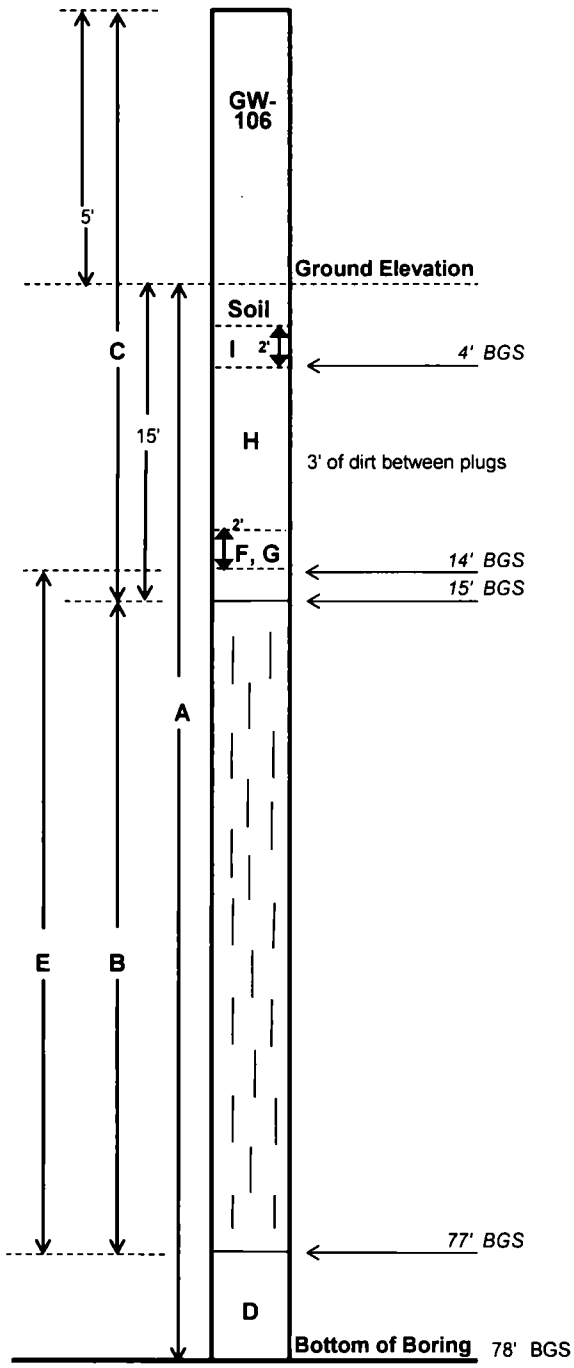
Depth to Top Liner: 15'

Depth to Waste: 3'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	100	8:15
10-20	MSW Soil=10% M=5% D=Minimal	106	8:49
20-30	MSW Soil=10% M=10% D=Moderate	105	9:12
30-40	MSW Soil=10% M=15% D=Moderate	117	9:56
40-50	MSW Soil=10% M=20% D=Moderate	133	10:19
50-60	MSW Soil=10% M=20% D=Moderate	114	10:55
60-70	MSW Soil=10% M=20% D=Moderate	118	11:30
70-80	MSW Soil=10% M=20% D=Severe	Final Depth 78' @ 12:48	
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes:



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-107 **Site:** JED Landfill

Project #: 083-82734.35
Onsite Rep: B. Poiencot

Date/Time Began Drilling: 3/17/14 7:50
Date/Time Complete Drilling: 3/17/14 9:03
Northing: 1,354,684.00

Date/Time Began Well Install: 3/17/14 9:05
Date/Time Complete Well Install: 3/17/14 10:00
Easting: 624,082.40
Ground Elevation: 129.6

		Design	Actual
A	Total Depth:	26	26'
B	Screen Length:	10.5	10'
C	Solid Pipe Length:	15'+5'=20'	15'+5'=20'
	# of Centralizers:	NA	NA

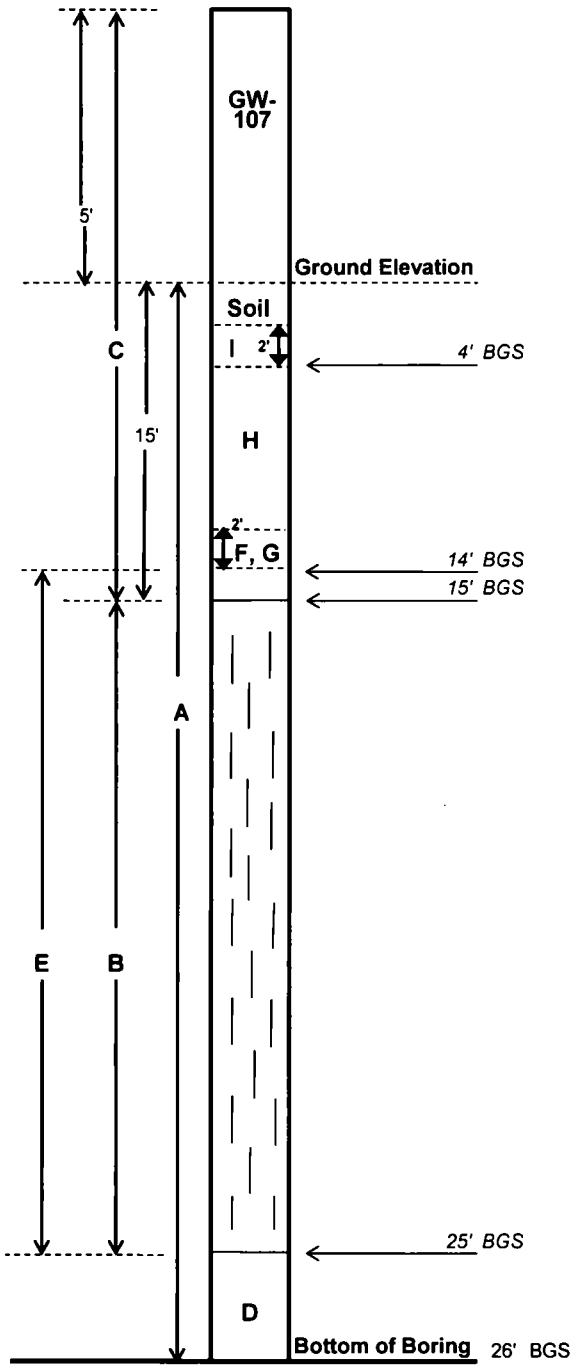
	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	25'
E	◉ #4 Stone? ○ #89 Stone?	☑	14'
F	GeoDisc?	☑	14'
G	1st Bentonite Seal?	☑	12'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

Depth to Top Liner: 15'

Depth to Waste: 3'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	100	8:15
10-20	MSW Soil=10% M=5% D=Minimal	102	8:45
20-30	MSW Soil=10% M=10% D=Moderate	100	9:03
30-40			
40-50			
50-60			
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition



Notes:

CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-108 **Site:** JED Landfill

Project #: 083-82734.35
Onsite Rep: B. Poiencot

Date/Time Began Drilling: 3/14/14 14:00
Date/Time Complete Drilling: 3/15/14 9:35
Northing: 1,354,722.50

Date/Time Began Well Install: 3/15/14 9:35
Date/Time Complete Well Install: 3/15/14 11:25
Easting: 624,245.20
Ground Elevation: 164.6

		Design	Actual
A	Total Depth:	63	63'
B	Screen Length:	47.5	47'
C	Solid Pipe Length:	15'+5'=20'	15'+5'=20'
	# of Centralizers:	NA	NA

	Checklist		BGS (to top of layer)
D	0.5' of #4 Stone?	☑	62'
E	◉ #4 Stone? ○ #89 Stone?	☑	14'
F	GeoDisc?	☑	14'
G	1st Bentonite Seal?	☑	12'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

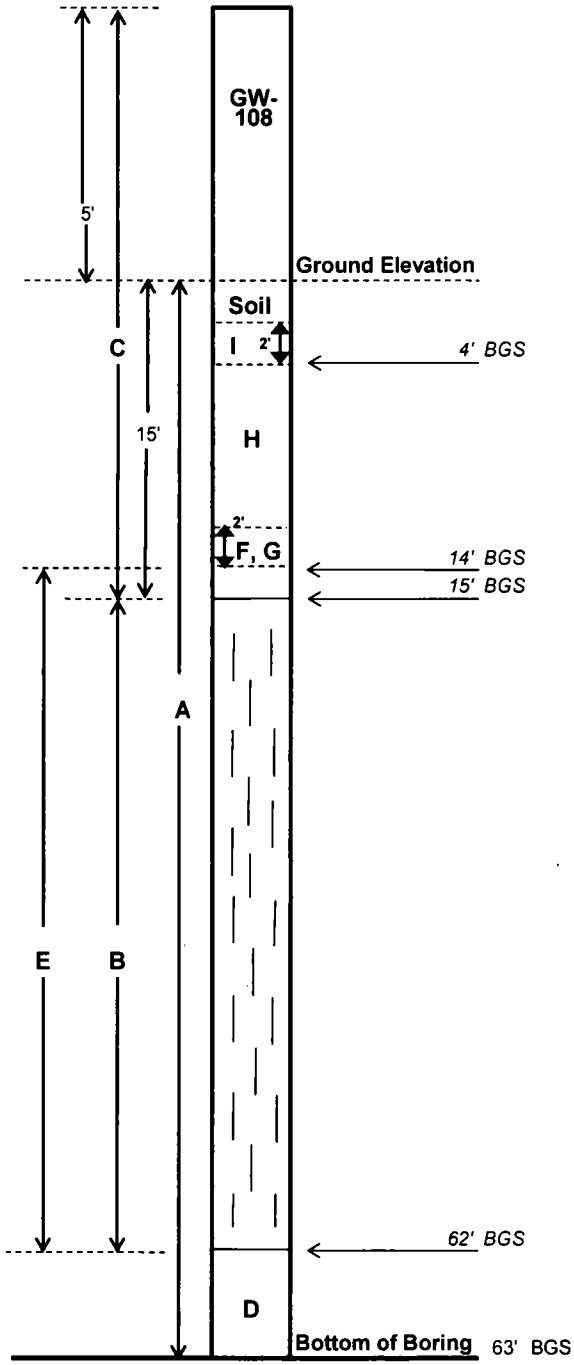
Depth to Top Liner: 15'

Depth to Waste: 3'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	102	14:00
10-20	MSW Soil=10% M=5% D=Minimal	111	14:35
20-30	MSW Soil=10% M=10% D=Moderate	113	15:38
30-40	MSW Soil=10% M=15% D=Moderate	113	8:15
40-50	MSW Soil=10% M=15% D=Moderate	110	8:52
50-60	MSW Soil=10% M=20% D=Moderate	108	9:19
60-70	MSW Soil=10% M=20% D=Severe	Final Depth 63' @ 9:35	
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes:



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-112 **Site:** JED Landfill

Project #: 083-82734.35
Onsite Rep: B. Poiencot

Date/Time Began Drilling:	3/17/14 9:40
Date/Time Complete Drilling:	3/17/14 11:21
Northing:	1,354,531.30
Date/Time Began Well Install:	3/17/14 11:23
Date/Time Complete Well Install:	3/17/14 12:30
Easting:	624,079.50
Ground Elevation:	127.5

		Design	Actual
A	Total Depth:	30	30
B	Screen Length:	14.5	14'
C	Solid Pipe Length:	15'+5'=20'	15'+5'=20'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	29'
E	◉ #4 Stone? ○ #89 Stone?	☑	14'
F	GeoDisc?	☑	14'
G	1st Bentonite Seal?	☑	12'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

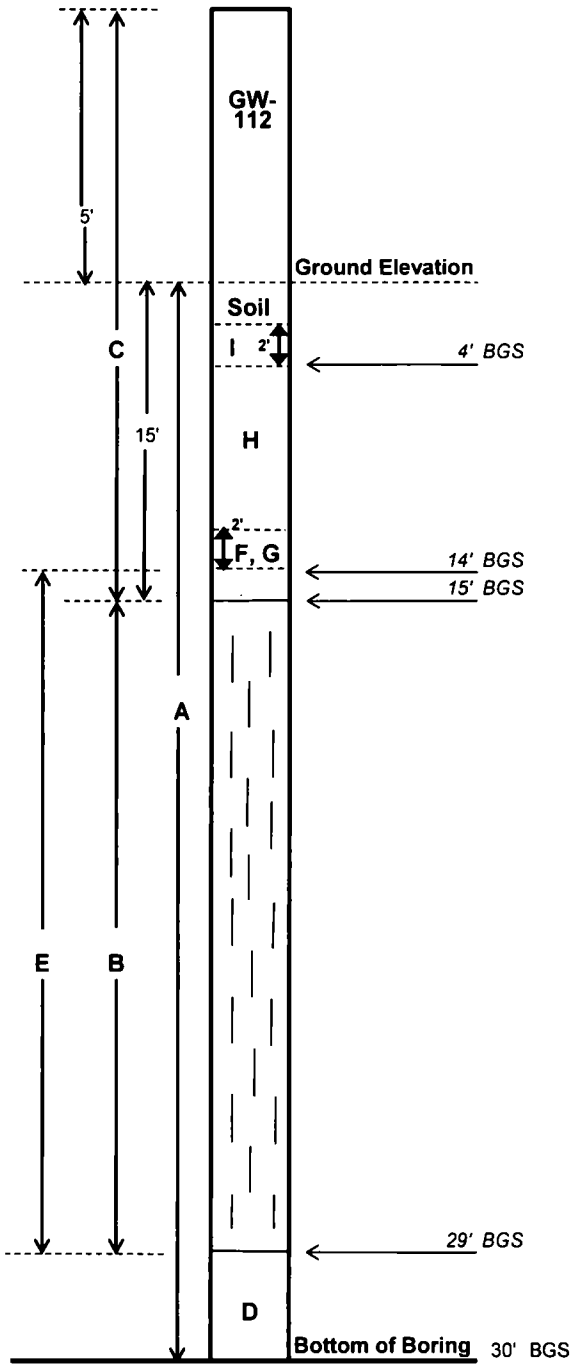
Depth to Top Liner: 15'

Depth to Waste: 3'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	90	10:00
10-20	MSW Soil=10% M=5% D=Minimal	103	10:45
20-30	MSW Soil=10% M=10% D=Moderate	100	11:21
30-40			
40-50			
50-60			
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes:



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-118 **Site:** JED Landfill

Project #: 083-82734.35
Onsite Rep: B. Poiencot

Date/Time Began Drilling: 3/15/14 10:52
Date/Time Complete Drilling: 3/15/14 12:15
Northing: 1,354,393.90

Date/Time Began Well Install: 3/15/14 12:30
Date/Time Complete Well Install: 3/15/14 14:21
Easting: 624,077.60
Ground Elevation: 125.4

		Design	Actual
A	Total Depth:	29	29'
B	Screen Length:	13.5	13'
C	Solid Pipe Length:	15'+5'=20'	15'+5'=20'
	# of Centralizers:	NA	NA

	Checklist		BGS *(to top of layer)*
D	0.5' of #4 Stone?	☑	28'
E	◉ #4 Stone? ○ #89 Stone?	☑	14'
F	GeoDisc?	☑	14'
G	1st Bentonite Seal?	☑	12'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	2'

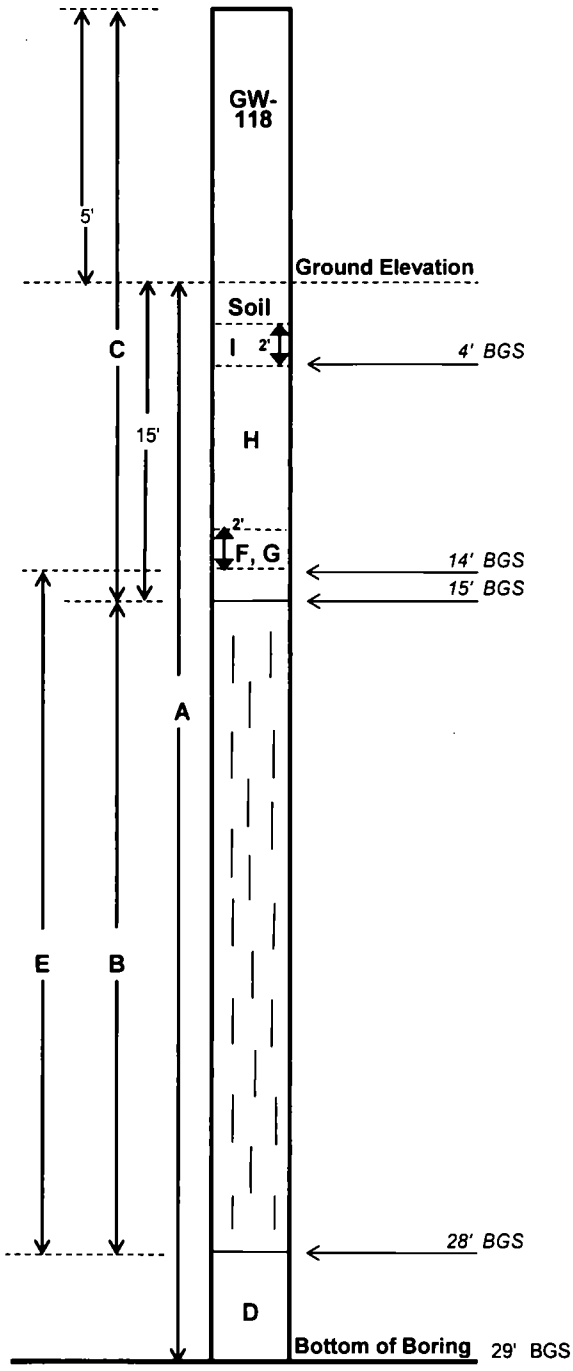
Depth to Top Liner: 15'

Depth to Waste: 3'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	97	11:09
10-20	MSW Soil=10% M=5% D=Minimal	113	11:47
20-30	MSW Soil=10% M=10% D=Moderate	112	12:15
30-40			
40-50			
50-60			
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes:



CQA Tech Signature: Date:

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-90A **Site:** JED Landfill Project #: Onsite Rep: B. Poiencot

Date/Time Began Drilling:	12/15/14 7:54
Date/Time Complete Drilling:	12/17/14 14:37
Northing:	1,355,649.92
Date/Time Began Well Install:	12/17/14 15:00
Date/Time Complete Well Install:	12/17/14 17:00
Easting:	624,480.97
Ground Elevation:	232

		Design	Actual
A	Total Depth:	127'	132'
B	Screen Length:	111'	85'
C	Solid Pipe Length:	20'	15'
	# of Centralizers:		

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	132'
E	◉ #57 Stone? ○ #89 Stone?	☑	95'
F	GeoDisc?	☑	9'
G	1st Bentonite Seal?	☑	9'
H	Soil Fill to 3' BGS?	☑	4'
I	2nd Bentonite Seal?	☑	4'

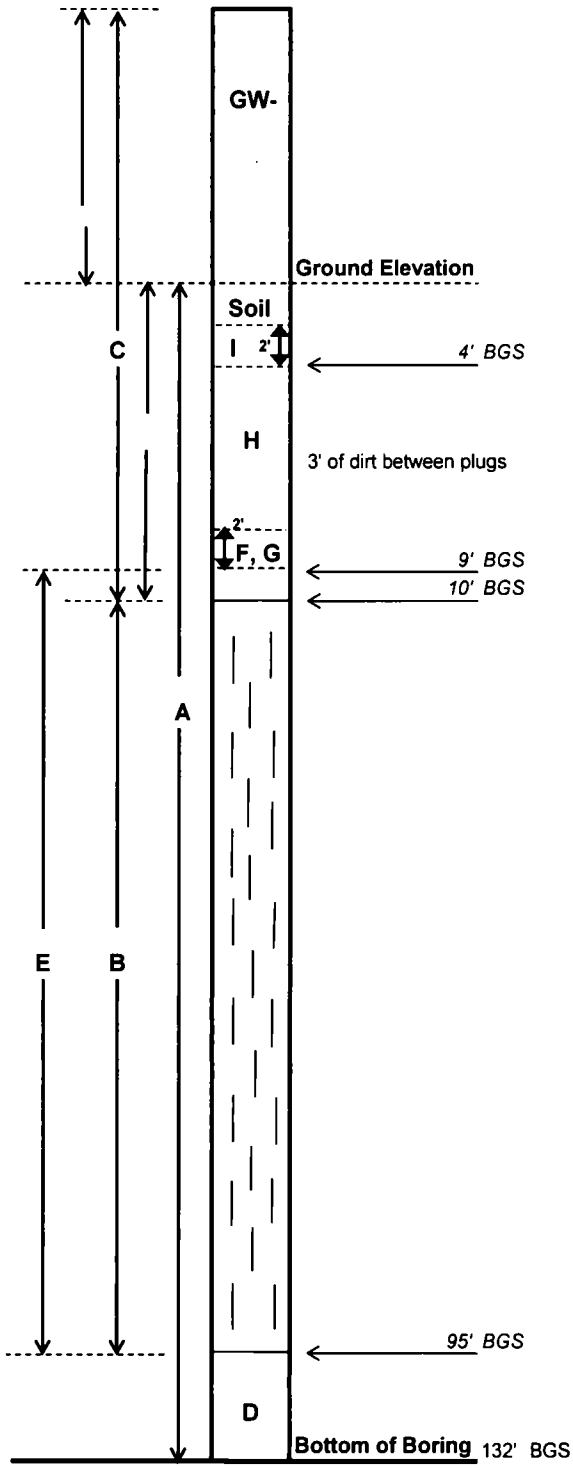
Depth to Top Liner: NA

Depth to Waste: 3'-4'

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=5% D=Minimal	96	12/15/2014 8:14
10-20	MSW Soil=10% M=5% D=Minimal/Moderate	101	9:15
20-30	MSW Soil=10% M=5% D=Moderate	121	12/17/2014 8:00
30-40	MSW Soil=10% M=30% D=Mod/Heavy	127	8:30
40-50	MSW Soil=10% M=30% D=Heavy	125	9:00
50-60	MSW Soil=10% M=30% D=Heavy	120	9:45
60-70	MSW Soil=10% M=30% D=Heavy	124	10:15
70-80	MSW Soil=10% M=50% D=Heavy	127	11:15
80-90	MSW Soil=10% M=50% D=Heavy	129	11:35
90-100	MSW Soil=10% M=50% D=Heavy	130	12:00
100-110	MSW Soil=5% M=75% D=Heavy	128	12:18
110-120	MSW Soil=5% M=75% D=Heavy	125	13:26
120-130	MSW Soil=5% M=75% D=Heavy	127	14:37

*Key: M=Moisture Content, D=Decomposition

Notes: Bottom of well set 5' above approximate saturated zone (100ft BGS)



CQA Tech Signature: Date:

APPENDIX F

PHOTOGRAPHIC DOCUMENTATION OF CONSTRUCTION ACTIVITIES

PHOTOGRAPHS

Photograph 1: Gravel backfill for extraction wells. Lab analysis: gravel finer than ¾" sieve is 1.4%, gravel finer than No. 4 sieve is 0.7%, gravel finer than No. 200 sieve is 0.2%, carbonate content is 0.1%.

Photograph 2: 8" SCH 80 slotted PVC pipe.

Photograph 3: 8" SCH 80 PVC 45° apart, staggered rows.

Photograph 4: 8" HDPE SDR 17 pipe.

Photograph 5: 12" HDPE SDR 17 pipe.

Photograph 6: Drilling operations.

Photograph 7: Saturated waste at bottom of boreholes for top tier wells.

Photograph 8: Lag bolting joints to provide additional support (typical).

Photograph 9: Backfilling extraction well with approved stone (typical).

Photograph 10: Hydrating bentonite plug at extraction well (typical).

Photograph 11: Digging out lower tier berm prior to drilling.

Photograph 12: Drilling lower tier wells.

Photograph 13: Standard trench for lateral (typical).

Photograph 14: Welding HDPE lateral piping (typical).

Photograph 15: Tie-in to existing lateral riser (typical).

Photograph 16: Installing new lateral assembly (typical).

Photograph 17: Electrofusion for 12" subheader tie-in at GW-89.

Photograph 18: Tie-in to 12" existing gas conveyance subheader.

Photograph 19: New 12" subheader stubout at GW-90.

Photograph 20: Excavation of 14" main header in Cell 8

Photograph 22: 8" lateral tie-in to 14" header in Cell 8 (typical).

Photograph 23: Backfilled trench. Caution tape applied and survey posts every 50' and at points of interest (typical).

Photograph 24: Regrading slopes with dozer (typical).

Photograph 25: Excavation of existing 18" main header in Cell 8.

Photograph 26: Electrofusion welding of tie-in to 18" main header.

Photograph 27: Completed tie-in to 18" main header.

Photograph 28: Existing 90° bend and 12" subheader riser at GW-70.

Photograph 29: Subheader tie-in at GW-70.

Photograph 30: New 12" subheader riser at GW-71.

Photograph 31: Completed wellhead.

Photograph 32: Progressive staff staking horizontal gas collector (HGC) locations.

Photograph 33: 10" HDPE SDR 11 pipe for HGC's

Photograph 34: Excavation hole for sumps at low points along HGC (typical).

Photograph 35: Tire chips used for drainage fill in HGC trenches (typical).

Photograph 36: 10" HDPE SDR 11 pipe weld (typical).

Photograph 37: Slope setting for CB&I laser level.

Photograph 38: Confirming slope as excavation progresses (typical).

Photograph 39: Placing horizontal gas collector into excavated trench (typical).

Photograph 40: Covering HGC pipe with tire chips (typical).

Photograph 41: Completely wrapping HGC and tire chips with geotextile (HGC-12 & HGC-13).

Photograph 42: Covered HGC with waste (typical).

Photograph 43: Covering solid pipe sections of HGC with clean fill (typical).

Photograph 44: Slotted SCH 80 PVC used for soil vapor extraction wells (typical).

Photograph 45: Drilling borehole for soil vapor extraction well installation (typical).

Photograph 46: Installing 4-inch SCH 80 PVC through center of auger bit (typical).

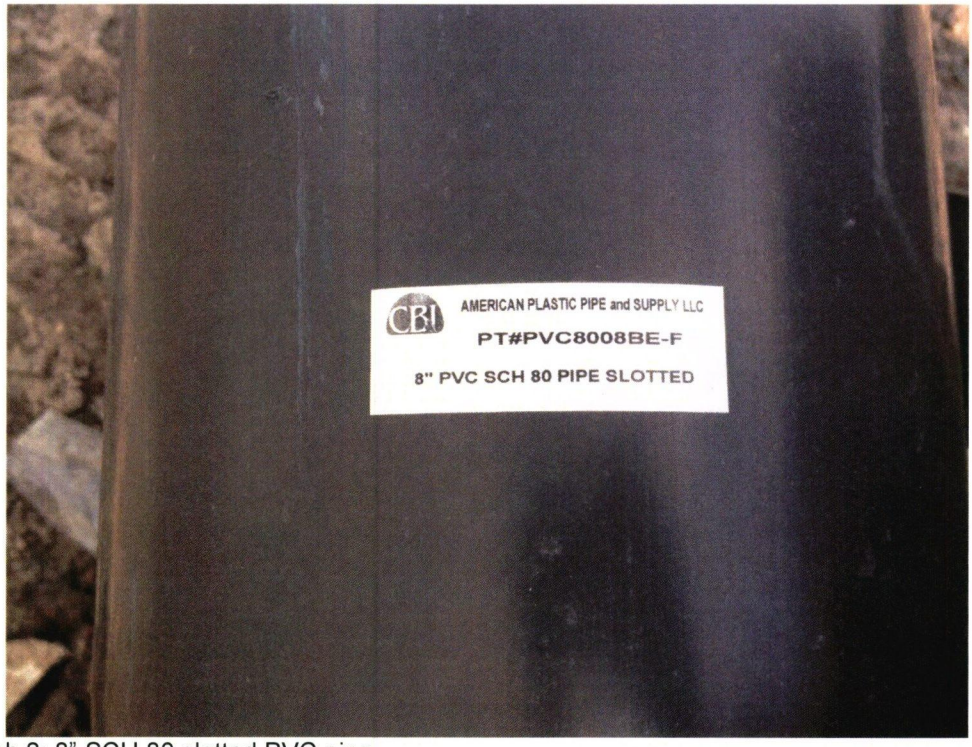
Photograph 47: Installing rock from bottom of borehole to 1-foot above top of slotted pipe (typical).

Photograph 48: Excavation of final cover soil to top of liner after well installation (typical).

Photograph 49: Comanco repairing liner (typical).

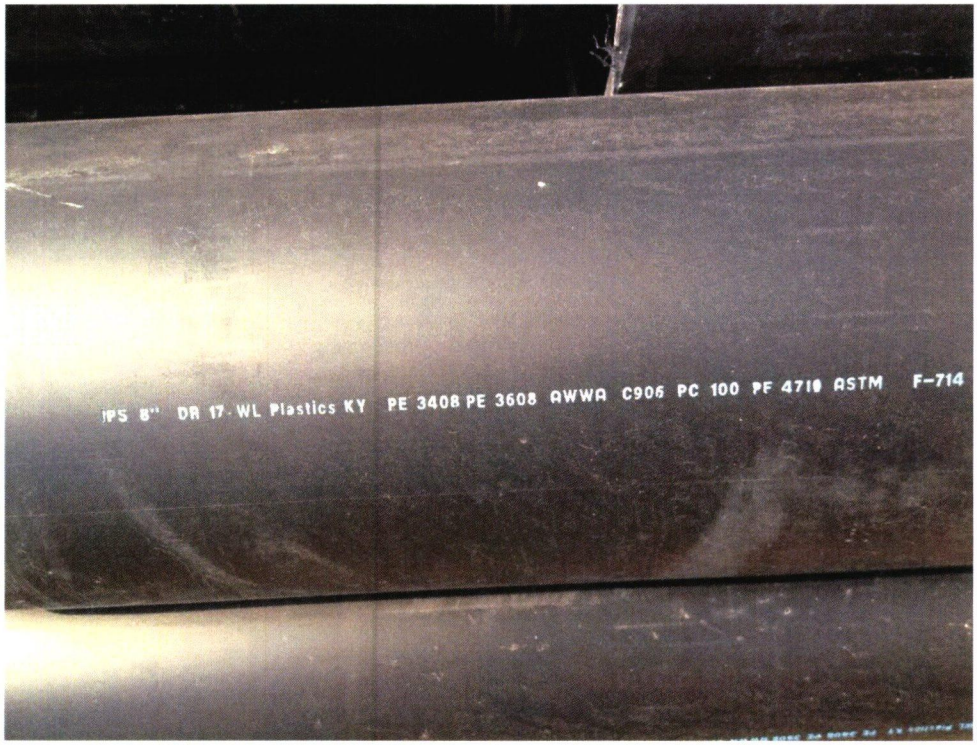
Photograph 50: Completed liner repairs (typical).

Photograph 1: Gravel backfill for extraction wells. Lab analysis: gravel finer than ¾" sieve is 1.4%, gravel finer than No. 4 sieve is 0.7%, gravel finer than No. 200 sieve is 0.2%, carbonate content is 0.1%.

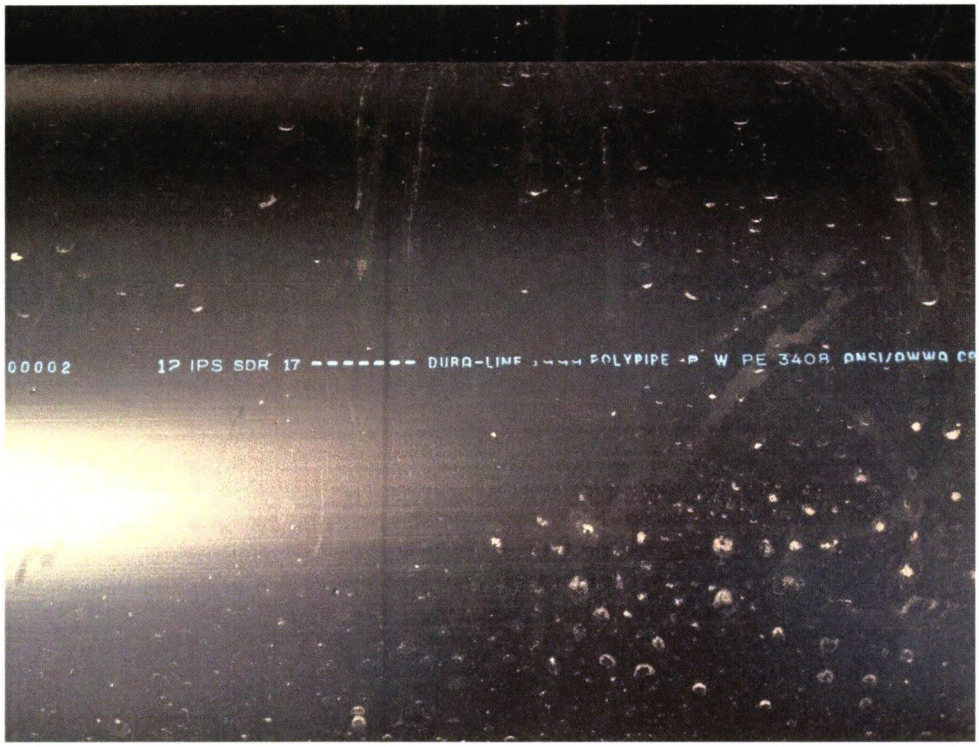


Photograph 2: 8" SCH 80 slotted PVC pipe.

Photograph 3: 8" SCH 80 PVC 45° apart, staggered rows.



Photograph 4: 8" HDPE SDR 17 pipe.



Photograph 5: 12" HDPE SDR 17 pipe.

Photograph 6: Drilling operations.

Photograph 7: Saturated waste at bottom of boreholes for top tier wells.

Photograph 8: Lag bolting joints to provide additional support (typical).

Photograph 9: Backfilling extraction well with approved stone (typical).

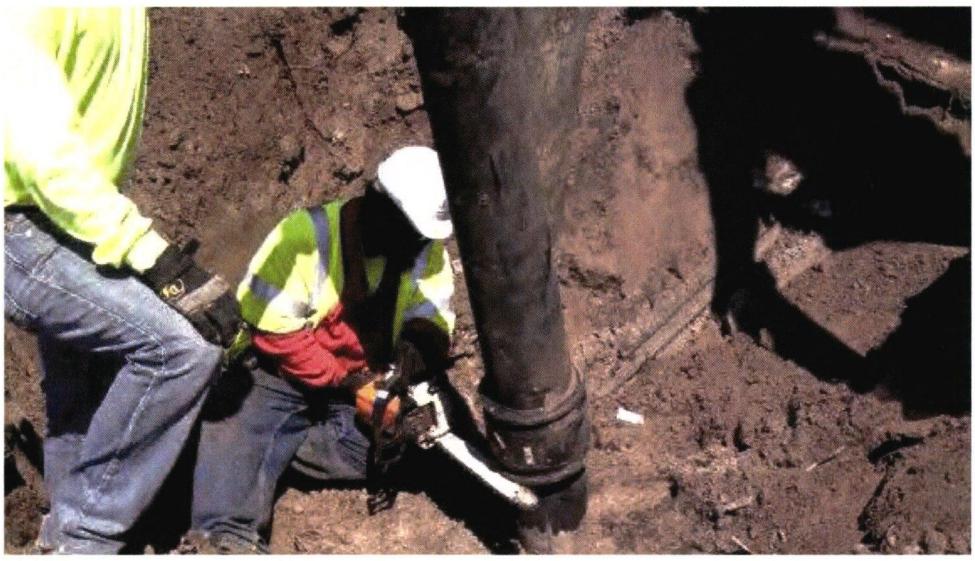
Photograph 10: Hydrating bentonite plug at extraction well (typical).

Photograph 11: Digging out lower tier berm prior to drilling.

Photograph 12: Drilling lower tier wells.

Photograph 13: Standard trench for lateral (typical).

Photograph 14: Welding HDPE lateral piping (typical).



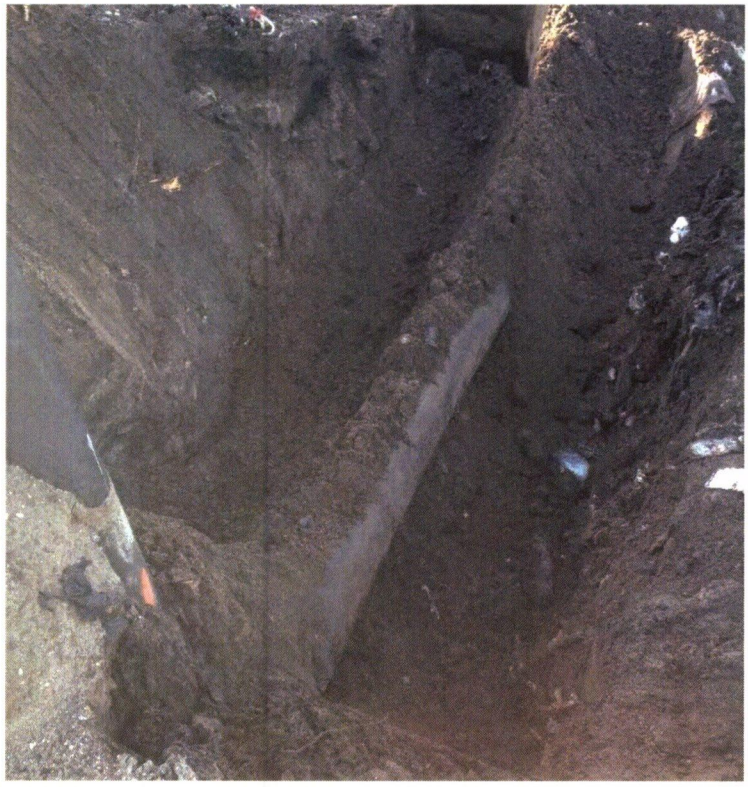
Photograph 15: Tie-in to existing lateral riser (typical).

Photograph 16: Installing new lateral assembly (typical).

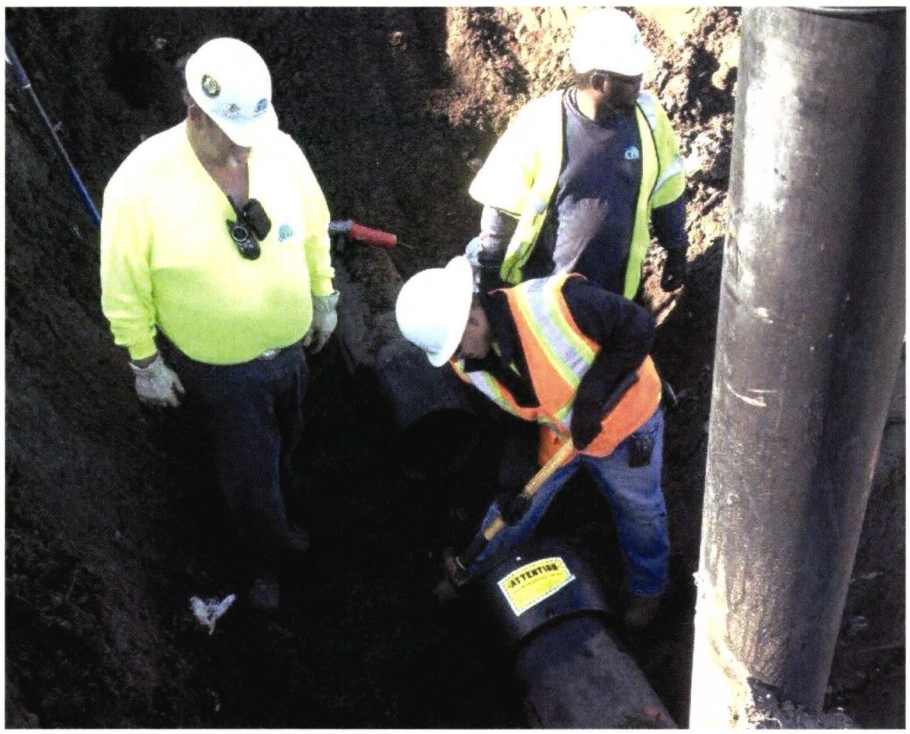
Photograph 17: Electrofusion for 12" subheader tie-in at GW-89.

Photograph 18: Tie-in to 12" existing gas conveyance subheader.

Photograph 19: New 12" subheader stubout at GW-90.



Photograph 20: Excavation of 14" main header in Cell 8



Photograph 22: 8" lateral tie-in to 14" header in Cell 8 (typical).

Photograph 23: Backfilled trench. Caution tape applied and survey posts every 50' and at points of interest (typical).

Photograph 24: Regrading slopes with dozer (typical).

Photograph 25: Excavation of existing 18" main header in Cell 8.

Photograph 26: Electrofusion welding of tie-in to 18" main header.

Photograph 27: Completed tie-in to 18" main header.

Photograph 28: Existing 90° bend and 12" subheader riser at GW-70.

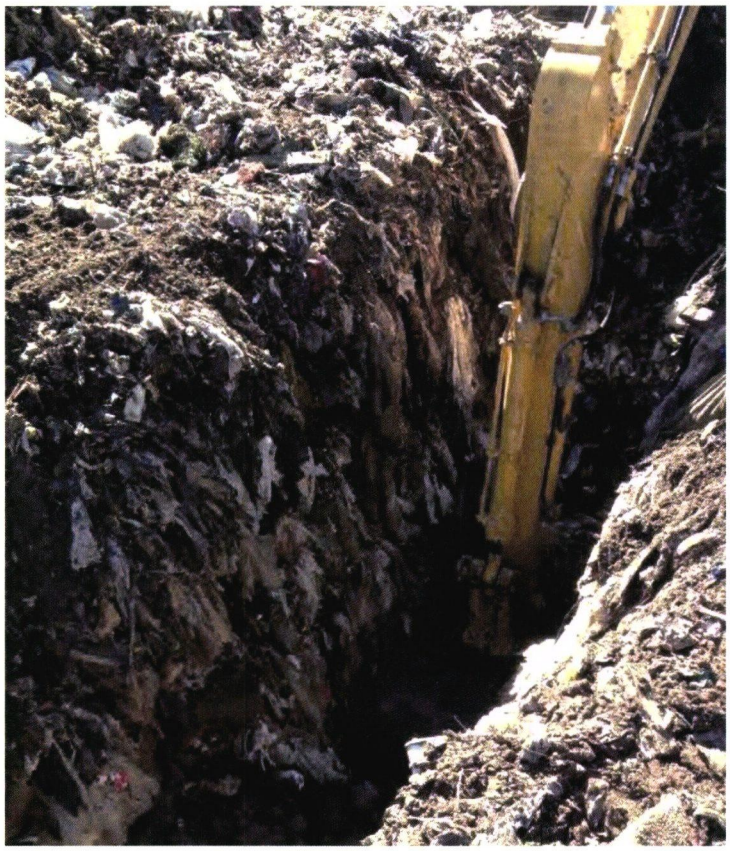
Photograph 29: Subheader tie-in at GW-70.

Photograph 30: New 12" subheader riser at GW-71.

Photograph 31: Completed wellhead.

Photograph 32: Progressive staff staking horizontal gas collector (HGC) locations.

Photograph 33: 10" HDPE SDR 11 pipe for HGC's



Photograph 34: Excavation hole for sumps at low points along HGC (typical).

Photograph 35: Tire chips used for drainage fill in HGC trenches (typical).

Photograph 36: 10" HDPE SDR 11 pipe weld (typical).

Photograph 37: Slope setting for CB&I laser level.

Photograph 38: Confirming slope as excavation progresses (typical).

Photograph 39: Placing horizontal gas collector into excavated trench (typical).

Photograph 40: Covering HGC pipe with tire chips (typical).

Photograph 41: Completely wrapping HGC and tire chips with geotextile (HGC-12 & HGC-13).

Photograph 42: Covered HGC with waste (typical).

Photograph 43: Covering solid pipe sections of HGC with clean fill (typical).

Photograph 44: Slotted SCH 80 PVC used for soil vapor extraction wells (typical).

Photograph 45: Drilling borehole for soil vapor extraction well installation (typical).

Photograph 46: Installing 4-inch SCH 80 PVC through center of auger bit (typical).

Photograph 47: Installing rock from bottom of borehole to 1-foot above top of slotted pipe (typical).

Photograph 48: Excavation of final cover soil to top of liner after well installation (typical).

Photograph 49: Comanco repairing liner (typical).

Photograph 50: Completed liner repairs (typical).

APPENDIX G

AGGREGATE BACKFILL LABORATORY TEST RESULTS

OMNI/2014 GCCS EXPANSION/FL
SUMMARY OF SOIL DATA

Sample Identification	Sample Type	Sample Depth	Soil Classification	Natural Moisture %	Atterberg Limits				Grain Size Distribution			Compaction		Gs	Unit Weight		Carbonate Content %	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)		
Omni Waste Rock	Bulk	-	GP	-	-	-	-	-	1.4	0.7	0.2	-	-	-	-	-	0.1	-

ABBREVIATIONS: LIQUID LIMIT (LL)
PLASTIC LIMIT (PL)
PLASTICITY INDEX (PI)
LIQUIDITY INDEX (LI)
SPECIFIC GRAVITY (Gs)
MOISTURE (Mc)

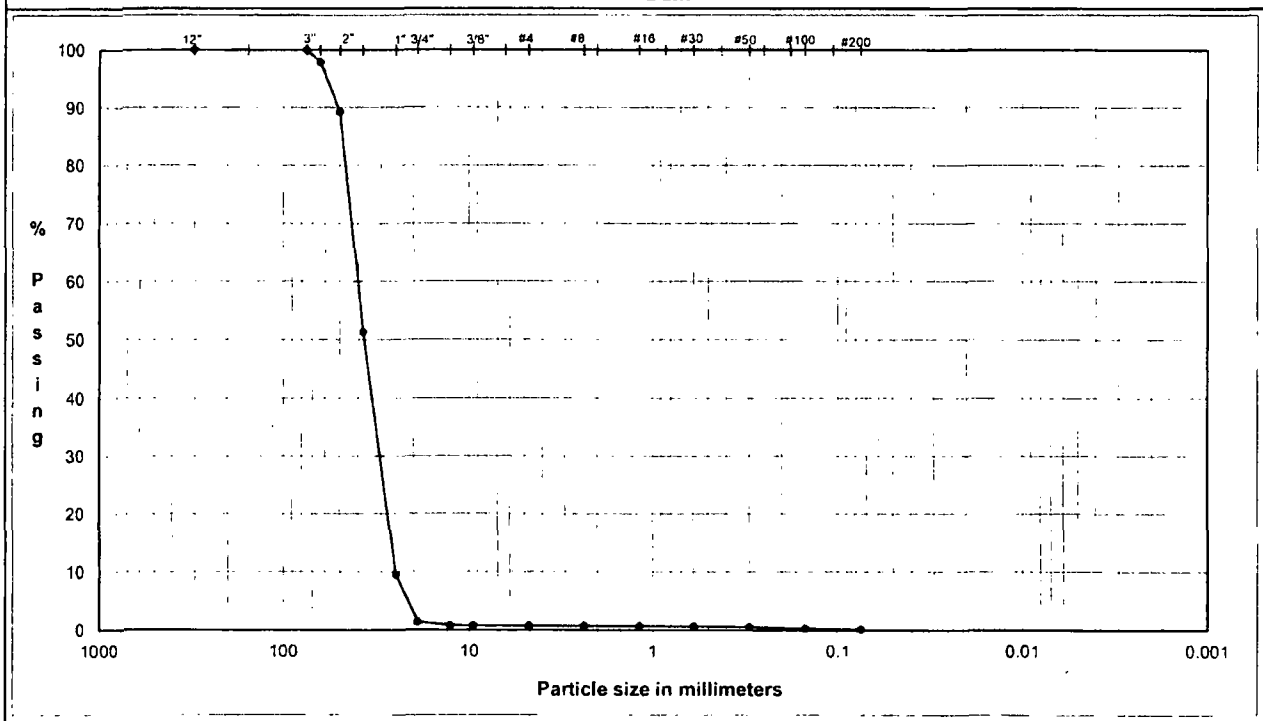
NOTES: T = TRIAXIAL TEST
U = UNCONFINED COMPRESSION TEST
C = CONSOLIDATION TEST
DS = DIRECT SHEAR TEST
O = ORGANIC CONTENT
P = pH

MARCH 2014 | 083-82734-35

PARTICLE SIZE DISTRIBUTION

ASTM C117, C136

PROJECT NAME: **Omni/2014 GCCS Expansion/FL**
SAMPLE ID: **Omni Waste Rock** - 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	97.9		
2.0"	50	89.3		
1.5"	37.5	51.3		
1.0"	25	9.5		
0.75"	19	1.4	Coarse Gravel	98.6
0.50"	12.7	0.8		
0.375"	9.5	0.7		
#4	4.75	0.7	Fine Gravel	0.7
#8	2.36	0.7	Coarse Sand	0.0
#16	1.18	0.7		
#30	0.60	0.6	Medium Sand	0.1
#50	0.30	0.5		
#100	0.15	0.3		
#200	0.075	0.2	Fine Sand	0.4
			Fines	0.2

D_{60}= 40.05	D_{30}= 30.50	D_{10}= 25.12
Cu = D60/D10 =	1.6	4
Cc = D30^2/(D10*D60) =	0.9	1

DESCRIPTION: GRAVEL, fine to coarse, trace fine to coarse sand, trace fines; light gray and red.

USCS: GP M_c

TECH	FT
DATE	3/10/14
CHECK	
REVIEW	
APPROVE	

Golder Associates Inc.

CARBONATE CONTENT
ASTM D 3042 - MODIFIED

PROJECT TITLE	**Omni/2014 GCCS Expansion/FL**
PROJECT NUMBER	**083-82734-35**
SAMPLE ID	**Omni Waste Rock**

Residue +Tare weight (g)	584.18	585.13	585.43
Tare Weight (g)	82.35	83.40	82.71
Residue weight (g)	501.83	501.73	502.72

After Acid Application and Wash

Residue + Tare weight (g)	583.84	584.57	584.41
Residue weight (g)	501.49	501.17	501.70
Carbonate Content (%)	0.1	0.1	0.2

Average Carbonate Content (%) **0.1**

REMARKS pH 4 HCl acid was used.

SAMPLE DESCRIPTION GRAVEL, fine to coarse, trace fine to coarse sand, trace fines; light gray and red.

USCS GP

MODIFIED: Only the Plus No.200 Size material used in the test.

TECH	TJ
DATE	3/10/14
CHECK	
REVIEW	
APPROVE	

OMNI/2014 VERT WELLS CQA/FL
SUMMARY OF SOIL DATA

Sample Identification	Sample Type	Sample Depth	Soil Classification	Natural Moisture %	Atterberg Limits				Grain Size Distribution			Compaction		Gs	Unit Weight		Carbonate Content %	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)		
Omni Waste Rock	Bulk	-	GP	-	-	-	-	-	1.4	0.7	0.2	-	-	-	-	-	0.1	-
JED-R-1	Bulk	-	GP	-	-	-	-	-	0.2	0.2	0.1	-	-	-	-	-	0.01	-

ABBREVIATIONS: LIQUID LIMIT (LL)
PLASTIC LIMIT (PL)
PLASTICITY INDEX (PI)
LIQUIDITY INDEX (LI)
SPECIFIC GRAVITY (Gs)
MOISTURE (Mc)

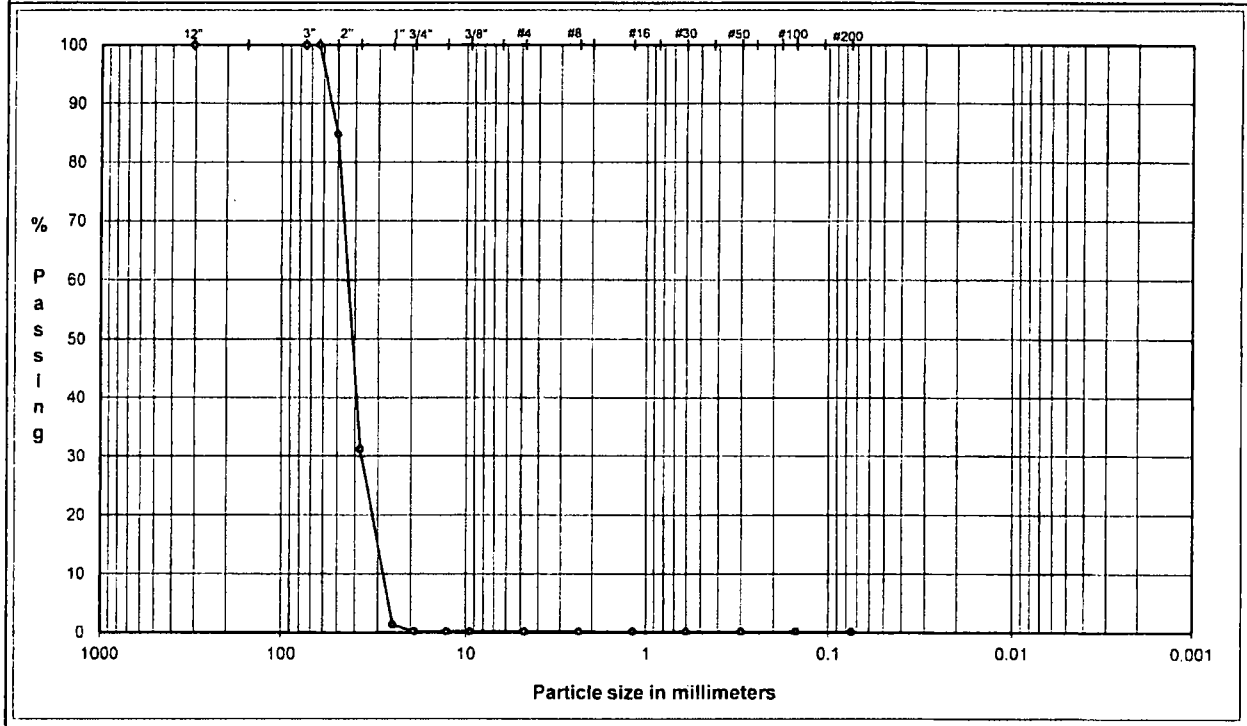
NOTES: T = TRIAXIAL TEST
U = UNCONFINED COMPRESSION TEST
C = CONSOLIDATION TEST
DS = DIRECT SHEAR TEST
O = ORGANIC CONTENT
P = pH

DECEMBER 2014 083-82734-35

PARTICLE SIZE DISTRIBUTION

ASTM C117, C136

PROJECT NAME: OMNI/2014 VERT WELLS CQA/FL
SAMPLE ID: JED-R-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	84.8		
1.5"	37.5	31.2		
1.0"	25	1.3		
0.75"	19	0.2	Coarse Gravel	99.8
0.50"	12.7	0.2		
0.375"	9.5	0.2		
#4	4.75	0.2	Fine Gravel	0.0
#8	2.36	0.2	Coarse Sand	0.0
#16	1.18	0.2		
#30	0.60	0.2	Medium Sand	0.0
#50	0.30	0.2		
#100	0.15	0.1		
#200	0.075	0.1	Fine Sand	0.1
			Fines	0.1

D_{60}= 43.78	D_{30}= 36.91	D_{10}= 28.13
Cu = D60/D10 =	1.6	< 4
Cc = D30^2/(D10*D60) =	1.1	1

DESCRIPTION: GRAVEL, coarse, trace fines; gray.

USCS: GP M_c

TECH	CG
DATE	12/12/14
CHECK	
REVIEW	
APPROVE	

Golder Associates Inc.

CARBONATE CONTENT
ASTM D 3042 - MODIFIED

PROJECT TITLE	**OMNI/2014 VERT WELLS CQA/FL**
PROJECT NUMBER	**083-82734-35**
SAMPLE ID	**JED-R-1**

Residue +Tare weight (g)	889.23	887.73	884.36
Tare Weight (g)	189.12	187.77	186.61
Residue weight (g)	700.11	699.96	697.75

After Acid Application and Wash

Residue + Tare weight (g)	889.17	887.60	884.36
Residue weight (g)	700.05	699.83	697.75
Carbonate Content (%)	0.01	0.02	0.00

Average Carbonate Content (%) **0.01**

REMARKS Used pH 4 acid.

SAMPLE DESCRIPTION GRAVEL, coarse, trace fines; gray.

USCS GP

MODIFIED: Only the Plus No.200 Size material used in the test.

TECH	TJ
DATE	12/12/14
CHECK	
REVIEW	
APPROVE	

APPENDIX H

CONSTRUCTION QUALITY ASSURANCE ENGINEER FIELD MONITORING REPORTS

Location Callahan, FL Date 12/16/13

Project / Client West Nassau LF / Nassau Co

WEATHER. Clear 40°F B. Poirier

0900 - Golder onsite to conduct quarterly surface emissions monitoring, weekly GHG reading and follow up for monthly monitoring. PreCal GEM 2000.

0910 - GHG Readings Cumulative Flow - 28099460 ml

Flow - 668

Temp - 115

0920 Follow up Readings. GW-32-O_2 GW-16-O_2 LCR-1 O_2

GW-37 GW-21-O_2

GW-16 Bad valve FENCO on well leaking.

1030 Begin SEM scan. FID Calid

1400 Complete SEM scan No exceedances

Continue monthly follow up readings

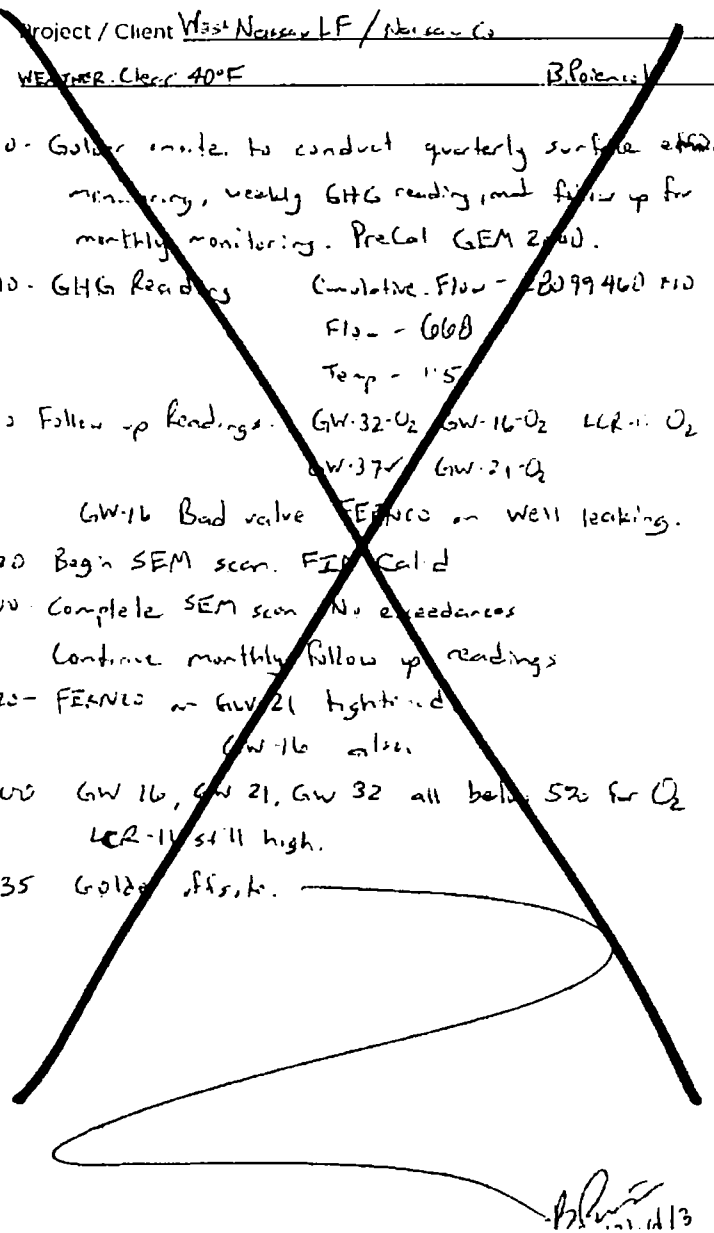
1420 - FENCO on GW-21 tightened

GW-16 also.

1500 GW 16, GW 21, GW 32 all below 5% for O_2

LCR-1 still high.

1535 Golder offsite.



Location Holopaw, FL Date 12/18/13

Project Client WSI/JED Landfill SVE Well Install/Progress

WEATHER. Clear 47°F B. Poirier

OBS-82737.31

0650 - Golder onsite. 4-Gas meter calid Healthand Safety review. HASP signed. Comanco onsite.

0800 - Environmental Drilling Services onsite. GeoProbe 7022DT Comanco placing well PVC together.

0900 - Protective soil - Elev. 82.00 Cell 3

Surface - Elev. 98.00

Cap Elev. - 95.6

0925 - N - 1356482.67 Elev. 98.46

E - 625304.74 95.60

2 BGS - 1:1 ner

+13.6 ft

16.46 ft to Protective Cover

0933 Begin drilling for Cell 3

0-5' Lt. Brown Sand

5' - Trace Pale Brown Very Brown Fine Sand Grey Clay

5-10' Brown Fine Sand Damp Trace Fines

10-15 " "

1155 Bore stopped at 15 ft BGS ~83.46 ELEV.

10-ft screen Top of screen ~93.46 ELEV.

Liner Elev = 95.60 95.60 - 93.46 = 2.14

Bentonite Plug = 2.14 ft

Location Holgrow, FL Date 12/18/13

Project / Client JED Landfill SVE Well Installs / Progressive

WEATHER: 71°F Clear BB Ewert

083-02734 31

1107 Borehole #2 N-1356495.619
E1. 97.9 E-625384.187

1115 - Begin drilling Borehole #2 Smp 3
0-5' Dk Brown Fine Sand
5-7' " "
7- Brown Fine Sand

1132 - Borehole complete. Total Depth - 15 Ft

1153 - Well in place

1200 Backfilling with

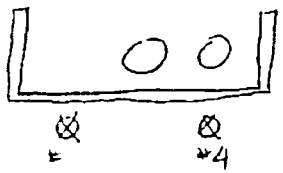
1300 Trick on Geoprobe rig Crew trying to fix

1350 Back in hole Crew cleaning rig and

1400 Commence installing Boot-set 2 to Cell 3 wells.

1410 Cell 2 Borehole #3
El 98.06 N-1357375.03
E 625093.99

C 2 Borehole #4
E 97.72 1357366.44
E 625101.76



#4

Location Holgrow, FL Date 12/18/13 ~~12/19/13~~

Project / Client JED Landfill SVE Well Instl / Progressive

WEATHER: Clear 60°F BB Ewert

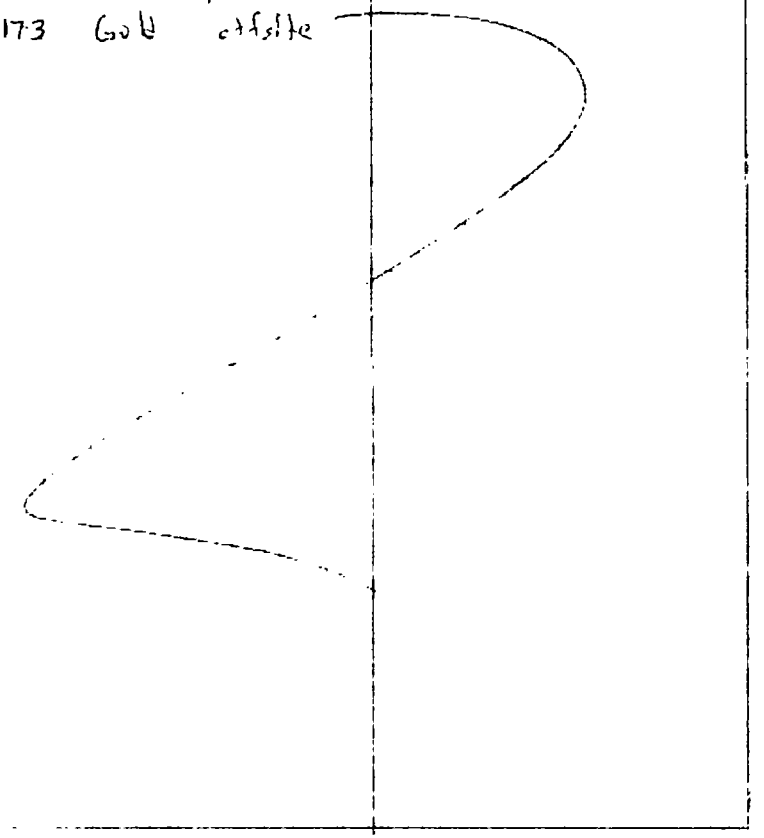
083 02734 31

1650 - Conf. mud select. w/ Mike Keller Drilling Corp. Ltd. Liner pieces assumed to be acceptable for cell construction

1659 - Drilling completed to 15 Ft BGS.

1720 - Well slid in side auger. Well ~~pulled inside~~ and auger pulled new & installed w/ rock.

1730 Gone offsite



Location Holopaw, FL Date 12/19/13

Project Client JED Landfill SVE Installs / Progressive

WEATHER 46°F Clear B. Pierce

083-02734.3

0715 - Grader on site. Comence on site repairing liner in and Sump for Cell 2.
Environmental Drilling Services on site

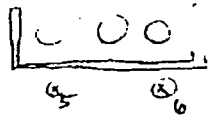
0720 - Gas meter calib Health + Safety Review.

0750 - Setting up on sumps for Cell 1

Borehole #5

N - 1357577.15 EL 97.607

E - 624014.17



Borehole #6

N - 1357586.05 EL 98.56

E - 624062.86

0810 Begin drilling Borehole #6 Cell 1

0-5' - Dk Brown Fine Sand Damp

5-10' - " "

11-15' - Brown Fine Sand Damp

0845 - Drilling complete to 15ft BGS

0855 - Well in place for Borehole #6 Cell 1

0901 - Begin drilling Borehole #5 Cell 1

0918 Drilling complete to BH #6 to 15ft BGS.

0950 - Well in place for Borehole #5 Cell 1.

0951 - Crew mobilizing to Cell 4 Sumps

0958 - Borehole #7

N - 1356487.01

E - 623962.23

12/19/13

Project Client JED Landfill SVE Installs / Progressive

WEATHER Clear 70°F B. Pierce

083-02734.31

Borehole #8

N - 1356474.60 98.14

E - 623962.33

1001 - Begin Drilling Borehole #7. Cell 4

1028 Drilling complete to Borehole #7 to 16ft BGS

1030 Begin drilling Borehole #8 Cell 4.

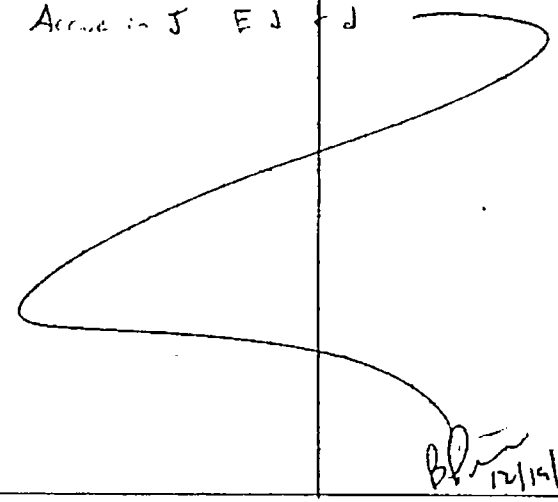
1105 Completed drilling Borehole #8 to 15ft BGS

1107 Well place Drill crew cleaning up site

1130 Daily activities complete Mobilized for Gold to stay on site to Comence over night Drilling

1150 - Clean site

1515 Arrive in JED Yard



BP 12/19/13

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.33 PROJECT TITLE: Cell 9 HGC Construction
OWNER: Progressive
LOCATION: JED Landfill CONTRACTOR: CB&I

DATE 1/14/2014 S M T W T F S

THE FOLLOWING WAS NOTED:

0700 - Golder on site. HASP reviewed and signed. Gas meter checked for calibration.

0707 - CB&I on site.

0720 - CB&I welding solid pipe onto a stretch of perforated pipe.

0810 - Excavtion resumed. Truck and front loader hauling and stockpiling tire chips.

0850 - Excavation for HGC-11 LP1 complete to a total depth of 13 feet with a 6 foot sump.

0937 - Offroad truck broke down while hauling soil to tie-in location and is out of service.

0950 - Excavator pushing truck to an area where Hertz can access it.

1010 - Excavation resumed.

1030 - Excavation at HGC-11 HP1. CB&I mobilizing to complete tie-in.

1034 - Rain starting.

1045 - Rain stopped. CB&I placing soil from header tie-in up to HP1 to maintain a 3% minimum slope.

1145 - Excavation complete for HGC-11.

1202 - CB&I beginning tie-in. Solid pipe will be hard welded to the header stubout for HGC-11.

1233 - Welding complete on tie-in. CB&I taking lunch.

1316 - Electrofusion coupler being used to connect the section of pipe used for the tie-in and the main stretch of pipe already in place for HGC-11.

1353 - CB&I having issues with their generator and are bringing up a second generator.

1401 - New generator operating. Electrofusion coupler connected.

1418 - Electrofusion connection complete.

1447 - Brad Robbins (Progressive) collecting as-built shots and confirming slopes from the tie-in to HP2.

1505 - CB&I backfilling.

1700 - CB&I offsite. Backfilling complete up to the solid to perforated pipe transition for HGC-11.

1730 - Golder offsite and driving back to Jacksonville.

2030 - Golder arrive in Jacksonville.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	083-82734.33	**PROJECT TITLE:**	Cell 9 HGC Construction
OWNER:	Progressive		
LOCATION:	JED Landfill	**CONTRACTOR:**	CB&I

DATE 1/6/2014 S M T W T F S

THE FOLLOWING WAS NOTED:

0715 - Golder onsite. HASP reviewed and signed. Gas meter checked for calibration.

CB&I onsite. Hertz is on the way to perform maintenance on the excavator. CB&I also waiting on an offroad dump truck to be delivered.

0827 - Golder starting to stake out the layout for HGC-10 with Brad Robbins of Progressive.

0851 - 1st HP and 1st LP for HGC-10 staked. CB&I continues to weld perforated pipe lengths.

CB&I has 4 crew members on site. Equipment onsite: Komatsu PC210 Excavator

John Deere 544K Front End Loader

The excavator is receiving service from a Hertz technician.

0945 - Excavator back online. Golder using cell floor as-builts to calculate the top of protective cover elevations along the path of HGC-10 and HGC-12. CB&I continues to weld.

1100 - CB&I searching through the site boneyard to collect 10" solid pipe.

1145 - CB&I welding lengths of solid pipe together. They were able to find approximately 75 feet between the boneyard and their own stockpile.

1200 - CB&I cutting geotextile fabris in widths of 3ft.

1220 - CB&I break for lunch.

1320 - CB&I continues to cut fabric.

1400 - CB&I moving equipment and materials to HGC-10 tie-in location.

1450 - John Deere 250D offroad dump truck delivered. CB&I now stockpiling soil and tire chips near construction area.

1630 - CB&I and Golder offsite.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.33 **PROJECT TITLE:** Cell 9 HGC Construction
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 1/7/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0710 - Golder onsite. CB&I onsite. HASP reviewed and gas meter checked for calibration.

0725 - Golder recording surface elevations at 100 ft marks with Brad (Progressive) and calculating slopes for HGC-10.

0735 - Excavation beginning at tie-in location for HGC-10. As the excavator digs and slope is confirmed, a 2-foot layer of tire chips is placed into the trench.

0900 - Excavation has reached HGC-10 High Point 1.

0910 - CB&I begin tie-in connection for HGC-10. The well will be hard welded to the header stubout.

0945 - Welding complete for HGC-10 tie-in.

1142 - HGC-10 Low Point 1 excavated to a total depth of approximately 14 feet. The sump is approximately 6 feet deep.

1200 - CB&I break for lunch.

1310 - Excavation continues for HGC-10.

1320 - Brad Robbins (Progressive) collecting as-built shots for HGC-10 from the tie-in to 50 feet beyond HP1 and confirming slopes every 50 feet.

1415 - Excavation finished for the day. CB&I backfilling up to LP1 w/ 1ft of tire chips, fabric, and waste.

1427 - Brad collecting as-built shots up to LP1 and confirming slopes.

1600 - CB&I welding more pipe onto the current in place pipe.

1650 - Golder and CB&I offsite.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.33 **PROJECT TITLE:** Cell 9 HGC Construction
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 1/8/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0720 - Golder and CB&I onsite. HASP reviewed and signed. Gas meter checked for calibration.

0800 - Excavation for HGC-10 resumed.

0830 - Excavation reached HGC-10 High Point 2.

0954 - Excavation complete for HGC-10 LP2 to a total depth of approximately 14 feet with a sump depth of 6 feet.

1127 - Excavation reached HGC-10 HP3.

1145 - CB&I break for lunch.

1315 - Excavation continues.

1335 - Brad Robbins (Progressive) recording as-built shots and confirming slopes from LP1 to HP3.

1400 - Excavation reached HGC-10 LP3

1450 - Excavation nearing the tipper lanes and cannot cross until after 1600. CB&I backfilling until the tipper lanes close.

1620 - Tippers have shutdown for the day. CB&I welding final length of pipe onto HGC-10.

1646 - Excavation resumes.

1743 - Excavation is approximately 20 ft beyond the tipper lanes and has stopped for the day. CB&I backfilling. Brad collecting as-built shots and confirming slopes from HP3 to 50 feet beyond HP4.

2000 - Golder and CB&I offsite.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.33 PROJECT TITLE: Cell 9 HGC Construction
OWNER: Progressive
LOCATION: JED Landfill CONTRACTOR: CB&I

DATE 1/9/2014 S M T W T F S

THE FOLLOWING WAS NOTED:

0715 - Golder and CB&I on site. HASP reviewed and gas meter checked for calibration.

0740 - Excavation resumed for HGC-10.

0830 - Excavation complete for HGC-10. Brad Robbins (Progressive) collecting as-built shots and confirming slopes. CB&I starting to backfill.

0920 - HGC-10 complete. CB&I welding end cap onto pipe for HGC-11. Truck and loader stockpiling tire chips. Rain starting.

1020 - Continuing to rain.

1100 - Rain continues and the forecast is not showing improvement. CB&I can't use their laser to excavate the required slopes so work can't begin on HGC-11.

1115 - Golder and CB&I offsite.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot
MONITOR

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER:	083-82734.33	**PROJECT TITLE:**	Cell 9 HGC Construction
OWNER:	Progressive		
LOCATION:	JED Landfill	**CONTRACTOR:**	CB&I

DATE 1/10/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0715 - Golder and CB&I onsite. HASP reviewed and signed. Gas meter checked for calibration.

0740 - Excavation starts for HGC-11.

0750 - CB&I is starting excavation at the end cap for HGC-11 as JED operations continues to move trash and cover towards the HGC-11 tie-in location. As CB&I excavates they are using the offroad truck to haul excess waste to the active working face.
The starting point for HGC-11 is a low point with a 5 foot sump.
The front loader has a flat tire and is out of service until Hertz can arrive.

0825 - Excavation has reached HGC-11 HP5 (the numbering is labeled from high to low).

0935 - Excavation at HGC-11 LP4.

0950 - Excavation complete for HGC-11 LP4 with a total depth of approximately 12 feet and a sump depth of 5 feet.

1019 - Hertz onsite to service the front loader.

1102 - Excavation at HGC-11 HP4. Front Loader repaired.

1110 - CB&I taking lunch.

1215 - Excavation continues.

1230 - Brad Robbins (Progressive) collecting as-built shots and confirming slopes from the end cap to HP4.

1326 - Excavation completed for HGC-11 LP3 with a sump depth of approximately 6 feet.

1345 - CB&I backfilling. Front Loader and Offroad truck hauling and stockpiling tire chips.

1500 - Brad collecting as-built shots and confirming slopes from HP4 to LP3.

1615 - Golder and CB&I offsite. No work on Saturday so Golder driving back to Jacksonville.

1900 - Golder arrive in Jacksonville.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

GCS FORM R1

(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER:	083-82734.33	**PROJECT TITLE:**	Cell 9 HGC Construction
OWNER:	Progressive		
LOCATION:	JED Landfill	**CONTRACTOR:**	CB&I

DATE 1/13/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0710 - Golder arrived oin site. CB&I on site. HASP reviewed and signed. Gas meter calibrated.

0740 - CB&I welding pipe.

0830 - Excavator and truck moving tire chips.

0920 - Excavation for HGC-11 resumes. Front Loader has another flat tire. Hertz servicing

0947 - Excavation at HGC-11 HP3.

1035 - Front Loader back in service.

1130 - Excavation complete for HGC-11 LP2 with a total depth of approximately 12 feet and a sump depth of 6 feet.

1237 - Front Loader and offroad truck hauling and stockpiling tire chips.

1258 - Excavation at HGC-11 HP2.

1340 - Excavation finished for the day. CB&I backfilling.

1353 - Brad Robbins (Progressive) collecting as-built shots and confirming slopes from LP3 to HP2.

1700 - Golder and CB&I offsite.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	083-82734.35	**PROJECT TITLE:**	2014 GCCS Expansion
OWNER:	Progressive		
LOCATION:	JED Landfill	**CONTRACTOR:**	CB&I

DATE 3/4/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

1030 - Golder leaving Jacksonville office

1330 - Golder arrived on site and checked in w/ Mike Kaiser

Drilling is scheduled to start tomorrow after the pre-construction meeting

1350 - CB&I not presently on site.

Equipiment on site:

John Deere 200D Excavator

TMI AF100 Drill Rig

Slotted and solid PVC pipe on site (8")

Solid HDPE pipe on site (6", 8", and 12")

Progressive has staked out vertical well locations and marked coordinates and surface elevations.

1645 - Golder met w/ M. Kaiser to review scope fo work. Well location and surface elevations sent to Golder office in Jax to create preconstruction well schedule

1715 - Golder offsite. End of day.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.35 **PROJECT TITLE:** 2014 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 3/5/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0730 - Golder on site. CB&I on site. Health and Safety review. Gas meter calibrated.
CB&I has 3 crew members and a project manager on site. 2 more members will arrive Monday.
0740 - CB&I beginning to fuse pipe until pre-con meeting.
0830 - PreCon meeting w/ CB&I and M. Kaiser.
General Scope: 10 vertical wells w/ ancillary lateral connections
Troubleshooting HGC-1 and HGC-6

GW-90, GW-95, GW-99, and GW-102 are all below final grade. Slotted pipe length reduced to 10-ft below ground surface. GW-71 not staked due to proximity of tire chip pile. Surface likely below final grade also.
945 - CB&I continuing to weld pipe
1430 - Golder finalized well schedule. GW-99 moved 10-ft south due to proximity to HGC-1
1615 - CAT 740B Offroad Dump Truck delivered.
1645 - Golder offsite.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot
MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.35 PROJECT TITLE: 2014 GCCS Expansion

OWNER: Progressive

LOCATION: JED Landfill CONTRACTOR: CB&I

DATE 3/6/2014 S M T W T F S

THE FOLLOWING WAS NOTED:

730 - Golder and CB&I onsite. Health and Safety Review

0750 - CB&I using excavator to create a level pad for drilling GW-95

0930- CB&I waiting on rock before they begin drilling

0938 - Rain starting. Welding continues

0942 - Rock on site

1010 - Golder collected sample of rock for gradation and carbonate content analysis

1159 - 11 trucks delivered rock to the site. Lightning in the area

1230 - Golder leaving site.

1335 - Rock sample relinquished to FedEx. End of day.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.35 **PROJECT TITLE:** 2014 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 3/7/2014 S M T W T F S

THE FOLLOWING WAS NOTED:

0730 - Golder on site. Health and Safety Review. Gas meter checked for calibration
CB&I onsite. Drilling started at 07:30 for GW-95.
1303 - Drilling at 85-ft on GW-95. Waste is extremely wet.
1315 - Drilling not progressing. Driller pulled up multiple empty buckets.
1330 - Drilling continuing in an effort to push past 85-ft
1400 - Drilling progressed to 86-ft over a 30 minute period. Waste is too wet at this depth. Well will be installed at 86-ft BGS.
1403 - CB&I placing well
1445 - Well pipe in place. 75-ft slotted, 15-ft solid (10-ft BGS)
1550 - GW-95 complete. CB&I performing general site cleanup and regrading well.
1615 - Golder off site.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.35 PROJECT TITLE: 2014 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill CONTRACTOR: CB&I

DATE 3/8/2014 S M T W T F S

THE FOLLOWING WAS NOTED:

0715 - Golder onsite. CB&I onsite. Health and Safety review.
CB&I de ciding to not drill today because of depth of next well and limited hours.
0730 - CB&I welding more pipe for laterals
0800 - Welding continues. General site cleanup.
0920 - Golder offsite.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot
MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.35**	**PROJECT TITLE:**	**2014 GCCS Expansion**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**CB&I**

DATE 3/10/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0720 - Golder on site. Health and Safety review. Gas meter checked for calibration
2 more CB&I crew members on site.
0730 - Drilling GW-90 started
0920 - 2nd Excavator delivered. Komatsu 210
0938 - Waste saturated at 43-ft
1042 - Drilling progress stopped at 56-ft due to waste being too wet.
1115 - Drilling not progressing after 45 minutes of trying. Final depth 57-ft.
1120 - CB&I beginning installation of GW-90. 47-ft slotted pipe and 15-ft of solid (10-ft BGS)
1211 - Begin drilling GW-99
1238 - CB&I begin excavation for lateral tie-in of GW-95
Well crew dumped too much rock into borehole for GW-90. 2 crewmembers removing excess rock.
1336 - CB&I has uncovered the existing lateral tie-in.
1650 - Drilling stopped at 58-ft for the day (GW-99)
1711 - Golder off site.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	083-82734.35	**PROJECT TITLE:**	2014 GCCS Expansion
OWNER:	Progressive		
LOCATION:	JED Landfill	**CONTRACTOR:**	CB&I

DATE 3/11/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0700 - CB&I and Golder on site. Health and Safety Review. Gas meter calibrated

0720 - Drilling resumed for GW-99.

0740 - Golder comparing existing grades to final grades at lateral tie-ins w/ B. Robbins

0830 - CB&I constructing lateral assembly for GW-95

1010 - Excavation begin for GW-95 lateral. Drilling hit water table at 86-ft BGS.

1150 - Drilling has stopped at 95-ft BGS after 40 minutes with no to little progress.

1155 - Begin well isntallation for GW-99.

1326 - GW-99 complete. CB&I now using one excavator to build bench for drilling GW-102.

1354 - CB&I placing 8" HDPE pipe into trench for GW-95 lateral.

1410 - CB&I cutting existing riser at GW-94. CB&I will weld in an 8x8 Tee for tie in.

1436 - Electrofusion start.

1445 - Fusion complete. CB&I backfilling, leaving survey stakes every 50-ft along lateral and marking depth measurements on risers.

1515 - JD 700J LGP Dozer delivered to site.

1545 - Progressive has staked GW-71

N: 1355603.72

E: 624905.14

Ground Surface Elev: 215.75

Final Top Cover Elev: 241.60

1605 - Backfilling complete for GW-95 lateral. Golder and CB&I offsite.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

GCS FORM R1

(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.35 PROJECT TITLE: 2014 GCCS Expansion

OWNER: Progressive

LOCATION: JED Landfill CONTRACTOR: CB&I

DATE 3/12/2014 S M T W T F S

THE FOLLOWING WAS NOTED:

0715 - Golder and CB&I onsite. Health and Safety review. Gas meter checked for calibration.

0730 - CB&I begins drilling GW-102

0800 - CB&I constructing GW-90 lateral and tie-in assembly. Drilling continues

0930 - Drilling GW-102, waste is very wet and black at 40ft

1047 - Drilling continues

1145 - Excavation started for subheader/lateral for GW-90. Drilling at 68-ft. Very wet and saturated.

1239 - Rain is moving into the area. Winds are high.

1250 - GW-102 finished at 76-ft after 45 minutes of drilling with little to no progress.

1255 - CB&I installing GW-102. Rain continues intermittently with hig winds. Excavation of 12" subheader/lateral continues.

1320 - Drilling crew having trouble setting well in windy conditions. Weather reports show winds greater than 20 mph with gusts over 30 mph.

1330 - Rain continues

1427 - GW-102 installed. CB&I now cleaning up excess trash. High winds are putting any further work on hold until tomorrow

1450 - Golder and CB&I off site.

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	083-82734.35	**PROJECT TITLE:**	2014 GCCS Expansion
OWNER:	Progressive		
LOCATION:	JED Landfill	**CONTRACTOR:**	CB&I

DATE 3/13/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0707 - Golder and CB&I on site. No activity from CB&I

Golder health and safety review and gas meter cal checked.

0723 - CB&I will not drill today due to high winds in forecast. All crew member will concentrate on lateral installation. Crew waiting on daylight to begin work.

0738 - All crew at top of hill refueling equipment

0743 - Excavation for 12" lateral/subheader resume

0800 - While excavation continues, 2 crew members constructing GW-90 lateral assembly

1 crew member using dozer to make a level pad for drill rig to set up on GW-106

0815 - Dozer dragging 12" lateral to excavation area

0900 - Excavation complete for 12". Pipe placed into trench

CB&I constructed a 6" assembly for a lateral run that is supposed to be an 8" line

0930 - CB&I mobilizing to begin 12" tie-in

1018 - Electrofusion begins

1034 - Electrofusion complete. CB&I starting to backfill

1044 - CB&I backfilling. Also starting to reweld lateral for GW-99

1057 - Excavation for GW-99 lateral starting

1115 - Offroad truck stuck on slope

1130 - Truck clear. Excavation resumes

1412 - Excavation of GW-99 lateral trench complete

1434 - Welding complete. CB&I dragging pipe into place.

1519 - Begin electrofusion

1532 - Electrofusion complete

1552 - CB&I backfilling

1645 - CB&I and Golder off site

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	083-82734.35	**PROJECT TITLE:**	2014 GCCS Expansion
OWNER:	Progressive		
LOCATION:	JED Landfill	**CONTRACTOR:**	CB&I

DATE 3/14/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0715 - CB&I on site. Moving drill rig into place
Golder on site. Helath and Safety review. Gas meter checked for calibration
Johnny Meyer (CB&I) is ill. He will finish grading the excavation area for the GW-99 lateral and then leave the site to see a doctor. Drillling will continue.
0750 - Drilling starts for GW-106
0830 - CB&I using a dozer to grade along GW-99 lateral
0900 - 1 crew member installing well head on GW-95
0945 - Johnny Meyers off site
0950 - GW-95 well head installed. Drilling continues
1200 - GW-99 well head installed. Drilling continues
1222 - GW-90 wellhead complete. Drilling continues
1248 - GW-106 drilling complete. Total depth 78-ft.
1250 - CB&I setting well GW-106.
1317 - Drill rig mobillizing to GW-108
1400 - Drilling begins for GW-108
1454 - GW-106 complete
1600 - CB&I covering borehole of GW-108 for the night. Current depth = ~30-ft
1615 - CB&I and Golder offsite

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.35 PROJECT TITLE: 2014 GCCS Expansion

OWNER: Progressive

LOCATION: JED Landfill CONTRACTOR: CB&I

DATE 3/15/2014 S M T W T F S

THE FOLLOWING WAS NOTED:

0715 - Golder on site. CB&I onsite

0730 - Drilling resumes for GW-108

0935 - Borehole complete for GW-108. Final depth at 63-ft

0940 - CB&I beginning well construction

1000 - Offroad truck stuck on slope

1010 - Offroad truck free. CB&I moving to GW-118 to build a pad to drill from

1052 - Start drilling of GW-118

1125 - GW-108 complete. CB&I no repairing slope from drilling activity. Drilling continues for GW-118

1215 - Drilling reached design depth of 29-ft

1230 - CB&I constructing GW-118

1421 - GW-118 complete. CB&I regrading around well

14

1430 - Golder and CB&I offsite

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

GCS FORM R1

(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.35 **PROJECT TITLE:** 2014 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 3/17/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0720 - Golder and CB&I on site. Health and Safety review. Gas meter checked for calibration
0725 - CB&I digging out berm in area of GW-107 to create a level pad to drill from
0742 - Drill rig moving into place
0750 - Drillng start for GW-107
0810 - CB&I is concerned with current winds and incoming weather. Excavation for lateral tie-in of GW-106 and GW-102 will begin w/ uncovering of GW-101 lateral riser. Then construction of lateral assembly. Weather status will be assessed after that
0903 - Drilling of GW-107 complete. Final depth 26-ft
0905 - CB&I installing GW-107
0940 - Drilling start for GW-112
1000 - GW-107 complete. Drilling GW-112 continues
1121 - GW-112 complete borehole to depth of 30-ft BGS. CB&I installing well now. CB&I also continuing construction of lateral assembly for GW-106/102
1245 - CB&I going to lunch
1403 - CB&I return from lunch
1432 - Lightning strike in the area
1450 - Multiple lightning striked over last 20 minutes. CB&I leaving site due to appraoching weather
1500 - CB&I and Golder off site

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.35 **PROJECT TITLE:** 2014 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 3/18/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0720 - Golder on site. CB&I on site. Health and Safety review. Gas meter calibrated
0725 - Begin drilling GW-71
0815 - Excavation GW-106/102 lateral begins
0920 - Drilling hit saturated conditions at 42-ft BGS
0955 - Drilling is at a depth of 45-ft
1021 - Drilling completed at a depth of 47-ft. Well will be installed at instruction of M. Kaiser (Progressive)
1025 - CB&I beginning well install
1200 - Surveyors on site to shoot in laterals 90, 95, and 99
1230 - GW-71 complete
1300 - CB&I going to lunch
1415 - CB&I back from lunch, refueling equipment
1435 - CB&I dragging lateral into place
1600 - Lateral connected
1608 - Begin electrofusion
1617 - Electrofusion complete at GW-101
1633 - CB&I backfilling
1735 - CB&I and Golder offsite

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.35**	**PROJECT TITLE:**	**2014 GCCS Expansion**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**CB&I**

DATE 3/19/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0710 - Golder and CB&I on site

0750 - CB&I dressing up slope along path of GW-102 lateral

0837 - CB&I uncovering header for tie-in to GW-107 lateral

0921 - Cutting header

1000 - Electrofusion start for 1st coupler. CB&I beginning to excavate trench for GW-107 and GW-108

1021 - Beginning electrofusion for 2nd coupler

1045 - Electrofusion complete

1130 - CB&I welding lateral assembly together. Excavation continues

1207 - Excavation complete. Welding continues

1300 - CB&I taking lunch

1420 - CB&I dragging pipe assembly into place

1453 - Begin electrofusion

1457 - Electrofusion complete. Tie-in for GW-107/108 complete. CB&I backfilling and mobilizing to next tie-in

1530 - CB&I uncovering header at GW-112 Tie-in

1641 - Begin electrofusion

1720 - Electrofusion complete. Excavation being left open over night

1735 - Golder and CB&I off site

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	083-82734.35	**PROJECT TITLE:**	2014 GCCS Expansion
OWNER:	Progressive		
LOCATION:	JED Landfill	**CONTRACTOR:**	CB&I

DATE 3/20/2014 S M T W T F S

THE FOLLOWING WAS NOTED:

0710 - Golder and CB&I on site. Helath and Safety review. Gas meter calibration checked
0730 - CB&I refueling equipment
0743 - CB&I bump testing gas meters
0751 - CB&I beginning to assemble lateral assembly for GW-112
0830 - CB&I checking for material to complete 12" subheader for GW-71
0900 - Excavation start for GW-112 lateral. Wedling continues for lateral assembly
0940 - Excavation complete. CB&I dragging lateral pipe into place
1005 - Begin electrofusion
1012 - Electrofusion complete. CB&I starting to backfill
1030 - CB&I uncovering header at GW-118 tie-in
1050 - Grinding electrofusion surface prior to cutting 18" header
1055 - Cutting 18" header
1130 - Electrofusion start. CB&I excavating lateral trench
1210 - Electrofusion fo 18x8 tee complete
1220 - CB&I taking lunch
1330 - CB&I return from lunch. Welding lateral for GW-118
1455 - Dragging pipe into place
1513 - Begin electrofusion
1520 - Electrofusion complete. CB&I backfilling. GW-118 lateral tie-in complete
1538 - CB&I uncovering 12" subheader at GW-70 for GW-71 tie-in
1600 - CB&I will cut off the existing 90 bend and weld directly to existing 12" subheader
1610 - CB&I is welding the assembly together
1700 - Golder and CB&I off site

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	083-82734.35	**PROJECT TITLE:**	2014 GCCS Expansion
OWNER:	Progressive		
LOCATION:	JED Landfill	**CONTRACTOR:**	CB&I

DATE 3/21/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0715 - CB&I and Golder on site. Health and Safety review. Calibration of gas meter checked

0800 - Excavation of trench for GW-71 lateral. CB&I also installing well heads

1105 - Trench complete. CB&I beginning to cut existing 12" 90

1111 - Cutting 12" subheader

1130 - Welding risers to 12" pipe assembly

1215 - CB&I taking lunch

1315 - CB&I return from lunch

1320 - CB&I dragging pipe asembly to 12" tie-in at GW-70

1351 - Electrofusion at existing 12" begins. CB&I backfilling will fusion process progreses

1404 - Fusion complete

1445 - Begin troubleshooting work on HGC-6

1613 - Lateral for HGC-6 uncovered and in good shape. No distinguishable leaks. Tie-in to 8" leachate riser also in good condition. CB&I opened the riser flange. Once the flange opened, vaccuum was noticeably higher at wellhead. CB&I used a 25-ft survey rod and hit water in the riser at approx. 27-ft (rod + arm length)
Either horizontal well or leachate riser or both are watered in, preventing gas flow into system

1620 - Begin excavation of HGC-1

1700 - Pipe not sloping up to a high point, as constructed. CB&I continuing to excavate to find the end of the sag in the line.

1730 - CB&I off site

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.35 **PROJECT TITLE:** 2014 GCCS Expansion
OWNER: Progressive
LOCATION: JED Landfill **CONTRACTOR:** CB&I

DATE 3/22/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0715 - CB&I on site. Golder on site. Health and Safety review. Gas meter checked for calibration

0815 - CB&I excavating along HGC-1. They found the point where the pipe slope levels off. Trench depth is getting too deep to safely work in and excavate.

0822 - CB&I will dig the trench depth to a slightly lower elevation to create more fall and eleminate the sag in in the line

0830 - Pipe now has fall from approximately level area to the wellhead.

0940 - CB&I installing final wellhead on GW-102 and cleaning/packing up trailers

1000 - Golder off site

SUBMITTED BY GOLDER ASSOCIATES

B.Poiencot

MONITOR

GCS FORM R1

(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.35**	**PROJECT TITLE:**	**HGC-12 and HGC-13 Construction**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**SCS Field Services**

DATE **8/18/2014** **S M T W T F S**

THE FOLLOWING WAS NOTED:

630 - Golder leaving Jacksonville office

1000 - Golder arrived on site and checked in w/ Brad Robbins

1005 - SCS has been electrofusing 10" HDPE perforate pipe together

1010 - Health & Safety Review

1045 - Meet SCS staff: Dustin Adams and 2 others

- 2 concerns from SCS: 5% slope won't hold fabric
- 120-ft or 150-ft solid pipe to wellhead?

Equipment on site:

- TEVEX TA 400 Dump truck
- XCMG XE210C Excavator
- Komatsu WA-320 Loader

1155 - Work stopped for SCS lunch break

1205 - Call to Don Grigg

- Don agrees with SCS that a minimum 100-ft. cap distance from side slopes
- both are upper tier HGC's
- there should be 200-ft spacing, cap to cap

1230 - Work resumes

1315 - 400-ft. of perf pipe fused together, moving to next line

1430 - vociemail from Don confirms the agreement between Progressive and SCS to construct the solid pipe at >5% slope and the perforate pipe at >3% slope

-pipes will be shifted ~60-ft from original proposed locations, buthe spacing between the two must be maintained

- still no tire chips on site

1555 - 800-ft of pipe has been fused together

1600 - loader taken down to retrieve solid pipe

1645 - all fusing stopped for the day

1700 - all parties off-site

SUBMITTED BY GOLDER ASSOCIATES

A. Marquez

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	083-82734.35	**PROJECT TITLE:**	HGC-12 and HGC-13 Construction
OWNER:	Progressive		
LOCATION:	JED Landfill	**CONTRACTOR:**	SCS Field Services

DATE 8/19/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0700 - Golder leaving Jacksonville office
0740 - Golder arrived on site and checked in w/ Brad Robbins
0805 - SCS resumes fusing pipes
0830 - Brad Robbins visits to discuss tire chips and surveying procedures
- tire chips still not here, and big unknown
1000 - Another 400-ft of perforated pipe has been electrofused
1030 - call to Brad, still no tire chips
1100 - Golder informed by SCS that tire chips might not arrive and we might have to demob. at end of day
1130- SCS takes lunch
1200 - SCS returns and is retrieving pipe from bottom
- will also begin hauling a few loads of clean fill
1215 - first load of clean fill dumped in staging area
1245 - 2nd load of clean soil staged
1310 - 3rd load of clean soil
1340 - 4th load of clean soil
1410 - 5th load of clean soil
1420 - fusing solid pipe and reducers together
1630 - no tire chips available, the job will resume starting next week. All personnel off site
1930 - Golder arrives back in Jacksonville office

SUBMITTED BY GOLDER ASSOCIATES

A. Marquez

MONITOR

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER:	083-82734.35	**PROJECT TITLE:**	HGC-12 and HGC-13 Construction
OWNER:	Progressive		
LOCATION:	JED Landfill	**CONTRACTOR:**	SCS Field Services

DATE 8/25/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

630 - Golder leaving Jacksonville office

1000 - Golder arrived on site and checked in w/ Brad Robbins

1010 - Health & Safety Review

1030 - SCS has already begun excavation near cell 6/9 horizontal HGC-12

- original wellhead starting point was shifted ~60-ft NW of proposed location

Equipment on site:

- TEVEX TA 400 Dump truck
- XCMG XE210C Excavator
- Komatsu WA-320 Loader

1105 - 1st pocket drain excavated at the end of the 120-ft of solid pipe + ~2-ft of perforated pipe.

Significant slope observed

- pocket drain dimensions: 5 x 2 x 10 ft below bottom of geotextile liner. Typical

1115 - begin excavation for > 3% upslope for perforated pipe.

- after solid pipe, the line turned west, more in-line with the original proposed location

1345 - Brad Robbins on site to GPS survey top of pipe every 50 ft. ~220-ft of pipe have been laid in ditch

1400 - All slopes have been met or exceeded the specified slopes. SCS begins Geotextile "burrito" wrap with 12" overlap around perforated pipe

1415 - Beg to Golder office in Jax to create preconstruction well schedule

1430 - Begin backfill of top with select waste and some clean fill

1610 - SCS begins refueling equipment

1645 - Everyone off-site

SUBMITTED BY GOLDER ASSOCIATES

A. Marquez

MONITOR

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER:	**083-82734.35**	**PROJECT TITLE:**	**HGC-12 and HGC-13 Construction**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**SCS Field Services**

DATE **8/26/2014** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0700 - Golder and SCS personnel on site (3 SCS)
0710 - Health & Safety Review
0720 - SCS fuses remaining pipe to be used today
0740 - Stake out the next 300 feet of excavation (low to high to low)
Equipment on site:
TEVEX TA 400 Dump truck
XCMG XE210C Excavator
Komatsu WA-320 Loader
0800 - begin excavation, checking grade with survey stake as they go
1030 - 2nd pocket drain excavated at ~320-ft from the beginning of the pipe (5 x 2 x 10-ft typical)
1200 - high point reached at ~420-ft
1330 - ~210-ft of pipe placed in the excavated trench
1340 - Brad Robbins on site to GPS locate every 50-ft.
- the fall from HP-1 to 250-ft. was too shallow and therefore regraded
1350 - pipe is re-surveyed - all required slopes met. See as-built
1445 - placing tire chips on sides (~1-ft) and on top (~1.5-ft)
1525 - placing select waste/soil cover to grade
1630 - pipe covered, no trash exposed
1645 - Golder and SCS off site
END OF DAY

SUBMITTED BY GOLDER ASSOCIATES

A. Marquez

MONITOR

GCS FORM R1

(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.35**	**PROJECT TITLE:**	**HGC-12 and HGC-13 Construction**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**SCS Field Services**

DATE **8/27/2014** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0700 - Golder and SCS personnel on site

0710 - Health & Safety Review

0720 - Stake out next 300-ft of pipe

0730 - begin clearing mounds for excavation

- setting up TopCon RL-200 which has been used daily to grade bottom ditch and ensure 1.5-ft of tire chips

0800 - begin excavation

1030 - Mike Kaiser on site, says we should cover with select waste more than clean fill

- wants a cap on the end of the wellhead side with 6-inch cap

1245 - SCS has placed ~250-ft of pipe in the trench

1250 - call to Brad Robbins to survey the 50's

1300 - SCS does various prep work as we wait for Brad Robbins

1600 - Brad Robbins on site to survey 50s

1615 - survey done, SCS begins filling in tire chips (~1-ft on sides, ~1.5' on top)

1630 - AM and Brad Robbins stake out the 2 ends of the future HGC-13 location

1745 - HGC-12 finally covered with select waste and soil

- a sump at the end of HGC-12 will still need to be constructed tomorrow morning

1800 - Golder and SCS off site

END OF DAY

SUBMITTED BY GOLDER ASSOCIATES

A. Marquez

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.35**	**PROJECT TITLE:**	**HGC-12 and HGC-13 Construction**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**SCS Field Services**

DATE **8/28/2014** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0700 - Golder and SCS personnel on site

0710 - Health & Safety Review

0720 - SCS sets up at end of HGC-12 to construct the final sump at the end of the 840-ft. pipe

0800 - Brad on site to discuss logistics

- HGC-13 will begin on the "inside" end, opposite of HGC-12. On the SW end of the pipe

0815 - final HGC-12 sump completed : 5 x 2 x 10-ft.

0825 - Begin backfilling sump and remainder of HGC-12 to completion

0950 - HGC-12 complete, and mounded up so that the landfill operations can avoid it

1015 - Brad Robbins returns to GPS the proposed start and end of HGC-13 so that SCS knows the length of pipe needed

1115 - SCS begins excavation of 1st sump at HGC-13

1215 - sump complete: 5 x 2 x 10-ft below the bottom of liner

1430 - 100-ft of pipe laid from first low point to first high point

1500 - Brad on site to survey. All slopes meet specs.

1515 - SCS begins "burrito" wrap of geotextile liner around pipe and tire chips

1530 - SCS begins placing tire chips around side and on top of perforated pipe

- Dustin moves the other piece of 400-ft pipe down the south side slope to get out of the way of tippers

1550 - the laid pipe has been completely covered after burrito wrap with select waste and soil

1605 - SCS places excavator at edge of pipe to guard it from the relocation of landfill operations

1615 - further dressing up of HGC-12 to protect it from the moving landfill operations

1645 - everyone off-site

END OF DAY

SUBMITTED BY GOLDER ASSOCIATES

A. Marquez

MONITOR

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER:	**083-82734.35**	**PROJECT TITLE:**	**HGC-12 and HGC-13 Construction**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**SCS Field Services**

DATE **8/29/2014** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0715 - Golder and SCS personnel on site
0720 - Health & Safety Review
0730 - Dustin notes that landfill operations are still interefering with completion of HGC-13
0740 - slow setup this morning due to road blockage, and truck unable to summit the sideslope
0815 - begin excavation from 100-ft to 200-ft, high point to low point at > 3% slope
1015 - 2nd sump constructed at 200-ft: 5 x 2 x 10-ft
1145 - high point reached at 300-ft.
1150 - call to Brad Robbins to survey 50's
1215 - Brad Robbins on site. All slopes meet specs
1235 - SCS begins "burrito" wrap of geotextile liner around pipe and tire chips
1300 - SCS begins placing tire chips around side and on top of perforated pipe
1400 - the laid pipe has been completely covered after burrito wrap with select waste and soil
1415 - Golder and SCS personnel offsite; AM of Golder returns to Jacksonville
- work will resume Tuesday 9/2/2014
1715 - AM of Golder arrives in Jacksonville
END OF DAY

SUBMITTED BY GOLDER ASSOCIATES

A. Marquez

MONITOR

GCS FORM R1

(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER:	**083-82734.35**	**PROJECT TITLE:**	**HGC-12 and HGC-13 Construction**
OWNER:	**Progressive**		
LOCATION:	**JED Landfill**	**CONTRACTOR:**	**SCS Field Services**

DATE **9/2/2014** **S M T W T F S**

THE FOLLOWING WAS NOTED:

0715 - Golder and SCS personnel on site
0720 - Health & Safety Review
0730 - Dustin notes that landfill operations are still interefering with completion of HGC-13
0740 - slow setup this morning due to road blockage, and truck unable to summit the sideslope
0815 - begin excavation from 100-ft to 200-ft, high point to low point at > 3% slope
1015 - 2nd sump constructed at 200-ft: 5 x 2 x 10-ft
1145 - high point reached at 300-ft.
1150 - call to Brad Robbins to survey 50's
1215 - Brad Robbins on site. All slopes meet specs
1235 - SCS begins "burrito" wrap of geotextile liner around pipe and tire chips
1300 - SCS begins placing tire chips around side and on top of perforated pipe
1400 - the laid pipe has been completely covered after burrito wrap with select waste and soil
1415 - Golder and SCS personnel offsite; AM of Golder returns to Jacksonville
- work will resume Tuesday 9/2/2014
1715 - AM of Golder arrives in Jacksonville
END OF DAY

SUBMITTED BY GOLDER ASSOCIATES

A. Marquez
MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER:	083-82734.35	**PROJECT TITLE:**	HGC-12 and HGC-13 Construction
OWNER:	Progressive		
LOCATION:	JED Landfill	**CONTRACTOR:**	SCS Field Services

DATE 9/3/2014 **S M T W T F S**

THE FOLLOWING WAS NOTED:

0700 - Golder and SCS personnel on site

0705 - Health & Safety Review

0710 - SCS moves perforated pipe to stage for electrofusion

0725 - Electrofusion begins

0800 - Electrofusion complete

0810 - Begin excavation past HP-2 to LP-3

0930 - Excavation stops to allow landfill operations to clear from our path

- tire chip stockpile re-staged further west and near excavation

0940 - excavation resumes

1030 - LP-3 reached and sump constructed

1200 - Brad Robbins on site to survey points. All slopes meet specs

1215 - SCS begins placing tire chips on side and on top, and burrito wrapping

1230 - SCS begins covering with select waste

1325 - all laid pipe today has been covered with appropriate cover

1330 - Begin excavating further towards E/NE

1340 - Stake out remaining distance

- remaining distance was 225-ft.

- the next low point will be just before the tipper road, which cannot be crossed until after 4PM

- Dustin's goal (Progress agrees) is to finish HGC-13 tonigh by constructing the final 125-ft. after the landfill operations shut down

1600 - Sump constructed at low point, ~600-ft. from start of pipe

1610 - begin excavation of final ~130-ft. at >5% slope for solid pipe to wellhead. Landfill operations have shut down

1700 - Excavation complete

1710 - electrofusion of final solid pipe to perf. Pipe

1740 - Pipe placed in trench. Total length = 729-ft. Brad Robbins surveys 50's. Slopes meet specs

1750 - begin placing tire chips over perf. Pipe, placing clean fill soil over solid pipe

1805 - all tire chips placed and burrito wrapped, achieving final cover grade

1845 - HGC-13 complete and staked by Brad Robbins to prevent damage by compactors

SUBMITTED BY GOLDER ASSOCIATES

A. Marquez

MONITOR

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: OB3 - 82734.41 **PROJECT TITLE:** Cell 9 Header Exp. + Sump Drilling
OWNER: Progressive Waste
LOCATION: JED LF Holopaw, FL **CONTRACTOR:** CB+I

DATE 12/10/14 S M T W T F S

THE FOLLOWING WAS NOTED: 0700 - Golder + CB+I on site. Health + Safety Review.
0730 - Construction crew continues to weld pipe. Currently constructing J-trap assembly. 7 CB+I crew on site. 3-drilling. 4-construction. CB+I still waiting on excavator + off-road dump truck. Issues w/ rental companies haulers have delayed delivery.
0830 - Golder staking out points for header expansion w/ Brad Robbins (Progressive) Excavator delivered.
0945 - Offroad dump truck Delivered. Drill rig mobilizing.
1100 - Drilling @ 43ft BGS for Point 1
1157 - Drilling @ 65 ft BGS.
1245 - Drilling @ 80 ft BGS. Equipment on site: Soilmec SR-30 Drilling
JD 2250 Excavator
Komatsu PC 200 Excavator
CAT 725C offroad truck
1415 - Drilling @ 101 ft BGS. CB+I switching to liquids bucket
1528 - Drilling @ 118ft BGS. Construction excavated around Existing 12" Blind at Header tie-in location. A stormwater down pipe is in the way of tie-in. CB+I will raise SW pipe enough for header to pass under.
1540 - CB+I switching back to standard drill bucket
1610 - Drilling @ ~126ft CB+I switching again to liquids bucket
1640 - Drilling @ 130 ft BGS. Drilling complete. CB+I Backfilling w/ fine chips up to 20ft BGS. Clean fill up to surface
1730 - CB+I + Golder off site. End of day.

SUBMITTED BY GOLDER ASSOCIATES

/ MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-02734.41 PROJECT TITLE: Cell 9 Header Expansion & Sump Drilling
OWNER: Progressive Waste
LOCATION: ~~Tri~~ JEA LF Hilaxon, FL CONTRACTOR: CB-I

DATE 12/11/14 S M T W (T) F S

THE FOLLOWING WAS NOTED: 0700- Golder & CB&I onsite. Health & Safety mtng.
0743- CB&I mobilizing to begin work. Drill rig staged at relocated Point 2.
0805- Drilling start. Construction crew welding pipe.
0855- Drilling @ 35ft BGS. Waste started getting wet @~33ft BGS
1015- CB&I switching to liquids bucket. Drilling @ ~65ft BGS
1100- Drilling @ 75ft BGS. 2nd CAT offroad truck delivered to the site.
1300- Drilling @ 108ft BGS. Mike Kaiser requested that CB&I drill another 5ft. Construction welding pipe & moving lengths to Cell 9 work area.
1327- Drilling completed @ 113ft BGS. CB&I backfilling borehole w/ tire chips up to 20ft BGS, then place textile, then soil up to surface.
1410- CB&I begin drilling Point 3.
1520- Drilling @ 37ft BGS
1600- Drilling stopped for the day @ ~54ftBGS. Waste starting to get wet.
1630- Golder collected rock sample for gradation and carbonate content testing. Golder offsite.
1730- Rock sample relinquished to FedEx for shipment to Golder lab in Atlanta, GA. End of day.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-02734.41
PROJECT TITLE: Cell 9 Header Expansion - Sump Drilling
OWNER: Progressive Waste
LOCATION: JEA LF Holsbeau, FL
CONTRACTOR: CB+I

DATE 12/12/14
S M T W T (F) S

THE FOLLOWING WAS NOTED: 0700 - Golder + CB+I on site. Health + Safety Review
0730 - Drilling resumes on Point 3.
0814 - Drilling @ ~ 63ft BGS. Waste saturated
0822 - CB+I swapping to liquids bucket. Drilling @ ~ 64-65ft BGS.
0824 - Heater crew removing stormwater down chute pipe from header tie-in location
0916 - Drilling @ ~ 75 ft BGS.
0945 - JD 650J Dozer delivered.
1130 - Drilling complete for Point 3. Final depth 111 ft BGS. CB+I backfilling borehole with tire chips up to 20ft BGS, then textile the soil up to the surface.
1154 - Begin drilling Point 4
1420 - Leachate is flooding into excavation @ header tie-in. CB+I instructed by Progressive to dig a nearby sump + trench leachate away from the work area
1425 - Drilling for Point 4 @ ~ 66ft. Waste was wet from 37-ft BGS.
1500 - Drilling complete @ 77ft BGS. Borehole backfilled with tire chips up to 20ft BGS, then textile the soil up to existing surface.
1630 - Golder + CB+I off site.

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MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE _____ OF _____

PROJECT NUMBER: 083-02734.41 PROJECT TITLE: Cell 9 Header Expansion + Sump Drilling
OWNER: Progressive Waste
LOCATION: J.E.D. Landfill CONTRACTOR: CB+I

DATE 12/15/14 S (M) T W T F S

THE FOLLOWING WAS NOTED: 0700 - Golder and CB+I onsite Health + Safety review
0730 - CB+I mobilizing to work areas. 18x18 cross for J-trap arrived over the weekend CB+I still waiting on 16x16" Tee.
0745 - CB+I servicing equipment
0754 - Begin drilling Point 5. Design Depth: 127' + 5' = 132 Ft
0814 - Drilling @ 10-ft.
0915 - Drilling @ ~23-ft. Drilling bucket cracked across bottom 2 rings. CB+I will have to drive north to ATL to weld a new bucket. (Half way between here + Ohio)
0945 - CB+I cut section of J-trap
1500 - J-trap complete. CB+I welding 16" blind flange together and reworking slope face
1630 - Work complete for the day

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE ____ OF ____

PROJECT NUMBER: 083-82734.41 **PROJECT TITLE:** Cell 9 Header Expansion + Sump Drilling
OWNER: Progressive Waste
LOCATION: J.E.D LF Holopaw, FL **CONTRACTOR:** CB+I

DATE 12/16/14 S M (T) W T F S

THE FOLLOWING WAS NOTED: 0700 - Golder + CB+I on site.

0815 - Mobilizing to work area.

0875 - CB+I working slope + beginning to resume excavation of trench

0900 - Stormwater down chute in conflict w/ Header installation ~75 Ft southwest of HighPoint SW pipe will need to be raised ~~and header slightly lowered~~ BKO

0920 - Brad w/Progressive told CB+I + Golder to cut header installation but leave trench open @ location I SW pipe. Progressive staff will repair later.

~~1330~~ 1330 - Excavation @ LP

1420 - Excavation of main trench complete. All slopes > 5%. Header will need to terminate ~5 ft north of HGC-11. HGC will still be tied-in.

1515 - Pit for sump complete. CB+I test fit J-trap in pit

1600 - Activity wrapping up. CB+I taping off pit. Leaving excavator over pit also.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 085-02734.11 **PROJECT TITLE:** Cell 9 Header Expansion - Soil Drilling
OWNER: Progressive Waste
LOCATION: J.E.D. LF Holopaw, FL **CONTRACTOR:** CB&I

DATE 12/17/14 S M T (W) T F S

THE FOLLOWING WAS NOTED: 0700- Golder & CB&I onsite. Health & Safety review
0730- Mobilizing to work areas
0800- Drilling resumes.
0900- Drilling @ ~45ft Dry → Moist Header crew welding stubouts into place
1015 - ~60ft.
1115 - ~75ft. Waste wet @ ~73ft
1149 - Header in trench up to 450 LF total
1155 - Drilling switched to liquids bucket @ ~78ft (11:30)
Now switching back to standard. ~91 ft
1218 - Switching to liquids bucket ~100ft
1235 - Switching back to standard bucket.
1255 Switch to Liquids Bucket
1304 - Drilling @ ~105ft
1326 - ~114
1401 - ~122
1437 - Drilling complete. 132ft Final. Install risk up to ~~100ft~~ 95 BGS, ~~90ft~~ 85 perf w/ rock. 10ft solid 2 bentonite plugs 2ft each.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 087-02734.41
PROJECT TITLE: Cell 9 Header Extension + Sump Drilling
OWNER: Progressive Waste
LOCATION: J.E.D.L.F Holopaw FL
CONTRACTOR: CB+I

DATE 12/18/14 S M T W (T) F S

THE FOLLOWING WAS NOTED: 0700- Golder and CB+I on site Health + Safety review.
0750- Drilling Pt.6 start.
Wet @ 5ft BGS
0845- 27ft
0902- 30ft. Teeth on bucket sheared off. Only 4 teeth left.
0950- Borehole backfilled w/ tire chips up to 3ft BGS. Textile then soil
0957- Begin Pt. 6R. ~20 ft south of Pt.6
1115- Pt. 6R complete to 44ft BGS. Backfill w/ tire chips up to 10ft BGS
1200- Begin drilling Pt. 7
1430- CB+I pressurizing pipeline.
1440- Drilling complete for Pt.7 Total Depth 41 ft BGS. Liquids Bucket not needed
1505- Header pressurized to 10 psi. Temp 72°F
1605- Pressure Test complete. Final pressure 10psi. Temp 72°F
CB+I backfilling Header trench leaving 4' stubbes every 50 ft + atop fittings. Also placing gas caution tape.
1700- Golder + CB+I off site.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82739.41 PROJECT TITLE: Cell 9 Header Expansion + Sump Drilling
OWNER: Progressive Waste
LOCATION: JEDLF Holopaw, FL CONTRACTOR: CB+I

DATE 12/19/14 S M T W T (F) S

THE FOLLOWING WAS NOTED: 0700 - Golder and CB+I on site Health + Safety review
08:30 - Begin drilling Point 9. Construction crew working on 12" Header Tie-In to existing
0912. Drilling @ 27ft BGS
1008 - Header tie-in complete
1019 - Drilling @ 45ft BGS. Waste wet @ ~37ft BGS
1115 - Drilling @ 50ft. CB+I changing to liquids bucket
1196 - Drilling @ 55ft BGS
1200 - Liquids Bucket split across the bottom
1230 - Tie-in backfilled. Stormwater pipe in area repaired. Crew moving to HGC tie-in
1238 - Drill rig staged at Point 9.
Liquids bucket needs to be sent to a repair shop 45 minutes away.
2 CB+I crew will deliver the bucket and return tomorrow to con't drilling
1300 - HGC-10 tie-in location excavated.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.41
PROJECT TITLE: Cell 9 Header Exp. - Soil Drilling
OWNER: Progressive Waste
LOCATION: JEB LF Holopaw, FL
CONTRACTOR: CB+I

DATE 12/20/14
S M T W T F (S)

THE FOLLOWING WAS NOTED: 0655 - Golder + CB+I on site Health + Safety Review
0710 - CB+I Begin drilling Pt. 9 w/ standard bucket. Liquids bucket should be repaired by 1000 and back on site before lunch.
0740 - Drilling @ 40ft BGS. Construction crew working on HGC-11 tie-in.
0900 - CB+I welding the HGC-11 tie-in.
0910 - Drilling @ 50ft BGS. Waste wet @ ~47ft BGS
1000 - HGC-11 Tie-in complete. CB+I backfilling
1030 - Liquids Bucket on site
1050 - CB+I switching to liquids bucket. Construction crew excavation for J-trap tie-in.
1200 - Drilling refused. Neither bucket is pulling up anymore waste
1245 - Point 9 Borehole backfilled with tire chips up to 10ft BGS, then textile, then soil up to surface. Drilling activities complete due to hours worked. J-trap tie-in con't.
1525 - Welding J-trap tie-in
1615 - J-trap tie-in complete. CB+I backfilling
~~1700~~ - CB+I + Golder offsite
1715

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-81734.41
PROJECT TITLE: Cell 9 Header Exp. & Sump Drilling
OWNER: Progressive Waste
LOCATION: JED LF Hilliard, FL
CONTRACTOR: CB&I

DATE 12/22/14
S (M) T W T F S

THE FOLLOWING WAS NOTED: 0700 - Golder and CB&I onsite, tailgate safety Review.
0730- CB&I pulling 6" HDPE and an 12"x 6" TEE from the LF boneyard for use on the new well tie-in in Cell 5.
0835- CB&I welding 6" HDPE to proper length for lateral.
1000 - CB&I excavating at location of of new lateral tie-in to existing crossover header, west of GW-90.
1045- CB&I cutting 12" crossover header.
1200 - CB&I has 12" TEE in place and is welding (electrofusion) the TEE into crossover header.
While electrofusing, CB&I excavating trench for lateral.
1300 - CB&I welding lateral pipe onto TEE.
1330 - CB&I backfilling lateral trench and tie-in excavation.
1440 - CB&I installing wellhead on new Cell 5 well.
1530 - Golder and CB&I off site.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.41
PROJECT TITLE: Cell 6 Leachate Seeps
OWNER: Progressive Waste
LOCATION: J.E.D. LF Hilspaw, FL
CONTRACTOR: CB+I

DATE 01/13/15 S M T W T F S

THE FOLLOWING WAS NOTED: 0700 - Golder on site. CB+I arrived earlier and started setting up the drill rig.
0730 - Golder + CB+I observing proposed borehole locations in Cell 6.
0750 - Golder truck stuck in perimeter road. Washout from side slope is covering the road.
0905 - Drill rig mobilizing to "Survey Point 2". CB+I mobilizing excavator to pull Golder truck out of the mud.
0845 - Drill rig staging at borehole location. Golder truck out of mud.
0900 - Begin drilling @ Survey Pt. 2.
0940 - Drilling @ ~23-ft
1000 - CB+I pickup truck is stuck on perimeter road near Cell 5. Excavator leaving liquids bucket at drill area and now tracking down to assist CB+I pickup
1015 - Drilling @ 40-ft. Waste Wet @ 35-ft.
1050 - Drilling @ 53-ft.
1145 - Drilling @ 62-ft. Offroad dump truck stuck on side slope. Excavator working to free offroad truck. Excavator also struggling with traction
1350 - Survey Pt 2 drilling complete @ 78 ft BGS. Offroad truck stuck again.
1436 - Rain moving in. CB+I backfilling borehole. Tire chips up to 10ft BGS the textile liner soil up to surface. Drill rig tracking down to laydown area
1700 - Backfilling complete. CB+I will return tomorrow to demob equipment Golder leaving site.
2114 - Golder arrive in Jacksonville. End of day.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

APPENDIX I

CERTIFICATION OF CONSTRUCTION COMPLETION OF A SOLID WASTE FACILITY

Florida Department of Environmental Protection
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, FL 32399-2400

DEP Form # 62-701.900(2)
Form Title Certification of Construction Completion
Effective Date May 19, 1994

DEP Application No. _____
(Filled by DEP)

Certification of Construction Completion of a Solid Waste Management Facility

DEP Construction Permit No: SC49-0199726-017 County: Osceola

Name of Project: 2014 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 $ 375,000 Actual $ 400,000

Site Design: Quantity: 7,500 ton/day Site Acreage: Ph I: 54, Ph II: 35, Ph 3: 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

Signature of Professional Engineer

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

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

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

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