REPORT

CONSTRUCTION RECORD DOCUMENTATION REPORT 2012-2013 CELLS 5, 6, 7, AND 8 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.
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Jacksonville, FL 32256 USA

Florida Board of Professional Engineers
Certificate of Authorization Number 1670

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1 Copy	Golder Associates Inc.

July 2013 **083-82734.25**

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July 9, 2013 083.82734.25

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
2012-2013 CELLS 5, 6, 7 AND 8 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 2012-2013 Cells 5, 6, 7, and 8 gas collection and control system (GCCS) expansion at the J.E.D. Solid Waste Management Facility located in Osceola County, Florida.

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

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

Sincerely,

GOLDER ASSOCIATES INC.

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

Kevin S. Brown, PE
Florida Professional Engineer No.57819
Certificate of Authorization No. 1670
7/3/13
Date

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

Enclosure: Construction Record Documentation Report

DEG/KSB/ams

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1.0 INTRODUCTION

The J.E.D. Solid Waste Management Facility (JED Facility) is 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 2012-2013 Cells 5, 6, 7, and 8 GCCS expansion at the JED Facility. Previous GCCS installation at the facility (Phase I, II) included approximately 75 vertical gas extraction wells, one skid mounted flare system, and header and lateral piping in the Cells 1-6 disposal areas.

The main components of the 2012-2013 Cells 5, 6, 7, and 8 GCCS expansion monitored by Golder were:

- Installation of 11 gas extraction wells (9 new wells and 2 replacement wells);
- Installation of 7 horizontal collectors, totaling approximately 4,800 feet in length
- Installation of approximately 2,780 feet of header and lateral gas conveyance pipe in Cells 5, 6, 7 and 8; and
- Improvements to the existing GCCS in Cells 5, 6, 7, and 8.

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 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8 were performed in accordance with the Phase III Construction Drawings prepared by Golder and Technical Specifications

prepared by Geosyntec which were submitted to the FDEP. A copy of the drawings and specifications are provided in Appendices A and B, respectively.

Gas wells were installed in the area of the landfill with intermediate cover or within the active filling area as well as the capped section of the landfill. Horizontal collectors were installed in Cells 5, 6, 7, and 8. 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. Four horizontal collectors were installed from September 6, 2012 to September 8, 2012. Four additional horizontal collectors were installed in 2013; two were installed from March 19, 2013 to March 25, 2013 and two were installed from April 22, 2013 to May 1, 2013. Construction activities for the remaining 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8 commenced on December 4, 2012 and were completed on December 21, 2012. Construction activities for improvements to the existing GCCS in Cells 5, 6, 7, and 8 commenced on January 2, 2013 and were completed on January 9, 2013.

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, tie-ins of the header and laterals to the existing GCCS, and improvements to the existing GCCS system in Cells 5, 6, 7, and 8. 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 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8, 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

Extraction wells GW-46R1 and GW-56R1 were redrilled in close proximity to their existing locations as shown in the as-built survey provided in Appendix C. Both of these wells were in an area which has undergone closure construction. After installation of redrilled extraction wells, the compromised extraction wells were abandoned by cutting the well pipe approximately 4 feet of pipe below ground surface (BGS), capping the top of the pipe with a 6-inch PVC cap, lag bolting the cap to the well casing, and backfilling the excavation with clean soil. Repairs and booting to the liner around the wells were made by Comanco Environmental Corporation prior to the contractor backfilling. The as-built well schedule presented in Appendix D provides the northing and easting for the redrilled 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. 4 stone. No. 4 stone was used for the 2012 GCCS expansion as opposed to No. 57 stone as stated in the technical specifications, which was accepted by Omni. 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 auto shredder material, soil, sludges, and other non-MSW wastes. Also, there were two extraction wells, GW-87 and GW-46R1, where the borehole began to cave in on itself thus preventing drilling depth advancement.

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-31	148	80	68
GW-87	110	80	30
GW-93	28	28	0
GW-94	61	59	2
GW-97	33	33	0
GW-98	69	60	9
GW-101	34	34	0
GW-105	33	33	0
GW-28B	138	62	76
GW-46R1	35	35	0
GW-56R1	34	34	0

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 two low points and high point of the header were modified to accommodate the two U-traps at the low points on the header. 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. Installation of the horizontal collectors constructed in September 2012 started at the end cap, which was placed at a high point. The horizontal collector then slopes down at a 3 percent minimum slope below ground for approximately 100 feet to a low point where a sump was placed. After the sump, the horizontal collector slopes up at a 3 percent minimum slope below ground for 100 feet to another high point. This pattern continues for the entire length of each horizontal gas collector and promotes improved drainage of condensate. The horizontal collectors constructed in March 2013 were installed in a similar sloping manner with installation starting at the tie-in point and sloping down to the first low point. The horizontal collector installed in April 2013 was field fit to the slopes of the interim waste grades. Sumps were spaced at intervals different from the previous installed collectors to minimize the depth of excavation for safety purposes and prevent contact with the base layer, while continuing to promote the drainage of condensate.

3.0 CONSTRUCTION ACTIVITIES

3.1 Project Participants

The parties involved in the 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8 included:

- Omni, as the owner;
- Golder, as the design engineer;
- Golder, as the CQA engineer
- Shaw Environmental, Inc./CB&I (Shaw), as the construction contractor and;
- Peavey & Associates, as the surveyor.

3.2 Gas Extraction Well Installation

Shaw performed the drilling and installation of 11 gas extraction wells during the 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8. The installation of the gas wells commenced on December 5, 2012 and was completed on December 13, 2012. The drill rig utilized was an IMT AF 100 with a 3-foot-diameter bucket auger. Shaw 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 3 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.

Some of the extraction wells had well casings installed approximately 7 feet to 17 feet above ground surface in anticipation of future final closure cover elevations; these wells received a larger amount of clean cover soil, which made mounds suitable for easy access to the wellhead for monitoring and wellhead tuning. 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

Shaw performed the installation of the lateral gas conveyance piping associated with the 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8. Pipe installation commenced on December 8, 2012 and was completed on December 21, 2012. Two excavators (Deere 200C LC and Deere 120D) 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 5 percent slope below ground. The lateral gas conveyance piping connects the extraction wells to the main header system that directs gas to the existing flare system. Header gas conveyance piping was 12-inch, 14 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.

3.4 Horizontal Gas Collectors Installation

Shaw/CB&I performed the installation of seven horizontal gas collectors, HGC-1, HGC-3, HGC-5, HGC-6, HGC-7, HGC-8, and HGC-9 during the 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8. The installation of the horizontal gas collectors commenced during September 2012, March 2013, and was completed on April 29, 2013. Two excavators (Deere 200C LC and Deere 120D) were utilized for trench excavation for the horizontal gas collector pipe installation. Horizontal gas collector piping was 10-inch HDPE SDR 11. The solid pipe portion of the horizontal gas collectors were installed at a minimum 3 percent slope below ground, and the perforated pipe portion of the horizontal gas collectors were installed at a minimum 4 percent slope below ground. The horizontal gas collector piping was connected to the side-slope risers. HGCs 1, 5, 6, and 8 were connected to the main header system in January 2013. HGCs 3, 7, and 9 were connected to the main header system in May of 2013. Note that HGC-9 was installed as two legs converging to a single wellhead. The westernmost leg was labeled HGC-9X while

the easternmost leg was labeled HGC-9Y to differentiate the points while surveying. 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.

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 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8 was performed in general accordance with the technical specifications prepared by Geosyntec and provided in Appendix B. Materials utilized in the 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8 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 lateral pipes during the 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8. 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. All header/lateral 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 Existing GCCS Improvements

Golder monitored the installation of several improvements to the existing GCCS system in Cells 5, 6, 7, and 8. Photographic documentation of existing system improvements is located in Appendix F. Improvements to the existing GCCS are summarized below:

- Abandoned existing 6" lateral and wellhead running to existing 2" PVC well located in Cell 5. Ran a new 8" lateral from the existing header and tied in existing 2" PVC well and two new 2" PVC wells with a 4" lateral. This was done to increase the flow capacity of the lateral;
- Uncovered and abandoned existing 6" drain lateral for U-trap located in Cell 6 and installed a new line 6" line that runs directly to the 24" side-slope sump riser. This was done to improve the performance of the U-trap; and,

- Tied in to both existing 24" primary sideslope sump risers in Cells 7 and 8 with new 4" lateral lines that run to a 6" riser and wellhead on the main header to control odors around the sumps and regulate landfill gas pressures in the sump piping system. These connections are consistent with Cells 1 through 6.

4.5 Horizontal Gas Collectors Installation

Golder monitored the installation of seven horizontal gas collectors during the 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8. 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 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8 at the JED Facility. These services included the quality assurance monitoring, documentation, and/or testing of the items listed below:

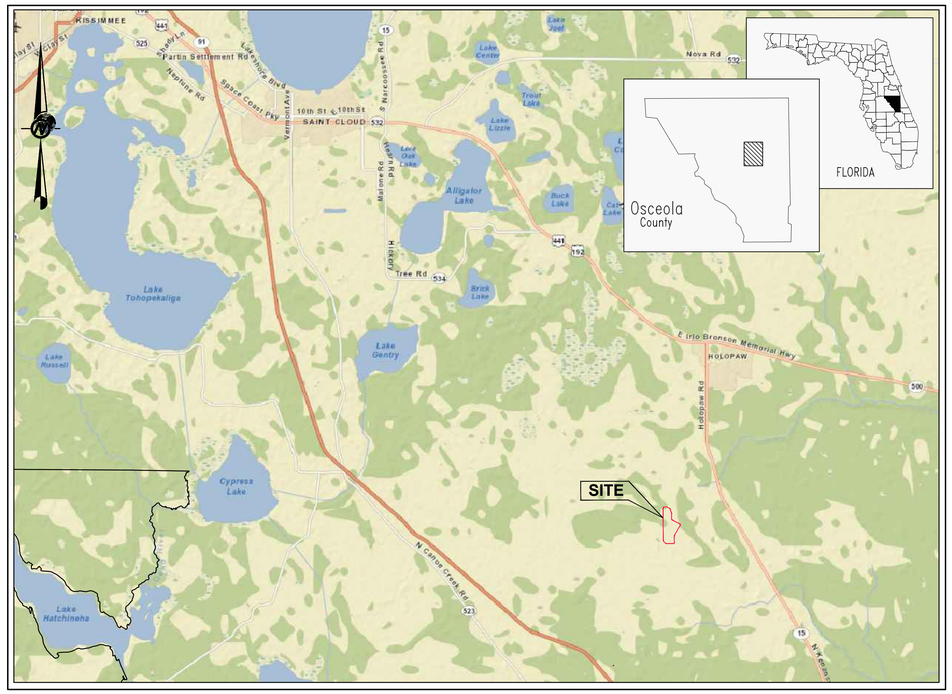
- Installation of 11 gas extraction wells (9 new wells and 2 replacement wells);
- Installation of approximately 2,780 feet of header and lateral gas conveyance pipe in Cells 5, 6, 7, and 8;
- Installation of 7 horizontal gas collectors; and
- Improvements to the existing GCCS in cells 5, 6, 7, and 8.

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 2012-2013 GCCS expansion in Cells 5, 6, 7, and 8 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.

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TEL: 407-891-3720 FAX: 407-891-3730

Prepared by:

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Jacksonville, Florida

September 2012

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COA No. 1670

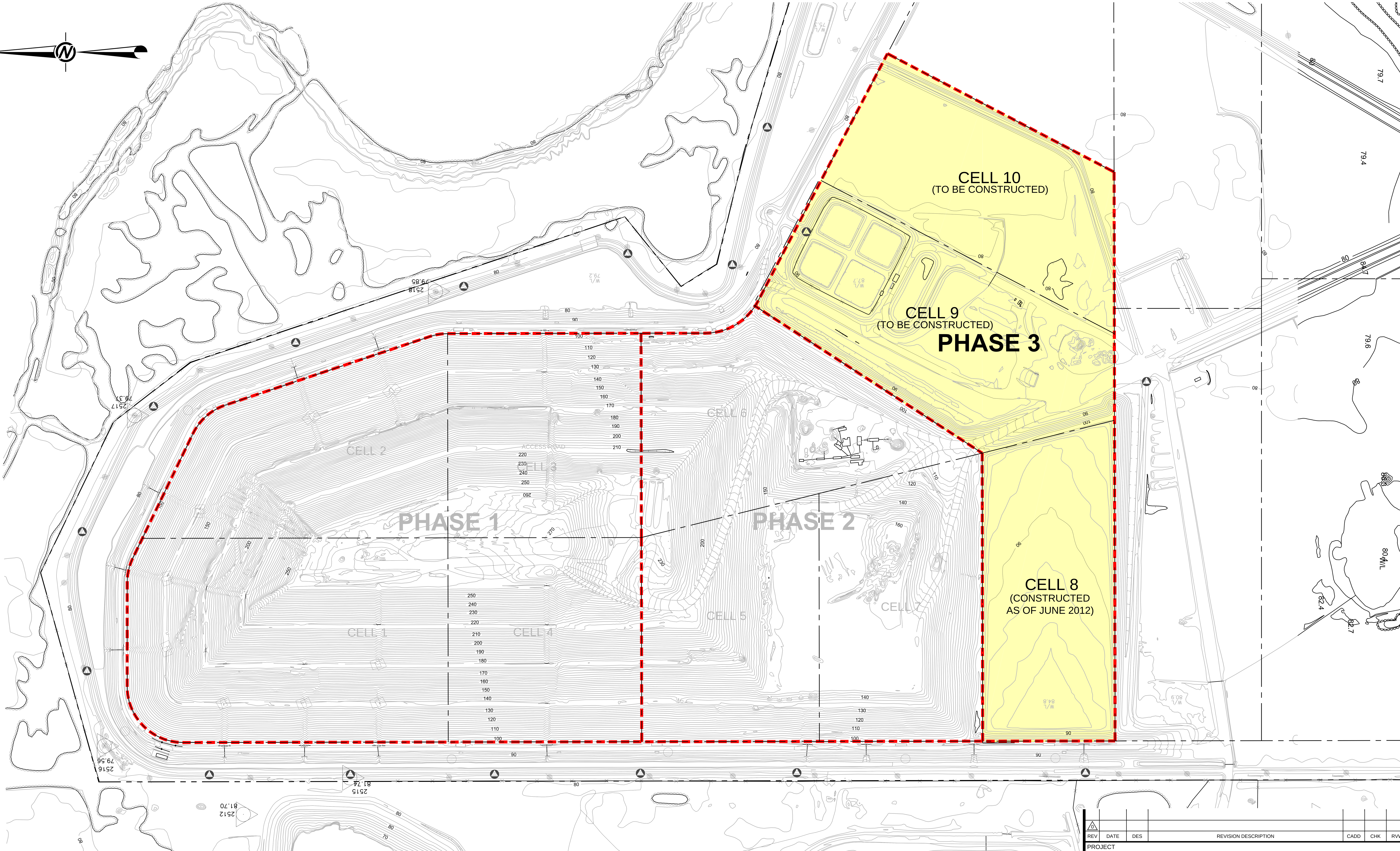
J.E.D. SOLID WASTE MANAGEMENT FACILITY
OSCEOLA COUNTY
FLORIDA

TITLE SHEET/LIST OF DRAWINGS

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

SHEET 1

PROJECT No.083-82734 FILE No.08382734G001 CADD BCL DATE 09/07/12



LEGEND

- PROPERTY BOUNDARY
- PHASE BOUNDARY
- PHASE 3 DISPOSAL AREA

NOTES

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

150 0 150 300
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
0						

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

TITLE
TOPOGRAPHIC MAP

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

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

PROJECT No.		083-82734.22	FILE No.	08382734G002
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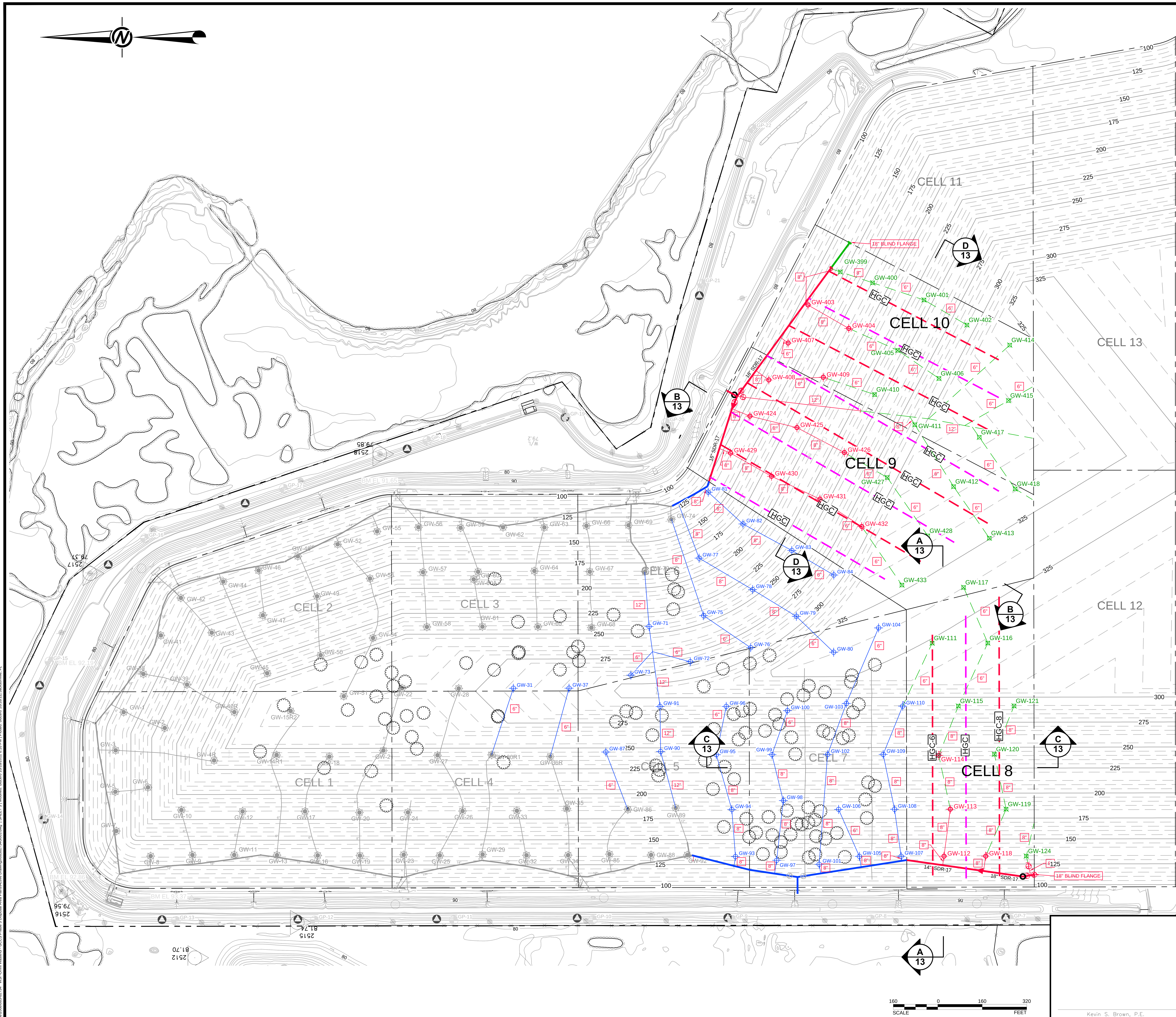
REVIEW	.	.		



LEGEND

- PROPERTY BOUNDARY
- EXISTING GROUND ELEVATION (FEET)
- EXISTING FENCE
- FINAL COVER ELEVATION (FEET)
- EXISTING VERTICAL GAS EXTRACTION WELL
- EXISTING HDPE HEADER PIPE
- EXISTING HDPE LATERAL PIPE
- APPROXIMATE LIMITS OF ASBESTOS (SEE NOTE 1)
- PROPOSED VERTICAL GAS EXTRACTION WELL
- PROPOSED HDPE HEADER PIPE
- PROPOSED HDPE LATERAL PIPE
- 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
- PREVIOUS PHASE PROPOSED VERTICAL GAS EXTRACTION WELL
- PREVIOUS PHASE PROPOSED HDPE LATERAL PIPE
- PREVIOUS PHASE PROPOSED HDPE HEADER PIPE

NOTES

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

GCCS NOTES

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

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
0						

PROJECT

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

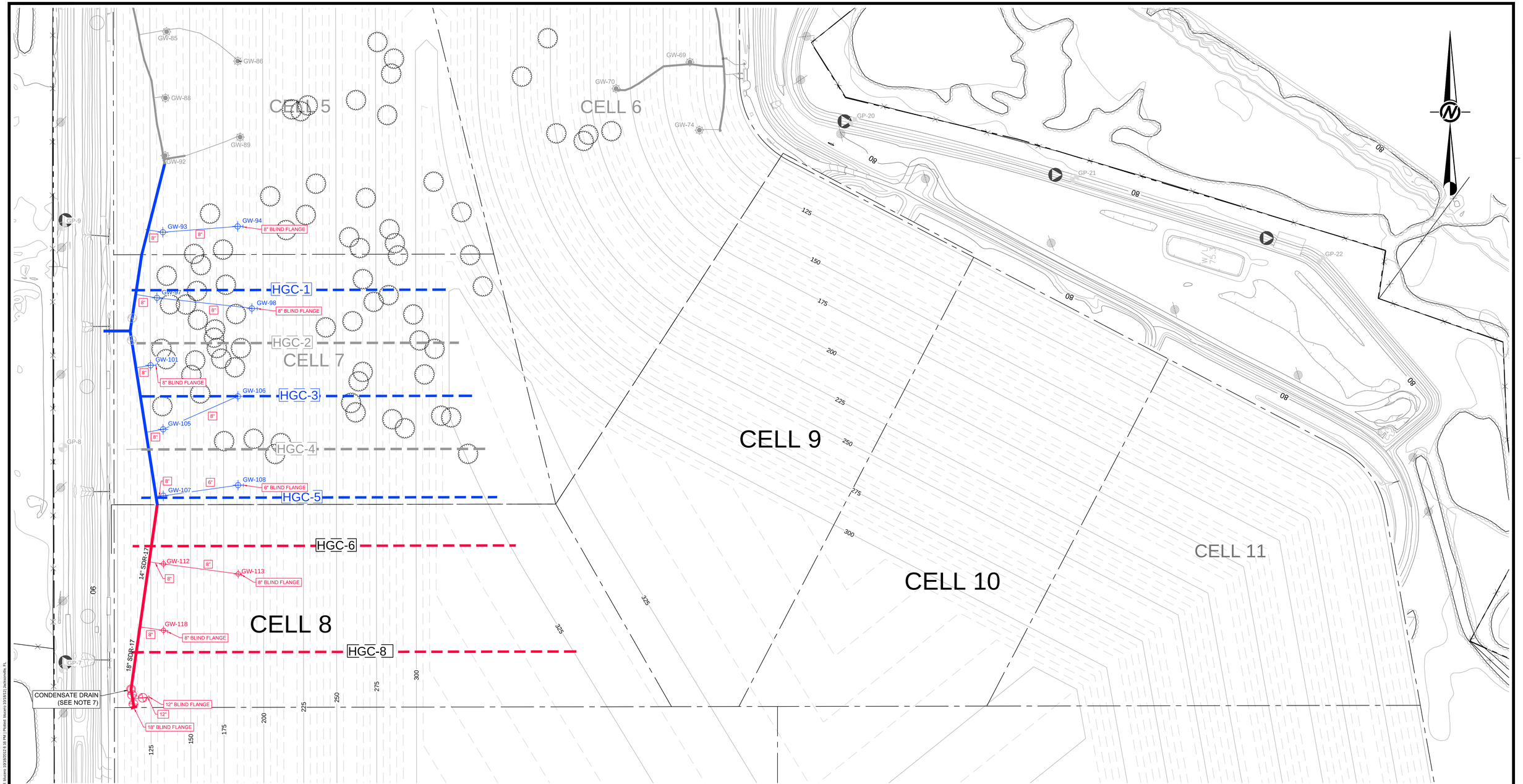
TITLE

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

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

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

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



LEGEND

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

GCCS NOTES

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

NOTES

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

100 0 100 200
SCALE FEET

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

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1						

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

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

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

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

SHEET 4

N:\PROJ\083\82734 - WSI Omni Waste\6 - GCCS Phase 3 Disposal Area Plans\Acad Drawings\82734G004.dwg | SHEET 4 | Modified: Autumn 19/18/2012 8:43 PM | Printed: Autumn 19/18/12 | Jacksonville, FL

LEGEND

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

GCCS NOTES

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

NOTES

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. 57819

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
0						

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

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

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

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

FILE No. 08382734G005
SCALE AS SHOWN

SHEET 5

LEGEND

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

GCCS NOTES

1. APPROXIMATE LIMITS OF ASBESTOS SHOWN WERE BASED ON GRID AND GPS TRACKING BY SITE OPERATIONS. THE LIMITS OF ASBESTOS WERE ASSUMED TO BE WITHIN 20-FT RADIUS OF THE COORDINATES PROVIDED BY OMNI. CONTRACTOR SHALL MARK THE INDICATED AREAS IN FIELD TO PREVENT INSTALLATION OF GAS EXTRACTION WELLS IN AREAS WHERE ASBESTOS WAS DISPOSED.
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3. GRADES INDICATED ON THIS SHEET WITHIN THE LANDFILL ARE TOP OF FINAL COVER SYSTEM GRADES.
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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.
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8. ALL PIPING WITHIN THE LIMITS OF WASTE TO BE INSTALLED WITH A MINIMUM OF 5% SLOPE.
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NOTES

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5. THE TOPOGRAPHIC INFORMATION PROVIDED DOES NOT NECESSARILY REPRESENT CURRENT CONDITIONS. THE CONTRACTOR SHALL UNDERSTAND CURRENT CONDITIONS BASED ON FIELD RECONNAISSANCE AND/OR ADDITIONAL TOPOGRAPHIC SURVEYS AT THEIR EXPENSE.

SCALE: 100 0 100 200 FEET

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

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

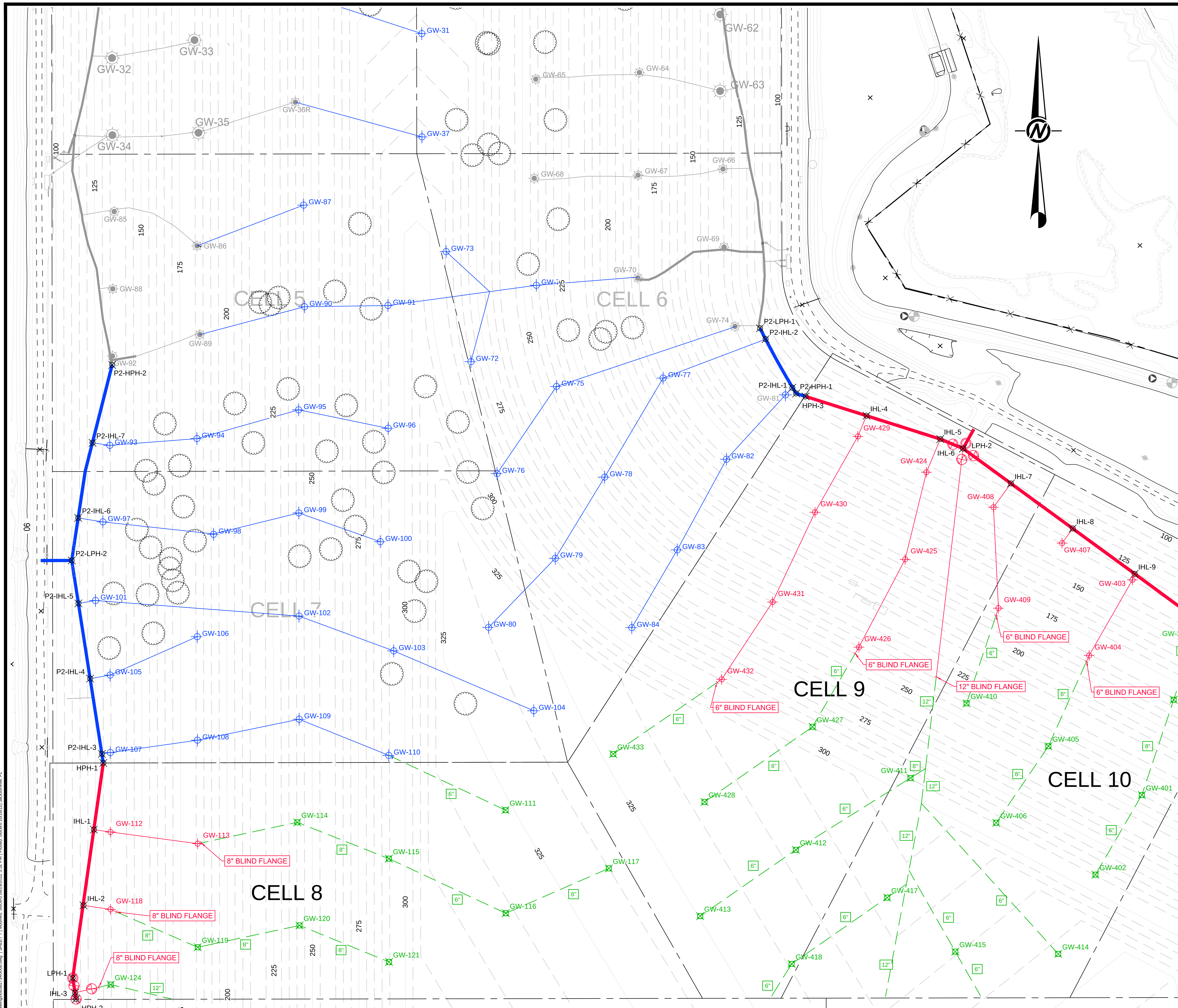
PROJECT
J.E.D. SOLID WASTE MANAGEMENT FACILITY
ST. CLOUD, OSCEOLA COUNTY, FLORIDA

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

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

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

SHEET 6



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

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

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

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

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

LEGEND

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

NOTES

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

SCALE 100 0 100 200 FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
0						

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

TITLE
GAS SYSTEM CONTROL POINTS

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

PROJECT No.	083-82734.22		FILE No. 08382734G008
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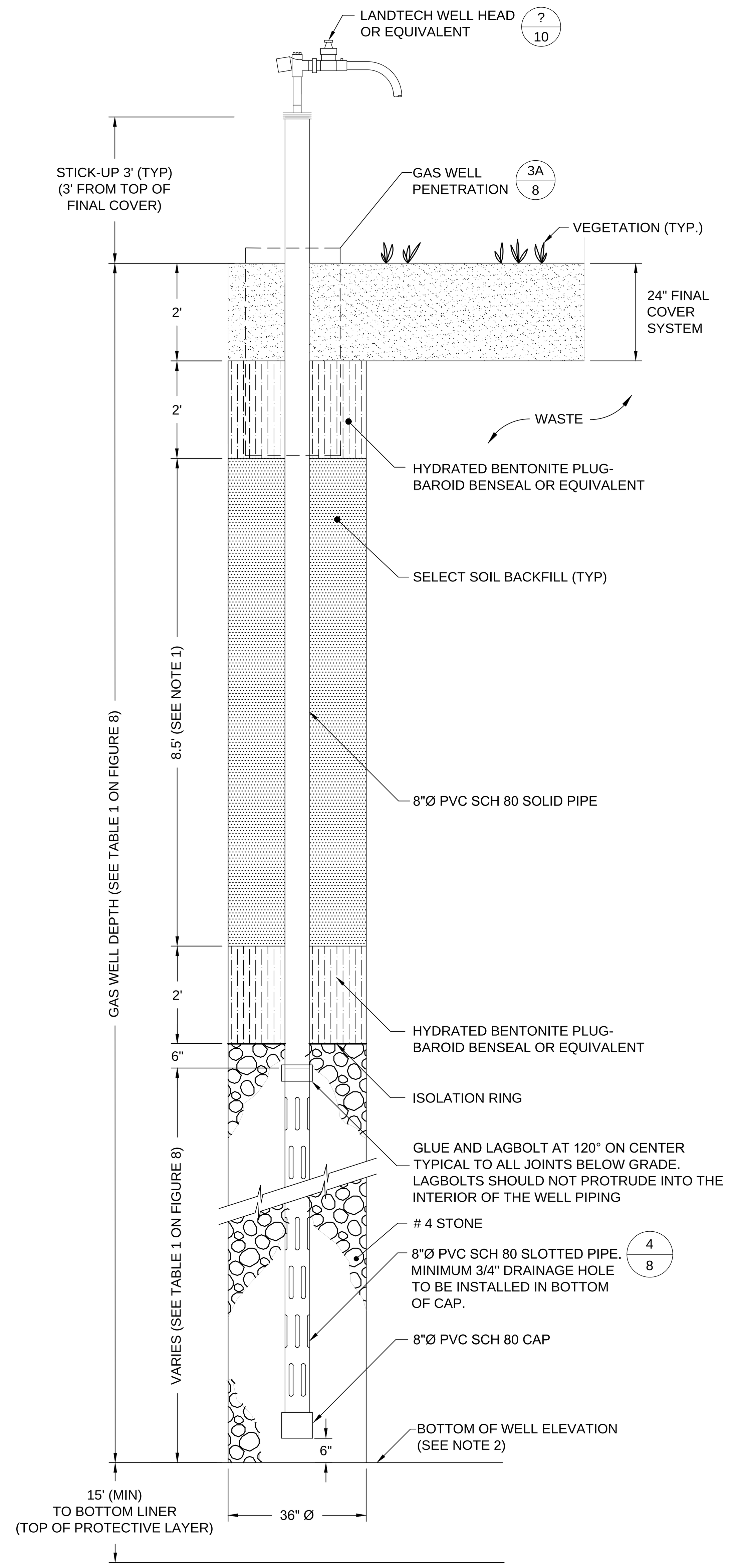
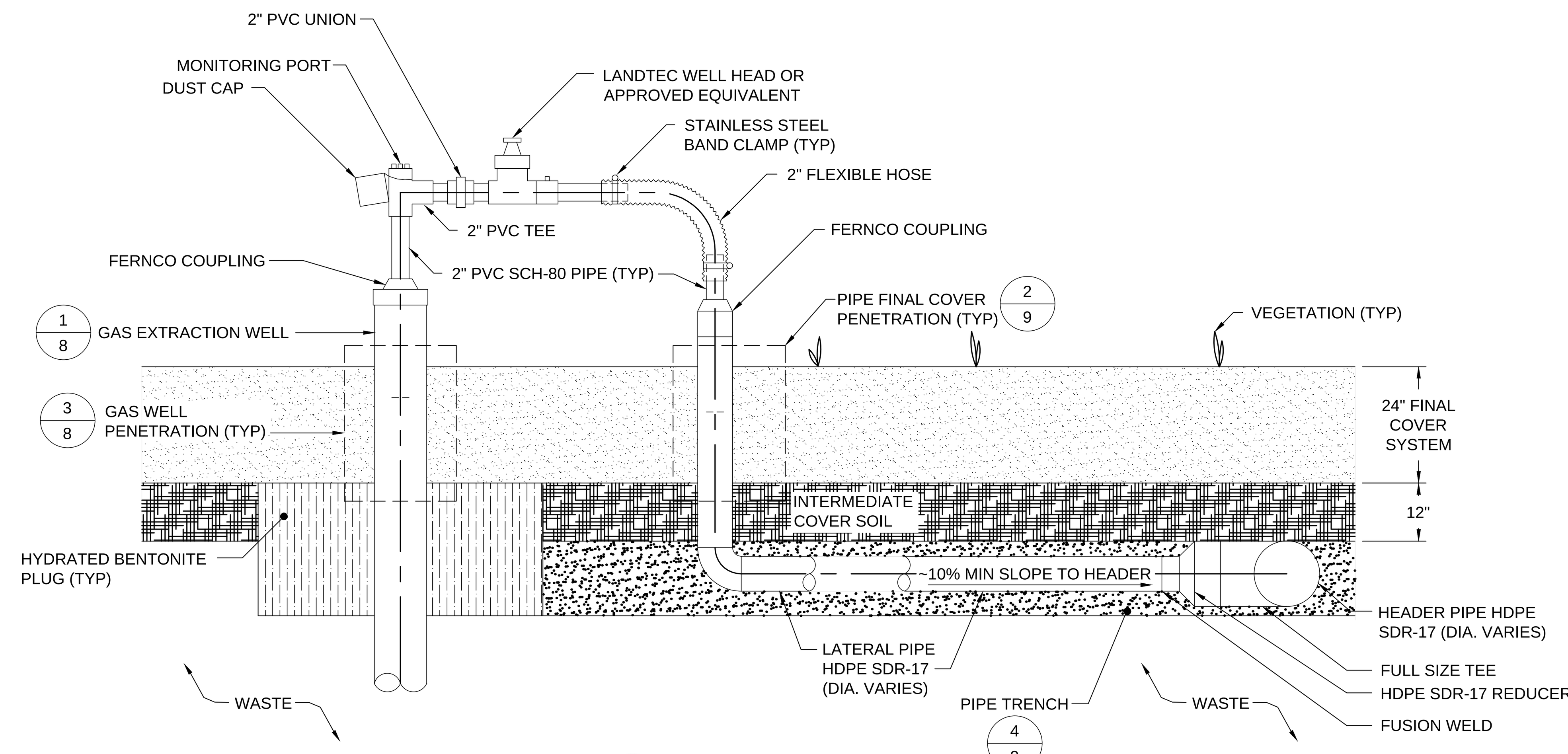
CADD	BCL	05/18/12	SHEET 7
CHECK	.	.	
REVIEW	.	.	



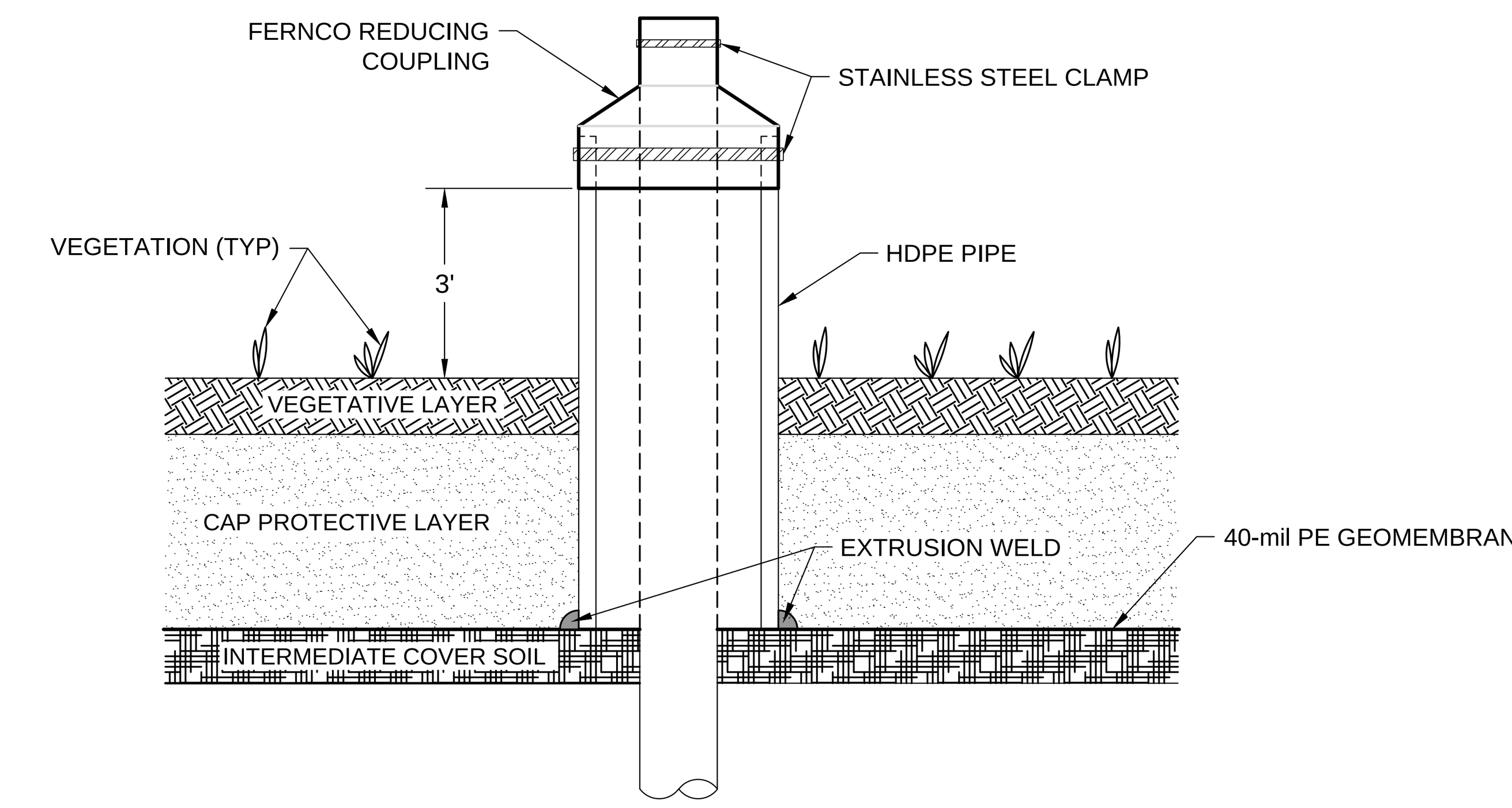
1 / 8 DETAIL
GAS EXTRACTION WELL
SCALE: N.T.S.
XREF: FL1452.03X021

NOTES:

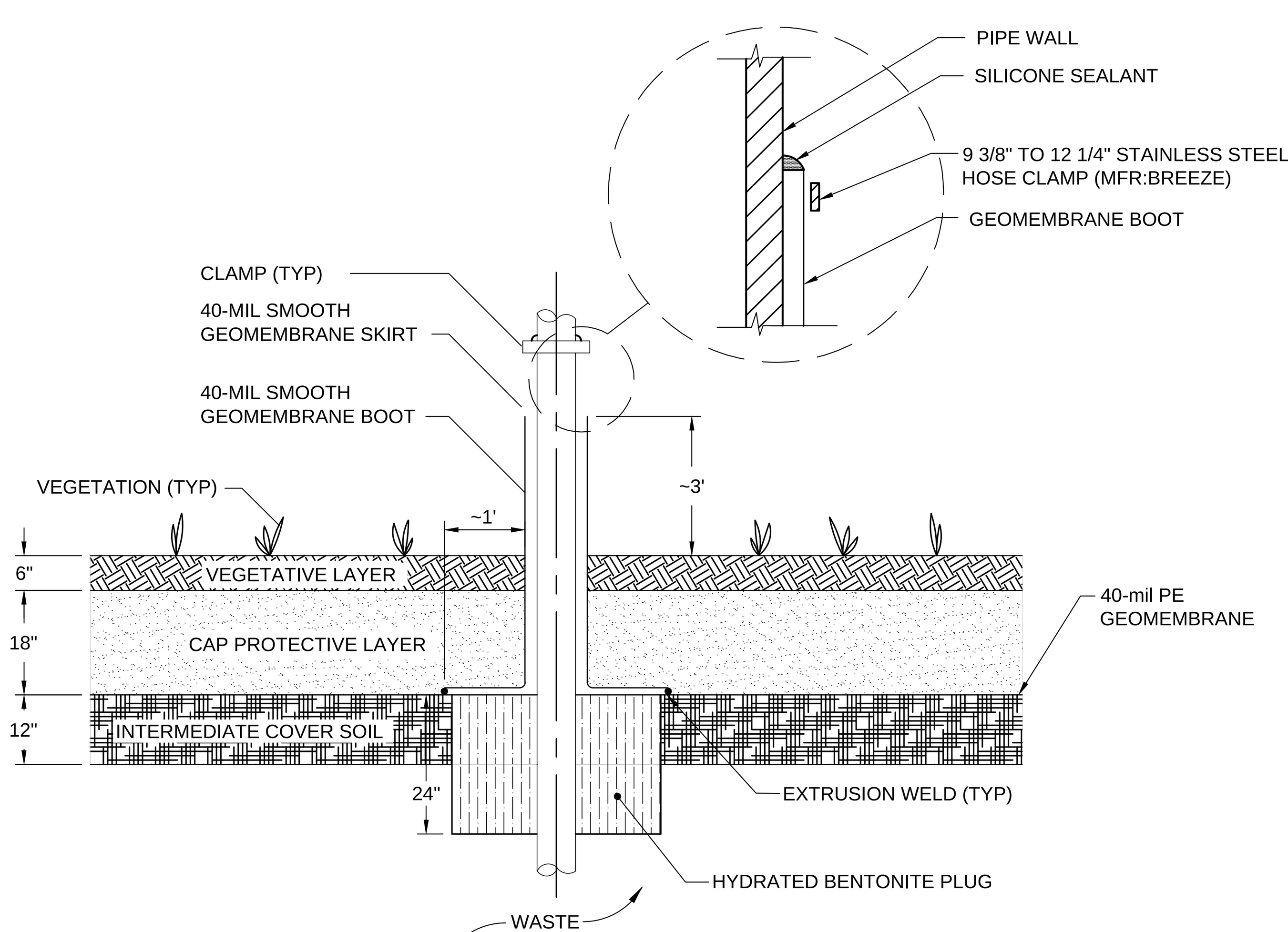
1. THE LENGTH OF SOLID PIPE EXTENDING BELOW THE FINAL COVER GEOMEMBRANE SHALL BE NO LESS THAN 13 FEET.
2. BOTTOM ELEVATION OF ALL GAS EXTRACTION WELLS SHALL BE MINIMUN 15' FROM THE BOTTOM LINER (TOP OF PROTECTIVE COVER LAYER).



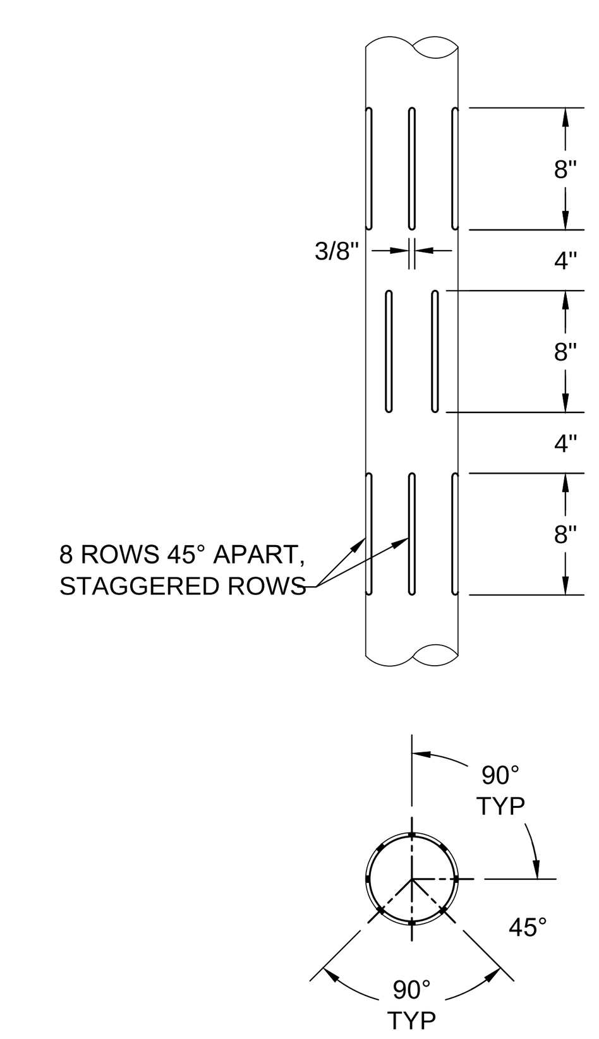
2 / 8 DETAIL
WELLHEAD TO LATERAL
SCALE: N.T.S.



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



3 / 8 DETAIL
GAS WELL FINAL COVER PENETRATION
SCALE: N.T.S.
XREF: FL18328.01X022



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

NOTES

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

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

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

TITLE
VERTICAL GAS EXTRACTION WELL DETAILS

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PROJECT No.		083-82734.22	FILE No. 08382734G009
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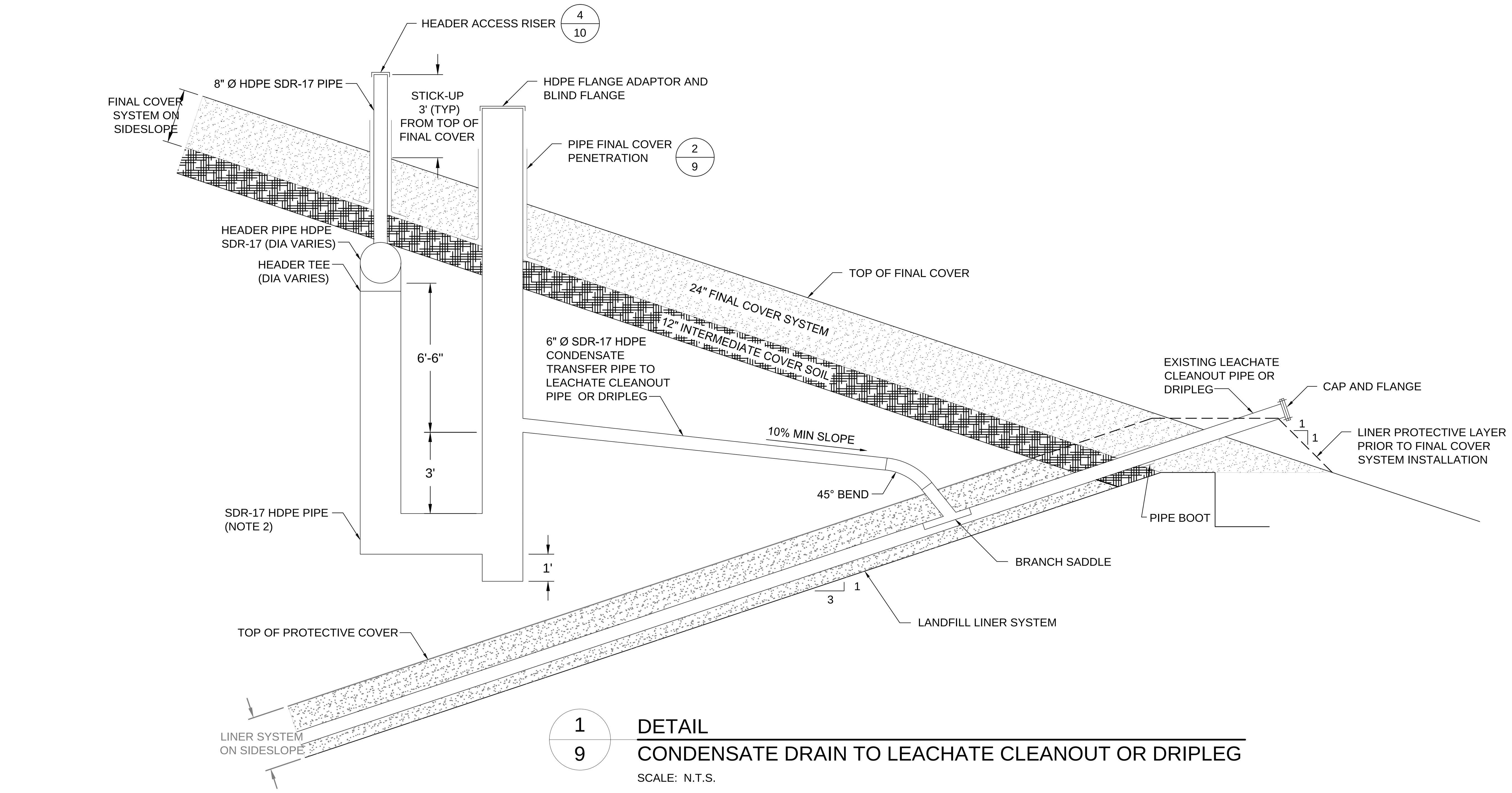
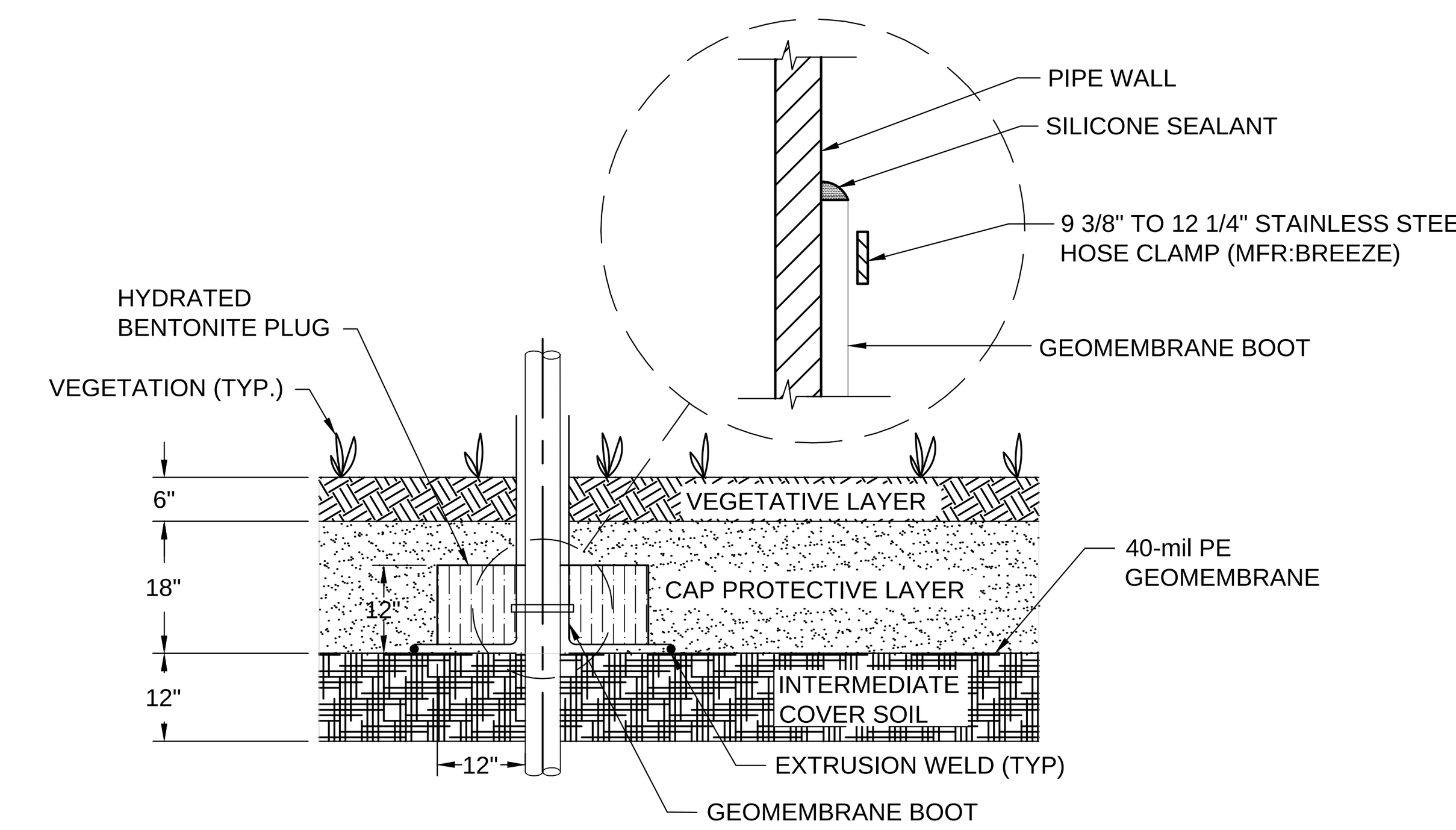
CADD	BCL	05/18/12	
CHECK	.	.	**SHEET 8**
REVIEW	.	.	

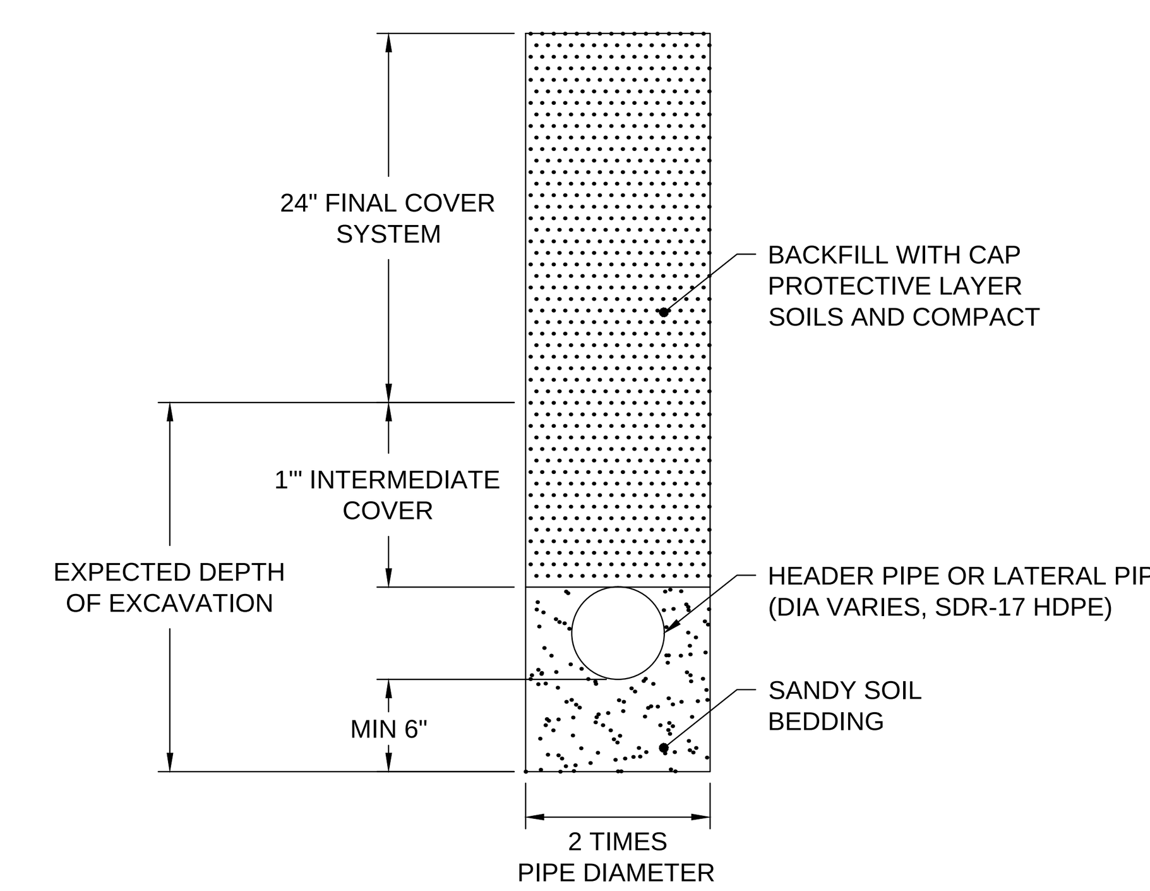


1/9 DETAIL
CONDENSATE DRAIN TO LEACHATE CLEANOUT OR DRIPLEG
SCALE: N.T.S.

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



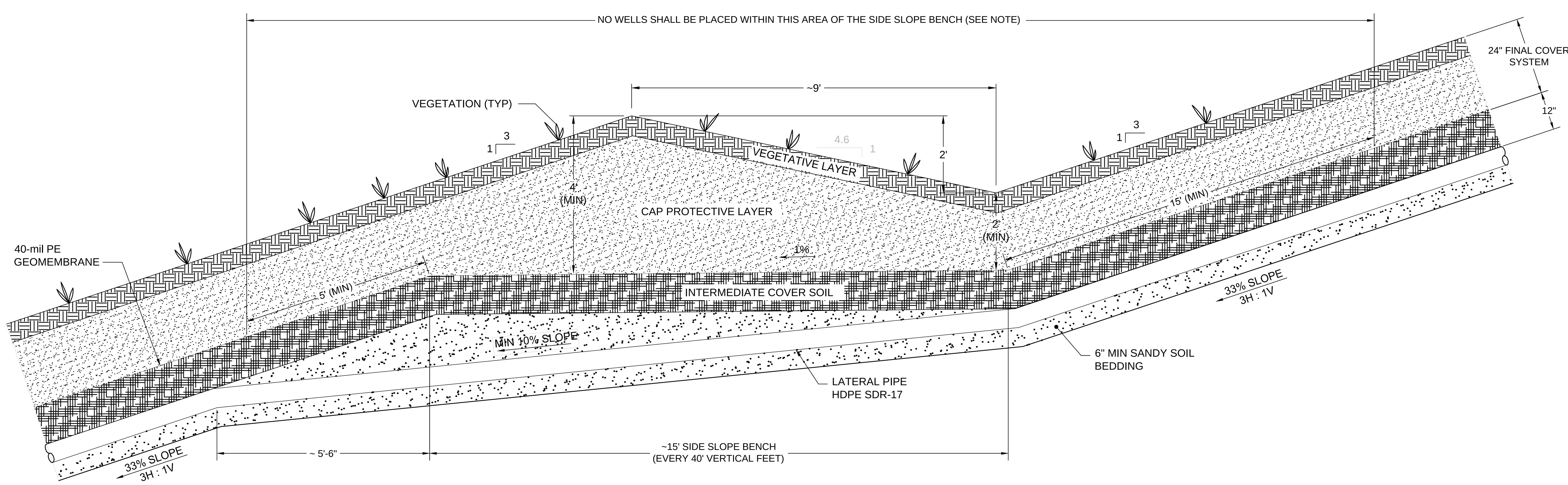
2/9 DETAIL
PIPE FINAL COVER PENETRATION
SCALE: N.T.S.



NOTE:

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.



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.

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
0						

PROJECT

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

TITLE

GCCS DETAILS (1 OF 2)

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COA No. 1670

PROJECT No.		083-82734.22	FILE No.	08382734G010
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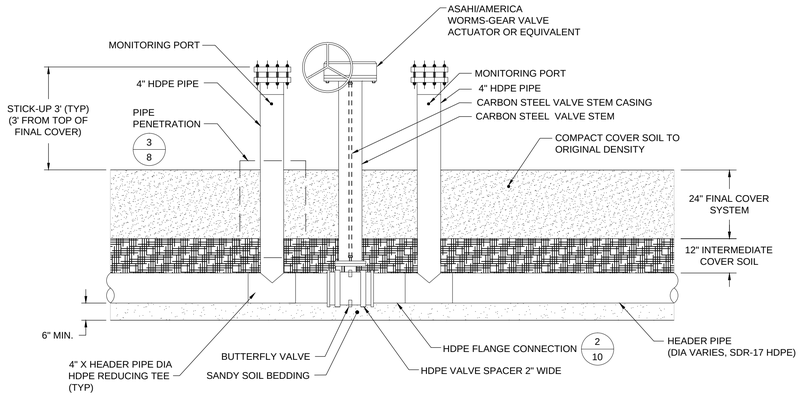
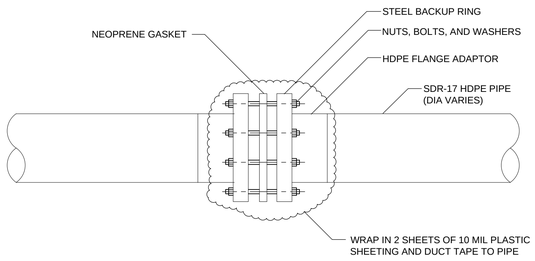
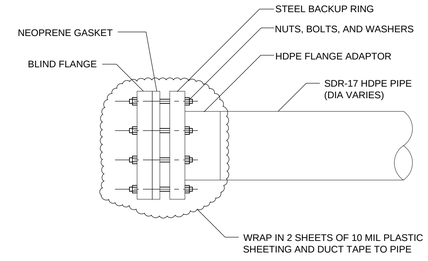
CADD	BCL	05/18/12	SHEET 9	
CHECK	.	.		
REVIEW	.	.		



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



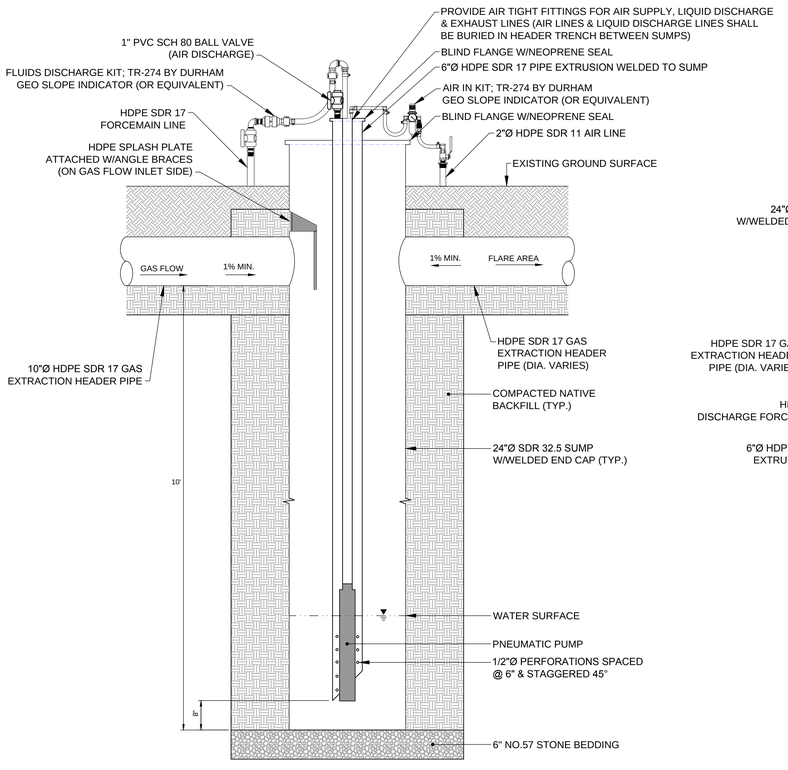
2/10 DETAIL
FLANGE CONNECTION (TYP.)
SCALE: N.T.S.



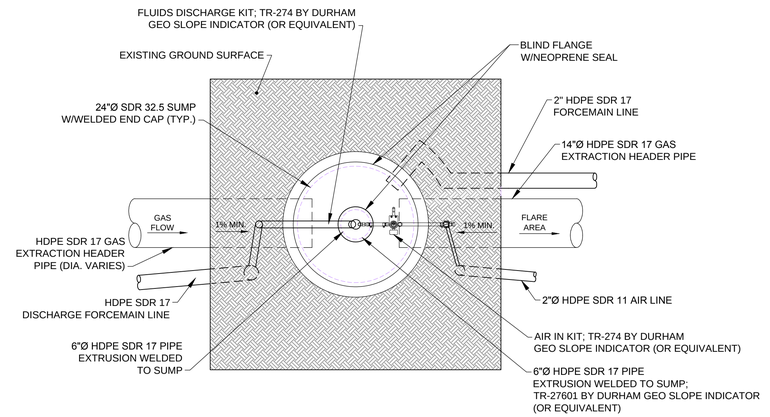
3/10 DETAIL
BLIND FLANGE (TYP)
SCALE: N.T.S.

4/10 DETAIL
HEADER ACCESS RISER
SCALE: NTS

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



SECTION



PLAN

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

NOTES

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

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1						

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

TITLE
GCCS DETAILS (2 OF 2)

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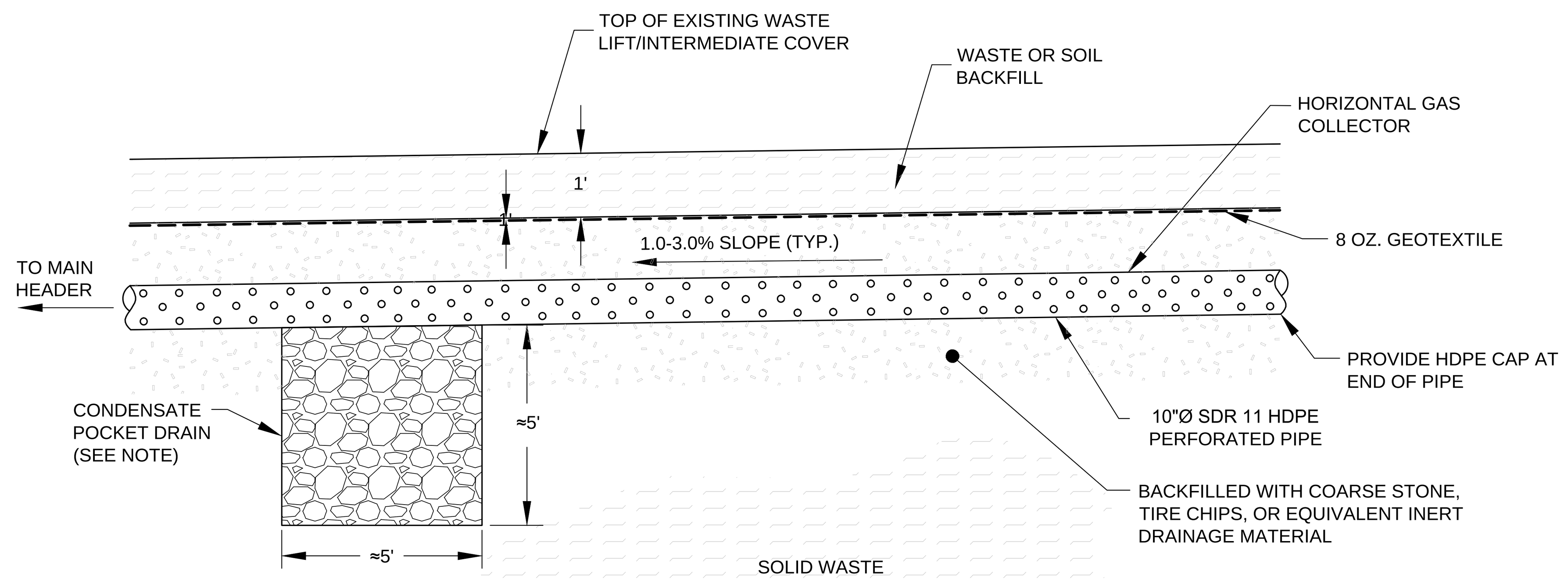
COA No. 1670

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

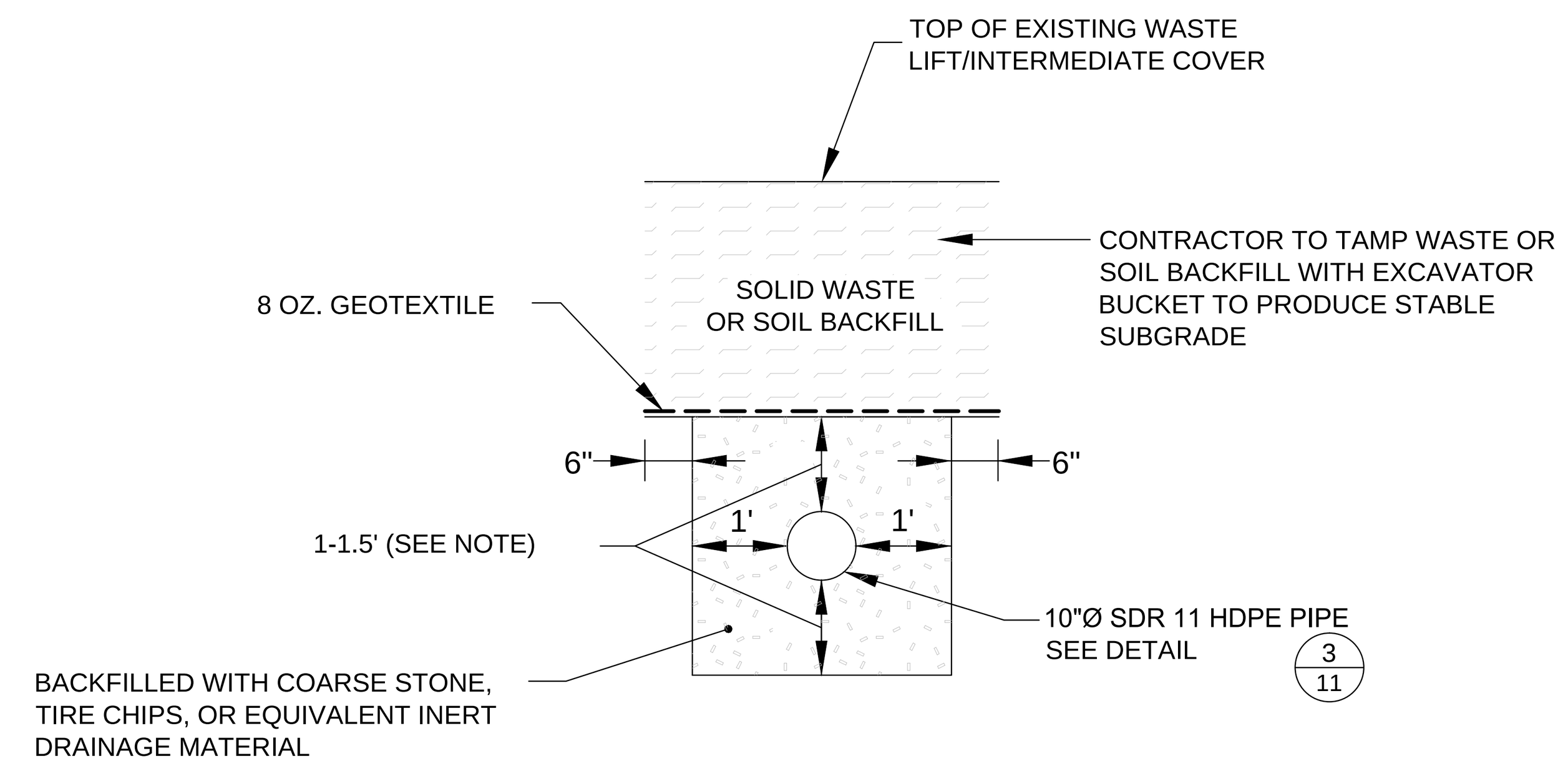


NOTES:
1. CONDENSATE POCKET DRAIN TO BE INSTALLED APPROXIMATELY EVERY 150 LINEAR FEET ALONG HORIZONTAL GAS COLLECTOR. DRAINS TO BE APPROXIMATELY 5'x5'x5' AND BACKFILLED WITH COARSE STONE, TIRE CHIPS, OR EQUIVALENT INERT DRAINAGE MATERIAL.

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

1/11 TYPICAL PROFILE OF HORIZONTAL GAS COLLECTOR

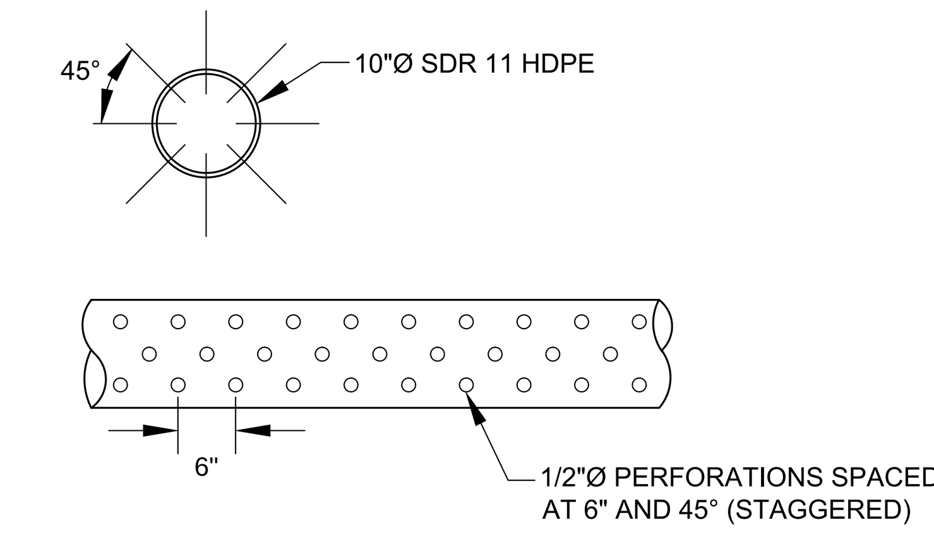
NTS



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

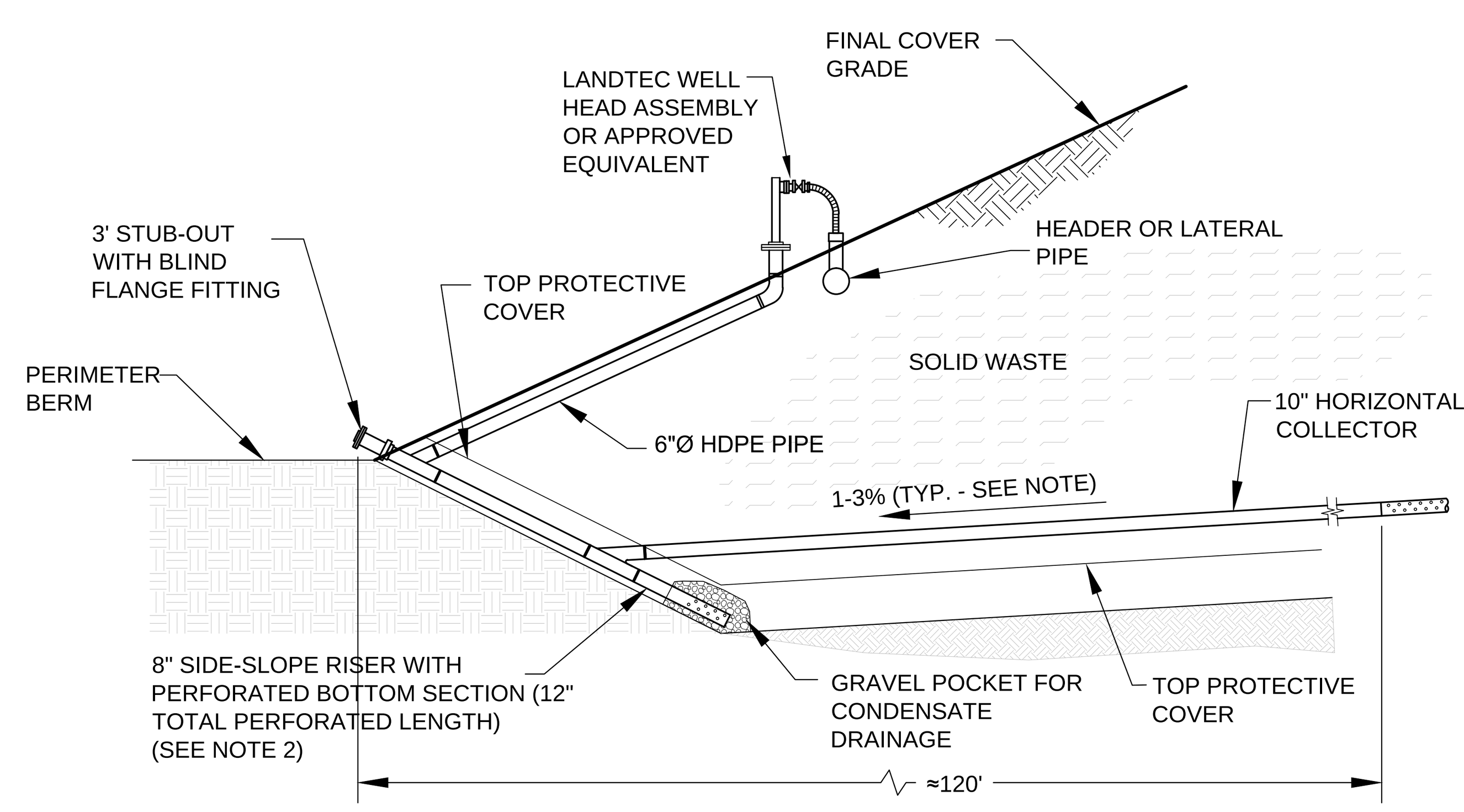
2/11 TYPICAL SECTION OF 10"Ø HDPE HORIZONTAL GAS COLLECTOR

NTS



3/11 HDPE PERFORATED PIPE DETAIL

NTS

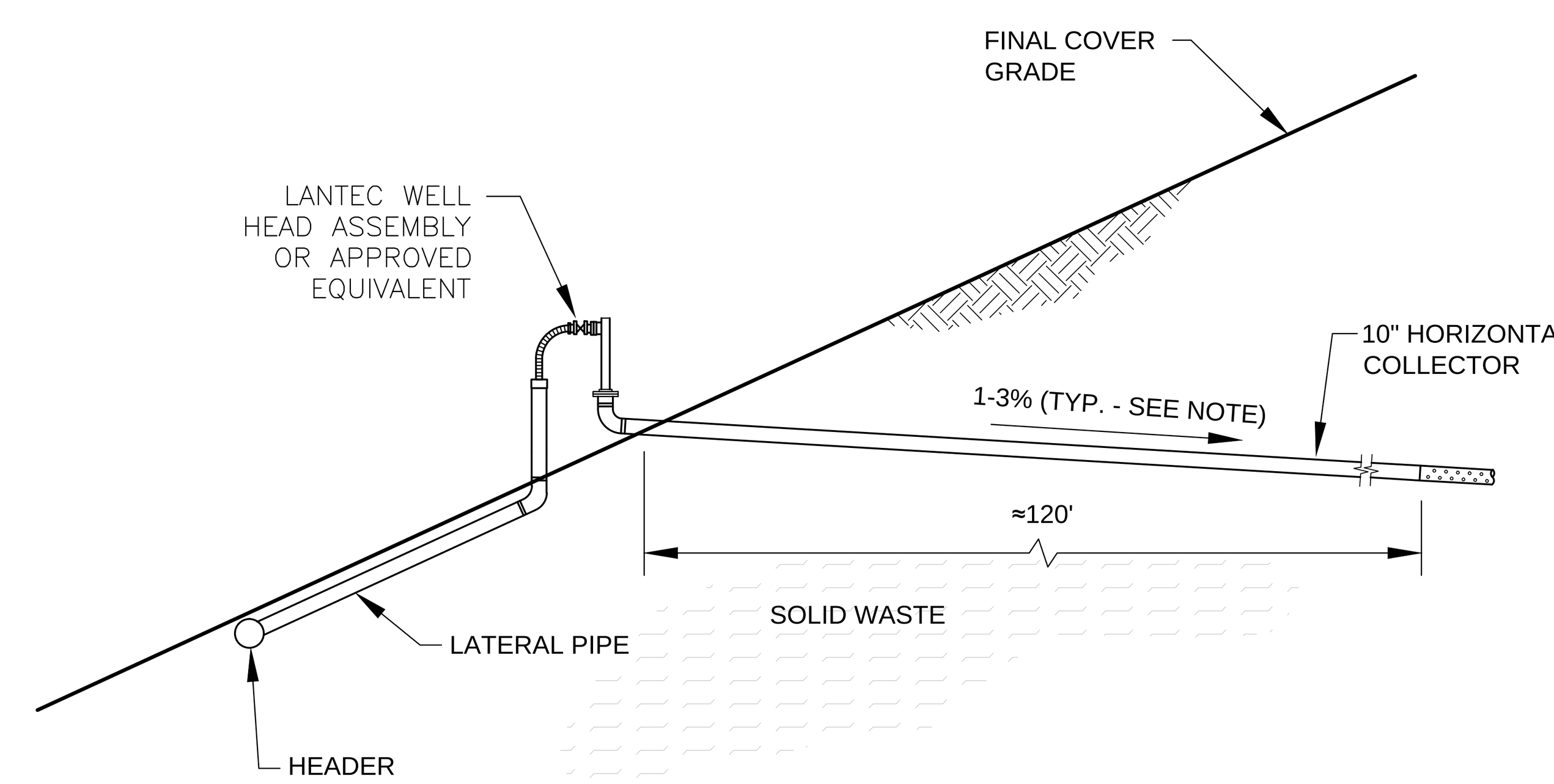


NOTES:
1. SLOPE DIRECTION AND GRADE OF HORIZONTAL GAS COLLECTOR WILL BE BASED ON SLOPE DIRECTION AND GRADE OF FILL OPERATIONS.

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

4/11 CONNECTION DETAIL HORIZONTAL GAS COLLECTOR 1ST LEVEL

NTS



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

5/11 CONNECTION DETAIL HORIZONTAL GAS COLLECTOR 2ND LEVEL

NTS

NOTES

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

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

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

TITLE
HORIZONTAL GAS COLLECTOR DETAILS

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

PROJECT No.		083-82734.22	FILE No. 08382734G011
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CADD	BCL	05/18/12	SHEET 11
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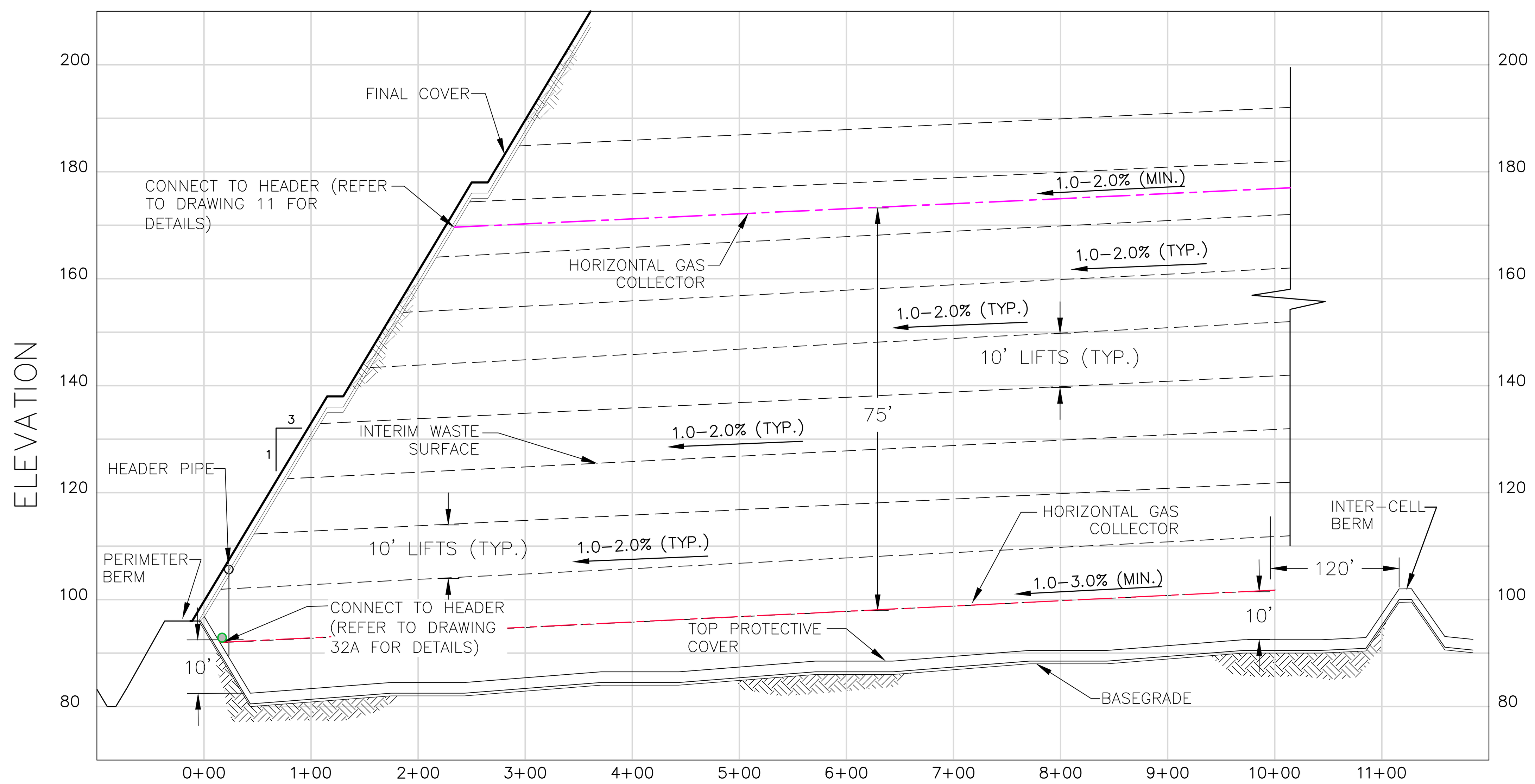
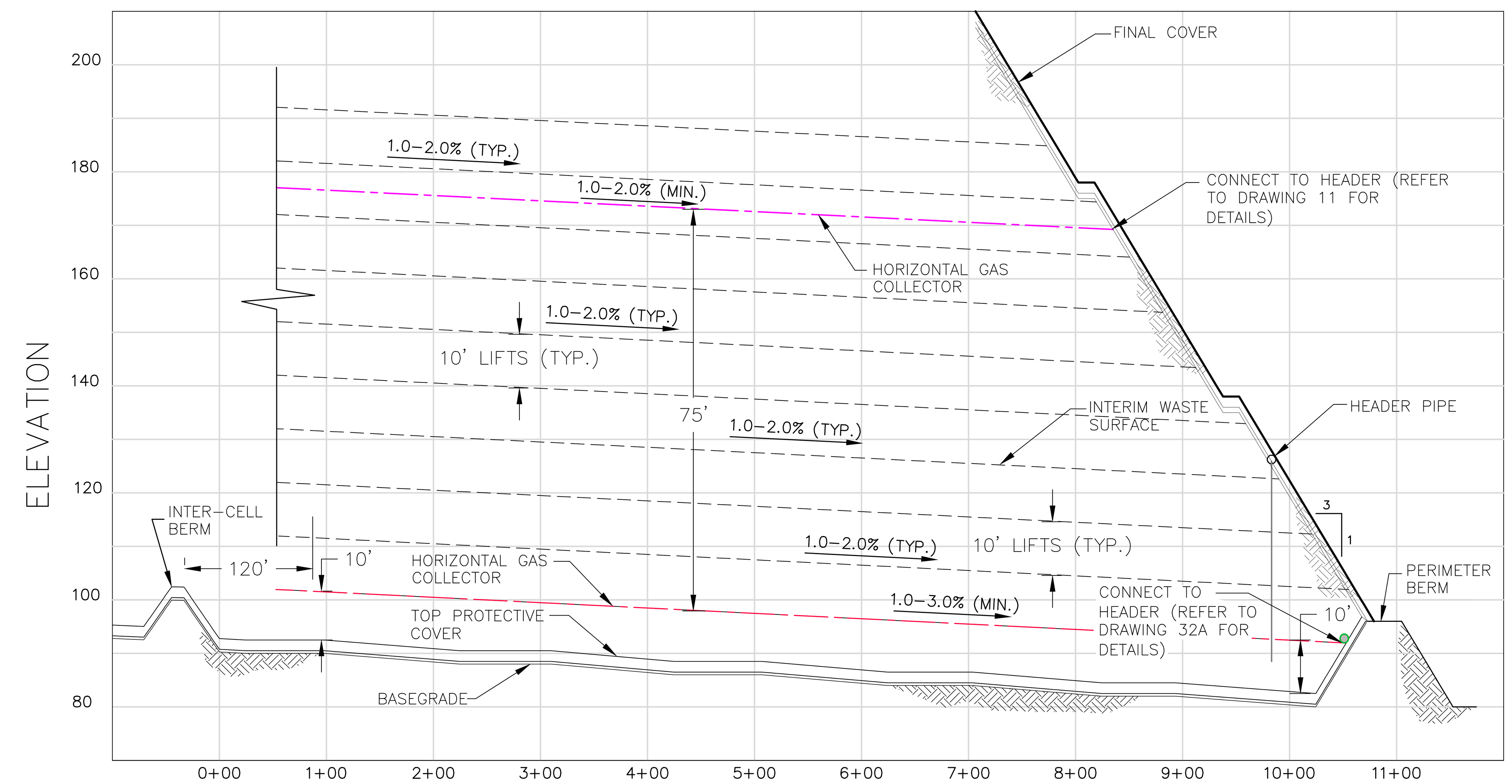
REVIEW	.	.	



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

A/12 CELLS 7 & 8 TYPICAL CROSS SECTION

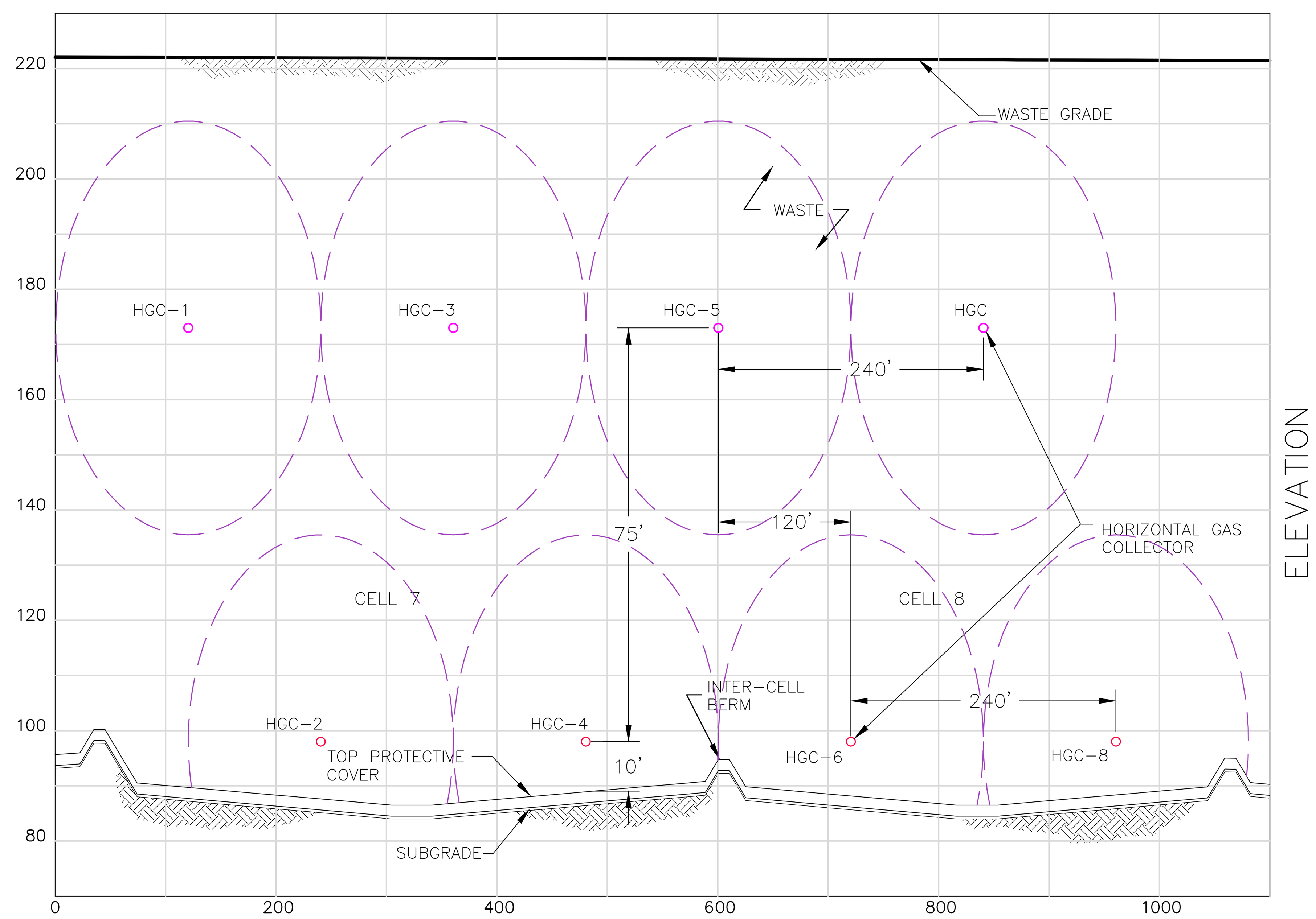
VERTICAL SCALE 20 0 20 FEET
HORIZONTAL SCALE 100 0 100 FEET



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

B/12 CELLS 9 & 10 TYPICAL CROSS SECTION

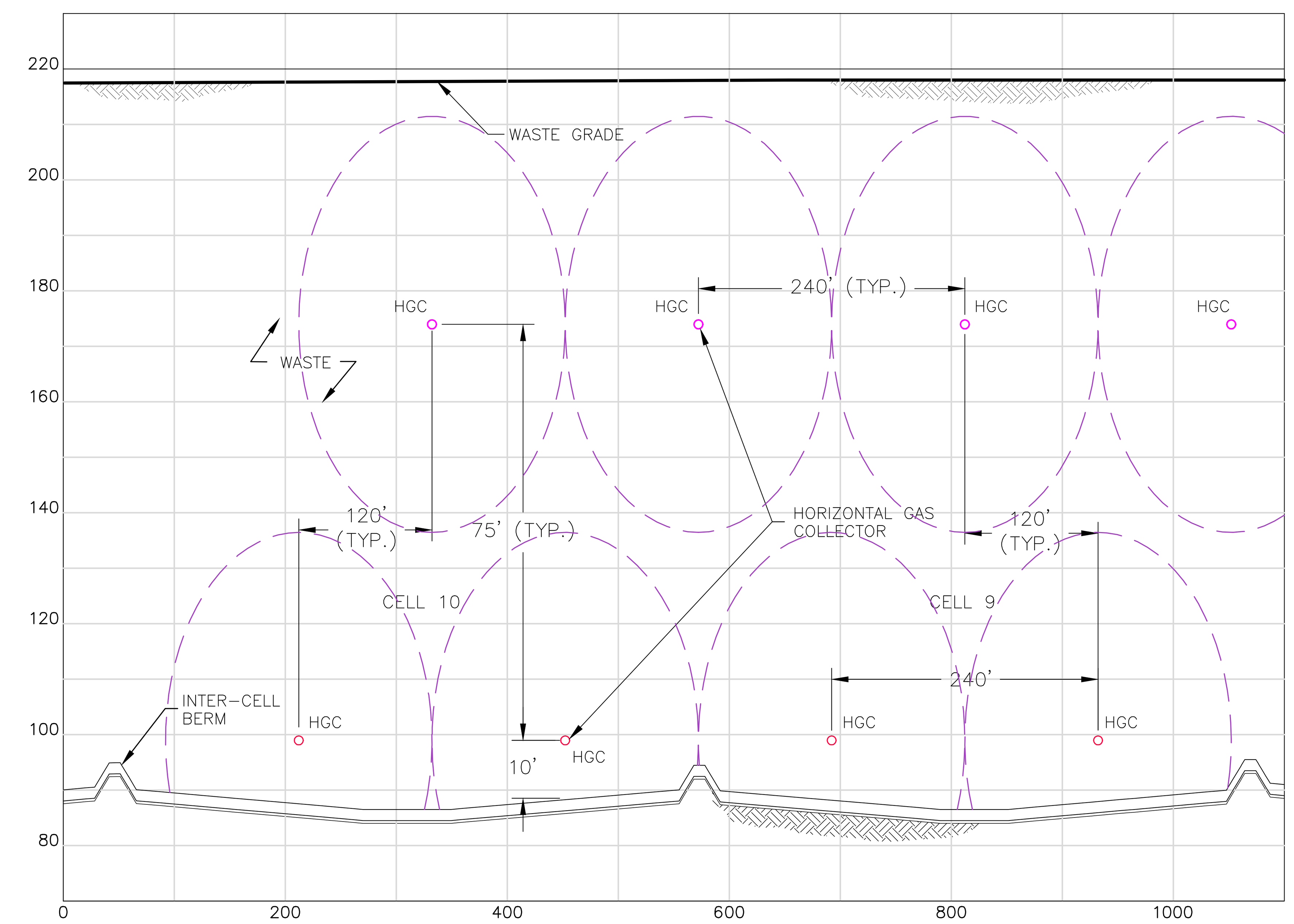
VERTICAL SCALE 20 0 20 FEET
HORIZONTAL SCALE 100 0 100 FEET



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

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COA No. 1670

PROJECT No.		083-82734.22	FILE No.	08382734G012
DESIGN	DEG	05/18/12	SCALE	AS SHOWN
CADD	BCL	05/18/12		
CHECK	-	-	SHEET 12	
REVIEW	-	-		

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

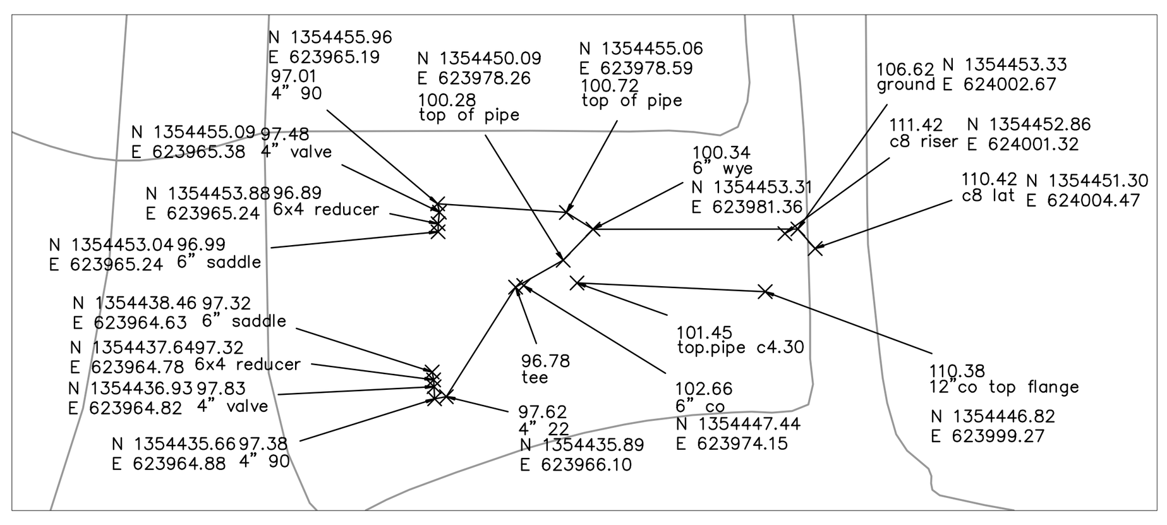
AS-BUILT SURVEY

SURVEYOR's NOTES:

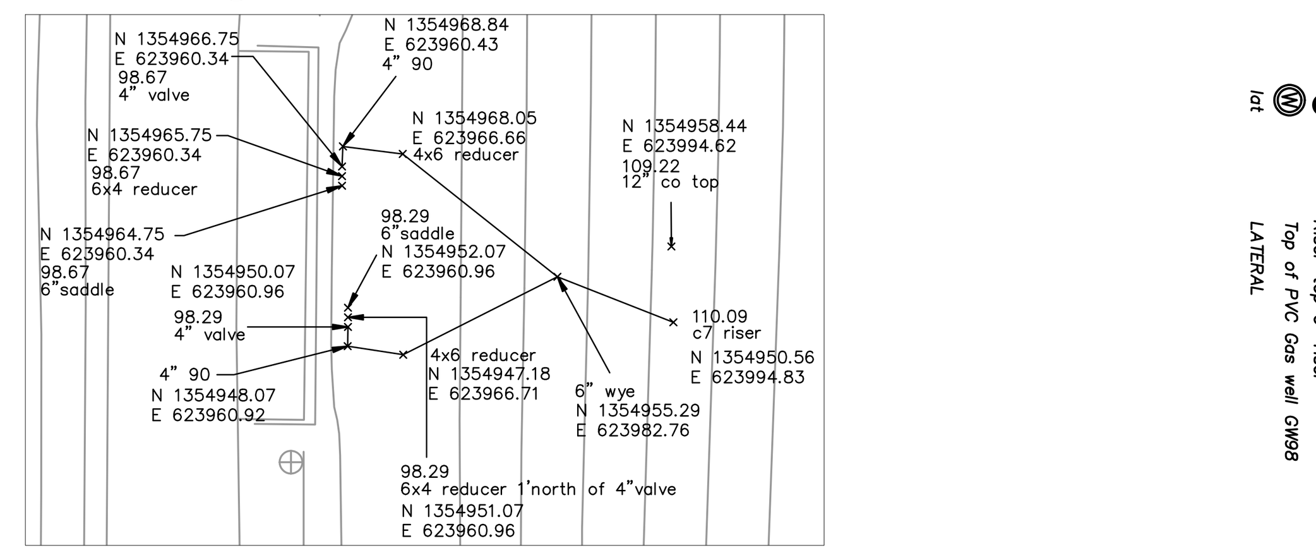
1.) North and coordinate basis is the East Zone of the Florida State Plane Coordinate System, and are based on NGS Control Station Numbers AJ7660(J496) and verified Pickett & Associates Targets 1 and 2 from Topographic Survey dated 12/13/01 as provided. The published values used for this survey are NAD 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 PK13 with an elevation of 92.92 and OC1406 with an elevation of 80.91.

SEE DETAIL B



SEE DETAIL A



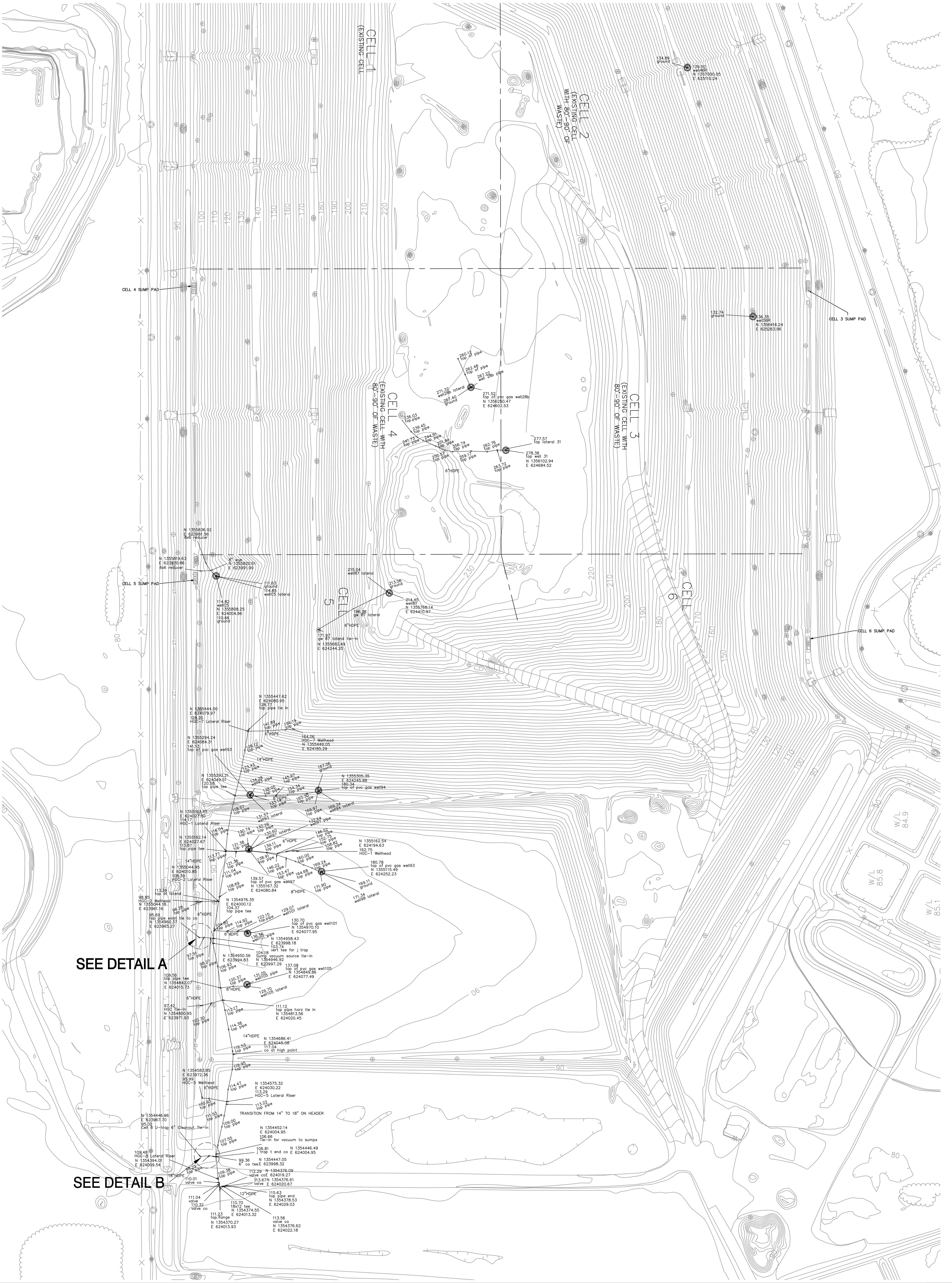
GRAPHIC SCALE

(IN FEET)

1 inch = 100 ft.

LEGEND:

NO.	NUMBER
ELEV.	ELEVATION
CONC.	CONCRETE
GW	GAS WELL
166.97 top pipe	ELEVATION TAKEN ON TOP OF PIPE DESCRIPTION
●	Riser-top 6" riser
Ⓦ	Top of PVC Gas well GW98
lat	LATERAL



DEBORAH L. PEAVEY, P.S.M. FLORIDA REGISTRATION NUMBER 6345 FLORIDA BUSINESS NUMBER 7779	
12/20/2012 SURVEY DATES	
SCALE 1"=100'	DRAWING NO. 228
PROJECT NO. 617	SHEET 1 OF 1

ASBUILT SURVEY - GCCS
CELLS 3 THROUGH 7
J.E.D. SOLID WASTE MANGEMENT FACILITY
1501 OMNI WAY ST. CLOUD, FL

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

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

Drawn By:	DLP
Party Chief:	DR
Field Book:	
Page:	

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

FILE NAME: 617-jed-gaspipe -12-20-2012.dwg

NO.	DATE	REVISION
1	2/19/13	Resurveyed GW93 & GW94 & revised per comments
2	3/6/13	Additional information surveyed for details
3	4/12/13	Additional pipe sizes shown

HGC-6 As-Built Survey			
Survey Performed by JED Facility Operations			
Point Name	**Measured Northing**	**Measured Easting**	**Measured Elevation**
HP1	1354585.0	624876.8	104.9
Sump1	1354584.9	624808.1	101.9
10in1	1354584.0	624759.4	104.7
HP2	1354583.9	624711.0	106.7
10in2	1354584.4	624660.5	104.8
Sump2	1354584.8	624609.5	102.3
10in3	1354587.1	624551.4	104.3
HP3	1354585.3	624517.8	105.2
10in4	1354583.5	624461.1	102.1
Sump3	1354582.2	624414.2	99.6
10in5	1354582.6	624368.0	100.9
HP4	1354584.3	624313.3	102.9
10in6	1354585.2	624262.9	99.6
Sump4	1354584.2	624210.0	97.3
10in7	1354584.3	624148.0	99.1
HP5	1354584.4	624108.9	101.4
10in8	1354594.5	624063.5	96.4
10in9	1354600.6	624036.4	94.3
10inTIE	1354586.5	623996.8	90.2

HGC-5 As-Built Survey			
Survey Performed by JED Facility Operations			
Point Name	**Measured Northing**	**Measured Easting**	**Measured Elevation**
HP1	1355394.1	624677.5	169.0
10in1	1355399.7	624628.9	166.8
Sump1	1355407.3	624576.6	164.4
10in2	1355412.2	624527.6	166.3
HP2	1355417.9	624479.8	168.6
10in3	1355424.2	624428.9	166.1
Sump2	1355430.8	624380.8	163.7
10in4	1355436.6	624333.0	167.9
HP3	1355439.5	624301.0	170.8
10in5	1355445.7	624243.5	168.2
EndCapWest	1355449.0	624186.4	165.1

HGC-1 As-Built Survey			
Survey Performed by JED Facility Operations			
Point Name	**Measured Northing**	**Measured Easting**	**Measured Elevation**
EndCapEast	1355162.7	624650.1	167.0
10in1	1355163.5	624607.3	164.6
Sump1	1355162.8	624569.1	163.5
10in2	1355160.7	624520.2	165.1
HP2	1355164.3	624462.8	167.1
10in3	1355164.6	624434.8	166.3
Sump2	1355166.1	624368.1	163.8
10in4	1355164.8	624315.0	166.2
HP3	1355162.4	624257.1	168.4
EndPointWest	1355162.1	624195.8	165.1

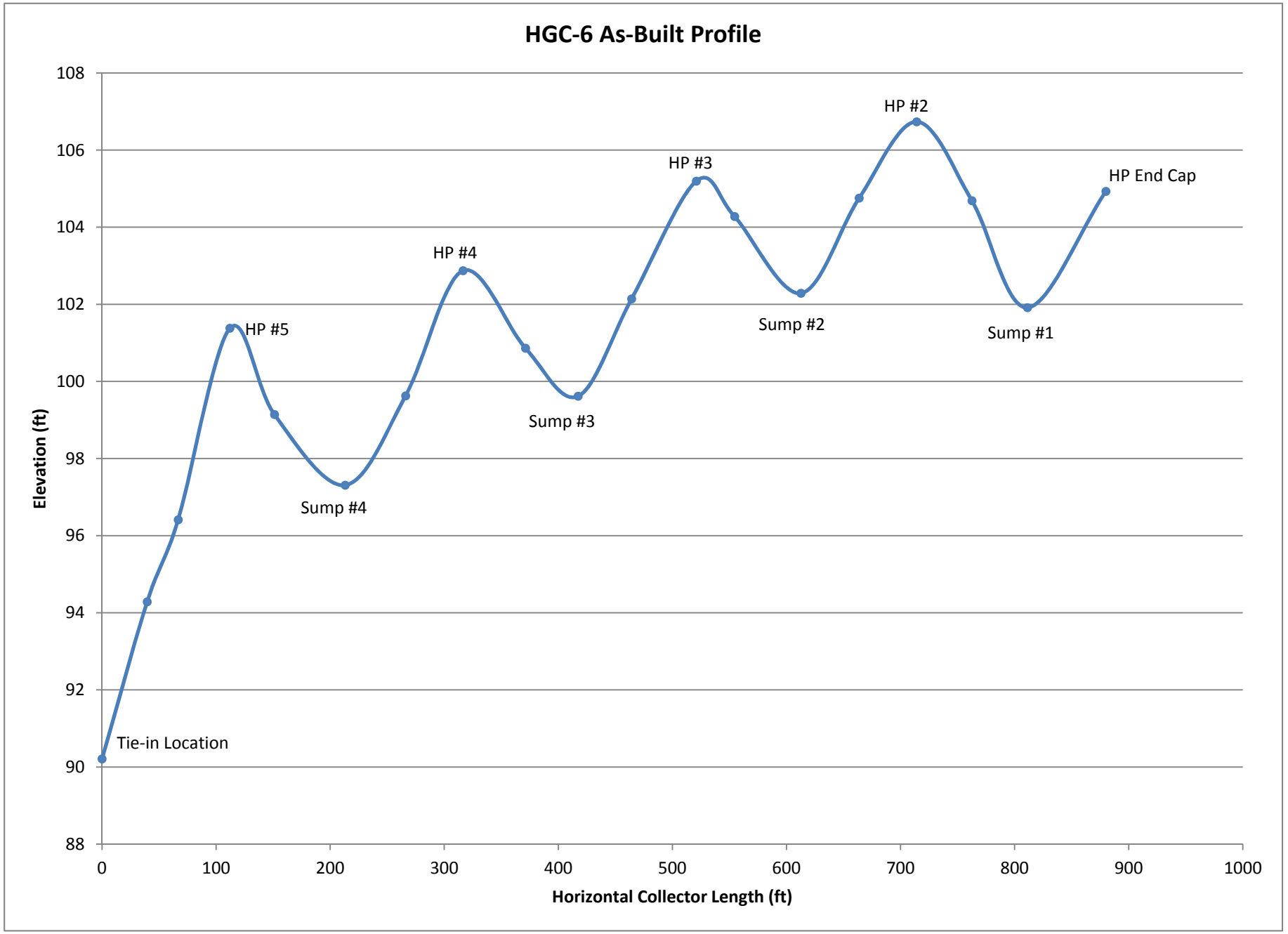
HGC-8 As-Built Survey			
Survey Performed by JED Facility Operations			
Point Name	**Measured Northing**	**Measured Easting**	**Measured Elevation**
HP1	1354344.9	624955.5	105.5
10in1	1354345.9	624907.7	104.6
Sump1	1354345.5	624856.6	103.1
10in2	1354344.9	624805.4	104.7
HP2	1354345.0	624758.3	106.6
10in3	1354342.7	624704.4	104.6
Sump2	1354343.9	624656.6	103.2
10in4	1354344.1	624609.1	104.9
HP3	1354343.7	624559.8	106.5
10in5	1354342.0	624510.4	104.6
Sump3	1354342.6	624457.4	101.7
10in6	1354344.1	624409.3	103.8
HP4	1354343.7	624375.7	104.8
10in7	1354343.3	624317.5	102.6
Sump4	1354345.1	624256.6	98.0
10in8	1354344.9	624209.8	99.4
HP5	1354344.9	624158.1	100.8
10in9	1354346.5	624105.9	98.1
10in10	1354357.4	624055.0	96.3
10in11	1354360.1	624037.1	95.0
10inTIE	1354347.9	623996.3	90.7

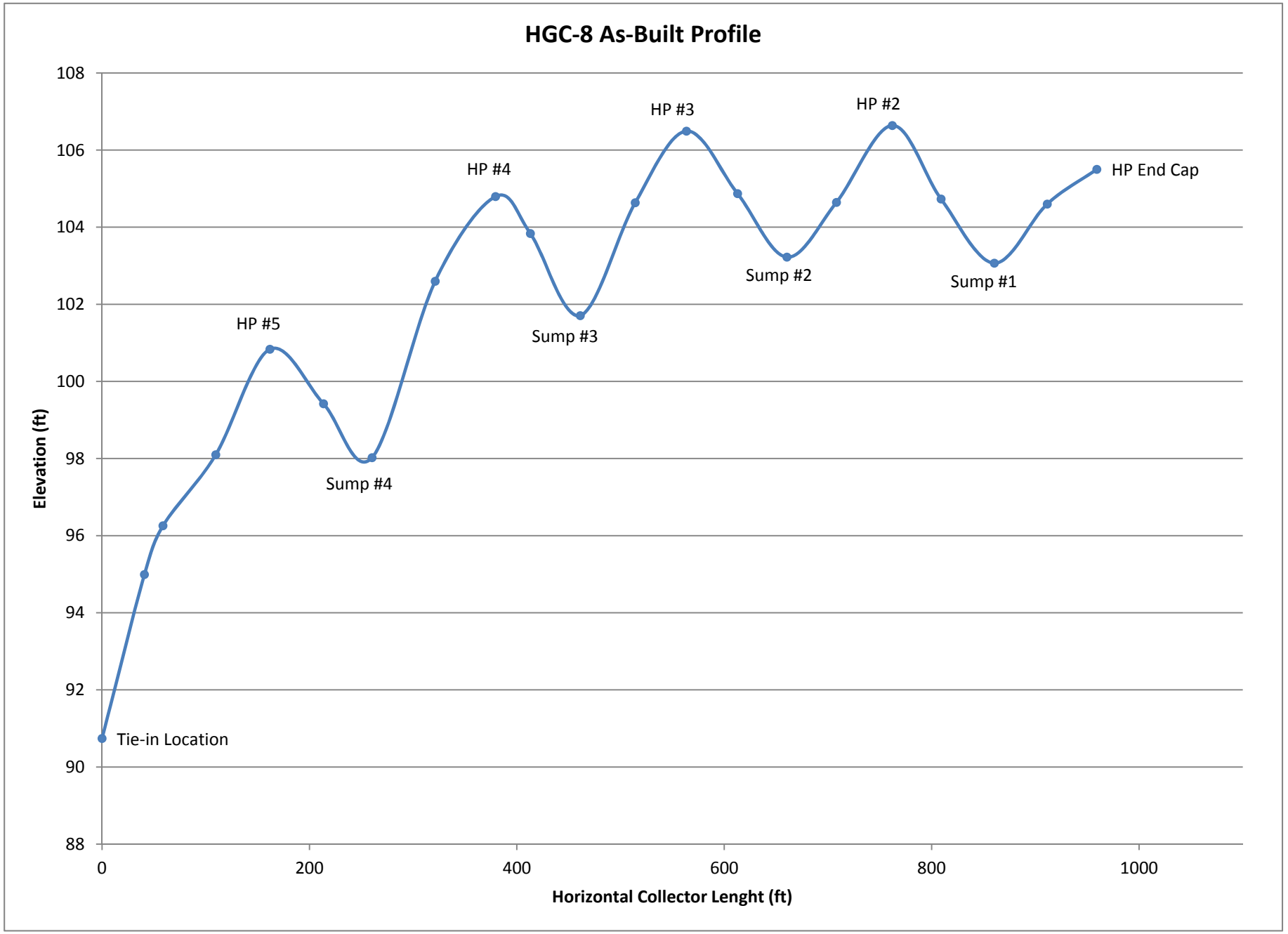
HGC-3 As-Built Survey			
Survey Performed by JED Facility Operations			
Point Name	**Measured Northing**	**Measured Easting**	**Measured Elevation**
HGC3 HP1 Tie-In	1354923.5	624221.1	168.1
HGC3 50	1354921.6	624270.5	166.3
HGC3 LP1	1354922.6	624329.9	164.6
HGC3 150	1354922.8	624369.5	166.4
HGC3 HP2	1354922.1	624428.4	168.7
HGC3 250	1354922.7	624470.7	167.1
HGC3 LP2	1354925.7	624535.7	164.7
HGC3 350	1354925.4	624619.1	167.5
HGC EndCap3	1354925.3	624663.1	169.1

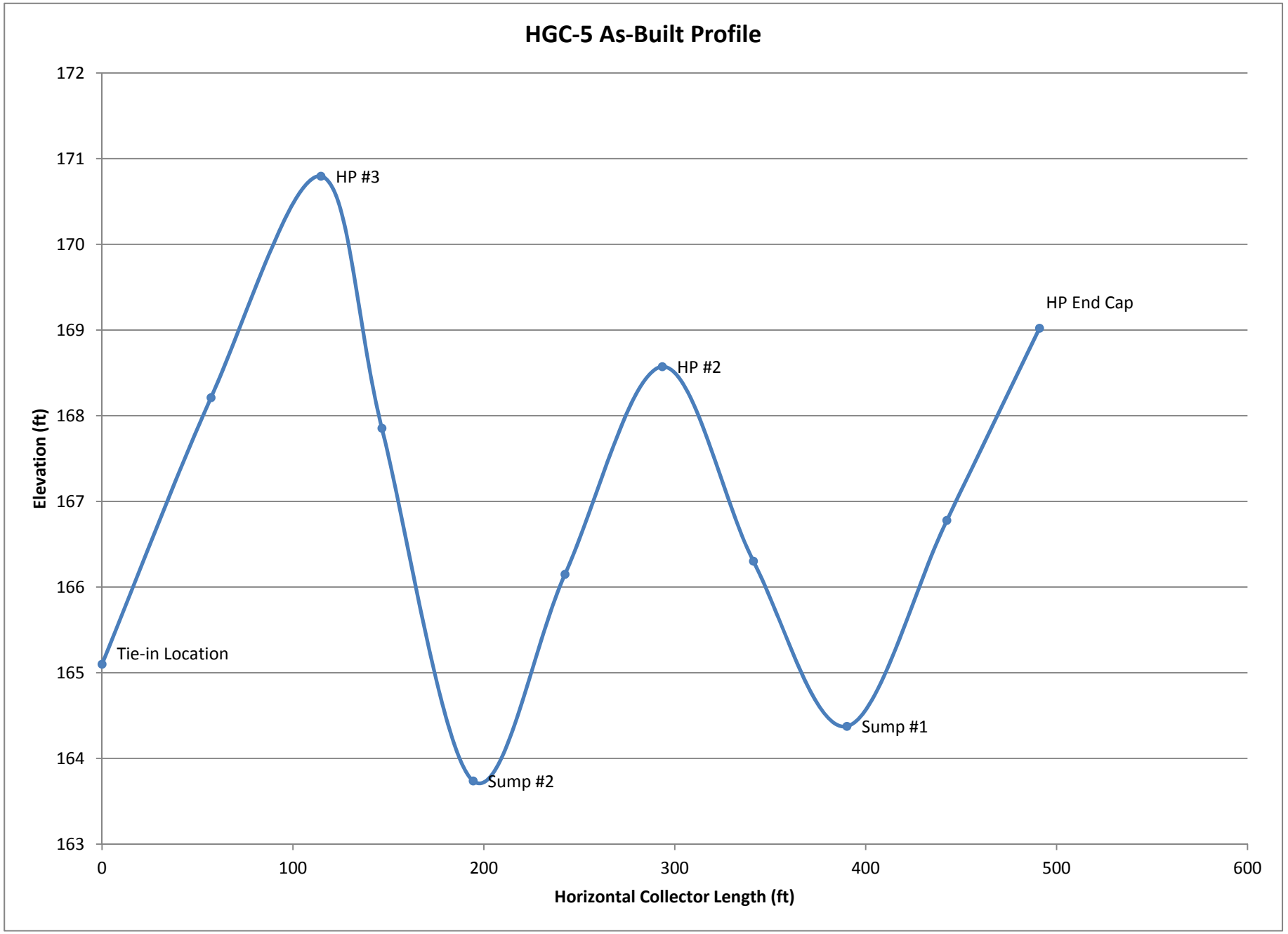
HGC-7 As-Built Survey			
Survey Performed by JED Facility Operations			
Point Name	**Measured Northing**	**Measured Easting**	**Measured Elevation**
HGC7 HP1 Tie-In	1354798.1	624212.1	166.1
HGC7 50	1354763.1	624250.7	163.3
HGC7 100	1354733.2	624285.1	161.9
HGC7 LP1	1354699.1	624323.2	160.4
HGC7 200	1354689.2	624375.1	164.5
HGC7 HP2	1354692.0	624422.1	168.4
HGC7 300	1354695.6	624473.7	166.9
HGC7 LP2	1354695.4	624526.9	165.2
HG7 400	1354696.1	624573.7	167.0
HGC7 HP3	1354695.4	624625.0	168.5
HGC7 LP3	1354693.0	624687.8	165.7

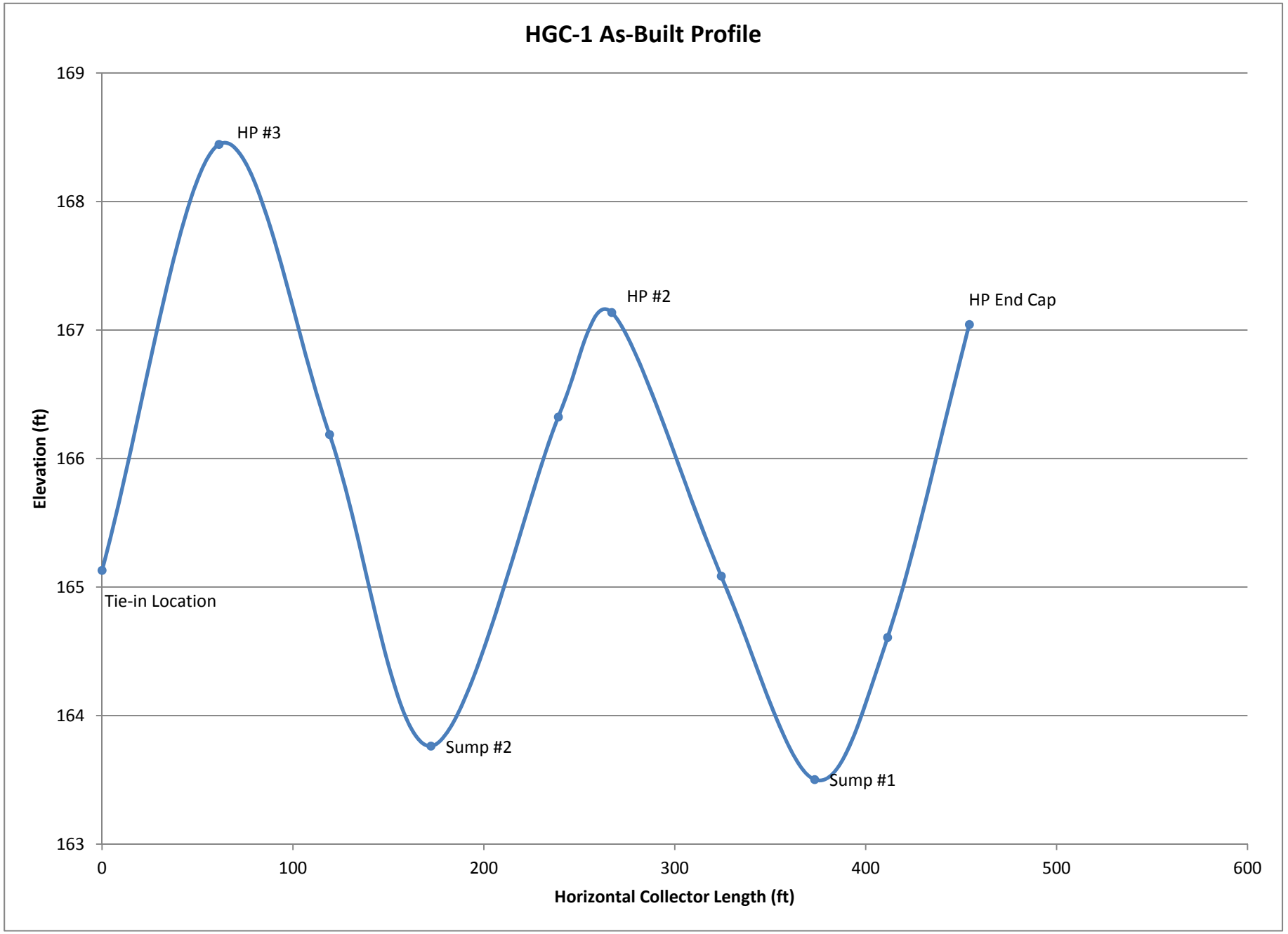
HGC-9X As-Built Survey			
Survey Performed by JED Facility Operations			
Point Name	**Measured Northing**	**Measured Easting**	**Measured Elevation**
HGC9Y LP1	1355272.4	625165.1	118.2
HGC9X 50	1355281.4	625115.2	115.0
HGC9X LP1	1355300.5	625069.3	112.9
HGC9X 150	1355300.3	625020.6	114.2
HGC9X HP1	1355281.6	624971.3	115.7
HGC9X 250	1355246.0	624942.6	113.3
HGC9X LP2	1355191.8	624928.4	111.0
HGC9X 350	1355150.2	624925.5	112.5
HGC9X HP22	1355093.5	624919.2	114.5
HGC9X 450	1355052.5	624913.5	113.3
HGC9X LP3end	1355025.9	624908.1	112.3

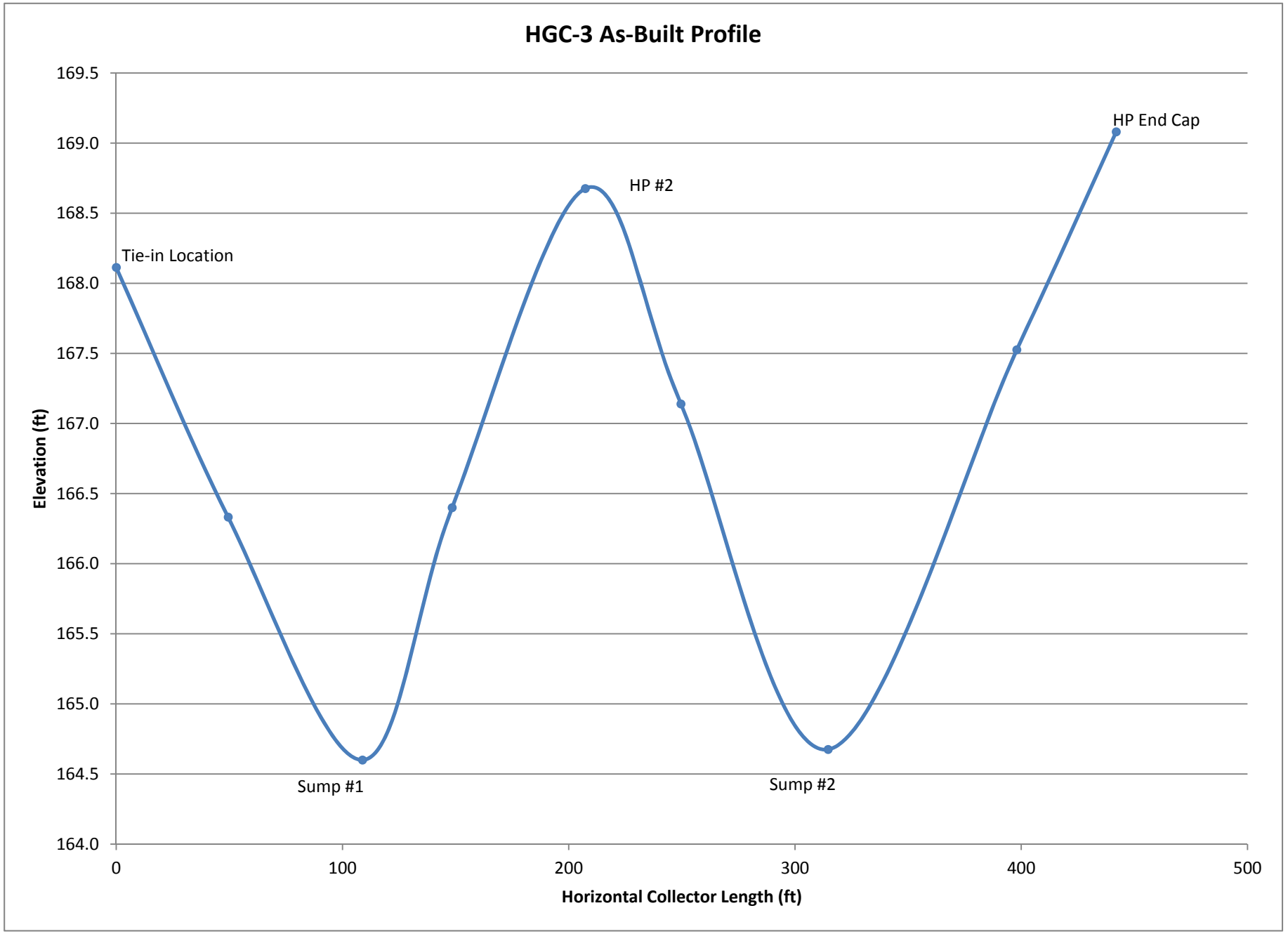
HGC-9Y As-Built Survey			
Survey Performed by JED Facility Operations			
Point Name	**Measured Northing**	**Measured Easting**	**Measured Elevation**
HGC9Y HP1	1355484.8	625258.8	139.8
HGC9Y 50	1355454.3	625240.9	137.5
HGC9Y 100	1355407.9	625222.3	132.2
HGC9Y 150tran	1355361.1	625203.6	128.4
HGC9Y200	1355315.8	625184.7	122.5
HGC9Y LP1	1355272.4	625165.1	118.2
HGC9Y 300	1355225.3	625142.7	115.4
HGC9Y 350	1355179.5	625123.0	113.1
HGC9Y 400	1355133.5	625101.6	110.3
HGC9Y LP2	1355075.4	625076.6	107.5
HGC9Y 500	1355033.0	625058.6	108.9
HGC9Y HP2	1354989.2	625040.4	110.6
HGC9Y 600	1354949.6	625021.4	108.5
HGC9Y 650	1354903.3	625000.2	106.2
HGC9Y 700	1354858.2	624981.9	104.1
HGC9Y LP3end	1354801.9	624959.2	101.1

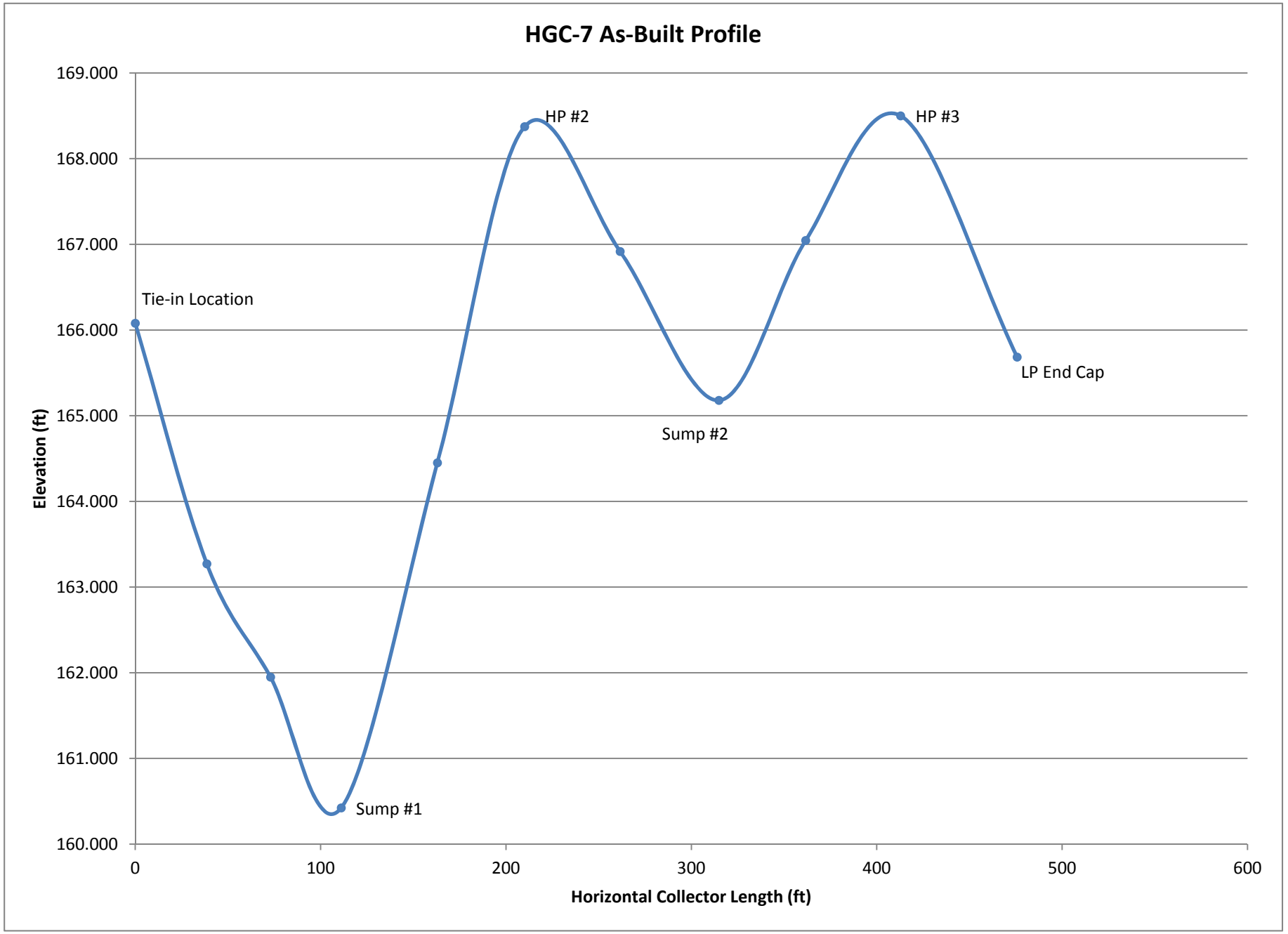

HGC-6 As-Built Profile
108
106
104
102
100
98
96
94
92
90
88
Elevation (ft)
0
100
200
300
400
500
600
700
800
900
1000
Horizontal Collector Length (ft)
Tie-in Location
HP #5
Sump #4
HP #4
Sump #3
HP #3
Sump #2
HP #2
Sump #1
HP End Cap

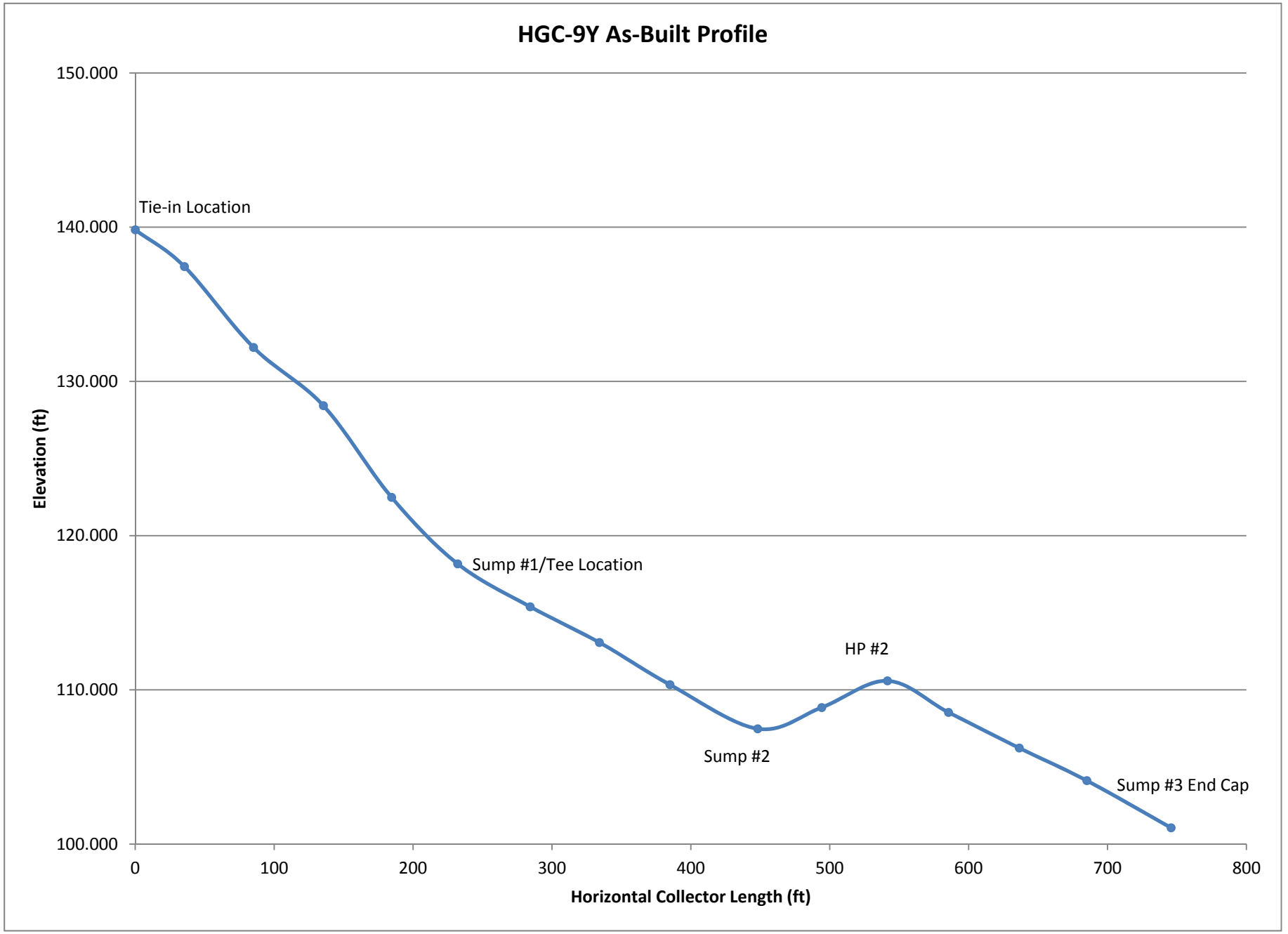

HGC-8 As-Built Profile
108
106
104
102
100
98
96
94
92
90
88
Elevation (ft)
0
200
400
600
800
1000
Horizontal Collector Lenght (ft)
Tie-in Location
HP #5
Sump #4
HP #4
Sump #3
HP #3
Sump #2
HP #2
Sump #1
HP End Cap

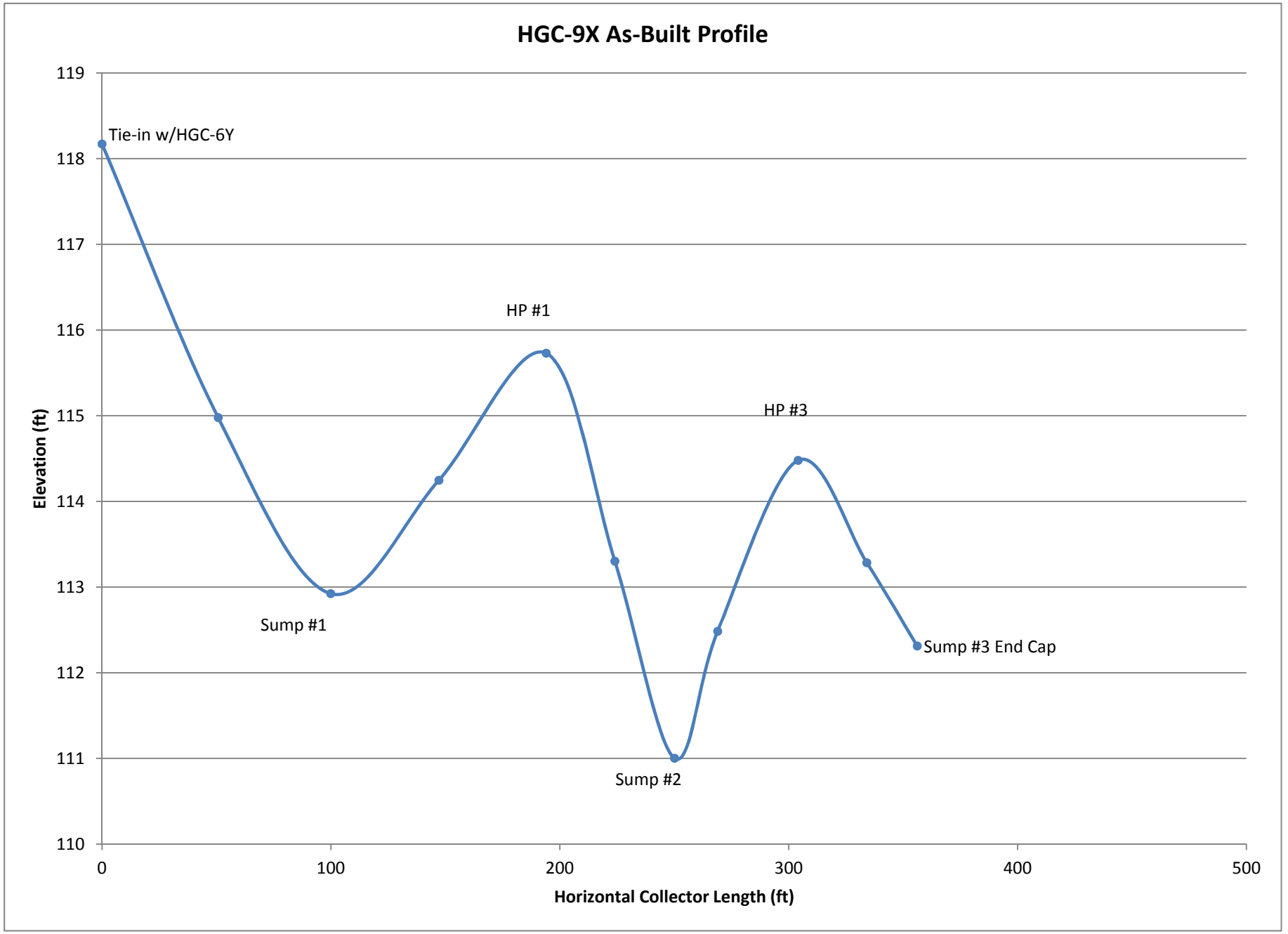

HGC-5 As-Built Profile
172
171
170
169
168
167
166
165
164
163
Elevation (ft)
HP #3
HP End Cap
HP #2
Tie-in Location
Sump #1
Sump #2
0
100
200
300
400
500
600
Horizontal Collector Length (ft)


HGC-1 As-Built Profile
169
168
167
166
165
164
163
Elevation (ft)
HP #3
HP #2
HP End Cap
Tie-in Location
Sump #2
Sump #1
0
100
200
300
400
500
600
Horizontal Collector Length (ft)


HGC-3 As-Built Profile
169.5
169.0
168.5
168.0
167.5
167.0
166.5
166.0
165.5
165.0
164.5
164.0
Elevation (ft)
Tie-in Location
HP #2
HP End Cap
Sump #1
Sump #2
0
100
200
300
400
500
Horizontal Collector Length (ft)


HGC-7 As-Built Profile
169.000
168.000
167.000
166.000
165.000
164.000
163.000
162.000
161.000
160.000
Elevation (ft)
Tie-in Location
HP #2
HP #3
LP End Cap
Sump #2
Sump #1
0
100
200
300
400
500
600
Horizontal Collector Length (ft)


HGC-9Y As-Built Profile
150.000
140.000
130.000
120.000
110.000
100.000
Elevation (ft)
Tie-in Location
Sump #1/Tee Location
HP #2
Sump #2
Sump #3 End Cap
0
100
200
300
400
500
600
700
800
Horizontal Collector Length (ft)


HGC-9X As-Built Profile
119
118
117
116
115
114
113
112
111
110
Elevation (ft)
Tie-in w/HGC-6Y
HP #1
HP #3
Sump #1
Sump #2
Sump #3 End Cap
0
100
200
300
400
500
Horizontal Collector Length (ft)

APPENDIX D
AS-BUILT WELL SCHEDULE

AS-BUILT WELL SCHEDULE - DECEMBER 2012 GCCS EXPANSION
J.E.D. Solid Waste Management Facility

Well ID	Northing	Easting	Ground Elevation[1] (ft)	Top of Protective Liner Elevation[2] (ft)	Total Well Depth (ft)	Slotted Length (ft)	BGS[3] Solid Length (ft)	AGS[4] Solid Length[5] (ft)
GW-31	1,356,102.94	624,684.52	264.1	100.61	80.0	69.0	10.0	15.0
GW-87	1,355,768.14	624,410.97	213.1	87.13	80.0	69.0	10.0	15.0
GW-93	1,355,294.24	624,084.31	134.3	88.40	28.0	17.0	10.0	7.0
GW-94	1,355,305.35	624,245.88	167.6	90.80	59.0	50.0	8.0	17.0
GW-97	1,355,167.32	624,080.84	130.6	84.23	33.0	22.0	10.0	7.0
GW-98	1,355,115.49	624,252.23	169.1	85.03	60.0	49.0	10.0	14.0
GW-101	1,354,970.10	624,077.95	130.7	80.78	34.0	23.0	10.0	6.0
GW-105	1,354,849.86	624,077.49	131.1	82.60	33.0	22.0	10.0	6.0
GW-56R1[6]	1,356,419.10	625,265.50	131.6	82.44	34.0	23.0	10.0	4.0
GW-28B[7,8]	1,356,250.47	624,602.53	267.4	92.50	62.0	49.0	12.0	4.0
GW-46R1[9]	1,356,997.92	625,111.32	133.7	82.97	35.0	24.0	8.0	6.0
Totals	---	---	---	---	**538**	**417**	**108**	**101**

Notes:

[1] Ground elevations provided by Peavey & Associates Surveying and Mapping, PA.

[2] Elevations provided by Geosyntec Consultants (Permit Drawings).

[3] BGS - Below ground surface

[4] AGS - Above ground surface

[5] The above ground surface solid pipe stick up have been extended as directed by WSI to accommodate final closure cover. Any stick up above 6' will need a soil mound placed around well at ground level to accommodate service to wellhead.

[6] Well GW-56R1 will be located in the field during the preconstruction survey by WSI. Note that GW-56 needs to be replaced and is located

[7] Well GW-28B was added at the request of WSI (12/6/12)

[8] Well depths have been limited to 138 feet based upon drilling capacity of the AF-100 drill rig.

[9] Well GW-56R1 was added at the request of WSI (12/12/12)

Prepared by: MWB
Checked by: DEG
Reviewed by: KSB

Golder Associates

APPENDIX E
WELL BORING LOGS

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-94 **Site:** JED Landfill

Project #: 083-82734.25
Onsite Rep: Matt Brazille

Date/Time Began Drilling:	12/5/12 13:22
Date/Time Complete Drilling:	12/5/12 17:00
Northing:	1,355,306.32
Date/Time Began Well Install:	12/5/12 17:05
Date/Time Complete Well Install:	12/5/12 17:37
Easting:	624,246.82
Ground Elevation:	167.60'

		Design	Actual
A	Total Depth:	61'	59'
B	Screen Length:	50'	50'
C	Solid Pipe Length:	10'+17'=27'	8'+19'=27'
	# of Centralizers:	0	0

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	59' (ends at 58.5' BGS)
E	◉ #57 Stone? ○ #89 Stone?	☑	58.5' (ends at 8' BGS)
F	GeoDisc?	☑	8' BGS
G	1st Bentonite Seal?	☑	8' (ends at 6' BGS)
H	Soil Fill to 3' BGS?	☑	6' (ends at 3' BGS)
I	2nd Bentonite Seal?	☑	3' (ends at 1' BGS)

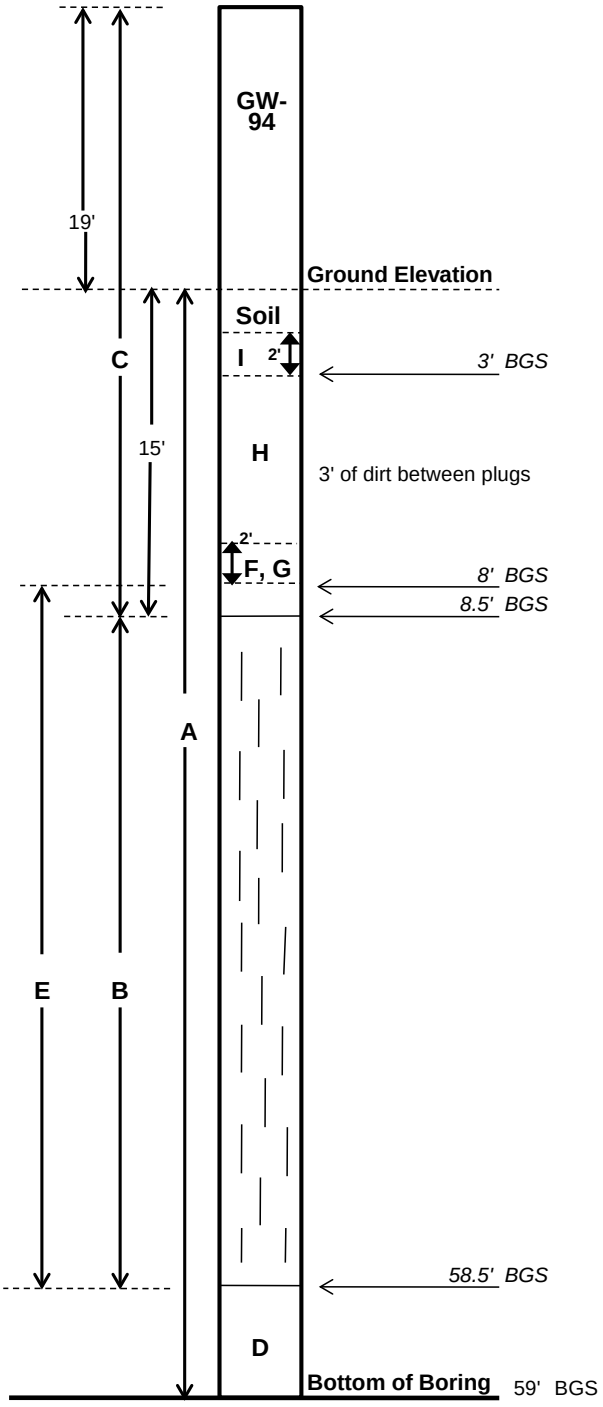
Depth to Top Liner: 15'

Depth to Waste: 3' top soil

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW Soil=30% M=10% D=Minimal	107.7	13:47
10-20	MSW Soil=10% M=10% D=Minimal	108.7	14:09
20-30	MSW Soil=10% M=10% D=Moderate	118.7	14:42
30-40	MSW Soil=10% M=10% D=Moderate	114.3	15:23
40-50	MSW Soil=10% M=15% D=Moderate	122.1	16:04
50-60	MSW Soil=10% M=30% D=Severe	126.2	17:00
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Drilled to 61,' but bottom of well was caving in on itself due to saturated materials, so well was set at 59;' 2' above liquids.



CQA Tech Signature:

Date: January 14, 2013

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-98 **Site:** JED Landfill

Project #: 083-82734.25
Onsite Rep: Matt Brazille

Date/Time Began Drilling:	12/6/12 7:45
Date/Time Complete Drilling:	12/6/12 13:18
Northing:	1,355,114.90
Date/Time Began Well Install:	12/6/12 13:25
Date/Time Complete Well Install:	12/6/12 14:27
Easting:	624,252.20
Ground Elevation:	169.20'

		Design	Actual
A	Total Depth:	69'	60'
B	Screen Length:	58'	49'
C	Solid Pipe Length:	10'+14'=24'	10'+14'=24'
	# of Centralizers:	0	0

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	60' (ends at 59.5' BGS)
E	(◉) #57 Stone? ( ) #89 Stone?	☑	59.5' (ends at 10' BGS)
F	GeoDisc?	☑	10' BGS
G	1st Bentonite Seal?	☑	10' (ends at 8' BGS)
H	Soil Fill to 3' BGS?	☑	8' (ends at 3' BGS)
I	2nd Bentonite Seal?	☑	3' (ends at 1' BGS)

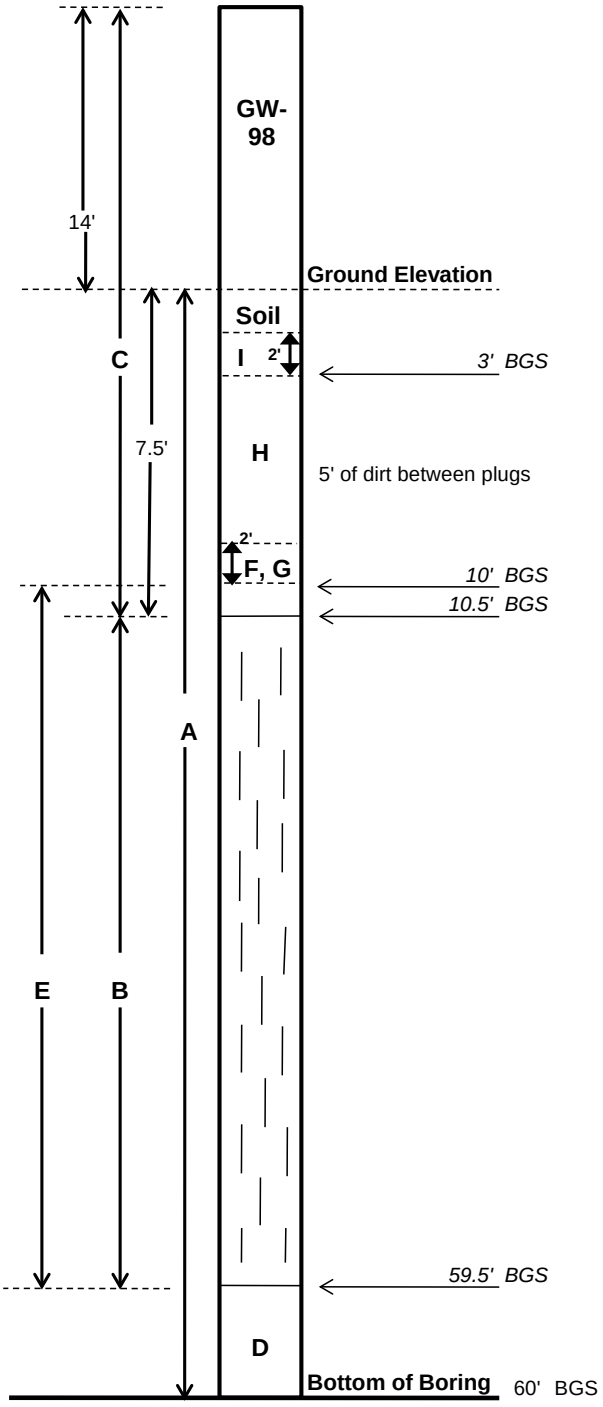
Depth to Top Liner: 15'

Depth to Waste: 2' top soil

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW S=20% M=10% D=Mild	99.1	8:07
10-20	MSW S=10% M=10% D=Mild	113.7	8:31
20-30	MSW S=10% M=15% D=Moderate	121.5	9:08
30-40	MSW S=10% M=15% D=Moderate	103.9	9:45
40-50	MSW S=10% M=15% D=Moderate	112.7	10:30
50-60	MSW S=75% M=15% D=Moderate	120.8	13:18
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Hit heavy loose soils at 50'. After trying to advance for 2 hours stopped and set well at 60' due to lack of progress per Mike Kaiser's request.



CQA Tech Signature: Matthew J. Brazille Date: January 14, 2013

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-87 **Site:** JED Landfill

Project #: 083-82734.25
Onsite Rep: Matt Brazille

Date/Time Began Drilling:	12/7/12 7:56	Date/Time Began Well Install:	12/7/12 15:20
Date/Time Complete Drilling:	12/7/12 15:15	Date/Time Complete Well Install:	12/7/12 16:41
Northing:	1,355,767.30	Easting:	624,410.89
		Ground Elevation:	212.2'

		Design	
A	Total Depth:	110'	80'
B	Screen Length:	99'	69'
C	Solid Pipe Length:	10'+15'=25'	10'+15'=25'
	# of Centralizers:	0	0

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	80' (ends at 79.5' BGS)
E	◉ #57 Stone? ○ #89 Stone?	☑	79.5' (ends at 10' BGS)
F	GeoDisc?	☑	10' BGS
G	1st Bentonite Seal?	☑	10' (ends at 8' BGS)
H	Soil Fill to 3' BGS?	☑	8' (ends at 3' BGS)
I	2nd Bentonite Seal?	☑	3' (ends at 1' BGS)

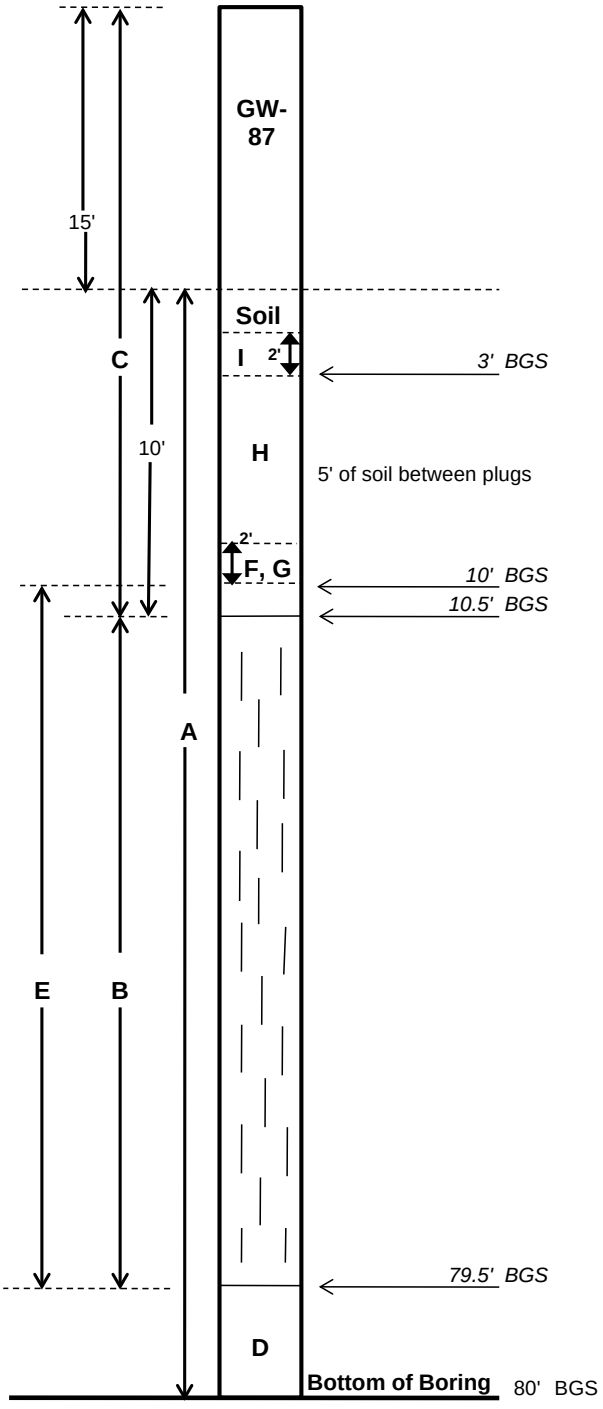
Depth to Top Liner: 15'

Depth to Waste: 3' top soil

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW S=30% M=10% D=Mild	96.4	8:24
10-20	MSW S=10% M=15% D=Moderate	106.2	8:52
20-30	MSW S=10% M=10% D=Moderate	113.1	9:24
30-40	MSW S=10% M=10% D=Moderate	113.3	10:00
40-50	MSW S=10% M=10% D=Moderate	130.3	10:40
50-60	MSW Soil=10% M=50% D=Severe	139.8	11:55
60-70	MSW Soil=10% M=40% D=Severe	130.6	13:06
70-80	MSW Soil=10% M=50% D=Severe	136.4	14:26
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Drilled to 89' and hit wet muck. Attempted to drill through for more than an hour, measured again, and found well to be at 83' and caving in. Set well at 80' above the muck per Keith Lunsford's request.



CQA Tech Signature:

Date: January 14, 2013

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-31 **Site:** JED Landfill

Project #: 083-82734.25
Onsite Rep: Matt Brazille

Date/Time Began Drilling:	12/8/12 7:42		Date/Time Began Well Install:	12/8/12 15:07	
Date/Time Complete Drilling:	12/8/12 15:01		Date/Time Complete Well Install:	12/8/12 16:20	
Northing:	1,356,101.50		Easting:	624,683.50	
			Ground Elevation:	264.1	

		Design	
A	Total Depth:	148'	80'
B	Screen Length:	137'	69'
C	Solid Pipe Length:	10'+15'=25'	10'+15'=25'
	# of Centralizers:	0	0

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	80' (ends at 79.5' BGS)
E	(◉) #57 Stone? ( ) #89 Stone?	☑	79.5' (ends at 10' BGS)
F	GeoDisc?	☑	10' BGS
G	1st Bentonite Seal?	☑	10' (ends at 8' BGS)
H	Soil Fill to 3' BGS?	☑	8' (ends at 3' BGS)
I	2nd Bentonite Seal?	☑	3' (ends at 1' BGS)

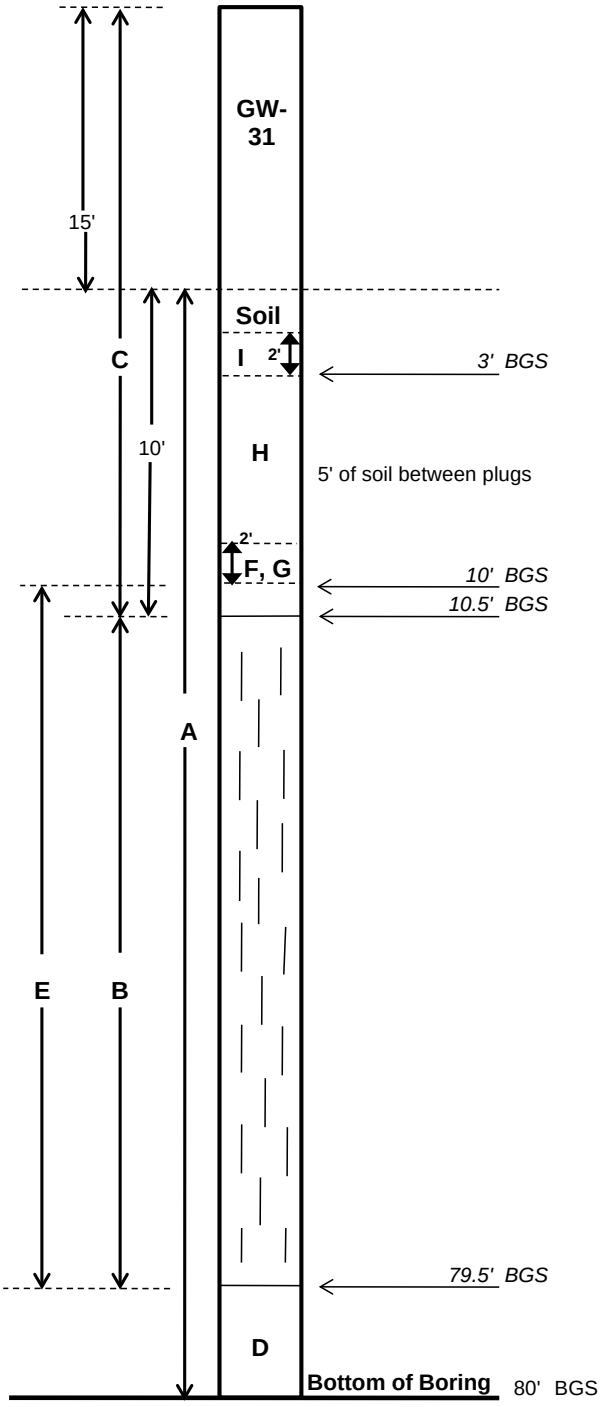
Depth to Top Liner: 15'

Depth to Waste: 2' top soil

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW S=20% M=10% D=Mild	95.6	8:04
10-20	MSW S=10% M=10% D=Moderate	107.1	8:26
20-30	MSW S=15% M=10% D=Moderate	117.1	9:00
30-40	MSW S=50% M=10% D=Moderate	120	9:53
40-50	MSW S=70% M=10% D=Moderate	118	10:30
50-60	MSW Soil=10% M=10% D=Moderate	134.8	11:40
60-70	MSW Soil=10% M=15% D=Severe	113.5	12:37
70-80	MSW Soil=10% M=20% D=Severe	137.7	13:52
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: 12' of pure soil from 35' to 47'. Hit wet waste at 56'. Hit soaked muck at 80', drilled to 83' and could proceed no further before the well started caving in on itself due to severe moisture. Set well at 80' above the muck per Keith Lunsford's request.



CQA Tech Signature:

Date: January 14, 2013

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-28B **Site:** JED Landfill

Project #: 083-82734.25
Onsite Rep: Matt Brazille

Date/Time Began Drilling:	12/10/12 7:57
Date/Time Complete Drilling:	12/10/12 14:30
Northing:	1,356,249.90
Date/Time Began Well Install:	12/10/12 14:50
Date/Time Complete Well Install:	12/10/12 16:20
Easting:	624,602.50
Ground Elevation:	267.3'

		Design	Actual
A	Total Depth:	138'	62'
B	Screen Length:	127'	49'
C	Solid Pipe Length:	10'+4'=14'	12'+4'=16'
	# of Centralizers:	0	0

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	62' (ends at 61.5' BGS)
E	(◉) #57 Stone? (○) #89 Stone?	☑	61.5' (ends at 12' BGS)
F	GeoDisc?	☑	12' BGS
G	1st Bentonite Seal?	☑	12' (ends at 10' BGS)
H*	Soil Fill to 3' below liner?	☑	10' (ends at 6' BGS)
I	2nd Bentonite Seal?	☑	6' (ends at 4' BGS)

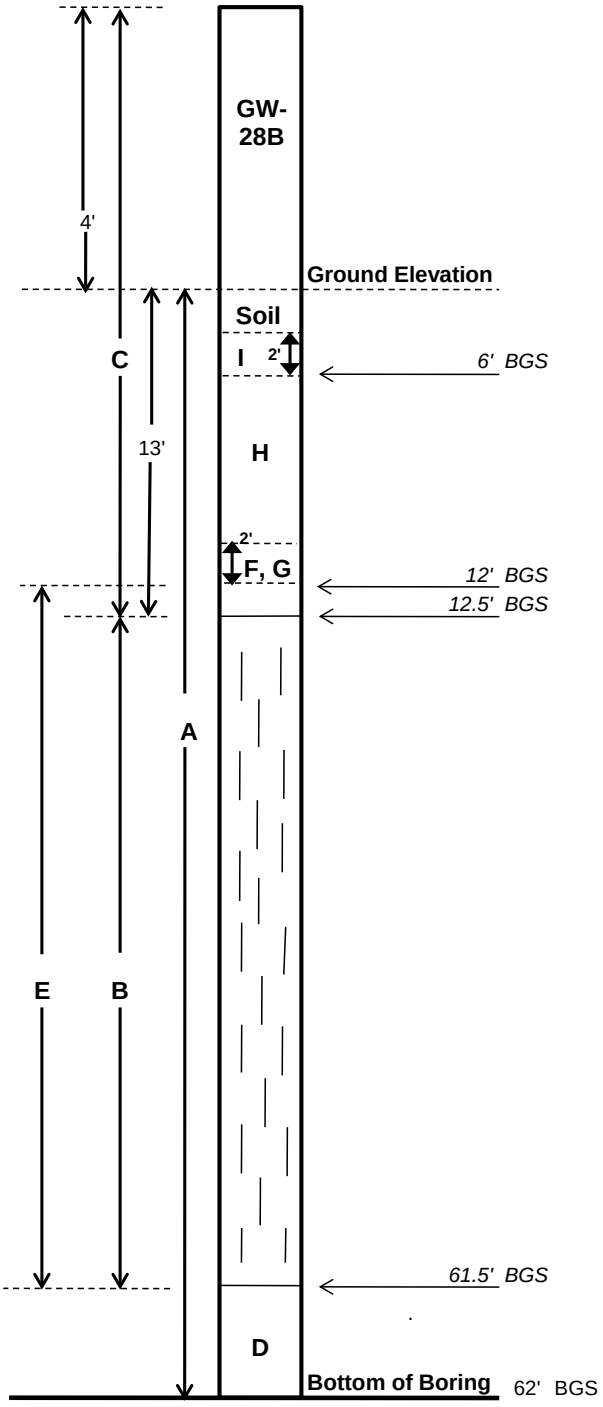
Depth to Top Liner: 15'

Depth to Waste: 13' (3' cap, 10' top soil)

Depth (bgs)	Description*	Temp (F)	Time
0-10	S=100% M=15% No MSW	95.2	8:25
10-20	MSW S=30% M=10% D=Moderate	103.8	9:05
20-30	MSW S=10% M=10% D=Moderate	123.3	9:39
30-40	MSW S=10% M=10% D=Severe	140.1	10:20
40-50	MSW S=10% M=20% D=Severe	139.4	11:00
50-60	MSW S=10% M=30% D=Severe	137	12:12
60-62	MSW S=40% M=60% D=Severe	138.2	14:30
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Hit top liner at 3' BGS. Hit liquids that were not passable at 60'; drilled for two hours and advanced only 2'. Set well at 62' above the muck per Keith Lunsford's request.



CQA Tech Signature:

Date: January 14, 2013

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-56R1 **Site:** JED Landfill

Project #: 083-82734.25
Onsite Rep: Matt Brazille

Date/Time Began Drilling:	12/11/12 7:56
Date/Time Complete Drilling:	12/11/12 10:02
Northing:	1,356,419.10
Date/Time Began Well Install:	12/11/12 10:07
Date/Time Complete Well Install:	12/11/12 12:33
Easting:	625,265.50
Ground Elevation:	131.6'

		Design	Actual
A	Total Depth:	34'	34'
B	Screen Length:	23'	23'
C	Solid Pipe Length:	10'+4'=14'	10'+4'=14'
	# of Centralizers:	0	0

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	34' (ends at 33.5' BGS)
E	(◉) #57 Stone? (○) #89 Stone?	☑	33.5' (ends at 10' BGS)
F	GeoDisc?	☑	10' BGS
G	1st Bentonite Seal?	☑	10' (ends at 8' BGS)
H*	Soil Fill to 3' below liner?	☑	8' (ends at 7' BGS)
I	2nd Bentonite Seal?	☑	7' (ends at 5' BGS)

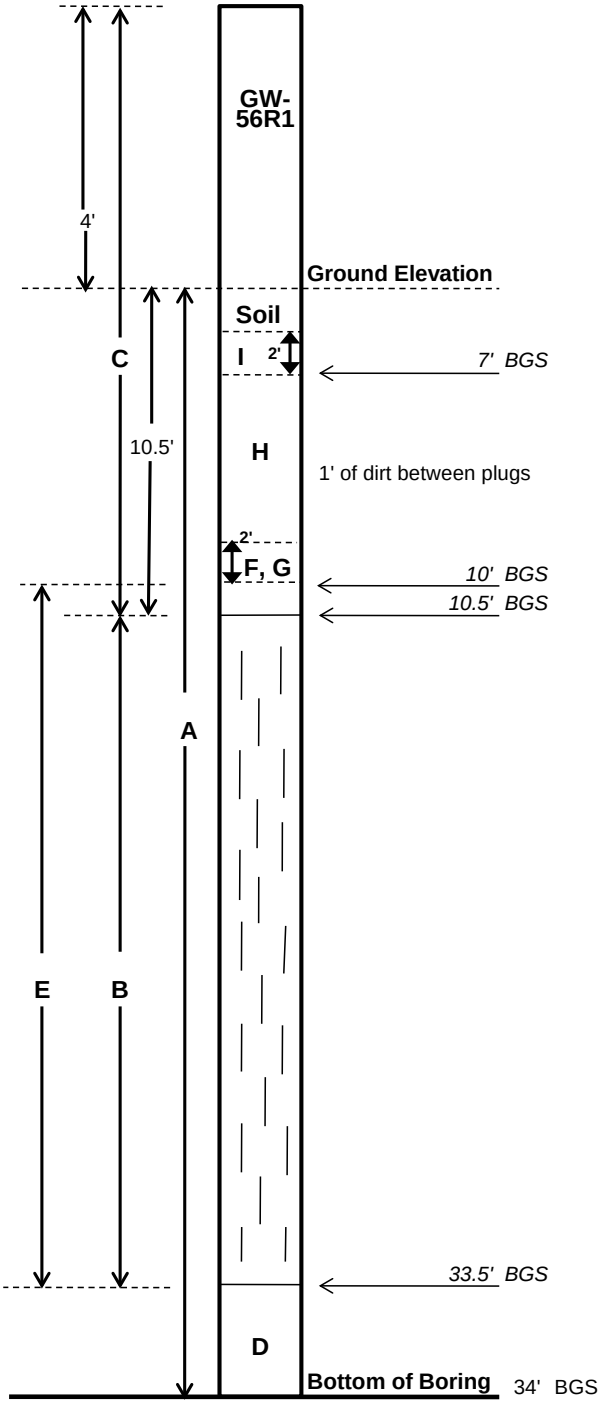
Depth to Top Liner: 15'

Depth to Waste: 10' (4' cap, 6' top soil)

Depth (bgs)	Description*	Temp (F)	Time
0-10	Soil=100% M=10% D=N/A	93.4	8:27
10-20	MSW Soil=15% M=15% D=Moderate	116.3	9:03
20-30	MSW Soil=10% M=15% D=Moderate	116.1	9:43
30-34	MSW Soil=10% M=15% D=Moderate	117.3	10:02
40-50			
50-60			
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Top liner 4' BGS. Well installed per specifications.



CQA Tech Signature:

Date: January 14, 2013

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-93 **Site:** JED Landfill

Project #: 083-82734.25
Onsite Rep: Matt Brazille

Date/Time Began Drilling:	12/12/12 10:07
Date/Time Complete Drilling:	12/12/12 11:37
Northing:	1,355,293.20
Date/Time Began Well Install:	12/12/12 11:45
Date/Time Complete Well Install:	12/12/12 13:15
Easting:	624,077.87
Ground Elevation:	131.8

		Design	Actual
A	Total Depth:	28'	28'
B	Screen Length:	17'	17'
C	Solid Pipe Length:	10'+7'=17'	10'+7'=17'
	# of Centralizers:	0	0

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	28' (ends at 27.5' BGS)
E	(◉) #57 Stone? (○) #89 Stone?	☑	27.5' (ends at 10' BGS)
F	GeoDisc?	☑	10' BGS
G	1st Bentonite Seal?	☑	10' (ends at 8' BGS)
H	Soil Fill to 3' BGS?	☑	8' (ends at 3' BGS)
I	2nd Bentonite Seal?	☑	3' (ends at 1' BGS)

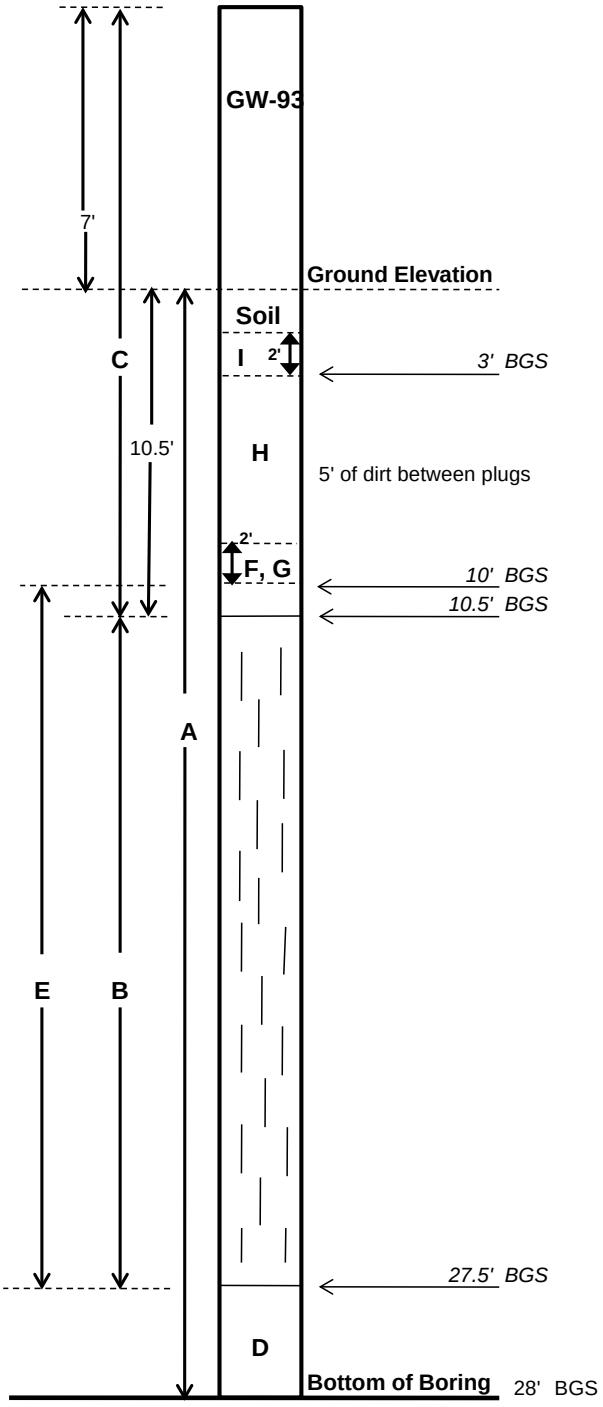
Depth to Top Liner: 15'

Depth to Waste: 2' top soil

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW S=20% M=10% D=Mild	100.7	10:33
10-20	MSW S=10% M=10% D=Mild	117	10:55
20-28	MSW Soil=10% M=15% D=Moderate	115.8	11:37
30-40			
40-50			
50-60			
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Well installed per specifications



CQA Tech Signature: Matthew J. Brazille

Date: January 14, 2013

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-97 **Site:** JED Landfill

Project #: 083-82734.25
Onsite Rep: Matt Brazille

Date/Time Began Drilling:	12/12/12 7:55
Date/Time Complete Drilling:	12/12/12 9:35
Northing:	1,355,165.90
Date/Time Began Well Install:	12/12/12 9:50
Date/Time Complete Well Install:	12/12/12 11:33
Easting:	624,083.10
Ground Elevation:	132.8

		Design	Actual
A	Total Depth:	33'	33'
B	Screen Length:	22'	22'
C	Solid Pipe Length:	10'+7'=17'	10'+7'=17'
	# of Centralizers:	0	0

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	33' (ends at 32.5' BGS)
E	◉ #57 Stone? ○ #89 Stone?	☑	32.5' (ends at 10' BGS)
F	GeoDisc?	☑	10' BGS
G	1st Bentonite Seal?	☑	10' (ends at 8' BGS)
H	Soil Fill to 3' BGS?	☑	8' (ends at 3' BGS)
I	2nd Bentonite Seal?	☑	3' (ends at 1' BGS)

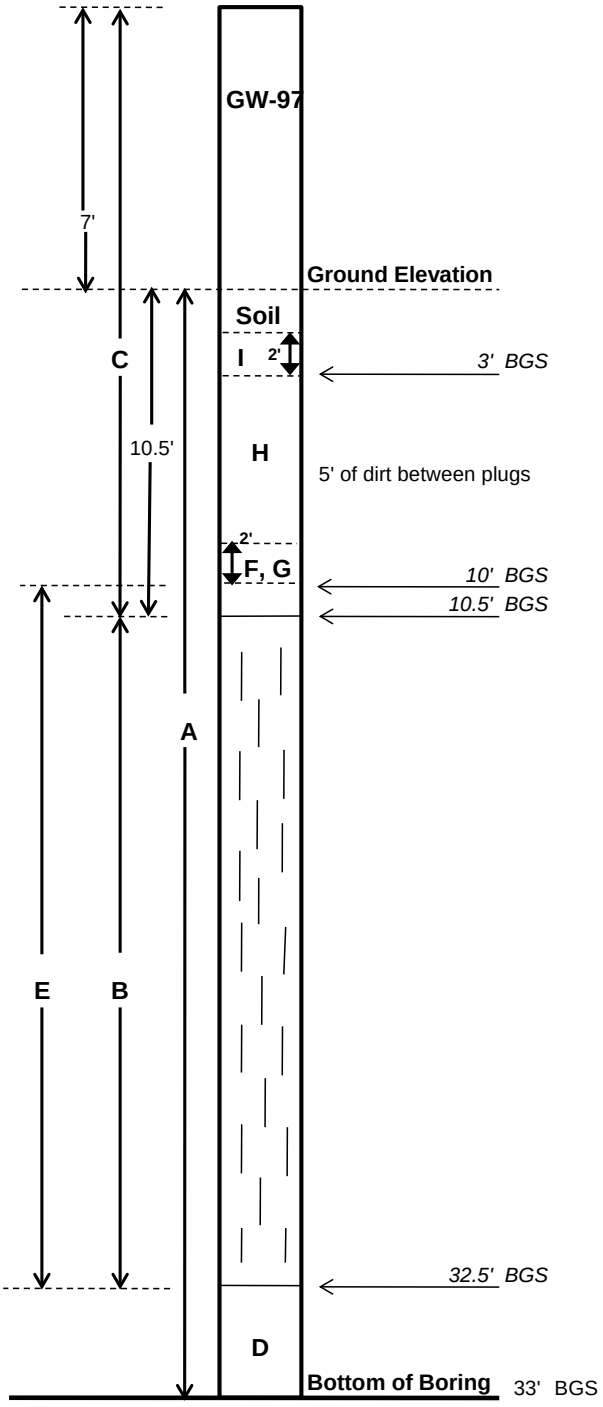
Depth to Top Liner: 15'

Depth to Waste: 2' top soil

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW S=20% M=15% D=Mild	93.4	8:24
10-20	MSW S=10% M=15% D=Mild	124.6	8:47
20-30	MSW Soil=10% M=15% D=Moderate	119.2	9:20
30-33	MSW Soil=10% M=10% D=Moderate	116.5	9:35
40-50			
50-60			
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Well installed per specifications



CQA Tech Signature:

Date: January 14, 2013

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-101 **Site:** JED Landfill

Project #: 083-82734.25
Onsite Rep: Matt Brazille

Date/Time Began Drilling:	12/11/12 14:38
Date/Time Complete Drilling:	12/11/12 16:29
Northing:	1,354,969.40
Date/Time Began Well Install:	12/11/12 16:35
Date/Time Complete Well Install:	12/12/12 9:04
Easting:	624,078.30
Ground Elevation:	130'

		Design	Actual
A	Total Depth:	34'	34'
B	Screen Length:	23'	23'
C	Solid Pipe Length:	10'+6'=16'	10'+6'=16'
	# of Centralizers:	0	0

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	34' (ends at 33.5' BGS)
E	(◉) #57 Stone? (○) #89 Stone?	☑	33.5' (ends at 10' BGS)
F	GeoDisc?	☑	10' BGS
G	1st Bentonite Seal?	☑	10' (ends at 8' BGS)
H	Soil Fill to 3' BGS?	☑	8' (ends at 3' BGS)
I	2nd Bentonite Seal?	☑	3' (ends at 1' BGS)

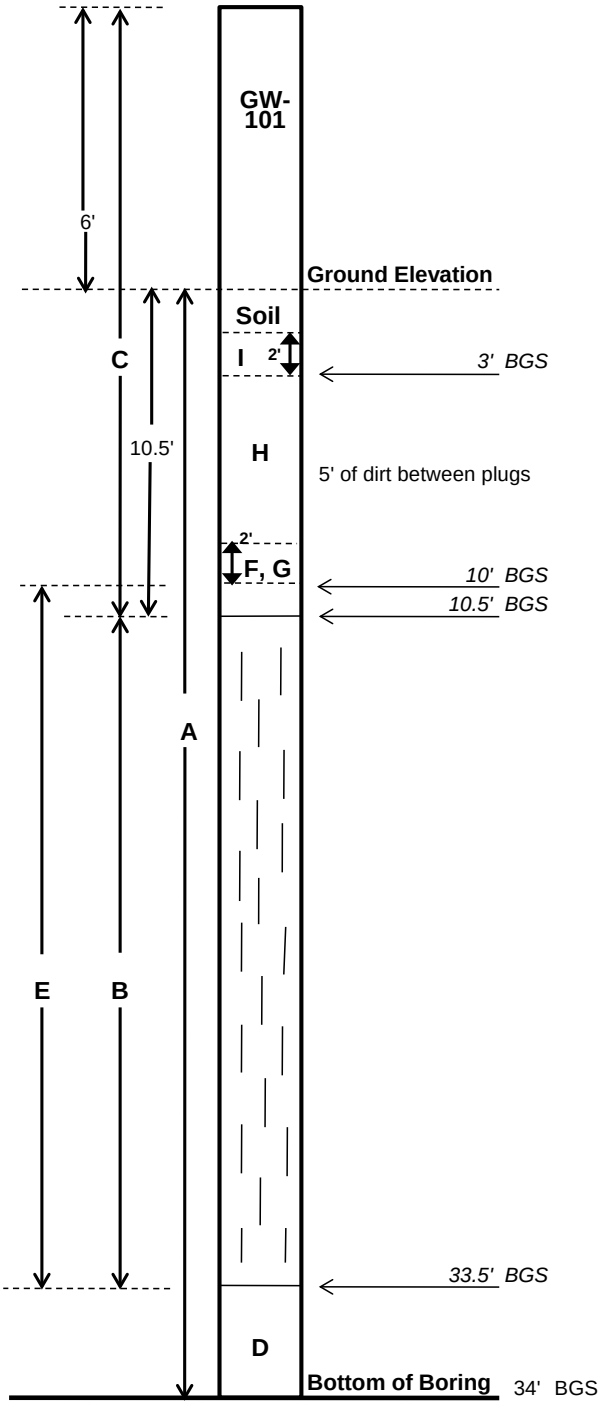
Depth to Top Liner: 15'

Depth to Waste: 3' top soil

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW S=30% M=10% D=Moderate	119.3	15:00
10-20	MSW S=10% M=10% D=Moderate	127.1	15:33
20-30	MSW Soil=10% M=10% D=Moderate	132.3	16:15
30-34	MSW Soil=10% M=10% D=Moderate	121.1	16:29
40-50			
50-60			
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Well installed per specifications. Placed well and stone on the night of 12/11 to prevent collapse and finished installing well on the morning of 12/12.



CQA Tech Signature: Matthew J. Brazille

Date: January 14, 2013

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-105 **Site:** JED Landfill

Project #: 083-82734.25
Onsite Rep: Matt Brazille

Date/Time Began Drilling:	12/11/12 11:20
Date/Time Complete Drilling:	12/11/12 13:54
Northing:	1,354,847.64
Date/Time Began Well Install:	12/11/12 13:57
Date/Time Complete Well Install:	12/12/12 15:55
Easting:	624,078.63
Ground Elevation:	131.4'

		Design	Actual
A	Total Depth:	33'	33'
B	Screen Length:	22'	22'
C	Solid Pipe Length:	10'+6'=16'	10'+6'=16'
	# of Centralizers:	0	0

	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	33' (ends at 32.5' BGS)
E	◉ #57 Stone? ○ #89 Stone?	☑	32.5' (ends at 10' BGS)
F	GeoDisc?	☑	10' BGS
G	1st Bentonite Seal?	☑	10' (ends at 8' BGS)
H	Soil Fill to 3' BGS?	☑	8' (ends at 3' BGS)
I	2nd Bentonite Seal?	☑	3' (ends at 1' BGS)

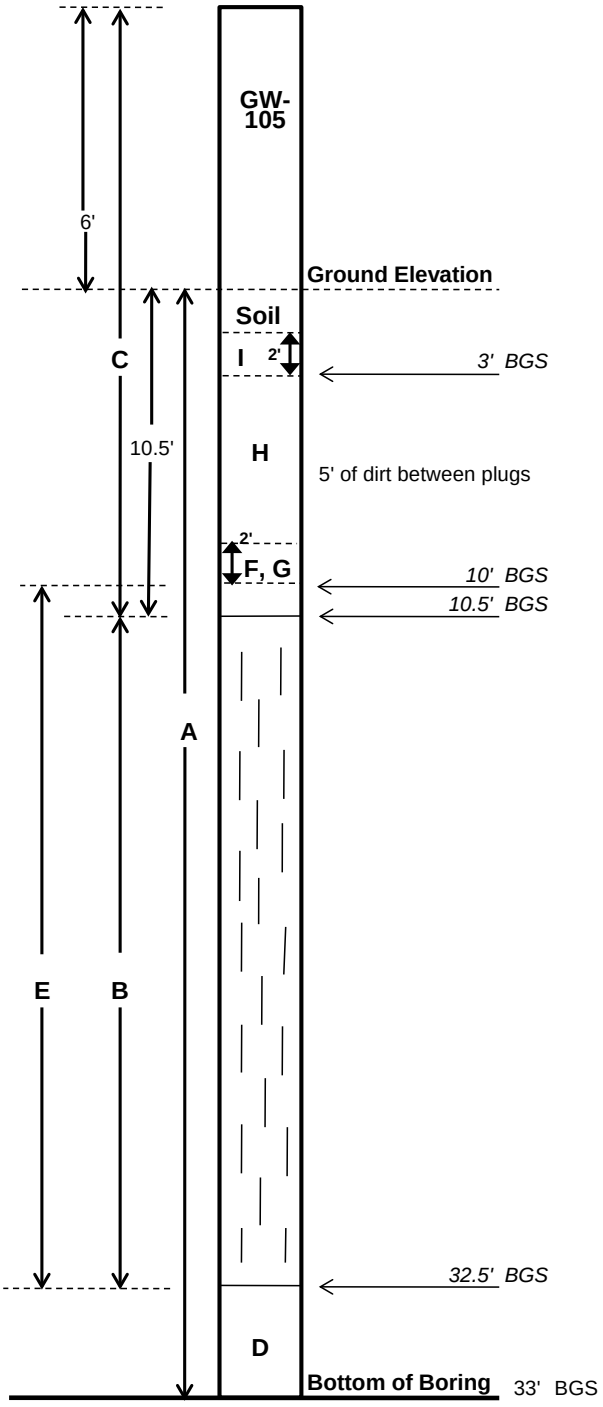
Depth to Top Liner: 15'

Depth to Waste: 1' top soil

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW S=30% M=15% D=Mild	117.8	12:44
10-20	MSW S=15% M=10% D=Moderate	126.4	13:09
20-30	MSW Soil=10% M=10% D=Moderate	117.6	13:45
30-33	MSW Soil=10% M=10% D=Moderate	119.7	13:54
40-50			
50-60			
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition

Notes: Well installed per specifications.



CQA Tech Signature:

Date: January 14, 2013

Landfill Gas Extraction Well Boring and Construction Log

Well ID: GW-46R1 **Site:** JED Landfill

Project #: 083-82734.25
Onsite Rep: Matt Brazille

Date/Time Began Drilling:	12/13/12 8:15
Date/Time Complete Drilling:	12/13/12 10:09
Northing:	1,356,997.92
Date/Time Began Well Install:	12/13/12 12:35
Date/Time Complete Well Install:	12/13/12 14:01
Easting:	625,111.32
Ground Elevation:	133.7'

		Design	Actual
A	Total Depth:	35'	35'
B	Screen Length:	24'	24'
C	Solid Pipe Length:	10'+4'=14'	10'+6'=16'
	# of Centralizers:	0	0

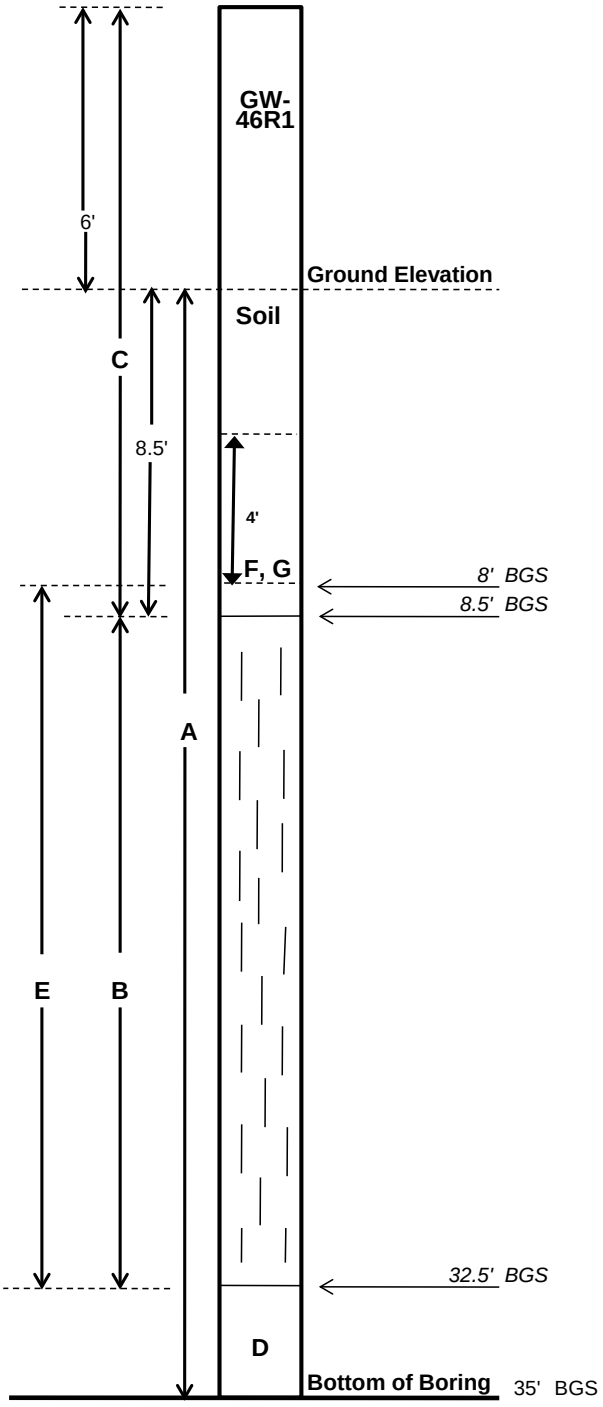
	Checklist		BGS *(to top of layer)*
D	0.5' of #57 Stone?	☑	33' (ends at 32.5' BGS)
E	◉ #57 Stone? ○ #89 Stone?	☑	32.5' (ends at 8' BGS)
F	GeoDisc?	☑	8' BGS
G	1st Bentonite Seal?	☑	8' (ends at 4' BGS)
H	Soil Fill to 3' below liner?	☐	N/A
I	2nd Bentonite Seal?	☐	N/A

Depth to Top Liner: 15'

Depth to Waste: 5' (3' of cap, 2' of top soil)

Depth (bgs)	Description*	Temp (F)	Time
0-10	MSW S=50% M=10% D=Moderate	92.8	8:44
10-20	MSW S=15% M=15% D=Severe	102.7	9:19
20-30	MSW Soil=10% M=70% D=Severe	103.6	9:42
30-35	MSW Soil=10% M=40% D=Severe	100.2	10:09
40-50			
50-60			
60-70			
70-80			
80-90			
90-100			
100-110			

*Key: M=Moisture Content, D=Decomposition



Notes: Hit top liner at 3' BGS. Hit liquids at 32' BGS, but were able to drill through to full depth. Boring caved in 2' before well could be installed due to liquids; left the additional 2' of stickup in place per Keith's request. Set well 6" above bottom of boring. Due to top liner and 2' cave in, a double bentonite plug 4' in depth was installed with Keith's approval.

CQA Tech Signature: Matthew J. Brazille Date: January 14, 2013

APPENDIX F

PHOTOGRAPHIC DOCUMENTATION OF CONSTRUCTION ACTIVITIES

PHOTOGRAPHS

Photograph 1: Gravel backfill for extraction wells. Lab analysis: gravel finer than ¾" sieve is 6.2%, gravel finer than No. 4 sieve is 1.2%, 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 solid PVC pipe.

Photograph 4: 8" SCH 80 PVC slot width.

Photograph 5: 8" SCH 80 PVC 45° apart, staggered rows.

Photograph 6: 6" HDPE SDR 17 pipe.

Photograph 7: 14" HDPE SDR 17 pipe.

Photograph 8: 18" HDPE SDR 17 pipe.

Photograph 9: HDPE SDR 17 hard weld showing acceptable bead.

Photograph 10: Fusion hot plate showing acceptable temperature (typical).

Photograph 11: Tie-in to existing gas conveyance header.

Photograph 12: Air testing gas conveyance system in Cell 8 (passed).

Photograph 13: Standard trench for lateral (typical).

Photograph 14: Applying PVC primer and cement when joining well casing joints (typical).

Photograph 15: Lag bolting joints to provide additional support (typical).

Photograph 16: Backfilling extraction well with approved stone (typical).

Photograph 17: Applying geotextile donut at extraction well (typical).

Photograph 18: Hydrating bentonite plug at extraction well (typical).

Photograph 19: Adding sandy soil backfill in between bentonite plugs (typical).

Photograph 20: 6" lateral tie-in to 12" header in Cell 7 (typical).

Photograph 21: Backfilled trench. Caution tape applied and survey posts every 50' and at points of interest (typical).

Photograph 22: Verifying minimum 5% slope for laterals and header while trenching (typical).

Photograph 23: Placement of pre-assembled U-trap (typical).

Photograph 24: Cutting and capping abandoned well casing minimum 1' below liner (typical).

Photograph 25: Repairing liner over abandoned well casing (typical).

Photograph 26: 90° 6" elbow with riser for wellhead vacuum source (typical).

Photograph 27: 18" x 12" header reducer in Cell 8.

Photograph 28: Installation of 12" x 6" electro fusion saddle for horizontal gas collector lateral tie-in in Cell 7 (typical).

Photograph 29: 18" and 12" valves and blind flanges in Cell 8 for future expansion.

Photograph 30: Tie-in to existing 6" lateral for well GW-28B in capped area of landfill.

Photograph 31: Trenching with mini-excavator in capped areas to prevent damage (typical).

Photograph 32: 12" x 6" electro fusion saddle with riser for clean out at U-trap in Cell 7 (typical).

Photograph 33: 6” U-trap drain line tie-in to existing 6” cleanout (typical).

Photograph 34: 6” lateral tie-in to existing horizontal gas collector (typical).

Photograph 35: Leachate infiltration in Cell 6.

Photograph 36: Removal of existing 6” riser pipe in Cell 6.

Photograph 37: Capping and abandoning existing 6” line and relocating 6” riser pipe in Cell 6.

Photograph 38: 6” HDPE 45° elbow to re-route U-trap drain line towards 24” primary sump in Cell 6.

Photograph 39: Verifying sufficient below ground fall while trenching in Cell 6 (typical).

Photograph 40: 24” x 6” electro fusion saddle reduced to a 4” valve and 4” 90° elbow in Cell 7 (typical).

Photograph 41: 4” laterals increasing to 6” HDPE SDR 17 with a vertical riser in Cell 7 (typical).

Photograph 42: 18” valve box (typical).

Photograph 43: Installing 24” x 6” electro fusion saddle on 24” primary sump in Cell 8 (typical).

Photograph 44: 4” lateral with 2” risers to tie-in 1 existing 2” PVC well and 2 new 2” PVC wells in Cell 5.

Photograph 45: WSI crew staking horizontal gas collector (HGC) locations.

Photograph 46: 10” HDPE SDR 11 pipe for HGC’s

Photograph 47: 10” HDPE SDR 11 perforation size and spacing.

Photograph 48: Excavation hole for sumps at low points along HGC (typical).

Photograph 49: Tire chips used for drainage fill in HGC trenches (typical).

Photograph 50: 10” HDPE SDR 11 pipe weld (typical).

Photograph 51: Placing horizontal gas collector into excavated trench (typical).

Photograph 52: Covering HGC pipe with tire chips (typical).

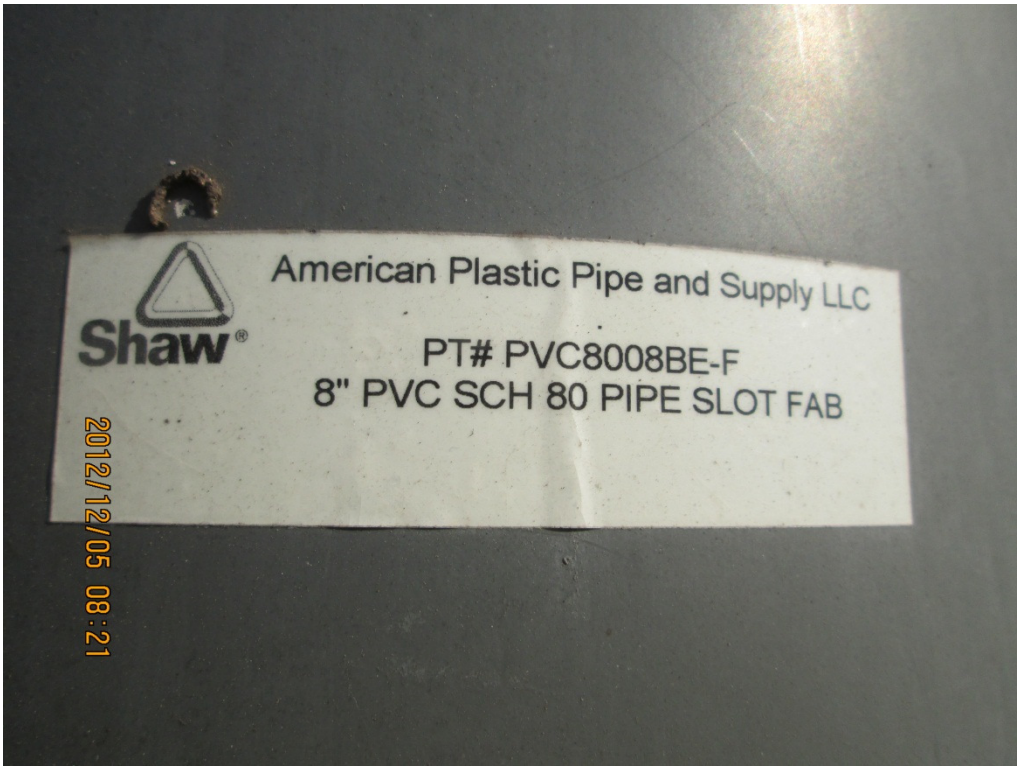
Photograph 53: Placing filter fabric over tire chips and HGC piping (typical).

Photograph 54: Covered HGC with waste (typical).

Photograph 55: Covering solid pipe sections of HGC with clean fill (typical).

Photograph 1: Gravel backfill for extraction wells. Lab analysis: gravel finer than ¾" sieve is 6.2%, gravel finer than No. 4 sieve is 1.2%, gravel finer than No. 200 sieve is 0.2%, carbonate content is 0.1%.

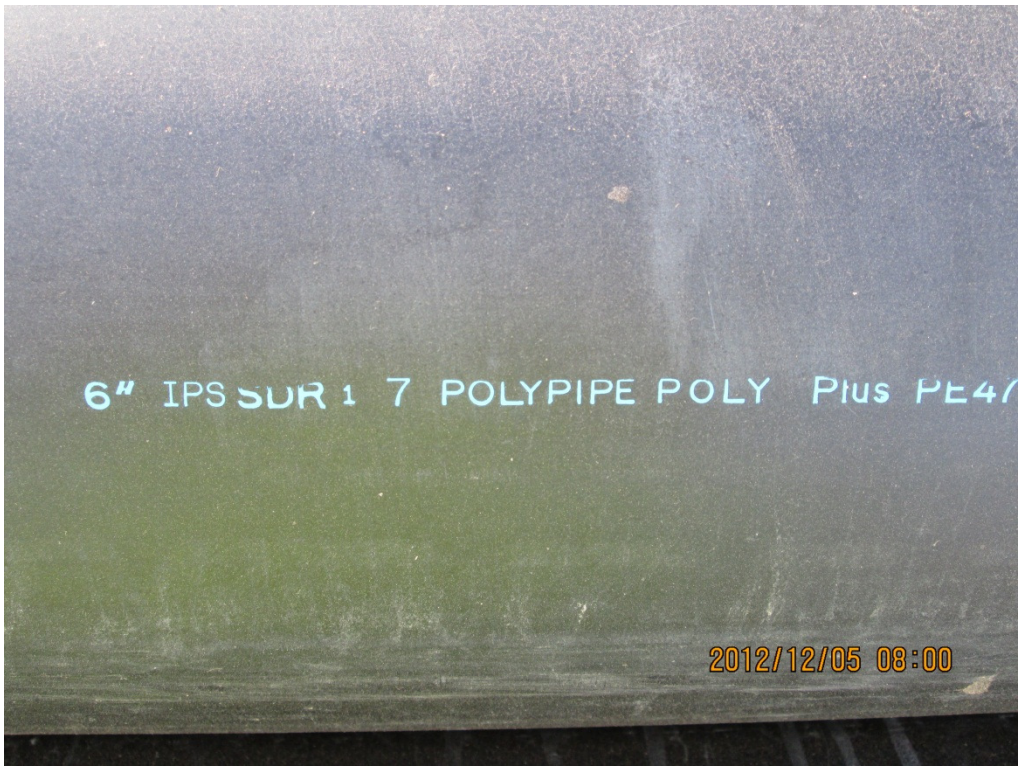
Photograph 2: 8" SCH 80 slotted PVC pipe.



Photograph 3: 8” SCH 80 slotted PVC pipe manufacturer’s label.

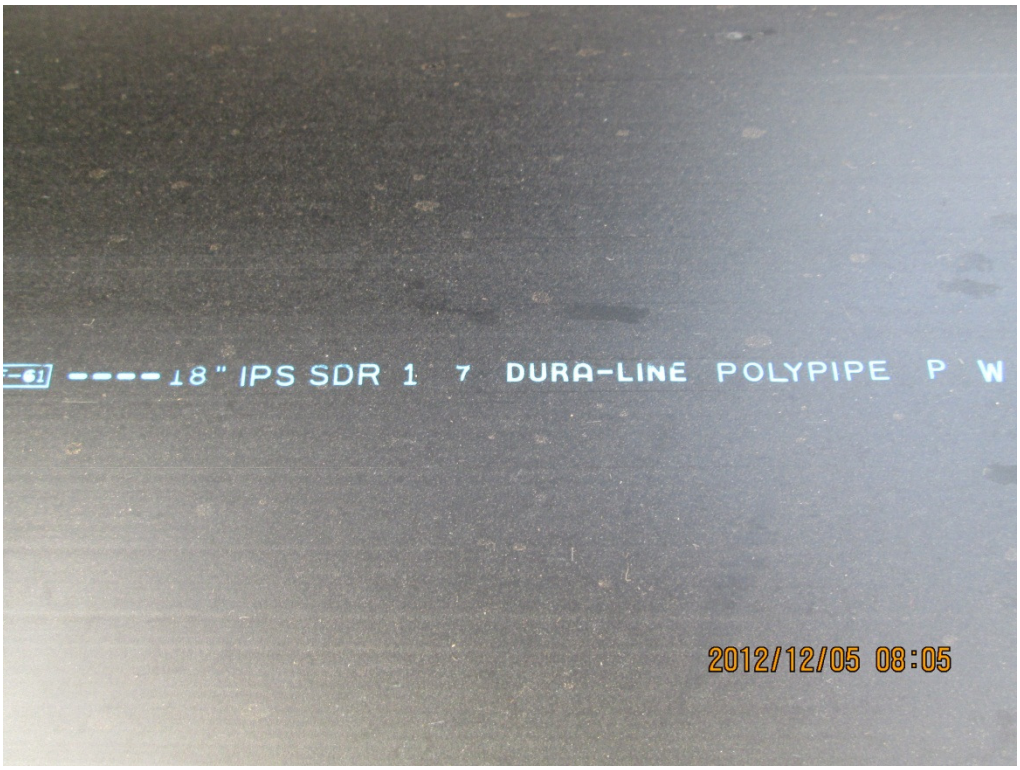
Photograph 4: 8” SCH 80 PVC sloth width.

Photograph 5: 8” SCH 80 PVC 45° apart, staggered rows.

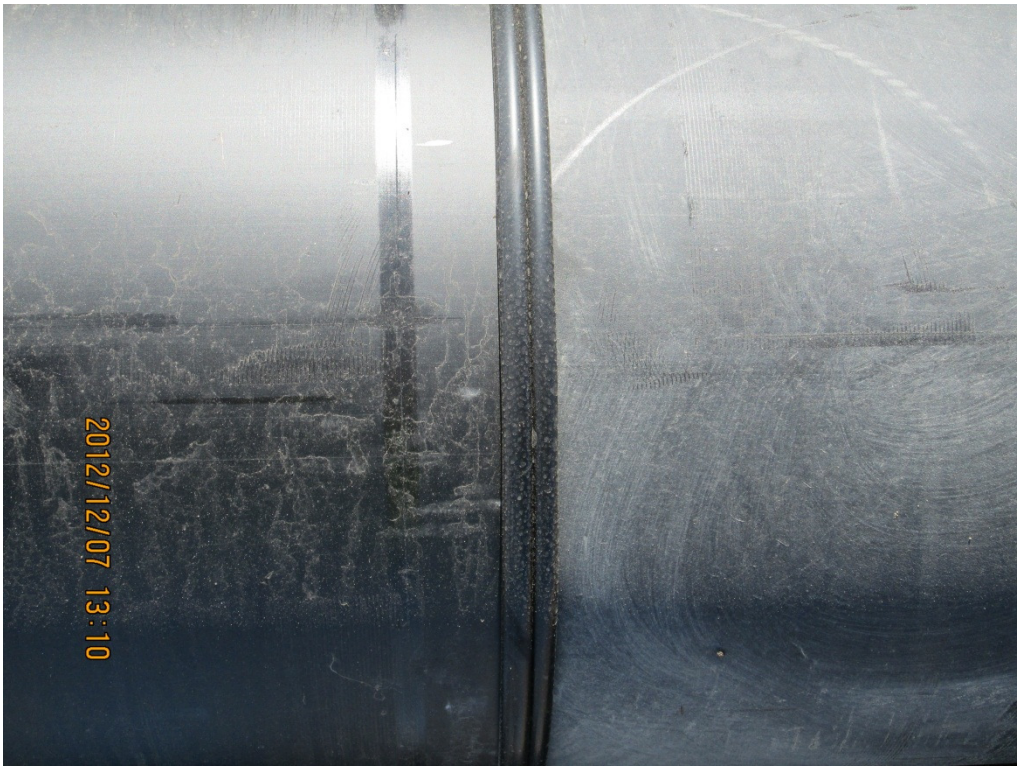


Photograph 6: 6” HDPE SDR 17 pipe.

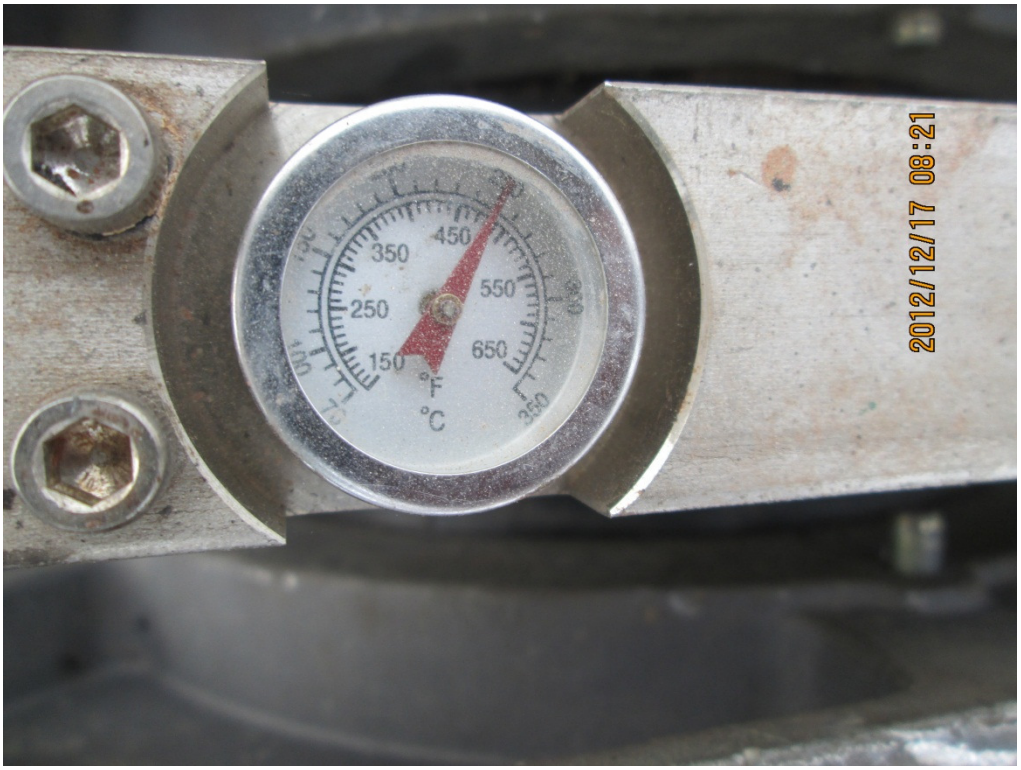
Photograph 7: 14” HDPE SDR 17 pipe.



Photograph 8: 18” HDPE SDR 17 pipe.



Photograph 9: HDPE SDR 9 hard weld showing acceptable bead.



Photograph 10: Fusion hot plate showing acceptable temperature (typical).

Photograph 11: Tie-in to existing gas conveyance header.

Photograph 12: Air testing gas conveyance system in Cell 8 (passed).

Photograph 13: Standard trench for lateral (typical).

Photograph 14: Applying PVC primer and cement when joining well casing joints (typical).

Photograph 15: Lag bolting joints to provide additional support (typical).

Photograph 16: Backfilling extraction well with approved stone (typical).

Photograph 17: Applying geotextile donut at extraction well (typical).

Photograph 18: Hydrating bentonite plug at extraction well (typical).

Photograph 19: Adding sandy soil backfill in between bentonite plugs (typical).

Photograph 20: 6” lateral tie-in to 12” header in Cell 7 (typical).

Photograph 21: Backfilled trench. Caution tape applied and survey posts every 50' and at points of interest (typical).

Photograph 22: Verifying minimum 5% slope for laterals and header while trenching (typical).

Photograph 23: Placement of pre-assembled U-trap (typical).

Photograph 24: Cutting and capping abandoned well casing minimum 1' below liner (typical).

Photograph 25: Repairing liner over abandoned well casing (typical).

Photograph 26: 90° 6” elbow with riser for wellhead vacuum source (typical).

Photograph 27: 18” x 12” header reducer in Cell 8.

Photograph 28: Installation of 12” x 6” electro fusion saddle for horizontal gas collector lateral tie-in in Cell 7 (typical).

Photograph 29: 18” and 12” valves and blind flanges in Cell 8 for future expansion.

Photograph 30: Tie-in to existing 6” lateral for well GW-28B in capped area of landfill.

Photograph 31: Trenching with mini-excavator in capped areas to prevent damage (typical).

Photograph 32: 12” x 6” electro fusion saddle with riser for clean out at U-trap in Cell 7 (typical).

Photograph 33: U-trap drain line tie-in to existing 6” cleanout in Cell 7 (typical).

Photograph 34: 6” lateral tie-in to existing horizontal gas collector (typical).

Photograph 35: Leachate infiltration in Cell 6.

Photograph 36: Removal of existing 6” riser pipe in Cell 6.

Photograph 37: Capping and abandoning existing 6” line and relocating 6” riser pipe in Cell 6.

Photograph 38: 6” HDPE 45° elbow to re-route U-trap drain line towards 24” primary sump in Cell 6.

Photograph 39: Verifying sufficient below ground fall while trenching in Cell 6 (typical).

Photograph 40: 24” x 6” electro fusion saddle reduced to a 4” valve and 4” 90° elbow in Cell 7 (typical).

Photograph 41: 4” Laterals increasing to 6” HDPE SDR 17 with a vertical riser in Cell 7 (typical).

Photograph 42: 18” valve box (typical)

Photograph 43: Installing 24” x 6” electro fusion saddle on 24” primary sump in Cell 8 (typical).

Photograph 44: 4” lateral with 2” risers to tie-in 1 existing 2” PVC well and 2 new 2” PVC wells in Cell 5.

Photograph 45: WSI crew staking horizontal gas collector (HGC) locations.

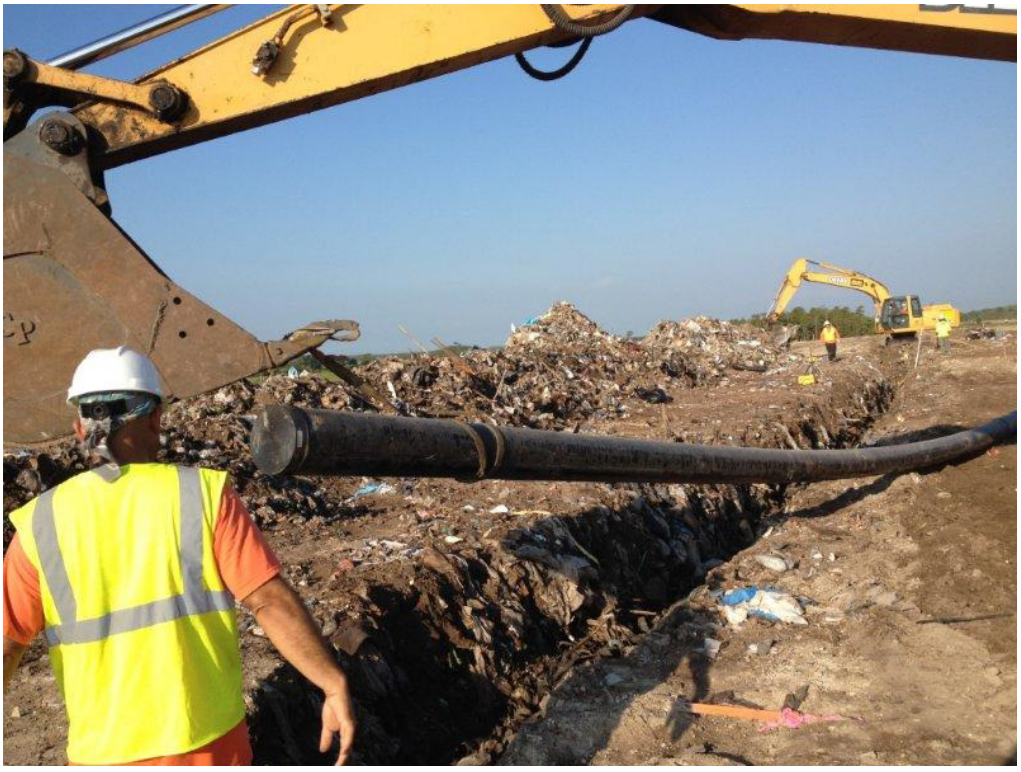
Photograph 46: 10” HDPE SDR 11 pipe for HGC’s.

Photograph 47: 10” HDPE SDR 11 perforation sizing and spacing.

Photograph 48: Excavation hole for sumps at low points along HGC (typical).

Photograph 49: Tire chips used for drainage fill in HGC trenches (typical).

Photograph 50: 10” HDPE SDR 11 pipe weld.



Photograph 51: Placing horizontal gas collector into excavated trench (typical).

Photograph 52: Covering HGC pipe with tire chips (typical).

Photograph 53: Placing filter fabric over tire chips and HGC piping (typical).

Photograph 54: Covered HGC with waste (typical).

Photograph 55: Covering solid pipe sections of HGC with clean fill (typical).

APPENDIX G
AGGREGATE BACKFILL LABORATORY TEST RESULTS

WSI/DECEMBER 2012 GCCS 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)		
AG-JED-1	Bulk	-	GP	-	-	-	-	-	6.2	1.2	0.2	-	-		-	-	0.1	-

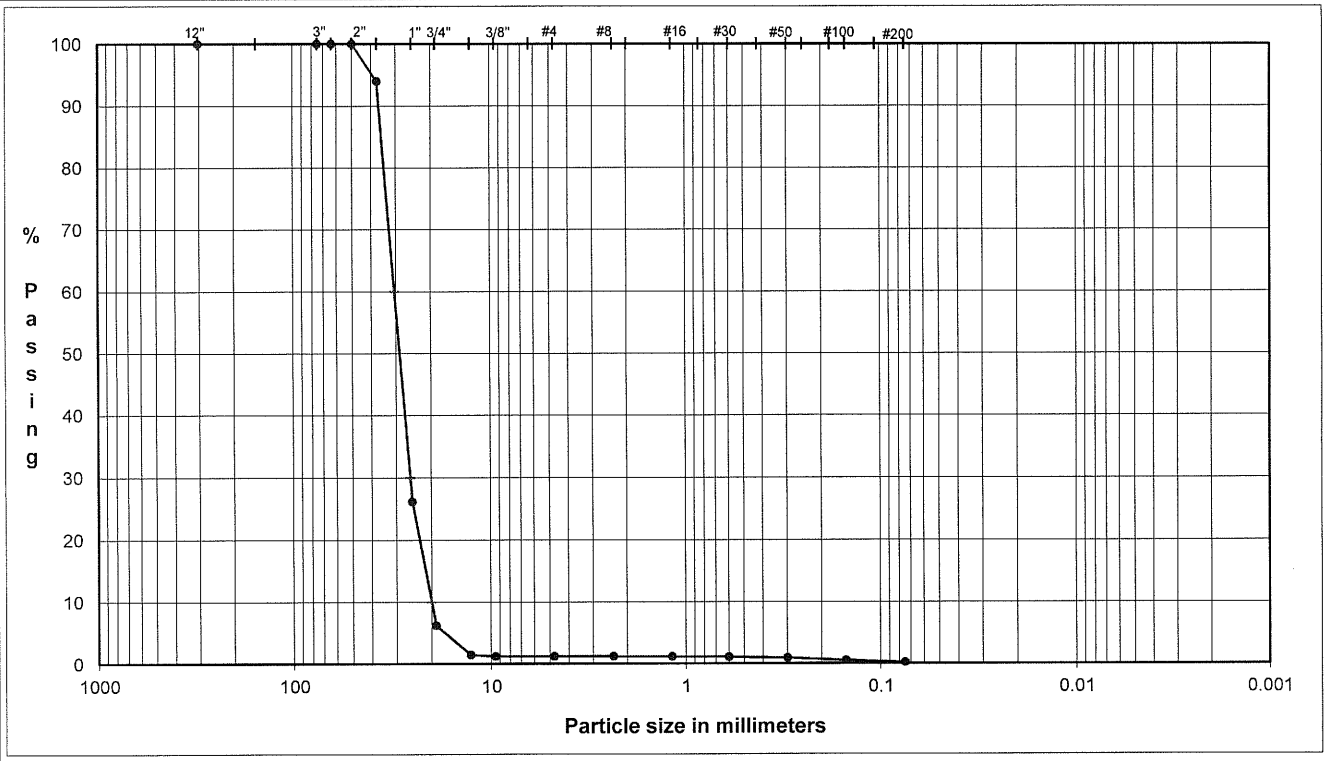
ABBREVIATIONS: LIQUID LIMIT (LL)
PLASTIC LIMIT (PL)
PLASTICITY INDEX (PI)
LIQUIDITY INDEX (LI)
SPECIFIC GRAVITY (Gs)
MOISTURE (Mc)

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

PARTICLE SIZE DISTRIBUTION

ASTM C117, C136

PROJECT NAME: **WSI/DECEMBER 2012 GCCS CQA/FL**
SAMPLE ID: **AG-JED-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	Particle Size Percentage
12.0"	304.8	**100.0**		
3.0"	75	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50	**100.0**		
1.5"	37.5	**94.0**		
1.0"	25	**26.1**		
0.75"	19	**6.2**	Coarse Gravel	**93.8**
0.50"	12.7	**1.5**		
0.375"	9.5	**1.2**		
#4	4.75	**1.2**	Fine Gravel	**5.0**
#8	2.36	**1.2**	Coarse Sand	**0.0**
#16	1.18	**1.2**		
#30	0.60	**1.1**	Medium Sand	**0.2**
#50	0.30	**1.0**		
#100	0.15	**0.6**		
#200	0.075	**0.2**	Fine Sand	**0.8**
			Fines	**0.2**

D_{60}= 30.6	D_{30}= 25.6	D_{10}= 20.0
Cu = D60/D10 =	**1.5**	< 4
Cc = D30^2/(D10*D60) =	**1.1**	> 1

DESCRIPTION: Gray, COARSE GRAVEL, trace medium to fine sand, trace fines.

USCS: GP

M_c

TECH	TW
DATE	12/5/12
CHECK	TW
REVIEW	DB
APPROVE	

Golder Associates Inc.

CARBONATE CONTENT
ASTM D 3042 - MODIFIED

PROJECT TITLE	**WSI/DECEMBER 2012 GCCS CQA/FL**
PROJECT NUMBER	**083-82734-25**
SAMPLE ID	**AG-JED-1**

Residue +Tare weight (g)	600.75	601.77	618.01
Tare Weight (g)	82.43	83.05	83.27
Residue weight (g)	518.32	518.72	534.74

After Acid Application and Wash

Residue + Tare weight (g)	600.12	601.42	617.68
Residue weight (g)	517.69	518.37	534.41
Carbonate Content (%)	0.1	0.1	0.1

Average Carbonate Content (%) **0.1**

REMARKS pH 4 HCl acid was used

SAMPLE DESCRIPTION Gray, COARSE GRAVEL, trace medium to fine sand, trace fines.

USCS GP

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

TECH	**SDM/TW/TJ**
DATE	**12/5/12**
CHECK	TW
REVIEW	DH
APPROVE	

APPENDIX H

CONSTRUCTION QUALITY ASSURANCE ENGINEER FIELD MONITORING REPORTS

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw

DATE 9/6/12 S M T W (T) F S

THE FOLLOWING WAS NOTED:

0630 - Golder onsite. Check In w/ Don Greig
0700 - Shaw onsite and mobilizing. Safety Meeting held. 6 men onsite.
0710 - Shaw arrived for project on Wednesday (9-5-12) and broke ground at around 1330. Excavation began on HGC-8 starting from the end cap and working towards the tie-in. Approximately 100-ft of trench was excavated and the bottom filled with tire chips. The first sump was also excavated and filled with tire chips.
0820 - Keith Lunsford (WSI) arrived on site to discuss construction schedule and changes to construction plans. The HGC design calls for all perforated pipe to be placed at a minimum 5% slope. Keith Lunsford and Mike Kaiser instructed Shaw to place perf. pipe at a 3% slope, ~~After discussion and depth checks~~ BKP in an effort to avoid compromise of the protective cover for cell floor. After discussion and depth checks, Shaw was given the go-ahead by WSI to place pipe at 4% slope, minimum. Also, due to changes (previously discussed between WSI & Golder) in cell construction from design, the location of the end cap was moved 50-ft west (into the cell). This change shortens the overall length and also sets the length of solid pipe to 150-ft (approximately).

Keith will survey top-of-pipe as Shaw installs pipe.
0845 - The first 400-ft of perf. pipe welded and beginning to be placed into trench, covered with tire chips, and covered with textile. Trench then backfilled with trash.

Shaw Equipment List:
- 2 x John Deere 200C LC Excavators
- 1 x Skytrack 8042 Forklift
- 1 x John Deere Offroad Dump Truck 250D
- 1 x Kubota side-by-side ATV

1010 - Remainder of HGC-8 path staked by Keith. High & low points marked.
1100 - Keith surveying first 3 points of HGC-8: HGC-8 EndCap HP
HGC-8 TP 10inch
HGC-8 Sump1
Survey points will be emailed to Golder after HGC-8 survey complete.
1332 - 1 x John Deere 544K front loader delivered to site.
1345 - Welding of perforated pipe for HGC-8 completed.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw

DATE 9/6/12 S M T W (T) F S

THE FOLLOWING WAS NOTED:

1530- Tires ~~chips~~ BKP are being hauled offsite to be chipped and hauled back for HGC installation. WSI discussed quantities of tire chips being used in a effort to estimate a per 100 lf of pipe tire chip quantity. Shaw estimates 9 or 10 truck loads total will be needed for all of HGC-8.

1620- WSI estimates ~~2700 tons/lf of pipe~~ BKP 4 of tire chips 27 tons/100 ft of pipe

lf ≡ linear foot

1645 - Golder and Shaw offsite. Rain moving into area.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw

DATE 9/7/12 S M T W T (F) S

THE FOLLOWING WAS NOTED:

0710 - Golder arrived onsite. Shaw onsite, conducting safety meeting and mobilizing. 1480 lf of perforated pipe delivered to the site.
0800 - Shaw continueing HGC-8 installation.
0815 - Pipe cover is minimal or non-existant at remaining high points for HGC-8 due to two factors; the change from 3% slope to 4% slope after 100ft of trench was already excavated and the current landfill grade slopes downward, as HGC-8 approaches the tie-in, between 1 and 2%.

The top-of-pipe elevation at HP2 is slightly above grade. Shaw will mound cover/trash around the trench to ensure 1.5 ft of tire chip cover over pipe. Once covered with textile, the trash layer will mound over the trench and Shaw will track over the mound and smooth out grade to protect HGC-8.
0850 - Shaw will maintain a 3ft depth at the ~~the~~ remaining high points. Approach and departure slopes will remain 4%, however once the trench depth reaches 3ft when approaching a high point, the slope will flatten out up to the high point.
0950 - Shaw excavating 4th and final sump for HGC-8.
1050 - Keith onsite for survey and to check high point issues. Keith found 2 areas that were less than 3% in slope. There was room to lower the low points and rework the trench from Sump 4 to Highpoint 5. Shaw was asked to fix these areas and Keith will return after lunch to reshoot.
1415 - Shaw continueing to excavate trench. Keith back onsite to reshoot points and check slopes. See attached table for details. All slopes checked out.
1500 - All perforated pipe placed in trench and remaining points shot by Keith.
1615 - Shaw backfilling up to last survey point and excavating remainder of trench up to tie-in. The Y-connection at tie-in does not align with trench as designed, but instead is at an angle pointing northeast. Shaw is curving the trench as ~~approaching~~ it approaches the tie-in to align trench and pipe with the Y-fitting.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw

DATE 9/7/12 S M T W T (F) S

THE FOLLOWING WAS NOTED:

Slope Check for Perforated Pipe: HGC-8

Point Name	Slope(%)	Point Name	Slope(%)
HP1 (end cap)		Sump 4	
	1.9		3.0
10in 1		10in 8	
	3.0		2.7
Sump 1		HP5	
	3.2		
10in 2		End of Perforated Pipe	
	4.1		
HP2			
	3.7		
10in 3			
	3.0		
Sump 2			
	3.5		
10in 4			
	3.2		
HP3			
	3.4		
10in 5			
	5.5		
Sump 3			
	4.4		
10in 6			
	2.9		
HP4			
	3.8		
10in 7			
	7.5		
Sump 4			

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw

DATE 9/8/12

S M T W T F (S)

THE FOLLOWING WAS NOTED:

0710 - Golder and Shaw onsite.
0720 - Shaw mobilizing
0800 - Shaw setting up equipment for solid pipe fusion to tie-in. Electrofusion.
0815 - Shaw stockpiling soil for solid pipe fill (backfill)
Shaw also opened cleanout for HGC-8 and monitored for gas before work on tie-in starts. No gas.
Cap on tie-in cut with chain saw. Shaw check for gas again. No gas.
0830 - Solid pipe and coupler fitted to tie-in.
0922 - Solid pipe fused to tie-in. Shaw letting weld ~~sit~~ cool and set before placing pipe in trench.
Shaw starting to fill trench with soil for pipe base.
0930 - Shaw backfilling over perforated pipe with tire chips, textile, and trash while tie-in fuse cools.
1025 - Shaw backfilling remainder of trench with soil and placing solid pipe into trench.
1125 - Solid pipe fused to perforated pipe.
1145 - Golder and Shaw off site.

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MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw

DATE 9/10/12 S (M) T W T F S

THE FOLLOWING WAS NOTED:

0710 - Golder and Shaw onsite.
0730 - Shaw finalizing slopes on last 50-ft of perforated pipe
0800 - Shaw placing remainder of HGC-8 into trench and staging lengths of perforated pipe to weld for HGC-6.
0900 - ~~covering~~ Shaw backfilling over HGC-8 and welding perforated pipe for HGC-6.
0920 - Keith on site for HGC-8 as-built survey
1015 - Keith staking first 266' of HGC-6 starting at end cap. Golder recording surface elevations and checking for pipe cover issues w/ 4% slope.
1030 - HGC Lengths: HGC-8: 959 LF installed (800' perf)
HGC-6: 865 LF designed (745' perf)
HGC-1: 509 LF designed
Keith (WSI) and Shaw have determined there are sufficient amount of tire chips on site for remaining work (HGC-6 + HGC-1). Approximately 9 truckloads were used for HGC-8. WSI has 300 tons of chips up near HGC-1 and nearly 9 truckloads near HGC-6.
1050 - Both excavators serviced today (1 at a time) and flat tire replaced on front-end loader.
1105 - Excavaton of HGC-6 started.
1315 - Shaw placing tire chips at bottom of HGC-6 trench as excavation continues. A light rain moves in.
1325 - Shaw placing perforated pipe into trench. Sump #1 excavated to 14 ft below grand surface, creating a 6ft deep sump.
1525 - Shaw excavated to the second hight point and stopped because of operations. Pipe is in trench and Keith surveying 50' pts while Shaw covers the pipe with tire chips.
1635 - Shaw covering trench w/ textile and trench up to 115ft mark from end cap. Landfill operations will move tippers to this location tomorrow.
1745 - Shaw and Golder offsite.

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MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw

DATE 9/11/12 S M T W T F S

THE FOLLOWING WAS NOTED:

0830- Golder and Shaw arrived onsite.
0850- WSI moving first tipper. Shaw backfilling tie-in area for HGC-8.
0945- Work area very congested with landfill operations on all sides of HGC-6. Once Shaw installs pipe up to Sump #2 and backfills the trench, WSI will move remaining tippers across HGC-6.
1038- Pipe in trench up to 50-ft mark between HP2 and Sump 2. Keith on site to survey HP2. Slope from 50-ft mark to HP2 is 4.2%.
WSI spreading fill over first 100-ft of HGC-6.
John Deere 250D dump truck taken off site.
1322- Keith (WSI) staking 50-ft marks for HGC-6. Golder recording surface elevations for pipe cover check. Landfill slopes down towards HP3, therefore Shaw will approach at a 3% slope.
1330- 2nd tipper moving
1345- 3rd tipper moving
1400- Sump #2 excavated to 15½-ft below ground surface.
1530- Shaw excavation at HP3.
1545- Keith (WSI) onsite for as-built survey and staking more points for HGC-6. Slope from HP2 to 50ft mark was 3.9% and slope from 50-ft mark to Sump #2 was 4.8%.
After staking and pipe cover calculations by Golder, Shaw will slope down at 6% and up at 3% because of the landfill grade falling at approximately 2%.
1620- Excavation nearly at Sump #3 and backfilling 150-ft behind excavation.
1645- Golder and Shaw offsite.

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MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw

DATE 9/12/12 S M T (W) T F S

THE FOLLOWING WAS NOTED:

0710 - Golder and Shaw onsite. Shaw mobilizing and conducting safety meeting
0740 - Excavation of HGC-6 trench continues. Shaw restaking points that were buried by operations (landfill).
0815 - WSI has assigned an excavator to clear a 30-ft wide work area for HGC-1.
0850 - Sump #3 excavated to 16-ft below ground surface.
0915 - Shaw welding remainder of perforated and solid pipe. Shaw's loader out of service with 4 flat tires. Front-end Loader. One excavator receiving service as well.
1100 - Excavator back in service.
1320 - All perforated pipe has been welded together for HGC-6.
1337 - Shaw excavation reached Sump #4. Sump approximately 17ft below ground surface
1415 - Keith Lunsford and Mike Kaiser on site.
Slope check: Sump 2 > 3.4% > 10in 3 > HP 3 > 2.8% > 10in 4 > 5.4% > Sump 3 > 5.4%
1540 - Excavation complete for today. High Point 5 was reached, final point before approach to tie-in. Tire-chip placement continues. Backfilling continues.
1630 - Golder and Shaw leave site.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw

DATE 9/13/12 S M T W (T) F S

THE FOLLOWING WAS NOTED:

0700 - Golder and Shaw onsite. Shaw mobilizing and conducting safety meeting. Golder sign HASP. 6 man crew.
0807 - Shaw excavating from tie-in to HP5 and backfilling w/ tire chips from Sump 3 to HP5.
0900 - Keith onsite for As-built shots. Slope check: Sump 3 > 10in5 (2.7%) > HP4 (3.7%) > 10in6 (6.4%)
HGC-6
0920 - WSI has tasked Shaw with installation of a fourth HGC, in cell #5. HGC is approximately 200-ft north of HGC-1 and at same level.
1005 - Golder and ~~Shaw~~ WSI staking path for HGC-1. Grade is level in this location, however more trash needs to be moved out of the way. HGC-1 will be approximately 450 lf.
1120 - Shaw completed tie-in connection for HGC-6.
1245 - Shaw backfilling with tire chips, textile, and trash over perforated pipe and soil under solid pipe.
1350 - WSI, Golder, and Shaw staking path for new HGC. Grade level in this area also. New HGC will be approximately 470 lf.
1445 - Keith shooting as-built shots for HGC-6. Slope check: 10in6 > 4% > Sump4 > 10in7 (3.6%) > HP5 (3.8%)
1530 - Shaw completing final weld for HGC-6 and placing pipe in trench.
1645 - Golder off site.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw

DATE 9/14/12 S M T W T (F) S

THE FOLLOWING WAS NOTED:

0700- Golder and Shaw onsite. Safety meeting & mobilizing. HASP signed. Shaw with a 6 man crew.
0730- Shaw moving tire chips off path of new HGC, with excavator. The 2nd excavator backfilling HGC-6 up to HP5.
0744- Solid pipe delivered to site.
0850- Shaw taking field measurements w/ transit to check slopes from HP5 to tie-in. All measurements >3% for HGC-6.
0854- Shaw completing soil placement under solid pipe for HGC-6. Shaw also continues to weld pipe and more tire chips for new HGC.
0923- Remainder of Shaw crew moved to area of new HGC as 1 man continues to backfill HGC-6.
1000- Shaw starting excavation for new HGC.
1215- HGC-6 backfilled up to HP5.
1330- Shaw excavation of new HGC has reached Sump #1. Total depth ~15 ft below ground surface.
Shaw welding lengths of solid pipe together.
1400- 2nd excavator placing tire chips into new HGC trench.
1540- Keith (WSI) onsite for as-built survey. All slopes for HGC-6 >3% from HP5 to Tie-In.
1555- Keith & Brad (WSI) shooting as-built for Cell 5 HGC. All slopes >3% from End Cap to Sump 1.
1620- Final run of cell 5 HGC from Sump 2, rise at 7.5% to being top-of-pipe close to grade and fall ~~to~~ to tie-in location at 3.0%. Minimum of 5 ft of pipe needs to be exposed out of slope.
1630- Golder and Shaw leaving site.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw

DATE 9/15/12 S M T W T F (S)

THE FOLLOWING WAS NOTED:

0710 - Golder and Shaw onsite. 6 men onsite for Shaw.
0720 - Shaw mobilizing to work area. Front Loader running tire chips from active cell to Cell 5.
0740 - Shaw continues to excavate the Cell 5 HGC. 2nd excavator backfilling HGC-6.
0815 - Shaw welding pipe for HGC-1
0900 - Shaw placing textile over pipe and tire chips. 2nd excavator completed w/ HGC-6.
0940 - Sump 2 for Cell 5 HGC reached and total depth approximately 16ft below ground surface.
1010 - Shaw laying pipe into Cell 5 HGC trench.
1100 - Excavation reached final high point (HP3).
1145 - Golder and Shaw leaving site.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw

DATE 9/17/12
S (M) T W T F S

THE FOLLOWING WAS NOTED:

0700 - Golder and Shaw onsite.
0730 - Shaw continuing Cell5HGC excavation and HGC-1 pipe welding.
0800 - Front Loader continues to transport tire chips from active cell to Cell5.
0825 - Shaw placing tire chips in Cell5HGC trench.
0900 - HGC-1 excavation starts.
0936 - Shaw welding solid pipe to perforated pipe, for Cell5HGC.
0950 - Welding for Cell5HGC complete. HGC-1 welding starting.
0955 - Keith (WSI) on site for as-built survey of Cell5HGC. All slopes from Sump1 to HP3 are greater than 3.0%.
1028 - Shaw will hold on backfilling solid pipe area until soil source or other backfill is approved.
1100 - HGC-1 excavation reached Sump1, which is approximately 14 ft below ground surface.
1310 - Shaw will use a WSI truck to haul soil for backfill in solid pipe areas.
1350 - First soil load arrives. Two crew members staging materials for unrelated project work for WSI.
1538 - Shaw placing perforated pipe into HGC-1 trench.
1633 - Excavation stopped for the day approximately 150-ft from tie-in location.
1640 - Golder and Shaw leaving site.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.23 PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL CONTRACTOR: Shaw

DATE 9/18/12 S M (T) W T F S

THE FOLLOWING WAS NOTED:

0710- Golder and Shaw onsite.
0745- Shaw using four men for HGC work and two men for unrelated lateral piping project for WSI.
HGC-1 trench excavation continues, approaching Sump 2.
0800- Shaw continues to place tire chips in trench bottom for HGC-1.
0852- Keith (WSI) onsite for as-built survey. Two points along solid pipe for Cell 5 HGC. All slopes are greater than 3.0%. Five points shot along HGC-1. All slopes greater than 3.0%.
0945- Dan Grigg onsite for site visit.
Shaw completing backfill of Cell 5 HGC.
1100- Excavation of HGC-1 complete. Shaw placing soil in areas of solid pipe and tire chips in areas of perforated pipe.
1322- Shaw setting up to weld perforated pipe to solid pipe for HGC-1. Dan offsite at 1200
1330- Thunderstorms moving into area.
1335- Work stopped due to lightning.
1485- Work starting again
1426- Welding complete. Shaw placing pipe into trench and backfilling.
1440- Shaw stopping work for today due to persistant rain.
1500- Keith (WSI) onsite for remaining HGC-1 as-built shots. Five shots were taken and all slopes were greater than 3.0%.
1530- Golder offsite. Shaw will complete project tomorrow after backfilling and cleanup. Golder will not be present for remaining activities

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 16

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: W.S.I J.E.D Landfill 2012 GCCS Construction

OWNER: W.S.I.

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE 12-4-12

S M (T) W T F S

THE FOLLOWING WAS NOTED: - Arrived on site at 08:00; met with Don Grigg and went on a site tour of the landfill.

- Met with Don Grigg, Keith Lunsford, and two guys from Shaw (Vince & Sam) to go over construction plan and the schedule for the job.
- Shaw's goal is to be done by December 20, 2012.
- Went through site with Keith and surveyed all well locations as well as high points and low points for the header.
- Lunch with Shaw from 12:10 to 13:10.
- Well GW-31 moved to coordinates N 1,356,181.5; E 624,683.5 to decrease overall stick-up and decrease the amount the well has to be raised later.
- Lateral for GW-31 will begin in a capped area; Keith stated that Shaw needs to be very careful to avoid damaging the liner.
- Well GW-87 moved 43' southwest due to current placement in road. See updated well schedule for exact coordinates.
- GW-98 moved to N 1,355,114.9; E 624,252.2 to decrease stick-up and further raising of the well.
- Wells stick-up 4' above final grades; wells 31, 87, 94, 98 will have a berm to allow access to wellhead.
- GW-56 will be cut-off and capped 1' below liner and a 4'x4' piece of plywood will be placed over it to distribute pressure on the liner during settlement.
- Left site @ 15:30

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Brazelle

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-8273.25 PROJECT TITLE: W.S.T. J.E.D. Landfill

OWNER: W.S.T. 2012 GCCS Construction

LOCATION: St. Cloud, Florida CONTRACTOR: Shaw Environmental

DATE 12-5-12 S M T (W) T F S

THE FOLLOWING WAS NOTED: - Arrived on site at 07:00; reviewed HASP.

- Tested/inspected 4 gas monitoring meter, read through and signed Shaw's HASP.
- 07:10 driller (Genc) arrives on site
- Spoke with Vince: 6" valves on drip legs, connection of horizontal wells, and cleanouts at U-traps not in scope → Wants consent from Mike Keiser to verify the work.
- Went around site and took pictures of all equipment and materials for job.
- Keith took the driller (Genc) around to show him where all of the wells are and he started tracking just after 09:00.
- Shaw is fusing pipe and assembling parts while taking a materials inventory.
- Revised well schedule obtained around lunchtime: Driller was set up on GW-87 but moved to a shallower well so it could be dug today.
- Elevations received for two low points along header:
  - LPH-1: 104.7' - 85.797' = 18.9'
  - P2-LPH-2: 107.0' - 84.289' = 22.7'
- Drilled well GW-94 and got pipe and rock in place, too dark to finish installation tonight; will finish in the morning.
- Left site at 17:45

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Brizille

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: W.S.I J.E.D. Landfill 2012 GCCS Construction

OWNER: W.S.I.

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE 12-6-12 S M T W (T) F S

THE FOLLOWING WAS NOTED: - Arrived on site @ 07:15; reviewed HASP and met with Shaw for a pre-day meeting.

- Began drilling well GW-98 at 07:45, Completed well GW-94 from previous day (added geotextile disc, both bentonite plugs and fill.
- Per conversation w/ Mike Kaiser & Keith, wells GW-97 and GW-101 are going to be moved to get them closer to the beach and avoid asbestos.
- GW-97 New Coordinates: N 1,355,165.9 E 624,083.1 Elev. 132.8'
- GW-101 New Coordinates: N 1,354,969.4 E 624,678.3 Elev. 130.0'
- Per conversation with Mike Kaiser and Keith the main header and u-trap are going to tie-in to the main cleanout at the sumps at both low points
- Added well GW-28R to project: N 1,356,249.9 E 624,602.5 Elev. 267.3'
- Changed Coordinates of P2-LPH-2 to locate behind sump. N 1,354,961.3 E 623,998.8 Elev. 105.7' ⇒ Bottom Liner Elev = 86.13' Diffrence = 19.57'
- Due to well GW-98 taking most of the day and Gino having to pick up another crew member at the airport, drilling was discontinued @ 14:45.
- Left site at 15:30

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Trujillo

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: WSI J.E.D. Landfill 2012 GCCS Construction

OWNER: W.S.I.

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE 12-7-12 S M T W T (F) S

THE FOLLOWING WAS NOTED: - Shaw arrived on site at 07:25, I arrived @ 07:00

- New crew member, Juan, first day on site.
- Heavy fog on site, - very low visibility.
- Shaw plans to fuse the last of the pipe today and start trenching/laying pipe tomorrow (12/8).
- Plans are to trench for half of each day and then lay pipe in the new trenches each afternoon.
- Hit wet muck on well GW-87 at 52', but continued to advance slowly - See well logs for details.
- Vince/Juan left site at 14:00 after completing all pipe fusing & prep.
- 12" blind flange/tee is shown on plans as 8"; spoke w/ Keith & Mike to verify it was supposed to be 12".
- Finished installing GW-87.
- Left site at 16:45.

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Zapille

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: WSI JED Landfill 2012 GCQS Construction

OWNER: WSI

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE 12-8-12

S M T W T F (S)

THE FOLLOWING WAS NOTED: Arrived on site @ 07:30; reviewed HASP.

- Drilled well GW-31 → got to 87', but could not advance further.
- Had to set well at 80' because the hole started filling back in.
- 3 guys trenched for main header until lunch @ 11:45; then laid pipe.
- Left site at 16:45.

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Forgette

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: WSI JED Landfill 2012 GCCS Construction

OWNER: WSI

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE 12-10-12 S (M) T W T F S

THE FOLLOWING WAS NOTED: 07:15 - arrive on site, review HASP

08:00 - begin drilling well GW-28B

To capped area so need to move machinery around as little as possible. Liner repair crew needs an additional 1' past boring hole down to the liner to repair and add well boot.

14:30 - Complete drilling at well GW-28B

Set at 62' due to liquids that were impassable w/ a bucked auger. See well logs for specifics.

- Two more workers will be on site Wed (12-12-12)
- A third excavator will arrive on site tomorrow (12-11-12)
- Trenched for main header all day

16:20 - Complete well install for GW-28B

- Mini dump truck is being taken out of service due to brakes failing.
- Trench crew & drill crew will have to share one dump truck temporarily.

16:45 - Left site

SUBMITTED BY GOLDER ASSOCIATES

Martha W. Boyle

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: WSI JED Landfill 2012 GCCS Construction

OWNER: WSI

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE 12-11-12 S M (T) W T F S

THE FOLLOWING WAS NOTED: 07:00 - arrived on site, reviewed HASP

07:56 - Began drilling GW-56R1

10:02 - Completed drilling GW-56R1

12:33 - Complete GW-56R1 install per specifications.

11:20 - Begin drilling GW-105

13:54 - Complete drilling GW-105

15:55 - Complete installation of GW-105 per specifications.

14:38 - Begin drilling GW-101

16:29 - Complete drilling GW-101

17:00 - Set GW-101 and placed gravel to keep well from collapsing. Will finish installation in the morning.

17:15 - Left site

- Keith/Mike added well GW-46R1
- N 1,356,997.92 E 625,111.32; Elev. 133.7'
- All horizontal collectors will have their own lateral (Keith)
- Josh Broggi (Shaw Project Manager) visited site

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Zigelle

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25
PROJECT TITLE: WST JED Landfill 2012 GCCS Construction
OWNER: WSI
LOCATION: St. Cloud, Florida
CONTRACTOR: Shaw Environmental

DATE 12-12-12 S M T (W) T F S

THE FOLLOWING WAS NOTED: 07:15 - arrived on site; reviewed HASP

09:04 - completed well install for GW-101 (soil, bentonite plugs, backfill)

07:55 - began drilling GW-97

09:35 - completed drilling GW-97

10:07 - began drilling GW-93

11:33 - completed installing GW-97 per specs.

11:37 - completed drilling GW-93

13:15 - finished installing GW-93

- Received 1.5"-2" of rain last night.
- Driller tried to track up slope to start GW-46R3; but the rig kept slipping b/c it was so wet → will drill tomorrow.
- Hertz did not deliver a 2nd dump truck so both crews had to share 1 truck again today.
- Shaw cancelled request for 2nd truck since there is only 1 well left.
- Installed ≈ 140' of header/lateral pipe and the U-trap in Cell 7.
- Cell 7 U-trap had to be taken out and fixed b/c it was 2' too tall - height of tee at bottom of trap was not accounted for when pre-built.
- Lost ≈ 1.5 hours

- Left site @ 1630

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Smith

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 053-82734.25

PROJECT TITLE: WSI JED Landfill 2012 GCCS Construction

OWNER: WSI

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE 12-13-12

S M T W (T) F S

THE FOLLOWING WAS NOTED: 07:15 - arrived on site, reviewed HASP.

08:15 - began drilling GW-46R1

10:09 - completed drilling GW-46R1

14:01 - completed well install; Had to bring all materials over from other side of landfill. See well logs for details.

- High point was moved up slope slightly b/c Cell 7 U-trap was placed directly behind the Cell 7 sumps in order to get 5% fall.

- Keith/Mike added additional cleanout riser at the U-trap drain line tie-in to the existing cleanout line.

- Left site @ 16:30

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Ragsdale

MONITOR

FIELD MONITORING REPORT

PAGE 10 OF 16

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: WSI JED Landfill 2012 GCCS Construction

OWNER: WSI

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE: 12-14-12

S M T W T (F) S

THE FOLLOWING WAS NOTED: 07:15 - arrived on site, reviewed HASP

- Trenched up to the U-trap in Cell 8.
- Got hole for utrap dug approximately half way down.
- 18" x 12" tee for 12" valve at end of header was not ordered - Should be here Monday (12-17-12)
- Fused 14" and 18" pipe to prepare to lay pipe tomorrow.
- Left site @ 16:30

SUBMITTED BY GOLDER ASSOCIATES

Martha W. Brazille

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25 PROJECT TITLE: WSI JED Landfill 2012 GCCS Construction

OWNER: WSI

LOCATION: St. Cloud, Florida CONTRACTOR: Shaw Environmental

DATE 12-15-12 S M T W T F (S)

THE FOLLOWING WAS NOTED: 07:00 - arrived on site, reviewed HASP.

- Ordered 18" X 12" valve and a few other parts to finish job.
- Installed cleanout risers at header high point.
- Installed electrofusion saddles on main header for HGC laterals.
- Supplier sent 18" X 12" reducer for main header instead of an 18" X 14" reducer
  - → Cell 8 u-trap and rest of header cannot be installed until it comes in.
  - → Should arrive by Tuesday (12-18-12)
- Electrofusion branch saddle for first upslope HGC slipped during installation limiting the amount of fall the lateral could have.
  - → Shaw fixed by adding half of a 45° elbow (22°) to the branch saddle.
- Left site at 15:30.

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Reville

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25 PROJECT TITLE: WSI JED Landfill

OWNER: WSI 2012 GCCS Construction

LOCATION: St. Cloud, Florida CONTRACTOR: Shaw Environmental

DATE 12-17-12 S (M) T W T F S

THE FOLLOWING WAS NOTED: 07:15 - arrived on site, reviewed HASP.

- Hooked up all 8" laterals
- Trenched above cap for lateral to well GW-28B, but trencher made a straight line with no fall. - Had to be backfilled and re-trenched down slope.
- 18" x 14" reducer was found locally and one of the crew members went to pick it up.
- Completed trenching for laterals for wells GW-31, GW-87, and GW-28B.
- Installed 18" x 14" reducer and 18" header pipe up to the U-trap in Cell 8.
- Surveyed points w/ Keith for location of horizontal wellhead lateral tie-ins to the existing pipe.
- Mike Kaiser visited site and gave approval to put 6" cleanouts on top of U-traps instead of 8".
- Placed and fused northern side of Cell 8 u-trap to the main header.
- Left site @ 18:15.

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Royalle

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: WSI JED Landfill 2012 GCCS Construction

OWNER: WSI

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE 12-18-12

S M (T) W T F S

THE FOLLOWING WAS NOTED: 07:15 - Arrived on site; reviewed HASP.

- Fused last 50' section of header onto southern side of Cell 8 u-trap.
- Installed 18" and 12" valves and attached them to the header.
- Fused on all valve cleanouts.
- Prepared to air test entire system; reached 10 PSI @ 17:27
- Left air test to sit over night.
- Left site @ 17:30

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Brazilla

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: WSI JED LandFill 2012 GCCS Construction

OWNER: WSI

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE: 12-19-12 S M T (W) T F S

THE FOLLOWING WAS NOTED: 07:15 - arrived on site; reviewed HASP

- Air test [redacted] failed over night due to drastic temperature drop.
- Refilled pipe up to 10 PSI to test again and check for leaks.
- Air test took place from 09:12 to 10:19 and passed. → After 8 hours pressure was still @ 10 PSI.
- 1 crew member was sick; 2 flew home
- Installed and backfilled laterals for wells GW-288 and GW-87.
- Placed last of survey risers and gas caution tape.
- Backfilled header trench & worked on clearing up slope.
- Waiting on 4 electrofusion saddles to connect the [redacted] remaining HCC's and the cleanouts at the U-trap in Cell 8.
- Left site @ 16:30.

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Ryan

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: WSI JED Landfill 2012 GCCS Construction.

OWNER: WSI

LOCATION: St. Cloud, Floride

CONTRACTOR: Shaw Environmental

DATE: 12-20-12 S M T W (T) F S

THE FOLLOWING WAS NOTED: 07:15 - Arrived on site; reviewed HASP.

- Installed lateral for well GW-31 and backfilled/removed excess garbage.
- Went around with survey crew and surveyed all risers, joints, tees, cleanouts, valves, fittings, and any other exposed pipe.
- Did not survey lateral for most southern HDC in Cell 8 b/c the trench was not dug yet.
- Installed and connected 6" drip leg and tied it into the existing cleanout in Cell 8.
- Dozed and continued to backfill and clean up slope in Cells 7 and 8.
- Left site at 17:30

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Bailey

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: WSI JEA Landfill 2012 GCCS Construction

OWNER: WSI

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE: 12-21-12 S M T W T (F) S

THE FOLLOWING WAS NOTED: 07:15 - arrived on site; reviewed HASP

- Installed 6" drip leg for U-trap in Cell 7.
- Trenched, tied-in, and backfilled southwwest HGC in Cell 8.
- Hauled dirt to wellheads with greater than 7' of stickup to make access piles
- Continued cleaning up slopes and backfilling
- Crew member driving dozer hit 6" riser of U-trap in cell 7 that is the vacuum source for the 4" lines coming off the primary sumps in Cell 7.
  - → Will have to be repaired after the holiday break.
- Returning for T&M work on January 2, 2013.
  - → Valve extensions
  - → Vacuum repair from dozer damage. } Remaining contract work.
  - → Backfilling around valves.
- Left site @ 16:00.

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Smith

MONITOR

FIELD MONITORING REPORT

PAGE 1 OF 7

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: JED Landfill 2013 Existing System Improvements

OWNER: WST

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE 1-2-13 S M T (W) T F S

THE FOLLOWING WAS NOTED: 08:15 - Arrived on site; reviewed HASP.

- Went around with Keith to check and see what contact work was left.
- Shaw installed all wellheads over the holiday break.
- Went around with Keith to discuss what T&M work there is.
- Cell 5:
  - Abandon wellhead and 6" lateral on slope. Bring down new 8" line from main header that reduces to 6" "y" joint then a 4" line runs to an existing valve box and behind sump wall to 1 existing 2" PVC well and 2 new 2" PVC wells. Tie everything in and backfill.
- Cells 7 & 8:
  - Tie-in to 24" primary sumps with 4" laterals and valves. Tie together with a "Y" joint and increase to 6". Run to header and hook up with a wellhead.
- Cell 6:
  - Abandon existing 6" drip leg off of U-trap at the cleanout riser and re-route it to the existing 24" sump.

-Left site at 09:30 due to no parts coming in.

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Griffith

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: JED Landfill 2013 Existing System Improvements

OWNER: WSI

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE: 1-3-13 S M T W (T) F S

THE FOLLOWING WAS NOTED: 07:00 - Arrived on site; reviewed HASP

- Installed horizontal wellheads (contract work)
- Put blind flanges on all cleanouts (contract work)
- Excavated directly next to u-trap in Cell 6.
  - → Hit liquids at 8'
  - → At 10' back of valves and the u-trap began caving in (had to abandon hole)
- Began excavating directly next to cleanout riser
  - → Liquids at 7'
  - → Backed up around the hole and let it fill up (going to pump it out in the morning)
- Left site @ 16:45.

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Smith

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: JED Landfill 2013 Existing System Improvements

OWNER: WSI

LOCATION: St. Cloud Florida

CONTRACTOR: Shaw Environmental

DATE 1-4-13

S M T W T (F) S

THE FOLLOWING WAS NOTED: 07:00 - Arrived on site; reviewed HASP.

- Pumped excavated hole dry and found that most leachate was coming from a compromised pipe.
- Cut out existing riser and damaged pipe.
- Fused butt cap in end of existing line.
- Moved existing riser up slope and re-fused with a 45° elbow on the end.
- Trenched for new 6" line to existing 24" sump (had to trench underneath existing lines)
- Tied into 24" line with a 24" x 6" electrofusion saddle and a 90° elbow.
- Left site at 18:15.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.25

PROJECT TITLE: JED Landfill 2013 Existing System Improvements

OWNER: WSI

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE 1-5-13

S M T W T F (S)

THE FOLLOWING WAS NOTED: 07:15 - Arrived on site; reviewed HASP

- Plan to backfill Cell 6 and clean up slope and move equipment to the other side of the landfill.
- 09:30 - finished backfill and cleanup.

Left site at 09:45

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Dowell

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083.82739.25

PROJECT TITLE: JED Landfill 2013 Existing System Improvements

OWNER: WSI

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE: 1-7-13

S (M) T W T F S

THE FOLLOWING WAS NOTED: 07:15 - Arrived on site; reviewed HASP

- Installed cleanout risr on drip leg from U-trap in Cell 7 where it ties into the existing 6" line.
- Trenched, installed, and backfilled all piping and valves for Cell 7 T&M work with no issues.
- Left site at 16:45

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

FIELD MONITORING REPORT

PAGE 6 OF 7

PROJECT NUMBER: 083-87739-25

PROJECT TITLE: JED Landfill 2013 Existing System Improvements

OWNER: USI

LOCATION: St. Cloud, Florida

CONTRACTOR: Shaw Environmental

DATE: 1-8-13

S M (T) W T F S

THE FOLLOWING WAS NOTED: 07:30 - Arrived on site; reviewed HASP.

- Trucked, installed, and backfilled all piping and valves for Cell 8 T&M work w/ no issues.
- Hooked up wellhead at Cell 8.
- Valve extensions for contract work arrived today.
- Uncovered existing 6" lateral to be abandoned at Cell 5 and started trenching for header.
- Keith and I surveyed two points to assist Shaw in finding the header.
- Shaw stopped work at 15:30
- Left site at 16:00

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.75 PROJECT TITLE: JED Landfill 2013 Existing System Improvements

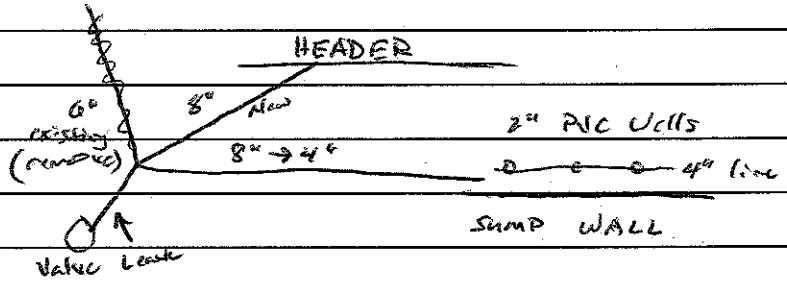
OWNER: WSI

LOCATION: St. Cloud, Florida CONTRACTOR: Shaw Environmental

DATE 1-9-13 S M T (W) T F S

THE FOLLOWING WAS NOTED: 07:00 - arrived on site; reviewed HASP.

- Plan for Cell 5 T&M:



- Installed, trenched and backfilled all Cell 5 T&M except for installing riser on header. (Waiting for 12"x8" saddle to come in)
- Left header exposed to make connection tomorrow.
- Hooked up all wellheads on 2" PVC wells
- Work Left:
  - Valve extensions
  - Riser @ header in Cell 5
  - Wellhead in Cell 7 for sump vacuum source
  - Cell 5 wellhead
- Keith will monitor tomorrow.
- Left site at 15:45.

SUBMITTED BY GOLDER ASSOCIATES

Matthew W. Pettitt

MONITOR

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.23 25
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw CB+I

DATE 03-19-2013
S M (T) W T F S

THE FOLLOWING WAS NOTED:

10:30 - Golder arrived onsite and checked in with Keith Lunsford (WSI) + Don Grigg (Golder). Signed HASP and calibrated Gas Monitor. Shaw staging pipe.

1050 - Shaw (GB+I) + Golder discussed plan. 3 crew members on site, 2 more arrive overnight. Brandon + Keith will stake high and low pts later.

Equipment on site:
- 1 Front Loader - JD 624K
- 1 4x4 ATV - Kubota
- 1 Company Truck - Chevy 2500
- 1 Pipe Welder - McElroy Trackster

Shaw currently using loader to deliver pipe from boneyard to work area. Tire chips already staged.

1115 - 1st stick of pipe on welder

1125 - Golder checked pipe. Meets specs. 1st weld completed

1300 - Shaw on't welding

1330 - Keith onsite to stake points. All high points @ approx. el 168.00'
HGC-3 ~436lf 3-high pts 2-low pts
Cut estimates written on grade stakes

1430 - Shaw will weld 2 more sticks + clean up for the day.

1445 - Checked in w/ Don

1500 - Golder off site.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.2325
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw CB+I

DATE 03-20-13
S M T W T F S

THE FOLLOWING WAS NOTED:

0715 - Golder onsite. Shaw onsite. 2 extra crew members and 1 Kubota 4x4 added.
HASP signed. Gas meter calibrated.
0730 - ~~Sh~~ CB+I will finish welding while waiting for excavator to be delivered.
0915 - HGC-5 tie-in location is currently too ~~shallow~~ low at current grade.
Tie-In moved north to a higher grade elevation
1st 106'f of HGC-3 will be solid pipe + remainder is perforated.
No tie-ins hooked up during this phase. CG+I will 90° ~~tie-in~~ up and
attach a 6" riser ~10' high.
Light rain
0920 - Excavator onsite. John Deere 200D
0940 - Excavator moving tire chips out of path of HGC-5
1040 - CB+I welding length of solid pipe to perforated for HGC-3.
1210 - WSI moving equipment away from excavation area for HGC-3.
1230 - Excavation starting for HGC-3. Laser set for 3.4% slope
1305 - CB+I PM onsite (Josh).
1430 - Excavation at LP-1
1450 - 1st LP complete ~10' sump(depth). filled w/tire chips.
1555 - 2nd HP excavated.
1600 - As-built shots w/ Keith.
HGC-3 HP1 Tie-In
HGC-3 50 > 3%
HGC-3 LP1
HGC3 50 > 4.5%
1630 - CB+I backfilling up to HGC-3 HP2
1700 - CB+I cleaning up
Golder offsite.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

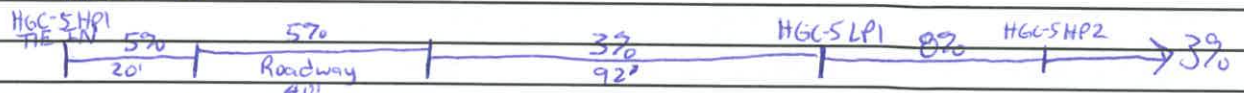
PROJECT NUMBER: 083-82734.23 **PROJECT TITLE:** JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL **CONTRACTOR:** Shaw CB+I

DATE 03-21-13 S M T W (T) F S

THE FOLLOWING WAS NOTED:

0715 - Golder onsite. Shaw (CB+I) on site. Gas meter calibrated and HASP signed.
0730 - At some point this morning a garbage truck backed into CB+I's front loader. Nobody was in or near the loader and the damage appears to be cosmetic. Golder and CB+I took pictures. CB+I got the driver's information.
0750 - CB+I servicing equipment
0800 - CB+I resumes excavation of HGC-3
0850 - Keith Lunsford on site. Spoke w/ CB+I regarding front loader damage. Begin determination of slopes for HGC-5.

HGC-5



CUT	2.0	3.6	5.2	10.6 ← Top of Pipe	
ELEV	165	164	162	159.2	167.2

1120 - CB+I welding final length of perforated pipe and end cap onto HGC-3 length.
1320 - HGC-3 in the ground and ready for As-built shots.
1400 - CB+I welding remainder of pipe for HGC-5 and moving tire chips from area of HGC-5.
1415 - Keith on site for as-built shots.
1530 - CB+I completes HGC-3 burial. Now moving tire chips away from HGC-5 excavation area. Prepping to weld 90° up + risers onto end of solid pipes for tie-in.
1600 - Golder offsite.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.~~23~~ 25
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw CB+I

DATE 03-22-13
S M T W T (F) S

THE FOLLOWING WAS NOTED:

0710 - Golder onsite. CB+I onsite. HASP signed and Gas Meter checked for calibration.
0730 - CB+I refueling equipment. Fittings never arrived yesterday so no further welding was completed. Tire chips are still in the area of HGC-5
0755 - Excavation starts for HGC-5. Front loader moving tire chips.
WSI asked that CB+I save and reuse as much of the road base as possible.
0850 - Excavation has crossed the access road.
1030 - Excavation at 1st sump.
1100 - First sump excavated approximately 5 to 6 feet below bottom of pipe. Tip of pipe is 11 feet deep.
1330 - Excavation has reached HP2. Digging stopping to bury pipe and seal up road.
1430 - Keith onsite for As-built shots.
1500 - CB+I backfilling. One crew member sent home because with the amount of work left, he is not needed.
1530 - Golder offsite.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PROJECT NUMBER: 083-82734.23
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: Shaw CB+I

DATE 03-25-13
S (M) T W T F S

THE FOLLOWING WAS NOTED:

0715 - Golder arrived on site. HASP signed and gas meter calibration checked.
0745 - On Saturday, 3/23/13, CB+I completed excavation of the trench for HGC-5. The pipe is in the trench on top of ~1ft layer of tire chips.
0800 - CB+I backfilling w/ tire chips and leaving 50-ft marks open for As-built shots.
0910 - Keith onsite for remaining as-built shots.
0940 - CB+I backfilling tire chips + trash.
1005 - Fabric is in place for entire collector and CB+I continues to backfill.
1030 - CB+I buttoning up site. Golder offsite.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.2825 PROJECT TITLE: JED GCCS HGC Install Cell 6
OWNER: WSI/OMNI
LOCATION: Holopaw, FL CONTRACTOR: ~~Shaw~~ CB+I

DATE 4/23/13 S M (T) W T F S

THE FOLLOWING WAS NOTED: Weather: Clear 82°F

0710 - Golder on site.

0800 - CB+I completed most of the pipe welding on 4/22/13. CB+I has 4 crew members on site.

Equipment on site:
- 1-JD 544K Front Loader
- 1-McElroy TracStar Fusion Welder
- 2-Chevy 2500 pickups
- 1-JD 250D Dump Truck
- 1-Kubota Diesel 4x4 RTV
- 1-JD 200D LC Excavator

0850 - Hertz delivers JD 250D.

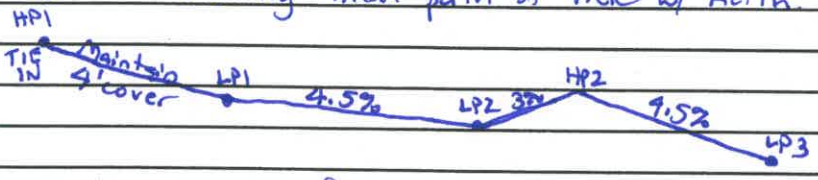
0915 - Keith Lunsford (WSI) on site for check-in.

1000 CB+I continues welding pipe.

1027 - Excavator delivered.

1030 - Golder staking out path for HGC with Keith. Elevations and slopes throughout Cell 6 made it difficult to continue 100' spacing between high points and low points.

1400 - CB+I welding 8" pipe for laterals and tie-ins.
Golder staking final path of HGC w/ Keith.



1500 - CB+I hauling clean fill to work area.

1515 - Golder offsite.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.~~23~~25
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: ~~Shaw~~ CB+I

DATE 4/24/13 S M T (W) T F S

THE FOLLOWING WAS NOTED: Weather: AM 63°F Clear PM 82°F Partly Cloudy

0710 - Golder onsite.
0830 - CB+I closing secondary haul road for excavation. Also dragging pipe up to work area.
0840 - Keith onsite, discussing needed fittings and fabric with CB+I.
0850 - Excavation starting at tie-in. CB+I also moving tire chips for easier access during excavation across haul road.
0930 - Keith has 10" Tee on order. CB+I will place the pipe and come back later to electrofuse the Tee fitting onto pipeline.
1115 - Excavation has reached point of transition from solid to perforated pipe. CB+I has begun backfilling 2 feet of tire chips as excavation progresses.
1255 - Excavation @ LP1.
1315 - First sump complete. Approximate depth ≈ 9 feet.
1340 - Performing as-built shots with Keith.
1415 - The 10" Tee has been delivered and will be hard fused as opposed to using electrofusion couplings.
1455 - Golder staking layout of second leg of HGC w/ Keith.
1530 - Tee has been installed at LP1.
1600 - CB+I backfilling up to LP1 so haul road can reopen. Most of the removed trash is being hauled up to the working face.
1720 - Trench filled up to LP1. Equipment parked around trench to act as barricade.
1730 - CB+I and Golder off site.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

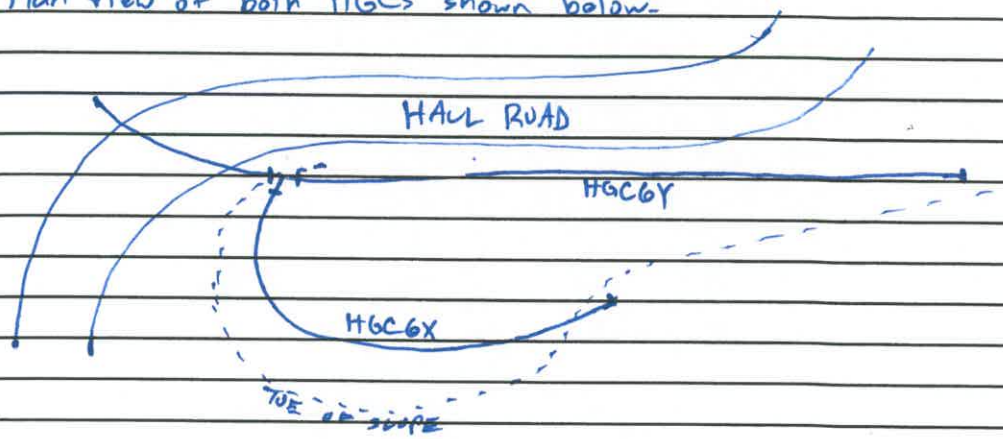
PAGE 1 OF 1

PROJECT NUMBER: 083-82734.~~23~~25
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: ~~Shaw~~ CB+I

DATE 4/25/13 S M T W T F S

THE FOLLOWING WAS NOTED: Weather: Partly Cloudy, 80°F

0715- Golder onsite.
0830- Keith onsite to complete layout of 2nd leg of HGC. HGC6X
Plan view of both HGCs shown below.



1000- CB+I cont to excavate for HGC6Y. Trash is being spread in immediate area and also filling a trench WSI has excavated for daily cover material. HGC6X will pass through this trench.
1215- Excavation at LP2.
1245- Sump at LP2 excavated to 6ft depth below pipe.
1300- Keith on site for as-built shots. up to the 350ft mark.
1400- Excavation at HP2
1415- Excavation complete for the day.
1430- As-built shots with Keith up to HP2.
The site is out of 8oz fabric. WSI instructed CB+I to use geocomposite for the remainder of work.
1630- WSI operations will move active spreading to the work area on Monday.
WSI instruted CB+I to begin work on HGC6X tomorrow so construction will be clear of the spreading operations.
1700- Golder offsite

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734-~~23~~ 25
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: ~~Shaw~~ CB+I

DATE 4/26/13 S M T W T (F) S

THE FOLLOWING WAS NOTED: Weather: Cloudy 86°F

0720 - Golder onsite
0800 - CB+I hauling perf pipe to work area for HGC6X.
0830 - CB+I cutting geocomposite into 3ft. widths for use in HGC installation.
0850 - CB+I welding lengths of perf pipe together for HGC6X.
1015 - Excavation started for HGC6X, however CB+I experiencing problems w/ laser level. Work stopped to fix level.
1115 - CB+I excavating HGC6X LP1.
1125 - Sump for LP1 at depth of 9ft below pipe.
1255 - Excavation at HP1. A few areas of excavation are saturated w/ leachate.
1310 - CB+I prepping Tee fittion on HGC6Y for electrofusion welding to HGC6X.
1340 - Fusion process complete.
1436 - Keith onsite for As-builts on HGC6X up to 250 ft mark.
1520 - Excavation at LP2.
1535 - Excavation of LP2 complete. Depth apprx. 8ft.
1615 - Excavation stopping at 350 ft mark for the day. CB+I backfilling over Tee fittings. Work tomorrow will focus on backfilling up to LP2 and continuing to excavate and install HGC6X. Keith and Golder will return to site Monday (4/29/13) for as-built shots.
1630 - Golder off-site.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.~~23~~ 25
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: ~~Shaw~~ CB+I

DATE 4/29/13
S (M) T W T F S

THE FOLLOWING WAS NOTED:

0730 - Golder arrived onsite
0745 - On Saturday 4/27/13, CB+I finished excavation and installation of HGC6X. The HGC was backfilled completely up to LP2. Areas every 50 ft from LP2 to the end cap were left open for as-built shots.
CB+I is welding lengths of perf pipe together for HGC6Y.
0755 - CB+I setting up laser level at 4.5% for final 200ft of HGC6Y
0830 - Keith on site for as-built shots on HGC6X.
0845 - CB+I backfilling HGC6X.
1030 - Keith on site for as-built shots on HGC6Y up to the 700ft mark.
1130 - HGC6Y LP3 has been excavated to a depth of 6ft below pipe.
Final as-builts with Brad (WSI).
HGC6Y is complete.
CB+I ~~for~~ offroad JD dump truck is down with a bad brake line. Back in service tomorrow.
1410 - CB+I moving to slope to find tie-in for HGC6Y.
1418 - CB+I damaged a stormwater culvert while excavating the 12" header.
1445 - The 12" header has been excavated. CB+I working to repair damaged culvert. The culvert was corrugated pipe. WSI has spare material in the boneyard.
1600 - CB+I repaired culvert. Golder offsite.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.~~23~~-25
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: ~~Shaw~~ CB+I

DATE 4/30/13
S M (T) W T F S

THE FOLLOWING WAS NOTED: HGC6XY tie-in work.

0705- Golder arrived on site. CB+I onsite. HASP signed. Calibration checked on gas monitor.
0750- Hertz mechanic on site to service the JD Dump Truck. The truck was leaking badly yesterday and running hot. CB+I is returning the Front Loader and getting a small dozer for remainder of lateral and tie-in work.
0845- CB+I cut blind flange from 12" header
0900- Excavation for 8" lateral to HGC6XY started. Minimum 3' cover.
0910- 12x8 Tee fitting welded to blind flange.
0945- Electrofusion complete. 12x8 Tee welded to 12" header.
1130- 8" lateral welded onto 12x8 Tee.
1430- 6" stick-up welded onto HGC6XY and wellhead installed.
1500- CB+I backfilling clean fill at minimum 1ft of cover and then trash.
1525- HGC6XY Lateral is covered. CB+I will rework slopes when dozer is delivered tomorrow.
1545- CB+I has moved to the west slope to uncover the header at tie-in locations for the HGC's installed in March. WSI is to confirm the header size.
1555- Header size is 14" at tie-in. CB+I finished for the day.
1615- Golder off site.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

FIELD MONITORING REPORT

PAGE 1 OF 1

PROJECT NUMBER: 083-82734.~~22~~ 25
PROJECT TITLE: JED GCCS HGC Install
OWNER: WSI/OMNI
LOCATION: Holopaw, FL
CONTRACTOR: ~~Shaw~~ CB+I

DATE ~~X~~ 5/1/13
S M T (W) T F S

THE FOLLOWING WAS NOTED:

0715 - Golder and CB+I onsite.
0830 - Excavation begins on 1st tie-in on west slope.
0915 - 14" header cut with chainsaw. Electrofusion couplings slid onto each end of the cut header pipe. Tee fitting slid in place and couplings shifted back over the Tee fitting.
0930 - Electrofusion process started for 1st Tee.
0945 - CB+I excavating final tie-in on west slope while 1st tee fitting is electrofused into place.
1045 - CB+I finished fusing 1st tee in place.
1105 - Electrofusion process started for 2nd Tee.
1145 - Electrofusion process complete for 2nd Tee. CB+I cleaning slope along HTGC6XY tie-in.
1300 - CB+I welding fittings for lateral and lateral riser.
1345 - Excavation and installation work completed for the day. CB+I will finish tie-in tomorrow.
1410 - Golder offsite.

SUBMITTED BY GOLDER ASSOCIATES

MONITOR

GCS FORM R1
(JUNE 1992)

GOLDER ASSOCIATES

APPENDIX I

CERTIFICATION OF CONSTRUCTION COMPLETION OF A SOLID WASTE FACILITY

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

DEP Application No. _____
(Filled by DEP)

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

Certification of Construction Completion of a Solid Waste Management Facility

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

Name of Project: 2012 Cells 5, 7 and 8 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 $ 900,000 Actual $ 924,310

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: February 4, 2013

Date: 7/3/13

Signature of 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