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BCP - C

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Golder Associates

FINAL REPORT ON

OFF-SITE GROUND WATER EXTRACTION SYSTEM AS-BUILT DOCUMENTATION AND CONSTRUCTION CERTIFICATION BELL AEROSPACE TEXTRON WHEATFIELD, NEW YORK

Submitted to:

Textron Defense Systems
201 Lowell Street
Wilmington, Massachusetts 01887

DISTRIBUTION:

13 Copies - Mr. Brian Smith; Textron Defense Systems; Wilmington, Massachusetts
3 Copies - Golder Associates Inc.; Buffalo, New York

April 1994

923-9055

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April 25, 1994

923-9055

Textron Defense Systems
201 Lowell Street
Wilmington, Massachusetts 01887

Attention: Mr. Brian Smith

RE: FINAL REPORT ON AS-BUILT DOCUMENTATION
AND CONSTRUCTION CERTIFICATION
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

Gentlemen:

Golder Associates Inc. (Golder Associates) is pleased to submit this final report on As-Built Documentation and Construction Certification for the Off-Site Ground Water Extraction System (Off-Site System) near the Bell Aerospace Textron (BAT) facility located in the Town of Wheatfield in Niagara County, New York. The attached document is submitted in compliance with the requirements of BAT's Title 6 New York Code of Rules and Regulations (6NYCRR) Part 373 Post Closure Permit (No. 9-2940-00001/00079-0) dated September 14, 1992.

This report documents that the construction of the Off-Site System was performed in substantial compliance with the plans and specifications in the approved Corrective Measures Implementation Plan (CMI) for the Off-Site System and subsequent design modifications and design clarifications issued by the designer for this project. This report incorporates the certification report for the electrical components of the project, prepared by Wendel Engineers, P.C., included as Appendix C to this report.

Golder Associates appreciates the opportunity to have provided Textron Defense Systems with construction quality assurance/quality control services during the construction of the Off-Site System. If you have any questions with regard to the contents of this report, please call.

Very truly yours,

GOLDER ASSOCIATES INC.

Anthony L. Grasso, P.G.
Associate

ALG:dml

Attachments

F/N: FINAL\AS-BUILT.FIN

STATEMENT OF CERTIFICATION

Golder Associates Inc. (Golder Associates) certifies that the Construction Quality Assurance/Quality Control (CQA/QC) program was conducted under the supervision of a Licensed New York State registered Professional Engineer (P.E.). Based on the CQA/QC monitoring of the Off-Site Ground Water Extraction System (Off-Site System) performed by Golder Associates and Wendel Engineers, P.C. (Wendel), Golder Associates certifies that the Off-Site System has been constructed in substantial compliance with the plans and specifications in the approved Corrective Measures Implementation Plan (CMI) for the Off-Site System, and approved design modifications and design clarifications. The limits and scope of the Off-Site System are identified in the attached report. The letters of certification from Wendel, the General Contractor, and subcontractors who worked on this project accompany this report. Design changes made during the construction are documented on the as-built drawings accompanying this report. It is the opinion of Golder Associates and Wendel that these changes are minor and did not change the intent of the design. This certification for the work completed by Golder Associates is issued under the seal of Mr. William B. Lozier, P.E., of Golder Associates Inc., with New York State License No. 067160.

William B. Lozier, P.E.
Associate



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1.0 INTRODUCTION

1.1 General

Bell Aerospace Textron, Inc. (BAT) has been issued a Title 6 New York Codes of Rules and Regulations (6NYCRR) Part 373 Post Closure Permit (No. 9-2940-00001/00079-0) dated September 14, 1992, for the BAT facility located in Wheatfield, New York (see Figure 1). Corrective remedial measures have been stipulated in the permit for two areas associated with past activities at the Wheatfield facility. A Corrective Measures Study (CMS) (Golder Associates Inc. (Golder Associates), June 1991) has been performed and approved by the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (USEPA) for these two areas, designated as the "on-site" area and the "off-site" area. Subsequently, a Corrective Measures Implementation Plan (CMI) (Golder Associates, March 1992) for the off-site area, which included a remedial design, was submitted to and approved by the NYSDEC and USEPA.

This report serves as the as-built documentation for the off-site ground water extraction remedial system (Off-Site System). This documentation includes descriptions and as-built drawings of the various system components and results of the construction quality assurance/quality control (CQA/QC) monitoring.

1.2 General Site Geology/Hydrogeology

The site is underlain by approximately 15 feet to 30 feet of silty and clayey overburden. Beneath the overburden, the bedrock stratigraphy consists of four zones. The zones are based on lithology and permeability characteristics as follows:

- Zone 1 comprises approximately the upper 10 feet to 20 feet of dolostone bedrock and occurs to depths of 25 feet to 50 feet below ground surface (bgs). It is a thinly bedded to laminated dolostone of moderate to high permeability and constitutes the upper bedrock aquifer;

- Zone 2 is a massive dolostone layer that averages approximately 8 feet in thickness. It directly underlies Zone 1 and is considered a bedrock aquitard that restricts the vertical movement of ground water;

- Zone 3 is a porous, vuggy dolostone of moderate permeability that varies in thickness from 18 feet to 28 feet. It constitutes an aquifer beneath Zone 2; and

- Zone 4 is a massive, low permeability dolostone underlying Zone 3.

1.3 Project Organization

BAT is the owner and operator of the Wheatfield facility and is responsible for the implementation of the corrective measures at the off-site area. BAT contracted the following parties for this project.

Golder Associates was retained by BAT as the design engineer of record (Designer). Golder Associates and its subcontractor, Conserva-Tech Engineering Services (Conserva-Tech), prepared the design drawings and technical specifications used in permitting and constructing the off-site extraction system (Golder Associates, March 1992). In addition, Golder Associates was retained by BAT to serve as BAT's on-site representative (Owner's Representative) during construction, and was present throughout drilling, trenching, and system installation to provide CQA/QC services. Wendel Engineers, P.C. (Wendel) was subcontracted by Golder Associates to provide CQA/QC inspection services and serve as the Owner's Representative for the electrical components of the system.

Clean Harbors, Inc. (Clean Harbors) was retained by BAT as the General Contractor for the project. Subcontractors to Clean Harbors included Buffalo Drilling Company (Buffalo Drilling) as the drilling and well installation contractor and Weydman Electric, Inc. (Weydman) as the electrical contractor. Burnham Process Control Services, Inc. (Burnham), a subcontractor of Weydman, was responsible for the pump control and remote monitoring software and programming.

1.4 Project Execution

The Off-Site System project was initiated on October 26, 1992, with a preconstruction meeting including representatives from BAT, Golder Associates, Clean Harbors, and Buffalo Drilling. Field construction activities began November 2, 1992, and continued on a full-time basis until March 15, 1993, and after that on at least a part-time basis until project completion in March 1994, with the final system testing of the Off-Site System. This final testing was performed by Clean Harbors under the direction and supervision

of BAT. Golder Associates was not present on-site during the final system test. The test results were accepted as "passing" by BAT.

The Off-Site System was substantially completed by mid-March 1993 allowing for start-up of the system to be initiated on March 15, 1993. The activities that continued after start-up of the system included:

- Installation of the leak detection system;
- Installation of the remote alarm;
- Final installation of heat trace and insulation;
- Plugging of extraction well 1 (EW-1) because pumping during start-up produced insufficient drawdown;
- Replacement of originally specified pump and flow limiter in EW-2 with a higher capacity pump and corresponding flow limiter in order to produce required drawdown during start-up (see Section 3.7 for details);
- Installation of quick disconnect plug at the sampling port in vault EW-6;
- Waterproofing of all vaults; and
- Site restoration, grading, and seeding.

CQA/QC inspection activities by Golder Associates were on a full-time basis during the drilling/trenching phases and on a part-time basis during the system completion phase prior to and after system start-up. Golder Associates' field reports of these activities are presented in Appendix A. CQA/QC inspection was provided by Wendel on a part-time basis throughout installation of the system's electrical components.

1.5 Purpose and Scope of the Certification Report

The purpose of this report is to present as-built documentation and certification of the construction of the Off-Site System to comply with the requirements of the site permit 6NYCRR Part 373, Permit No. 9-2940-00001/00079-0. This report includes:

- An overview of the project design;

- Documentation of the trench system construction activities and the materials used during the construction;
- Documentation of the extraction and monitoring well systems construction activities and the materials used during construction;
- Summaries of soils and air testing;
- Summaries of field hydraulic conductivity testing of the monitoring wells;
- Design modifications, upgrades, and clarifications; and
- As-built drawings.

This report presents a brief discussion of the above items and activities that occurred during the construction period that are relevant to the construction of the designed system. Certification letters from the General Contractor and major subcontractors are presented in Appendix B.

2.0 DESIGN OVERVIEW

2.1 General

The off-site ground water extraction system consists of six ground water extraction wells placed within the Niagara Mohawk Power Corporation (Niagara Mohawk) utility easement, located south of the BAT facility and parallel to Walmore Road (Figure 2). The extraction wells are designed to primarily extract ground water from the uppermost bedrock (Zone 1) aquifer system to remediate the aquifer of dissolved phase contamination present in the ground water system. The extracted ground water is transferred via a pumping system and a double-containment underground pipeline network to a sanitary sewer inlet for eventual treatment at the Wheatfield, New York Publicly Owned Treatment Works (POTW).

2.2 System Components

Each extraction well was designed to be capable of extracting ground water via a submersible pump at a rate of approximately 5 gallons per minute (gpm) to 14 gpm (a larger capacity pump (18 gpm to 32 gpm capacity) was installed in EW-2 subsequent to system start-up, see Section 3.7 for details). The well head is recessed, installed in a vault buried below the ground surface. A buried double-walled pipeline network transmits extracted ground water to a sewer inlet.

A 3-inch diameter pipe, constructed of polypropylene material serves the carrier pipe; a 7-inch diameter pipe, consisting of high density polyethylene (HDPE) material serves as the containment pipe. These materials are chemically compatible with the known contaminants present in the ground water of Zone 1 in the off-site area based on a pipe manufacturer's review of the data.

The buried vaults consist of pre-cast concrete material with a 36-inch diameter steel manhole cover for access into the vaults. Each vault houses an expansion loop to facilitate movement of the carrier pipe due to thermal expansion and contraction of the pipe. The containment pipe does not require an expansion loop as pipe movement is restricted by the weight of the backfill material over the pipe.

The water level in each extraction well is maintained between prescribed elevations by using a water level control pressure transducer unit to activate and deactivate the pump based on the water level in the well. The pumping rate is controlled by manually adjusting two butterfly valves at the well head to establish the desired flow rate. A high and low alarm setting has also been established for each well.

The leak detection system installed in the Off-Site System consists of catch basins, installed under the containment pipe annuli in vaults EW-2 through EW-6, in which float sensors are installed. Leak detection devices were not installed in vault EW-1 as the extraction well was taken out of service during start-up activities (see Section 3.7 for details).

At each well, a flow meter registers the flow rate and totalized flow, both of which are displayed at the vault. In vault EW-6, a flow meter registers and displays the flow rate for the entire system. The water level in the well is also displayed in each vault, as recorded by the pressure transducer system.

The Off-Site System can also be monitored from the BAT facility. Operational data are transmitted, via a telephone line and modem system, to a computer located at the BAT facility. The following information can be monitored at the computer terminal:

- Water level elevation in each well;
- Flow rate at each well;
- Flow rate for the system;
- Totalized flow for the system; and
- Alarm status for leak detection, high alarms, and low alarms.

Three monitoring wells (93-01(1), 93-02(1), and 93-03(1)) were also installed in the off-site area to be used to monitor the performance of the system.

3.0 SUMMARY OF CONSTRUCTION AND CONSTRUCTION QUALITY ASSURANCE/QUALITY CONTROL (CQA/QC) ACTIVITIES

3.1 General

The following sections discuss activities performed during construction of the Off-Site System. As-built drawings (Sheets A-1 through A-7), prepared by Golder Associates, along with supporting appendices attached hereto, present final construction details of the Off-Site System. As-built documentation of the electrical components of the system, prepared by Wendel, is presented as Appendix C. Appendix D presents a listing of products used in the construction of the Off-Site System, and the corresponding manufacturer/supplier of the product.

3.2 Extraction Wells

Construction activities were initiated with the installation of the extraction wells on November 2, 1992. The wells were completed by December 16, 1992. Six extraction wells were installed, designated EW-1 through EW-6, following the procedures presented herein. The overburden was drilled to the bedrock surface using either 12½-inch outside diameter (OD) hollow stem augers or 14-inch OD solid stem augers. The borehole was then advanced from 3 feet to 6 feet into the Zone 1 dolostone using a 12¼-inch tricone bit. Polypropylene overburden casing (10 inch nominal) was installed in the borehole and tremie grouted in place using a cement/bentonite mixture. Subsequent drilling was completed by advancing through the inside annulus of the casing and into the Zone 1 bedrock using HW or NX size rock coring techniques with air. The rock core was logged and stored in core boxes by Golder Associates' personnel. Rock coring continued to a depth of approximately 0.4 feet to 1.6 feet into the Zone 2 dolostone as determined by Golder Associates' personnel. The rock coring drill rods were removed from the borehole and drilling continued by reaming the cored bedrock with an 8-inch roller cone bit using air rotary techniques or an 8-inch downhole hammer. Following reaming of the borehole, it was developed by blowing air through the drill rods in a "pulsing" fashion until drill cuttings were removed and clear water was returned to the surface. Drilling fluids and cuttings generated during drilling and development activities were contained and transported to the BAT facility for disposition by BAT. Sheet A-2 presents the documented

locations of the extraction wells and a profile of the extraction system. Detailed extraction well boring and drilling logs are included in Appendix E.

After installation of the extraction wells, the overburden material was excavated from around the overburden casing and the concrete vaults were set in place over the casing with the casing protruding from the floor of the vault. The floor of the vault was set to approximately 5 feet bgs. The overburden casing stick-up inside the vault was subsequently fitted to the design stick-up of approximately 2 inches above the floor of the vault. As-built details for the extraction wells are presented on Sheet A-3 and vault details are presented on Sheet A-5.

3.3 Monitoring Wells

Monitoring wells, 93-01(1), 93-02(1), and 93-03(1) were installed, at the locations shown on Sheet A-2, to monitor the performance of the Off-Site System. Installation of these wells began on January 26, 1993, and was completed by February 19, 1993. These wells were installed in accordance with the procedures presented herein.

Overburden material was augered to the bedrock surface using 6¼-inch inside diameter (ID) hollow stem augers. Continuous split spoon sampling was completed to the bedrock surface and soil samples were retained and placed in 8-ounce glass jars. The headspace of the soil samples in the sample jars was analyzed with an organic vapor monitor (OVM) by Golder Associates' personnel. Results of the headspace analyses indicated that volatile organic compounds (VOCs) were not detected from any of the soil samples analyzed.

With the augers in the hole, a HW drill casing (4-inch ID) was drilled 3 feet to 5 feet into the top of the rock. The hole was then advanced through the inside annulus of the HW drill casing by HW or NX rock coring using air to a depth of 0.7 feet to 1.6 feet into the Zone 2 dolostone as determined by Golder Associates' personnel. Where NX coring was used, the hole was later reamed with a 3⅞-inch tricone bit to obtain the desired finished well diameter of approximately 4 inches. Upon termination depth, the borehole was developed by blowing air through the drill rods in a "pulsing" fashion until drill cuttings were removed and clear water was returned to the surface.

Each monitoring well was installed immediately after each borehole had been advanced to its required depth. A minimum of 0.6 feet of silica sand was tremied through the HW casing (installed through the overburden to the top of Zone 1) and into the bottom of the open bedrock hole. A 10-foot well screen and riser pipe were assembled and lowered into the open borehole to the predetermined level. Silica sand was installed around the screen and ranges from 2.2 feet to 3.5 feet above the top of the screen.

Bentonite pellets were then placed above the filter sand and extends at least to the Zone 1/overburden contact. The thickness of the bentonite seal ranges from 7.5 feet to 16.4 feet. In wells 93-01(1) and 93-03(1), the HW casing and augers were pulled up and the bentonite reached a minimum of 1.4 feet into the overburden. The bentonite was covered by approximately 6 inches of #4Q sand in these two wells before they were grouted to the surface. In well 93-02(1), the bottom of the hole started to collapse as the augers were removed so this hole was pressure grouted from the top of rock to the surface with no additional bentonite or sand. A lockable 4-inch diameter, 5-foot long, steel protective casing was placed over wells 93-01(1) and 93-03(1) and a 12-inch diameter, 5-foot long, steel protective casing was placed over well 93-02(1). These protective casings were grouted in place with a cement/bentonite grout mix. Pea gravel was placed in the inside annulus of the protective casing to within 4 inches of the top of the well. Three ¼-inch diameter drain holes were installed in the protective casing at the elevation of the grout/pea gravel contact. Sheet A-2 presents the documented locations of the monitoring wells. Detailed monitoring well boring and drilling logs are included in Appendix E.

All three monitoring wells were developed using a stainless steel bailer and a Teflon® waterra pump with HDPE tubing. The initial purge within the bailer consisted of one well volume of water. After that, development continued with the waterra and tubing until a minimum of five well volumes were removed. However, monitoring well 93-01(1) recovered extremely slowly and was not fully developed as only approximately 1.5 well volumes were removed before the well went "dry". The water level in the well has since not recovered to a static water level representative of the off-site area.

After the wells were developed, a rising head test was performed on each well to estimate the approximate hydraulic conductivity of the screened strata. Drilling fluids and cuttings generated during drilling and development activities were contained and transported to the BAT facility for disposition by BAT. Table 1 presents a summary of the rising head tests while well development field records and rising head test data are presented in Appendix F. Because monitoring well 93-01(1) has not recovered to static conditions, the rising head test completed of the well is considered invalid and no estimate for hydraulic conductivity is given for this well.

Monitoring well 93-01(1) is scheduled for abandonment and replacement in 1994. A letter addendum to this as-built report will be prepared once the well has been replaced.

3.4 Trench Excavation/Backfill

Sheet A-2 presents the as-built layout of the trench. Excavation work commenced December 1, 1992, and was completed by February 8, 1993. Work included excavating around the extraction well overburden casings for placement of the concrete vaults, and trench excavation for placement of the ground water transfer system piping.

The excavation and placement of vault 4 initiated this portion of the field activities. Trenching proceeded from vault 4 south, through the vault 5 location, to the vault 6 location. Trenching then proceeded from the vault 3 location north, through the vault 2 location, to the vault 1 location. The trenching from the vault 4 location to the vault 3 location, completed next, was complicated by the necessity of damming a small drainage ditch and pumping the drainage discharge water around the area to be excavated. Trenching excavation was completed with the excavation from the vault 6 location south, and then east, to the sewer inlet.

Excavation of the piping trench and vault pits was performed with a Caterpillar 235 C track-mounted excavator with a 3-foot bucket or with a smaller Komatsu 200 with a 2-foot bucket. The smaller machine was used to excavate the trench section from vault 6 to the sewer because of the lower clearances under the Niagara Mohawk power transmission lines in that section.

Trench wall stability was found to be a problem due to the very wet site conditions. For this reason, the trench was benched to maintain stability. Trench cross-sectional dimensions were measured by Golder Associates every 25 feet and are documented in Appendix G. The average depth of the trenches is approximately 5.7 feet and the average width of the trench bottom is approximately 4.9 feet.

The trenches were generally excavated in 50-foot sections, with the excavated material placed to the side of the open trench and covered with tarps if precipitation was expected. The trenches were backfilled to within 2 feet of the ground surface on the same day of excavation to help maintain trench stability. If any portion of the trench remained open overnight, it was encircled with caution fencing for safety reasons.

The trench bottom was designed to slope at a nominal 0.5 percent from the midpoint between each vault down to the vault. Trench bottom elevations were field measured by Clean Harbors to verify that the final slope met the design requirements.

Trench backfill consisted of New York State Department of Transportation (NYSDOT) #1A stone (#1A stone), 2-inch Run-of-Crusher (ROC) stone, and excavated native material. The bottom of the trench was filled with approximately 6 inches of compacted #1A stone. After placement of the piping on this layer, 6 inches of compacted #1A stone was placed above the pipe. At this point, the communication and power conduits were placed on the stone and covered with an additional 6 inches of compacted #1A stone. The #1A stone was covered with a geotextile prior to backfilling the top 3 feet to 4 feet of the trench with compacted, excavated native material (see Sheet A-4, Detail A-A').

In four instances, the backfill material sequence deviated from the above description. Under the temporary access road off of Walmore Road (see Sheet A-2, Detail 1), the trench was backfilled with #1A stone to within one foot bgs, with a one foot cap of compacted, native material, in order to better support vehicular traffic. In the three other instances, due to difficulty in meeting the soil compaction requirements for the native material, compacted 2-inch ROC stone was placed on top of the geotextile to approximately 1 foot bgs. Compacted, excavated native material was then placed on top of the 2-inch ROC

stone up to ground surface. In these three instances where the top of the containment pipe was less than 50 inches from the ground surface, insulation, 2-inches thick by approximately two feet wide, was placed on top of the #1A stone, below the geotextile, prior to placing of the upper backfill, to minimize frost penetration through the 2-inch ROC stone.

The concrete vaults were placed on a minimum of 6 inches of compacted #1A stone and 1-inch thick insulation. The area between the vault excavation and vault sidewalls were backfilled with compacted excavated material after placing 1-inch thick insulation around the sides.

Golder Associates obtained representative samples of the #1A stone at a frequency of one per every five truck loads and performed particle size analyses, in accordance with the design specifications. A total of 14 tests were performed representing 65 truck loads and one preconstruction sample of the #1A stone. Test results are presented in Appendix H. Of the 14 tests, none of the tests met the design specification for a #1A stone, which was obtained from the NYSDOT. The NYSDOT #1A stone specification was chosen by the Designer because it was anticipated that the stone, to specification, was readily available. However, the #1A stone received at the site deviated slightly from the NYSDOT specification, as the stone was generally finer than specified. The Designer reviewed the test results during construction and considered the #1A stone to be in substantial compliance with the intent of the design. As such, the #1A stone was used as backfill material.

Prior to backfilling, all backfill material was laboratory tested to determine material maximum density for compaction requirements (see Appendices I, J, and K). In the case of the excavated native material, two samples were tested and the average maximum dry density for the two samples was used for compaction requirements. During backfilling, compaction specifications were tested with a nuclear/density gauge. A CPN Model MC-3 or a Troxler Model 3411B was used throughout the backfilling activities. The #1A stone was compacted with a vibrating compactor and tested at a minimum frequency of one test per every 50 feet per lift. The 2-inch ROC stone was compacted with the backhoe bucket

and tested once per 100 feet per lift. The excavated native material was also compacted with the backhoe bucket and tested with a frequency of one test per 50 feet per lift. The backfill material around the vaults was compacted with the excavator bucket but was not compaction tested due to insufficient clearance for testing; Golder Associates' personnel approved the compaction effort completed by the contractor at the vaults. Backfill compaction test results and design requirements are summarized in Table 2. Nuclear density gauge field test results are found in Appendix L.

3.5 Piping/Pumping System

The containment and carrier pipes were prefabricated in 45-foot lengths by Clean Harbors. The inner, carrier pipe was butt fused, while the outer, containment pipe was joined with resistance-heated, fusible couplings as per the pipe manufacturer's specifications for assembly. The preassembled sections were placed on 6 inches of compacted #1A stone in the open excavations then welded together in the trench and backfilled. The piping is anchored at the midpoints between the vaults and at the 90-degree turns south of vault 6 (see Sheet A-6). Where the carrier and containment pipes cross below the drainage ditch between vaults 3 and 4 (see Sheet A-2), the piping has been heat traced, insulated, and installed within a 15-inch diameter concrete culvert (see Sheet A-6).

The piping slopes at a 0.5 percent minimum from a high point at the midpoint between two vaults toward the vaults. An expansion loop was integrated into the piping and is located at the midpoint of the east-west pipe segment between vault 6 and the sewer inlet (see Sheet A-6). The piping slopes at a 0.5 percent minimum from a high point at the expansion loop toward the sewer inlet and toward vault 6. A summary of the survey data of the top of the pipe elevations (invert) and other survey data, as provided by Clean Harbors is presented in Appendix M.

Much of the piping within the vaults was prefabricated on-site by Clean Harbors and joined, in large sections, within the vault. A submersible pump connected to a 1¼-inch diameter stainless steel riser pipe was installed at each extraction well to a depth specified by the Designer (see Sheet A-2). In addition, a 2-inch diameter stainless steel stilling well

was installed at each extraction well. The vault piping configuration details are shown on Sheets A-3 and A-4.

The containment and carrier pipes were separately air tested as per manufacturer's recommendations, and as approved by the Designer. The pressure test procedure and results are found in Appendix N. Four leaks were detected in the 8-inch containment pipe during testing. Three leaks were discovered to be in the flange seal next to the anchor blocks between vaults 1-2, 2-3, and 4-5. These leaks were caused by compaction forces mis-aligning the pipe joint during backfilling. The leaks were repaired by excavating around the joints, realigning the pipes and backfilling by hand. One leak was found in the westernmost fusion coupling in the expansion loop between vault 6 and the sewer. It was repaired by excavating and re-fusing the joint.

3.6 Electrical

As previously mentioned, part-time CQA/QC inspection services for the electrical components of the Off-Site System were provided by Wendel. Wendel's as-built certification report for the electrical portion of the Off-Site System can be found as Appendix C.

Some electrical CQA/QC inspection services were provided by Golder Associates, with prior oversight review and briefing by Wendel, when necessary. The items inspected by Golder Associates include:

- Conduit installation between vaults 1 and 5;
- Pulling of power/communication cable between vaults 1 and 5;
- Heat trace wrapping in concrete culvert and vaults 2, 3, 4, and 5;
- Installation of control panel box;
- Installation of junction and breaker boxes; and
- Repair of broken conduits.

3.7 Initial Pump Control Settings and Flow Rates

Table 3 presents the initial pump control settings for each extraction well. The control settings include high water level alarm and low water level alarm indicators, and pump on and pump off settings. The settings, established by the Designer, are viewed as the

lowest levels (most conservative) required to achieve the objective of creating an effective cone-of-depression in the off-site area.

The initial pump flow rates, as set during start-up of the system, was approximately 7 gpm for each well. The flow rates, however, were adjusted during start-up based on the response of the water level in the well to pumping. The butterfly valves at the well head were subsequently fully opened thus providing maximum pumping at each well of approximately 11 gpm to 13 gpm. As determined during start-up, the hydraulic response to pumping at EW-1 and EW-2 at the maximum pumping rate was not sufficient in lowering the water level in those wells. Thus, as recommended by the Designer, a larger capacity pump (18 gpm to 32 gpm) replaced the original pump in EW-2 to enhance drawdown in the well. Evaluation of the hydraulic response to pumping at EW-1 indicated that a pump of higher capacity than 32 gpm would be required to produce substantial drawdown at the well. Therefore, as recommended by the Designer, the pump in EW-1 was removed and the well was plugged. Apparently, based on the hydraulic response observed at EW-1 during start-up, EW-1 was installed in an area where the hydraulic conductivity is much higher (more highly fractured), compared to hydraulic conductivity values estimated from other wells in the off-site area (see Design Modifications 22 and 23 referenced in Section 4.0 for more details). Ground water flow in Zone 1 is likely influenced to some degree by Bergholtz Creek, located approximately 650 feet north of EW-1. Zone 1, in the vicinity of EW-1, may be partially recharged from Bergholtz Creek, via fractures in Zone 1 (i.e. EW-1 may be hydraulically connected to Bergholtz Creek).

3.8 Health and Safety

Golder Associates and its subcontractor, Wendel, followed the procedures outlined in the Health and Safety Plan (Golder Associates, December 1991), approved by the NYSDEC for this project. Health and safety air monitoring was provided by Golder Associates during construction activities when on-site. Air monitoring performed during excavation and drilling operations indicated that the action levels for total organics, oxygen, hydrogen sulfide, the lower explosive limit, and particulates specified in the Health and Safety Plan were not exceeded. Air monitoring field forms are presented in Appendix O.

4.0 DESIGN MODIFICATIONS AND CLARIFICATIONS

During construction of the Off-Site System, it occasionally became necessary to clarify or modify the design and/or specification. The Designer provided a design modification and/or clarification in writing as outlined on the forms presented in Appendix P. A summary of the design modifications and clarifications made during the project are presented in Table 4. All design modification and clarifications were approved by the Designer.

5.0 SUMMARY

Golder Associates was contracted by BAT to perform the CQA/QC monitoring of the Off-Site System installed near the BAT Wheatfield, New York, plant. A representative of Golder Associates, or a subcontracted firm, was present on site on a full-time or part-time basis, as required, for the project construction.

This document, including all appendices and drawings attached hereto, serves as the As-Built documentation for the Off-Site System which was installed as required by the BAT's permit. This document reflects the construction methods and the resulting constructed systems, including the modifications from the original design.

GOLDER ASSOCIATES INC.

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F/N: FINAL\AS-BUILT.FIN

REFERENCES

Golder Associates Inc., June 1991, "Final Report on Corrective Measures Study, Bell Aerospace Textron, Wheatfield Plant, Wheatfield, New York".

Golder Associates Inc., December 1991, "Final Health and Safety Plan for the Corrective Measures Implementation Plan, Bell Aerospace Textron, Wheatfield Plant, Niagara Falls, New York".

Golder Associates Inc., March 1992, "Final Report on Corrective Measures Implementation Plan Off-Site System, Bell Aerospace Textron, Wheatfield, New York".

TABLE 1
MONITORING WELL RISING HEAD TEST SUMMARY
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

WELL I.D.	DATE TESTED	HYDRAULIC CONDUCTIVITY cm/s
93-01(1)	2/24/93 - 3/3/93	*
93-02(1)	2/24/93	8.15 X 10-5
93-03(1)	2/24/93	1.85 X 10-5

NOTE:

* Lack of significant recovery in this well invalidates rising head test results.

F/N: FINAL\TABLE1.WK1

TABLE 2
IN-PLACE FIELD MOISTURE/DENSITY TEST SUMMARY
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK
PAGE 1 OF 7

DATE	TEST NO.	BACKFILL TYPE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	PERCENT COMPACTION (1)	PASS/ FAIL	LIFT NO.	STATION (2)
02-DEC-93	1	#1A STONE	104.9	19.5	95.6	P	1	V4 1+30
02-DEC-93	2	#1A STONE	104.9	16.3	95.6	P	1	V4 0+93
02-DEC-93	3	#1A STONE	104.9	18.4	95.6	P	1	V4 0+65
02-DEC-93	4	#1A STONE	104.3	24.2	96.1	P	1	V4 0+35
04-DEC-93	5	#1A STONE	106.4	2.3	96.9	P	2	V4 0+50
04-DEC-93	6	#1A STONE	105.1	2.4	95.7	P	2	V4 1+00
04-DEC-93	7	#1A STONE	105.4	3.2	96.0	P	2	V4 1+40
04-DEC-93	8	#1A STONE	106.4	4.5	96.9	P	1	V4 1+85
04-DEC-93	9	#1A STONE	104.5	4.8	95.2	P	2	V4 1+85
05-DEC-92	10	#1A STONE	106.6	4.4	97.1	P	1	V4 2+50
05-DEC-92	11	#1A STONE	107.0	3.9	97.5	P	2	V4 2+50
05-DEC-92	12	#1A STONE	105.0	3.1	95.7	P	3	V4 2+50
05-DEC-92	13	#1A STONE	107.1	3.0	97.6	P	4	V4 2+50
07-DEC-92	14	#1A STONE	106.6	3.5	97.1	P	5	V4 2+50
07-DEC-92	15	#1A STONE	106.1	4.0	96.7	P	6	V4 2+50
07-DEC-92	16	#1A STONE	105.1	5.0	95.8	P	7	V4 2+50
07-DEC-92	17	#1A STONE	105.8	2.8	96.4	P	8	V4 2+50
07-DEC-92	18	#1A STONE	106.2	3.0	96.7	P	9	V4 2+50
07-DEC-92	19	#1A STONE	106.6	3.0	97.1	P	10	V4 2+50
07-DEC-92	20	#1A STONE	105.3	2.8	95.9	P	1	V4 2+95
07-DEC-92	21	#1A STONE	105.1	0.5	95.7	P	2	V4 2+95
07-DEC-92	22	#1A STONE	106.3	2.6	96.8	P	1	V5 0+50
08-DEC-92	23	#1A STONE	106.8	2.8	97.3	P	1	V5 1+00
08-DEC-92	24	#1A STONE	105.9	1.0	96.4	P	1	V5 1+45
09-DEC-92	25	#1A STONE	106.6	2.1	97.1	P	2	V5 0+50
09-DEC-92	26	#1A STONE	107.9	1.6	98.3	P	2	V5 1+00

NOTES:

(1) Compaction Requirement for #1A Stone = 95%, for Clay = 90%, and for 2" ROC = 90% of Maximum Dry Density.

(2) Station designation gives vault number (e.g. V2) and number of feet south of that vault towards the next vault. From vault 6, the station designation includes vault number and distance towards the sewer inlet.

F/N: FINAL\TABLE2.WK1

TABLE 2
IN-PLACE FIELD MOISTURE/DENSITY TEST SUMMARY
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK
PAGE 2 OF 7

DATE	TEST NO.	BACKFILL TYPE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	PERCENT COMPACTION (1)	PASS/ FAIL	LIFT NO.	STATION (2)
09-DEC-92	27	#1A STONE	108.3	2.9	98.7	P	2	V5 1+45
09-DEC-92	28	#1A STONE	105.7	3.7	96.2	P	1	V5 2+00
09-DEC-92	29	#1A STONE	105.3	4.3	95.9	P	1	V5 2+50
09-DEC-92	30	#1A STONE	107.7	1.0	98.1	P	1	V5 2+95
10-DEC-92	31	#1A STONE	105.5	5.6	96.1	P	2	V5 2+00
10-DEC-92	32	#1A STONE	105.6	5.8	96.2	P	2	V5 2+50
10-DEC-92	33	#1A STONE	106.2	4.4	96.7	P	3	V4 2+50
10-DEC-92	34	#1A STONE	105.7	6.6	96.2	P	3	V4 2+95
15-DEC-92	35	#1A STONE	111.3	5.6	101.4	P	1	V3 2+00
15-DEC-92	36	#1A STONE	108.5	4.5	98.8	P	1	V3 2+50
15-DEC-92	37	#1A STONE	107.1	4.7	97.6	P	1	V3 2+95
15-DEC-92	38	CLAY	103.3	20.9	91.4	P	1	V4 2+50
15-DEC-92	39	CLAY	105.9	21.5	93.8	P	1	V4 2+70
15-DEC-92	40	CLAY	106.4	16.1	94.2	P	2	V4 2+70
15-DEC-92	41	CLAY	106.2	19.0	94.0	P	2	V4 2+50
15-DEC-92	42	CLAY	102.2	20.6	90.4	P	3	V4 2+70
15-DEC-92	43	CLAY	102.9	20.2	91.0	P	3	V4 2+50
15-DEC-92	44	CLAY	106.5	19.0	94.3	P	4	V4 2+70
15-DEC-92	45	CLAY	104.1	19.9	92.2	P	4	V4 2+50
15-DEC-92	46	#1A STONE	109.1	1.4	99.4	P	3	V5 0+50
15-DEC-92	47	#1A STONE	107.3	1.9	97.7	P	3	V5 1+00
15-DEC-92	48	#1A STONE	109.4	0.3	99.6	P	3	V5 1+50
15-DEC-92	49	#1A STONE	106.5	1.5	98.8	P	3	V5 2+00
15-DEC-92	50	#1A STONE	105.4	1.8	96.0	P	3	V5 2+50
15-DEC-92	51	CLAY	104.7	19.3	92.6	P	1	V5 0+50
15-DEC-92	52	CLAY	104.3	20.0	92.3	P	1	V5 1+00

NOTES:

(1) Compaction Requirement for #1A Stone = 95%, for Clay = 90%, and for 2" ROC = 90% of Maximum Dry Density.

(2) Station designation gives vault number (e.g. V2) and number of feet south of that vault towards the next vault. From vault 6, the station designation includes vault number and distance towards the sewer inlet.

F/N: FINAL\TABLE2.WK1

TABLE 2
IN-PLACE FIELD MOISTURE/DENSITY TEST SUMMARY
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK
PAGE 3 OF 7

DATE	TEST NO.	BACKFILL TYPE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	PERCENT COMPACTION (1)	PASS/ FAIL	LIFT NO.	STATION (2)
15-DEC-92	53	CLAY	105.0	17.6	92.9	P	2	V5 0+50
15-DEC-92	54	CLAY	104.6	21.3	92.6	P	2	V5 1+00
15-DEC-92	55	CLAY	104.4	19.5	92.4	P	3	V5 0+50
15-DEC-92	56	CLAY	105.5	21.5	93.4	P	3	V5 1+00
17-DEC-92	57	#1A STONE	107.2	6.3	97.7	P	3	V4 2+00
17-DEC-92	58	#1A STONE	107.6	3.4	98.0	P	3	V4 1+50
17-DEC-92	59	CLAY	104.5	20.0	95.7	P	1	V4 1+50
17-DEC-92	60	CLAY	100.9	19.7	92.4	P	1	V5 1+50
17-DEC-92	61	CLAY	101.9	19.5	93.3	P	1	V5 2+00
17-DEC-92	62	CLAY	103.4	19.2	95.2	P	2	V5 1+50
17-DEC-92	63	CLAY	102.4	19.5	93.8	P	2	V5 2+00
17-DEC-92	64	CLAY	101.4	19.7	92.9	P	3	V5 1+50
17-DEC-92	65	CLAY	100.9	19.8	92.4	P	3	V5 2+00
17-DEC-92	66	CLAY	100.4	19.8	92.0	P	1	V5 2+50
17-DEC-92	67	CLAY	99.9	20.0	91.5	P	1	V5 2+95
17-DEC-92	68	CLAY	99.2	22.0	90.9	P	2	V5 2+50
17-DEC-92	69	CLAY	99.9	22.1	91.5	P	2	V5 2+95
17-DEC-92	70	CLAY	100.0	22.9	91.6	P	3	V5 2+50
17-DEC-92	71	CLAY	99.4	23.3	91.1	P	3	V5 2+95
17-DEC-92	72	CLAY	98.4	23.2	90.1	P	4	V5 1+50
17-DEC-92	73	CLAY	99.3	19.8	90.9	P	4	V5 2+00
17-DEC-92	74	CLAY	98.6	23.2	90.3	P	4	V5 1+00
18-DEC-92	75	2" ROC	130.1	2.3	92.3	P	1	V4 2+00
18-DEC-92	76	2" ROC	127.0	0.1	90.1	P	2	V4 2+00
18-DEC-92	77	#1A STONE	110.5	0.4	100.7	P	2	V3 2+00
18-DEC-92	78	#1A STONE	110.7	0.4	101.8	P	2	V3 2+50

NOTES:

(1) Compaction Requirement for #1A Stone = 95%, for Clay = 90%, and for 2" ROC = 90% of Maximum Dry Density.

(2) Station designation gives vault number (e.g. V2) and number of feet south of that vault towards the next vault. From vault 6, the station designation includes vault number and distance towards the sewer inlet.

F/N: FINAL\TABLE2.WK1

TABLE 2
IN-PLACE FIELD MOISTURE/DENSITY TEST SUMMARY
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK
PAGE 4 OF 7

DATE	TEST NO.	BACKFILL TYPE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	PERCENT COMPACTION (1)	PASS/ FAIL	LIFT NO.	STATION (2)
18-DEC-92	79	#1A STONE	111.1	1.3	99.8	P	2	V3 2+95
18-DEC-92	80	#1A STONE	106.0	2.7	96.6	P	3	V4 0+50
18-DEC-92	81	#1A STONE	105.1	2.5	95.7	P	3	V4 1+00
18-DEC-92	82	#1A STONE	107.4	1.1	97.8	P	3	V3 2+95
18-DEC-92	83	#1A STONE	105.3	1.5	95.9	P	3	V3 2+50
18-DEC-92	84	#1A STONE	105.4	1.0	96.0	P	3	V3 2+00
18-DEC-92	85	2" ROC	128.0	2.2	90.8	P	3	V4 2+00
22-DEC-92	86	2" ROC	128.1	1.9	90.8	P	1	V4 1+00
22-DEC-92	87	2" ROC	128.8	1.8	91.3	P	2	V4 1+00
06-JAN-93	88	#1A STONE	110.7	5.6	100.8	P	1	V2 2+95
06-JAN-93	89	#1A STONE	111.1	5.5	101.2	P	1	V2 2+50
06-JAN-93	90	#1A STONE	111.5	5.6	101.6	P	1	V2 2+00
06-JAN-93	91	#1A STONE	110.3	7.6	100.5	P	1	V2 1+50
06-JAN-93	92	#1A STONE	108.4	7.1	98.7	P	2	V2 2+95
06-JAN-93	93	#1A STONE	110.4	6.4	100.5	P	2	V2 2+50
06-JAN-93	94	#1A STONE	107.4	6.4	97.9	P	2	V2 2+00
06-JAN-93	95	#1A STONE	105.4	0.7	96.0	P	2	V2 1+50
07-JAN-93	96	#1A STONE	110.9	1.4	101.0	P	1	V2 1+00
07-JAN-93	97	#1A STONE	105.6	2.4	96.1	P	1	V2 0+50
07-JAN-93	98	#1A STONE	109.1	2.1	99.3	P	1	V2 0+05
07-JAN-93	99	#1A STONE	110.4	2.5	100.5	P	2	V2 1+00
07-JAN-93	100	#1A STONE	107.1	0.6	97.5	P	2	V2 0+50
08-JAN-93	101	#1A STONE	107.7	0.7	98.1	P	2	V2 0+25
08-JAN-93	102	#1A STONE	106.4	0.6	96.9	P	1	V1 2+95
08-JAN-93	103	#1A STONE	106.4	1.3	96.9	P	3	V2 0+50
08-JAN-93	104	#1A STONE	106.8	2.2	97.3	P	3	V2 1+00

NOTES:

(1) Compaction Requirement for #1A Stone = 95%, for Clay = 90%, and for 2" ROC = 90% of Maximum Dry Density.

(2) Station designation gives vault number (e.g. V2) and number of feet south of that vault towards the next vault. From vault 6, the station designation includes vault number and distance towards the sewer inlet.

F/N: FINAL\TABLE2.WK1

TABLE 2
IN-PLACE FIELD MOISTURE/DENSITY TEST SUMMARY
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK
PAGE 5 OF 7

DATE	TEST NO.	BACKFILL TYPE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	PERCENT COMPACTION (1)	PASS/ FAIL	LIFT NO.	STATION (2)
08-JAN-93	105	#1A STONE	107.0	0.5	97.4	P	3	V2 1+50
08-JAN-93	106	#1A STONE	107.4	0.6	97.8	P	3	V2 2+00
08-JAN-93	107	#1A STONE	106.7	0.8	97.2	P	3	V2 2+50
08-JAN-93	108	#1A STONE	107.2	0.7	97.7	P	3	V2 2+80
08-JAN-93	109	CLAY	99.0	19.2	90.6	P	1	V2 2+95
08-JAN-93	110	CLAY	99.0	21.0	90.7	P	2	V2 2+95
09-JAN-93	111	CLAY	99.5	21.7	91.1	P	3	V2 2+95
09-JAN-93	112	CLAY	100.8	19.0	92.3	P	1	V2 2+50
09-JAN-93	113	CLAY	99.6	22.9	91.2	P	2	V2 2+50
09-JAN-93	114	CLAY	99.9	21.5	91.4	P	3	V2 2+50
09-JAN-93	115	CLAY	99.1	21.2	90.7	P	4	V2 2+50
09-JAN-93	116	CLAY	98.7	21.7	90.4	P	4	V2 2+95
11-JAN-93	117	CLAY	98.6	23.1	90.3	P	1	V2 2+00
11-JAN-93	118	CLAY	91.3	27.7	91.3	P	2	V2 2+00
11-JAN-93	119	CLAY	90.7	23.6	90.7	P	3	V2 2+00
11-JAN-93	120	CLAY	99.2	20.3	90.9	P	4	V2 2+00
11-JAN-93	121	CLAY	97.2	22.6	97.2	P	5	V2 2+00
12-JAN-93	122	#1A STONE	105.9	1.0	96.4	P	1	V1 2+50
12-JAN-93	123	#1A STONE	105.4	1.4	96.0	P	1	V1 2+00
12-JAN-93	124	#1A STONE	106.0	0.3	96.5	P	1	V1 1+50
12-JAN-93	125	#1A STONE	105.8	0.7	96.4	P	2	V1 2+95
12-JAN-93	126	#1A STONE	105.4	0.9	96.0	P	2	V1 2+50
12-JAN-93	127	#1A STONE	105.0	1.2	95.6	P	2	V1 2+00
12-JAN-93	128	#1A STONE	105.8	0.9	96.3	P	2	V1 1+50
12-JAN-93	129	#1A STONE	105.1	1.0	95.7	P	1	V1 1+00
12-JAN-93	130	#1A STONE	105.0	1.1	95.6	P	1	V1 0+50

NOTES:

(1) Compaction Requirement for #1A Stone = 95%, for Clay = 90%, and for 2" ROC = 90% of Maximum Dry Density.

(2) Station designation gives vault number (e.g. V2) and number of feet south of that vault towards the next vault. From vault 6, the station designation includes vault number and distance towards the sewer inlet.

F/N: FINAL\TABLE2.WK1

TABLE 2
IN-PLACE FIELD MOISTURE/DENSITY TEST SUMMARY
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK
PAGE 6 OF 7

DATE	TEST NO.	BACKFILL TYPE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	PERCENT COMPACTION (1)	PASS/ FAIL	LIFT NO.	STATION (2)
12-JAN-93	131	2" ROC	131.8	3.6	93.5	P	1	V2 1+50
12-JAN-93	132	2" ROC	130.3	4.8	92.4	P	1	V2 0+50
12-JAN-93	133	2" ROC	128.5	0.1	91.2	P	2	V2 1+50
12-JAN-93	134	2" ROC	127.3	1.1	90.3	P	2	V2 0+50
12-JAN-93	135	2" ROC	127.5	1.2	90.4	P	3	V2 1+50
12-JAN-93	136	2" ROC	128.3	1.2	91.0	P	3	V2 0+50
13-JAN-93	137	#1A STONE	108.5	1.3	98.8	P	2	V1 1+00
13-JAN-93	138	#1A STONE	105.0	4.6	95.7	P	2	V1 0+50
14-JAN-93	139	#1A STONE	108.7	2.9	99.0	P	3	V1 2+95
14-JAN-93	140	#1A STONE	108.8	2.9	99.1	P	3	V1 2+50
14-JAN-93	141	#1A STONE	105.3	1.4	95.9	P	3	V1 2+00
14-JAN-93	142	#1A STONE	105.6	1.2	96.1	P	3	V1 1+50
14-JAN-93	143	2" ROC	126.9	0.2	90.0	P	1	V1 2+50
14-JAN-93	144	2" ROC	127.0	0.1	90.0	P	2	V1 2+50
14-JAN-93	145	#1A STONE	110.6	2.5	100.7	P	1	V3 1+30
14-JAN-93	146	#1A STONE	112.6	1.7	102.5	P	1	V3 1+00
18-JAN-93	147	#1A STONE	110.5	2.3	100.6	P	2	V3 0+50
18-JAN-93	148	#1A STONE	112.0	1.8	102.0	P	2	V3 1+00
18-JAN-93	149	#1A STONE	111.2	1.7	101.3	P	2	V3 1+30
18-JAN-93	150	#1A STONE	110.8	0.8	101.0	P	3	V3 0+50
18-JAN-93	151	#1A STONE	109.7	1.8	100.1	P	3	V3 1+00
18-JAN-93	152	2" ROC	129.4	8.0	91.7	P	1	V3 0+75
18-JAN-93	153	2" ROC	132.0	5.9	93.6	P	2	V3 0+75
19-JAN-93	154	#1A STONE	110.2	5.8	100.4	P	3	V1 1+00
19-JAN-93	155	#1A STONE	106.1	14.7	97.1	P	3	V1 0+50
19-JAN-93	156	CLAY	99.0	23.4	90.7	P	1	V1 1+50

NOTES:

(1) Compaction Requirement for #1A Stone = 95%, for Clay = 90%, and for 2" ROC = 90% of Maximum Dry Density.

(2) Station designation gives vault number (e.g. V2) and number of feet south of that vault towards the next vault. From vault 6, the station designation includes vault number and distance towards the sewer inlet.

F/N: FINAL\TABLE2.WK1

TABLE 2
IN-PLACE FIELD MOISTURE/DENSITY TEST SUMMARY
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK
PAGE 7 OF 7

DATE	TEST NO.	BACKFILL TYPE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	PERCENT COMPACTION (1)	PASS/ FAIL	LIFT NO.	STATION (2)
19-JAN-93	157	CLAY	101.1	21.0	92.6	P	1	V1 1+00
19-JAN-93	158	CLAY	98.6	20.7	90.3	P	2	V1 1+50
19-JAN-93	159	CLAY	98.3	20.9	90.1	P	2	V1 1+00
19-JAN-93	160	CLAY	99.5	21.7	91.2	P	3	V1 1+50
19-JAN-93	161	CLAY	99.0	21.9	90.7	P	3	V1 1+00
19-JAN-93	162	CLAY	99.0	23.2	90.6	P	1	V1 0+50
19-JAN-93	163	CLAY	98.3	18.1	90.0	P	2	V1 0+50
19-JAN-93	164	CLAY	98.6	16.4	90.3	P	3	V1 0+50
02-FEB-93	165	#1A STONE	105.1	4.5	95.7	P	1	V6 0+50
02-FEB-93	166	#1A STONE	109.7	0.5	100.0	P	1	V6 1+00
02-FEB-93	167	#1A STONE	109.4	8.5	99.6	P	2	V6 1+00
02-FEB-93	168	#1A STONE	109.1	16.2	99.4	P	1	V6 1+50
05-FEB-93	169	#1A STONE	113.4	2.9	103.3	P	2	V6 0+50
05-FEB-93	170	#1A STONE	105.7	4.9	96.2	P	2	V6 1+50
05-FEB-93	171	#1A STONE	108.9	3.7	99.2	P	3	V6 0+50
05-FEB-93	172	#1A STONE	108.4	2.5	98.7	P	3	V6 1+00
05-FEB-93	173	#1A STONE	107.8	2.4	98.2	P	3	V6 1+50
05-FEB-93	174	2" ROC	141.1	8.3	100.1	P	1	V6 1+00
05-FEB-93	175	2" ROC	140.0	9.2	99.2	P	2	V6 1+00

NOTES:

(1) Compaction Requirement for #1A Stone = 95%, for Clay = 90%, and for 2" ROC = 90% of Maximum Dry Density.

(2) Station designation gives vault number (e.g. V2) and number of feet south of that vault towards the next vault. From vault 6, the station designation includes vault number and distance towards the sewer inlet.

F/N: FINAL\TABLE2.WK1

TABLE 3
INITIAL PUMP CONTROL SETTINGS
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

WELL NO.	TOP OF CASING	HIGH LEVEL ALARM	PUMP ON SETTING	PUMP OFF SETTING	LOW LEVEL ALARM
EW-1	569.0	558.1	556.1	552.1	550.1
EW-2	568.2	555.8	553.8	549.8	547.8
EW-3	569.6	556.4	554.4	550.4	548.4
EW-4	570.1	556.7	554.7	550.7	548.7
EW-5	568.2	555.2	553.2	549.2	547.2
EW-6	569.5	557.6	555.6	551.6	549.6

NOTE:

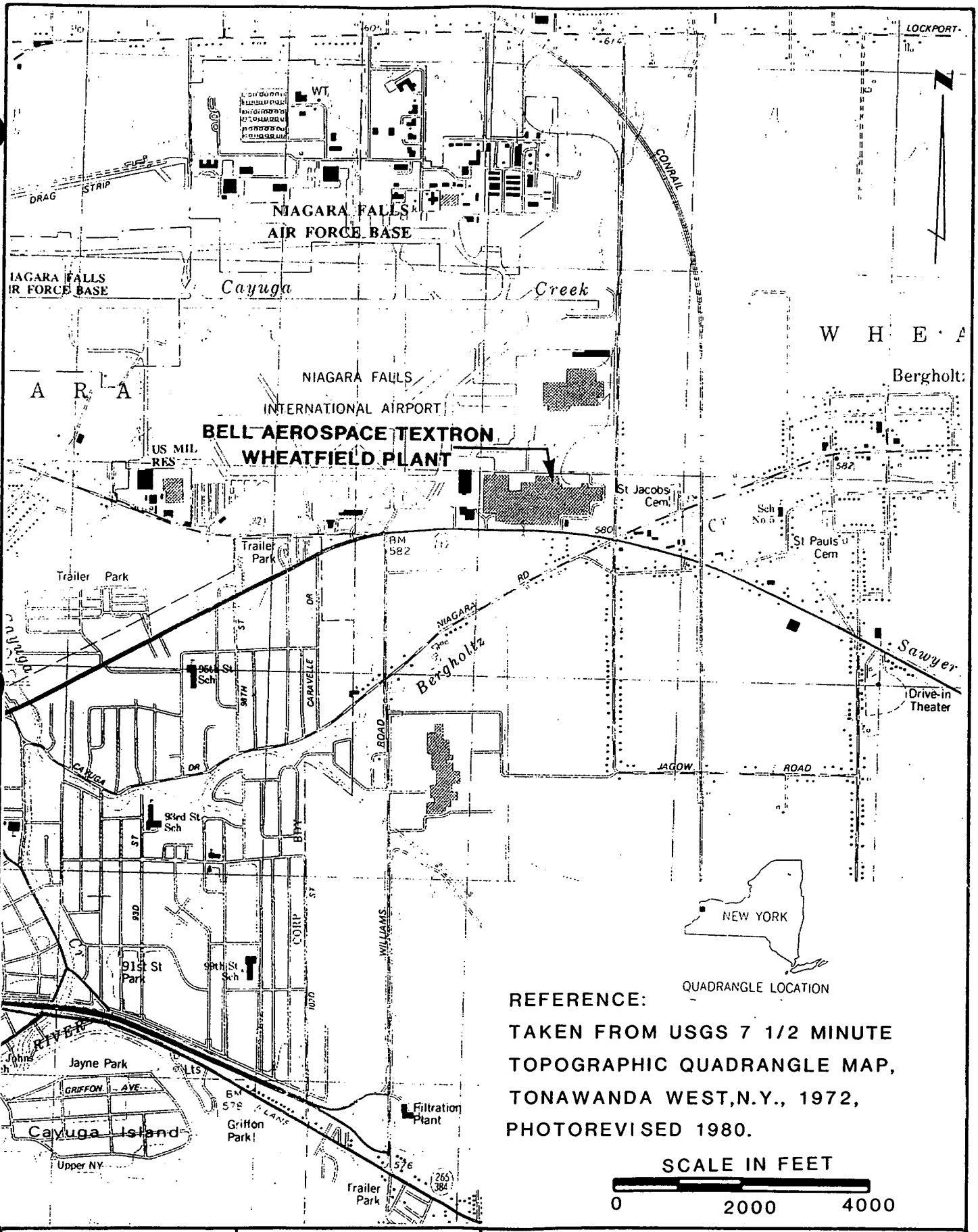
All values in feet mean sea level.

F/N: FINAL\TABLE3.WK1

TABLE 4
SUMMARY OF DESIGN MODIFICATIONS AND CLARIFICATIONS
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

DESIGNER APPROVAL DATE	CLASSIFICATION	SUBJECT	FORM NO.
11/19/92	Design Clarification	Separation of Power/Control Cables	1
01/18/93	Design Clarification	Sample Ports	2
01/18/93	Design Clarification	Pipe Slope South of EW-6	3
01/26/92	Design Clarification	Riser Pipe Torque	4
05/17/93	Design Clarification	Vapor Barrier for Pipe Annulus	5
11/92-02/93	Design Clarification	#1A Stone Specifications	6
02/05/93	Design Clarification	Pressure Testing Procedure	7
01/27/93	Design Clarification	Pump Control Settings	8
04/21/94	Design Clarification	Survey Data and Pipe Slope	9
11/02/92	Design Modification	Pump Electrical Specifications	1
11/05/92	Design Modification	Vault Manhole Dimensions	2
11/19/92	Design Modification	Surface Casing Depths	2
11/19/92	Design Modification	Transducer Specifications	3
11/20/92	Design Modification	Expansion Loop South of EW-6	5
.02/09/93	Design Modification	Pipe Seal	5R
11/20/92	Design Modification	Pipe Inverts Inside Vaults	6
12/09/92	Design Modification	Additional Leak Detector Cables	7
12/10/92	Design Modification	Conduit Size Increase	7R
12/02/92	Design Modification	Pipe Sleeve Over Ditch Crossing	8
12/03/92	Design Modification	Access Road Crossing Improvement	9
12/01/92	Design Modification	Sub-Vault Bedding Requirements	10
12/14/92	Design Modification	Soil Compaction	11
12/18/92	Design Modification	Substitute 2-inch Rock Stone Soil Backfill	12
01/18/93	Design Modification	Autosampler Port	13
01/11/93	Design Modification	Substitute 2-inch Rock Stone Soil Backfill	14
01/20/93	Design Modification	Install 12-inch Protective Casings	15
01/26/93	Design Modification	Pump Hanger Plate	16
01/28/93	Design Modification	Move Vault Ladder/Panel	17
02/09/93	Design Modification	Vent, Bracket, Null Temperature	18
02/02/93	Design Modification	Substitute 2-inch Rock Stone Soil Backfill	19
03/03/93	Design Modification	Omit Vault Grate	20
05/17/93	Design Modification	Vapor Barrier for Pipe Annulus	21
03/25/93	Design Modification	EW-1 and EW-2 Pump Size Increase	22
03/29/93	Design Modification	EW-1 Pump Removal	23
09/28/93	Design Modification	Revised Leak Detection System	24

F/N: FINAL\TABLE4.WK1



REFERENCE:
TAKEN FROM USGS 7 1/2 MINUTE TOPOGRAPHIC QUADRANGLE MAP, TONAWANDA WEST,N.Y., 1972, PHOTOREVISED 1980.

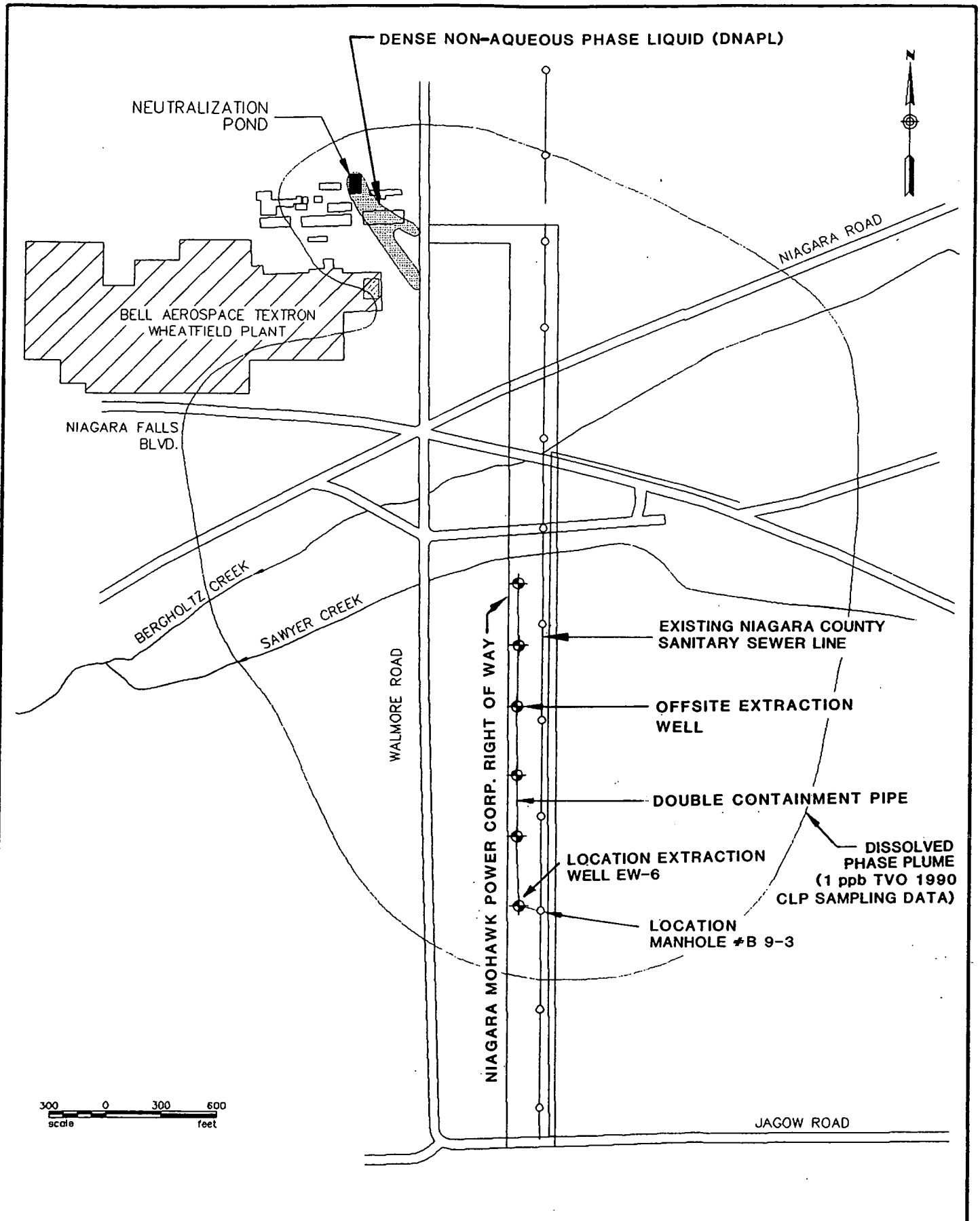
SCALE IN FEET

0 2000 4000

JOB No.: 923-9055	SCALE: AS SHOWN	SITE LOCATION MAP	
DRAWN: BEC	DATE: 6/4/93		
CHECKED: ALG	DWG. No.: 8		
Golder Associates		BELL AEROSPACE TEXTRON	FIGURE 1

158696

BUF/FILE # 9141014



JOB No.: 923-9055	SCALE: AS SHOWN	LOCATION OF OFFSITE SYSTEM	
DRAWN: BEC	DATE: 6/4/93		
CHECKED: ALG	DWG. No.: NY01-275		
Golder Associates		BELL AREOSPACE TEXTRON	FIGURE 2

158696

Bell Aerospace TEXTRON

WHEATFIELD, NEW YORK

AS BUILT
OFFSITE GROUNDWATER EXTRACTION SYSTEM
FOR
BELL AEROSPACE TEXTRON
WHEATFIELD PLANT
WHEATFIELD, NEW YORK

DRAWING LIST

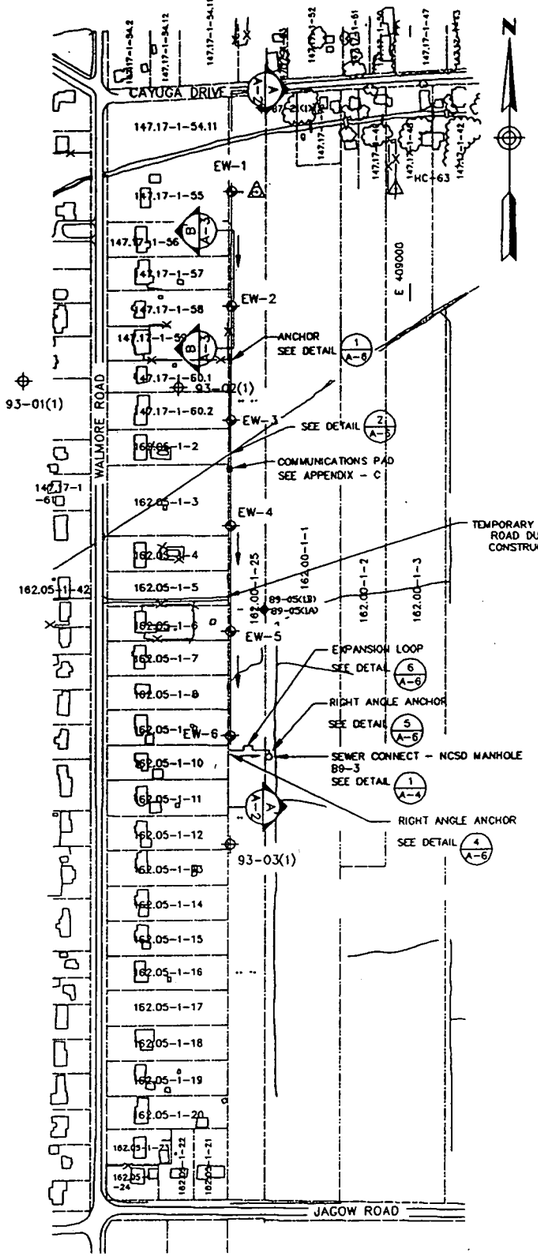
Sheet No.	Drawing Title
A-1	COVER SHEET
A-2	OFFSITE GROUNDWATER EXTRACTION SYSTEM PLAN AND PROFILE
A-3	EXTRACTION SYSTEM DETAILS (SHEET 1 OF 2)
A-4	EXTRACTION SYSTEM DETAILS (SHEET 2 OF 2)
A-5	VAULT DETAILS
A-6	PIPING DETAILS
A-7	LEAK DETECTION SYSTEM DETAILS

Prepared by:

Golder Associates

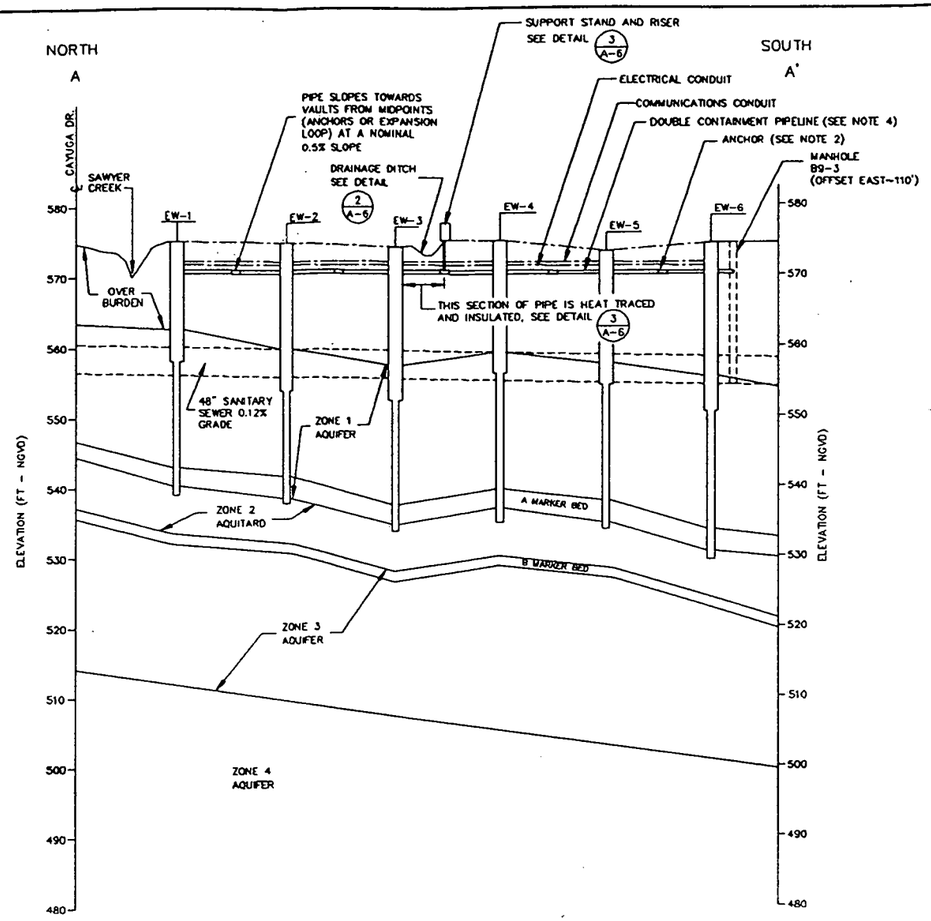
Buffalo, New York

APRIL 1994



1/A-2 OFFSITE EXTRACTION SYSTEM

200 0 200 400
scale feet



A-A' / A-2 EXTRACTION SYSTEM PROFILE SECTION A-A'

200 0 200 400
horizontal scale feet

10 0 10 20
vertical scale feet

SCHEDULE OF APPROXIMATE LOCATION (FT.)

EXTRACTION WELL No.	* SURFACE CASING DEPTH (FT. BGS)	8" BOREHOLE DEPTH (FT. BGS)
EW-1	17.0	36.0
EW-2	21.0	37.0
EW-3	21.8	40.5
EW-4	18.9	40.1
EW-5	19.0	39.6
EW-6	24.0	45.1

* VAULTS NOT SHOWN

LEGEND

- 89-05(1B) — EXISTING MONITORING WELL LOCATIONS
- EXISTING MANHOLE
- EXISTING SANITARY SEWER
- 93-01(1) — NEW MONITORING WELLS
- EW-3 — EXTRACTION WELL
- BURIED PIPELINE
- COMMUNICATIONS PAD
- ANCHOR
- SEWER CONNECTION MANHOLE
- DIRECTION OF FLOW IN PIPELINE
- INFERRED GROUND SURFACE
- EW-3 — EXTRACTION WELL ID
- SURFACE CASING
- UNCASED BOREHOLE
- PIPELINE
- CONDUIT LINES
- MAINTENANCE RISER
- ANCHOR
- 1/A-2 — DETAIL/CROSS SECTION DESIGNATION; SHT. No. WHERE DETAIL/CROSS SECTION IS PRESENTED

NOTES

1.) ALL STRATIGRAPHIC CONTRACTS BETWEEN BOREHOLES ARE INFERRED

2.) INSTALLED AT ONE-HALF THE DISTANCE BETWEEN VAULTS. SEE DETAIL 1/A-6

3.) WELLS AND SURFACE CASING NOT SHOWN TO SCALE.

4.) INVERT ELEVATION OF BURIED PIPELINE IS A NOMINAL 4.5 FT. BELOW GROUND SURFACE (EXCEPT BENEATH DRAINAGE DITCH BETWEEN EW-3 AND EW-4)

STATE OF NEW YORK ★ WILLIAM BLAINE LOZIER ★ LICENSED PROFESSIONAL ENGINEER 067160

REV	DATE	DESCRIPTION	DR. BY	APP. BY

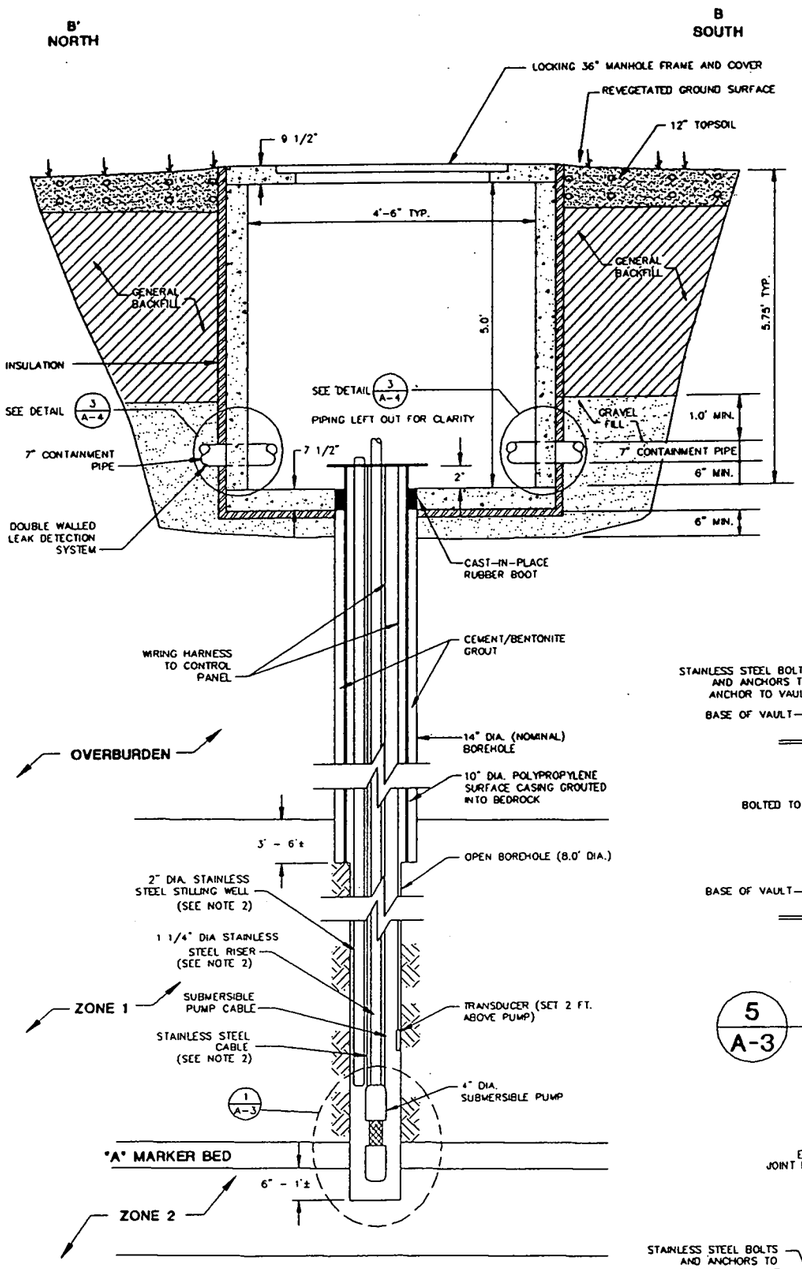
CLIENT/PROJECT: Bell Aerospace TEXTRON, WHEATFIELD, NEW YORK

TITLE: AS BUILT OFFSITE GROUNDWATER EXTRATION SYSTEM PLAN AND PROFILE

Buffalo, New York

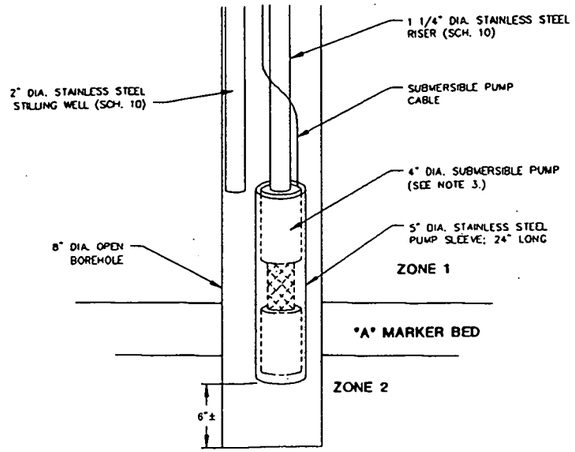
Golder Associates

DRAWN	BEC	DATE	6/4/93
DESIGNED	DCW	SCALE	AS SHOWN
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APPROVED		DWG. NO.	26
FILE NO.	913-9014	ORDER	A-2



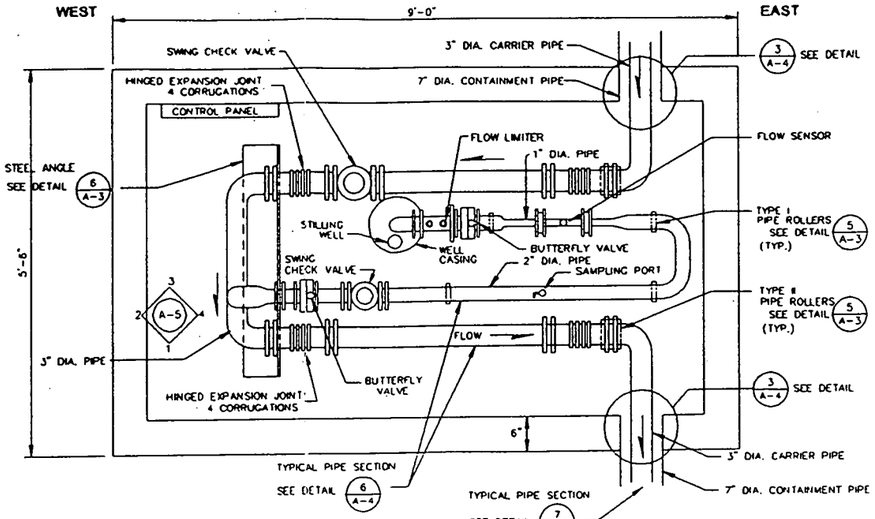
B-B' / A-3 TYPICAL EXTRACTION WELL

NOT TO SCALE



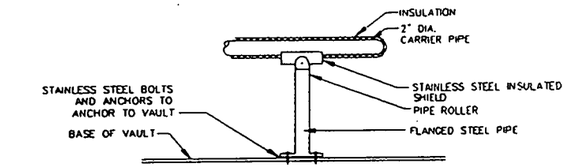
1 / A-3 BOTTOM DETAIL

NOT TO SCALE

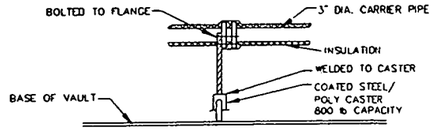


2 / A-3 VAULT DETAIL EW2 - EW5

scale 1 0 1 2 feet



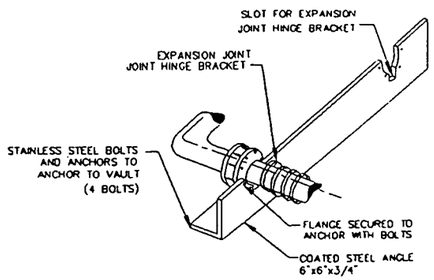
TYPE I



TYPE II

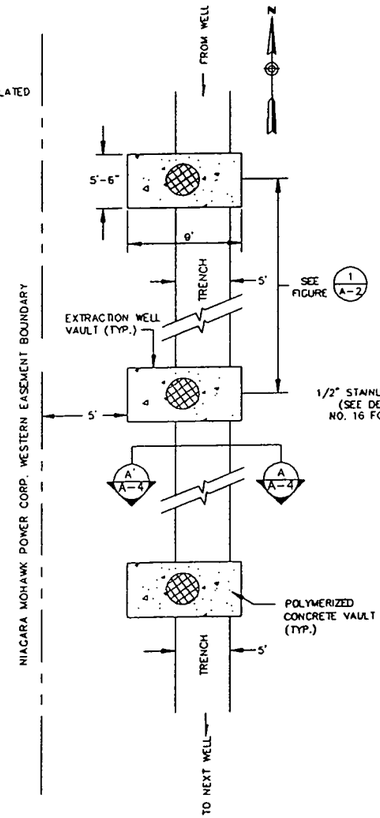
5 / A-3 PIPE ROLLER DETAIL (ELEVATION VIEW)

NOT TO SCALE



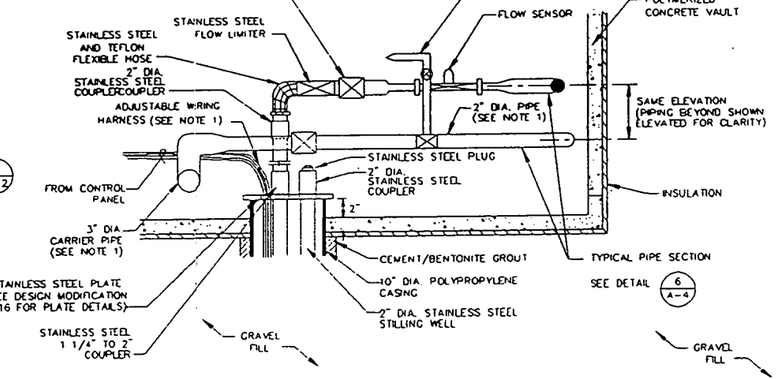
6 / A-3 FIXED ANCHOR DETAIL

NOT TO SCALE



3 / A-3 EXTRACTION SYSTEM LAYOUT

NOT TO SCALE



4 / A-3 CONTROL/DATA COLLECTION SYSTEM

NOT TO SCALE

STATE OF NEW YORK
WILLIAM BLAINE LOZIER
LICENSED PROFESSIONAL ENGINEER
067160

LEGEND

1/A / A-2 — DETAIL/CROSS SECTION DESIGNATION; SHT. No. WHERE CROSS SECTION IS PRESENTED

NOTES:

1. INVERT OF 3" DIA. PIPE IS A NOMINAL 8" ABOVE BASE OF VAULT. INVERT ELEVATION OF 2" DIA. PIPE IS A NOMINAL 17" ABOVE BASE OF VAULT.
2. SEE DESIGN MODIFICATION No. 16, TABLE 2 FOR SCHEDULE OF RISER PIPE, STILLING WELL AND SUPPORT CABLE LENGTHS.
3. NO PUMP, RISER OR STILLING WELL IS INSTALLED IN EW-1. SUBMERSIBLE PUMP OF 5 gpm TO 14 gpm CAPACITY INSTALLED IN EW-3 THROUGH EW-6; SUBMERSIBLE PUMP OF 18 gpm TO 32 gpm CAPACITY INSTALLED IN EW-2.

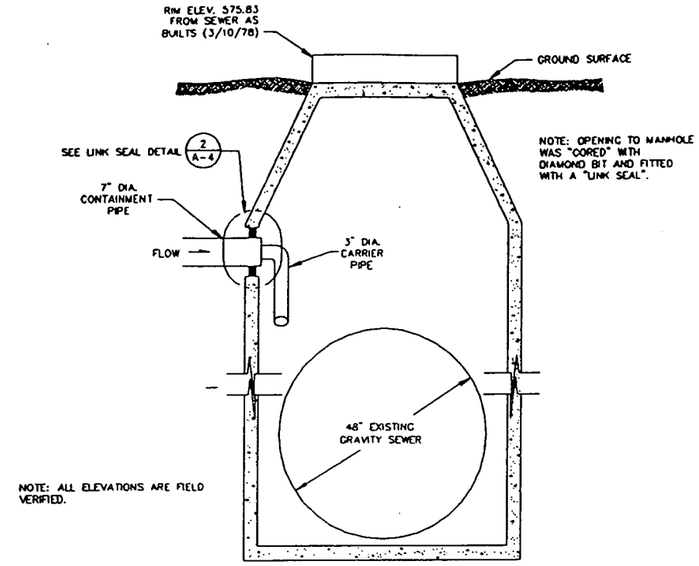
REV.	DATE	DESCRIPTION	DR. BY	APP. BY

CLIENT/PROJECT: Bell Aerospace TEXTRON, WHEATFIELD, NEW YORK

TITLE: EXTRACTION SYSTEM DETAILS (SHEET 1 OF 2)

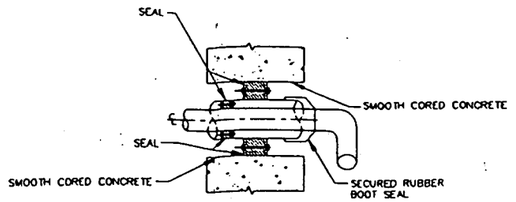
Golder Associates — Buffalo, New York

DRAWN	BEC	DATE	6/4/93
DESIGNED	DCW	SCALE	AS SHOWN
REVIEWED		JOB NO.	923-9055
APPROVED		DWG. NO.	27
FILE NO.	913-9014	REV.	A-3



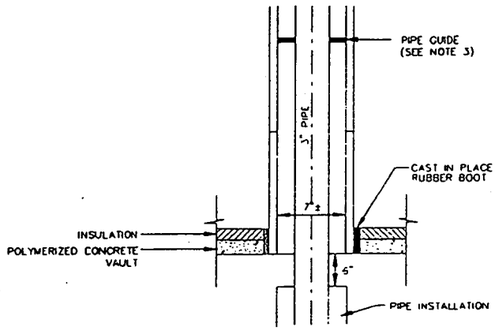
1 / A-4 **EXISTING MANHOLE MODIFICATION (#B9-3)**

NOT TO SCALE



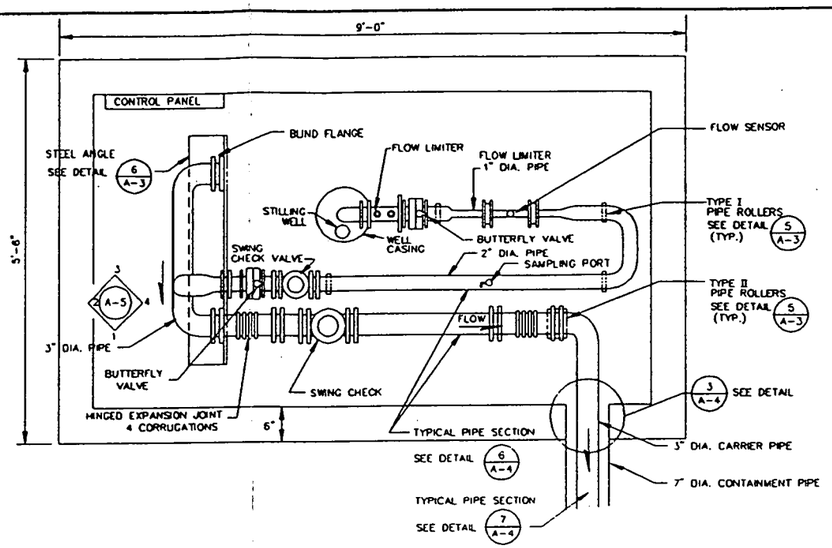
2 / A-4 **LINK SEAL (TYP.)**

NOT TO SCALE



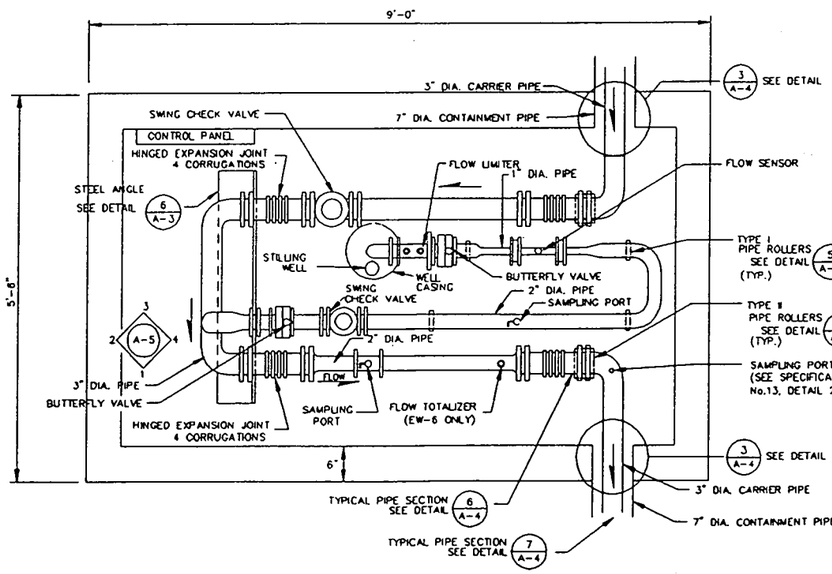
3 / A-4 **CONTAINMENT / VAULT CONNECTION DETAIL**

NOT TO SCALE



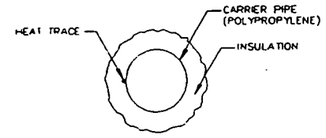
4 / A-4 **VAULT DETAIL EW1**

scale 1 0 1 2



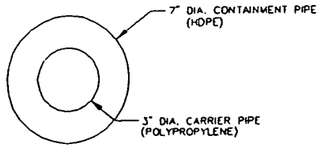
5 / A-4 **VAULT DETAIL EW6**

scale 1 0 1 2 feet



6 / A-4 **TYPICAL PIPE CROSS SECTION INSIDE VAULT**

NOT TO SCALE



7 / A-4 **TYPICAL PIPE CROSS SECTION OUTSIDE VAULT**

NOT TO SCALE

A-A' / A-4 **TYPICAL TRENCH DETAIL**

NOT TO SCALE

NOTE

1.) NATIVE MATERIAL REPLACED WITH #1A STONE AND GEOTEXTILE FROM TOP OF PIPE BEDDING TO 1 FT. BELOW GROUND SURFACE IN A 30 FT. SECTION OF TRENCH THAT CROSSES FROM ACCESS RD TO WALMORE RD. (SEE DESIGN MODIFICATION No.10). SIMILARLY, REPLACED WITH 2 IN. ROC STONE AND INSULATION IN THREE SECTIONS OF TRENCH AS SPECIFIED IN DESIGN MODIFICATION No. 12, 14, AND 19.

2.) STATION SPECIFIC TRENCH DIMENSIONS FOUND IN APPENDIX B, OFFSITE DOCUMENTATION/CERTIFICATION REPORT. STATION NUMBERS START AT CENTER OF EXTRACTION WELL AND INCREASE TO THE SOUTH (WITH THE FLOW IN PIPE).

3.) PIPE GUIDE PLACED 15 IN. FROM VAULT WALL SPACED EVERY 59 INCHES THEREAFTER.

LEGEND

1/A-2 — DETAIL/CROSS SECTION DESIGNATION
SHT. No. WHERE DETAIL/CROSS SECTION IS PRESENTED

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067160

REV.	DATE	DESCRIPTION	DR. BY	APP. BY

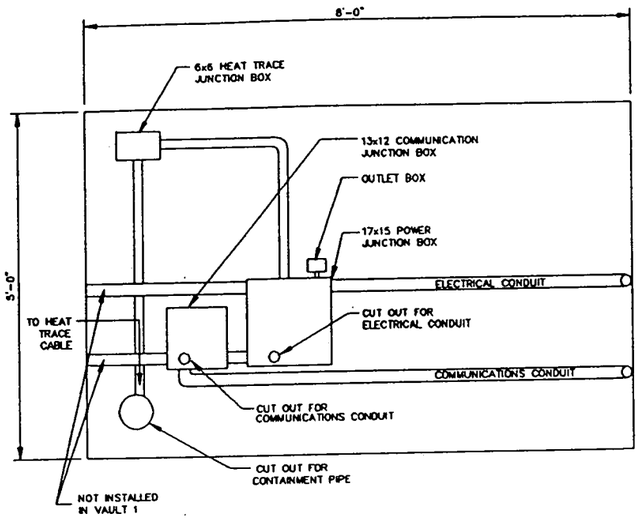
CLIENT/PROJECT: Bell Aerospace TEXTRON, WHEATFIELD, NEW YORK

TITLE: AS-BUILT EXTRACTION SYSTEM DETAILS (SHEET 2 OF 2)

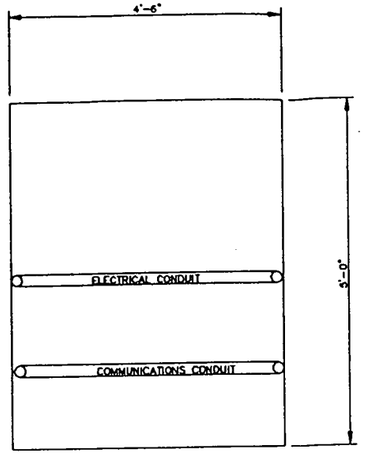
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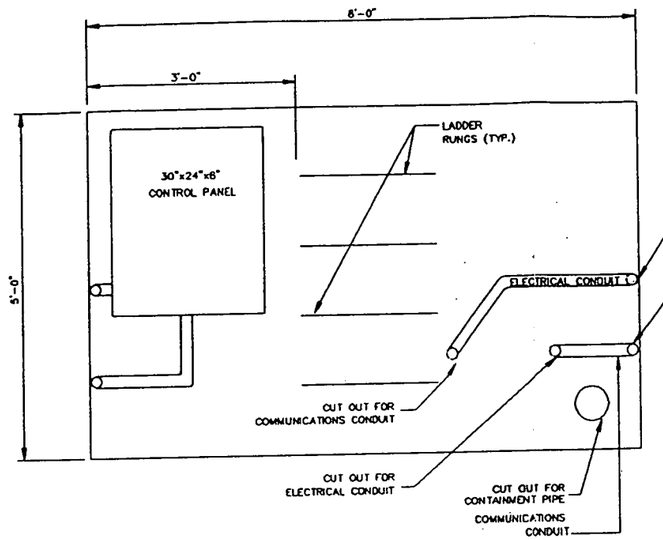
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RECHECKED	DCW	SCALE	AS SHOWN
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APPROVED		DWG. NO.	28
FILE NO.	913-9014	REVISED	A-4



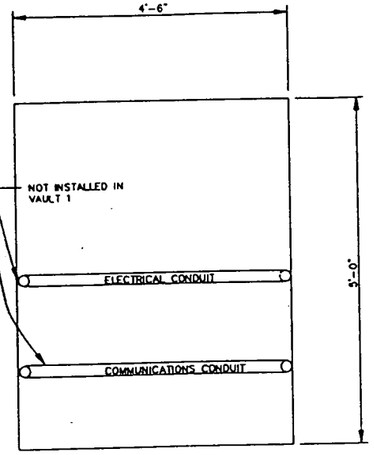
1/A-5 **ELEVATION 1**
NOT TO SCALE



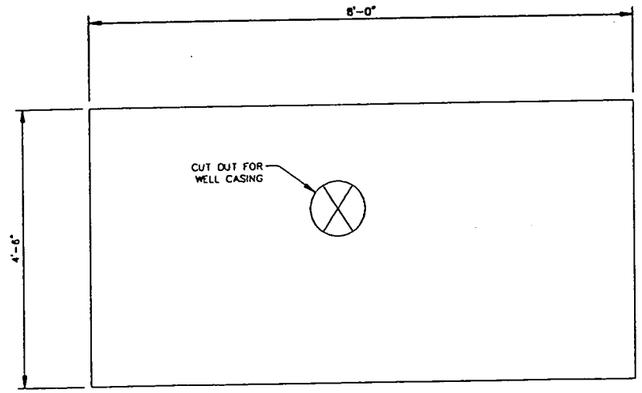
2/A-5 **ELEVATION 2**
NOT TO SCALE



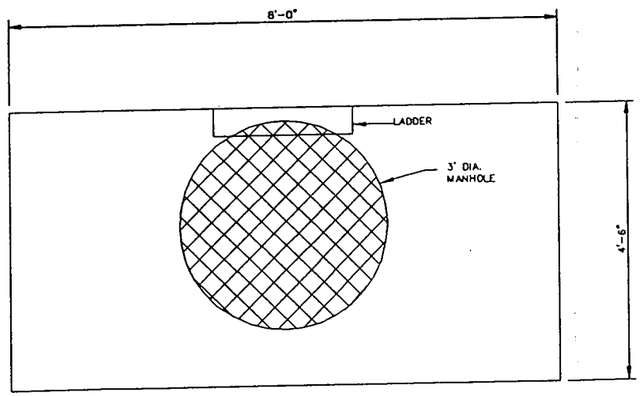
3/A-5 **ELEVATION 3**
NOT TO SCALE



4/A-5 **ELEVATION 4**



5/A-5 **VAULT BASE**
NOT TO SCALE



6/A-5 **VAULT CAP**
NOT TO SCALE

LEGEND

1/A-2 ← DETAIL/CROSS SECTION DESIGNATION
SHT. No. WHERE DETAIL/CROSS SECTION IS PRESENTED

NOTE

ELECTRICAL CONDUITS ARE 2 1/2 IN. DIA. PVC (SCHEDULE 40). COMMUNICATIONS CONDUITS ARE 2 IN. PVC (SCHEDULE 40).

IN VAULT 6, ALL JUNCTION BOXES, CONDUITS AND PANELS ARE LOCATED ON THE NORTH WALL OF THE VAULT (ELEVATION 3).

PRE-CAST CUT-OUTS FOR CONDUITS/PIPES ARE PLUGGED IF NOT USED.

OUTSIDE HEIGHT OF VAULTS IS 6'-5", INCLUDING CEILING THICKNESS OF 9 1/2" AND FLOOR THICKNESS OF 7 1/2".

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067160

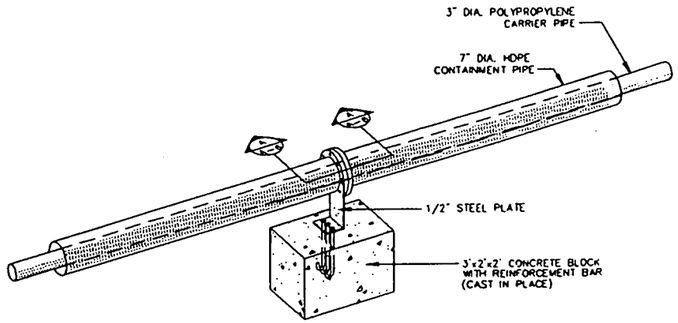
CLIENT/PROJECT
Bell Aerospace TEXTRON
WHEATFIELD, NEW YORK

TITLE
AS-BUILT
VAULT DETAILS

Golder Associates
Buffalo, New York

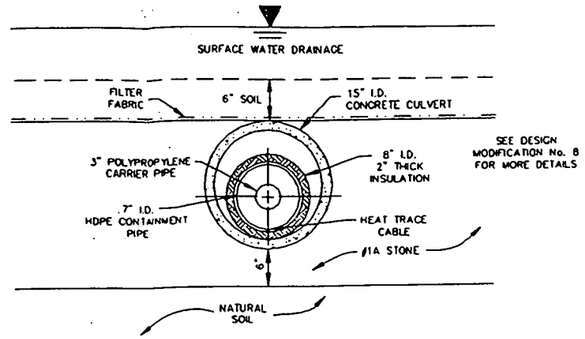
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RESPONSIBLE	DCW	SCALE	AS SHOWN
REVIEWED		JOB NO.	923-9055
APPROVED		DWG. NO.	30
FILE NO.	913-9014	ISSUED	A-5

REV.	DATE	DESCRIPTION	DR. BY	APP. BY



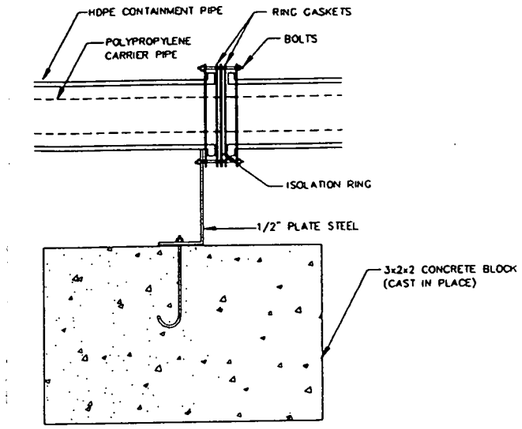
1 / A-6 **ANCHOR DETAIL**

NOT TO SCALE



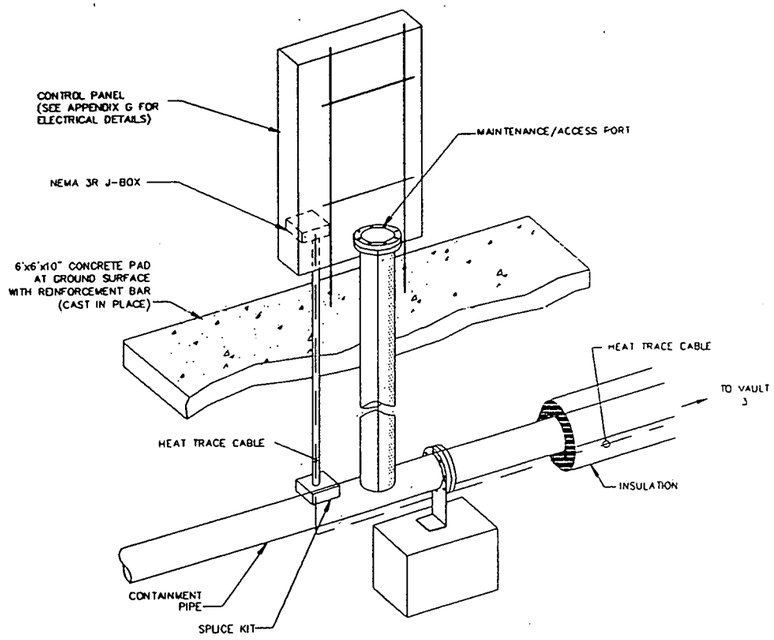
2 / A-6 **PIPE CROSS-SECTION AT DRAINAGE DITCH CROSSING (TYPICAL)**

NOT TO SCALE



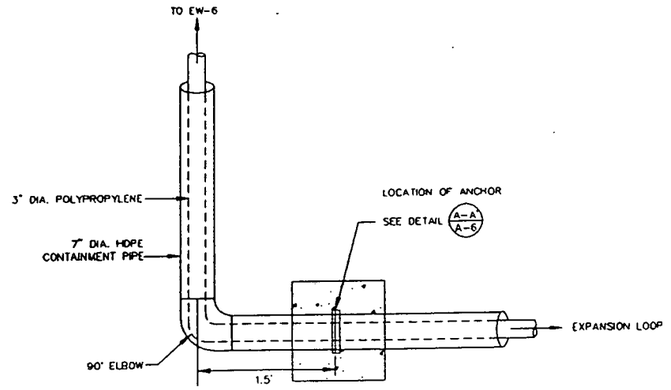
A-A' / A-6 **ANCHOR SUB-ASSEMBLY DETAIL**

NOT TO SCALE



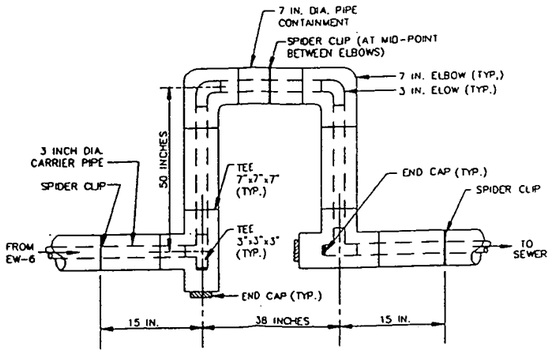
3 / A-6 **HEAT TRACE AND LEAK DETECTION ACCESS DETAIL**

NOT TO SCALE



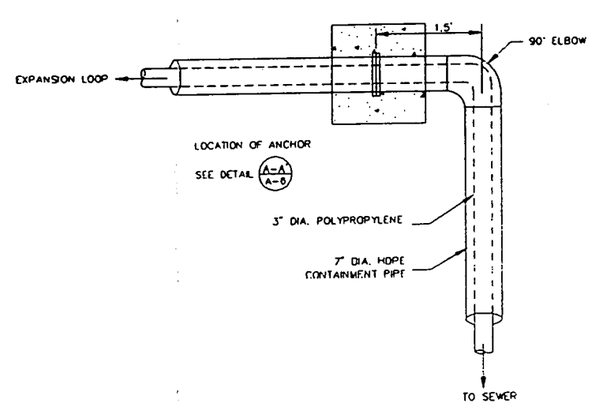
4 / A-6 **RIGHT ANGLE ANCHOR DETAIL (PLAN VIEW)**

NOT TO SCALE



6 / A-6 **EXPANSION LOOP DETAIL (PLAN VIEW)**

NOT TO SCALE



5 / A-6 **RIGHT ANGLE ANCHOR DETAIL (PLAN VIEW)**

NOT TO SCALE

STATE OF NEW YORK ★ WILLIAM BLAINE LOZIER ★ LICENSED PROFESSIONAL ENGINEER 067160

LEGEND

1/A-2 — DETAIL/CROSS SECTION DESIGNATION
SHT. No. WHERE DETAIL/CROSS SECTION IS PRESENTED

REV.	DATE	DESCRIPTION	DR. BY	APP. BY

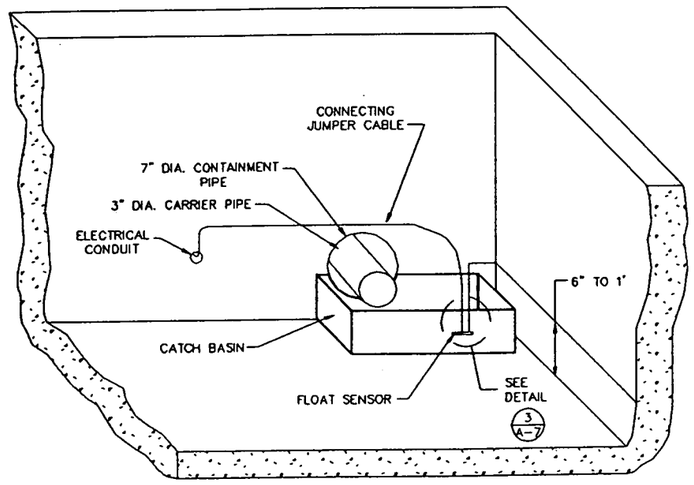
CLIENT/PROJECT: Bell Aerospace TEXTRON, WHEATFIELD, NEW YORK

TITLE: AS-BUILT EXTRACTION SYSYEM PIPING DETAILS

Buffalo, New York

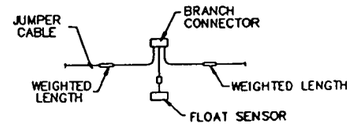
Golder Associates

DRAWN	BEC	DATE	6/4/93
DESIGNED	DCW	SCALE	AS SHOWN
REVIEWED		JOB NO.	923-9055
APPROVED		APPL. NO.	29
FILE NO.	913-9014	SHEET	A-6



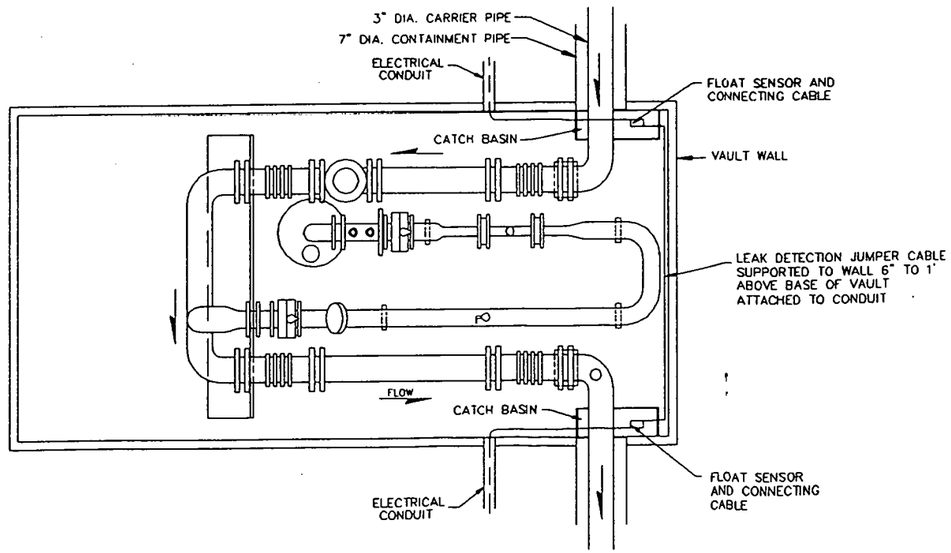
1 / A-7 **TYPICAL CATCH BASIN AND FLOAT SENSOR (INSIDE VAULT)**

NOT TO SCALE



3 / A-7 **SENSOR CONNECTION DETAIL**

NOT TO SCALE



2 / A-7 **DETAIL 1 (TYP.) VAULT DETAIL (PLAN VIEW)**

NOT TO SCALE

STATE OF NEW YORK
WILLIAM BLAINE LOZIER
067160
LICENSED PROFESSIONAL ENGINEER

NOTES

1.) EW-1 DOES NOT CONTAIN CATCH BASINS OR FLOAT SENSORS.
2.) EW-2 HAS FLOAT SENSOR UNDER SOUTH ANNULUS ONLY.

LEGEND

1/A-7 — DETAIL/CROSS SECTION DESIGNATION
SHT. No. WHERE DETAIL/CROSS SECTION IS PRESENTED

KEY	DATE	DESCRIPTION	DR. BY	APP. BY

CLIENT/PROJECT: Bell Aerospace TEXTRON, WHEATFIELD, NEW YORK

TITLE: LEAK DETECTION SYSTEM DETAILS

Golder Associates — Buffalo, New York

DRAWN	BEC	DATE	3/14/94
DESIGNED	DCW	SCALE	AS SHOWN
REVIEWED		JOB NO.	923-9055
APPROVED		DWG. NO.	BELL43
FILE NO.	913-9014	SHEET	A-7

APPENDIX A

GOLDER ASSOCIATES INC.
FIELD REPORTS

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

DATE 11/2/92 TIME IN TIME OUT
WEATHER Rain -45°
PRESENT AT SITE Clean Harbors
Buffalo Drilling
GAI - Dave Wohn

8:30 On Site - EW 5 area

9:30 G. Fielding and T. Riordan (Clean Harbors) arrive

10:30 Buffalo Drilling arrives

Attempt is made to position rig, ground is too soft.

G. Fielding decides more road stone must be put down - no more drilling today

11:15 T. Riordan and I collect soil sample for compaction test approx. 170' S and 20' E of EW 4.

1235 - 1445 Inspect cores - building 70 - BAT plant

Signed: Dave Wohn

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

TO: file
Brian Smith

NO. 1

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

DATE 11/3 TIME IN TIME OUT
WEATHER Sun 60°
PRESENT AT SITE CAI - DCW
CLEAN HARBORS
BUFFALO DRILLING

8:00 On Site - EW5

More stone is put down leading to EW4 and EW5 as ground is very soft

930 Noticed fuel oil leak from overfilled - sun warmed fuel tank on large rig. Rate - several drops per min to 1 drop / sec. Leak stopped about 1000 by pumping fuel out of tank. Location approx 75' NE of EW5

1015 Decon pad set up
Storage trailer moved into position (difficult due to soft ground)

1200 The rock pad placed earlier places the extended rig boom too close to the power lines. A new pad is installed parallel to and adjacent to the Sheriff's property - Rig moved in

1415 Drilling of EW5 starts with 14" SSA
Auger refusal at 16' at 1500 - All cuttings drumme
no water noted

Signed: David Wilson

TO: file
Brian Smith

NO. 2

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FIELD REPORT

JOB NO. 923 - 9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

DATE 11/4/92 TIME IN TIME OUT
WEATHER Rain - 58°
PRESENT AT SITE GAI - DCW
Buffalo Drilling
Clean Harbors

800 On Site - Office trailer (between EW-4 and EW-5)

830 Auger rig dragged by Trackhoe to EW-1. Too wet to move itself. Plan is to auger EW-1 through EW-4 today.

930 A geofabric and rock pad is built to support rig for drilling. Loader hauling stone gets stuck. Trackhoe pulls it out with difficulty. Movement of all wheeled equipment is very difficult due to soft conditions on power company easement

1100 Rock pad at EW-1 not yet ready - no traction

1130 Rig is relocated to pad built earlier at EW-4

1230 Drilling starts at EW-4. Hole is wet near surface (due to rain), some caving from 2-4 feet. Auger refusal at 16.0 feet. Hole is Temporarily cased with 17" ID steel pipe to prevent collapse until the coring rig is put on hole. While augering EW-4, a path to EW-6 was improved by placing several loads of stone.

1400 Stone path to EW-6 nears completion - Augers deconned

1430 Offsite - drillers sent home.

Signed: Dave Kehn

TO: File
Brian Smith

NO. 3

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION TRENCH AREA
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

DATE 11/9/92 TIME IN TIME OUT
WEATHER Cloudy
PRESENT AT SITE
GAI D. WEHN

~~1400~~
1420 At site to deliver 2 sets of construction drawings dated May 18, 1992 to T. Riordan.

Photograph property adjacent to trench (backyards) to record pre-trench conditions - also - soft places along right-of-way.

Signed: Dave Weh

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TO: file
Brian Smith

NO. 4

FIELD REPORT

JOB NO. 923- 9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

DATE 11/10/92 TIME IN TIME OUT
WEATHER Cloudy - 50°
PRESENT AT SITE
GAI - D. Wehn C. Prucha

800 At site trailer - with C. Prucha (GAI) walk to EW-1 to show C. Prcha site conditions

930 EW-6 is augered with 8¼ ID (approx 12" OD) HSA. Augers clean but worn.

945 Frey drilling arrives with Ingersol-Rand T-4 air rotary rig

1000 Auger refusal (EW-6) at 158 FT

1150 Drill casing socket at EW-4 with 12¼" tricone bit with T-4 rig. Gearbox leaks gear oil onto plywood around the hole. It soon stops after ± ¼ cup is spilled. Hole drilled 3 FT and blown clean by 1230.

1250 Grouting of EW-4 complete (see * below)

1400 T-4 rig moved to EW-5 - mud with fills hole is pumped out - temporary 17" casing is placed to prevent caving

1515 Drilling socket at EW-5 begins - hole is drilled 3 FT and blown clean by 1610.

Signed: Dan Wehn

* Grout mix: 5 bags cement / 30g H_2O / ¼ bag bentonite. Method: One load (5 yd) of grout tremied into hole, casing with pre-hardened grout plug in ~~bottom~~ bottom is placed in hole and filled with water to sink it. Remainder of grout tremied around casing

NO. 5

cc Brian Smith

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

DATE 11/11/92 TIME IN TIME OUT
WEATHER Rain 45°
PRESENT AT SITE
GAR D. WEHN

800 On Site - Measure distances between EW locations to check accuracy

EW-1 to EW-2	=	324'	(tape)
EW-2 to EW-3	=	324'	(tape)
EW-3 to EW-4	=	310'	(pace)
EW-4 to EW-5		301'	(pace)
EW-5 to EW-6		300'	(tape)

1000 T-4 rig sets up on EW-6 to socket casing, drilling starts at 1100, completed by 1120. Hydraulics fail on rig, unable to pull up bit, clean hole or grout.

1200 CME-1 rig (Buffalo drilling) cores EW-4 (a 6" steel casing is set inside 10" HDPE casing to protect the latter) Hole is dry until ≈ 24 FT, then hole makes water in increasing amounts (5-55 gal drums by 1645) H size double barrel core outfit is used (not a wireline)

1645 off site

Plan for tomorrow: (discussed with G Fielding / T. Riordan) grout EW-6 with repaired T-4 rig - core EW-5 with CME-1. Friday - core EW-6 - ream 4,5 & 6 to 8" with T-4 rig.

Signed: Daniel Wehn

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Telephone (716) 691-1156
Fax (716) 691-5109

TO: Brian Smith

NO. 6

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CAA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

DATE 11/12/92 TIME IN TIME OUT
WEATHER Cloudy - some rain - 60°
PRESENT AT SITE
GAE - D WEHN C. PRUCHA

800 On site DCW at EW-4, CP at EW-6

1 FT of additional core is drilled at EW-4, CME-1 rig is then moved to core EW-5

At EW-6, the casing (20 FT) is too short for the bottom of socket (22 FT) so a longer casing is sought (25 FT). EW-6 is blown clean. Cleaned-out debris is not contained, though drillers were told at start all fluids were to be contained. Work stopped at this point anyway due to measurements that revealed that the 3 FT socket was actually only 1.3 FT into rock. Because the rig hydraulics failed late yesterday, Frey must remove the rig (a T-4), repair it, and set and grout EW-6 monday (11/16/92).

As soon as coring at EW-5 starts (1100), air bubbles are noted as far as 20 FT from rig in all directions. Pressure is cut to less than 80 psi. Bubbles diminish & do not disappear. Before core run (2), the hole was cleaned out with a small tricone bit to remove debris. The rotation of the bit inside the 6" temporary casing breaks the grout seal on the 10" casing because the top rock is weathered and weak. (The bubbles revealed the core run (1) fractured nature of the rock.) The driller (C. Nicometi) indicated the ~~for~~ the casing will be pressure grouted tomorrow (11/13/92).

1500 Off site

Signed: Dave Wehn

NO. 7

CC: Brian Smith

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Fax (716) 691-5109

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CAN OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

DATE 11/13/92 TIME IN TIME OUT
WEATHER Sun 35° Windy - 20-40
PRESENT AT SITE
GAI - David Wohn

800 On site - EW-5 Buffalo drilling preparing to pressure grout well after tremied grout fails.

915 Grout mix (5 bags grout, 6 5gal buckets of water, ¼ bag bentonite) pumped into hole through packer. Very little is placed before packer explodes. This is probably due to the packer (5½" OD) being too small for the casing being packed (10" ID).

Drillers attempt to use another packer (a 5") to try again. I caution them that the results will likely be similar to the first try. They state they were told by their office to try.

1015 Packer inflated. After about two minutes and very little grout the packer ruptures, showering area with water and a little grout.

1045 After discussion with person in their office, drillers state that a larger packer will be flown in and grouting of EW-5 may resume Tuesday 11/17/92.

1100 Offsite

Signed: David Wohn

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TO: Brian Smith

NO. 8

FIELD REPORT

JOB NO. 923-9055
DATE 11/17/92 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER Snow 32°
LOCATION
PRESENT AT SITE
CLIENT BAT
GAI - DCW, CCP
OWNER
CONTRACTOR CLEAN HARBORS
PAGE (1) of 2

815 On site, with C. Prucha (GAI.)

CCP observes and documents fabrication of A double wall pipe. the inner wall of After shaving off ends of pipe to get clean surface, two 16 FT lengths of DEKAPROP PP-R typ3 pipe* are fused with a Bielomatic joiner by heating outside of pipe ends and inside of coupling to 500°F then mating them and allowing to cool (See photos). Pipe centralizers have been spaced 59" apart, which is contrary to specs. of 50". Clean Harbors must submit proof manufacturer recommends 59+". CCP collects sample of centralizer weld rod.

DCW observes pressure grouting of EW-5

1100 Buffalo Drilling Co. (BDC) starts pumping grout into EW-5. The rate of take is low, fractures plugged with silt? The packer used was a 5" with approx. a 3/4" "boot" over it. I express opinion that this arrangement will not work any better than the previous two, which both burst. After several minutes, it ruptures, lifting the top of the 10" casing more than 6 FT above ground surface where it sticks and can not be pushed back into its socket.

See page 2

* DIN 8077/78

Signed: Daniel W. Welsh

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Fax (716) 691-5109

TO: Brian Smith

NO. 9

FIELD REPORT

JOB NO. 923-9055
DATE 11/12/92 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER Snow 32°
LOCATION
PRESENT AT SITE
CLIENT BAT
GAR DCW, CCP
OWNER
CONTRACTOR CLEAN HARBORS

1130 BDC drillers call their office I speak with J. Baron of BDC and agree that the reason the grout first failed at EW-5 was due to the fractured nature of the rock (as evidenced by the surfacing air bubbles during coring, amount of water and mud flowing into the hole and the poor quality of the recovered rock during coring) and was not due to out of spec grouting. I disagreed with him that the packers ruptured due to excess pressure applied by the grout, instead maintaining that the packers used were too small for the casing being packed. We agreed that the socket on EW-5 should be deepened (which I recommended on 11/12/92).

T. Riordan, G. Fielding and I agree that if the dolostone seems fractured in the other wells (as evidenced by air bubbles, water inflow etc as above) the socket should be cut to 4 or 5 feet.

Plan for 11/18/92: Bring in big rig to socket EW-6 resocket EW-5. Grout both if possible

Signed: David Welch

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TO: Brian Smith

NO. 9

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

DATE 11/18/92 TIME IN TIME OUT
WEATHER Cloudy 35°
PRESENT AT SITE
GAI - DCW

1240 On site - trailer

Nothnagle Drilling has arrived to deepen socket on EW-6 and grout well. Rig - Rockdrill SK-35. Driller - Randy Parks

Upon arriving at EW-6, I notice temporary 14" x 19.4' temporary steel casing is at least 15° out of plumb. Trackhoe bucket is used to attempt to straighten it. The effort is partially successfull, casing ≤ 10° out of plumb.

Drillers socket cut to 22' (a 3' socket) easily and in less than a minute. Driller reports a "soft socket". Hole makes several hundred gallons of water, which is collected to use to mix grout. I instruct drillers to go another 2'. The rock is not as fractured here.

1430 EW-6 socket bottomed at 24 FT. (a 5 FT socket)

1530 EW-6 grouting begins

1700 Grouting complete, using more grout that the annulus between the casings should contain - grout is filling fractures. Off site

Signed: Dan Welk

TO: Brian Smith

NO. 10

Golder Associates
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FIELD REPORT

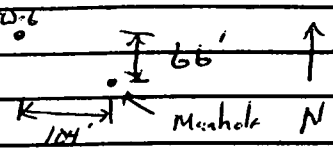
JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

DATE 11/19/92 TIME IN TIME OUT
WEATHER P. Cloudy - 38°
PRESENT AT SITE
GAI - DCW

800 On site - Trailer
G. Fielding asks for copies of well logs

T. Grosse calls and wants N-S and E-W offsets of EW-6 and the sewer manhole taped off

N-S = 66'
E-W = 104'



930 Temporary casing (14" x 17') is set in EW-5
Coring rig relocated to EW-6, most core after 1700, 11/19/92

1030 Socket rig cuts socket to 21 FT (5' socket) on EW-5. Socket cut and cleaned by 1100.

1400 Grouting of EW-5 complete - 10 bags cement, ½ bag bentonite

Water level in EW-4 before 8" ream is 4.85' BGS (5.95' BTOC)

1500 8" reaming started on ~~EW~~ EW-4 with 7¾" tricone bit
T. Grosse approves use of 8" downhole hammer for future ream.

1645 8" reaming complete - hole clean. Bottom at 41.15' BTOC

Signed: David Wolf

TO:
40.1' BGS
2FT into Zone 2

NO. 11 cc. Brian Smith

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FIELD REPORT

JOB NO. 923-9055
DATE 11/20/92 TIME IN TIME OUT
PROJECT TDS CAA OFFSITE
WEATHER 40° Sunny
LOCATION
PRESENT AT SITE
CLIENT BAT — GAI - DCW
OWNER
CONTRACTOR CLEAN HARBORS

800 On Site
Buffalo drilling sets up to core EW-6 with a CME-1 rig
C. Nicometi - driller

A 6" protective casing is set (with a casing shoe) a few inches into the grout plug at the bottom of the 10" casing

1000 Coring of EW-6 starts

1140 Rock near top of hole falling in as rods are removed - Interval 1 is cored again

1200 Decision is made to ream to 6" distance of first two core runs (= 6'). Temporary 6" casing is run another 5' into rock to prevent loose bits from fouling core barrel.

1300 6" casing is driven

1315 T. Grasso calls - wants dimensions of sewer manhole near EW-6: Top cover 2', Inside diameter - 4', Distance from cover to top of sewer pipe - 17', distance from cover to bottom of reducing bell - 6'.

Signed: David Wahn

~~TO:~~ 1515 Reaming complete at 30.5' - Ready to core.

1530 Off-Site

NO. 12

cc: Brian Smith

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FIELD REPORT

JOB NO. 923 - 9055
DATE 11/23/92 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER
LOCATION
PRESENT AT SITE
CLIENT BAT
GAI - DCW
OWNER
CONTRACTOR CLEAN HARBORS

800 On Site, EW-6

Buffalo drilling sets up to finish coring EW-6. The hole is sounded, and is open to 30 FT which reveals a few inches of debris in hole

930 Core run 3 is started at EW-6

1345 Coreing at EW-6 complete at 44.7' BGS with a 1 FT stickup. Drillers break down rig and set it up on EW-5. Driller - Larry Schroeder

1400 Offsite

Air Monitering Update: Up to this date, no action levels for any of the air monitering parameters has been exceeded at any time.

Signed: David Wohn

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TO: Brian Smith

NO. 13

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

DATE 11/24/92 TIME IN TIME OUT
WEATHER Cloudy - 45° - Rain
PRESENT AT SITE
GAI - DCW and CCP

800 On site, trailer, with Chris Prucha (GAI)

DCW is to monitor coring of EW-5, CCP is to monitor 8" reaming of EW-6

900 Coring of EW-5 starts

1100 Reaming of EW-6 starts

1200 Reaming of EW-6 (with 8" downhole hammer on low air) is complete at 45.1' BGS (1 FT stickup).

1400 Coring of EW-5 complete at 39.0 FT BGS. When reamed, bottom should be 39.6 FT BGS for a 1FT sock Rigs are deconned

1500 Coring rig moved to EW-3, socket rig to EW-5

1530 Augering (12" SSA) of EW-3 begins

1535 Reaming of EW-5 (8") complete at 39.6 FT BGS.

1630 12" augering of EW-3 complete a 16.8 FT BGS. Offsite

Signed: David Wilson

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TO: Brian Smith

NO. 14

FIELD REPORT

JOB NO. 923-9055
DATE 11/25/92 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER Cloudy -45°
LOCATION
PRESENT AT SITE
CLIENT BAT GAI - DCW
OWNER
CONTRACTOR CLEAN HARBORS

830 Onsite

Nothnagle drilling moves socket rig to EW-3 after changing bits and decanning rig.

The rig, a Reedrill SK-35, gets stuck about 100 FT North of EW-3. The loader tries to place railroad-tie pads under the rigs wheels. The loader gets stuck - too soft to move the pads around. Trackhoe can not develop sufficient traction to move the rig, though it does free the loader. Work ceases. Plan for Monday, 11/30/92, is to place pads behind the rig and pull it backwards to EW-3 on the pads.

1100 Offsite

Concrete vaults arrived on site 11/24/92. Nearly all piping that can be prefabricated in the trailer is ready. EW-6, EW-5, and EW-4 are ready for vault installation.

Signed: David Wolk

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Fax (716) 691-5109

TO: Brian Smith

NO. 15

FIELD REPORT

JOB NO. 923-9055 DATE 11/30/92 TIME IN TIME OUT

PROJECT TDS CQA OFFSITE WEATHER

LOCATION PRESENT AT SITE

CLIENT BAT GLZ - DCW

OWNER

CONTRACTOR CLEAN HARBORS

0800 On site

0900 Nothnagle Drilling (ND) and Clean Harbors personnel arrive.

An attempt is made to move large socket rig onto EW-3 by scraping off about 1 FT of soft topsoil from the field to make a path from where the rig is currently stuck to EW-3. This is to give both the trackhoe and the rig better footing. It is successful.

1000 Rig on hole, socketing starts at 1030. Hole produces a lot of water. Driller reports a void from 17.6 to 18 FT BGS. Get a 11.2 ppm hit on OVM - due to coring rig's gasoline engine exhaust. No action taken except to move monitoring location

1130 Because of loose rock, socket will be cut to 22.8 FT BGS (about a 6 FT socket). A 20 FT casing will be used with a short protective casing near the top (cleared with T. Riordon).

1245 Some overflow of water collection pit - no barrels available. More will be brought in.

1345 Grouting of EW-3 - 20 bags

Signed: David Wohl

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TO: Brian Smith

NO. 16

FIELD REPORT

JOB NO. 923-9055
DATE 12/1/92 TIME IN TIME OUT
PROJECT TDS / CQA OFFSITE / NY
WEATHER
LOCATION
PRESENT AT SITE DCW, CDM (GAI)
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

800 Onsite, CDM - monitor trenching, DCW - monitor drilling

DCW - EW-3 takes 2 more bags of grout to bring level up

930 CDM - Clean Harbors starts excavating #4 Vault.

1100 DCW - T. Riordan and drillers agree not to core EW-3 today DCW Offsite. CDM - Talked to T. Riordan and G. Fielding abo 12" min gravel fill spec. for base of vaults. CH plans to place vaults on natural soil base (if firm) and not on gravel. CDM agrees but will check with designer. CH state it can always remove vaults and add gravel. Also, CH agrees with CDM's recommendation to cover trench cuttings with visqueen so they will stay dry enough to pass compaction tests. CH encounters large boulder in excavation for vault #4 uses jackhammer to remove it. Red firm clay base of excavation should be OK to set vault upon. CH shooting elevations as vault hole is excavated.

1240 First load of #1A backfill stone arrives. Dimensions of Vault #4 excavation: Top = 15'x16', Bottom = 12'x14' Checked firmness of base with steel rod - OK. Vault excavation cut to 8" below grade, filled with 7" of compacted #1A stone, 1" Styrofoam insulation then Vau

Signed: David Welch

TO: Brian Smith

NO. 17

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FIELD REPORT

JOB NO. 923 - 9055
DATE 12/1/92 TIME IN TIME OUT
PROJECT TDS / CAA OFFSITE / NY
WEATHER
LOCATION
PRESENT AT SITE
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

1431 CH removes vault, chips away more rock, then replaces it. Checked invert of main line to vault #5 - its off 0.07 FT.

1445 Lunch

1515 Started excavating trench from vault 4 to vault 5. Checked grade every 20'. Trench bottom is fine graded with compacted gravel before placing pipe. Trench base is firm red clay 1' to 2' below tan, sandy overburden. Asked T Riordan about covering natural backfill, he said CH is worried about cost. Trench is fenced on property owner side. Placed pipe anchor between vaults 4 and 5 shot its elevation - its too high by ≈ 1.0 FT

1730 Offsite

Signed: Dennis Wilson

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TO: Brian Smith

NO. 17

FIELD REPORT

JOB NO. 923-9055 | DATE 12/2/92 TIME IN | TIME OUT
PROJECT TDS / CAA OFFSITE / NY | WEATHER
LOCATION | PRESENT AT SITE DCW - CDM / GAE
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

800 Onsite, CDM - monitors trenching, DCW - monitors drilling. Buffalo Drilling (BDC) sets up to core EW-3

900 CDM - T. Grasse said Brian Smith wants clay covered. Get high point cover depths from CH. Talked with T Rivers and G Fielding - they asked if surface water in trench can be pumped out (no containment). They (CH) will cover soil if weather is bad as well as the compacted gravel. CH want a representative proctor test done

930 DCW - 6" inner protective casing is set. CDM - Checked with T. Grasso, OK to pump trench onto ground. GAE won't tell CH to cover soil. Covering gravel is OK. GAE will send out a proctor today.

1000 CDM - Called F. Adams about gravel spec. for vault sides and bottom. He says 6" min on bottom compacted clay on sides OK. CH cleaning trench bottom of water and slumped soil - widening and benching also

1100 DCW - coring of EW-3 begins.

gned: Dawn Wilson

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TO: Brian Smith

NO. 18

FIELD REPORT

JOB NO. 923-9055
DATE 12/2/92 TIME IN TIME OUT
PROJECT TDS / COA OFFSITE / NY
WEATHER
LOCATION
PRESENT AT SITE DCW - CDM (GAI
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

1200 - Lunch - Clay is covered with plastic due to snow
Elevation of 89-5 (1A)
TOR 577.56' (MSL)

1300 Work resumes
CDM-CH checked elevation of drainage ditch between EW-4 and EW-3, 6" of cover on pipe at ditch bottom. Discussed ways to protect pipe - pour concrete around pipe, place pipe inside concrete pipe - will check with T. Grasso. Unloaded truckload of vaults. Checked inverts of vault 4 and anchor between vaults 4 and 5.

1630 DCW - Coring ceases with one run to go - too dark to continue today. DCW offsite.
~~CDM and DCW~~

1730 CDM offsite. CH Welded one outer pipe joint by and

Base lift gravel
Compacted with 3 passes
of plate

	%PR	DD	WD	MC	MD
V4 - 129.6	96.59	99.5	138.9	19.53	10
V4 - 93	91.55	104.9	121.2	16.3	10
V4 - 65	96.7	101.9	120.4	18.4	10
V4 - 35	96.1	101.3	125.5	24.2	10

Signed: David Wh

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TO: Brian Smith

NO. 19

FIELD REPORT

JOB NO. 923-9055 | DATE 12/3/92 | TIME IN | TIME OUT

PROJECT TDS / CGA OFFSITE / NY | WEATHER

LOCATION | PRESENT AT SITE DCW, CDM, CGAI

CLIENT BAT

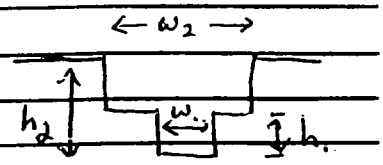
OWNER | Page 1 of 3

CONTRACTOR CLEAN HARBORS (CH)

800 Onsite CDM - monitors trenching DCW - monitors drilling

CDM - Measured trench dimensions (FT)

		h_1	h_2	w_1	w_2	
V4	0+25	4	7	5.7	11	
V4	0+50	4	7	7.0	11	
	0+75	3	6	6	11	
	1+00	3	4.5	5	11	
	1+25	4	7	5	11	
	1+50	4	7	3.5	9.5	
	1+75	4	6	3.5	9.5	12/4/92
V4	2+00	4.5	6	3.5	8.5	



CH checked grade of 40' section of pipe from anchor block to V4 every 20 FT. Pumping water from around V4 to ground. Placing gravel around pipe Bottom of trench: firm base, reddish brown firm clay, some standing water. Original trench width was 2' but walls were caving in. Trench widened for safety. Had to clean trench out where banks caved in on gravel compacted yesterday. T. Riordan (CH) asked how to prevent this → shore the sides or backfill trench soon

900 CDM - Collected 1A stone sample SA# 1-5 (Trucks 1-5) STA V4 - 0+00 to V4 - 1+50

Signed: David Lamb

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TO: Brian Smith

NO. 20

FIELD REPORT

JOB NO. 923-9055 DATE 6/3/92 TIME IN TIME OUT

PROJECT TDS / CAA OFFSITE / NY WEATHER

LOCATION PRESENT AT SITE DCW, CDM CGAI

CLIENT BAT

OWNER

CONTRACTOR CLEAN HARBORS (CH)

1015 DCW Coring of EW-3 complete at 40.6 FT BGS with a 11 FT socket into Zone 2.

DCW - Much effort is expended into moving the large (Nothnagle) rig onto the hole due to the soft ground. The track hoe is used (by CH) to move dirt away from the hole as well as to push and pull the rig around.

1100 CDM - Phone conversation with CDM, A Grasso, T. Riordan and G. Fielding about trench wall collapse. Resolved to place remaining pipe in open trench, cover with gravel and compact etc. while keeping as little trench open as possible. Method: Trench 50 FT, place / compact stone, place 45 FT pipe section, cover with stone and compact. Repeat next 50 F Operator will bench 2 FT down to keep walls stable. No open (un backfilled) trench to be left overnight. This will allow the trench width to stay near the spec. of 2 FT, not the current 5 or 6 FT, reducing the stone requirements. All other specs the same. Most pressure test pipe after backfill so joints will be mapped.

1045 A. Grasso onsite.

Signed: David Wade

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TO: Brian Smith

NO. 20

FIELD REPORT

JOB NO. 923-9055 | DATE 12/3/92 TIME IN | TIME OUT
PROJECT TDS / COA OFFSITE / NY | WEATHER
LOCATION | PRESENT AT SITE DCW / CDM (GAE)
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

1130 CDM - CH placed pipe in trench - V4 - 0400 to V4 - 1H

1200 DCW Rig lined up - 8" downhole hammer reaming of EW-3 starts. - ~~front~~

1230 CDM Lunch till ~~130~~ 1300

1300 CDM - CH welding pipe DCW - Auger rig moved to EW-2 after decanning. Warn drillers about raising boom too close to power lines, especially without the ground strap. (Tip of boom passes within 5 FT of lines) Told T. Riordan to warn them also.

1315 DCW Reaming EW-3 to 8" done - bottom at 40.5 FT

1420 DCW Augering of EW-2 done at approx. 15 FT BGS. The large rig is moved to EW-2 with difficulty - soft ground. 1 FT of topsoil is scraped off in a ≈15 F wide path from EW-3 to EW-2. This helps som but rig still sinks in one spot.

1530 DCW - Offsite - rig not yet in position

Signed: David Wilson

~~DCW~~ 1630 CDM - CH finishes welding pipe. Final grade of pipe slightly more Tha 0.5 %.

NO. 20 1700 CH backfills trench
1730 CDM offsite

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cc Brian Smith

FIELD REPORT

JOB NO. 923 - 9065
DATE 12/4/92 TIME IN TIME OUT
PROJECT TDS / CQA OFFSITE / NY
WEATHER
LOCATION
PRESENT AT SITE DCW - CDM (GAI)
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS

800 Onsite CDM - monitor trenching DCW - monitor drilling

900 DCW - Helped by a light freeze solidifying the ground, the large rig is moved onto EW-2 to drill 12 1/4" casing socket.

920 DCW - drilling EW-2 socket begins - target depth is 19 FT BGS for an approx. four foot socket in zone 1 bedrock

1015 DCW - Socket finished at 21 FT BGS, two feet deeper than asked and six feet into zone 1. Driller reports "good solid rock".

1045 DCW - Grouting of EW-2 begins - Bags of Grout = (13) total

1100 CDM - Tested compacted stone (see page 2)

1200 DCW - Grouting complete - offsite

1230 CDM - Lunch till 1300

1300 Electricians placing conduit to anchor block from V4

Signed: David Welch

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cc Brian Smith

TO: CH places gravel in trench
It starts snowing, CH compacts gravel, tests and places pipe, backfills 6" above pipe, compacts and tests. (from STA V4 - 1+85)
NO. 21 Soil covered with plastic.
1700 Offsite (CDM)

FIELD REPORT

JOB NO. 923- 9055
PROJECT TDS / CQA OFFSITE / NY
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 12/4/92 TIME IN TIME OUT
WEATHER
PRESENT AT SITE CDM, DCW (GAI)

Stone Compaction Tests
(by CDM)

STA		% PR	DP	WD	MC	MDD	Depth	Lift
V4	0+50	96.93	106.4	108.9	2.3	109.8	6"	2
V4	1+00	96.74	105.1	107.7	2.42	109.8	6"	2
V4	1+40	95.98	105.4	108.8	3.2	109.8	6"	2
V4	1+85	96.89	106.4	111.1	4.45	109.8	6"	1
V4	1+85	95.21	104.5	109.6	4.8	109.8	6"	2

Signed: Dave Wade

TO: Brian Smith

NO. 21

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FIELD REPORT

JOB NO. 923-9055.1A
PROJECT TDS/CQA off-site / NY
LOCATION Niagara Falls
CLIENT Bell
OWNER Bell
CONTRACTOR Clean Harbors

DATE 12/5/12 TIME IN 8:00 TIME OUT 4:00
WEATHER Snow, 26°
PRESENT AT SITE
Golder Associates
Clean Harbors

8:00 on site
Contractor shoring up a 20' section of trench that fell in over night (Station V4 2+25).

Excavated 60' of trench (Station V4 2+00 to V4 2+60)

Placed 6" #1A stone in base of trench and compacted. Calibrated CPN and tested stone for Density.
Placed 45' section of pipe in trench and welded in place. Backfilled pipe and compacted stone.

- Placed conduit for comunications and power lines from Station V4 0+00 to V4 2+50. Compacted stone in 6" lifts to with in 2' of top of trench at road crossing. Tested all lifts for compaction.
- Shored up trench sides at the last 20' of open trench. Blocked off road and put up fencing around trench.

Returned to office and performed Moisture Content tests on #1A stone to verify calibration of CPN nuclear Density Guage.

4:00 left office

gned: Chris Martin

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TO: File
Brian Smith

NO. 22

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 12/7/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE CDM-DCW/GAI

800 Onsite DCW - monitors drilling CDM - monitors trenching DCW - Buffalo drilling sets up to place 6" protective casing on EW-2. Driller K. Danser tapes hole at 21.0' BGS
CDM - 1 truckload of gravel arrived, CH starts compacting 6" lifts at road crossing to surface. (See page 2 for compaction test results). Placed ≈ 6" of Shot rock over compacted #1A stone, will eventually remove and replace with soil.

1030 DCW - Driving of 6" casing begins. CDM - Started trench excavation V4 2+50 - 3+00

1100 CDM - CH starts placing stone on trench bottom, ex vault 6

1130 DCW - lunch till 1230

1200 CDM - CH places and compacts 6" of #1A stone under Vault 5 placed 1" of insulation and lowered vault. Level and invert of Vault 5 dimensions Width 13.5', Length 14.5', Depth 7.5'
John Davis on site ≈ 30 min.
PR # 2 MDD = 113.0, OMC = 15.2, w_n = ? (wetter)
Welded pipe 2+50 - 3+60 (V4) Covered with stone and tested. Placed insulation on sides of V5. Covered clay pile with plastic. Excavated to V5 0+60, placed

Signed: Daniel Wahn

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TO: Brian Smith

NO. 23

FIELD REPORT

JOB NO. 923 - 9055
DATE 12/8/92 TIME IN TIME OUT
PROJECT TDS CAA OFFSITE
WEATHER
LOCATION
PRESENT AT SITE DCW CDM (GAI)
CLIENT BAT
OWNER

CONTRACTOR CLEAN HARBORS

compacted, tested 6" of #1A stone - 1st Lift.

1230 DCW - Set up rig to core (Buffalo drilling)

1300 Coring EW-2 begins

1530 DCW offsite - drillers done for today

1730 CDM offsite

Compaction Test Results - CDM

STA	% PR	DD	WD	MC	MDD	Depth	Lift
V4 2+95	95.74	105.1	105.7	0.53	~~109.8~~ 109.5	6"	2
2+50	97.13	106.6	110.4	3.49	~~109.8~~ 109.5	6"	5
2+50	96.68	106.1	110.4	3.97	109.8	6"	6
2+50	95.77	105.1	110.4	4.91	109.8	6"	7
2+50	95.31	104.6	109.4	4.51	109.8	6"	8
2+50	96.69	106.2	109.4	3.03	109.8	6"	9
2+50	97.13	106.6	109.9	3.02	109.8	6"	10
2+95	95.19	104.5	106.5	1.9	109.8	6"	1
~~2+75~~							~~3~~
~~2+95~~							~~3~~
V5 0+50	96.79	106.3	109.1	2.63	109.8	6"	1

Signed: Dan Wolf

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TO:	STA	h_1	h_2	w_1	w_2
V4	2+75	6.5	3.4	7.8	4
	2+95	6.5	4	9	6

CDM - Trench dimensions

NO. 23

cc Brian Smith

FIELD REPORT

JOB NO. 923-9055 | DATE 12/8/92 TIME IN | TIME OUT
PROJECT TDS CQA OFFSITE | WEATHER
LOCATION | PRESENT AT SITE DCW - CDM (GAE)
CLIENT BAT
OWNER B
CONTRACTOR CLEAN HARBORS (CH)

800 Onsite CDM, monitor trench. DCW, monitor drilling DCW - Buffalo drilling resumes coring EW-2. CDM - CH excavating from V5 0+50 and placing first lift of stone. Electrician gluing conduit to V5. CH compacts stone. Compaction O.K.

1200 DCW - Coring of EW-2 completed at 37.6 FT BGS with a 1.3 FT socket into Zone 2 dolostone.

1300 DCW - CH moves small CME-1 rig onto EW-1 with tool

1430 CDM - CH places anchor at V5 1+50, sets pipe and connects to anchor. Weld pipe from V5 0+00 to V5 1+50 Talked with T. Grasso about trench side stability and backfill. All trench sides good and firm except for the top ½ to 2 FT. This area is loose and some times saturated. From Sta V4 0+00 to V4 1+50 sides are saturated and sloughing to trench bottom. 3 Truck loads of # 1A stone delivered.

1440 DCW - Augering of EW-1 begins. Hole is 10 FT E of property line instead of the specified 9 FT due to obstructions. Auger refusal at 12.4 FT BGS

1600 DCW offsite CH moving drill water barrels. 1700 CDM OFFsite.

Signed: Dan Welch

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TO: BRIAN SMITH / FILE

NO. 24

FIELD REPORT

JOB NO. 923- 9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 12/9/92 TIME IN TIME OUT
WEATHER ~~Cloudy~~ Sun 30°F
PRESENT AT SITE DCW CDM (GAI)

0800 Onsite DCW monitor drilling CDM - monitor trenching DCW - Buffalo Drilling drains surface water ~~out~~ out of large cuts near rig in preparation for reaming EW-2. Heaters are used to soften frozen ground under rig so it may be moved. CDM - CH excavating trench from VS 1+50 and backfilling pipe from VS 0+00 to VS 1+50. Stone is compacted tested over pipe. CH places stone in trench bottom VS 1+50 to 3+00, compacted, tested. Trench sides firm with the exception of the top 1½ FT from VS 0+00 to VS 3+00

1230 Buffalo drilling awaits arrival of trackhoe to move rig onto EW-2. Drillwater collection pit enlarged. (DCW)

1300 CDM - CH excavates soil for vault 6. Vault hole dimensions: Depth - 7.5 FT, Width - 13 FT, Length 16 FT. Upon firm base placed and compacted 6" #1A stone, 1" insulation, then the vault. CH welds pipe from STA VS 1+50 to 3+00.

1430 8" downhole hammering of EW-2 begins. Driller reports fracture zone or void at 30 to 31 FT BGS (DCW)

Signed: David Wohn

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TO: BRIAN SMITH / FILE

NO. 25

FIELD REPORT

JOB NO. 923-9055
DATE 12/9/92 TIME IN TIME OUT
PROJECT JDS CQA OFFSITE
WEATHER
LOCATION
PRESENT AT SITE DCW - CDM (GAI)
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

1450 DCW - EW-2 reamed to 37.0 FT BGS (8" DIA.)

1530 CDM - CH Backfilling stone at vault & base

1620 DCW offsite

1730 CDM offsite

Signed: David Wilson

TO: BRIAN SMITH / FILE

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NO. 25

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 12/10/92 TIME IN TIME OUT
WEATHER Snowing - 22°F
PRESENT AT SITE CDM, DCW (GAI)

800 Onsite CDM- monitor trenching, DCW - monitor drilling
DCW- CH and Buffalo Drilling move Nothnagle's large air rig to EW-1 from EW-2 using the trackhoe.
CDM- Disussed with D. Wehn and T. Riordan Clean Harbors Plans:
1) Backfill conduit
2) Pre-test pipes for 1 hr.
3) Backfill clay from STA V4 2+50 to V6
4) Start pressure testing (24 hr.) later this week
5) Move surveying control points to vicinity of V
6) Start excavating from V4 North
7) Straighten out trench 25 - 30 FT North of V6. (Alignment off enough to prevent conduit connect

Electricians on site - couldn't run pull line through conduit because air bottle was empty. They (Weydman Electric) run temporary power line from generator towards vault 1. CH widens trench from V5 2+50 to 3+00 finishes welding last section of pipe from V5 2+50 to 3+00 and squares Vault 6.

1100 Wendel Engineers on site - Robert McNamara and John R.
Their comments:
- Need marker tape above conduit
- Need separation of wires down well
- Hard to tape off end of pipe

Signed: Dave Wehn

TO: BRIAN SMITH / FILE

NO. 26

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 12/10/92 TIME IN TIME OUT
WEATHER
PRESENT AT SITE CDM- DCW (GAI)

Wendel Comments cont. - Use 2½" Sched. 40 pipe
- Backfill conduit like pipe
- Wendel wants to see electrical boxes before installation.
- Will check expansion loops

Everything "looks good" to Wendel.

Before glueing conduit from V5 to V6 we checked to verify power conduit size. Electrician says CH wants a 2" conduit from V5 to V6 and V2 to V1. CH told GAI they would use a 2½" conduit throughout. Verified that 2" conduit is correct with electrician's shop and with T. Riordan. 2" conduit O.K. with GAI as long as it meets code. All agree 2" is O.K.

1130 CH backfills pipe from V5 1+50 to V5 3+00, compacts and tests. CH backfills conduit 6" from STA V4 2+50 to 3+00, compacts and tests. Min depth over pipe = 1 FT. Placed 9" clay backfill STA 3+00 - 2+80 (Snow turns to wet sleet) Compacted with small flat plate vibratory compactor. Tests after several passes. (Test results below) 1730 offsite (CDM

Signed: Dick Wedl

TO: BRIAN SMITH / FILE

	% PR	MC
1 Pass	85.5	26.9
3 Passes	79.45	31.95
5 Passes	83.8	27.5
In place	87.44	27.95

NO. 26

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FIELD REPORT

JOB NO. 923-9055
DATE 12/11/92 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE NY
WEATHER Snow
LOCATION
PRESENT AT SITE CDM (GAI)
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

800 On site (C. Muth)

CH not working today because of heavy snow

1030 Offsite - sent SA #6-10 for GSD

Signed: David Wick

TO: FILE / BRIAN SMITH

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NO. 27

FIELD REPORT

JOB NO. 923- 9055
DATE 12/14/92 TIME IN TIME OUT
PROJECT JDS COA OFFSITE NY
WEATHER
LOCATION
PRESENT AT SITE DCW, CDM (GAI)
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

800 Onsite C. Muth monitors trenching, D. Wehn monitors drilling DCW- Buffalo Drilling (BDC) sets up to core EW-1. 12+" of snow and some frozen equipment hinders things slightly. Air compressor was moved from trailer area to EW-1

940 CH onsite CDM- CH started shoveling snow from trench, pumping water from VS. Gravel trucks arrive.

1200 CH removes clay in trench from Friday (12/11/92)

1240 DCW - Coring starts at EW-1. Poor core recovery - drillers report not enough air volume - compressor is switched for other (larger) compressor onsite. Drillers collection pit excavated and lined with plastic. Not much water produced 1st two core runs.

1330 CDM - CH places fabric in trench VH 2+50 to 3+00

1500 CDM - CH places 9" clay, could not achieve 95% MDP on two test strips. Will discuss with T. Gresso. Pumped water from VS. Water is leaking in around two pipes (N and S) for header line.

Signed: David Wehn

TO: FILE / BRIAN SMITH

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NO. 28

FIELD REPORT

JOB NO. 923- 9055
PROJECT TDS COA OFFSITE NY
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 12/14/92 TIME IN TIME OUT
WEATHER
PRESENT AT SITE Dcw, CDM (GAI)

1530 CDM - Talked with G. Fielding, T Riordan and T. Grosso about inability to get 95% compaction of clay. T. Grasso checked with B. Smith and agreed to change compaction spec. to 90% MDD. Also discussed with T. Riordan and electrician about placing caution tape 1 FT above electrical conduit before backfill for future safety. T. Riordan said O.K., the electrician could not find a requirement to do so, and Wendel (Electrical COA) would like it done.

1600 Dcw - Coring done for today - offsite

1700 CDM - Four loads of gravel today - offsite

Signed: David Welch

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TO: FILE / BRIAN SMITH

NO. 38

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 12/15/92 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW, CDM (G+I)

800 Onsite CDM - trench monitor DCW - drilling monitor DCW - Buffalo Drilling resumes coring EW-1. After approx. 28 FT BGS the hole starts producing a great deal of water. Drillers estimate volume at 30+ gallons a min. CDM - took #1A stone samples SA # 11-15, # 16-20. Inspected trench and vaults 4, 5 and 6. Vault 5 is still leaking and the inside of one pipe got wet, the other was plugged yesterday. More grave is needed under conduit. CH starts excavating towards vault 3. Told T. Rierdan he needs to drain pipes from V5 and cap ends until seals are fixed.

930 CDM - CH backfilling conduits from STA V5 0+00. Cap frozen where compacted yesterday - STA V4 2+70. Checking trench depth every 20 FT while excavating. CH shoveling snow out of trench STA V4 0+00 to 2+50. Trench is wet and sides are loose and caving into trench V3 1+50 to 3+00. CH is shoveling out more before backfilling trench bottom with stone.

1130 DCW - Drillers sent to lunch while CH excavates another, larger, lined pit to collect the large amount of drillwater from EW-1. At the current rate, total will be several thousand gallons.

Signed: David Wah

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TO: FILE / BRIAN SMITH

NO. 29

FIELD REPORT

JOB NO. 923-9055 DATE 12/15/92 TIME IN TIME OUT

PROJECT TDS CDM OFFSITE WEATHER

LOCATION PRESENT AT SITE DCW, CDM (GAI)

CLIENT BAT

OWNER

CONTRACTOR CLEAN HARBORS

1240 CDM - CH compacts 6" lift of stone in trench base STA V3 1+50 to 3+00 - tested. CH pumps water from outside V4 and trench. Told T. Riordan and G. Fielding that the gravel under the conduits by the vaults needs to be compacted better.

1330 DCW - Coring of EW-1 complete at 36.2 FT BGS for a 1.6 FT socket into zone 2 dolostone.

1400 DCW, offsite CDM - CH starts placing clay STA V4 2+50 to 3+00 and compacting with trackhoe. CH welding pipe V3 1+50 to 3+00. Placed yellow caution tape approx 1 FT about conduit and backfilled with clay. Rocks, timber, etc. discarded before back filling

1500 J. Devic onsite. CH compacted 6" lift of stone over conduit (and tested) STA V5 0+00 to 2+50 Three loads of stone delivered today. Soil is falling in on pipe CH is shoveling out soil before backfilling with stone

~~1200~~ 1740 Work stops

1800 CDM offsite

Signed: Dick Welch

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NO. 29

FIELD REPORT

JOB NO. 923-9055
DATE 12/16/92 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE NY
WEATHER
LOCATION
PRESENT AT SITE DCW, CDM (GAI)
CLIENT BAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

0800 Onsite CDM - trench monitor DCW - drill monitor Buffalo Drilling demobilizes CME-55 rig. Nothnagle Drilling is to ream to 8" EW-1 when they arrive (with their SK-35 rig). CDM - CH working on pipe STA 1+50 to 3+00. STA V3 1+50 to 2+25 not backfilled with gravel last night. Trench sides caved in around pipe and water backed up from V4. CH must shovel out mud before backfilling. CH plans to use bentonite around header pipe boots on outside of vaults to help seal them. A. Grasso says to use average proctor values (MDD)

1030 K. Danser (Buffalo Drilling) told DCW that Nothnagle he broken down on the way to the site. The problem is fixed - they are on the way. S. Radon from NYSDEC onsite.

1100 Nothnagle Drilling arrives - sets up SK-35 on EW-1 Resident warned driver not to park by his house or he will call sheriff. Resident told Nothnagle driver to get the NYSDEC truck moved also. Nothnagle moves. DCW warns S. Radon. Not sure of resident's identity.

Signed: David Walker

TO: FILE / BRIAN SMITH

NO. 30

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FIELD REPORT

JOB NO. 923 9065
PROJECT TDS CQA OFFSITE
LOCATION
CLIENT RAT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 12/16/92 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW, CDM (GAI)

CDM - CH excavates and sets Vault 3 after placing 6" of stone and 1" insulation. Well is slightly atesian, trickling slowly into V3. This water must be drummed (told CH). CH shoveling snow from trench V4 0+00 to 2+50, preparing to backfill conduit with stone.

1230 DCW - Rig's left outrigger looses its footing on the plank supports and slips off into the soft earth. With boom raised, rig nearly tips over. Nothnagle driller probably saves it by lowering right side quickly. Effort is made to find more lumber to support this heavy rig in the soft soil around EW-1.

1300 CDM - Water in V5 backed up to V5 1+00. CH needs to pump trench around V5 before backfilling clay from V5 1+00 to 3+00

1330 DCW - Rig stable, reaming (8") of EW-1 begins
1400 CDM - CH Backfilling conduit V4 0+00 to 2+50
1430 DCW - Reaming of EW-1 complete at 36.0 FT BGS
1500 DCW offsite
1600 CDM offsite

Signed: David Wels

TO: FILE / BRIAN SMITH

NO. 30

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CQA off-site/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 12/17/92 TIME IN 8:00 TIME OUT 6:3
WEATHER Rain
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors

8:00 on site - No need for air monitoring because of Rain.

Compacted and tested #1A stone backfill over conduits from S+A V4 1+50 to V4 2+00.

Tried to place and compact clay backfill but the material was too wet M.C ≈ 33%. Had contractor remove failed clay (~20'). Tested Stockpile of clay (V4 0+00 to V4 2+00) all material too wet. Moisture Content ranged from 29 to 34%.
Contractor recieved permission from owner and designer to use 2" crushed ROC to use as backfill.

Contractor concentrated on backfilling clay between Vaults 5 and 6 where clay is not so wet.

5:30 Sent stone samples for GSD testing.
6:30 off site

gned: Brian Muth

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TO: File
Brian Smith

NO. 31

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS / COA off-site / NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 12/18/92 TIME IN 8:00 TIME OUT 6:0
WEATHER Clear
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors

8:00 On Site - Extremly wet conditions, NO air Monitoring.

Contractor backfilling 6-9" top soil from STA V4 2+50 to V5 3+00.

Backfilled vaults 5 and 6 with #1A stone.

Electrician on site installing conduit pipes.

Backfilling trench with #1A stone and 2" ROC from STA V3 2+00 to V4 2+00. Contractor placing 2" styrofome insulation over top of #1A stone then covering with textile and then backfilling with 2" ROC as required by design.

4:40 left site for office, sent out CPN due to dead battery.

6:00 left office

gned: Chris Muth

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TO: File
Brian Smith

NO. 32

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CoA off-site/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 12/19/02 TIME IN 8:00 TIME OUT 1:00
WEATHER Clear
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors

8:00 on site

No air monitoring Required (No excavation, wet conditions)

Took Water Level readings on Vaults 4 and 6
Vault 5 is under water, leaking boot on Vault.

- Contractor welding pipe sections from S+A V3 1+20 to 1+50.
- Removing and spreading wet clay stockpile V4 0+00 - 2+75

10:00 Backfilling trench with 2" ROC, Compacting to 90% MDD.

1:00 off site

gned: Chris Muth

TO: File
Brian Smith

NO. 33

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CoA off site/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 12/21/92 TIME IN 8:00 TIME OUT 12:0
WEATHER clear
PRESENT AT SITE
Golder Assoc. - C. Muth
Clean Harbors -

8:00 on site

Contractor grading site from STA V4 2+50 to V6

Placing topsoil over trench @ V4 0+00 to V4 2+50

Cleaning trench sides in preperation for #1A Stone backfill.

12:00 off site

gned: Chris Muth

TO: Brian Smith

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NO. 34

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CQA off-site/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 12/22/92 TIME IN 8:00 TIME OUT 1:00
WEATHER Clear
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors

8:00 on site

Backfilled and tested 2" RoC from STA NY 0+00 to 1+00.

Electrician on site setting up conduits for center point control panel.

Poured concrete pad. Started trench for power line.

1:00 off site

Clean Harbors local workers ~~Contractor~~ plans to pump vaults dry and fix leaks during the week of 12/28 - 12/31. Also place Temp covers over vaults. The crew from Boston won't return until 1/4/93.

gned: Chris Muth

TO: Brian Smith

NO. 35

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CQA off-site / NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/4/92 TIME IN 8:00 TIME OUT 5:00
WEATHER Rain
PRESENT AT SITE
Golder - C. Muth
Clean Harbors

8:00 - 10:00 Reviewed Contractors Survey Data

10:00 on site
Vaults 4, 5, 6 are completly under water. Adjacent Landowners property is draining their surface water to low spots in construction area.
- Contractor pumped out water from Vaults. (Surface Wat
- Fixed 20' section of pipe (STA V3 1+30) where water floated it out of trench, had to rebackfill it with #1A Stone

Checked water level in MW 89-5(1A). W.L. approx 3' above normal level for this time of year.
- Water level in EW 5 is approx 0.5' above top of casing and water from well filling Vault 5. Told contractor that they need to plug well or add extensi to casing to contain well water because all well water will have to be contained and removed in Drums, and cant be pumped on to ground.

Set lids on vaults 4, 5, 6.

5:00 off site

gned: Chris Muth

TO: File, Brian Smith

NO. 36

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS / CQA off-Site / NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/6/93 TIME IN 8:00 TIME OUT 5:00
WEATHER Snow
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors
DEC - Stan Radon

12:00 on Site (Contractor cleaning up site on 1/5/93. No QA Work)
- Checked water levels in Vaults 3 - 6. High water in V-3, 4, 5
- Contractor tried Plugging vault 3 and lost plug down well Will have to use Magnet to fish out plug from well.

1:30 - DEC on Site for approx 1 hr. Concerned about start-up date. No other problems. Asked about water in V3. Replied No decision Y

- Contractor Excavated from STA V2 3+00 to V2 1+50. Placed & Compacted pipe bedding. Tested for Density Welded 150' of pipe. Set Anchor @ V2 1+50. Backfilled pipe, compacted, tested.

- Soil from V2 3+00 to V2 1+50 looks dry will try to use as clay backfille Covered clay piles with plastic.

- Air Monitoring of enclosed vaults showed no problems with air quality.

- Vault 4 leaking surface water from broken conduit line Clean Harbors exposed break in conduit and will fix.
- Tony Cerasso says to plug wells and monitor Water levels untill they subside and will then drain vaults into well.

5:00 off Site

gned: Chris Muth

TO: File, Brian Smith

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NO. 37

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CQA off-site/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/7/93 TIME IN 7:30 TIME OUT 6:00
WEATHER Overcast
PRESENT AT SITE
Golder - C. Muth
Clean Harbors
Weydman electrical

7:30 Pickup equipment from office
7:50 - On Site calibrated Air monitoring equipment. Tested Air in Vaults 3-6 (No high readings).
- Checked water levels in Vaults 3-6 and MW 89-5(14) Water levels down ~ 0.5' except for Vault 3 which Raised ~ 0.7'. None of wells plugged yet. Told Gordon that the wells should be plugged as Tony requested on Monday. ASO told Gordon that Vault 6 should be drained right away by drilling holes in Casing 2" up from vault base.
- Clean Harbors plugged wells 3-6 by the end of Day. But didnt get holes drilled in V6 to drain.

- Excavated 150', STA V2 1+50 to V2 0+00.
3:30 - Placed Vault 2, set lid. Cut casing off 2' above Water L
Placed 150' header pipe V2 1+50 to 0+00.
Backfilled and tested 150' stone back fill 1st & 2nd lifts.
- Electrician placed 150' conduit V2 3+00 to V2 1+50.

- 8 Trucks of #1A stone arrived. Took Stone Samples.

5:45 Left Site for office

gned: Claire Muth

TO: File, Brian Smith

NO. 38

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CQA off-site/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/8/93 TIME IN 8:00 TIME OUT 5:0
WEATHER Overcast
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors

8:00 on site.
Calibrated Air monitoring equipment, Trex.
Checked water levels and air quality in vaults 2-6.
Water levels dropped ~0.5'. Gordon said he would drill holes in casings tomorrow to drain vaults. Removed plug from vault 4 to drain, other vaults are plugged.

- Electrician on site, placed conduit V2 1+50 to 0+00. Looked for break in conduit between S+A V3 1+50 & 3+00, but couldn't find it. Will try again Monday.

- Excavated 120', S+A V1 3+00 to 1+80. Compacted & tested 1st lift of #1A stone. Placed ~100' pipe, and backfilled with #1A Stone. Backfilled, compacted, & tested #1A stone over conduit V2 area - 3

- Placed 2 lifts 50' long of clay. Compaction & Moisture content passed tests. S+A V2 2+50 - 3+00
- Track hoe broke down

5:00 off site

* Stan Radon (DEC) on site for ~ 1/2 hour. No questions, No problems.

gned: Brian Muth

TO: File, Brian Smith

NO. 39

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS / CQA off-site / NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/9/93 TIME IN 8:00 TIME OUT 1:00
WEATHER Snow
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors

8:00 on site
Calibrated air monitoring eq. ip & Trexler.
Checked water levels in 3 (5) (4) vaults 2-6.
water up ~ 0.3'. Bailed vault 6 dry and plugged casing.
Bailed some water in vaults 3 and 4 but water not dissipating very fast. Clean Harbors drilled holes in vault 4. Plugged casings before leaving because W. Inc. are rigging.

- Compacted clay back fill to within 9" of ground surface and coverd with topsoil. St A 2+00 - 3+00 V2. Selecting dryest clay for backfill. Approx 50% of clay piles are too wet (>30%) for compacted backfill.

- Mechanics / operators fixing broken Track hoe.

1:00 off-site

Clean Harbors set liner on vault 3 and cleaning/grading mud around site.

gned: Chris Muth

TO: File, Brian Smith

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NO. 40

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS / CQA offsite / NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/11/93 TIME IN 8:00 TIME OUT 5:00
WEATHER Snow 17°
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors
Weydman Electrical

8:00 On site
Checked water level MW 89-5(A). WL. increased 0.32'
Well casings are plugged. Vaults 2, 6 are Dry,
Vaults 3, 4 have 2" water in bottom, Vault 5
has water to top of casing (0.9').

Placed clay backfill sta V2 250 - 2+00.
Removed 1 lift because M.C. ≈ 35% (approx 1 hour)

Set midpoint anchor between vaults 1 & 2.
Placed #1A stone, 1st lift sta 2+50 - 1+50
Compacted stone, tested, placed header pipe (100')

Electrician located broken conduit but the pipe
still leaks. Electrician will look for 2nd break in
conduit tomrow.

Monitored Air quality throughout the day.

4:00 Left site

gned: Chris Muth

TO: File, Brian Smith

NO. 41

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CQA off-site/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/12/93 TIME IN 8:00 TIME OUT 5:3
WEATHER Overcast
PRESENT AT SITE
Golder Assoc. - C. Muth
Clean Harbors
Weydmann Electrical

8:00 On site
Calibrated Air Monitoring equip, trox

- Checked Air quality in Vaults 2-6, no problems.
- Contractor backfilling trench with soil. Had to remove 30' section, too wet. Used all dry material and then contractor started using 2" ROC.
- Backfilling pipe with #1A stone sta VI 1+50 - 3+00
Excavating trench VI 1+50 - 0+00.
Welding pipe VI 1+50 - 0+00
- Tested all backfill for density.
- Electrician found and fixed 2nd break in conduit.

Contractor placing topsoil over 2" ROC backfill

5:30 off site

gned: Chris Muth

TO: File, Brian Smith

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NO. 42

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CoA off-Site/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/13/93 TIME IN 8:00 TIME OUT 4:00
WEATHER Sleet / Freezing rain
PRESENT AT SITE
Golder Assoc. - C. Muth
Clean Harbors
Waldman Electrical

8:00 On Site
Calibrated Troxler, No air Monitoring because of freezing rain. Talked with Gordon about precautions of entering confined spaces of the Vaults, he knows of procedures.

- Backfilled excavations for broken conduit with compacted Stone/insulation/Stone/Soil.
- Backfilling Pipe with #1A Stone sta V1 1+50 - 0+50
Tested All Backfill with troxler for Density.

- Placed pipe V1 0+50 - 0+00
Excavated hole for Vault 1, placed 12" Stone
- Set Vault 1, cut casing 3' above water level.

Electrician placing conduit V1 3+00 - 0+50.

Backfilling topsoil V2 0+50 - 0+00.

4:00 Off-site

gned: Chris Muth

TO: File, Brian Smith

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NO. 43

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CQA off-site/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 12/14/93 TIME IN 8:00 TIME OUT 5:3
WEATHER Overcast
PRESENT AT SITE
Golder Assoc. - C. Muth
Clean Harbors
Weydman Electrical / Wendel Engr

8:00 on site
Calibrated Air monitoring equip, Trexler.
Monitored Air in Working areas

- Backfilling conduit VI 3+00 - 1+50
Tested All backfill for Density
Placed 2" insulation under filter fabric
backfilled trench with 2" ROC VI 3+00 - 1+50.
Compacting stone in 9" lifts with hoe bucket

Dammed creek and pumped water around trench.
Excavated across ditch placed stone, compacted
Placed 1st concrete culvert section placed pipe
through culvert. Wrapped heat trace wire
with tape every 3' Wrapped insulation over
heat traced pipe. Filled 2 concrete culvert section
over pipe. Sealed pipe connections with rubber
O-rings. Backfilled culvert with #1A Stone.
Sealed North end of culvert with bentonite.
4:00 John Devic on site / 1:00 Wendel inspected heat trac
Checked Air in Vaults 2, 4.
5:30 off site

gned: Chris Muth

TO: File Brian Smith

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NO. 44

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS / CQA offsite / NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/15/93 TIME IN 8:00 TIME OUT 3:00
WEATHER Overcast
PRESENT AT SITE
Golder Assoc - C. Muth
Clean Harbors
Weyderan Electric

8:00 on Site
Calibrated Air Monitoring equip & Trexler.
Monitored air in working area.

Contractor excavated trench from V2 0+80 - 0+00
Set Pipe from N. end of culvert to Vault 2.
Heat traced and insulated ~ 20' from culvert.

Backfilled Pipe V2 0+80 - 0+00.
Sealed N. end of culvert with bentonite.

Tested all Backfill for density.

Electrician Set conduit V2 0+80 - 0+00.

3:00 off Site

gned: Chris Muth

TO: File, Brian Smith

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NO. 45

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS / CQA off-site / NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/18/93 TIME IN 11:00 TIME OUT 5:00
WEATHER Clear
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors

11:00 on site
Calibrated Air testing equip. and Monitored Air quality in vaults 4-6, during pressure testing.

Contractor drumming water from vault 5. Only about 2" in bottom of vault 5 had to be drummed. Plugs in casings of all wells.

Water floated pipe out of #1A backfill (6") at Sta V3 0+50-0+00. Contractor pumped water from trench and reset pipe to proper elevation and backfilled with #1A stone, then 2" Roc and top soil. Compacted and tested all stone backfill. Surrounding soil too wet for compaction.

Pressure tested lines V5-6 primary 26 psi
left overnight V4-5 primary 25 psi
- Manufacture recomends 25-30 psi overnight and repressurize next day and check after ~4 hr. Plugs blowing out of pipes if pressurized much above 27 psi.
Backfilled drainage ditch culvert. Sealed culvert end 5:00 off site with bentonite. Placed Filter Fabric and ~6" clay over culvert

gned: Chris Muth

TO: File - Brian Smith

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NO. 46

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS / CQA off-Site/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clega Harbors

DATE 1/19/93 TIME IN 8:00 TIME OUT 5:0
WEATHER Overcast
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors

8:00 on site. Calibrated Air monitoring equip., Troxle
Monitored Air quality in vaults 2, 4, 5 and 6.

Backfilled trench top soil Stg V3 0+00 - 0+80, V1 0+00 - 2+0
Backfilled conduit w/ #1A Stg V1 1+00 - 0+00
Backfilled trench w/ clay stg V1 2+00 - 0+00
- Compacted and tested Stone and clay backfill.

Pressure test failed due to leaking plug, Pipe section V5-6 prima
Repressurized V5-6 primary to 26 psi and let sit overnight

Pressure of 25psi held overnight V4-5 watched pressure
till noon and test passed.

Pressure on lines V3-4 primary 26 psi
V2-3 primary 26 psi

Vault 5 leaking at South boot. Contractor excavated
boot and sealed with bentonite. Tim R. says Vault
manufacturer will come to site and pressure seal any
leaking vaults after piping is completed.

5:00 off site

gned: Chris Muth

TO: File - Brian Smith

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NO. 47

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CQA off-Site/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/20/93 TIME IN 8:00 TIME OUT 12:0
WEATHER Clear
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors

8:00 on site. Calibrated air monitoring equip. and monitored Air quality in vaults 1-6.

Clean Harbor pumping water from Vaults 1, 2, 3. Contractor thinks secondary line is leaking at midpoint of V2-3. All Vaults & casings are plugged so water in Vaults can be returned to the surface.

- Backfilled vaults 1, 2 to ground surface after sealing vault joints. Top of vaults 3-6" below G.S., Clean Harbor will have to regrade G.S. or add extensions on lids

Pressure tests: V5-6 primary passed
V3-4 primary passed
V2-3 primary Failed (Plug blew out)

12:00 off-Site. Returned to Site at 4:00 to check Pressure Testing:

V2-3 primary 25psi let set overnight
V1-2 primary 25psi "

- Fabricating pipe to go in Vaults.

5:00 off site

gned: Chris Muth

TO: File - Brian Smith

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NO. 48

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CQA/HY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/21/93 TIME IN 8:00 TIME OUT 5:0
WEATHER Rain
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors

8:00 on site. Calibrated Air monitoring equip, monitored Air quality in Vaults 1, 2, 3, 5, and 6 c(4)

Pressure Testing: V2-3 primary passed
V1-2 primary Failed (leaking Plug)

V1-2 primary 25psi let set overnight
V5-6 secondary 6psi "

Tim R. said manufacturer recomends 5-8 psi for secondary pipe (since joints cant be soaped to check for leaks) and follow procedures for testing primary pipe.

Sounded wells for depths below bottom of vaults.
Note - Told Tim R. Plug in Vault 3 has to be removed to get depth for pump riser.

Pumped water from Vaults 1 & 2, water from leaking V2-3 secondary pipe.

Backfilled Vault 3 to ground surface.
- Fabricating Pipe to go in Vaults
5:00 off site

gned: Chris Muth

TO: File - Brian Smith

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NO. 49

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/CoA/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/22/93 TIME IN 8:00 TIME OUT 2:00
WEATHER Rain
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors
Weydman Electrical

8:00 on Site. Calibrated Air Monitoring equip.
Monitored Air quality in Vaults 1-6.

Electricians on site to blow water from conduits and run rope through them in preperation of pulling in Electricians to set pull boxes in vaults monday and pull wire by mid week.
- Wendel scheduled to inspect electrical next week.
- Drillers scheduled for Monitoring wells Monday.

Pressure testing: V1-2 primary Failed (leaking plug)
V5-6 secondary Passed

V2-3 secondary 6 psi let set overnight
V1-2 primary keeps blowing out Plugs @ 25 psi.
Repaired leaking midpoint connection from V2-3. Backfilled with Stone and clay.

Water in V1-4 from leaking midpoint @ V2-3. Pumped water from Vaults 1, 2, 3. Vault 5 has water from water leaking in vent ho
Vault 5 under water from draining adjacent properties owners yard
- Fabricating Pipe to go in vaults, grading Site.
2:00 off-Site

gned: Chris Muth

TO: File - Brian Smith

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NO. 50

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/COA off-site/NY
LOCATION Niagara Falls
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 1/23/93 TIME IN 8:30 TIME OUT 1:3
WEATHER Clear
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors

8:30 on site. Calibrated Air Monitoring Equip.
Monitored Air quality in vaults 1-5.

Pumped water from vaults 1-5. Surface water entering vaults from vent holes and another broken conduit (St A V3 0+00 to 0+80). All well casings are plugged. Water transmitting to other vaults through header pipes. Suggested to contractor to isolate leaking vaults by temporarily capping ends of header pipes in all vaults.

Grading area around trailers. Backfilled vaults 5, 4. Using dry soil for backfill excavated from hole near vaults.

Pressure Testing: V2-3 secondary Failed (Plug ripped apart from Se

V1-2 primary	25 psi	let set until Monday
V2-3 secondary	6 psi	"
V3-4 secondary	60 psi	"

1:30 off-site

gned: Chris Muth

TO: File - Brian Smith

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NO. 51

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEAT FIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 1/25/93 TIME IN TIME OUT
WEATHER Clear
PRESENT AT SITE
C. MUTH (GAI)

800 On Site - Calibrated Air equip. CH digging up electrical conduit from pole because of blockage in conduit. Pumping vaults. Water leaking into V6 and flowing through pipe to other vaults. Suggested to T. Riordan that they plug ends of pipes to isolate leaking vaults.

Water level 89-5(1A) = 7.83' BTOC

Conduit leaking into V4 Filling up V1-4. Leak between control panel pad to V3. Back Filling V5

V1-2	Primary	15 psi		
V2-3	Secondary	5 psi	@ 9:00 AM	Passed
V3-4	Secondary	0 psi		Failed - Repressurized to 25 psi
V1-2	Primary	25 psi	@ 10:20 AM	
		25 psi	@ 4:00 pm	Passed

9:00 - 9:30 Bob Simms was grading site near V6 when the power line farthest from vaults arced to trackhoe. Bob lowered bucket. No one was hurt. Niagara Mohawk came to site and talked with T. Riordan. T. Riordan contacted Bell and G. Fielding. G called Tony Grasso. Power at TDS may have been interrupted temporarily.

Signed: David Wehr for C. Muth

TO: File / Brian Smith

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NO. 52

FIELD REPORT

JOB NO. 923 - 9055
DATE 1/26/93 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER Clear
LOCATION WHEATFIELD
PRESENT AT SITE
CLIENT TDS C. Muth (GAI)
OWNER
CONTRACTOR CLEAN HARBOES (CH)

Bob Simms is not sure how close the hoe was to the power line. J. Devic was on site after incident. Stopped work in the area. Stopped Buffalo Drilling Co. (BDC) drillers from working in the area. They were planning on setting up rig S. of V6.

CH installing ladders on N. side of Vault. Checked with Russ J (Healy) - 30" ~ 36" from West side. Ladders = 16". Relocating electrical panel. Piping changes.

Tried to retrieve plug from casing in V3 with threaded poles but no success. Will try magnets tomorrow. Pulled main power line to control panel. Fixed leaking conduit between V3 1+50 & 0+C Fixed broken conduit for main power line.

330 pm offsite - office work

Signed: David Wehn for C. Muth

TO: File / B. Smith

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NO. 52

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEAT FIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS

DATE 1/26/93 TIME IN TIME OUT
WEATHER Cloudy 32°F
PRESENT AT SITE
DCW, CDM (GOLDER ASSOC.)

900 On Site T. Riordan of Clean Harbors (CH) shows me the future locations of wells 93-02(1) and 93-01(1). These wells are on private property behind houses at 6789 and 6790 Walmore Rd., respectively. G Fielding of CH shows the prefabricated parts for the in-vault piping system.

1000 Core boxes for EW-1, EW-2, ~~and~~ EW-3 and EW-5 are re-photographed due to poor results initially.

1030 Await J Devic and Buffalo Drilling Co. (BDC) to position rig on MW-93-02(1)

1200 C Muth and I locate wells 89-11(1) and 89-20(3) by garage at 6683 Walmore Rd. These are to be decomissioned

1300 BDC obtains decon water at Bell - decons rig (a D-50)

1600 Plywood is put down from driveway at 6789 Walmore to the backyard well site to prevent ruts from rig. After rig is positioned, plywood is moved to form a walkway to protect grass if the weather warms (ground is presently frozen).

1630 Offsite

Signed: David Welch

Page 1/2

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TO: File / B. Smith

NO. FR53

FIELD REPORT

JOB NO. 923- 9055
PROJECT TDS CQA OFFSITE
LOCATION WHEAT FIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 1/26/93 TIME IN TIME OUT
WEATHER Cloudy 30°F
PRESENT AT SITE
DCW - CDM (GAI)

900 On Site
Air Tests -
V3-4 Sec. failed (Blew out plug last night)
V1-2 Sec. leaking at midpoint.
Calibrated air monitoring equip.
V3-4 Repressurized to 6 psi
- Pressure testing lines
- Digging surface drainage ditch on N. side of existing ditch (as requested by property owner).

Reminded G. Fielding of submittals required by GAI
1) Pressure test procedures.
2) Temperature check for expansion of pipe.

Dropped off film.

200 PM Off site - sent seven stone samples
Electricians on site pulling rope through conduit
Rescheduled electrical inspection for later in week when pull boxes are installed.

500 Done with TDS work for day

Signed: Daniel Wehr For C. Muth

TO: File / B. Smith

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NO. 53

FIELD REPORT

JOB NO. 923-9055
DATE 1/27/93 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER P. Cloudy - 30°
LOCATION WHEATFIELD
PRESENT AT SITE
CLIENT TDS
Dow CDM (GOLDER ASSOC.)
OWNER
CONTRACTOR CLEAN HARBORS

830 On Site - Lable sample jars

900 Buffalo Drilling Co. (BDC) arrives - sets up containment pad around rig at 93-02(1)

1000 Split spoon sampling / 6¼ ID augering begins.

1230 Auger refusal at 16.9 FT BGS.

1330 BDC sets up to core 93-02(1) - Places 6" temporary casing ≈ 3 FT into rock using casing shoe.

1530 Coring begins on 93-02(1) Run 1 produces dust - no water Notice grease leaking from rig's gear housing driving the rods. Notice blobs on drillers, rig and containment pad.

1600 Shut down rig due to potential contamination of the well with grease. All downhole equipment to be decon'ed. A new rig will be brought in tomorrow

1630 Offsite

Signed: David Wilson

Page 1/3

TO: File / B. Smith

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NO. #1B54

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 1/27/93 TIME IN TIME OUT
WEATHER Snow
PRESENT AT SITE
DCW - CDM (GAI)

800 On Site - Calibrated air monitoring equip. Electricians pulling ropes through conduit. CH repairing leak at midpoint V1-V2

V3-4 6 psi @ 8:30 AM (Secondary)
V4-5 leaking at midpoint (Secondary) fixed leak - repressurized to 6 psi
V1-2 6 psi @ 11:00 AM

Checked temperature probe - it is broken. Told T. Riordan to fix before installation. CH fabricating pipes in trailer. I document photos.

Leaking midpoints, V1-2, V2-3, V4-5 all leaking in the same manner. Air/water leaking out/in secondary pipe because the 6" pipe flanges were moved out of alignment during backfilling.

Fix - CH exposed joints, loosened bolts, realigned secondary pipe and tightened bolts. Air tested with soap before backfilling.

Signed: David Weh for C. Muth

TO: File / B. Smith

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NO. 54

FIELD REPORT

JOB NO. 923 - 9055
PROJECT TDS / CQA / OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 1/27/93 TIME IN TIME OUT
WEATHER Snow
PRESENT AT SITE
COM- DCW (GAI)

Checked with R. Healey about CH's proposed method of monitoring subsurface temp before installing probe. Russ has no problems with it. Will leave probe in one place and monitor whenever temp. readings are needed to evaluate expansion of pipes previous to installation.

Installed temp probe at pipe level, backfilled with stone / soil to grade. Put pipe around top of probe for protection and covered with bucket to protect from rain.

530 Offsite

Discussed with G. Fielding the installation of pumps. Explained that when the pumps are installed the vaults will fill with well water - the amount depend on the water levels. CH now plans to install pumps first then piping. I recommend installing the pumps last and turning them on as soon as they are installed to prevent flooding the vaults. I told G. Fielding he will have to drum all well water pumped from vaults. He said he would have scheduling problems with workers if the pumps are installed last.

Signed: David Wohl for C. Muth

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TO: Fik / B. Smith

NO. 54

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEAT FIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS

DATE 1/28/93 TIME IN TIME OUT
WEATHER P Sunny 34°
PRESENT AT SITE

845 On Site Buffalo Drilling Co. (BDC) is deconning the leaking rig on pad near trailers.

900 Another D-50 rig from BDC arrives and is deconned. Deconning is slow because of frozen pipes and hoses.

1115 Rig positioned on 93-02(1)

1200 Coring begins - Poor results are obtained - the core barrel continually blocks off after coring only several inches.

1400 Coring is stopped as no progress is being made. BDC reports that an NX barrel and bit will be brought in tomorrow (the hole will need to be reamed to 4 IN afterwards). A new HW bit and core retainer will be obtained for wells 93-01(1) and 93-03(1).

1500 Offsite

Signed: Dave Welch

TO: File / B. Smith

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NO. 11455

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 1/28/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE
DCW CDM (GAI)

1100 On Site
V1-2 6 psi @ 8:00 AM
6 psi @ 12:00 PM passed

CH pressure testing secondary lines, installing ladders 30-36" from NW side. CH has a magnet to retrieve plug from V3 casing. Electrician installing pull boxes. Plug in V3 removed.

Conduit in V5 leaking at boot. G. Fielding says he will get manufacturer to seal them.

Documented Photos

3:00pm off site - paperwork until 5:00 pm

Signed: David Wahl For C. Muth

TO: File / B. Smith

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NO. 55

FIELD REPORT

JOB NO. 923-9055
DATE 1/29/93 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER Sunny 22° F
LOCATION WHEATFIELD
PRESENT AT SITE
CLIENT TDS
Dcw, COM (GAI)
OWNER
CONTRACTOR CLEAN HARBORS (CH)

1000 Onsite - COM subbing in my absence. No coring yet - HW rods frozen together, rented compressor would not start.

1100 Coring (with HX barrel) starts

1200 - 1300 Break to remove drill water - lunch

1300 Coring resumes.

1400 Job stops - drill water containers all full. Chris Gailer of Clean Harbors reports he can not remove water as forklift at Bell is down. CH will have a pump large enough to work around the forklift problem Monday.

1415 Off site

(C. Muth on site from 8:00 to ~~1300~~ 1330 - first to cover for Dcw until his arrival then to document photos)

Signed: David Wahl

TO: File / B. Smith

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NO. ~~1356~~

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEAT FIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/1/93 TIME IN TIME OUT
WEATHER Snow - 4°F
PRESENT AT SITE DCW (GAF)

830 Onsite - Buffalo Drilling Co. (BDC) arrives shortly afterwards.

930 After discussion with C. Gailor of CH, driller C. Nicometi (BDC) decides that it would be impractical to try to core and contain (thus pump) water because of the extreme cold (4°F, -28°F windchill). The danger of frostbite was also a concern. BDC offsite.

I leave after telling CH to call if any trenching is to be done today, as I am to replace C. Muth for trenching observation today

Paperwork at office

Signed: David Weeks

TO: File / B. Smith

NO. 57

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FIELD REPORT

JOB NO. 923-9055
DATE 2/2/93 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER Sun 16°F
LOCATION WHEAT FIELD
PRESENT AT SITE
CLIENT TDS
Dcw, CDM (GAI)
OWNER
CONTRACTOR CLEAN HARBORS (CH)

830 Onsite - Talk with T Riordan, CH will be trenching from Vb to manhole today. Call Office - C. Muth is coming today - also requested C. Prucha to order a new 50% LEL calibration (methane) cylinder.

930 NX coring of 93-02(1) begins. BDC drillers are reminded again not to wear yellow tyveks - state their blue ones are not large enough to wear a heavy coat under. Helper later switches to a blue one.

1030 Drillers report they have not been getting air return to carry cuttings/water upwards. They will spin the 6" protective casing farther into the rock to attempt to block off the fractures probably responsible for the air loss.

11:15 6" casing driven another 2 FT (Total approx. 5 FT BGS) No water or air return yet.

1200 4" reaming of 93-02(1) starts (to clear hole of fractured rock) after an air line ice-up is cleared. The drillers discover that this was the cause of the "no air return" all along. The reaming will proceed to 23 FT BGS, approximately

Signed: Dave Wahl

Page 1 / #3

TO: File / B. Smith

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NO. 58

FIELD REPOR.

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEAT FIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/2/93 TIME IN TIME OUT
WEATHER Sun 15°F
PRESENT AT SITE
DCW, CDM (GAI)

the depth of the cored interval at this point.

12:45 Standby time - all drillwater containers full. CH was to empty them. BDC driller sends helper to Bell to get empty drums so he may continue.

13:15 BDC helper arrives with 8 more drums - reaming resumes.

13:40 Reaming complete at 27.6 FT BGS. Driller overdrilled approx. 4.5 FT beyond the depth requested - stated he "miscounted the rods". Driller reports rock quite "soft" (fractured). NX Coring resumes.

14:10 Standby time - all drillwater containers Full (10 drums and stock tank). CH has not yet moved any water from the on-site drums. BDC driller talks to T. Riordan about bringing a 1000 gal poly tank on site to reduce his downtime. T. Riordan and I agree this would be a good idea, it will arrive tomorrow. Coring must cease for today.

15:15 Offsite - office paperwork

Signed: Dave Weber

Page 2/2

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TO: File / B. Smith

NO. 58

FIELD REPOR.

JOB NO. 923-9055
PROJECT TDS / COA off-site/NY
LOCATION Wheatfield
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 2/2/93 TIME IN 9:00 TIME OUT 5:3
WEATHER Clear
PRESENT AT SITE
Golder Associates - C. Muth, D Wehn
Clean Harbors
Buffalo Drilling

9:00 on site
Contractor installing piping in Vault 6.

Excavating from V60+50 to Sewer

Pressure testing section of secondary pipe V4-5

Placed pipe from V6 0+50 - 0+00
Backfilled Pipe with #1A Stone
Compacted and tested backfill.

Notified Electrical inspector (Wendel Engr) to be on-site tomorrow when electricians pull power cables.

Talked with contractor about using soil to backfill trench. Probably wont pass compaction because its frozen but advised contractor to try anyway.

Clean Harbors had to relocate anchor at S+A V60+50 because it was facing the wrong Direction.

5:30 off-Site

gned: Chris Muth

TO: File / Brian Smith

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NO. 58

FIELD REPORT

JOB NO. 923-7055
PROJECT TDS CAA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH

DATE 2/3/93 TIME IN TIME OUT
WEATHER Clear 35°
PRESENT AT SITE
DCW, CDM (GAI)

830 Onsite. Buffalo Drilling Co. (BDC) sets up rig, services air compressor. 1250 gal polyethylene tank placed near end of drive in yard.

945 NX coring of 93-02(1) starts using new diamond bit to speed drilling. Start at 29.1 FT BGS.

1010 BDC driller pulls up bit after making little progress. Discovers that bit is clogged with metal. Driller reports that either someone dropped something down the well overnight or a piece of bit from a bit broken the previous day remained. The driller is of the opinion that the broken-off pieces were all recovered in the core barrel the previous day, which looked to be the case to me. Driller goes to CH in search of a magnet. CH says it will bring one. Hole depth now 29.8 FT BGS.

1045 Decision is made the roller-bit out the metal. Target depth 30 FT BGS.

1100 - 1120 4" Roller bit reaming - Depth 30 FT BGS

1135 NX Coring resumes - good progress now made.

Signed: David Welch

TO: File / B. Smith

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NO. 59

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/3/93 TIME IN TIME OUT
WEATHER Clear 35°F
PRESENT AT SITE
DCW, CDM (GAI)

1310 Drillers break for lunch - allow CH to move water from the full 1250 poly tank.

1355 Drillers return - CH still removing water - standby time.

1440 Tank drained to 2/3 full. Coring able to resume. Rock is very fractured (No RQD greater than zero yet). Drilling is producing approx. 200 gals. of water per foot of core. T. Riordan has relayed J. Devics' concerns about the large amounts of water produced, as has T. Grasso. We have been working with BDC from the beginning of the project to address this problem, and are producing as little water as possible under current drilling specifications.

Driller is delayed in his coring as he must frequently pause to pump water to the poly tank.

1630 Coring complete at 38.0 FT BGS. Driller reports a void from 38.0 to 39.4 FT BGS

1700 Offsite

Signed: David W. [illegible]

TO: File / B. Smith

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Fax (716) 691-5109

NO. 59

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS / CQB off-site / NY
LOCATION Wheatfield
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 2/3/93 TIME IN 8:00 TIME OUT 4:0
WEATHER Clear
PRESENT AT SITE
Golder Associates - C. Muth, D. Wehn
Clean Harbors, Wendel Engr
Buffalo Drilling, Weydman Electrical

8:00 - 9:00 Meeting with Tony Grasso. Discussed installation of piping in vaults.

9:00 On site

Contractor excavating from V6 1+00 to sewer
Cored sewer line for pipe inlets
Pressure grouting leaks at Vaults
Installed Vault Vents
Working on piping in Vaults 5-1
Placed expansion loop at V6 1+00 and anchor.

Electrican pulling power lines through conduit V5-6
Wendel Engr on site to inspect power lines.

4:00 off site

gned: Chris Muth

TO: File / Brian Smith

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NO. 59

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS COA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/4/93 TIME IN TIME OUT
WEATHER Sun 35°
PRESENT AT SITE
DCW, CCP, CDM (GAE)

0830 Onsite Buffalo Drilling Co. (BDC) setting up to finish reaming to 4" 93-02(1). Target depth 37.4 FT BGS

1000 Reaming of MW 93-02(1) starts - 3 7/8" tricone bit.

1025 Reaming complete at 37.4 FT BGS - Rods are broken down.

1100 While preparing to install well, BDC drillers notice that the stainless steel risers have no male threads. BDC breaks early for lunch while someone from their shop brings the proper supplies.

1200 Drillers return - await riser pipe.

1230 Riser sections arrive - well is installed.

1430 When the temporary casing was lifted to allow bentonite into the auger bore two feet above the rock / soil interface, the bottom of the soil core started to collapse. The two feet of bentonite and six inches of sand were omitted and the well was pressure grouted from 17.0

Signed: David Wah

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TO: File / B. Smith

NO. 60

FIELD REPOR.

JOB NO. 923-9055
PROJECT TDS COA OFFSITE
LOCATION WHEAT FIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBOR (CH)

DATE 2/4/93 TIME IN TIME OUT
WEATHER Sun 35°F
PRESENT AT SITE
DCW, CCP, CDM (GAI)

FT BGS to the surface.

1510 Well installation complete with the exception of the grout inside the protective casing, pea gravel and the drain holes. The grout will be installed tomorrow

1530 offsite

Signed: Daniel Welsh

TO: File / B. Smith

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NO. 60

FIELD REPOR.

JOB NO. 923-9055
PROJECT TDS / CQA off-site / NY
LOCATION Wheatfield
CLIENT TDS
OWNER TDS
CONTRACTOR Clear Harbors

DATE 2/4/93 TIME IN 8:00 TIME OUT 6:00
WEATHER Clear
PRESENT AT SITE
Golder Associates Inc - C. Muth, D. Welch, C. Procha
Clear Harbors
Buffalo Drilling.

8:00 - 10:00 Paper work, Meeting with Anthony Grasso to discuss mechanical design/construction of piping/grating in Vaults

10:00 on Site
Took water levels in Vaults

Stan Raden (NYS DEC) on site for ½ hr, NO Problems.

Contractor installing piping in Vaults 2, 3.
Placed pipe from expansion loop to sewer.

1:00 Chris Procha (GAI) on site to inspect piping and backfill

Backfilling pipe V6 0+00 - 1+00 with #1A Stone
Compacted and tested Backfill.

Took last #1A Stone sample 65 truck loads total

Reminded Contractor to check with Sewer Authority about length of pipe required for extraction system out-let in sewer.
Contractor installing bracket for sewer out let pipe.
Suggested to contractor to install boot @ sewer over 8" containment pipe to prevent methane gases from entering Vaults.
6:00 off-Site.

gned: Chris Muth

TO: File / Brian Smith

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NO. 60

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS COA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/5/93 TIME IN TIME OUT
WEATHER Sun 32°
PRESENT AT SITE DCW, CCP (GAI)

900 Onsite - update field files - discuss project with C. Prucha, who is replacing C. Muth for trench observation. Buffalo Drilling Co (BDC) decontaminates rig.

1000 Take "after" photographs of area surrounding 93-02(1). The yard in good shape, with only some short minor ruts at the edge of the brush lot in back. Take "before" photos of 93-01(1) where BDC is to drill today.

1100 BDC moves rig to 93-01(1) and sets up to auger and split spoon sample.

1145 Augering and sampling begins

1315 Augering complete at 14 FT BGS. No OVM readings above zero on the soil sample jars

1430 Offsite

Signed: David Wohl

Page 1/2

TO: File / B. Smith

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NO. 61

FIELD REPORT

JOB NO. 923-9055
DATE 2/5/93 TIME IN 0900 TIME OUT 1720
PROJECT CQA Off-Site
WEATHER Clear - Cold
LOCATION Wheatfield
PRESENT AT SITE CAP, Contractor, DCW
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

0900 - Contractor working on backfill from U6 to sewer
- put lift of clay down to test compaction limits - Failed ; will use 2" stone above 1st stone

Contractor working on piping in U1 and U2

1130 - connected pipe from expansion loop to 90° before sewer

Contractor spoke w Russ about soil T° for piping in vaults - originally was 65°
- after checking T° in pipe and consulting w ALG and Russ Contractor informed that soil T° is 50°F not 65°

1500 - set up pressure test of 8" pipe - will let sit overnight.

1720 - off site

gned: Christopher P Parks

Page 2/2

TO: File / B. Smith

NO. 61

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FIELD REPORT

JOB NO. 923-9055
PROJECT CQA Offsite
LOCATION Wheatfield
CLIENT TDS
OWNER
CONTRACTOR Clean Harbors

DATE 2/6/93 TIME IN 0820 TIME OUT 1430
WEATHER Clear - Cold
PRESENT AT SITE CPP, CM, Contractor

0830 - ✓ air pressure in 8" pipe - still @ 6 psi Therefore passed test.

Contractor will continue backfill in trench V6 to sewer

1145 - C Muth here - measured round of water levels in Extraction wells

1300 - set up for pressure test in 3" carrier pipe. Will let sit until Mon

gned: Christopher P. Smith

Page 1/1

TO: File / B. Smith

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NO. 62

FIELD REPOR.

JOB NO. 923 - 9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/8/93 TIME IN TIME OUT
WEATHER Cloudy - 30°F
PRESENT AT SITE

830 Onsite

900 Buffalo Drilling Co. (BDC) arrives - sets up to drive 4" casing and core the well. (93-01(1))

945 Driving of the 4" casing begins. Reminded driller (C. Nicomel) to wear blue tyvek. He refuses, saying he doesn't want to get wet without a raincoat and does not want to wear two layers. Tell G. Fielding about the situation. G Fielding sends a man to the rig and has him tell the driller to put on the blue tyveks which he has brought. The driller says he will, but does not do it.

1030 4" casing driven approx. 18.5 FT BGS. Driller puts on a blue tyvek. Drillers set up to NK core 93-01(1). NK coring, instead of the specified HW, will be done to speed up the coring process and thus produce less water. Bottom of hole taped at 16 FT BGS - will start coring at this depth.

1100 Coring of MW 93-01(1) begins. Dust is produced.

Signed: David Wh

TO: File / B. Smith

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NO. 63

FIELD REPOR.

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEAT FIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/8/93 TIME IN TIME OUT
WEATHER Cloudy 30° F
PRESENT AT SITE

1235 Coring stops - lunch

1335 Coring resumes - very little water produced

J. Devic and B. Smith stop by rig.

1530 Coring 93-02(1) stops today at 32.1 FT BGS. Total drillwater produced = approx. 20 gallons.

1600 offsite to Bell plant to obtain lock for 93-02(1) from J. Devic Well is locked.

Signed: Dave Welch

TO: File / B. Smith

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NO. 63

FIELD REPOR.

JOB NO. 923-9055
DATE 2/8/93 TIME IN 8:00 TIME OUT 5:0C
PROJECT TDS/CQA off-site/NY
WEATHER Clear
LOCATION Wheatfield
PRESENT AT SITE
CLIENT TDS
Golder Associates Inc - C. Muth, D. Wehn
OWNER TDS
Clean Harbors A. Grasso
CONTRACTOR Clean Harbors
TDS - Brian Smith, John Devic

8:00 On Site

Electricians pulling power lines through conduit from Vault 3 to 4.

Contractor Backfilled Vault 6 and backfilling trench from Vault 6 to the sewer with 2" ROC. Compacted and tested backfill.

Pressure testing primary line from V6 to 90° Elbow before Sewer connection.

Backfilled trench V6 to within 15' of sewer with topsoi

Site Visit By TDS. John Devic, Brian Smith on site Golder Assoc. Inc Site Visit by Anthony Grasso.

Finnished compaction testing for entire trench and Returned Trailer to Atlanta.

5:00 off site

gned: Clin Muth

TO: File / Brian Smith

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NO. 63

FIELD REPORT

JOB NO. 923 - 9055
PROJECT TDS COA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/9/93 TIME IN TIME OUT
WEATHER P. Cloudy -20°F
PRESENT AT SITE

830 Onsite

845 Buffalo Drilling Co. (BDC) arrives - sets up to finish coring 93-01(1). Rigs clutch is frozen, will not engage. Efforts are made to thaw it. New driller L. Shoeder.

945 Coring starts - hole is producing water now.

1215 Lunch until 1300

1400 Coring of MW 93-01(1) complete at 40.1 FT BGS. for a 1.0 FT Socket into ZONE 2 Dolomite. BDC sets up to ream hole to 4" dia.

1445 4" reaming of 93-01(1) begins.

1600 4" reaming ends for the day - only approx. 2 FT remaining.

1630 Offsite after taking photos of 93-02(1) and 93-01(1) core.

Signed: [signature]

TO: File / B. Smith

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NO. 64

FIELD REPORT

JOB NO. 923-9055
PROJECT Offsite CQA
LOCATION Westfield
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 2/9/93 TIME IN 1030 TIME OUT 1245
WEATHER Clear Cold
PRESENT AT SITE CPP, ALG, Russ Hadge, Clean Harbors

10:30 - on-site w/ ALG and RH to inspect piping in vaults

~~12:25~~
12:00 Showed Contractor the questions/clarifications/problems found while inspecting vaults

gned: Christopher P. Pratt

TO: Bill / Brian Smith

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NO. 64

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEAT FIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/10/93 TIME IN TIME OUT
WEATHER Cloudy 35° F
PRESENT AT SITE
A. Taney, DCW (GAF)

830 Onsite.

930 Buffalo Drilling Co. (BDC) arrives - delayed at shop. BDC sets up to finish 4" reaming of 93-01(1) A. Taney arrives at rig to observe well installation.

1005 4" reaming complete at 40.2 FT BGS. Well installation starts. Total water produced approx. 600 gals

1215 Lunch - only grouting remains at this point

1315 MW 93-01(1) is grouted. Area around rig is cleared. Rig is moved to area by extraction wells. ~~and is decontaminated.~~

1630 Offsite after completing paperwork.

Signed: David Wedekin

TO: File / B. Smith

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NO. 65

FIELD REPOR.

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/11/93 TIME IN TIME OUT
WEATHER Cloudy 20°F
PRESENT AT SITE
DCW

900 Onsite - Rephotograph core from EW-6

920 Buffalo Drilling Co. (BDC) arrives from Bell plant. Drillers report that water supply at Bell is frozen and that they can not obain decon water. CH sends a man to the plant with BDC to try to get water.

1100 BDC returns with water and starts cleaning rig and equipment.

Vaults 3 and 4 have had their internal piping installed, but I can not enter them alone to check the work. The elbows in V2 have not yet been straightened. CH is currently trying to get an air-tight seal for the testing of the section of pipe from the last elbow to the sewer manhole.

1145 CH can not get a good link seal to air test the last section of pipe. They will consider other options

1230 BDC sets up rig to sample / auger MW 93-03(i)

1445 Sampling complete at 17.4 FT BGS. Finish augering tomorrow.

Signed: David Wick

TO: File / B. Smith

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NO. 66

FIELD REPORT

JOB NO. 923-9065
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/12/93 TIME IN TIME OUT
WEATHER Cloudy
PRESENT AT SITE

0830 Onsite - with C. Prucha (GAI). As drillers prepare to drive 4" casing, I assist CP with measuring water levels in EW-1 through EW-6 and several monitoring wells.

1030 Return to site - drillers have started driving 4" casing.

1115 4" casing driven to 22.8 FT BGS, which is approx. 5' into rock. BDC sets up to core MW 93-03(1)

1140 Coring of 93-03(1) starts at 22.3 FT BGS

1300 One run complete, poor (16%) recovery. Driller L. Shroeder reports he is sick and is going home. He has had a cold since Wednesday (2/10/93). Told him to improve core recov

1330 Offsite

Signed: David Wolf

TO: File / B. Smith

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NO. 67

FIELD REPORT

JOB NO. 923-9055
PROJECT CQA Offsite
LOCATION Westfield
CLIENT TDS
OWNER TDS
CONTRACTOR —

DATE 2/12/93 TIME IN 0830 TIME OUT 1400
WEATHER Overcast - Cold
PRESENT AT SITE CLP

0830 - on site to take a round of water level Readings for system start-up.

gned: Christopher P. Parker

TO: File / Brian Smith

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NO. 67

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEAT FIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/15/93 TIME IN TIME OUT
WEATHER P. Sunny 25°F
PRESENT AT SITE DCW

830 Onsite

1000 Buffalo Drilling Co. sends a man to the site to state that no one was available for the job today as many people called in sick. He said the office tried to call the trailer but there was no answer. CH personnel and I were there but CH admitted the phone ringer has been giving them problems.

1015 offsite

Signed: David Wolf

TO: File / B. Smith

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NO. 68

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/16/93 TIME IN TIME OUT
WEATHER Snow - 30°F
PRESENT AT SITE DCW

830 Onsite

845 Buffalo Drilling Co. (BDC) arrives, sets up to core MW 93-03(1).

1145 Core run #2 (approx. 10 FT) complete. Recovery was poor, amounting to a few inches of crushed dolomite gravel. I shut job down until a better performing barrel is obtained. This core barrel (NX size) has been giving poor results all along, but is now completely unuseable

Weydman Electric Inc. Schedule ↓

2/17 - 2/18 : Install periferal 1" conduits, heat trace box and thermostats.

Next week : Control box, heat trace cable
CH will insulate pipe.

1:15 Offsite

Signed: Dave Weh

TO: File / B. Smith

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NO. 69

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/17/93 TIME IN TIME OUT
WEATHER P. Cloudy 20°F
PRESENT AT SITE DCW

815 Onsite

845 Buffalo Drilling Co. (BDC) onsite - sets up to core MW 93-03(1) with a replacement core barrel and bit. The bit looks to be worn.

945 Coring (NX size) begins.

1045 Coring bit burns out (worn out). Drillers will ream to 4" the existing core hole while awaiting a new NX bit which may arrive today.

Core depth approx. 38 FT BGS

1130 4" reaming of 93-03(1) begins

1230 Reaming ends at approx 38 FT BGS.

1300 offsite - new bit will not arrive until tomorrow afternoon (2/18/93). Drilling can not resume until Friday (2/19/93). It may be possible to complete the well the 19th.

Signed: Dave Welch

TO: File / B. Smith

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NO. 70

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/19/93 TIME IN TIME OUT
WEATHER P Cloudy 10°F
PRESENT AT SITE DCW (GAI)

900 Onsite. Buffalo Drilling Co. (BDC) arrived at 8:15 with a new coring bit and proceeded to set up rig.

945 Coring (NX size) begins on MW 93-03(1)

1045 Coring complete at 45.1 FT BGS, 4" Ream depth target (for a one foot socket into Zone 2) is 45.4 FT BGS

1110 Stan Radon of NYSDEC stops by rig - looks at recovered core. No complaints.

1145 4" Reaming complete at 45.4 FT BGS - BDC installs well.

1345 MW 93-03(1) installation complete.

1430 Offsite

Signed: Dave Welch

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TO: File / B. Smith

NO. 71

FIELD REPORT

JOB NO. 923-9055
DATE 2/24/93 TIME IN TIME OUT
PROJECT TDS CGA OFFSITE
WEATHER
LOCATION WHEATFIELD
PRESENT AT SITE DCW, CCP
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

830 On site with C. Prucha. Monitoring wells 93-01(1), 93-02(1) and 93-03(1) were developed. MW 93-01(1) did not recover enough to remove five well volumes, it will have to be bailed again at a later date.

Buffalo Drilling Co installed the pumps in EW-1 and EW-2 but were not inspected as it was not anticipated they would install the pumps today. CH will help me inspect them March 1st. CH is replacing the cracked elbows in vault 2, and is repairing an air leak in the outer pipe near the expansion loop from vault 6 to the sewer.

Signed: David Wolf

TO: File / B Smith

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NO. 72

FIELD REPORT

JOB NO. 923-9055
PROJECT COA offsite
LOCATION Wheatfield NY
CLIENT TDS
OWNER TDS
CONTRACTOR —

DATE 2/24/93 TIME IN 0830 TIME OUT 1600
WEATHER Sunny - Cold
PRESENT AT SITE CPP / DCW

- Measured Water Levels in new Extraction Wells, EW1 - EW6

- Developed new monitoring wells 93-01(i), -02(i), -03(i)
  - performed Rising head tests in 93-01(i) and 93-02(i)

gned: Christopher P. Pratt

TO: File / Brian Smith

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NO. 72

FIELD REPOR.

JOB NO. 923- 9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/25/93 TIME IN TIME OUT
WEATHER Sunny 20°
PRESENT AT SITE DCW

830 Onsite. I am informed that the planned installation of the pumps in vaults EW-3 & EW-6 will not occur because the Buffalo Drilling Co. crew called in sick. The outer pipe from V6 to the sewer will be tested today if the air boot arrives.

Talked with T. Grasse and Weydman (electric) about the use of one of the drain holes in the well cap for the pump power leads. All agree - O.K.

945 Document EW-1 vault pipe inverts / installation

1030 Accompany C. Prucha with several monitoring well water level measurements while waiting for air test to begin.

1200 - 1300 Lunch

1300 Air boot will not arrive today. I document pipe inverts / installation in vaults EW-3, EW-4 EW-5 and sketch a typical electrical box layout - document junction box / conduit materials.

15:30 Off site

Signed: David Weber

TO: File / B. Smith

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NO. 73

FIELD REPOR.

JOB NO. 923-9055
PROJECT CAA offsite
LOCATION Wheatfield, NY
CLIENT TDS
OWNER TDS
CONTRACTOR -

DATE 2/25/93 TIME IN 0900 TIME OUT 1630
WEATHER Sunny - Cold
PRESENT AT SITE CPP

- Took round of water levels for off-site system start-up and on-site system design.

gned: Christopher L. Perks

TO: File / Brian Smith

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NO. 73

FIELD REPORT

JOB NO. 923-9055
DATE 2/26/93 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER Sunny 20°
LOCATION WHEAT FIELD
PRESENT AT SITE DCW
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

830 Buffalo Drilling Co. (BDC) setting up to install pump in EW-3

10 15 BDC moves to EW-5

1030 A glitch. The pumps to be installed in EW-5 and EW-6 lack a green wire, having only red, yellow and black ones. All the pumps meet the specifications, though the 3-wire pump has an ID # of 79453101 and the 4-wire # 79453301 so they are clearly different. The specifications indicate that the exact pump wiring connection is to be determined in the field, so it is up to CH and Weydman (electric) to agree on a solution.

11 30 BDC and Weydman (shops) discuss ~~placing~~ clamping a ground wire to the stainless pump riser and running it ~~th~~ to the control box to provide the missing ground. I state that if Weydman contacts Grundfos (th pump manufacturer) directly and clears this, I have no problems with Weydman adding the ground

Signed: David Wels

TO: File / B. Smith

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NO. 74

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CGA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/26/93 TIME IN TIME OUT
WEATHER Sunny 20°
PRESENT AT SITE DCW

T. Riordan tells me system start up is scheduled for March 15.

Bob from Grundfos' PA office talked to John from Weydman. All agree that clamping a ground wire to the pump riser is functionally equivalent to the ground wire provided by Grundfos. Result: EW-1 through EW-4 have 4-wire, Grundfos grounded pumps. EW-5 and EW-6 have 3-wire, Weydman grounded pumps. All six pumps have internal thermal protection as well as the thermal protection installed by Weydman in the motor starters in the control boxes.

Wells 93-01(1) and 93-03(1) grouted inside the protective casing.

12:30 EW-5 pump installed. CH repairing fusible coupling on west end of the expansion loop on the pipe run from the sewer to V6.

13:15 EW-6 pump installed. Installation photographed. Sketched top of riser connection.

Signed: David Wahl

TO: File / B. Smith

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NO. 74

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 2/26/93 TIME IN TIME OUT
WEATHER Sunny 20° F
PRESENT AT SITE DCW

1400 EW-4 pump installed

1500 Offsite after discussing CH's schedule for next week

Monday: Air test V6 to sewer
Air test entire inner pipe.

Wed. Pipe insulation subcontractor to start.

Signed: Dwk Wch

TO: File / B. Smith

Golder Associates
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NO. 74

FIELD REPORT

JOB NO. 923-9055
DATE 3/11/93 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER P. Cloudy
LOCATION WHEATFIELD
PRESENT AT SITE DCW
CLIENT TDJ
OWNER
CONTRACTOR CLEAN HARBORS (CH)

13 30 Onsite - Talk with Joe Horton of CH. Elbow at west edge of expansion loop between sewer and vault 6 is still leaking. They are discussing the problem with a representative from + GF + J (pipe manufacturer). The carrier (inner) pipe is scheduled to be air tested tomorrow. Preliminary tests have gone well. Insulation contractor scheduled to arrive Thursday (3/4/93)

1400 Talk with John of Weydman (electric)

Vaults 1 and 2 are electrically complete with the exception of the pulling and connection of the leak detection cable. Vault 3 will be also by the end of the day

Vaults 4, 5 + 6 need flow sensor terminations, motor connections + heat trace + connections ye

Wendle will inspect the finished vaults tomorrow

1430 Documented transducer types and depths in all wells, pump riser + stilling well depths in vaults 1 and 2. Water level in 93-01(1). 1630 Offs

Signed: Dawn Wick

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TO: File / B. Smith

NO. 75

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS COX OFFSITE
LOCATION WHEAT FIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/2/93 TIME IN TIME OUT
WEATHER P Sunny 45°F
PRESENT AT SITE DCW

9:45 Air test of 8" outer pipe from Vault 6 to sewer starts. The coupler that was leaking was re-fused earlier this morning. ~~Weydman has finished~~

1300 Weydman has finished the electrical installations in Vaults 4 & 5 with the exception of pulling and connecting the leak detection cable. (This cable has yet to be installed in any of the vaults because of the need to keep them dry.)

1345 CH fills in the excavation over the former pipe leak.

1495 Air test of 8" pipe from V6 to sewer - passes

1510 Offsite

Signed: Dan Wilson

Page 1/1

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TO: File / B. Smith

NO. 76

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/3/93 TIME IN TIME OUT
WEATHER Fog / Sun 40°F
PRESENT AT SITE DCW

845 On site. Air test of entire 3" carrier pipe starts at 8:50 @ 25 psi after overnight pressure stabilization

945 Measure water level in MW 93-01(1). Document pipe inverts in Vault 6.

1250 Air test of entire (VI to sewer) 3" carrier pipe passes. End pressure 25 psi Document Vault 2 pipe inverts.

12" Protective casing at 89-17(1) will be installed friday (3/5/93) by CH. Remind CH that the pea gravel and drain holes have yet to be installed in 93-01(1), 93-02(1) & 93-03(1).

1330 offsite

Signed: David Weber

Page 1/1

TO: File / B. Smith

NO. 77

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FIELD REPORT

JOB NO. 923-9055
DATE 3/12/93 TIME IN TIME OUT
PROJECT TDS CCA OFFSITE
WEATHER Sun - 5°F
LOCATION WHEATFIELD
PRESENT AT SITE DCW - CDM
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS

1100 C. Muth and I install data loggers in wells 93-02(1) and 89-17(1)

89-17(1)
Depth of Transducer (BTOR) 15.0'
Water level (BTOR) - 5.55
9.45

Transducer reading (9:07 AM) 9.32

Calibration Δ = 9.45 - 9.32 = (0.13')

93-02(1)
Depth of transducer (BTOR 25.0'
Water level (BTOR) - 9.54
15.46

Transducer reading (9:32 AM) 15.42

Calibration Δ = 15.46 - 15.42 = (0.04')

Transducers set for 1 HR average. Data begins to write over old data after 134 days

Signed: David W Doh

Page 1/2

TO: File / B. Smith

NO. 78

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FIELD REPOR.

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEAT FIELD
CLIENT TDS
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/12/93 TIME IN TIME OUT
WEATHER Sun 50°F
PRESENT AT SITE Dew - COM

10 00 Wendel personell (J. Raven + S. Haney) accompany C Muth + I to gate 3 at Bell plant to inspect remote monitoring system.

Remote monitoring panel at gaurd desk is present but not mounted or connected.

Computer, printer, modem and uninterruptable power supply present in J. Perić's office Modem phone line is not connected and it is not clear if the proper software has been installed. We get assurances from Weydman (electric) and Burnham (electronic controls) that all will be up & running before the 900 AM start up time March 15, 1993.

CH continues to dry pipe interiors.

Signed: Daniel Welsh

TO: File / B. Smith

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NO. 78

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/5/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW (GAI)

830 On site - access road off Walmore road blocked by snow. Drive to Bell plant to drop of package from S. Wozik (GAI) to J. Devic. Weydman (Electric) was at plant installing alarm hardware. Wendel was inspecting the installation.

900 Burnham arrives at plant to complete software installation.

930 J. Norton (CH), Stu Haney (Wendel), John Richter (Weydman P. Shultz (Burnham) and I gather at trailer for start-up. T. Riordan (CH) C. Fiekling (CH) and B. Smith are stranded in Boston. J. Devic will come to the site to observe start up.

~~1350~~ 1100 J. Devic and B. Sullivan arrive - look over electrical diagrams. Group inspects vaults 6, 5 and 4. Weydman and Burnham report that there is no "process variable" signal at the communications pad. The transducer leads were reversed, and must be switched around. Power leads to pump EW-6 were routed to heat trace EW-6 mistakenly. This is corrected

Signed: Dave Welk

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TO: File / B. Smith

NO. 79

FIELD REPOR.

JOB NO. 923- 9055
PROJECT TDS COA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/15/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW (GAI)

1345 T. Riordan, G. Fielding, B. Smith and J. Winarski (Be arrive. C. Pitaressi (CH) arrives.

1400 R. Hasley from Niagara Co. Sewer Authority arrives.

Pump in EW-6 started - flow is adjusted down to 7 gpm. All electronics O.K. in vault. Thermal protector shuts down pump after several minutes. The units are rated too low and must be swapped for higher current units in all six motor starters.

Most of group leaves for plant

Weydman replaces motor starter thermal cutouts

1630 Offsite - All pumps set to run tomorrow. Remote monitoring should be up tomorrow AM.

Signed: David Wehr

TO: File / B. Smith

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NO. 79

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS COA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/16/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW

Page 1/1

830 Water levels in all vaults measured. Pumps started. All run O.K. and are set to 7 gpm Electronic level control in EW-1 not funtioning so pump is shut down and unit is pulled for inspection. EW-4 is drawn down quickly so pump rate is reduced to 4.5 gpm to reduce pump cycling rate.

1200 All pumps are shut down as there is still a line or modem fault in the remote monitoring system.

1310 Offsite CH continues to dry containment pipe. Level control in EW-1 is cleaned and re-installed. It now operates correctly

Signed: David Waber

TO: File / B. Smith

NO. 80

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FIELD REPORT

JOB NO. 923-9065
DATE 3/17/93 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER
LOCATION WHEAT FIELD
PRESENT AT SITE DCW - ALG
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

930 On site - all pumps started. Many of the vaults flooded last night because of the wet weather and lack of pumping. Containment pipe wet again - must be re-dried

1100 ABrasso (GAI) on site. Increased flow in EW-1 to aprox. 13 gpm (wide open) to produce more drawdown. Total EW-1 volume 1140 gal.

1120 Increased flow in EW-2 from 7 to 10 gpm to increase drawdown at northern end of pumping field. Total EW-2 volume 1820 gal.

1145 Sample flow at auto sampler port with peristaltic pump. Sample # SU-1

1200 Weydman adjusting heat trace - was slightly off-spec. Wendel ~~Ed~~ inspecting.

Signed: David Welch

TO: File / B. Smith

NO. 81

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS COA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/17/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW ALG

1400 ALG and I go to location of remote monitoring terminal near J. Davis office. R. Burnham and P. Shultz are there to explain system to us and J. Davis - B. Sullivan. The remote system is operating, all components except leak detection cable and alarm bell at the gaurd desk connected. There are some data transmission error flags - probably due to the temporary phone line being used.

CH is called and told to increase the flow in EW-2 wide open. We watch the increase in flow on screen from approx 10 gpm to 13 gpm

1450 ALG and I take a second sample at the auto-sampler port - Sample # SU-2

1700 Offsite - pumps will remain running - CH continues to dry containment pipe

Signed: David Wohl

TO: File / B. Smith

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NO. 81

FIELD REPORT

JOB NO. 923-9055 | DATE 5/18/93 TIME IN | TIME OUT
PROJECT TDS CQA OFFSITE | WEATHER
LOCATION WHEATFIELD | PRESENT AT SITE DCW
CLIENT
OWNER | Page 1/2
CONTRACTOR CLEAN HARBORS

930 Onsite.

955 EW-3 opened wide to approx 11 gpm

1000 EW-5 opened to 10 gpm (from 7). Southern 7" pipe leaking from annulus into vault. J. Horton says it is water draining from flooded pipes. I will monitor this.

1005 EW-6 opened wide to approx 13 gpm. Total flow approx. 63 gpm for system.

All heat trace inspected - O.K. Containment pipe inspected - there is room for a sealing boot between the 3" and 7" pipes in the vaults.

Surface water noted leaking into vaults (where halves join) in EW-1, EW-2 EW-3 and EW-6. Tell CH these must be sealed. They kn

Vault 6 insulation complete.

Signed: David Wh

TO: File / B. Smith

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NO. 82

FIELD REPORT

JOB NO. 923-9055
DATE 3/18/93 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER
LOCATION WHEAT FIELD
PRESENT AT SITE DCW
CLIENT
OWNER
Page 2/2
CONTRACTOR CLEAN HARBORS (CH)

1200 Measured water level in MW 93-03(1)

Note! a kerosene heater was found in Vault 1. I told CH to remove it due to the potential for contamination.

Return air cylinder to welding shop.

1540 Measure water levels in 93-01(1), 87-19(1) and 89-03(1)

16:06 Increased flow in EW-4 from 3.5 gpm to 5.0 gpm. Total Flow approx 66 gpm.

16:10 Offsite - system running well.

Signed: David Welch

TO: File / B. Smith

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NO. 82

FIELD REPORT

JOB NO. 923 9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/19/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW

Page 1/1

1330 On site to measure water levels.
Vaults 6 through 4 insulation complete.
CH drying containment pipe. J. Norton
indicates farmer will block his access
road 3/29/93 - we must make arrangement
for sampling.

Measure water levels in the extraction
wells and ten monitoring wells.

1630 Offsite

Signed: David Wilson

TO: File / B. Smith

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NO. 83

FIELD REPORT

JOB NO. 923 - 9055
DATE 3/22/93 TIME IN TIME OUT
PROJECT TDS COA OFFSITE
WEATHER
LOCATION WHEATFIELD
PRESENT AT SITE DCW (GAI)
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

Page 1/1

11:45 On site. B. Murphy (CH) in charge of demobilizing site - the process is starting today. Talked to T Riordan (CH) about getting his sub to put a total flow volume display on the communication pad panel. He will look into it. GAI is looking into sealing boot options for the carrier / containment pipe annulus.

Surface water is still leaking into vault 3 at the seam over the junction boxes. Told CH

Weydman (electric) repaired EW-5 (which shut down approx. 8:00 this AM) by replacing the thermal protection unit with one having a higher rating (5 amp instead of 4.5). Pump manufacturer indicates this is in spec.

Leak detection cable installation postponed until Friday

14:30 FLI (lab) arrives to sample flow. Sample labled as "Sewer Discharge". This represents the first of the weekly samples. Total flow at the time of sampling is 475802 gallons.

15:30 Off site

Signed: [signature]

TO: File / B. Smith

NO. 84

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FIELD REPORT

JOB NO. 923-9055
PROJECT JDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/23/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW (GAI)

1300 On site. Talked to J. Norton about CH's activities

1320 Ran a bailer down the stilling well of EW-1 to check for possible sediment build-up in the well. The water came up clear. Pump running at 12.9 gpm Water level in vault up to lip of casing. Was several inches higher this morning. Record high water table is keeping the bottom of the cone of depression above the vault floor.

Surface water from melting snow rose above the manhole cover at EW-2 and flooded the vault to the lip on the casing (≈ 2" deep). CH attempting to dry out the vault, demobilize.

13:50 Drive to remote monitoring station at Bell plant. Met with J Devic to discuss odd drop in flow at EW-1 and EW-2 when EW-5 shut down yesterday. Observe that when EW-5 shut down at 8:15, 3/22/93, both EW-1 and EW-2 simultaneously dropped in flow by several gpm. EW-5 re-start at 13:00 did not affect them. EW-1 and EW-2 flow were restored to previous rates by shutting down the pumps for a moment and re-starting.

Signed: Daniel Welch

TO: File / B. Smith

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NO. 85

FIELD REPORT

JOB NO. 923-9055
DATE 3/23/93 TIME IN TIME OUT
PROJECT TDS CQA OFFSITE
WEATHER
LOCATION WHEATFIELD
PRESENT AT SITE DCW
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

Observe on combined flow rate and well level screen for all wells that as pump in EW-4 cycles on and off, the flow in the other wells (except EW-1) slightly falls and rises, respectively. This is as expected.

See Tina Voulgaris or Joe Winarski for key to remote terminal room.

Suspect flow limiters are responsible for the pressure variations in EW-1, EW-2 and EW-5, though this may not be a malfunction. Will contact limiter manufacturer to clarify the situation.

15:30 Offsite

Signed: Dave Welch

TO: File / B Smith

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NO. 85

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/24/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE SDCW

15:20 On site - take water levels in five monitoring wells and discuss with J. Norton (CH) the problem of water flooding in EW-1. I recommend a sump pump to move water from vault EW-1 to the stilling well in EW-2, where the water level is several feet lower. The water in the vault is approx. 8" deep. The creek ≈ 90 Ft to the north of EW-1 is almost at bank full discharge.

The insulating of vault 1 will be postponed due to the rising water.

Note that pea gravel and drain holes have not yet been installed in 93-01(1), 93-02(1) and 93-03

Tell CH to separate power and transducer cables in vaults as well as in well.

Signed: David Wolf

TO: File / B. Smith

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NO. 86

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS

DATE 3/26/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW

1000 Onsite - measure water levels in five monitoring wells. Water is several feet deep in EW-1 and EW-2

1035 EW-4 opened wide (≈ 12 gpm)

1040 EW-5 opened wide (≈ 11 gpm)

Farmer Devantier does not want remote monitoring system cable on his property. I tell J. Devic.

CH sets up to pump from EW-2 into the stilling well of EW-3. The insulation in EW-2 is soaked and will have to be replaced.

1300 CH starts to survey monitoring wells - prepares to pump water From EW-2 to EW-3. Water level in EW-3 564.6

1350 Pumping starts - 4 minutes later water level in EW-3 reaches top of casing lip. Pump is shut down. The water level in EW-2 dropped about 2 inches. Pumping rate is about 50 gpm This is tried once more for about a minute.

Signed: David Welch

TO: File / B. Smith

NO. 87

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS COA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/26/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE SCW

EW-3 is pumping about 10.1 gpm. Stopping and restarting the pump does not change the flow rate.

1400 J. Davis arrives with a 2-inch ball valve to reduce the flow to a rate that can be maintained continually. Water flow from EW-2 to EW-3 through the pipe annulus increased from zero early this morning to approx. 1 gpm. The EW-2 to EW-3 pumping is abandoned.

Surface water observed rising above level of EW-1 manhole cover. A pump is positioned to remove it.

CH will have someone on site 24 hours / day over this weekend to monitor water levels and man the pumps when needed.

The new extraction well pumps are to arrive Monday 3/29. In order to install the pumps, CH will use a large gas-powered pump with flow meter to lower the vault water levels - pumping directly into the sewer

Signed: Dave Welch

TO: File / B. Smith

NO. 87

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/29/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW

8:45 Deliver photo book to J. Devic at Bell plant.

9:00 Go to site. Flow / level data faxed to us by J. Devic at 7:30 this morning indicates that the pump in EW-1 is not running, and has not been since Friday evening. I confirm that the pump is inoperative. All panel indicators are lit, however. High water mark in vault EW-1 indicates that the level of water in the vault was approx. 5" above the bottom of the main control panel. J Horton (CH) confirms that this level was reached Friday evening (the 26th). A submersible pump with flow meter was placed in the vault at 8:05 3/27/93. It pumped at 28 gpm through a hose directly into the nearest sewer manhole. The water level has decreased from a high of 32 IN deep Friday to 24 IN deep this morning.

10:45 Talked with A. Grasso. Because EW-1 has been pumped at 28 gpm for more than 48 hours and the water level is still 24 IN above the vault floor, placing the planned 32 gpm Grundfos pump in EW-1 will probably not produce the desired drawdown. Decision is made

Signed: David Wick

TO: File / B. Smith

NO. 88

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FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEAT FIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/29/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW

to pull the pump in EW-1 and plug the casing. The 3½ gpm pump will be placed in EW-2 tomorrow.

11:15 Offsite

13:30 Onsite at 6683 Walmore Rd to decommission wells 89-11(1) and 89-20(3). Driller Mark Seiler from Advanced Drilling Investigations (ADI)

13:50 Drillers overdrill 2" casing with a 3" coring bit on shallow (89-11(1)) well. Rig is a mobile drill B-57. Drillers are using recirculated potable water as drilling fluid. I remind drillers not to wear yellow tyvek - that only blue or grey is acceptable.

14:30 J. Horton (CH) stops by. Thermal protector tripped on EW-1 - this is the reason it quit Friday the 26th. CH reset the protector this morning. Water is being removed from EW-1 by two pumps (in well and in vault) at a combined rate of 40 gpm, yet the water has only dropped from 24" to 2" inches deep in the last hour

Signed: Dirk Wick

TO: File / B. Smith

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NO. 88

FIELD REPORT

JOB NO. 923- 9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/29/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW

15:30 3" overdrilling halts at 25 FT BGS as drill cuttings contain metal bits. Attempt to pull the 2" casing before it is cut through.

1600 The original well bore is not concentric with the surface casing (which resisted removal), thus the bit did not follow the 2" casing down but rather cut through it. The top 9 FT of the riser was cut off by the bit and was brought to the surface. The surface casing was removed and an attempt was made to center the 3" bit over the cut-off top of the 2" bit. The grout prevents this. Will try to auger through the grout tomorrow

1700 Offsite

Signed: David Wilson

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TO: File / B. Smith

NO. 88

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS COA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/30/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW

830 Onsite at 6683 Walmore to decommission well 89-11(1)

6¼" ID augers are advanced to bedrock (approx 16 FT BGS). As each flight is advanced, the inside of the auger was checked to see that the 2" casing was contained inside.

10:30 With the augers still in the ground, the 3" coring bit was placed over the twisted top of the 2" casing. 3" overdrilling proceeds.

11:25 3" overdrilling complete at 32.5 FT BGS. All well materials are removed.

12:45 55 gal of bentonite slurry was placed in well bore to surface. Well area cleared of equipment

13:30 As augers are removed hole is grouted to within 2.5 FT of surface. (50 gal of cement / bentonite grout mix used). Drillers set up on well 89-20(3), decon rig. Offsite 15:3

Signed: David Wahl

TO: File / B. Smith

NO. 89

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FIELD REPORT

JOB NO. 923-9055.1A
PROJECT TDS / off-site CQA / NY
LOCATION Wheatfield
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

DATE 3/30/93 TIME IN 8:00 TIME OUT 5:00
WEATHER Clear
PRESENT AT SITE
Golder Associates - C. Muth
Clean Harbors, Weydmon Electrical
~~Nothnagle Drilling~~ Buffalo Drilling

8:30 on site

Clean Harbors pumping water from Vault 1 to the sewer with a trash pump.
Removed submersable pump from vault 2 and replaced it with a 30 gpm pump.

Electrician rewired pump and restarted it. Pump operating at 28 gpm, reduced flow to 26 gpm untill the flow meter can be recalibrated.

Removed submersable pump from Vault 1 and plugged off the well head.

5:00 off site

* Drillers Dropped a 2 foot wrench down the well in Vault 1. Didnt have a magnet or any hooks to retrieve the wrench with. Buffalo Drilling says they will return and retrieve the wrench when the water level recedes

gned: Chris Muth

TO: File / Brian Smith

NO. 89

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210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS COA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 3/31/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW / KFN (GA

8:30 Offsite system. K. Nossavage and I download data logger TDS-2 at 93-02(1). Notice that when contractor placed pea gravel 3/27/93 they lowered the transducer cable 2.7". Water levels reported by the datalogger with be 2.7" too deep from the morning of 3/27/93 until 9:06 this morning when the transducer is correctly repositioned.

9:20 Farmer Devantier places "No Tresspassing" sign across access road off Walmore and curses at K. Nossavage for being on his property when, in fact, we had not been on his property at any time that day.

9:40 Download datalogger TDS-2 at MW 89-17(1)

Talk with J. Norton (CH). Observe cable contractor installing remote monitoring system cable (permanent). Their trucks had to leave the field via the access road. The "no tresspassing sign was removed and replaced. The farmer was not present.

Signed: Dave Welch

TO: File / B. Smith

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

NO. 90

FIELD REPORT

JOB NO. 923-9055 | DATE 3/31/93 TIME IN | TIME OUT
PROJECT TDS CQA OFFSITE | WEATHER
LOCATION WHEAT FIELD | PRESENT AT SITE DCW / KFN
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS

J. Norton is the only CH representative on site. He is monitoring surface water conditions and cleaning up the site.

10:30 Check on progress of MW 89-20(3) decommissioning. Drillers in yellow Tyvek again. GAI rep (Aitken on rig has already warned them about this. I leave to report this to J. Norton CC

10:55 Meet with J. Norton - Building 70 at Bell plant. Tell him about Tyvek problems, he will talk to the drillers. I donate several blue Tyveks to CH to fix the immediate problem. J Norton states P. Shultz from Burnham controls is calibrating the flow meter in EW-2 (because of the new pump). At 800 this AM the calibrated flowmeter in vault EW-2 read 25 gpm. Weydman will be onsite 4/1/93 to permanently attach the cable junction box to the communications pad.

13:20 Check on 89-20(3) and with A. Taney. They are having some problems and I suggest some solutions (see his field reports).

Signed: David Welch

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

TO: File / B. Smith

NO. 90

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS(CH)

DATE 3/31/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE

Page 3/4

14:55 At remote monitoring station. P. Shultz is changing the software variables to accomodate the new flowrate at EW-2 Note that as pump in EW-4 turns on and off, the flow rate in EW-2 decreases and increases by approx. 1 gpm respectively (25.2 to 26.2 gpm).

15:10 Return to MW 89-20(3). All attempts to remove well casings have failed (see A. Taney's notes). Drillers quit for the day while we consider alternatives and try to contact Bell representatives.

15:30 Offsite

Signed: David Wohn

TO: File / B. Smith

NO. 70

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

FIELD REPORT

JOB NO. 923-9055
DATE 3/3/93 TIME IN 8:20 AM TIME OUT 4:00
PROJECT TDS / CQM - offsite
WEATHER cloudy and cold
LOCATION Wheatfield NY Bell
PRESENT AT SITE Al Tawes
CLIENT
ADE Drillers & Mark & Dan
OWNER
CONTRACTOR Clean Harbour

Page 4/4

Arrived at the drilling site at 8:20 Am. The Drillers were already there setting up. I told them they needed to wear blue Tyvek's. They said they did not have any so they were Yellow Tyvek's.

Around 9:00 Am, they started coring w/ a 3" diamond bit the process was slow. At 9:45 Am, the drill rig broke down. The drillers repaired the problem (broken Tool) and started drilling again at 11:00 Am.

At 11:15 Am they checked the diamond bit and saw that it was damaged from the S.S. pipe. This is when they decided to use a Tri cone bit. The idea was to grind up the 2" S.S. pipe At 12:00 pm they started grinding. This was unsuccessful, the tri cone was damaged.

After Lunch, they tried using a 300 lb hammer, to pound a 3" pipe through the grout. This was unsuccessful. I then spoke w/ Dave (1:15 pm) and we agreed that they should try to core around the 4" ϕ casing into the rock 35 Ft. This would create a good seal and allow them to pull the 2" ϕ 4" pipes and fill the hole with slurry. Around 2:54 pm the 10¼" core bit became stuck. This was thought to be caused by couplings on the 4" casing. The drillers were able to remove the bit and rod. The drillers tried to pull the 8" casing out of the ground. They were unsuccessful. At 4:00 pm they quit for the day.

gned: Alfred A. Tawes

TO: File / B. Smith

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

NO. 90

FIELD REPORT

JOB NO. 923-9055
DATE 4/1/93 TIME IN TIME OUT
PROJECT TDS COA OFFSITE
WEATHER
LOCATION WHEAT FIELD
PRESENT AT SITE DCJ
CLIENT
OWNER
Page 1/2
CONTRACTOR CLEAN HARBORS (CH)

10:00 Onsite 6683 Walmore Rd. at MW 89-20(3) after getting client approval to cut off casing below ground surface and grout the 2" casing. Drillers are moving cuttings barrels from 89-11(1) to Building 70 and moving the rig off the hole as I arrive.

12:40 Excavation of pit around 89-20(3) starts. OVM readings zero as pit is excavated.

13:15 The 8" casing is cut off 4 FT BGS, then slit lengthwise to free it from the 4" casing. Rig is moved to Bell to give more ~~more~~ room in driveway to homeowner.

14:00 The 4" casing is cut off 4 FT BGS. The 2" casing is visible just below the 4 FT BGS level, but was crushed by the tricone bit and will not pass the tremie pipe. Efforts are made to pound / pry it open.

14:45 The excavation is shored up with plywood, as the sides are beginning to sluff. A trash pump is used to remove surface water from

Signed: David Weber

TO: File / B. Smith

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

NO. 91

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CQA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 4/1/93 TIME IN TIME OUT
WEATHER
PRESENT AT SITE DCW

the excavation.

16:00 The 2" casing is now open, but some grout chips caught inside still prevent insertion of the tremie tube. ADI will clear them tomorrow using the split spoon rods and hammer.

16:30 Offsite

Signed: David Welch

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

TO: File / B Smith

NO. 91

FIELD REPORT

JOB NO. 923-9055
DATE 4/2/93 TIME IN TIME OUT
PROJECT TDS CoA OFFSITE
WEATHER
LOCATION WHEATFIELD
PRESENT AT SITE DCW
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

9:00 On site 6683 Walmore Rd. J. Norton (CH) reports that the cable company's junction box has been O.K.ed to mount on the communications pad at the offsite system. The drillers on the decommissioning job have removed the safety barriers and are moving the rig back to the well location so that they may use the spoon hammer to clear the 2" riser

9:45 Spoon hammering begins.

10:30 Two-inch riser cleared to 47 FT BGS. Tremie tube inserted to nearly 50 FT BGS and bentonite slurry is pumped into the riser. A little bentonite is splashed onto homeowner's boat. It was immediately washed off with Alconox detergent.

11:00 Two-inch riser is sealed. Cement bentonite grout placed 6" deep over top of cut-off casings and over excavation bottom. Drillers break down rig and move to Bell plant to decon.

12:00 Offsite

Signed: Dave Wick

TO: File / B. Smith

NO. 92

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CAA OFFSITE
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 4/8/93 TIME IN TIME OUT
WEATHER Sunny 50°F
PRESENT AT SITE DCW

13:00 On site of well decommissionings 89-11(1) and 89-20(3). Inspect topsoil and seed placed over well areas and spot rutted by rig. Surface is smooth. Looks O.K.

[redacted] Both property owner where wells existed and owner of access drive (6683 Walmore) seem satisfied with the job when I asked their opinion subsequent to the job's completion.

13:30 Offsite

Signed: David Welch

TO: File / B. Smith

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

NO. 93

FIELD REPORT

JOB NO. TDS CQA OFFSITE
PROJECT 923-9065
LOCATION WHEATFIELD
CLIENT
OWNER
CONTRACTOR CLEAN HARBORS (CH)

DATE 4/14/93 TIME IN TIME OUT
WEATHER Sun - 50°F
PRESENT AT SITE D. Wehn A. Grasso

10:00 At Bell Offsite extraction system with A. Grasso, J. Devic, Dan Gailor (CH) and ? Pitcher from leak detector company. We bring a sample of the annulus pipe sealing boot and discuss its installation with CH and the leak detector cable rep. No problems envisioned in installing it.

10:30 Open vault 6. Totalizer shows 2,742,709 gallons of flow since start-up March 15. Note vault is full of water to top of casing lip. Not sure of source.

Open vaults 5, 4 and 1. Vaults 5 and 4 are full of water to the top of the casing lip. Not sure of the leak source in vault 4, but 5 is leaking from the southern carrier / containment pipe annulus.

Vault 1 has about an inch of water in it - no obvious source.

CH agrees it must fix the leaks.

12:00 Offsite

Signed: Daniel Wehn

TO: File / B. Smith

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

NO. 94

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS/BAT OFF-SITE CQA
LOCATION BAT, WHEATFIELD, NY
CLIENT TDS
OWNER TDS
CONTRACTOR

DATE 6/14/93 TIME IN 11:30 TIME OUT 14:00
WEATHER SUNNY, 75°F
PRESENT AT SITE SHELDON NOZIK GAI
ANTHONY GRASSO GAI
WILLIAM JOHNSON FLI

11:30 Meet Bill Johnson from FLI at the Off-Site system location. Objective is to inspect each of the 6 vaults to determine whether standing water is present and whether ground water can be observed leaking into the vaults.

Begin with EW-6. No "star bolts" present on manhole. Bill J. opens manhole and monitors air quality with PID and O2 LEL mud and debris observed as well as about 0.5-1" of water in vault.

Continue to EW-5 through EW-1. Manholes fastened with 7/8" hexagonal bolts instead of "Star bolts"

Site was recently graded but not sufficient to promote drainage away from manholes. No drainage ditch located between EW-3 and EW-1.

Standing water observed in every vault. condensation also present on liners. Insulation not installed exactly as requested in design modifications (no gap existing near walls to allow inspection of desiccant.

2:00 off site return to office.

gned: Shelly Nozik

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

TO: Brian Smith - TDS
file

NO. 95

FIELD REPORT

JOB NO. 923-9055
PROJECT TDS CGA OFF-SITE
LOCATION
CLIENT
OWNER
CONTRACTOR

DATE 12/16/93 TIME IN TIME OUT
WEATHER SUN 30's
PRESENT AT SITE DCW

8:30 Arrive off-site area. Clean Harbors (CH) has installed catch basins under containment pipes in vaults EW-2 through EW-6. Sample port hanger missing in EW-2 and one pipe support roller missing in EW-6. Existing insulation has been removed prior to replacement. CH has removed the leak detection cable between all vaults and is pulling new wire to connect the new float switches (which have been installed).

Signed: David Wake

Golder Associates
210 John Glenn Drive, Suite 1
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Telephone (716) 691-1156
Fax (716) 691-5109

TO: File
Brian Smith - TDS

NO. 96

FIELD REPORT

JOB NO. 923-9055
DATE 12/29/93 TIME IN TIME OUT
PROJECT TDS/CQA OFF-SITE/NY
WEATHER SUN/SNOW 20's
LOCATION OFF-SITE
PRESENT AT SITE ALGrasso
CLIENT TDS
OWNER TDS
CONTRACTOR Clean Harbors

9:30 On-site, Clean Harbors installing leak detection system and re-installing insulation in vaults. Leak detection system is scheduled to be completed and tested today

11:00 Having problems with communications - alarm status for wells indicates high alarm, and in one case both high and low alarm signals at same time. Also, alarm at Gate 3 guard desk is not operating correctly.

2:00 Clean Harbors said they will work on adjusting system and that testing of system will have to be delayed.

gned: Anthony L Grasso

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

TO: File
Brian Smith TDS

NO. 97

APPENDIX B

CERTIFICATION LETTERS

Clean Harbors®
ENVIRONMENTAL SERVICES, INC.
1200 CROWN COLONY DRIVE, P.O. BOX 9137 • QUINCY, MA 02269-9137
(617) 849-1800

Textron Defense Systems
201 Lowell Street
Wilmington, MA 01887

April 12, 1994

ATT: Brian Smith

RE: Bell Textron Aerospace Offsite Extraction
Well System, Niagara Falls, New York

Dear Brian,

Clean Harbors Environmental Services, Inc. confirms that all work for the above referenced project has been installed in accordance with the plans and specifications.

Sincerely,

Gordon Fielding Jr.
Sr. Project Manager

cc: Anthony Grasso
John Devic
Tim Riordan

Weydman electric inc.

ELECTRICAL CONTRACTORS
Industrial • Commercial • Institutional

November 5, 1993

Mr. Gordon Fielding
Clean Harbors
325 Wood Road
Braintree, MA 02184

Re: Bell Aerospace Textron, Wheatfield, NY
Installation of Electrical Equipment & Monitoring System

Dear Mr. Fielding,

We are confirming that all work for the above named project has been installed in accordance with the plans and specifications.

Very truly yours,

WEYDMAN ELECTRIC, INC.

George C. Weydman III
President

BUFFALO DRILLING COMPANY
INC.
10440 MAIN STREET
CLARENCE, NEW YORK
14031
(716) 759-7821
FAX (716) 759-7823

January 13, 1994

Clean Harbors
325 Wood Road
Braintree, MA 02184

ATTN: Mr. Gordon Fielding

RE: Installation of Monitoring System, Bell Aerospace Textron, Wheatfield, New York

Dear Mr. Fielding:

We are confirming that all work for the above referenced project has been installed in accordance with the plans and specifications.

Very truly yours,
BUFFALO DRILLING COMPANY, INC.

James S. Barron, P.E.
President

APPENDIX C

WENDEL ENGINEERS, P.C.
ELECTRICAL INSPECTION REPORT

CQA CERTIFICATION REPORT OF ELECTRICAL INSTALLATION

TABLE OF CONTENTS

CQA Certification Letter

Introduction

Scope of Field Observation

Description of System Operation

References

Attachments

I Field Reports

II Conformed Drawings

WENDEL

SUITE 100
95 JOHN MUIR DRIVE
BUFFALO, NEW YORK 14228
716/688-0766 or 625-6867
FAX 716/625-6825

April 20, 1994

Mr. Anthony Grasso, P.G.
Golder Associates, Inc.
210 John Glenn Drive
Suite One
Amherst, NY 14228

SUBJECT: CQA CERTIFICATION OF ELECTRICAL INSTALLATION
FOR THE OFF-SITE GROUND WATER EXTRACTION SYSTEM,
BELL AEROSPACE TEXTRON, WHEATFIELD, NY
WENDEL PROJECT 2847-2/700

Dear Mr. Grasso:

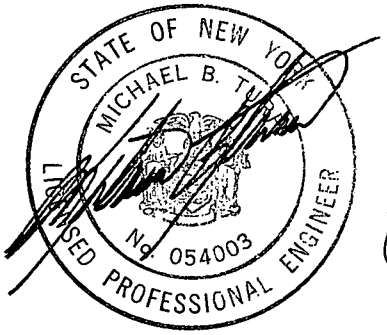
Wendel Engineers, P.C. provided site observation of the electrical installation during construction of the off-site ground water extraction system for Bell Aerospace Textron in Wheatfield, New York. This project encompassed the off-site facilities at the Niagara Mohawk Power Corp. right-of-way south of the plant on the east side of Walmore Road. Our site visits included the CQA monitoring of the installation of the electrical service connection, all conduit, cabling and terminations, the panels for power and control, all electrical devices and equipment and any other miscellaneous materials pertaining to the electrical work on this project. Based on our site observations, Wendel certifies to the best of our knowledge that the electrical installation of this ground water extraction project has been constructed in substantial accordance with the approved contract plans and specifications along with the approved construction design changes.

The certification for the work completed is issued for Wendel under the seal of Michael B. Turri, P.E., Principal of Wendel Engineers, P.C., with New York State License No. 54003.

If you have any questions with regard to the contents of this certification report, please contact the undersigned.

Yours very truly,

WENDEL



Michael B. Turri, P.E.
Principal

Robert J. McNamara, P.E.
Project Manager

RJM:cmt

INTRODUCTION

This document is the Electrical Certification and Inspection Report for the Off-Site Ground Water Extraction Construction Project for Bell Aerospace Textron (B.A.T.). This report pertains to the electrical work performed under the General Construction Contract at the off-site facility.

Wendel Engineers, P.C. was retained as a sub-consultant by Golder Associates Inc. to provide review and comments on the electrical portion of the construction documents, field observation at the site during construction and start-up, and at completion of construction, a set of conformed drawings which have been generated from design drawings with incorporation of contractor field as-built mark-ups and site observation information. The extent of the work performed by the electrical contractor, Weydman Electric Co., was to provide the electrical service, the conduit and cable for the various systems, and the supply and installation of the electrical equipment, including panels, starters, controls, and other materials necessary for completion of fully operational systems as described by the construction specifications and drawings presented in the Off-Site Corrective Measures Implementation Plan (Golder Associates Inc., March 1992) and design modifications and design clarifications submitted by the designer.

SCOPE OF FIELD OBSERVATION

Considering the relative straight forward nature of this project with regard to the electrical installation, the need for a full-time electrical site observer was deemed not to be necessary. Since our CQA inspection would be done on a part-time basis, a review of the installation documents was done to determine the areas or phases of the electrical work which were defined as necessary for Wendel field observers to view. Any other observations not listed below were done on an as-requested basis from Golder Associates.

1. The initial installation of the below grade conduit.
2. All below grade conduit prior to backfill.
3. Each fabricated electrical panel, on-site, prior to installation.
4. The installation of each type of electrical panel, enclosure and device prior to field wiring.
5. The initial pulling of wire/cable into conduits.
6. The installation and cabling for transducer and pump in wells.
7. The completed installation and wiring of each electrical panel and device.
8. The installation of the leak detection system.

The above items were observed during the construction period and reported as per the field observation sheets shown in Attachment 1. The electrical work was constructed in substantial accordance with the approved contract documents. The approved construction changes are incorporated in the conformed drawings included in Attachment 2, consisting of Drawing Sheets E1, E2, and E3 as updated by Wendel and Drawings Series B-1525 (14 sheets) as provided by Burnham Process Control Services Inc. and Contractor Certifications are also included in Appendix B of this report. Final Testing of the Off-Site System was performed by the general contractor (Clean Harbors) in March 1994 under the direction of B.A.T. with the acceptance of the test results by B.A.T.

DESCRIPTION OF SYSTEM OPERATION

This system from a control standpoint consists of the local operation of six (6) submersible well pumps at vaults off-site. The operation is monitored using an RTU (off-site communication unit) via a phone leased line to an on-site monitoring computer. This computer monitors process data such as flows and level in real time for data logging, trending, and alarming. A common alarm output from the computer is transmitted to an on-site guard shack. Well EW-1 was plugged after system start up. (See the main text of this report for details regarding this.)

DETAILS OF OPERATION

At each extraction well vault control panel, the well level (hydraulic depth) is displayed and the level indicating controller controls the operation of the well pump. There are operator set points which determine the start and stop points for the pump as well as the high and low level alarms. Initial set points established for the Off-Site System are presented in table 3 of this report.

At the well vault panel, the pump can also be controlled by an Automatic/Off/Hand selector switch. Also, at each well vault panel, the flow rate is displayed and totalized. The last vault, Panel EW-6, has the total flow rate and total discharge flow.

The RTU (off-site communication unit) transmits the following data in real time continuously to the on-site computer monitor:

Analog:
Pump flow rate (5-14 GPM) wells EW-3 through EW-6
Pump flow rate (18-32 GPM) well EW-2
Total flow rate (0-100 GPM) at EW-6
Well level depth from datum (0-34.5 ft.)

Discrete alarms:
Leak Detect #1 Circuit N.C. and #2 Circuit N.C.
Pump Overload N.C., each well
Well Low Water Alarm, each well
Well High Water Alarm, each well

On-site, the computer continuously monitors the above data in real time. This information is displayed in standard Molygraphics template formats for ease of operator use. Flows and levels are displayed in real time bar-graphs, trend lines and data logs, as well as a system flow totalizer on screen. Alarms are handled in a standard format with time and date stamp. Molygraphics allows the operator to print on demand, on a time basis, or on alarm initiation. Alarms are printed out automatically. Also, the totalized flow for the Off-Site System is calculated based on individual pump flow per well and is displayed on the computer monitor.

A common alarm output from the computer is hardwired to the single point alarm panel at the guard shack. An audible buzzer is acknowledged by push-button, and the status is indicated by a pilot light. The individual alarm condition is reported at the Computer Monitor Station.

REFERENCES

Golder Associates Inc., May 1992, "Off-Site Ground Water Extraction System Construction Specifications and Drawing Package" submitted to: Bell Aerospace Textron, 2221 Niagara Falls Blvd., Niagara Falls, New York 14304.

Attachment I

Field Reports

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility
Electrical Certification

FR NO: 1

PROJECT #: 2847-2

CONTRACT #: 923-9055.1B

INSPECTOR: Robert J. McNamara
John J. Rauen

CONTRACTOR: Weydman Electric

SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric

DATE: December 10, 1992

Observations and directives are as follows:

Electrical

Observed installation of 2½" and 1½" conduits in trench between extraction wells #4 and #5. Installation of assembly acceptable.

Submitted by: WENDEL

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility Electrical Certification

FR NO: 2

PROJECT #: 2847-2

CONTRACT #: 923-9055.1B

INSPECTOR: Robert J. McNamara

CONTRACTOR: Weydman Electric

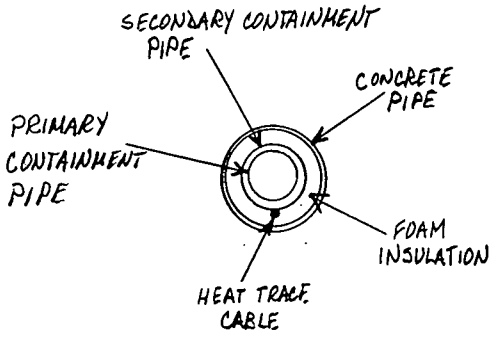
SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric

DATE: January 14, 1993

Observations and directives are as follows:

Electrical

Observed installation of heat trace cable (8 w/ft) for piping in area across drainage or creek crossing. Cable to be pulled into pipe system after installation of pipe by using fish line. Cable to be between secondary containment pipe and outer foam insulation. Will be held against pipe by compression of insulation material within outer concrete shell.



Submitted by: WENDEL

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility
Electrical Certification

FR NO: 3

PROJECT #: 2847-2

CONTRACT #: 923-9055.1B

INSPECTOR: John J. Rauen

CONTRACTOR: Weydman Electric

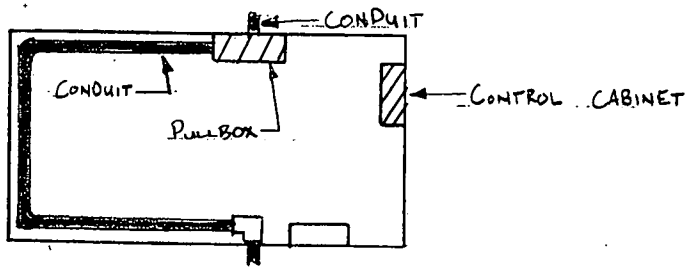
SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric

DATE: January 26, 1993

Observations and directives are as follows:

Electrical

Observed installation of pull rope for wire pulling in conduit. All wires to be pulled in after installation of pull wires. Checked control cabinet box in construction trailer. Box is Stahlin NEMA 4x enclosure UL listed Cat. No. J1210W. Checked panelboard installation. Discussed installation of conduit in manhole as shown on diagram below.



Submitted by: WENDEL

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility Electrical Certification

FR NO: 4

PROJECT #: 2847-2

CONTRACT #: 923-9055.1B

INSPECTOR: John J. Rauen

CONTRACTOR: Weydman Electric

SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric

DATE: February 3, 1993

Observations and directives are as follows:

Electrical

Observed wiring pulling of power cables from vault 5 to 6. 4 — #4, 2 — #2, and 1 — #8 GND with two fish lines were pulled. This corresponds with the drawings. Wires were wrapped with color tape before pulling. Manual pulling was done by using a rope that had been pulled through the conduit. Pull went through without any interference. Electrician stated that conduit did have some water in it but that the conduit was blown clean and swabbed. Wires were observed when they came out of vault 6, no stress or water was seen on end of wires. Electrician will commence pulling rest of power wire, observation will be made on completion of pulls. (Southwire brand was used, 600V THHN black copper.)

Submitted by: WENDEL

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility Electrical Certification **FR NO:** 5

PROJECT #: 2847-2 **CONTRACT #:** 923-9055.1B

INSPECTOR: John J. Rauen **CONTRACTOR:** Weydman Electric

SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric **DATE:** February 18, 1993

Observations and directives are as follows:

Electrical

At Weydman Electric Warehouse, Young St., Tonawanda.
Observed extraction Well Panels EW-1 through EW-6 and Communications Panel upon delivery at Weydman Electric. The EW-1 through EW-6 panels were all similar, they consisted of NEMA 4 Hoffman enclosures with hand-off-auto selector switch, well level indicator/controller and pump flow rate indicator mounted on panel door. Panel is labeled "Vault EW1 through EW-6 Control Panel". Pump flow rate indicator is Signet 9010. Well level indicator/controller is Powers. Starter is NEMA Size 00 Allen Bradley with overload relay and Allen Bradley NM 700 latch relay. Heater is mounted inside control panel and each panel has a 20A duplex receptacle in it. The Communications Panel consisted of 2 Raychem Tracetek leak detectors model #TTBFA, a 32 channel remote transmitting unit manufactured by Molytek, modem mounted on enclosure door is Alliance V.32, 24V power supply is Powerone 24V D.C. at 1.5A, 5V power supply Powerone 5V D.C. at 2.4A, heater, wiremold; surge protector and fuses for transformer protection. All units are mounted in a NEMA 4 stainless steel enclosure. Also inspected was AST 486sx/25 computer, Panasonic KX-P1180I printer, 14" SVGA AST color monitor, 101 AST keyboard, guard shack panel, computer modem and Emerson Model 30 UPS Accupower power supply.

Submitted by: WENDEL

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility Electrical Certification **FR NO: 6**

PROJECT #: 2847-2 **CONTRACT #:** 923-9055.1B

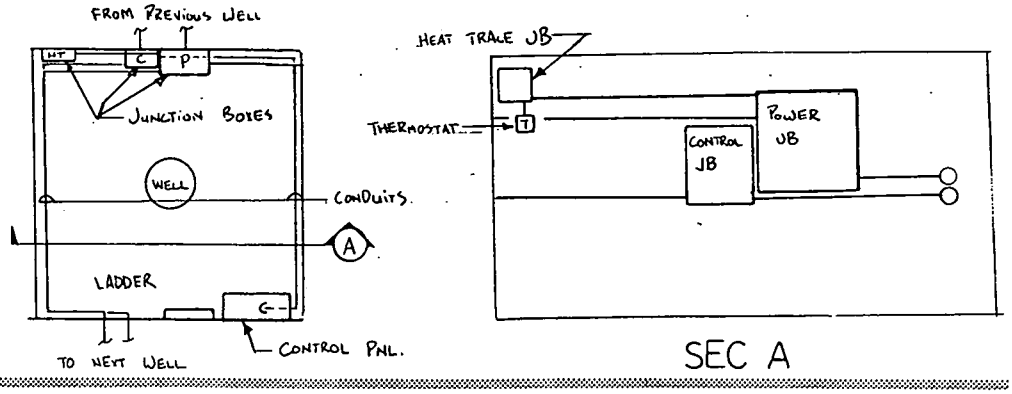
INSPECTOR: John J. Rauen **CONTRACTOR:** Weydman Electric

SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric **DATE:** February 25, 1993

Observations and directives are as follows:

Electrical

Observed control panels 1-6 which were installed in the wells. They were mounted next to ladders (see diagram). They were secured with sinks and bolts. 3 holes were put in the bottom of each control panel for motor power cable, flow, and level indicators. Terminations were made and observed in well #5, 240V connections for motor supply, 120V connection for control power, and telephone cable was terminated. Motor was installed in well #2, but no connections were made. GFI receptacles were installed in each well above power junction boxes on wall opposite ladder. 5-6/10 amp fuses were installed in each control panel. Heat trace cable was installed in 4 of the 6 wells. Heat trace was attached to the pipes with plastic tie straps. A barrier of foil was placed over the heat race cable. The heat trace was not yet terminated. Heat trace is Chemelex. Thermostat is in a NEMA 4x enclosure, mounted under heat trace junction box on opposite wall from ladder. The communications panel is mounted behind the power panel and meter. All conduits are connected, wires are not yet terminated. See diagram for junction box and equipment layouts in wells, typical for all.



Submitted by: WENDEL

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility Electrical Certification **FR NO:** 7

PROJECT #: 2847-2 **CONTRACT #:** 923-9055.1B

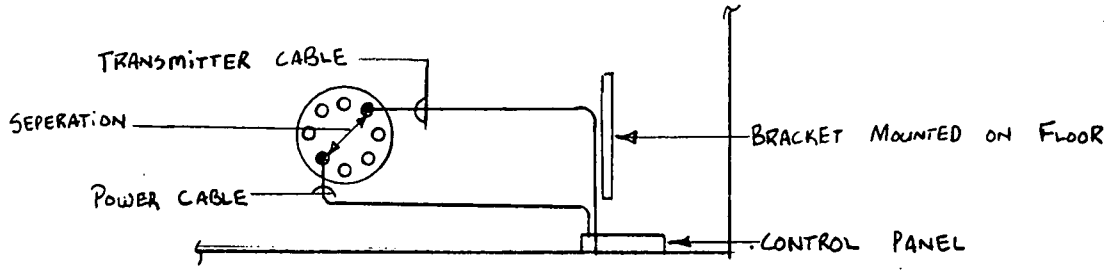
INSPECTOR: John J. Rauen **CONTRACTOR:** Weydman Electric

SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric **DATE:** March 2, 1993

Observations and directives are as follows:

Electrical

Observed final terminations in control panels. Cables for level and flow transmitters were installed, along with pump power cable. Separation between power wires and transmitter wires was maintained by inserting wire through holes on opposite sides of plate. Cables were attached to metal bracket and run up wall to bracket. (See diagram below)



Splices were made in power junction box with approved method, 1'-2' of slack was left in each box and all splices were properly taped. No splices were made in control junction boxes. Heat tracing was complete except for a small amount of pipe which was not installed yet, extra heat trace wire was coiled in each vault for completion of work. Leak detection cable is not yet installed.

Submitted by: WENDEL

WENDEL

Field Report

PROJECT:	BAT. Off-Site Extraction Facility Electrical Certification	**FR NO:**	8
PROJECT #:	2847-2	**CONTRACT #:**	923-9055.1B
INSPECTOR:	John J. Rauen Stewart C. Haney	**CONTRACTOR:**	Weydman Electric
SUPERINTENDENT/ FOREMAN:	John Richter, Weydman Electric	**DATE:**	March 12, 1993

Observations and directives are as follows:

Electrical

Met with Chris Muth and Dave When of Golder Associates at the off-site well location. The installation was discussed including the fact that the leak detection equipment (cable) has not yet been installed. Wendel and Golder representatives proceeded to the guard shack off of Walmore Road. It was determined that this is not the location of the alarm panel as previously thought. A BELL representative, Red, escorted us to the main guard desk at the main building where the alarm panel was found uninstalled. Red then took us to the location of the on-site computer equipment. An AST computer, keypad and monitor were found to be powered and in operation complete with modem and UPS. The modem however, was not functional. Bob Hobba of Weydman electric was contacted to determine when the installation would be completed. Weydman stated there was 1-2 hours work remaining to complete the installation and that their crew would be on-site at 7:00 a.m. Monday morning to complete installation before the 9:00 a.m. startup.

Submitted by: WENDEL

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility Electrical Certification **FR NO: 9**

PROJECT #: 2847-2 **CONTRACT #:** 923-9055.1B

INSPECTOR: Stewart C. Haney **CONTRACTOR:** Weydman Electric

SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric **DATE:** March 15, 1993

Observations and directives are as follows:

Electrical

(1) Observed the installation of the well status panel at the guard desk of the main building at Bell Aerospace. The status panel was mounted and powered by John Richter of Weydman Electric. The alarm input from the supervisory computer was not connected due to the electricians confusion over which wires to terminate. (2) Due to the weather and the late arrival of out of town Bell and Clean Harbor personnel a considerable delay (approx 2 hours) was encountered before the beginning of start-up. Upon the arrival of all the key personnel from Bell and Clean Harbors testing of the pumps in each vault was performed by Weydman and Burnham (Paul Schultz). (3) Initial observations resulted in the determination that the level signal to the offsite communication enclosure was only functioning correctly for well EW-2. It was determined that the signal wire within the well control panels was reversed. Weydman switched the signal wires at the offsite communication enclosure for wells EW-1,3,4,5 & 6 which corrected the problem. (4) Weydman and Burnham went from well to well bumping motors to determine if they would operate under automatic or manual modes. As a result it was noted that the power for the motors in wells EW-1 and EW-6 were inadvertently supplied from the heat trace circuit breakers while the heat trace was inadvertently fed from the pump power circuit breakers. Nothing was done to rectify the situation but the pumps were energized from the heat trace circuit breakers for testing. (5) Golder Associates (Dave When) noted that the pump casing in wells EW-5 and EW-6 were not supplied grounded by the manufacturer as they were in all other wells. Weydman provided grounds to the casing in Wells EW-5 and EW-6. (6) The control panel strip heater in well EW-1 was found not to work. It was determined that the .5 amp controller fuse was inadvertently installed where the 1.5 amp heater fuse was required. The .5 amp fuse had blown and the heater had not been functioning for some time. The controller which was protected by the 1.5 amp fuse was not operating properly. When the 1.5 amp fuse was moved to supply the panel heater as intended the heater still did not function. A replacement .6 amp fuse, OK'd by Burnham was installed to protect the controller which still did not function properly. (7) A ground jumper was found missing within the well control panel for well EW-3. Weydman added the jumper that was required to the control panel. (8) During a short demonstration of pump EW-6 the control panel thermal overload heaters tripped after approximately 5 minutes of operation. It was determined that the thermal overload heaters in the well control panels were undersized and Weydman was charged with supplying the correct heaters by Tuesday March 16,1993.

Submitted by: WENDEL

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility Electrical Certification

FR NO: 10

PROJECT #: 2847-2

CONTRACT #: 923-9055.1B

INSPECTOR: Stewart C. Haney

CONTRACTOR: Weydman Electric

SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric

DATE: March 16, 1993

Observations and directives are as follows:

Electrical

(1) Weydman installed the correct overload heaters in each of the Well control panels. All of the well pumps were functional except that of Well EW-1 which did not have a functional automatic controller. Pumps were run for longer than 5 minutes each without any overload trip occurrences. (2) The installation of the heat trace around valves was noted to be straight along the longitudinal section of the valve. The designer, Russ Healey of Conserva-Tech indicated that the heat trace should be wrapped around the valve per Chemelex recommendations. Conserva-Tech also indicated that the heat trace should not be operated without insulation or the warranty may be voided. Informed Clean Harbors that the heat trace could not be operated until the insulation is installed in order to ensure warranty coverage. Conversation with Joe Clemente of Cascade control corporation revealed that the heat trace should be fastened to the pipe with glass tape and should be wrapped around the valves. Cascade Control indicated that with plastic pipe aluminum tape acts to disperse heat better and would be preferred but not required.

Submitted by: WENDEL

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility Electrical Certification **FR NO: 11**

PROJECT #: 2847-2 **CONTRACT #:** 923-9055.1B

INSPECTOR: Stewart C. Haney **CONTRACTOR:** Weydman Electric

SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric **DATE:** March 17, 1993

Observations and directives are as follows:

Electrical

(1) Observed the installation of aluminum tape to secure heat trace cable in place against the process piping in wells EW-6 and EW-5 per the manufacturers representatives recommendations. Heat trace cable rerouted at valves to wrap around the valve body instead of taking a straight path across the valve. Reviewed the installation of heat trace in well EW-5 with Golder Associates (Dave When) indicating properties of the installation to verify in the remaining wells.

Submitted by: WENDEL

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility Electrical Certification

FR NO: 12

PROJECT #: 2847-2

CONTRACT #: 923-9055.1B

INSPECTOR: John J. Rauen

CONTRACTOR: Weydman Electric

SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric

DATE: March 23, 1993

Observations and directives are as follows:

Electrical

Went to site to observe heat trace taping. Insulation was installed over the piping in wells #2-6 therefore heat tracing could not be checked. Heat trace in well #1 was still the same, held to pipes with plastic tie straps. Wires for pump power and level were tie strapped together from top of well to control panel. These wires should be separated by fastening either power or level wires to the other side of the steel plate are fastened to.

Submitted by: WENDEL

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility
Electrical Certification

FR NO: 13

PROJECT #: 2847-2

CONTRACT #: 923-9055.1B

INSPECTOR: Stewart C. Haney

CONTRACTOR: Weydman Electric

SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric

DATE: May 18, 1993

Observations and directives are as follows:

Electrical

AM

1. Pulled leak detection cable from vault 1 to vault 2. Some water present. Low read 25 mA, high read 266 mA, final read 266 mA or saturated.
2. Pull from vault 2 to vault 3. Max reading 90, final reading 77mA.
3. Pull from vault 3 to center port cable too short. Appears dry read 14 mA.

PM

1. Pull rope from center port to vault 4 was saturated. Clean Harbors swabbed dry with towels.
2. Pull from vault 4 to vault 5 okay, leak detection cable reading 0 mA.
3. Center port to vault 4 pulled later, final reading 0 mA.
4. Pull from vault 5 to 6 okay, leak detection cable reading 0 mA.

Submitted by: WENDEL

WENDEL

Field Report

PROJECT: BAT. Off-Site Extraction Facility Electrical Certification **FR NO: 14**

PROJECT #: 2847-2 **CONTRACT #:** 923-9055.1B

INSPECTOR: Stewart C. Haney **CONTRACTOR:** Weydman Electric

SUPERINTENDENT/ FOREMAN: John Richter, Weydman Electric **DATE:** May 19, 1993

Observations and directives are as follows:

Electrical

11:30 AM

1. Progress includes leak detection cable in vault 4 and vault 5.
2. Leak detection cable from vault 2 to vault 3 reading 54 mA.

PM

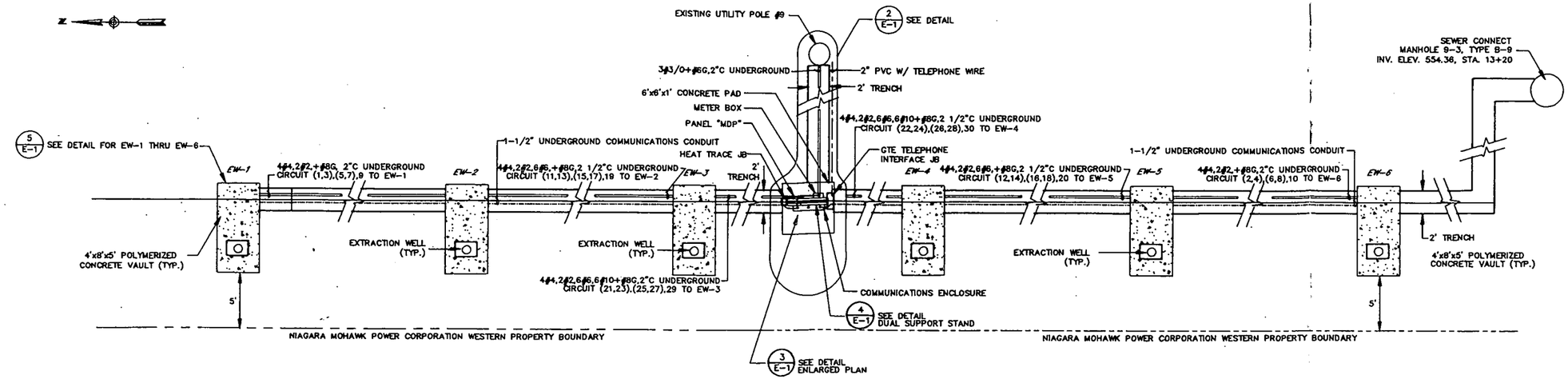
1. Installed leak detection cable on pipe in vaults 1, 2, 3, & 6.
2. Vault 6 to sewer is wet, pull rope and rag are stuck in pipe.
3. Control panel connected to vault 4, vault 5, and vault 6 reads moisture at 518'.
4. Leak detection cable from vault 1 to vault 2 pulled out, rags run through the pipe to dry it out. Leak detection cable pulled back in, final reading 000 mA.
5. Due to thermostat setting, the heat trace was on in every vault. Thermostats were adjusted to turn on heat trace at 40°F.
6. John Devic from Bell briefly stopped by to see how things were progressing and to show NMPC representative location of meter for reading. Bell indicated that the alarm panel at the guard desk is not hooked up. Weydman indicated that this would be the last panel connected.
7. The modem and phone system are connected as Bell is taking readings at the "on-site" computer.
8. Vault 1 is not complete due to mechanical/process problems. The pump is not installed, the control is off, etc.
9. 1' cold leads required at the entrance and exit of each vault are still not installed. Eric Matteson of Burns Cascade will put on connectors for Weydman to install at a later date.
10. Mapping not done yet. Eric Matteson must make another trip.
11. Eric not available now for 1-2 weeks.

Submitted by: WENDEL

Attachment II

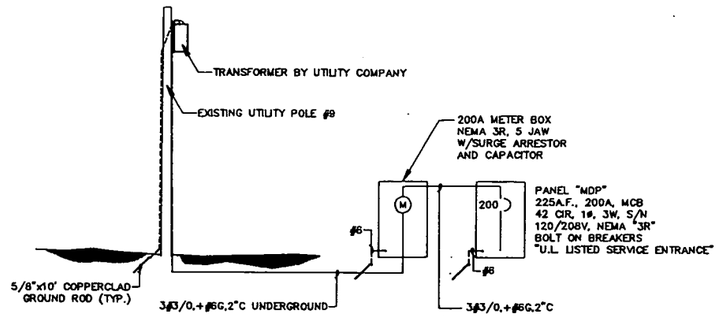
Conformed Drawings

E-1



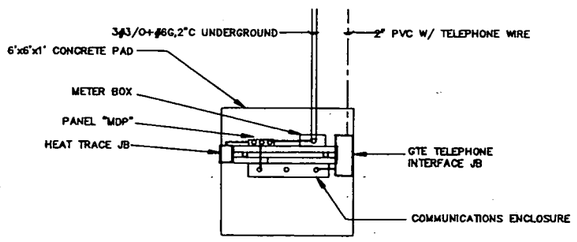
1 E-1 WIRING AND CONDUIT PLAN TO WELLS

5 0 5 10
scale feet



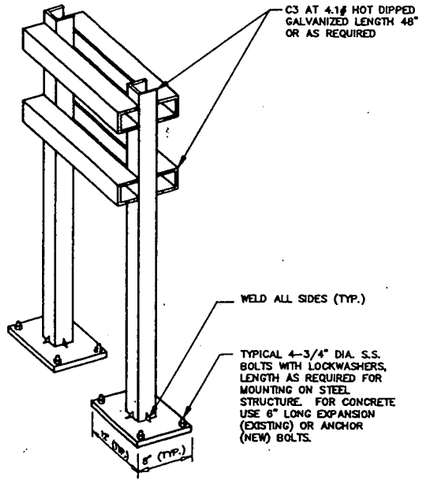
2 E-1 ELECTRICAL SINGLE LINE DIAGRAM

NOT TO SCALE



3 E-1 ENLARGED SERVICE ENTRANCE PLAN

NOT TO SCALE



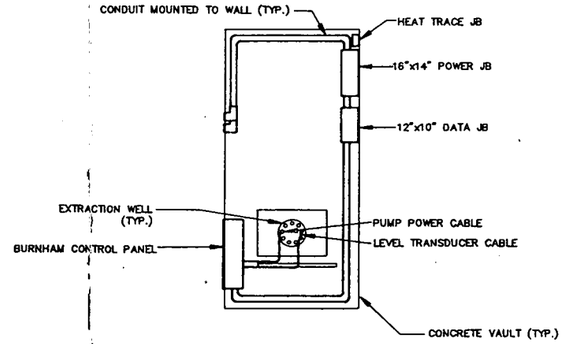
NOTES

1.) SPACE AS REQUIRED TO ACCOMMODATE EQUIPMENT.

2.) ALL HARDWARE TO BE STAINLESS STEEL

4 E-1 DUAL SUPPORT STAND DETAIL

NOT TO SCALE



5 E-1 TYPICAL EXTRACTION WELL 1-6 PANEL AND CONDUIT LAYOUT

SCALE: 1/2"=1'-0"

LEGEND

1/A 20 — DETAIL/CROSS SECTION DESIGNATION
SHT. No. WHERE DETAIL/CROSS SECTION IS PRESENTED

NO.	DATE	REVISION	BY	APPD.

AS BUILT

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Bell Aerospace TEXTRON
WHEATFIELD, NEW YORK

EXTRACTION SYSTEM ELECTRICAL PLAN

DWN. JJR	CHK.	APPD.	CAD FILE No. NY01-282
			DATE
			SCALE AS NOTED
			JOB NO. 2847-2

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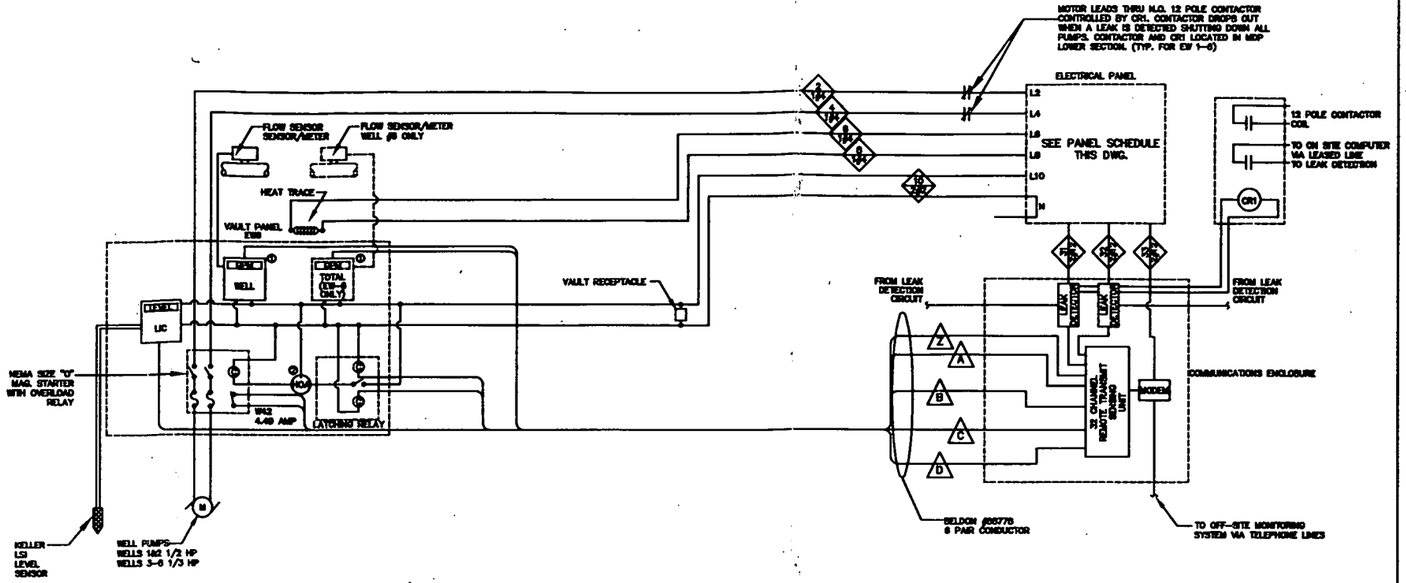
E-1

PANEL SCHEDULE

PANEL "MDP"
225 AMP FRAME , 200 AMP MCB, 42 CIR
1ø, 3W, 120/208V, S/N, BOLT ON BREAKERS
NEMA "3R", U.L. LISTED FOR SERVICE ENTRANCE

CKT#	LOAD	C/B	KVA	WIRE SIZE	CKT#	LOAD	C/B	KVA	WIRE SIZE
1	PUMP EW-1	20/2	1.44	2#4	2	PUMP EW-6	20/2	1.44	2#4
3	PUMP EW-1				4	PUMP EW-6			
5	EW-1 HEAT TRACE,	15/2	1.68	2#4	6	EW-6 HEAT TRACE,	15/2	1.68	2#4
7					8				
9	EW-1 CONTROLS, RECEPTACLE	20/1	1.2	2#2	10	EW-6 CONTROLS, RECEPTACLE	20/1	1.2	2#2
11	PUMP EW-2	20/2	1.44	2#6	12	PUMP EW-5	20/2	1.44	2#6
13	PUMP EW-2				14	PUMP EW-5			
15	EW-2 HEAT TRACE,	20/2	2.18	2#6	16	EW-5 HEAT TRACE,	15/2	1.68	2#6
17					18				
19	EW-2 CONTROLS, RECEPTACLE	20/1	1.2	2#6	20	EW-5 CONTROLS, RECEPTACLE	20/1	1.2	2#6
21	PUMP EW-3	20/2	1.44	2#10	22	PUMP EW-4	20/2	1.44	2#10
23	PUMP EW-3				24	PUMP EW-4			
25	EW-3 HEAT TRACE,	20/2	2.18	2#10	26	EW-4 HEAT TRACE,	15/2	1.68	2#10
27					28				
29	EW-3 CONTROLS, RECEPTACLE	20/1	1.2	2#10	30	EW-4 CONTROLS, RECEPTACLE	20/1	1.2	2#10
31	LEAK DETECTION	20/1	1.2	2#12	32	LEAK DETECTION	20/1	1.2	2#12
33	MODEM	20/1	0.8	2#12	34	SPACE			
35	SPACE				36	SPACE			
37	SPACE				38	SPACE			
39	SPACE				40	SPACE			
41	SPACE				42	SPACE			

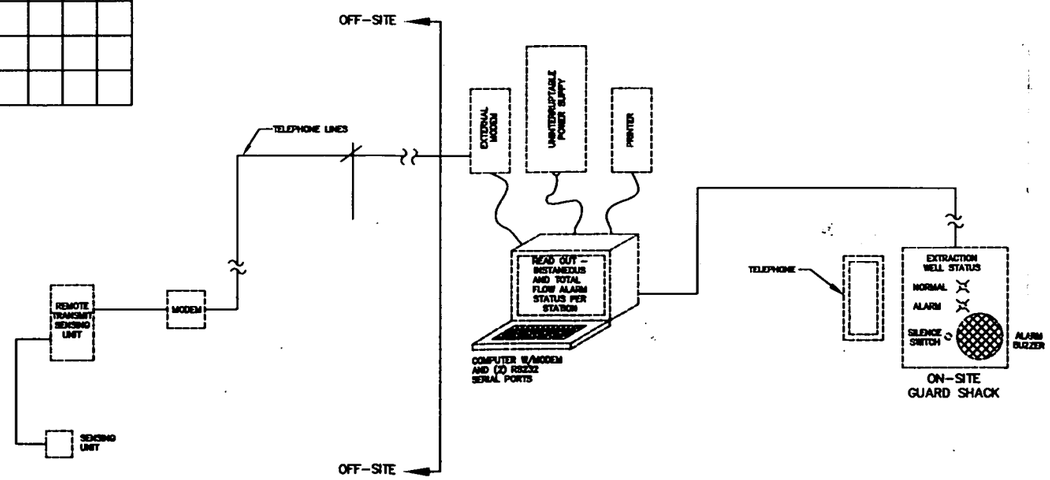
TOTAL KVA DEMAND = 28.82



1.) DIGITAL FLOW READOUT MOUNTS IN VAULT PANEL.
2.) HOA - HAND/OFF/AUTO SWITCH MOUNTED ON PANEL FACE.

1 / E-3 OFF-SITE CONTROL AND MONITORING DIAGRAM (TYPICAL 1 OF 6)

NOT TO SCALE



2 / E-2 ON-SITE MONITORING SYSTEM

NOT TO SCALE

LEGEND

- CIRCUIT NUMBER / NUMBER AND SIZE OF WIRE
- A / B — REMOTE TRANSMIT SENSING UNIT CHANNELS
- 1/A / 20 — DETAIL/CROSS SECTION DESIGNATION / SHT. No. WHERE DETAIL/CROSS SECTION IS PRESENTED

AS BUILT

NO.	DATE	REVISION	BY	APP'D.

Bell Aerospace TEXTRON
WHEATFIELD, NEW YORK

EXTRACTION SYSTEM ELECTRICAL DETAILS

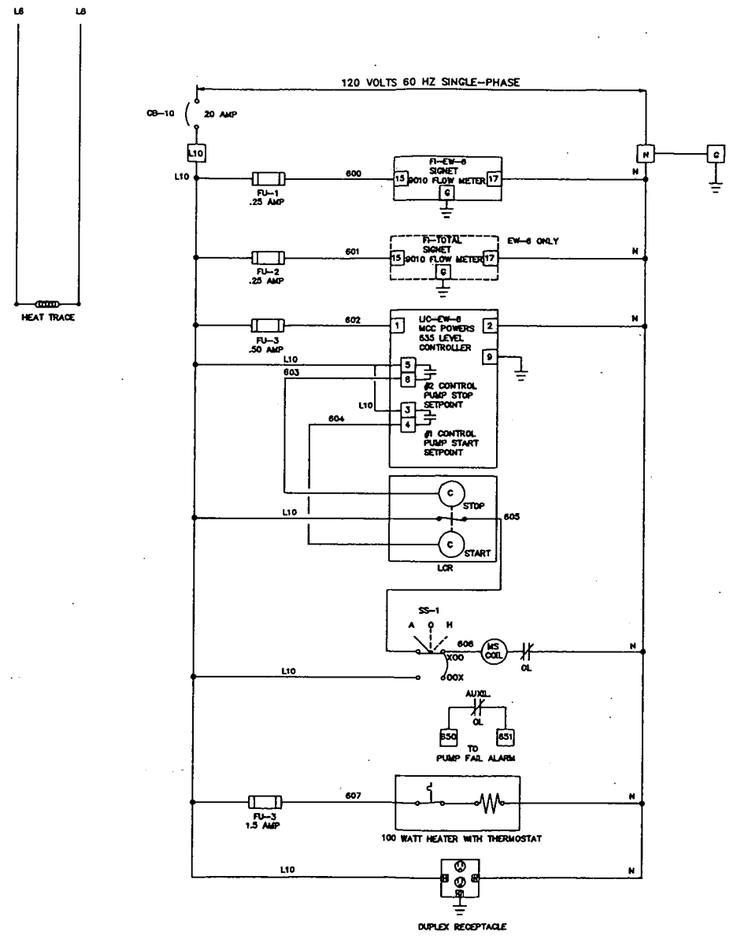
DWN. J.J.R. CHK. APP'D. CAD FILE No.
DATE
SCALE AS NOTED
JOB NO. 2847-2

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E-2

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1 / E-3 **LADDER DIAGRAM (EW-6)**

NOT TO SCALE

TYPICAL FOR WELLS (EW-1 THRU EW-6)

AS BUILT

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Bell Aerospace TEXTRON
WHEATFIELD, NEW YORK

LADDER DIAGRAM

DWN. JJR	CHK.	APPD.	CAD FILE No.
			DATE
			SCALE AS NOTED
			JOB NO. 2478-2

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E-3

BELL AEROSPACE TEXTRON

OFFSITE GROUNDWATER EXTRACTION SYSTEM

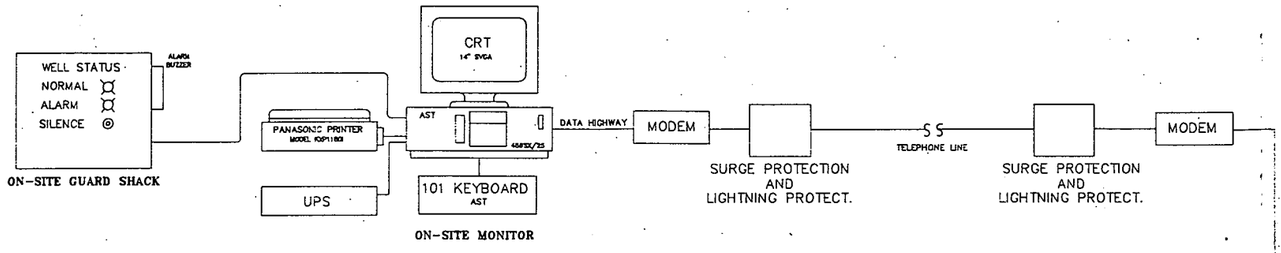
WHEATFIELD, NEW YORK

ENGINEERS:
GOLDER ASSOCIATES INC.
CONSERVA-TECH

ELECTRICAL CONTRACTOR
WEYDMAN ELECTRIC INC.
TONAWANDA, NEW YORK

INSTRUMENT SYSTEMS SUPPLIER
BURNHAM PROCESS CONTROL SERVICES INC.
P.O. BOX 50
RUSH, NEW YORK 14543

OFFSITE GROUNDWATER EXTRACTION SYSTEM
FOR
BELL AEROSPACE TEXTRON



ALARM:
LEAK DETECT #1 N.C. AND LEAK DETECT #2 N.C.

OFFSITE COMMUNICATION ENCLOSURE WITH RTU (REMOTE TRANSMITTING UNIT)

WELL EW-1
ALARMS:
PUMP OVERLOAD N.C.
WELL LOW WATER ALARM N.C.
WELL HIGH WATER ALARM N.C.

ANALOG:
PUMP FLOW RATE 4-20 mA (0-16 GPM)
WELL LEVEL 4-20 mA (0-34.5 FT.)
0-15 PSI

WELL EW-2
ALARMS:
PUMP OVERLOAD N.C.
WELL LOW WATER ALARM N.C.
WELL HIGH WATER ALARM N.C.

ANALOG:
PUMP FLOW RATE 4-20 mA (0-16 GPM)
WELL LEVEL 4-20 mA (0-34.5 FT.)
0-15 PSI

WELL EW-3
ALARMS:
PUMP OVERLOAD N.C.
WELL LOW WATER ALARM N.C.
WELL HIGH WATER ALARM N.C.

ANALOG:
PUMP FLOW RATE 4-20 mA (0-16 GPM)
WELL LEVEL 4-20 mA (0-34.5 FT.)
0-15 PSI

WELL EW-4
ALARMS:
PUMP OVERLOAD N.C.
WELL LOW WATER ALARM N.C.
WELL HIGH WATER ALARM N.C.

ANALOG:
PUMP FLOW RATE 4-20 mA (0-16 GPM)
WELL LEVEL 4-20 mA (0-34.5 FT.)
0-15 PSI

WELL EW-5
ALARMS:
PUMP OVERLOAD N.C.
WELL LOW WATER ALARM N.C.
WELL HIGH WATER ALARM N.C.

ANALOG:
PUMP FLOW RATE 4-20 mA (0-16 GPM)
WELL LEVEL 4-20 mA (0-34.5 FT.)
0-15 PSI

WELL EW-6
ALARMS:
PUMP OVERLOAD N.C.
WELL LOW WATER ALARM N.C.
WELL HIGH WATER ALARM N.C.

ANALOG:
PUMP FLOW RATE 4-20 mA (0-16 GPM)
WELL LEVEL 4-20 mA (0-34.5 FT.)
0-15 PSI
TOTAL FLOW RATE 4-20 mA (0-100 GPM)

BELL AEROSPACE TEXTRON
OFFSITE GROUNDWATER EXTRACTION SYSTEM
SYSTEM LAYOUT

ENGRS.
GOLDER ASSOCIATES INC.
CONSERVA-TECH

CONTRACTOR
WEYDMAN ELECTRIC INC.

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LTR	Revision	APP	Date

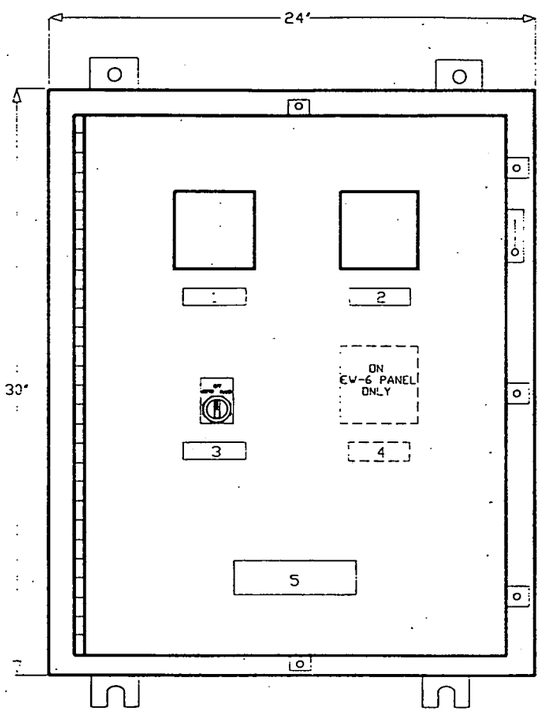
Work from dimensions – do not scale

References
Used on
Product Code

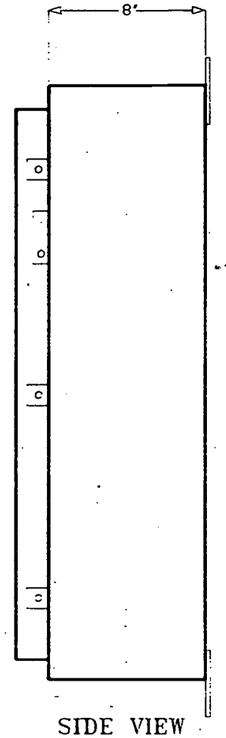
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BURNHAM PROCESS CONTROL SERVICES INC. Rochester, New York

Scale	NONE	Approved	Date
Drawn	RMB	Date 11/20/97	
Checked		Date	

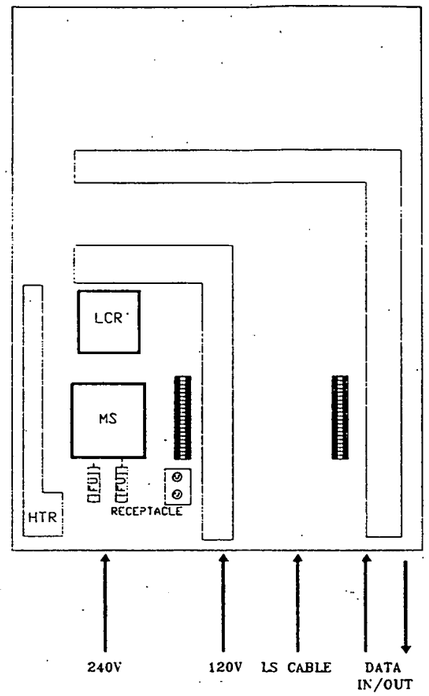
B-1525-GA2-0



FRONT VIEW



SIDE VIEW



BILL OF MATERIAL

TAG	QTY	MANUFACTURER	PART NUMBER
	1	HOFFMAN ENCLOSURE NEMA 4X	A-30H2408SSLP WITH A30P24 PANEL
MS	1	ALLEN BRADLEY	240V, 1/3HP MOTOR STARTER WITH OVERLOAD 509TOD WITH 120 VOLT COIL
	1	ALLEN BRADLEY	AUXILIARY CONTACT FOR O.L.TRIP 595-B00
LCR	1	ALLEN BRADLEY	4 POLE LATCH RELAY 700NM400A1
SS	1	ALLEN BRADLEY	3 POSITION SELECTOR SWITCH WITH LEGEND PLATE 800H-JR2A
FU	1	GOULD	2 POLE FUSE BLACK #20308 WITH FUSES, 5.6 AMP
RECEP.	1	HUBBELL	DUPLEX RECEPTACLE WITH 2X4 BX AND COVER #5252
TERM	A/R 1 LOT	ALLEN BRADLEY	TERMINALS 1492F1
HTR	1	WATLOW	ELECTRIC HEATER WITH THERMOSTAT 02012096B-40 SET @ 40 DEG. F

NAMEPLATE SCHEDULE

NO.	SIZE	WORDING
1	1" X 3"	WELL LEVEL INDICATOR/CONTROLLER
2	1" X 3"	PUMP FLOW RATE INDICATOR
3	1" X 3"	EW# 1-6 PUMP
4	1" X 3"	TOTAL FLOW RATE INDICATOR (EW-6 ONLY)
5	2" X 4"	VAULT #EW #1-6 CONTROL PANEL

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ENGRS.
GOLDER ASSOCIATES INC.
CONSER-A-TECH

CONTRACTOR:
WEYDMAN ELECTRIC INC.

BELL AEROSPACE TEXTRON
OFFSITE GROUNDWATER EXTRACTION SYSTEM
GENERAL ARRANGEMENT

LTR	Revision	APP	Date

Work from dimensions – do not scale

References

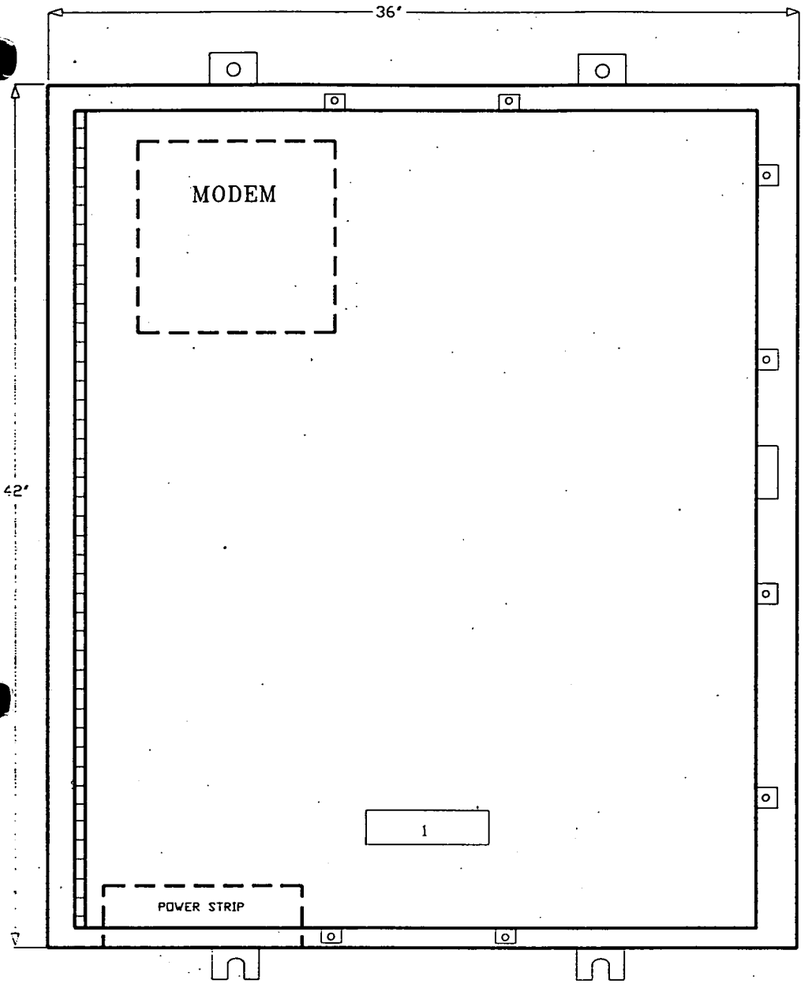
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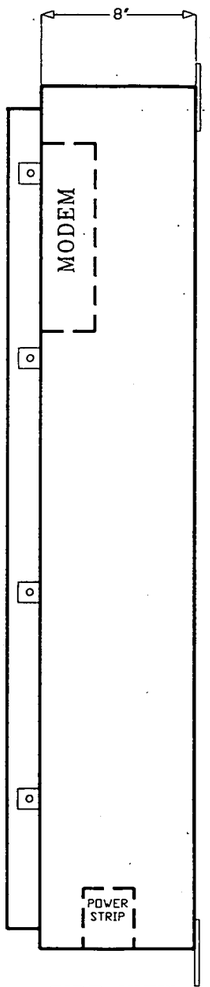
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Scale	NONE	Approved	Date
Drawn	RMB	Date 11/19/92	
Checked		Date	

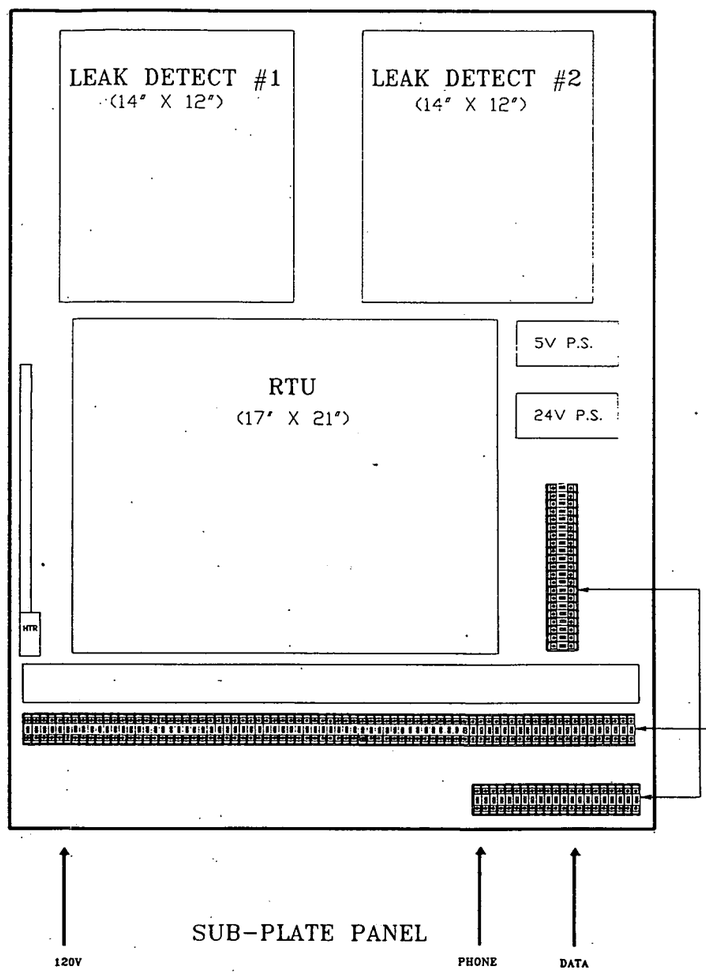
B-1525-GA1-3



FRONT VIEW



SIDE VIEW



SUB-PLATE PANEL

BILL OF MATERIAL

TAG	QTY	MANUFACTURER	PART NUMBER
RTU	1	MOLYTEK	MRTU100040100 RUGGED NEMA STYLE SPLASH-PROOF ENCLOSURE WITH KEY LOCK DOOR. PAINTED INSIDE AND OUT WITH POLYURETHANE ENAMEL. OPTIONS: KEYBOARD & DISPLAY LEFT & RIGHT VACUUM FLUORESCENT DISPLAYS.
MODEM	1	PENRIL	ALLIANCE V.32 STAND ALONE MODEM MODEL #2432-01
HTR	1	WATLOW	ELECTRIC HEATER WITH THERMOSTAT 02012096B-40 SET @ 40 DEG. F
TERM	1 LOT	ALLEN BRADLEY	TERMINALS 1492F1 & 1492N1 1492CE6 FUSE HOLDERS
LEAK DETECT	2	RAYCHEM	TTB ALARM AND LOCATOR MODULE (SUPPLIED BY OTHERS)
POWER STRIP	1	SENTREX BRONZE	M4BZ 4 PLUG PROTECTOR
PS-1	1	POWER ONE 24V REGULATED POWER SUPPLY	HC24-2.4A
PS-2	1	POWER ONE 5V REGULATED POWER SUPPLY	HA5-1.5

NAMEPLATE SCHEDULE

NO.	SIZE	WORDING
1	2" X 4"	COMMUNICATION PANEL DATA ACQUISITION

BELL AEROSPACE TEXTRON

OFFSITE GROUNDWATER EXTRACTION SYSTEM

MAIN COMMUNICATION PANEL

ENGRS.
GOLDER ASSOCIATES INC.
CONSERVA-TECH

CONTRACTOR:
WEYDMAN ELECTRIC INC.

AS BUILT

LTR	Revision	APP	Date

References

Used on

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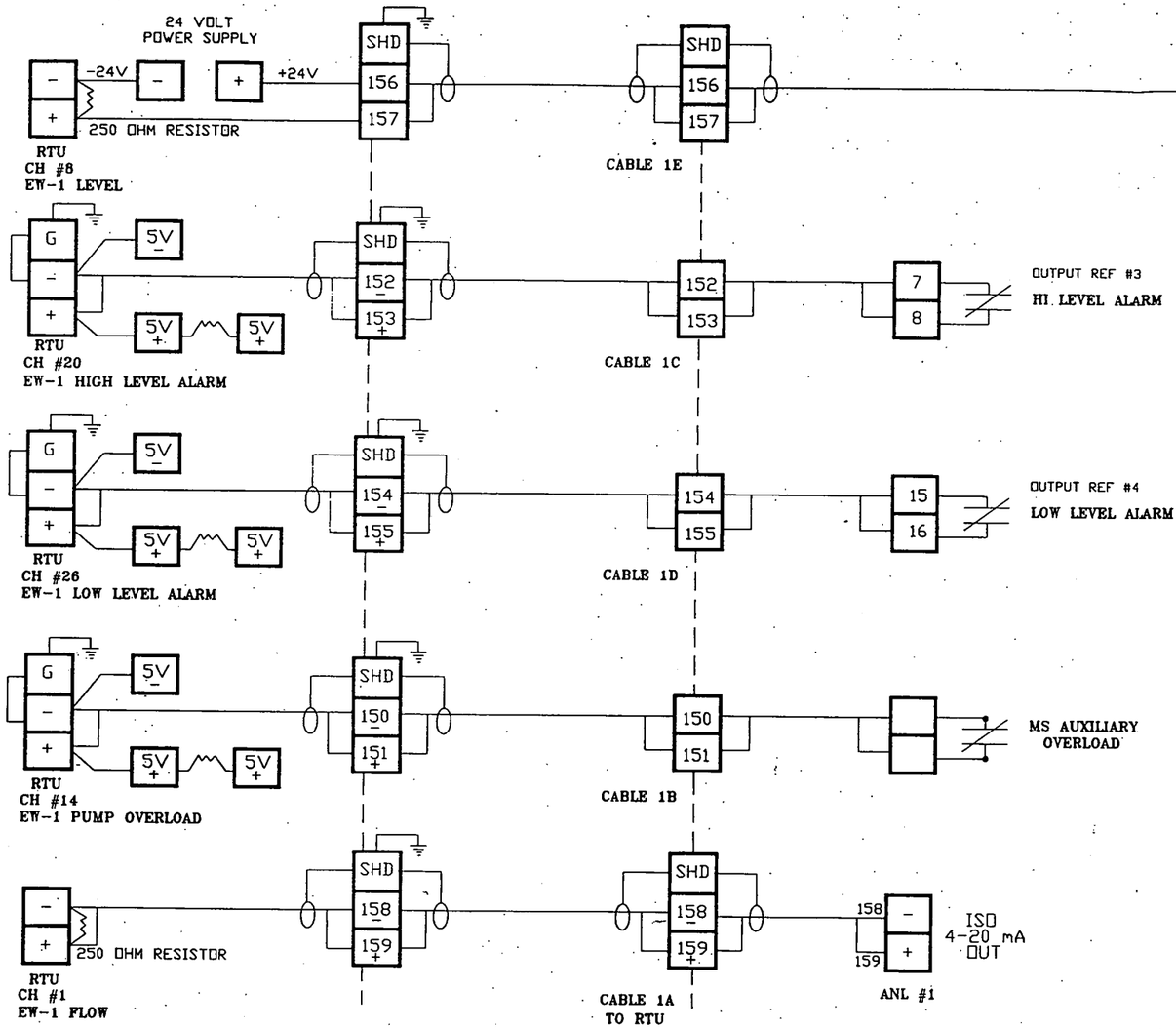
BURNHAM PROCESS CONTROL SERVICES INC. Rochester, New York

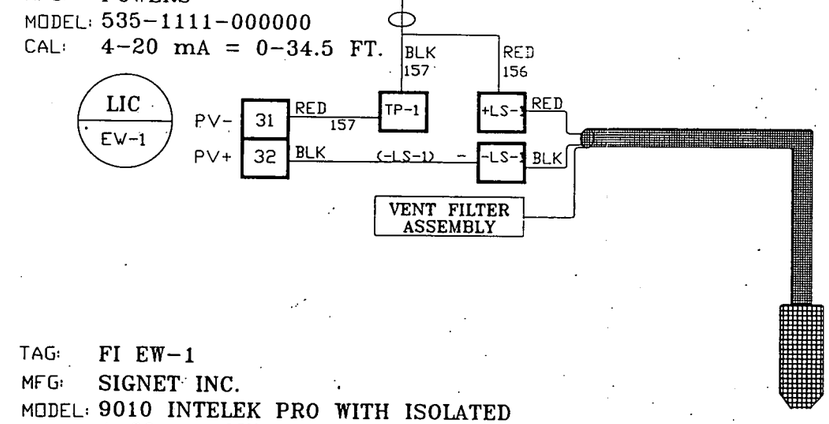
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Drawn	RMB	Date	11/21/92
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Product Code			B-1525-GA3-3

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RTU COMMUNICATION PANEL FIELD WIRING

VAULT PANEL EW-1

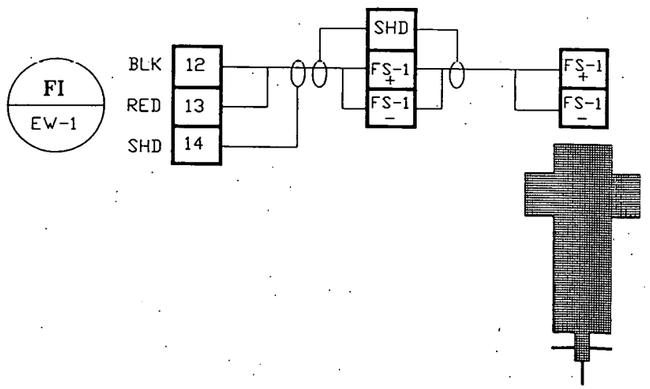




TAG: LIC EW-1
MFG: POWERS
MODEL: 535-1111-000000
CAL: 4-20 mA = 0-34.5 FT.

TAG: LS-1
MFG: KELLER
MODEL: 200S
CAL: RANGE 0-15 PSI
0-34.5 FT.=4-20 mA
WETTED PARTS 316 S/S VITON
NO OPTIONS

TAG: FI EW-1
MFG: SIGNET INC.
MODEL: 9010 INTELEK PRO WITH ISOLATED
4-20 mA OUTPUT CARD #3-9000.460-1
CAL: 4-20 mA = 0-16 GPM



TAG: FLOW SENSOR FS-1
MFG: SIGNET
MODEL: 51530-P0
CAL: 0-16 GPM

ENGRS.
GOLDER ASSOCIATES INC.
CONSERVA-TECH

CONTRACTOR:
WEYDMAN ELECTRIC INC.

BELL AEROSPACE TEXTRON
GROUNDWATER EXTRACTION
EW-1
INSTRUMENT LOOP DIAGRAM

AS BUILT

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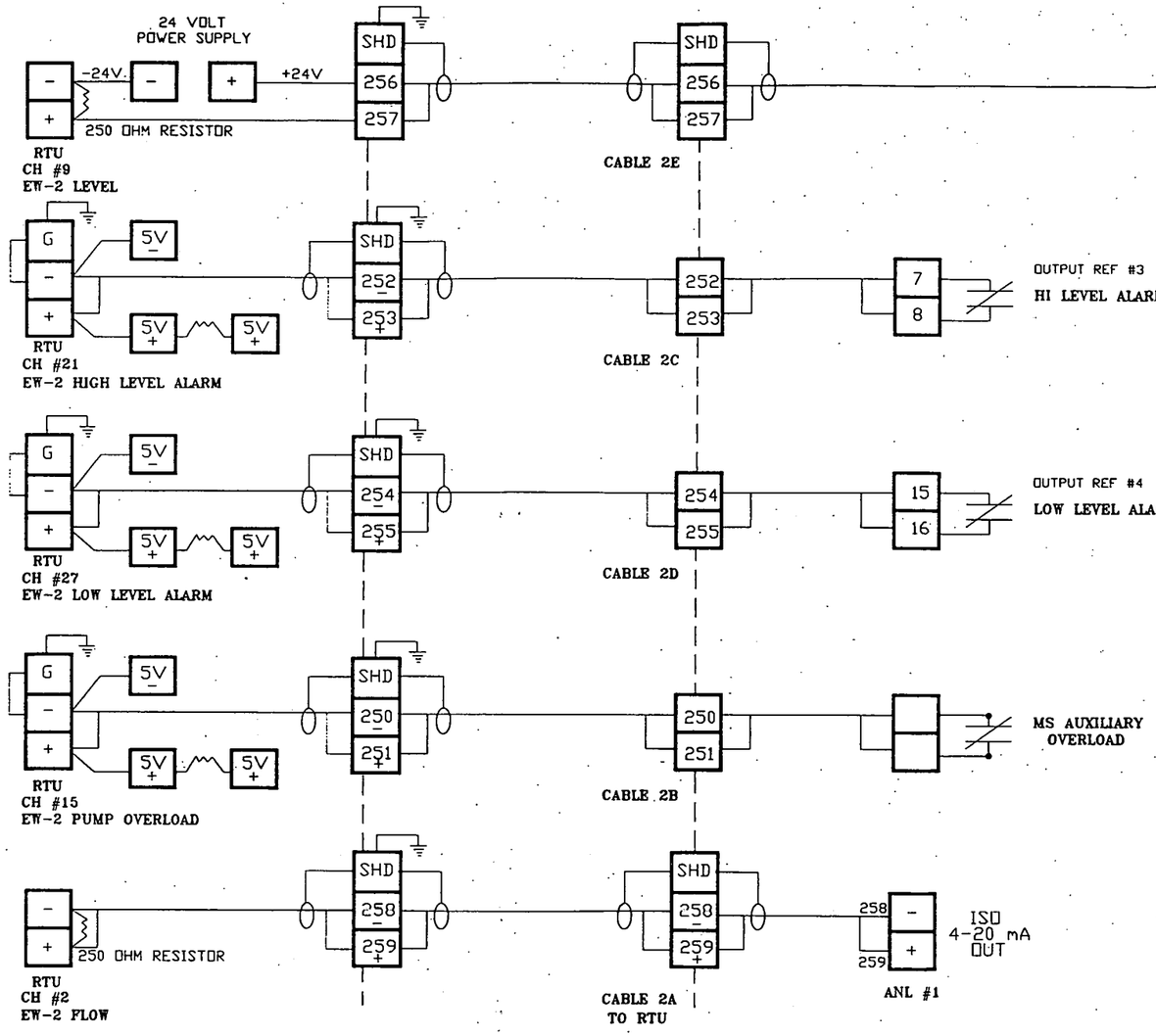
References

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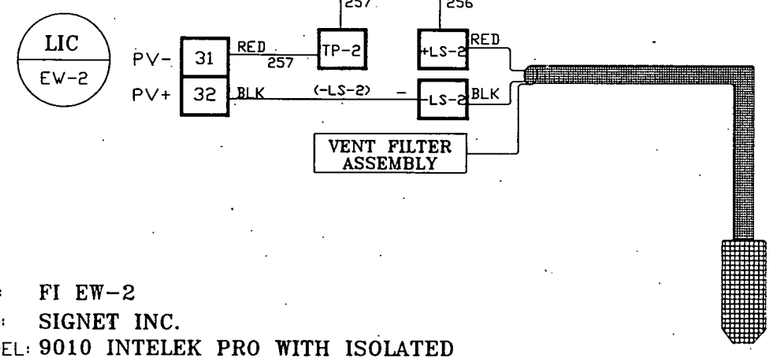
Scale	NONE		Approved		Date
Drawn	RMB	Date 11/26/92			
Checked		Date			
Product Code					B-1525-LP1-2

RTU COMMUNICATION PANEL FIELD WIRING



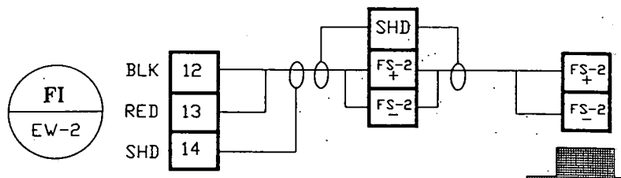
VAULT PANEL EW-2

TAG: LIC EW-2
MFG: POWERS
MODEL: 535-1111-000000
CAL: 4-20 mA = 0-34.5 FT.



TAG: LS-2
MFG: KELLER
MODEL: 200S
CAL: RANGE 0-15 PSI
0-34.5 FT.=4-20 mA
WETTED PARTS 316 S/S VITON
NO OPTIONS

TAG: FI EW-2
MFG: SIGNET INC.
MODEL: 9010 INTELEK PRO WITH ISOLATED
4-20 mA OUTPUT CARD #3-9000.460-1
CAL: 4-20 mA = 0-16 GPM



TAG: FLOW SENSOR FS-2
MFG: SIGNET
MODEL: 51530-P0
CAL: 0-16 GPM

ENGRS.
GOLDER ASSOCIATES INC.
CONSERVA-TECH

CONTRACTOR:
WEYDMAN ELECTRIC INC.

BELL AEROSPACE TEXTRON
GROUNDWATER EXTRACTION
EW-2
INSTRUMENT LOOP DIAGRAM

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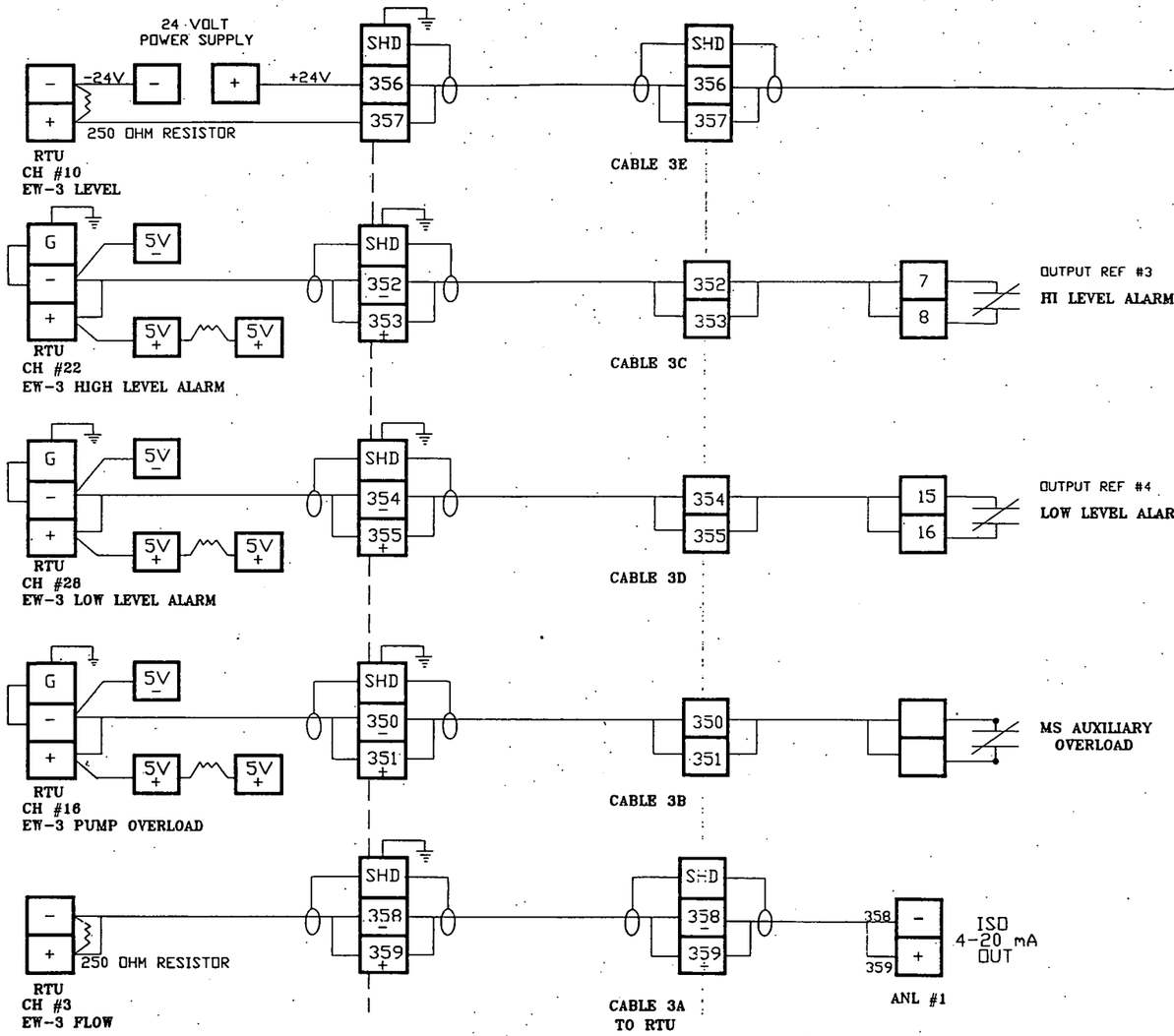
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Checked		Date	
Product Code			B-1525-LP2-2

RTU COMMUNICATION PANEL FIELD WIRING

VAULT PANEL EW-3



TAG: LIC EW-3
MFG: POWERS
MODEL: 535-1111-000000
CAL: 4-20 mA = 0-34.5 FT.

LIC
EW-3

PV- 31 RED 357 TP-3
PV+ 32 BLK (-LS-3)

BLK 357
RED 356
+LS-3 RED
-LS-3 BLK

VENT FILTER ASSEMBLY

50 FT. OF CABLE

TAG: LS-3
MFG: KELLER
MODEL: 200S
CAL: RANGE 0-15 PSI
0-34.5 FT.=4-20 mA
WETTED PARTS 316 S/S VITON
NO OPTIONS

TAG: FI EW-3
MFG: SIGNET INC.
MODEL: 9010 INTELEK PRO WITH ISOLATED
4-20 mA OUTPUT CARD #3-9000.460-1
CAL: 4-20 mA = 0-16 GPM

FI
EW-3

BLK 12
RED 13
SHD 14

SHD
FS-3 +
FS-3 -
FS-3 +
FS-3 -

TAG: FLOW SENSOR FS-3
MFG: SIGNET
MODEL: 51530-P0
CAL: 0-16 GPM

ENGRS.
GOLDER ASSOCIATES INC.
CONSERVA-TECH

CONTRACTOR:
WEYDMAN ELECTRIC INC.

BELL AEROSPACE TEXTRON
GROUNDWATER EXTRACTION
EW-3
INSTRUMENT LOOP DIAGRAM

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LTR	Revision	APP Date

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LTR	Revision	APP Date

References

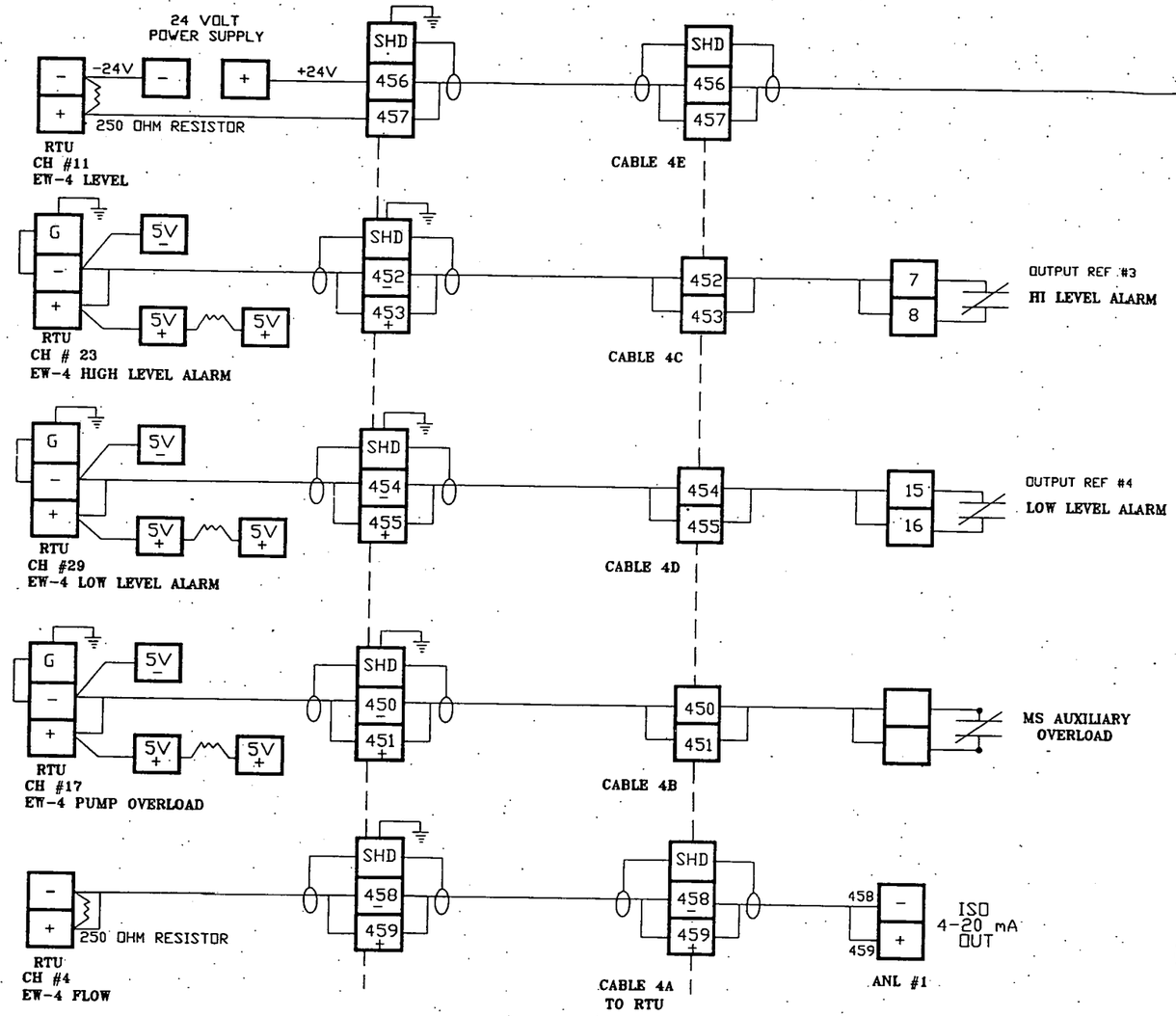
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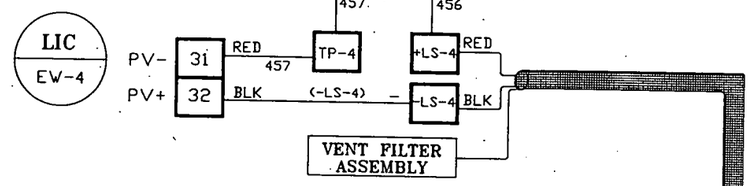
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Checked		Date	
Product Code			B-1525-LP3-2

RTU COMMUNICATION PANEL FIELD WIRING

VAULT PANEL EW-4



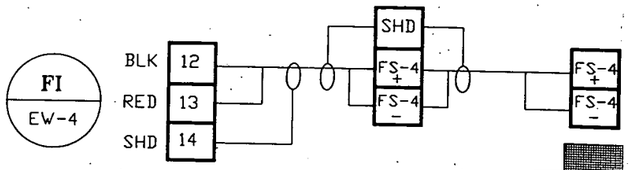
TAG: LIC EW-4
MFG: POWERS
MODEL: 535-1111-000000
CAL: 4-20 mA = 0-34.5 FT.



50 FT. OF CABLE

TAG: LS-4
MFG: KELLER
MODEL: 200S
CAL: RANGE 0-15 PSI
0-34.5 FT.=4-20 mA
WETTED PARTS 316 S/S VITON
NO OPTIONS

TAG: FI EW-4
MFG: SIGNET INC.
MODEL: 9010 INTELEK PRO WITH ISOLATED
4-20 mA OUTPUT CARD #3-9000.460-1
CAL: 4-20 mA = 0-16 GPM



TAG: FLOW SENSOR FS-4
MFG: SIGNET
MODEL: 51530-P0
CAL: 0-16 GPM

ENGRS.
GOLDER ASSOCIATES INC.
CONSERVA-TECH

CONTRACTOR:
WEYDMAN ELECTRIC INC.

BELL AEROSPACE TEXTRON
GROUNDWATER EXTRACTION
EW-4
INSTRUMENT LOOP DIAGRAM

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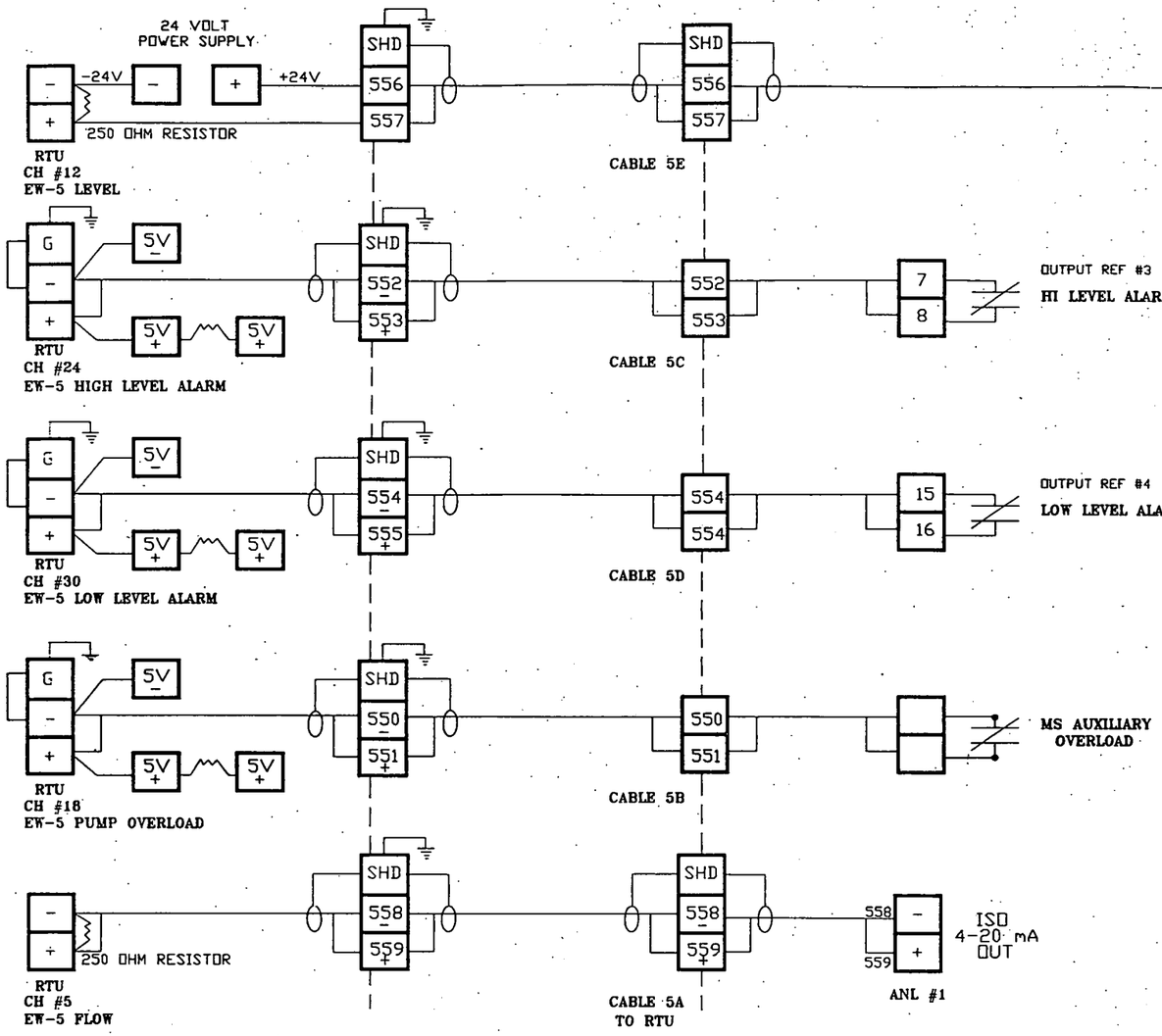
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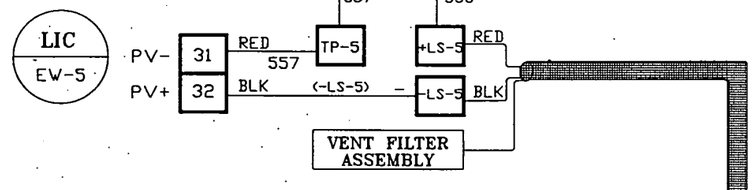
B-1525-LP4-2

RTU COMMUNICATION PANEL FIELD WIRING

VAULT PANEL EW-5



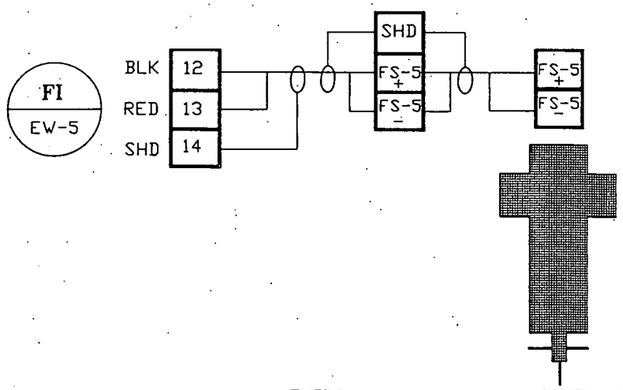
TAG: LIC EW-5
MFG: POWERS
MODEL: 535-1111-000000
CAL: 4-20 mA = 0-34.5 FT.



50 FT. OF CABLE

TAG: LS-5
MFG: KELLER
MODEL: 200S
CAL: RANGE 0-15 PSI
0-34.5 FT.=4-20 mA
WETTED PARTS 316 S/S VITON
NO OPTIONS

TAG: FI EW-5
MFG: SIGNET INC.
MODEL: 9010 INTELEK PRO WITH ISOLATED 4-20 mA OUTPUT CARD #3-9000.460-1
CAL: 4-20 mA = 0-16 GPM



TAG: FLOW SENSOR FS-5
MFG: SIGNET
MODEL: 51530-P0
CAL: 0-16 GPM

ENGRS.
GOLDER ASSOCIATES INC.
CONSERVA-TECH

CONTRACTOR:
WEYDMAN ELECTRIC INC.

BELL AEROSPACE TEXTRON
GROUNDWATER EXTRACTION
EW-5
INSTRUMENT LOOP DIAGRAM

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References
Used on
Product Code

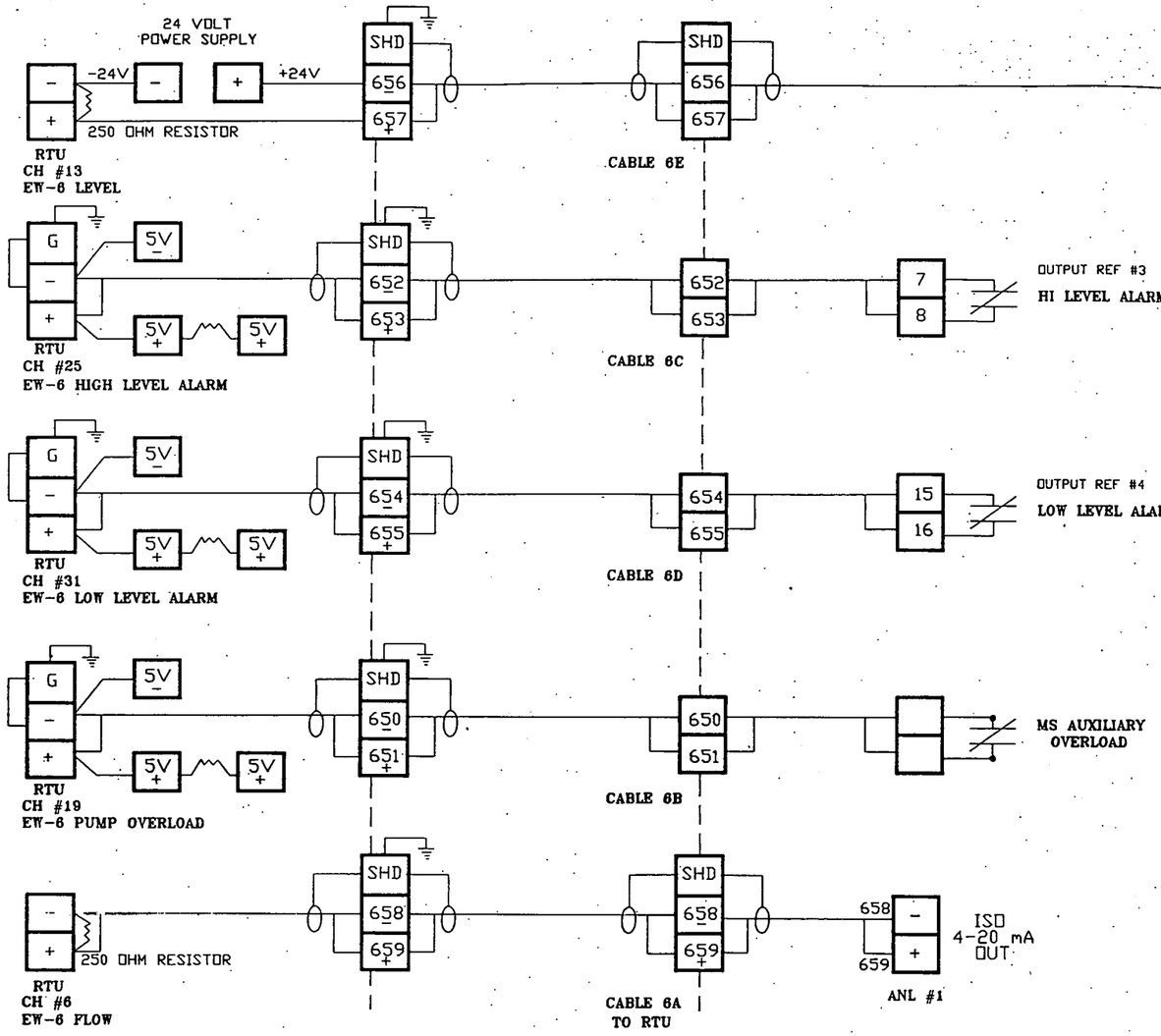
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Checked		Date	

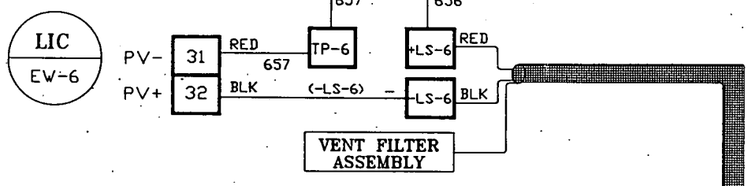
B-1525-LP5-2

RTU COMMUNICATION PANEL FIELD WIRING

VAULT PANEL EW-6



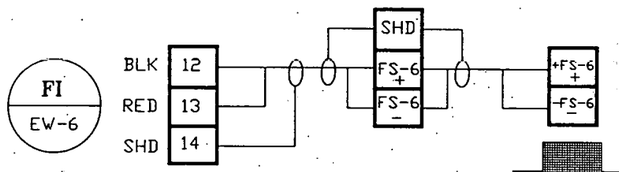
TAG: LIC EW-6
MFG: POWERS
MODEL: 535-1111-000000
CAL: 4-20 mA = 0-34.5 FT.



50 FT. OF CABLE

TAG: LS-6
MFG: KELLER
MODEL: 200S
CAL: RANGE 0-15 PSI
0-34.5 FT.=4-20 mA
WETTED PARTS 316 S/S VITON
NO OPTIONS

TAG: FI EW-6
MFG: SIGNET INC.
MODEL: 9010 INTELEK PRO WITH ISOLATED
4-20 mA OUTPUT CARD #3-9000.460-1
CAL: 4-20 mA = 0-16 GPM



TAG: FLOW SENSOR FS-6
MFG: SIGNET
MODEL: 51530-P0
CAL: 0-16 GPM

ENGRS.
GOLDER ASSOCIATES INC.
CONSERVA-TECH

CONTRACTOR:
WEYDMAN ELECTRIC INC.

BELL AEROSPACE TEXTRON
GROUNDWATER EXTRACTION
EW-6
INSTRUMENT LOOP DIAGRAM

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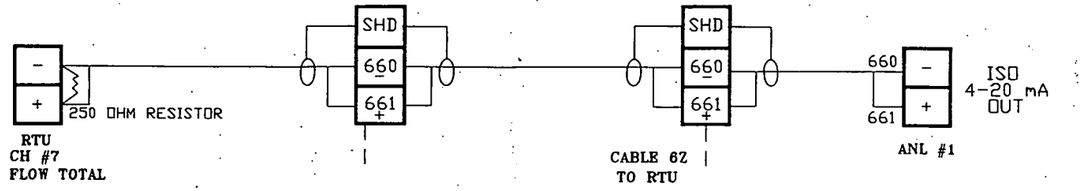
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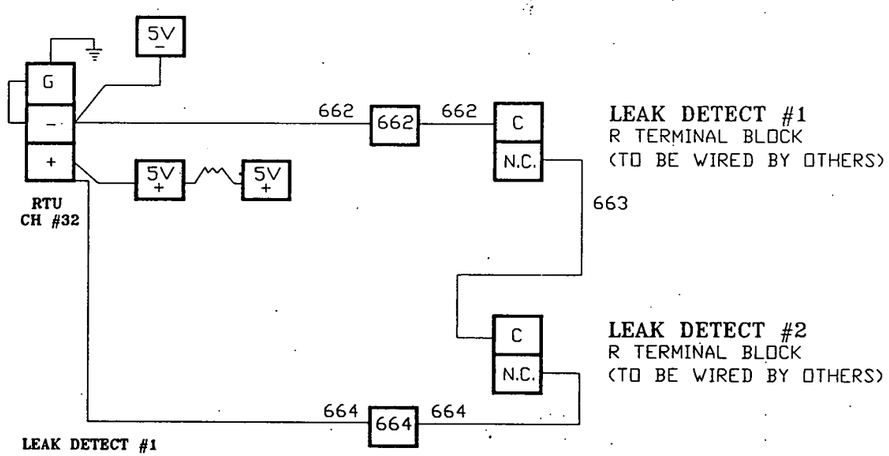
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Product Code			B-1525-LP6-2

RTU COMMUNICATION PANEL FIELD WIRING



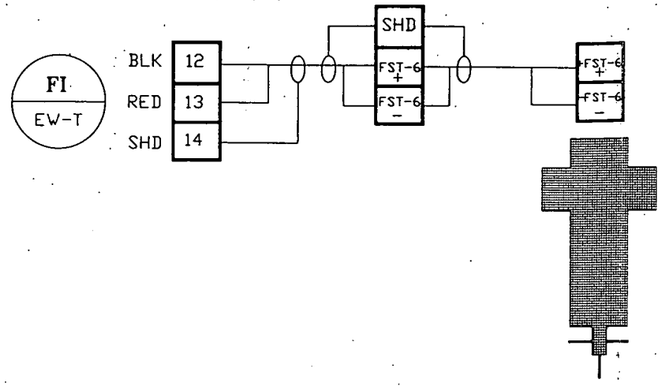


LEAK DETECT #1
R TERMINAL BLOCK
(TO BE WIRED BY OTHERS)

LEAK DETECT #2
R TERMINAL BLOCK
(TO BE WIRED BY OTHERS)

VAULT PANEL EW-6

TAG: FI EW-T
MFG: SIGNET INC.
MODEL: 9010 INTELEK PRO WITH ISOLATED
4-20 mA OUTPUT CARD #3-9000.460-1
CAL: 4-20 mA=0-100 GPM



TAG: FLOW SENSOR FS-T
MFG: SIGNET
MODEL: 51530-P0
CAL: 0-100 GPM

AS BUILT

ENGRS.
GOLDER ASSOCIATES INC.
CONSERVA-TECH

CONTRACTOR:
WEYDMAN ELECTRIC INC.

BELL AEROSPACE TEXTRON
GROUNDWATER EXTRACTION
EW-6
INSTRUMENT LOOP DIAGRAM

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LTR	Revision	APP	Date

Work from dimensions – do not scale

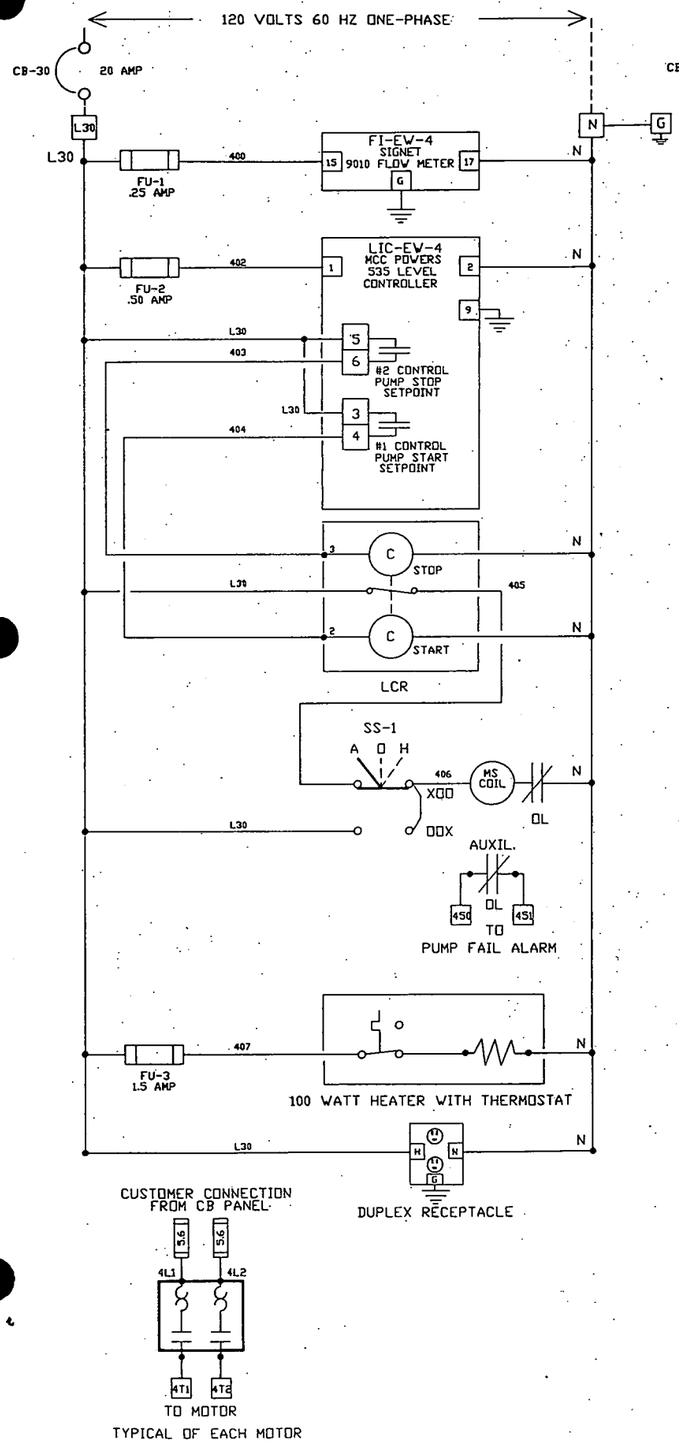
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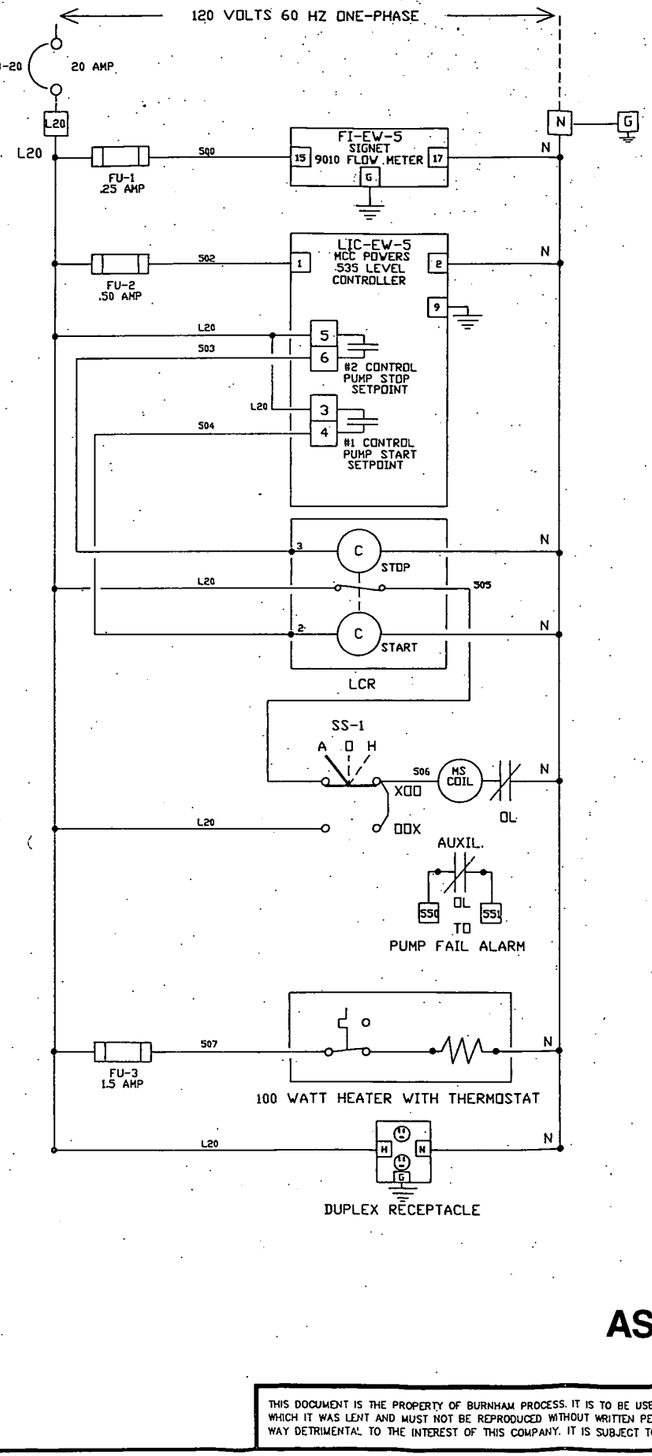
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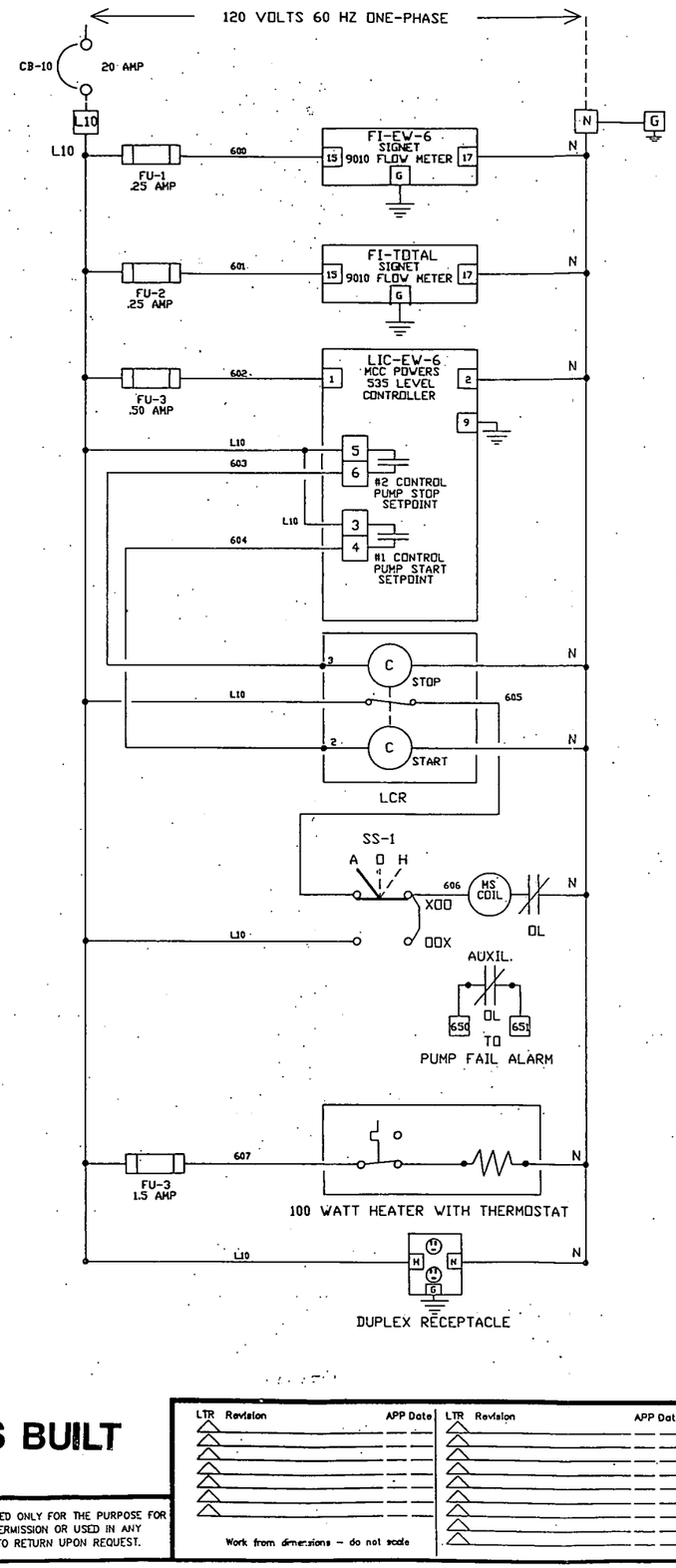
Product Code

BURNHAM
BURNHAM PROCESS CONTROL SERVICES INC. Rochester, New York

Scale	NONE	Approved	Date
Drawn	RMB	Date 11/29/92	B-1525-LP7-1
Checked		Date	







BELL AEROSPACE TEXTRON

GROUNDWATER EXTRACTION
CONTROL PANELS EW-4,-5,-6
LADDER DIAGRAM

AS BUILT

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LTR	Revision	APP	Date

Work from dimensions – do not scale

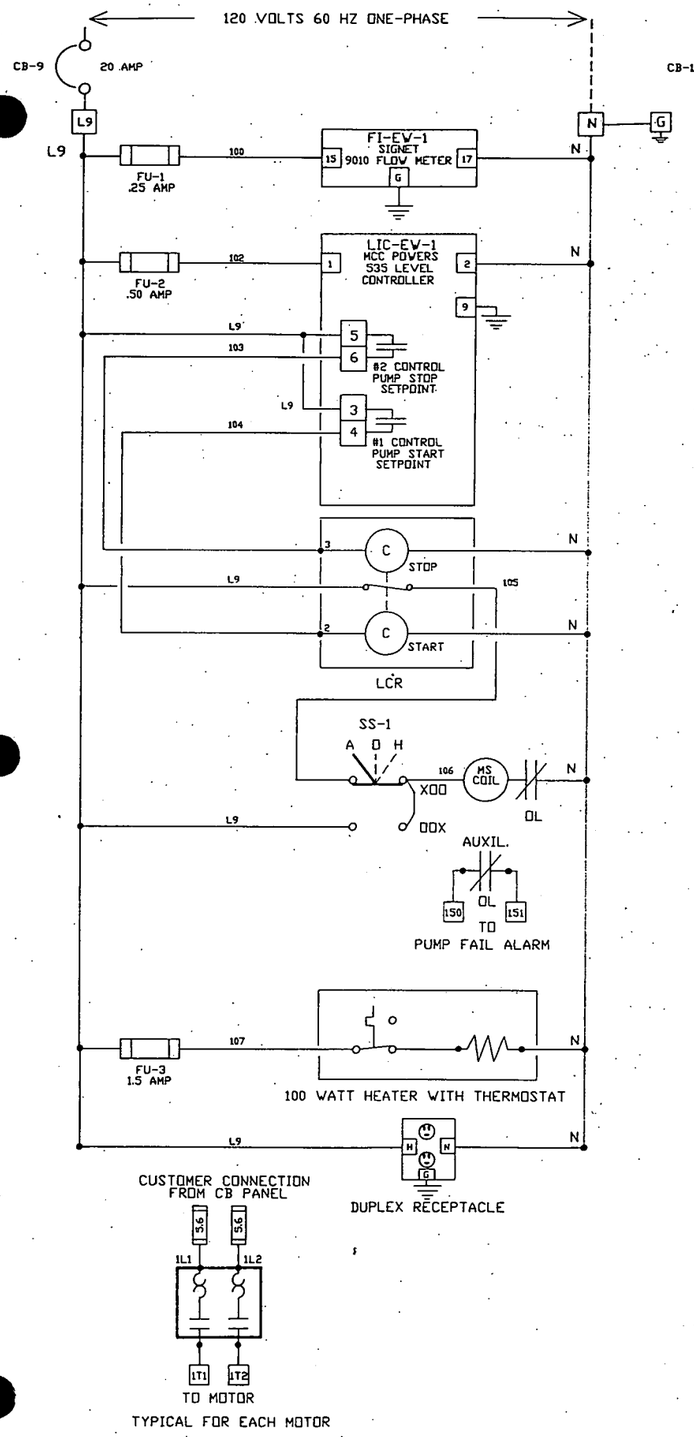
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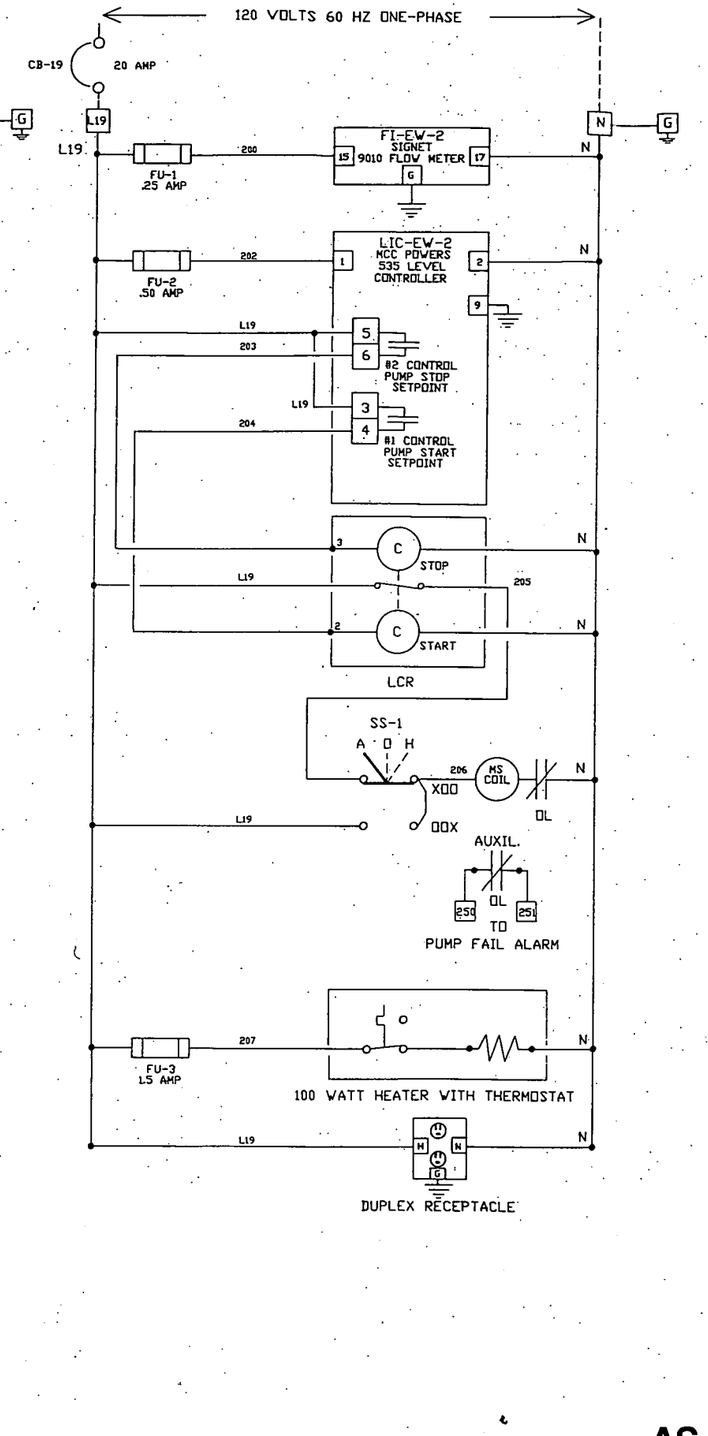
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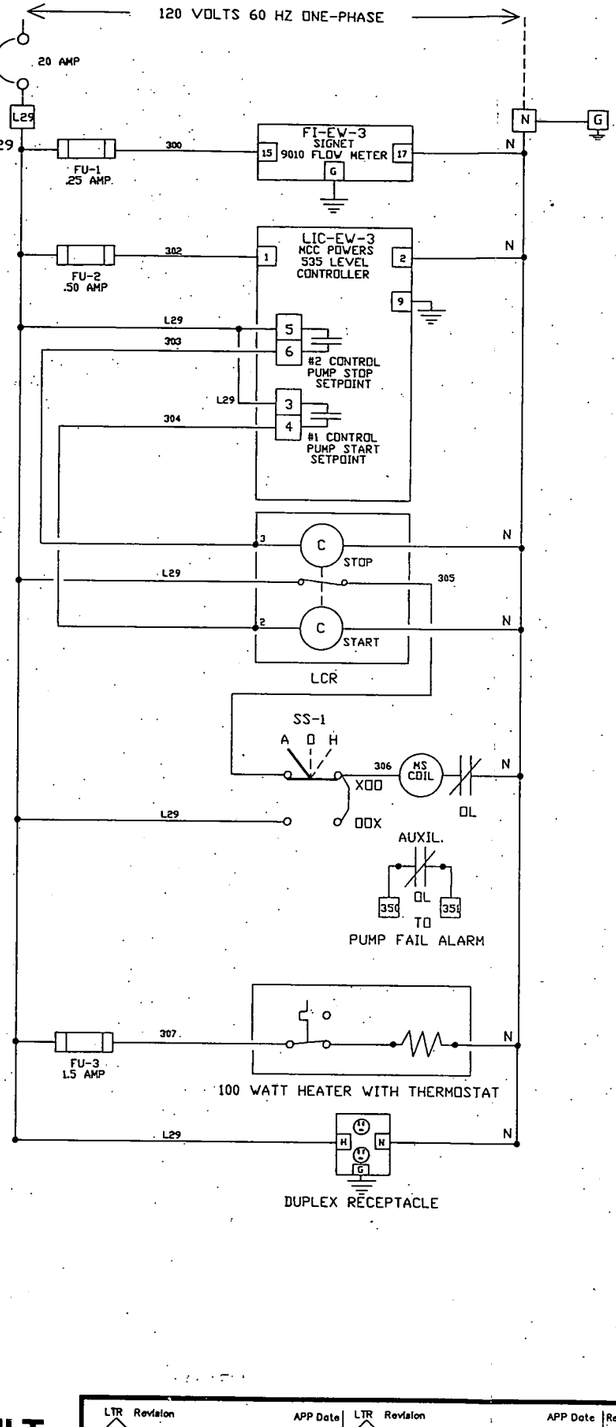
BURNHAM

BURNHAM PROCESS CONTROL SERVICES INC. Rochester, New York

Scale	NONE	Approved	Date
Drawn	RMB	Date	11/23/92
Checked		Date	
Product Code			B-1525-EL1-2







BELL AEROSPACE TEXTRON

GROUNDWATER EXTRACTION CONTROL PANELS EW-1,-2,-3 LADDER DIAGRAM

AS BUILT

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LTR	Revision	APP	Date

Work from dimensions – do not scale

References

Used on

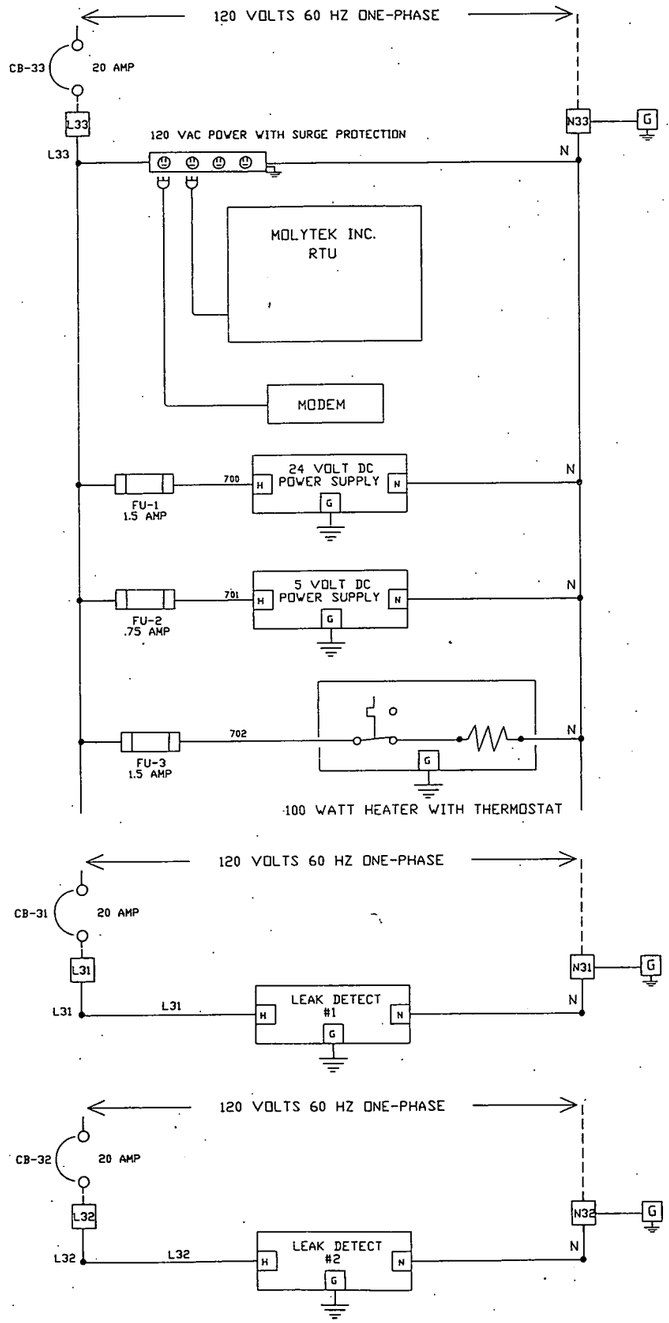
BURNHAM

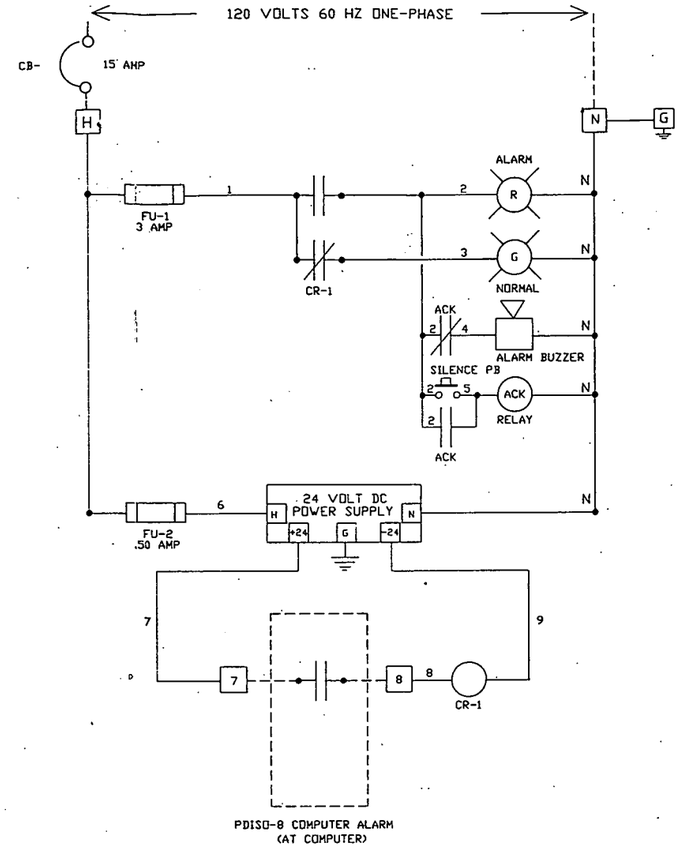
BURNHAM PROCESS CONTROL SERVICES INC. Rochester, New York

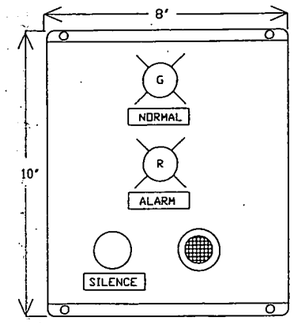
Scale	NONE		Approved	Date
Drawn	RMB	Date 11/23/92		
Checked		Date		

Product Code

B-1525-EL2-2







WELL STATUS GUARD SHACK PANEL

BELL AEROSPACE TEXTRON
GROUNDWATER EXTRACTION
COMMUNICATION RTU PANEL
POWER DISTRIBUTION

ENGRS.
GOLDER ASSOCIATES INC.
CONSERVA-TECH

CONTRACTOR:
WEYDMAN ELECTRIC INC.

AS BUILT

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LTR	Revision	APP	Date

Work from dimensions – do not scale

References

Used on

BURNHAM
BURNHAM PROCESS CONTROL SERVICES INC. Rochester, New York

Scale	NONE		Approved		Date
Drawn	RMB	Date	11/25/92	B-1525-EL3-2	
Checked		Date			
Product Code					

APPENDIX D

MANUFACTURER'S PRODUCT DATA

LIST OF EQUIPMENT
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK
PAGE 1 OF 3

ITEM	MANUFACTURER OR SUPPLIER
Remote Transmit Unit (RTU)	Molytek Inc.
Computer System	AST
Computer Printer	Panasonic
Uninterruptible Power Supply (UPS)	Emerson
Well Level Sensor	Keller
Modem	Gandolf
Level Indicator Controller	MCC Powers
Flow Indicator	Signet
Paddlewheel Flow Sensor	Signet
Leak Detection System	Raychem
Selector Switch	Allen Bradley
Latch Relay	Allen Bradley
Motor Starter with Overload Relay	Allen Bradley
Vault Panel and RTU Panel	Hoffman
Computer Output Alarm Driver	Metrabyte
DC Power Supplies	Power One
Alarm Buzzer in Guard Station	Sonalert
Power Surge Protector	Sentrex
Enclosure Heater	Watlow
Normally Closed (N.C.) Auxiliary Contact Kit	Allen Bradley
Position Selector Switch	Allen Bradley
Magnetic Controller	Allen Bradley
Pilot Devices	Allen Bradley
Flow Sensor Installation Fitting	Signet
2-inch Butterfly Valve	Asahi/America
2-inch and 3-inch Swing Check Valves	Asahi/America

LIST OF EQUIPMENT
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

ITEM	MANUFACTURER OR SUPPLIER
Submersible Pump, Vaults 3 through 6	Grundfos 5 to 14 gpm
Submersible Pump, Vault 2	Grundfos 18 to 32 gpm
Precast Concrete Vault	Kistner
Vault Sealants	Con-Wrap
Manhole Frame and Cover	Syracuse Castings
Stainless Steel Expansion Joints	Adsco
Flexible Connector (piping to pump riser)	Titeflex
Flow Limiter	Griswold 14 gpm (Vaults 3 through 6) and 35 gpm (Vault 2)
Electrical Conduit	Cantex
Insulated Wire	American
Electrical Cable	Belden
Meter Box and Components	Milbank
Electrical Control Panel "MDP" and Components	Square "D"
Ground Fault Receptacles	Leviton
PVC In-Vault Electrical Boxes	Staglin
12 Pole Contactor	Square "D"
Heat Trace Cable and Thermostat	Raychem
Fiberglass Vault Pipe Insulation	Manville
Cellular Glass Underground Pipe Insulation	Foamglass
Exterior Vault Insulation	UCI
7-inch HDPE, 3-inch PP Double Wall Piping	George Fischer
Monitoring Well Screen	Houston Screen
Portland Cement	Canada Cement LaFarge Ltd.

LIST OF EQUIPMENT
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK
PAGE 3 OF 3

ITEM	MANUFACTURER OR SUPPLIER
Bentonite Pellets	PDG Co.
Silica Sand	Ricci Brothers Co.
10-inch Diameter Polypro. Pipe	Harrison Machine and Plastics Corp.
Powdered Bentonite	Riverside Chemical Co.
Geo-Textile	AHH Harris
Auto Sampler Connection	Cole Parmer

F/N: FINAL\APPENDIX.D

APPENDIX E

WELL BORING AND INSTALLATION LOGS

APPENDIX E-1

WELL BORING AND INSTALLATION LOGS

Extraction Wells

RECORD OF DRILLHOLE EW-1

Sheet 1 of 1

PROJECT: TDS CQA OFFSITE
PROJECT NO: 923-6055
LOCATION: WHEATFIELD, NY

BORING METHOD: SEE NOTES
DRILLING DATE: SEE NOTES
DRILL RIG: SEE NOTES

DATUM: MSL
COORDINATES N: 1128515.43
AZIMUTH: N/A

COLLAR ELEV: 569.0
E: 408488.29
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, I-Irregular
P-Polished, K-Slikensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	DESCRIPTION	GRAPHIC LOG	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD	FRACTURES PER FOOT	DISCONTINUITY DATA: DIP wrt CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: GRAPHIC LOG	WEATHERING INDEX	STRENGTH INDEX
0	Soil not sampled											
5												
10												
15	12.4-17.0 ft. bgs Auger refusal at 12.4 ft. bgs. Rock not sampled to casing depth 17.0 ft. bgs.											
20	17.0-32.0 ft. bgs. Fresh, med. gray, fine grained, thinly bedded to laminated DOLOSTONE, bedding partings are argillaceous or gypsum coated to 3mm with the gypsum coatings tending to weather out. ZONE 1 23.4-23.7 ft. bgs OOLITIC ZONE		17.00	1	71							
			21.20	2	86							
25			23.40	3	98							
30	32.0-34.6 ft. bgs. Fresh, med. brownish gray, med. grained, med. bedded gypsiferous stylolitic DOLOSTONE with thinly interbedded zones. Top and bottom of bed marked by distinct stylolites. A MARKER BED		28.40	4	100							
35	34.6-36.2 ft. bgs Fresh, light to med. brownish gray, fine to med. grained, med. to thickly bedded, massive textured stylolitic DOLOSTONE with some distinct gypsiferous beds and occasional faintly porous, pitted beds. ZONE 2		31.90	5	100							
	Coring terminated at 36.2 ft. bgs. 8 in. bore terminated at 36.0 ft. bgs.		36.20									
40												

NOTES

SOIL AUGERED 12/8/92 BY K. DANSER WITH CME-55 (12.5 IN SSA).

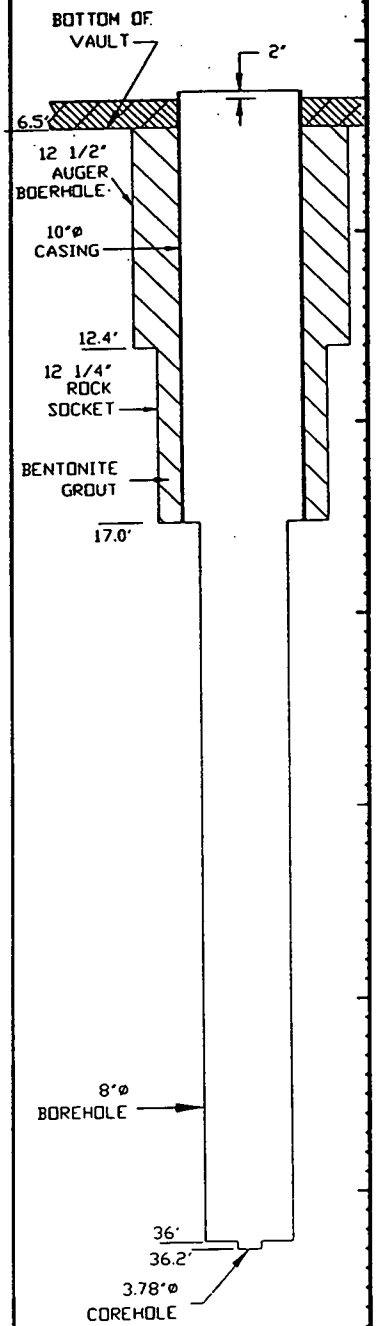
CASING SOCKET CUT 12/10/92 BY R. PARKS WITH SK-35 (12 1/4 IN. TRICONE BIT).

ROCK CORED 12/14/92 BY K. DANSER WITH CME-55 HW.

ROCK REAMED 12/16/92 BY R.PARKS WITH SK-35 (8 IN. DOWNHOLE HAMMER).

HOLE PRODUCED 30+ GPM WATER AFTER 28 FT. BGS. WHILE CORING AND 50+ GPM WHILE REAMING.

WELL INSTALLATION WELL SKETCH



DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: SEE NOTES

LOGGED: D. WEHN
CHECKED: ALG
DATE: SEE NOTES

Golder Associates

RECORD OF DRILLHOLE EW-2

Sheet 1 of 1

PROJECT: TDS CQA OFFSITE
PROJECT NO: 923-9055
LOCATION: WHEATFIELD, NY

BORING METHOD: SEE NOTES
DRILLING DATE: SEE NOTES
DRILL RIG: SEE NOTES

DATUM: MSL
COORDINATES N: 1128189.24
AZIMUTH: N/A

COLLAR ELEV: 568.2
E: 408487.69
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, I-Irregular
P-Polished, K-Slikensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	DESCRIPTION	GRAPHIC LOG	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD 80 60 40 20	FRACTURES PER FOOT 2 4 6 8 10	DISCONTINUITY DATA: DIP wrt CORE AXIS 0 30 60 90	TYPE AND SURFACE DESCRIPTION	GRAPHIC LOG	WEATHERING INDEX: FR SW MW HW CW	STRENGTH INDEX: R6 R5 R4 R3 R2 R1
0	Soil not sampled											
15	15.0-21.0 ft. bgs. Auger refusal at 15.0 ft. bgs. Rock not sampled to casing depth of 21.0 ft. bgs.											
20	21.0-33.1 ft. bgs. Fresh, med. gray, fine grained, thinly bedded to laminated DOLOSTONE, bedded partings are argillaceous or gypsum coated to 3mm with the gypsum coated tending to weather out. ZONE 1		21.00	1	85							
25	24.5-24.75 ft. bgs OOLITIC ZONE		25.10	2	100							
30	33.1-36.3 ft. bgs. Fresh, med. brownish gray, med. grained, med. bedded gypsiferous stylolitic DOLOSTONE with thinly interbedded zones. Top and bottom of bed marked by distinct stylolites. A MARKER BED		30.00	3	90							
35	36.3-37.6 ft. bgs Fresh, light to med. browish gray, fine to med. grained , med. to thickly bedded, massive textured stylolitic DOLOSTONE with some distinct gysiferous beds and occasional faintly porous, pitted beds ZONE 2		33.00	4	88							
			35.50	5	90							
	Coring terminated at 37.6 ft. bgs. 8 in. bore terminated at 37.0 ft. bgs.		37.60									
40												

NOTES

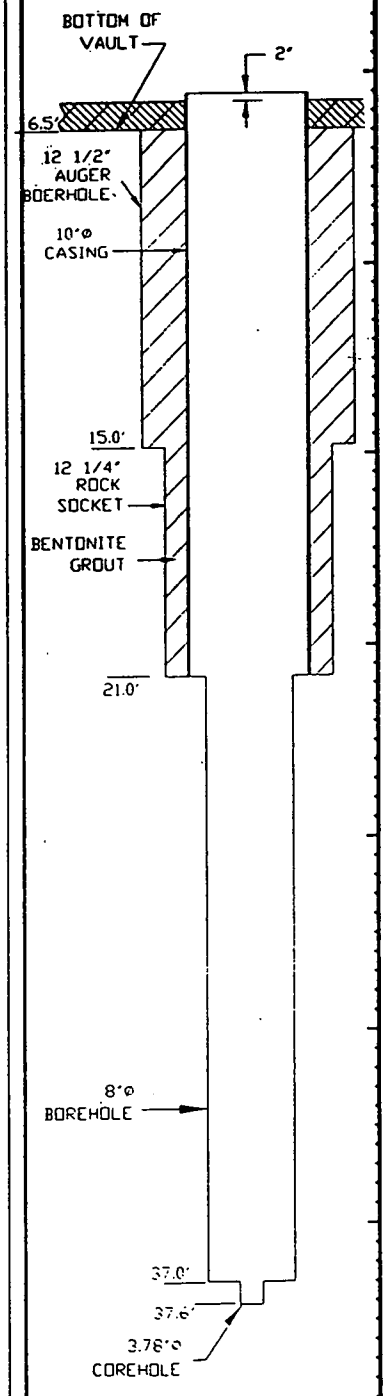
SOIL AUGERED 12/3/92 BY L. SCHROEDER WITH CME-55 (12.5 IN. SSA)

CASING SOCKET CUT 12/4/92 BY R. PARKS WITH SK-35 (12.25 IN. TRICONE BIT)

ROCK CORED 12/7/92 BY K. DANSER WITH CME-55 (HW)

ROCK REAMED 12/9/92 BY R. PARKS WITH SK-35 (8 IN. DOWNHOLE HAMMER)

WELL INSTALLATION WELL SKETCH



DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: SEE NOTES

LOGGED: D. WEHN
CHECKED:
DATE: SEE NOTES

Golder Associates

RECORD OF DRILLHOLE EW-3

Sheet 1 of 2

PROJECT: TDS CQA OFFSITE
PROJECT NO: 923-9055
LOCATION: WHEATFIELD, NY

BORING METHOD: SEE NOTES
DRILLING DATE: SEE NOTES
DRILL RIG: SEE NOTES

DATUM: MSL
COORDINATES N: 1127866.87
AZIMUTH: N/A

COLLAR ELEV: 569.6
E: 408486.88
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, I-Irregular
P-Polished, K-Slikensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	ROCK TYPE DESCRIPTION	GRAPHIC LOG	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD	FRACTURES PER FOOT	DISCONTINUITY DATA: DIP wrt CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: GRAPHIC LOG	WEATHERING INDEX	STRENGTH INDEX
0	Soil not sampled											
5												
10												
15												
20	16.8-21.8 ft. bgs. Auger refusal at 16.8 ft. bgs. Rock not sampled to casing depth of 21.8 ft. bgs.											
25	21.8-36.6 ft. bgs. Fresh, medium gray, fine grained, thinly bedded to laminated DOLOSTONE, bedding partings are argillaceous or gypum coated to 3mm with the gypsum coating tending to weather out. 27.2-27.7 ft. bgs OOLITIC ZONE ZONE 1		21.80	1	63							
			24.80	2	88							
30			30.00	3	94							
			33.20	4	100							
35	36.6-39.5 ft. bgs. Fresh, med. brownish gray, med. grained,med. bedded gypsiferousstylolitic DOLOSTONE withthinly interbedded zones.Top and bottom of bed markedby distinct stylolites. A MARKER BED		36.40	5	98							
40	See sheet 2 for description.		39.50									

NOTES

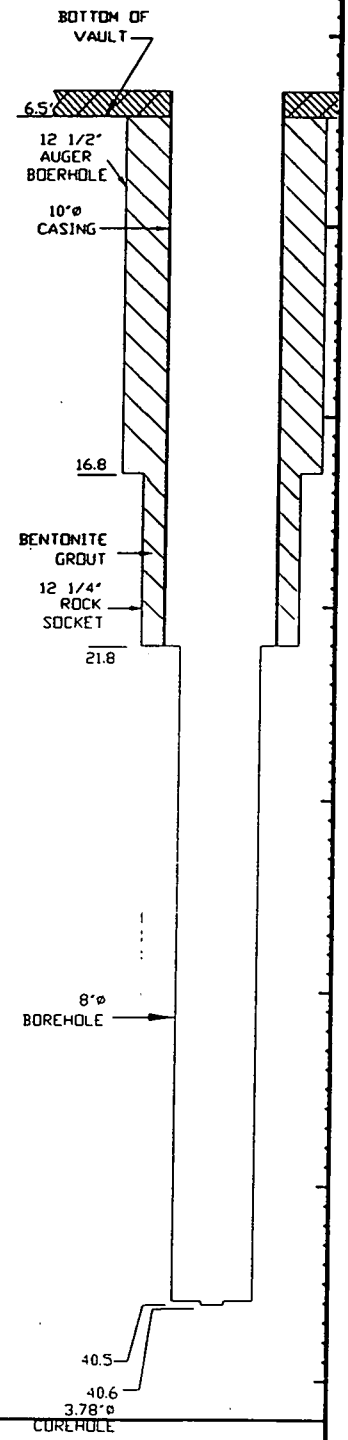
SOIL AUGERED 11/24/92 BY L.SCHROEDER WITH CME-55 (12.5 IN SSA).

CASING SOCKET CUT 11/30/92 BY R. PARKS WITH SK-35 (12 1/4 IN. TRICONE BIT).

ROCK CORED 12/02/92 BY L. SCHROEDER WITH CME-55 (12.5 IN. SSA).

ROCK REAMED 12/03/92 BY R.PARKS WITH SK-35 (8 IN.DOWNHOLE HAMMER).

WELL INSTALLATION WELL SKETCH



DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: SEE NOTES

LOGGED: D. WEHN
CHECKED: [illegible]
DATE: SEE NOTES

Golder Associates

RECORD OF DRILLHOLE EW-3

PROJECT: TDS CQA OFFSITE
PROJECT NO: 923-9055
LOCATION: WHEATFIELD, NY

BORING METHOD: SEE NOTES
DRILLING DATE: SEE NOTES
DRILL RIG: SEE NOTES

DATUM: MSL
COORDINATES N: 1127866.87
AZIMUTH: N/A

COLLAR ELEV: 569.6
E: 408486.88
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, I-Irregular
P-Polished, K-Slickensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	ROCK TYPE / DESCRIPTION	GRAPHIC LOG	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD (60 80 40 20)	FRACTURES PER FOOT (2 4 6 8 10)	DISCONTINUITY DATA: DIP wrt CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: GRAPHIC LOG	WEATHERING INDEX (SW FR MW HW CW)	STRENGTH INDEX (R6 R5 R4 R3 R2 R1)	NOTES WELL INSTALLATION WELL SKETCH
40	39.5-40.6 ft. bgs Fresh light to med. brownish gray, fine to med. grained, med. to thickly bedded, massive textured stylolitic DOLOSTONE with some distinct gypsiferous beds and occasional fairly porous, pitted beds. ZONE 2			5	96								
			40.60										
45	Coring terminated at 40.6 ft. bgs. 8 in bore terminated at 40.5 ft. bgs.												
50													
55													
60													
65													
70													
75													
80													

DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: SEE NOTES

LOGGED: D. WEHN
CHECKED:
DATE: SEE NOTES

Golder Associates

RECORD OF DRILLHOLE EW-4

Sheet 1 of 1

PROJECT: TDS CQA OFFSITE
PROJECT NO: 923-9055
LOCATION: WHEATFIELD, NY

BORING METHOD: SEE NOTES
DRILLING DATE: SEE NOTES
DRILL RIG: SEE NOTES

DATUM: MSL
COORDINATES N: 1127565.95
AZIMUTH: N/A

COLLAR ELEV: 570.1
E: 408486.66
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, I-Irregular
P-Polished, K-Slikensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	DESCRIPTION	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD	FRACTURES PER FOOT	DISCONTINUITY DATA: DIP wrt CORE AXIS	TYPE AND SURFACE DESCRIPTION	WEATHERING INDEX (SW FR, MW, HW, CW)	STRENGTH INDEX (R6, R5, R4, R3, R2, R1)
0	Soil not sampled									
15	15.0-18.9 ft. bgs. Auger refusal at 16.0 ft. bgs. Rock not sampled to casing depth of 18.9 ft. bgs.									
20	18.9-35.4 ft. bgs. Fresh, med. gray, fine grained, thinly bedded to laminated DOLOSTONE, bedded partings are argillaceous or gypsum coated to 3mm with the gypsum coated tending to weather out. ZONE 1 26.5-26.8 ft. bgs OOLITIC ZONE	18.90	1	64						
25		23.90	2	98						
30	35.4-38.1 ft. bgs. Fresh, med. brownish gray, med. grained, med. bedded gypsiferous stylolitic DOLOSTONE with thinly interbedded zones. Top and bottom of bed marked by distinct stylolites. A MARKER BED	28.90	3	100						
35	38.1-39.4 ft. bgs Fresh, light to med. browish gray, fine to med. grained , med. to thickly bedded, massive textured stylolitic DOLOSTONE with some distinct gysiferous beds and occasional faintly porous, pitted beds ZONE 2	33.80	4	100						
		37.10	5	100						
		38.30	6	100						
40	Coring terminated at 39.4 ft. bgs. 8 in. bore terminated at 40.1 ft. bgs.	39.40								

NOTES

SOIL AUGERED 11/4/92 BY B. TRUAX WITH HUGHES DIGGER LDH (14 IN SSA).

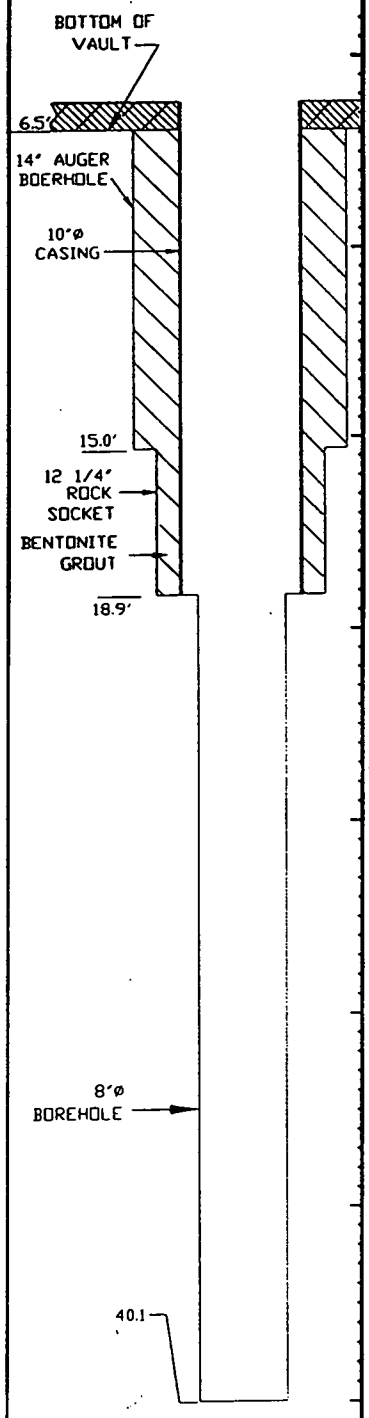
CASING SOCKET CUT 11/10/92 BY D. NUWER WITH IR T-4 (12 1/4 IN. TRICONE BIT)

ROCK CORED 11/11/92 BY C. NICOMETI WITH CME-55 (HW).

ROCK REAMED 11/19/92 BY R.PARKS WITH SK-35 (7 3/4 IN. TRICONE BIT.

HOLE PRODUCED 2.5+ GPM WATER BELOW 24 FT. BGS.

WELL INSTALLATION WELL SKETCH



DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: SEE NOTES

LOGGED: D. WEHN
CHECKED: MLG
DATE: SEE NOTES

Golder Associates

RECORD OF DRILLHOLE EW-5

Sheet 1 of 1

PROJECT: TDS COA OFFSITE
PROJECT NO: 923-9055
LOCATION: WHEATFIELD, NY

BORING METHOD: SEE NOTES
DRILLING DATE: SEE NOTES
DRILL RIG: SEE NOTES

DATUM: MSL
COORDINATES N: 1127265.02
AZIMUTH: N/A

COLLAR ELEV: 568.2
E: 408486.09
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, I-Irregular
P-Polished, K-Slikensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	ROCK TYPE DESCRIPTION	GRAPHIC LOG	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD	FRACTURES PER FOOT	DISCONTINUITY DATA: DIP wrt CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: GRAPHIC LOG	WEATHERING INDEX	STRENGTH INDEX
0	Soil not sampled											
5												
10												
15												
20	16.0-21.0 ft. bgs. Auger refusal at 16.0 ft. bgs. Rock not sampled to 19.0 ft. bgs. casing re-set after 1st core rune to 21.0 ft. bgs. 19.0-35.5 ft. bgs. Fresh, med. gray, fine grained, thinly bedded to laminated DOLOSTONE, bedded partings are argillaceous or gypsum coated to 3mm with the gypsum coated tending to weather out. ZONE 1		21.00	1	50							
25			24.50	2	100							
30	35.5-38.6 ft. bgs. Fresh, med. brownish gray, med. grained, med. bedded gypsiferous stylolitic DOLOSTONE with thinly interbedded zones. Top and bottom of bed marked by distinct stylolites. A MARKER BED		29.10	3	96							
			31.40	4	97							
35	38.6-39.0 ft. bgs Fresh, light to med. browish gray, fine to med. grained, med. to thickly bedded, massive textured stylolitic DOLOSTONE with some distinct gysiferous beds and occasional faintly porous, pitted beds ZONE 2		34.60	5	100							
40	Coring terminated at 39.0 ft. bgs. 8 in. bore terminated at 39.6 ft. bgs.		39.00									

NOTES

SOIL AUGERED 11/3/92 BY B.TRUAX WITH HUGHES DIGGER LDH (14 IN. SSA).

CASING SOCKET CUT 11/10/92 BY D. NUWER WITH IR T-4 (12 1/4 IN. TRICONE BIT).

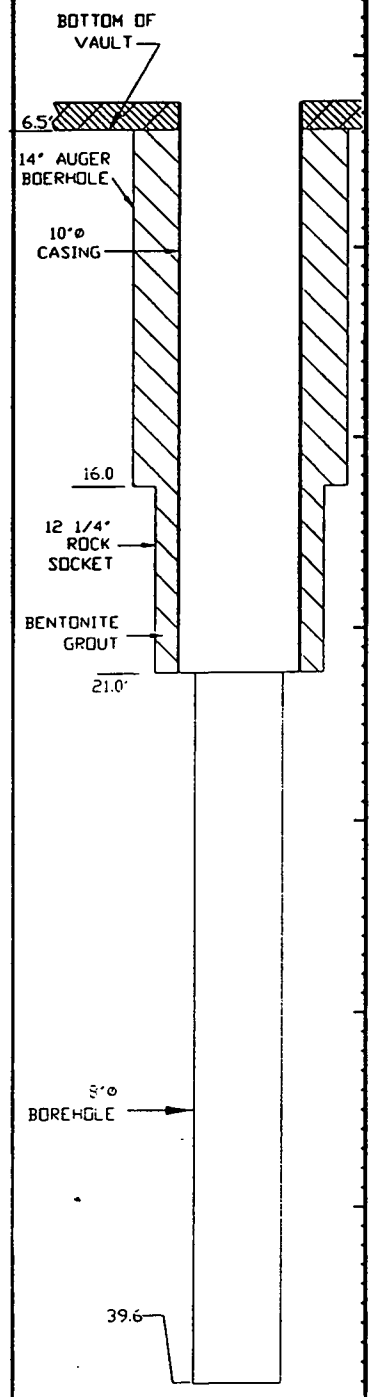
RUN ONE CORED 11/12/92 BY C. NICOMETI WITH CME-55(HW).

CASING SOCKET DEEPENED FROM 19.0 FT. BGS. TO 21.0 FT. BGS. 11/19/92 BY R. PARKS WITH SK-35 (12 1/4 IN. TRICONE BIT)

RUNS TWO-FIVE CORED 12/24/92 BY C. NICOMETI WITH CME-55 (HW).

ROCK REAMED 11/24/92 BY R. PARKS WITH SK-35 (8 IN. DOWN-HOLE HAMMER).

WELL INSTALLATION WELL SKETCH



DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: SEE NOTES

LOGGED: D. WEHN
CHECKED: M.L.G.
DATE: SEE NOTES

Golder Associates

RECORD OF DRILLHOLE EW-6

PROJECT: TDS CQA OFFSITE
PROJECT NO: 923-6055
LOCATION: WHEATFIELD, NY

BORING METHOD: SEE NOTES
DRILLING DATE: SEE NOTES
DRILL RIG: SEE NOTES

DATUM: MSL
COORDINATES N: 1126966.87
AZIMUTH: N/A

COLLAR ELEV: 569.5
E: 408486.29
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, I-Irregular
P-Polished, K-Slikensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	ROCK TYPE DESCRIPTION	GRAPHIC LOG	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD (80 60 40 20)	FRACTURES PER FOOT (2 4 6 8 10)	DISCONTINUITY DATA: DIP wrt CORE AXIS (0 30 60 90)	TYPE AND SURFACE DESCRIPTION	GRAPHIC LOG	WEATHERING INDEX (SW FR MW HW CW)	STRENGTH INDEX (R6 R5 R4 R3 R2 R1)
0	Soil not sampled											
20	19.0-24.0 ft. bgs. Auger refusal at 19.0 ft. bgs. Rock not sampled to casing depth of 24.0 ft. bgs.											
25	24.0-40.8 ft. bgs. Fresh, med. gray, fine grained, thinly bedded to laminated DOLOSTONE, bedded partings are argillaceous or gypsum coated to 3mm with the gypsum coated tending to weather out. ZONE 1		24.00	1	56							
30			29.00	2	100							
35			30.50	3	88							
40			35.40	4	100							

NOTES

SOIL AUGERED 11/10/92 BY C.NICOMETI WITH CME-55 (12.5 IN SSA).

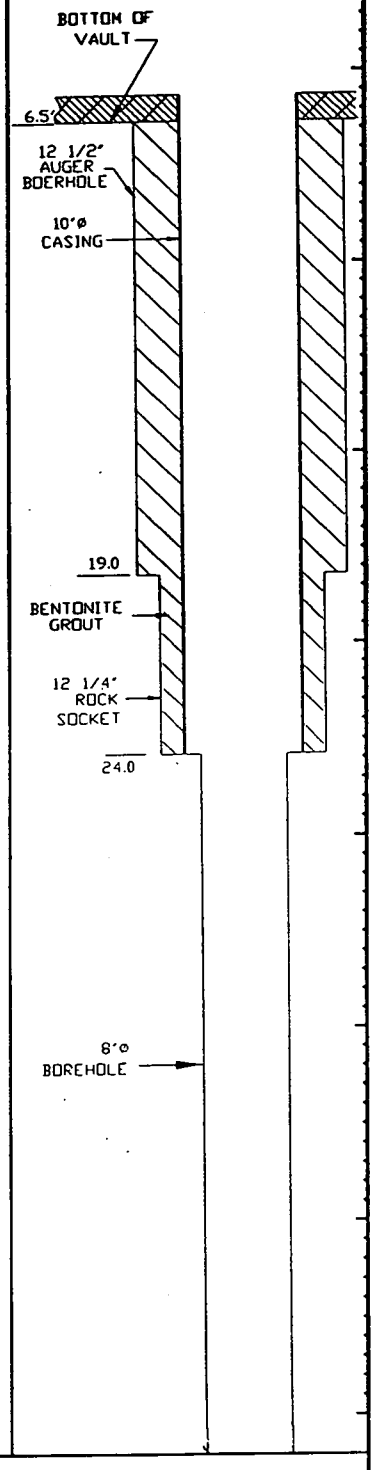
CASING SOCKET CUT 11/11/92 TO APPROX. 21.0 FT. BGS. BY D. NUWER WITH IR T-4 FINISHED 11/18/92 BY R. PARKS WITH SK-35 (12 1/4 IN. TRICONE BIT).

ROCK CORED 11/20/92 BY C. NICOMETI WITH CME-55 (HW).

ROCK REAMED 11/24/92 BY R. PARKS WITH SK-35 (8 IN DOWN-HOLE HAMMER).

30.5-31.3 FT. BGS. EXTENSIVELY FRACTURED ZONE.

WELL INSTALLATION WELL SKETCH



DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: SEE NOTES

LOGGED: D. WEHN
CHECKED: RLG
DATE: SEE NOTES

Golder Associates

RECORD OF DRILLHOLE EW-6

PROJECT: TDS CQA OFFSITE
PROJECT NO: 923-6055
LOCATION: WHEATFIELD, NY

BORING METHOD: SEE NOTES
DRILLING DATE: SEE NOTES
DRILL RIG: SEE NOTES

DATUM: MSL
COORDINATES N: 1126966.87
AZIMUTH: N/A

COLLAR ELEV: 569.5
E: 408486.29
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, I-Irregular
P-Polished, K-Slikensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	ROCK TYPE DESCRIPTION	GRAPHIC LOG	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD (80 40 20)	FRACTURES PER FOOT (2 4 6 8 10)	DISCONTINUITY DATA: DIP wrt CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: GRAPHIC LOG	WEATHERING INDEX (SW FR MW HW CW)	STRENGTH INDEX (R6 R5 R4 R3 R2 R1)	NOTES WELL INSTALLATION WELL SKETCH
40				4	100								40.5
	40.8-43.9 ft. bgs. Fresh, med. brownish gray, med. grained, med. bedded gypsiferous stylolitic DOLOSTONE with thinly interbedded zones. Top and bottom of bed marked by distinct stylolites. A MARKER BED		40.00	5	100								
			42.60	6	86								
45			44.70										
	43.9-44.7 ft. bgs Fresh, light to med. browish gray, fine to med. grained, med. to thickly bedded, massive textured stylolitic DOLOSTONE with some distinct gysiferous beds and occasional faintly porous, pitted beds ZONE 2												
50	Coring terminated at 44.7 ft. bgs. 8 in. bore terminated at 45.1 ft. bgs.												
55													
60													
65													
70													
75													
80													

DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: SEE NOTES

LOGGED: D. WEHN
CHECKED: AJG
DATE: SEE NOTES

Golder Associates

APPENDIX E-2

WELL BORING AND INSTALLATION LOGS

Monitoring Wells

PROJECT: TDS/CQA OFF-SITE

RECORD OF BOREHOLE 93-01(1)

SHEET: 1 OF 1

PROJECT LOCATION: WHEATFIELD, NEW YORK

BORING DATE: 2/5/93

DATUM: MSL

PROJECT NUMBER: 923-9055

BORING LOCATION: WHEATFIELD, NEW YORK

COORDINATES:

GROUND ELEVATION: 575.59

TOC ELEVATION: 578.37

N: 1127971.80 E: 407662.32

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV / DEPTH	SAMPLES: NUMBER	TYPE	BLOWS / 6 in	N	REC/ATT	PIEZOMETER INSTALLATION: NOTE / WELL SKETCH
0		0-1.1 ft. bgs. TOPSOIL									
		1.1-9.7 ft. bgs. Moist, predominantly brown with red and grey mottling, SILTY CLAY SILTY SAND lens from 2.6-3.0 ft. bgs. LACUSTRINE CLAY			1.00	1	SS	1-2-4-5	0	1.3/2	
						2	SS	3-2-3-6	0	1.5/2	
5						3	SS	7-14-14-15	0	1.9/2	
						4	SS	6-8-10-11	0	1.6/2	
						5	SS	1-1-1-9	0	2/2	
10		9.7-13.0 ft. bgs. Compact, red-brown SAND AND SILT with some gravel and clay. TILL			9.70	6	SS	4-6-12-10	0	0.9/2	
		Auger Refusal at 13.0 ft. bgs. See next page for rock core log descriptions.			13.00	7	SS	3-26-44-103	0	1.3/2	
15											
20											
25											
30											
35											
40											

DRILL RIG: D-50

DRILLING CONTRACTOR: BUFFALO DRILLING CO.

DRILLER: C. NICOMETI

Golder Associates

LOGGED: D. WEHN

CHECKED: RLG

DATE: 4/29/94

PROJECT: TDS/CQA OFF-SITE

RECORD OF BOREHOLE 93-02(1)

SHEET: 1 OF 1

PROJECT LOCATION: WHEATFIELD, NEW YORK

BORING DATE: 1/27/93

DATUM: MSL

PROJECT NUMBER: 923-9055

BORING LOCATION: WHEATFIELD, NEW YORK

COORDINATES:

GROUND ELEVATION: 576.39

TOC ELEVATION: 579.05

N: 1127959.02

E: 408379.54

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV / DEPTH	SAMPLES: NUMBER	TYPE	BLOWS / 6 in	N	REC/ATT	PIEZOMETER INSTALLATION: NOTE / WELL SKETCH
0		0-0.6 ft. bgs. TOPSOIL			0.60	1	SS	1-2-4-4	0	1.4/2	
		0.6-8.0 ft. bgs. Moist to dry, soft to stiff, red-brown mottled SILTY CLAY				2	SS	6-6-12-14	0	1.8/2	
5		LACUSTRINE CLAY				3	SS	4-8-12-20	0	1.8/2	
						4	SS	5-8-11-13	0	1.2/2	
		8.0-16.9 ft. bgs. Compact, red-brown SAND AND SILT with some gravel and clay. TILL			8.00	5	SS	4-5-6-9	0	1.7/2	
10						6	SS	7-54-37-59	0	1.4/2	
						7	SS	14-57-40-40	0	1.4/2	
15						8	SS	20-34-16-14	0	1.5/2	
						9	SS	70-00	0	0/1	
		Auger Refusal at 16.9 ft. bgs. See next page for rock core log descriptions.			16.90						
20											
25											
30											
35											
40											

DRILL RIG: D-50

DRILLING CONTRACTOR: BUFFALO DRILLING CO.

DRILLER: C. NICOMETI

Golder Associates

LOGGED: D. WEHN

CHECKED: RLG

DATE: 4/2/94

PROJECT: TDS/CQA OFF-SITE

RECORD OF BOREHOLE 93-03(1)

SHEET: 1 OF 1

PROJECT LOCATION: WHEATFIELD, NEW YORK

BORING DATE: 2/11/93

DATUM: MSL

PROJECT NUMBER: 923-9055

BORING LOCATION: WHEATFIELD, NEW YORK

COORDINATES:

GROUND ELEVATION: 569.97

TOC ELEVATION: 572.30

N: 1126667.15

E: 408486.48

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV / DEPTH	SAMPLES: NUMBER	TYPE	BLOWS / 6 in	N	REC/ATT	PIEZOMETER INSTALLATION: NOTE / WELL SKETCH
0		0-0.2 ft. bgs. TOPSOIL			0.20						
		0.2-14.7 ft. bgs. Moist, soft to firm predominantly red-brown with brown and grey mottling, SILTY CLAY LACUSTRINE CLAY				1	SS	4-2-3-3	0	0.8/2	
						2	SS	4-8-7-15	0	1.2/2	
5						3	SS	10-16-19-24	0	1.8/2	
						4	SS	4-6-5-4	0	2/2	
						5	SS	2-2-3-4	0	1.8/2	
10						6	SS	2-3-3-3	0	2/2	
						7	SS	WR-WH-WH-2	0	2/2	
15		14.7-17.4 ft. bgs. Compact, red-brown SAND AND SILT with some gravel, trace silt. TILL			14.70	8	SS	2-3-10-25	0	1.5/2	
						9	SS	9-47-100/.4	0	1/1.4	
		Auger Refusal at 17.4 ft. bgs. See next page for rock core log descriptions.			17.40						
20											
25											
30											
35											
40											

DRILL RIG: D-50

DRILLING CONTRACTOR: BUFFALO DRILLING CO.

DRILLER: C. NICOMETI

Golder Associates

LOGGED: D. WEHN

CHECKED: Ali

DATE: 4/2/94

RECORD OF DRILLHOLE 93-01(1)

Sheet 1 of 2

PROJECT: TDS COA OFFSITE
PROJECT NO: 823-8055
LOCATION: WHEATFIELD, NY

BORING METHOD: NX CORE - AIR
DRILLING DATE: 2/8/93
DRILL RIG: D-50

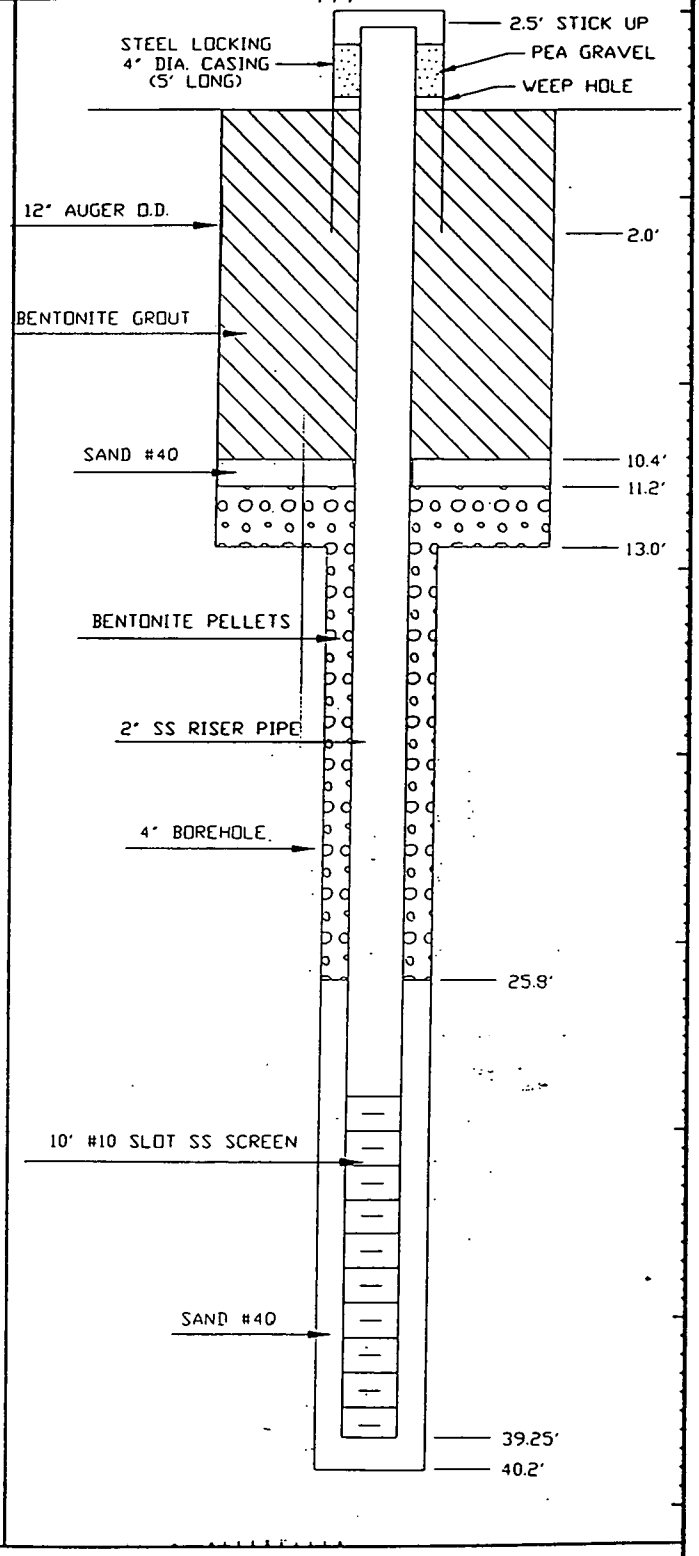
DATUM: MSL
COORDINATES N: 1127971.80
AZIMUTH: N/A

COLLAR ELEV: 578.37
E: 407662.32
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, Irregular
P-Polished, K-Slikensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	ROCK TYPE / DESCRIPTION	GRAPHIC LOG	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD	FRACTURES PER FOOT	DISCONTINUITY DATA: DIP wrt CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: GRAPHIC LOG	WEATHERING INDEX (SW FR, MW HW CW)	STRENGTH INDEX (R5 R6, R4 R3 R2 R1)
0	See previous page for soil boring log descriptions											
5												
10												
15	13.0-36.3 ft. bgs Fresh, med. gray, fine grained, thinly bedded to laminated DOLOSTONE, bedding partings are argillaceous or, more commonly, gypsum coated to 3 mm with the gypsum coatings tending to weather out. ZONE 1			1	26							
20			23.40									
25				2	34							
30			32.10	3	81							
35	36.3-39.1 ft. bgs. Fresh, med. brownish gray, med. grained, med. bedded gypsiferous stylolitic DOLOSTONE with thinly a interbedded zone. Top and bottom of bed are marked by distinct stylolites. A MARKER BED		34.10	4	100							
			36.20	5	100							
			37.90	6	95							
40	39.1-40.1 ft. bgs.											

NOTES
WELL INSTALLATION
WELL SKETCH



DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: C. NICOMETI

LOGGED: D. WEHN
CHECKED: PLG
DATE: 4/20/94

Golder Associates

RECORD OF DRILLHOLE 93-01(1)

PROJECT: TDS CQA OFFSITE
PROJECT NO: 923-9055
LOCATION: WHEATFIELD, NY

BORING METHOD: NX CORE - AIR
DRILLING DATE: 2/8/93
DRILL RIG: D-50

DATUM: MSL
COORDINATES N: 1127971.80
AZIMUTH: N/A

COLLAR ELEV: 578.37
E: 407662.32
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, I-Irregular
P-Polished, K-Slickensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	ROCK TYPE / DESCRIPTION	GRAPHIC LOG	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD	FRACTURES PER FOOT	DISCONTINUITY DATA: DIP wrt CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: GRAPHIC LOG	WEATHERING INDEX	STRENGTH INDEX	NOTES / WELL INSTALLATION / WELL SKETCH
40	Fresh, light to med. brownish gray, fine to med. grained, med. to thickly bedded, massive textured stylolitic DOLOSTONE with some distinct gypsiferous beds and occasional faintly porous, pitted beds. ZONE 2		40.10	6	95	80 60 40 20	2 4 6 8 10	0 30 60 90			SW FR MW HW CW	R5 R6 R4 R3 R2 R1	
45													
50													
55													
60													
65													
70													
75													
80													

DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: C. NICOMETI

LOGGED: D. WEHN
CHECKED: AKi
DATE: 4/20/94

Golder Associates

RECORD OF DRILLHOLE 93-02(1)

Sheet 1 of 1

PROJECT: TDS COA OFFSITE
PROJECT NO: 923-9055
LOCATION: WHEATFIELD, NY

BORING METHOD: NX CORE - AIR
DRILLING DATE: 1/27/93
DRILL RIG: D-50

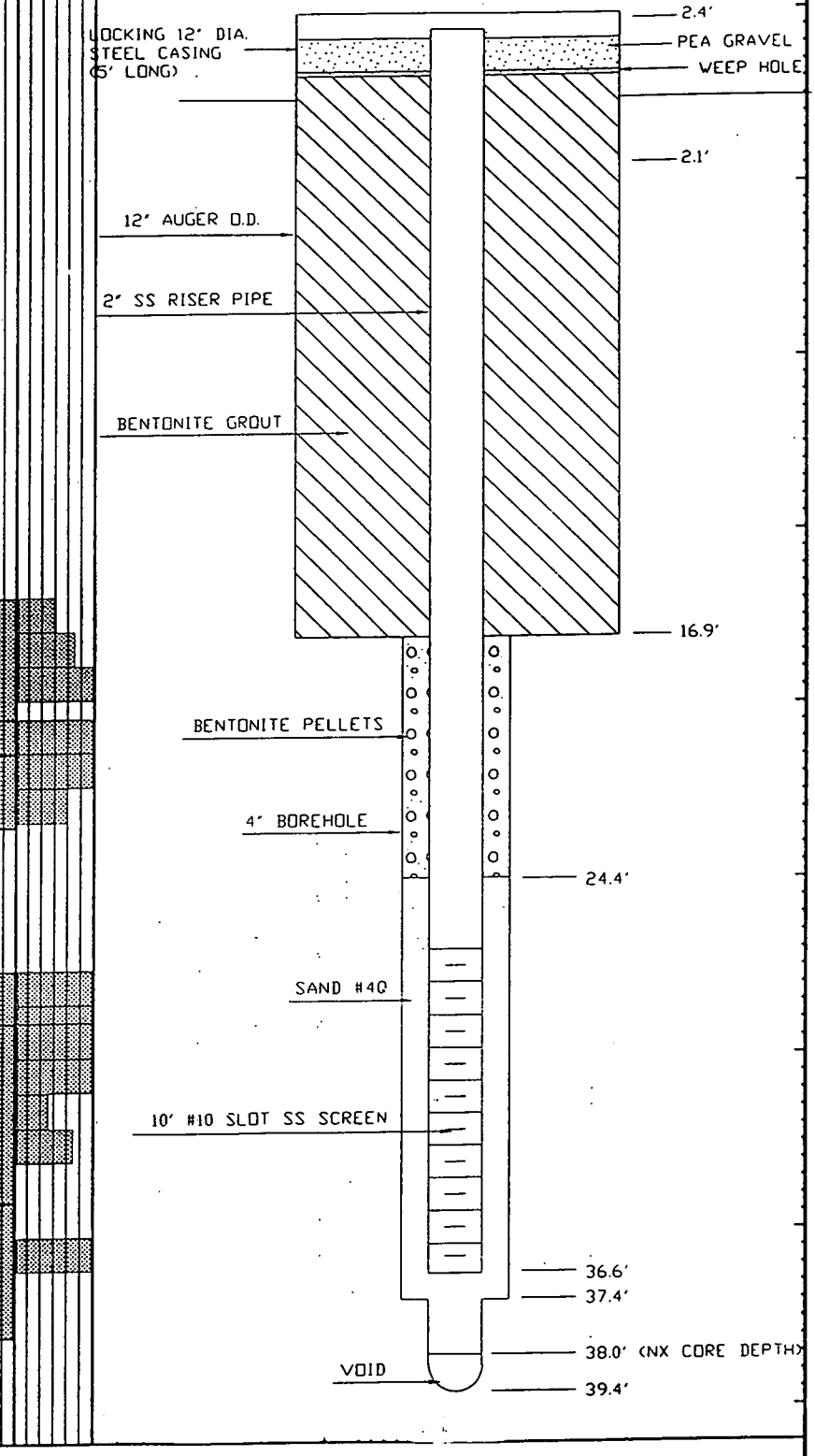
DATUM: MSL
COORDINATES N: 1127959.02
AZIMUTH: N/A

COLLAR ELEV: 579.05
E: 408379.54
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, Irregular
P-Polished, K-Slikensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	ROCK TYPE DESCRIPTION	GRAPHIC LOG	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD	FRACTURES PER FOOT	DISCONTINUITY DATA: DIP wrt CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: GRAPHIC LOG	WEATHERING INDEX (SW, FR, HW, MW, CW)	STRENGTH INDEX (R6, R5, R4, R3, R2, R1)
0	See previous page for soil boring log descriptions											
5												
10												
15												
20	16.9-32.6 ft. bgs Fresh, med. gray, fine grained, thinly bedded to laminated DOLOSTONE, bedding partings are argillaceous or, more commonly, gypsum coated to 3 mm with the gypsum coatings tending to weather out. ZONE 1		16.90	1	89							
			20.40	2	100							
			21.40	3	95							
25			23.50									
				4	93							
30	32.6-36.4 ft. bgs. Fresh, med. brownish gray, med. grained, med. bedded gypsiferous stylolitic DOLOSTONE with thinly a interbedded zone. Top and bottom of bed are marked by distinct stylolites. A MARKER BED		29.10	5	90							
35	36.4-38.0 ft. bgs. Fresh, light to med. brownish gray, fine to med. grained, med. to thickly bedded, massive textured stylolitic DOLOSTONE with some distinct gypsiferous beds and occasional faintly porous, pitted beds. ZONE 2		34.20	6	42							
40			38.00									

NOTES
WELL INSTALLATION
WELL SKETCH



DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: C. NICOMETI

LOGGED: D. WEHN
CHECKED: ALG
DATE: 4/20/94

Golder Associates

RECORD OF DRILLHOLE 93-03(1)

Sheet 1 of 2

PROJECT: TDS COA OFFSITE
PROJECT NO: 923-9055
LOCATION: WHEATFIELD, NY

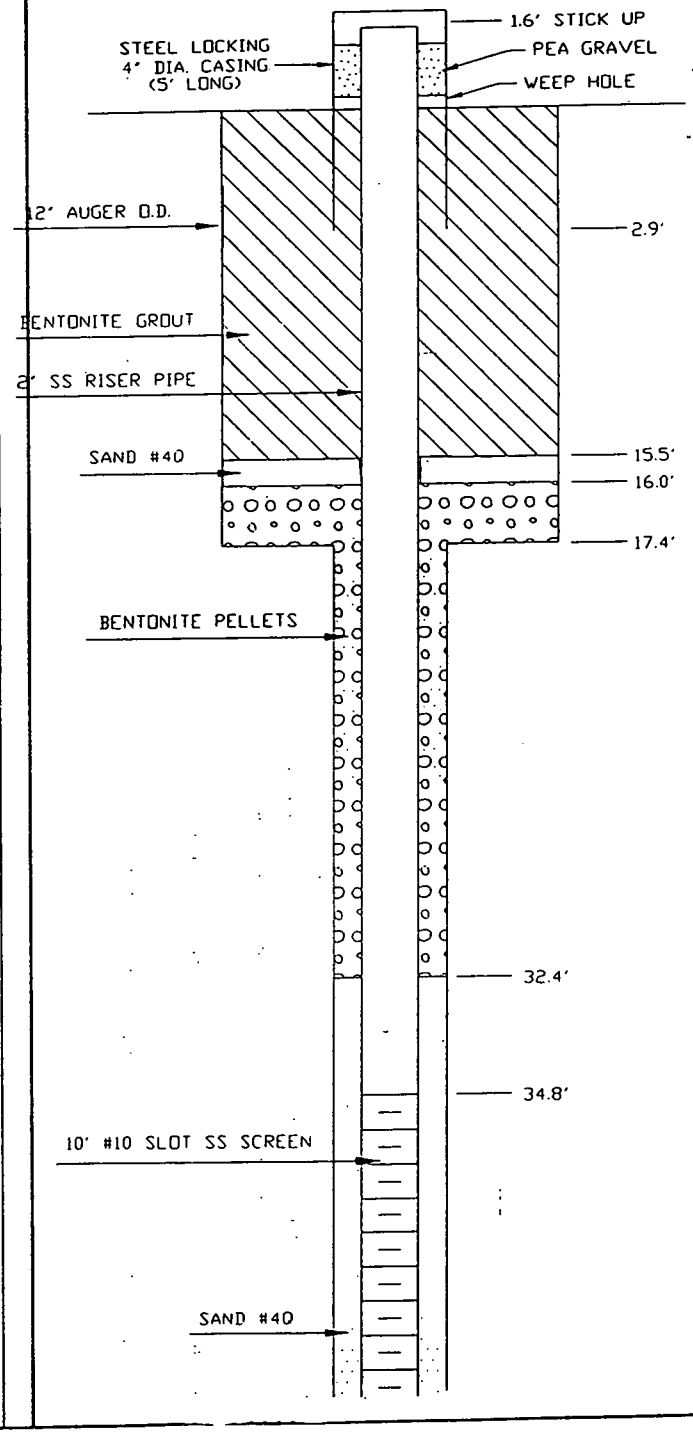
BORING METHOD: NX CORE - AIR
DRILLING DATE: 2/12/93
DRILL RIG: D-50

DATUM: MSL
COORDINATES N: 1126667.15
AZIMUTH: N/A

COLLAR ELEV: 572.30
E: 408486.48
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, I-Irregular
P-Polished, K-Slickensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	ROCK TYPE / DESCRIPTION	GRAPHIC LOG	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD	FRACTURES PER FOOT	DISCONTINUITY DATA: DIP wrt CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: GRAPHIC LOG	WEATHERING INDEX (SW FR, MW, HW, CW)	STRENGTH INDEX (R5 R6, R4, R3, R2, R1)	NOTES WELL INSTALLATION WELL SKETCH
0	See previous page for soil boring log descriptions												
5													
10													
15													
20	17.4-41.9 ft. bgs Fresh, med. gray, fine grained, thinly bedded to laminated DOLOSTONE, bedding partings are argillaceous or, more commonly, gypsum coated to 3 mm with the gypsum coatings tending to weather out. ZONE 1			1	16								
25			27.20										
30				2	4								
35			37.20	3	50								
40			38.00	4	100								
			40.00										



DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: L. SCHROEDER

LOGGED: D. WEHN
CHECKED: RLi
DATE: 4/20/94

Golder Associates

RECORD OF DRILLHOLE 93-03(1)

PROJECT: TDS COA OFFSITE
PROJECT NO: 823-9055
LOCATION: WHEATFIELD, NY

BORING METHOD: NX CORE - AIR
DRILLING DATE: 2/12/93
DRILL RIG: D-50

DATUM: MSL
COORDINATES N: 1126667.15
AZIMUTH: N/A

COLLAR ELEV: 572.30
E: 408486.48
INCLINATION: 0

J-Joint, F-Fault, S-Shear, B-Bedding, F-Foliation
PL-Planar, C-Curved, U-Undulating, ST-Stepped, I-Irregular
P-Polished, K-Slickensided, SM-Smooth, R-Rough, VR-V. Rough

DEPTH SCALE (FEET)	ROCK TYPE / DESCRIPTION	GRAPHIC LOG	ELEV / DEPTH (FT)	RUN NO.	CORE RECOVERY	RQD	FRACTURES PER FOOT	DISCONTINUITY DATA: DIP wrt CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	GRAPHIC LOG	WEATHERING INDEX	STRENGTH INDEX	NOTES WELL INSTALLATION WELL SKETCH
40			40.00	5	100								
	41.9-44.4 ft. bgs. Fresh, med. brownish gray, med. grained, med. bedded gypsiferous stylolitic DOLOSTONE with thinly a interbedded zone. Top and bottom of bed are marked by distinct stylolites. A MARKER BED		42.00	6	100								
45			45.10										44.8' 45.4'
	44.4-45.1 ft. bgs. Fresh, light to med. brownish gray, fine to med. grained, med. to thickly bedded, massive textured stylolitic DOLOSTONE with some distinct gypsiferous beds and occasional faintly porous, pitted beds. ZONE 2												
50													
55													
60													
65													
70													
75													
80													

DEPTH SCALE: 1"=5'
DRILLING CONTRACTOR: B.DRILLING CO.
DRILLER: L. SCHROEDER

LOGGED: D. WEHN
CHECKED: ALL
DATE: 4/20/94

Golder Associates

APPENDIX F

RISING HEAD TEST RESULTS AND MONITORING WELL DEVELOPMENT DATA

RISING HEAD TEST

WELL 93-02(1)
DATE OF TEST: 02/24/93

STATIC WATER DEPTH	=	11.00	FEET BELOW TOC
STANDPIPE DIAMETER	=	2.00	INCHES
SANDPACK DIAMETER	=	8.00	INCHES
TOP OF SATURATED SAND	=	26.80	FEET BELOW TOC
BOTTOM OF SANDPACK	=	40.40	FEET BELOW TOC

24 HOUR CLOCK HR	MIN	SEC	ELAPSED TIME (MIN)	DEPTH TO WATER (FT TOC)	HEAD (FEET)	HEAD RATIO (H/Ho)		LOG HEAD RATIO
12	52	10	0.00	12.35	-1.35	1.000		0.0000
12	54	45	2.58	11.62	-0.62	0.459		-0.3379
12	55	30	3.33	11.50	-0.50	0.370		-0.4314
12	56	30	4.33	11.40	-0.40	0.296	*	-0.5283
12	57	30	5.33	11.33	-0.33	0.244		-0.6118
12	58	30	6.33	11.28	-0.28	0.207		-0.6832
12	59	30	7.33	11.24	-0.24	0.178	*	-0.7501
13	0	30	8.33	11.22	-0.22	0.163		-0.7879
13	2	0	9.83	11.14	-0.14	0.104		-0.9842
13	5	0	12.83	11.14	-0.14	0.104		-0.9842

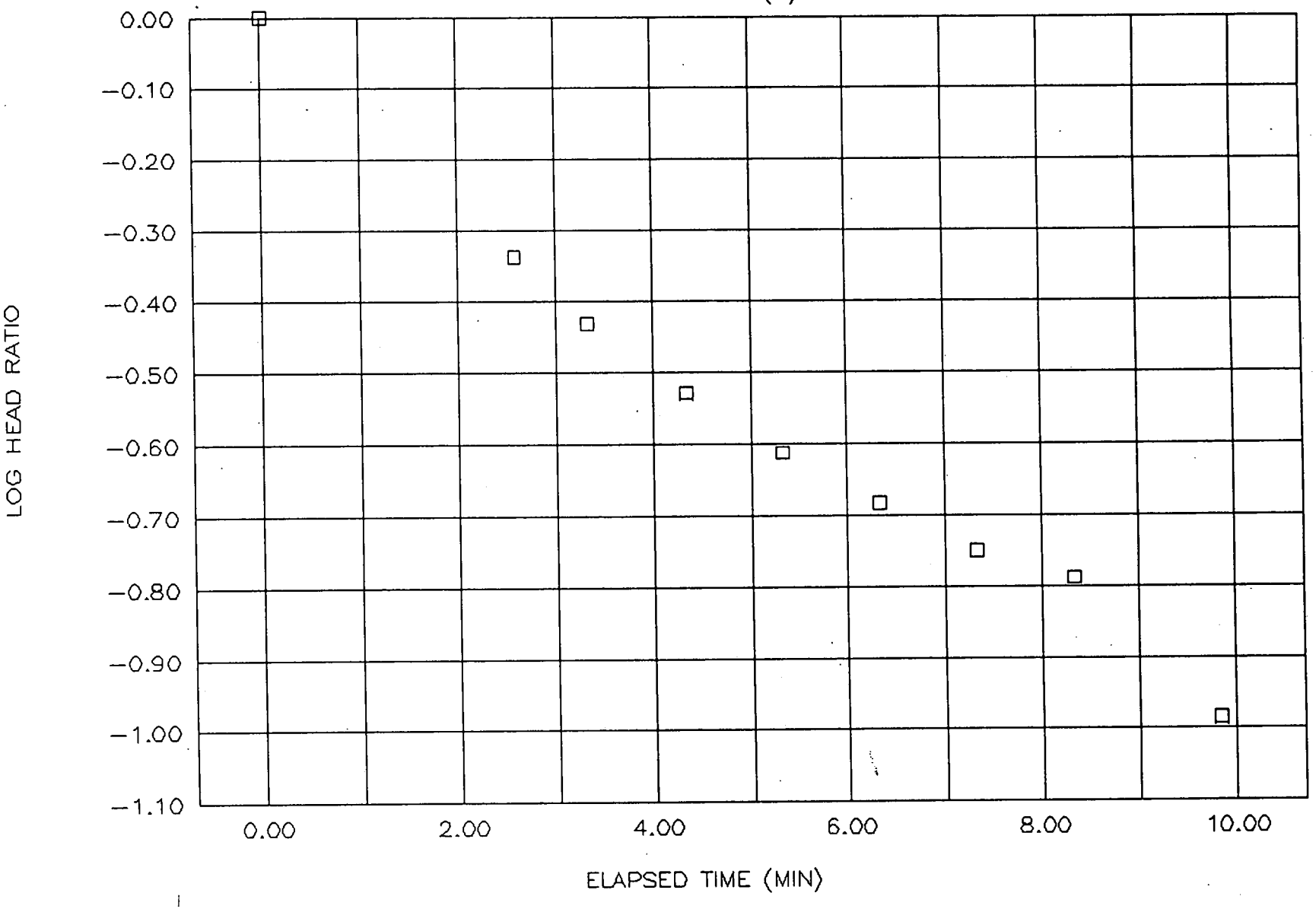
NOTES:

1) * INDICATES THE BEST FIT LINE PASSES THROUGH THESE POINTS WHICH ARE USED TO CALCULATE HYDRAULIC CONDUCTIVITY

K= 8.15E-05 CM/SEC

RISING HEAD TEST

WELL 93-02(1)



Golder Associates

RISING HEAD TEST

WELL 93-03(1)
DATE OF TEST: 02/24/93

STATIC WATER DEPTH	=	9.22	FEET BELOW TOC
STANDPIPE DIAMETER	=	2.00	INCHES
SANDPACK DIAMETER	=	8.00	INCHES
TOP OF SATURATED SAND	=	34.40	FEET BELOW TOC
BOTTOM OF SANDPACK	=	47.40	FEET BELOW TOC

24 HOUR CLOCK HR	MIN	SEC	ELAPSED TIME (MIN)	DEPTH TO WATER (FT TOC)	HEAD (FEET)	HEAD RATIO (H/Ho)		LOG HEAD RATIO
15	9	35	0.00	9.35	-0.13	1.000		0.0000
15	10	34	0.98	9.31	-0.09	0.692		-0.1597
15	12	56	3.35	9.30	-0.08	0.615	*	-0.2109
15	15	20	5.75	9.29	-0.07	0.538		-0.2688
15	20	38	11.05	9.28	-0.06	0.462	*	-0.3358

NOTES:

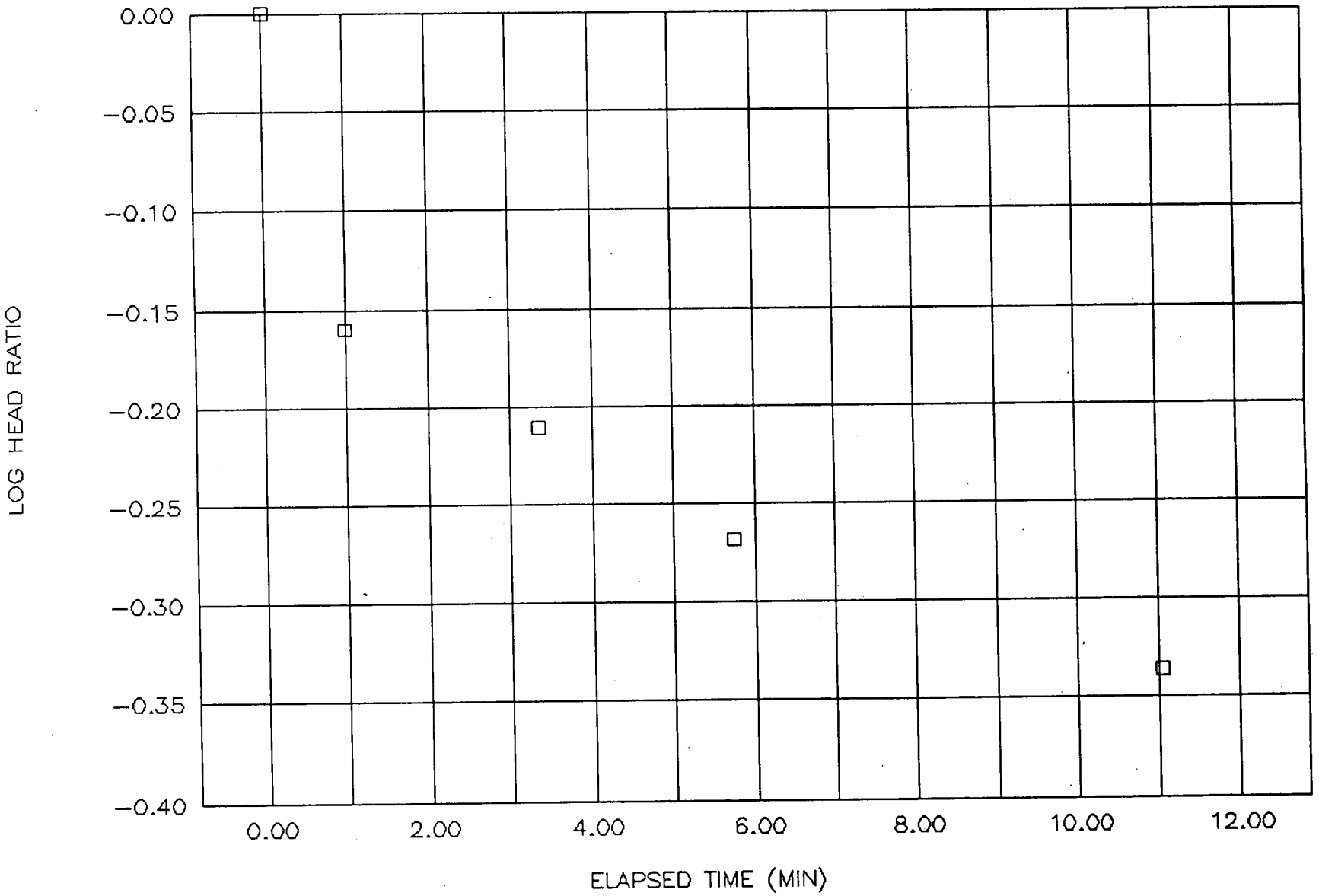
1) * INDICATES THE BEST FIT LINE PASSES THROUGH THESE POINTS WHICH ARE USED TO CALCULATE HYDRAULIC CONDUCTIVITY

K= 1.85E-05 CM/SEC

	ELAPSED TIME	HEAD RATIO
POINT 1	3.350	0.615
POINT 2	11.050	0.462

RISING HEAD TEST

WELL 93-03(1)



Golder Associates

Golder Associates

VARIABLE HEAD ("SLUG") TEST FIELD RECORD

JOB NAME CQA offsite JOB NO. 923-1055 WELL NO. 93-01(1)

BY CPP/DCW DATE 2/24/93 SHEET 1 OF 1

MEASURING POINT DESCRIPTION TOR

MEASURING POINT ELEVATION — DATUM —

WELL CASING RADIUS(D/2) 1" BOREHOLE RADIUS(D/2) 8" 2"

SATURATED SCREEN LENGTH/OPEN INTERVAL LE LENGTH 10'

WELL DEPTH(BELOW MEASURING POINT) 41.56

PUMP OR SUCTION LINE DEPTH(BMP) —

STATIC WATER LEVEL– 9.44 (DEPTH(BMP)) 2/24/93 (DATE) 1005 (TIME)

	TIME	DEPTH TO WATER	HEAD DIFFERENTIAL(H)	COMMENTS
2/24/93	10:59:00	39.40		
	11:06:55	38.59		
	11:14:50	38.35		
	11:26:00	38.15		
	12:47:45	37.80		
	14:05:10	37.59		
	15:56:12	37.47		
2/25/93	9:04:45	37.04		
	16:18:45	36.92		
3/1/93	14:03:00	36.52		
3/3/93	9:51:00	36.09		

Golder Associates

VARIABLE HEAD ("SLUG") TEST FIELD RECORD

JOB NAME CQA off Site JOB NO. 923-9055 WELL NO. 93-02(1)

BY CPP/DCW DATE 2/24/93 SHEET 1 OF 1

MEASURING POINT DESCRIPTION TOR

MEASURING POINT ELEVATION — DATUM —

WELL CASING RADIUS(D/2) 1" BOREHOLE RADIUS(D/2) 4"

SATURATED SCREEN LENGTH/OPEN INTERVAL LE LENGTH 10'

WELL DEPTH(BELOW MEASURING POINT) 38.61

PUMP OR SUCTION LINE DEPTH(BMP) —

STATIC WATER LEVEL– 11.00 DEPTH(BMP) 2/24/93 DATE 1145 TIME

TIME	DEPTH TO WATER	HEAD DIFFERENTIAL(H)	COMMENTS
1252 10	12.35		
1254 45	11.62		
1255 30	11.50		
1256 30	11.40		
1257 30	11.33		
1258 30	11.28		
1259 30	11.24		
1300 30	11.22		
1302 00	11.14		
1305 00	11.14		

Golder Associates

VARIABLE HEAD ("SLUG") TEST FIELD RECORD

JOB NAME CQA offsite JOB NO. 923-9055 WELL NO. 93-03(1)

BY CPP/DCW DATE 2/24/93 SHEET 1 OF 1

MEASURING POINT DESCRIPTION TOR

MEASURING POINT ELEVATION — DATUM —

WELL CASING RADIUS(D/2) 1 BOREHOLE RADIUS(D/2) 4

SATURATED SCREEN LENGTH/OPEN INTERVAL LE LENGTH 10'

WELL DEPTH(BELOW MEASURING POINT) 46.87

PUMP OR SUCTION LINE DEPTH(BMP) —

STATIC WATER LEVEL– 9.22 DEPTH(BMP) 2/24/93 DATE 1416 TIME

TIME	DEPTH TO WATER	HEAD DIFFERENTIAL(H)	COMMENTS
1509 35	9.35		
1510 34	9.31		
1512 56	9.30		
1515 20	9.29		
1520 38	9.28		

Golder Associates

WELL DEVELOPMENT FIELD RECORD

JOB NAME TDS/CAA offsite/NY
DEVELOPED BY CPP/DCW
STARTED DEVEL. 2/24/93 (DATE) 1 (TIME) 10:06
W.L. BEFORE DEVEL. 9.44 (DEPTH) 12/24/93 (DATE) 1005 (TIME)
WELL DEPTH: BEFORE DEVEL. 41.57
STANDING WATER COLUMN (FT.) 31.5
SCREEN LENGTH 10 FT

JOB NO. 923-9055 WELL NO. 93-01(1)
DATE OF INSTALL. 2/9/93 SHEET 1 OF 1
COMPLETED DEVEL. 2/24/93 (DATE) 1 (TIME) 1030
AFTER DEVEL. 37.47 (DEPTH) 12/24/93 (DATE) 1 (TIME) 1556
AFTER DEVEL. 41.56 WELL DIA. (In) 2
STANDING WELL VOLUME 5.20 gal.
DRILLING WATER LOSS — gal.

DATE/TIME	VOLUME REMOVED (GALS)	FIELD PARAMETERS SPEC. COND. (umhos/cm)	TEMP. (C)	pH (s.u.)	Turb/ ~~OTHER~~	REMARKS
2/24/93 10:25	8	1600	7.7	7.29	>200 NTU	Pumps on first trailer
	8	= TOTAL VOLUME REMOVED (gal.)				

DEVELOPMENT METHOD: SS Bailer

NOTES: Well not fully developed due to insufficient recovery

Golder Associates

WELL DEVELOPMENT FIELD RECORD

JOB NAME TDS/CQA offside/NY
DEVELOPED BY CPP/DCW
STARTED DEVEL. 2/24/93 1145 (DATE / TIME)
W.L. BEFORE DEVEL. 11.00 12/24/93 1145 (DEPTH / DATE / TIME)
WELL DEPTH: BEFORE DEVEL. 38.59
STANDING WATER COLUMN (FT.) 27.26
SCREEN LENGTH 10'

JOB NO. 923-9055 WELL NO. 93-02(1)
DATE OF INSTALL. 2/4/93 SHEET 1 OF 1
COMPLETED DEVEL. 2/24/93 1250 (DATE / TIME)
AFTER DEVEL. 11.14 12/24/93 1305 (DEPTH / DATE / TIME)
AFTER DEVEL. 38.61 WELL DIA. (In) 2"
STANDING WELL VOLUME 4.4 gal
DRILLING WATER LOSS — gal.

DATE/TIME	VOLUME REMOVED (GALS)	FIELD PARAMETERS SPEC. COND. (umhos/cm)	TEMP. (C)	pH (s.u.)	Turbid ~~OTHER~~	REMARKS
2/24/93 1200	—	1450	7.2	7.04	>200	Perms. from 1st Bailer
2/24/93 1254	27	1450	—	7.6	81.5	Perms from final Purge
	27	= TOTAL VOLUME REMOVED (gal.)				

DEVELOPMENT METHOD: SS Bailer / Teflon Waterra w HDPE Tubing

NOTES:

Golder Associates

WELL DEVELOPMENT FIELD RECORD

JOB NAME TDS/CQA Offsite/NY
DEVELOPED BY CPP/DCW
STARTED DEVEL. 2/24/93 (DATE) 1425 (TIME)
W.L. BEFORE DEVEL. 9.22 (DEPTH) 12/24/93 (DATE) 14:16 (TIME)
WELL DEPTH: BEFORE DEVEL. 46.89
STANDING WATER COLUMN (FT.) 37.67
SCREEN LENGTH 10 FT

JOB NO. 923955 WELL NO. 93-03(1)
DATE OF INSTALL. 2/19/93 SHEET 1 OF 1
COMPLETED DEVEL. 2/24/93 (DATE) 1500 (TIME)
AFTER DEVEL. 9.28 (DEPTH) 12/24/93 (DATE) 1520 (TIME)
AFTER DEVEL. 46.89 WELL DIA. (In) 2
STANDING WELL VOLUME 6 gal.
DRILLING WATER LOSS – gal.

DATE/TIME	VOLUME REMOVED (GALS)	FIELD PARAMETERS SPEC. COND. (umhos/cm)	TEMP. (C)	pH (s.u.)	OTHER TURB.	REMARKS
2/24/93 14:26	–	1800	8	9.15	>200 NTU	Parameters - first bailer
2/24/93 1500	30	1425	–	9.30	>200	" - final
	30	= TOTAL VOLUME REMOVED (gal.)				

DEVELOPMENT METHOD: SS Bailer / Teflon Waterra & HDPE Tubing

NOTES:

APPENDIX G

TRENCH DIMENSION LOGS

DAILY TRENCH EXCAVATION RECORD

JOB NAME TDS/CQA OFF-SITE/NY

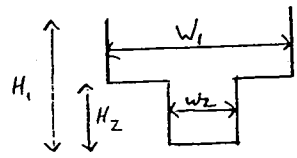
JOB NUMBER 923-9055

INSPECTOR CDM

DATE 12/3/92

WEATHER/ TEMPERATURE Snow / 32°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
8:00	V4 0+25	7'	4'	11'	5.7'	Firm, reddish brown, CLAY, some standing water
	0+50	7'	4'	11'	7'	"
	0+75	6'	3'	11'	6'	"
	1+00	4.5	3'	11	5	"
	1+25	7	4	11	5	"
	1+50	7	4	11	5	"

F/N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME TDS/CQA OFF-SITE/NY

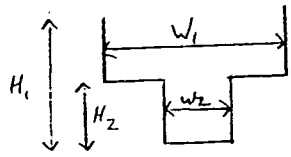
JOB NUMBER 923-9055

INSPECTOR CDM

DATE 12/4/92

WEATHER/ TEMPERATURE Snow / 32°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
10:30	V4 1+75	6'	4'	9.5'	3.5'	Firm reddish brown CLAY, some standing water.
	2+00	6'	4.5'	8.5'	3.5'	

F/N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME TDS/CQA OFF-SITE/NY

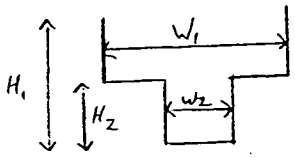
JOB NUMBER 923-9055

INSPECTOR CDM

DATE 12/5/92

WEATHER/ TEMPERATURE Snow / 25°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
11:30	V4 2+25	5.5	3.5	8.5	4	Firm, Reddish brown clay, some standing water.
	2+50	5.5	2.4	8	4	

F/N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME TDS/CQA OFF-SITE/NY

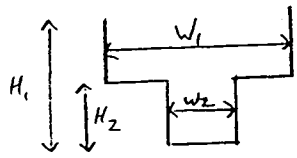
JOB NUMBER 923-9055

INSPECTOR CDM

DATE 12/7/92

WEATHER/ TEMPERATURE Cloudy, Flurries / 26°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
1:00	V4 2+75	6.5	3.5	7.5	4	Firm, Reddish brown, clay, little water.
1:00	V4 2+95	6.5	4	9	6	"

F/N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME TDS/CQA OFF-SITE/NY

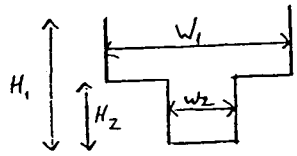
JOB NUMBER 923-9055

INSPECTOR CPM

DATE 12/8/92

WEATHER/ TEMPERATURE Snow / 27°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
10:00	VS 0+25	5.5	3.5	8.5	4	Firm, reddish brown, clay, some water.
"	0+50	5.5	3	8	4	"
"	0+75	5.5	3	8.5	4.5	"
"	1+00	5.5	3	8	4	"
"	1+25	5.5	3.5	9	4	"
"	1+45	5	3.5	9	4	"
4:30	VS 1+75	5	3	10	4	"
	2+00	5	3	9.5	4	"
	2+25	5	3	9.5	4.5	"

F/N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME TDS/CQA OFF-SITE/NY

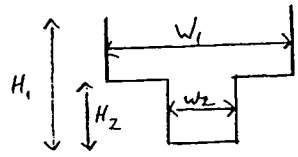
JOB NUMBER 923-9055

INSPECTOR CDM

DATE 12/9/92

WEATHER/ TEMPERATURE Clear / 23°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
12:30	VS 2+50	5	4	10	4.5	Firm, reddish brown, clay, some standing water.
	2+75	5.5	4	9	4.5	"
	2+95	6	3.5	10.5	4.5	
12/10/92	Widened Trench - Pipe didn't line up w/ VS 2+50				5.5	
9:30	2+75				6.0	
	2+95				8.0	

F/N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME TDS/CQA OFF-SITE/NY

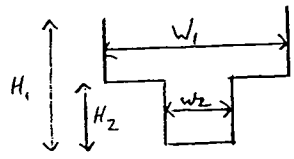
JOB NUMBER 923-9055

INSPECTOR CDM

DATE 12/15/92

WEATHER/ TEMPERATURE Clear 150°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
2:30	V3 1+75	5	3	8	5.5	Firm, reddish brown clay,
	V3 2+00	5	3	8	5	soft and saturated in areas
	V3 2+25	6	4	8	4.5	Sides loose, soft, saturated,
	V3 2+50	6	3.5	8.5	5	caving in continously.
	V3 2+75	6	3.5	9	5	"
	V3 2+95	6	4	9	4.5	"

F/N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME TDS/CQA OFF-SITE/NY

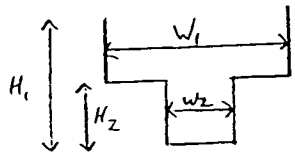
JOB NUMBER 923-9055

INSPECTOR CDM

DATE 12/22/92

SHEET 1 OF 1

WEATHER/
TEMPERATURE



Trench
Cross-section
(Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
8:30	V3 1+50	4.5'	3'	9'	5.5'	Firm, reddish brown Clay,
	V3 1+25	4.5'	3'	9'	5.5'	100% saturated sides.

F/N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME: TDS/CQA OFF-SITE/NY

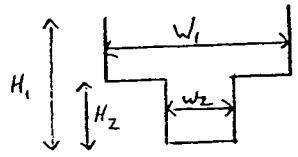
JOB NUMBER: 923-9055

INSPECTOR: CDM

DATE: 1/6/93

WEATHER/ TEMPERATURE: Overcast / 32°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
12:00	V2 2+75	6.5	4	10.5	4	Firm, reddish Brown, clay
	2+50	6	4	10	5	"
	2+25	6	4.5	9	4	"
	2+00	5.5	4	8.5	4	"
	1+75	5.5	3.5	9.5	4	"
3:00	1+50	5.5	4	10	4	"
						* Firm sides

F:\N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME TDS/CQA OFF-SITE/NY

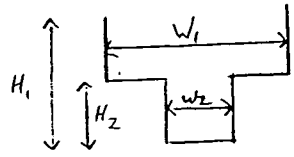
JOB NUMBER 923-9055

INSPECTOR CPM

DATE 1/7/93

WEATHER/ TEMPERATURE overcast / 32°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
9:00	V2 1+25	5.5	3	8.5	4	Firm, reddish brown, clay,
	1+00	5.5	3.5	9	4.5	"
	0+75	5.5	3	9.5	4	"
	0+50	6	3.5	9.5	4	"
	0+25	5	3.5	10	5	"
	0+00	5.5	3.5	11	5.5	"
						* Firm sides

F/N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME: TDS/CQA OFF-SITE/NY

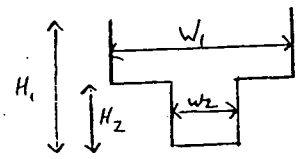
JOB NUMBER: 923-9055

INSPECTOR: CDM

DATE: 1/8/93

WEATHER/ TEMPERATURE: Overcast / 32°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
11:00	VI 2+95	6	4	10	4.5	Firm, reddish brown clay.
	VI 2+75	6	3	10	4	Some water in places.
	2+50	6.5	4	10	4	Firm sides.
	2+25	6.5	4.5	9	4.5	"
	2+00	6.5	3.5	10	4	"
	1+75	6.0	4	10	4	"
	1+50	6.0	4	9	4	"

F:\N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME: TDS/CQA OFF-SITE/NY

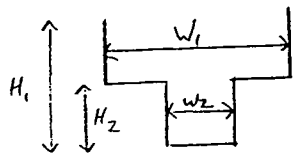
JOB NUMBER: 923-9055

INSPECTOR: CDM

DATE: 1/12/93

WEATHER/ TEMPERATURE: Overcast / 41°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
11.00	V1 1+25	5.5	3	4	4.5	Firm reddish brown clay, Firm Sides
	1+00	5.5	3.5	4.5	4.5	"
	0+75	5.5	3	4	4.5	"
	0+50	5.5	3.5	4	4.5	"
	0+25	5.5	4	10	4.5	"

F/N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME: TDS/CQA OFF-SITE/NY

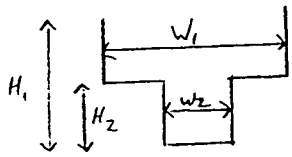
JOB NUMBER: 923-9055

INSPECTOR: CDM

DATE: 1/15/93

WEATHER/ TEMPERATURE: Clear / 37°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
10:30	V3 0+25	6.5	6.5	9	9	Firm, wet, reddish brown clay,
	0+50	5.5	5.5	7	7	some gravel. Firm sides
	0+75	6	3	9	4	"
	1+00	3	3	5	5	"

F:\N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME TDS/CQA OFF-SITE/NY

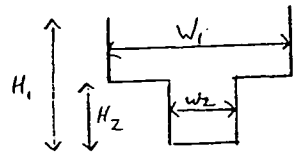
JOB NUMBER 923-9055

INSPECTOR CDM

DATE 2/2/93

WEATHER/ TEMPERATURE Clear / 26°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
13:30	V6 0+25	5.5'	3'	9'	4.5'	Firm reddish brown clay
	V6 0+50	6'	3.5'	9'	3.5'	"
						"

F/N:TRENCHREC.WK1

DAILY TRENCH EXCAVATION RECORD

JOB NAME: TDS/CQA OFF-SITE/NY

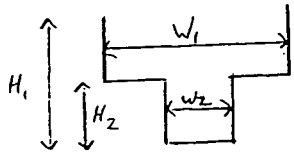
JOB NUMBER: 923-9055

INSPECTOR: CDM

DATE: 2/4/93

WEATHER/ TEMPERATURE: Clear / 6°

SHEET 1 OF 1



Trench Cross-section (Typ.)

TIME	STATION	H1	H2	W1	W2	TRENCH CONDITION
13:30	V6 0+75	6	3.5	12	10	Firm reddish brown clay.
	V6 1+00	5	2.5	10	6	"
	V6 1+25	5	2.5	14	9	"
	V6 1+50	5	3.5	8	4.5	"

F/N:TRENCHREC.WK1

APPENDIX H

#1A STONE GRAIN SIZE DISTRIBUTION RESULTS

U S C S

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA/OFFSITE	**Sample No.**	STB-1
PROJECT NUMBER:	923-9055	**Sample ID:**	BULK

WATER CONTENT (Delivered Moisture)

tare no.		BL-5
wt soil & tare,moist	(w1)	889.51
wt soil & tare,dry	(w2)	870.16
wt tare	(w3)	193.28
wt moisture	(w4=w1-w2)	19.35
wt dry soil	(w5=w2-w3)	676.88
% water	(w4/w5)*100	2.86%

200 WASH (Percent Fines)

tare no.		L-5
wt soil & tare,before wash	(w6)	861.03
wt soil & tare,after wash	(w7)	853.38
wt tare	(w8)	192.10
wt fines lost	(w9=w6-w7)	7.65
wt dry soil	(w10=w6-w8)	668.93
% lost	(w9/w10)*100	1.14%

U S C S	SIEVE	wt ret	% ret	% PASS	SIEVE	
			{(wt ret/w10)*100}	(100 - %ret)		
coarse gravel	3.000		0.0%	100.0%	3.000	coarse gravel
	1.500		0.0%	100.0%	1.500	
	1.000		0.0%	100.0%	1.000	
fine gravel	0.750		0.0%	100.0%	0.750	fine gravel
	0.375	0.37	0.1%	99.9%	0.375	
coarse sand	#4	535.98	80.1%	19.9%	#4	coarse sand
medium sand	#10	659.86	98.6%	1.4%	#10	medium sand

SPLITTING INFORMATION

Wt in pan, from coarse sieve stack	
Wt split for fine stack sieve	
Percent of original wt in pan	100.00%

	#20	660.23	98.7%	1.3%	#20	
fine sand	#40	660.35	98.7%	1.3%	#40	fine sand
	#60	660.44	98.7%	1.3%	#60	
	#100	660.54	98.7%	1.3%	#100	
	#200	660.73	98.8%	1.2%	#200	
fines	PAN	661.48	98.9%	1.1%	PAN	fines

% C GRVL	0.0%
% F GRVL	80.1%
% C SAND	18.5%
% M SAND	0.1%
% F SAND	0.1%
% FINES	1.2%
% TOTAL	100%

Sample STB-1

Wet Color: Variegated

Description: f GRAVEL, some c sand, trace fines

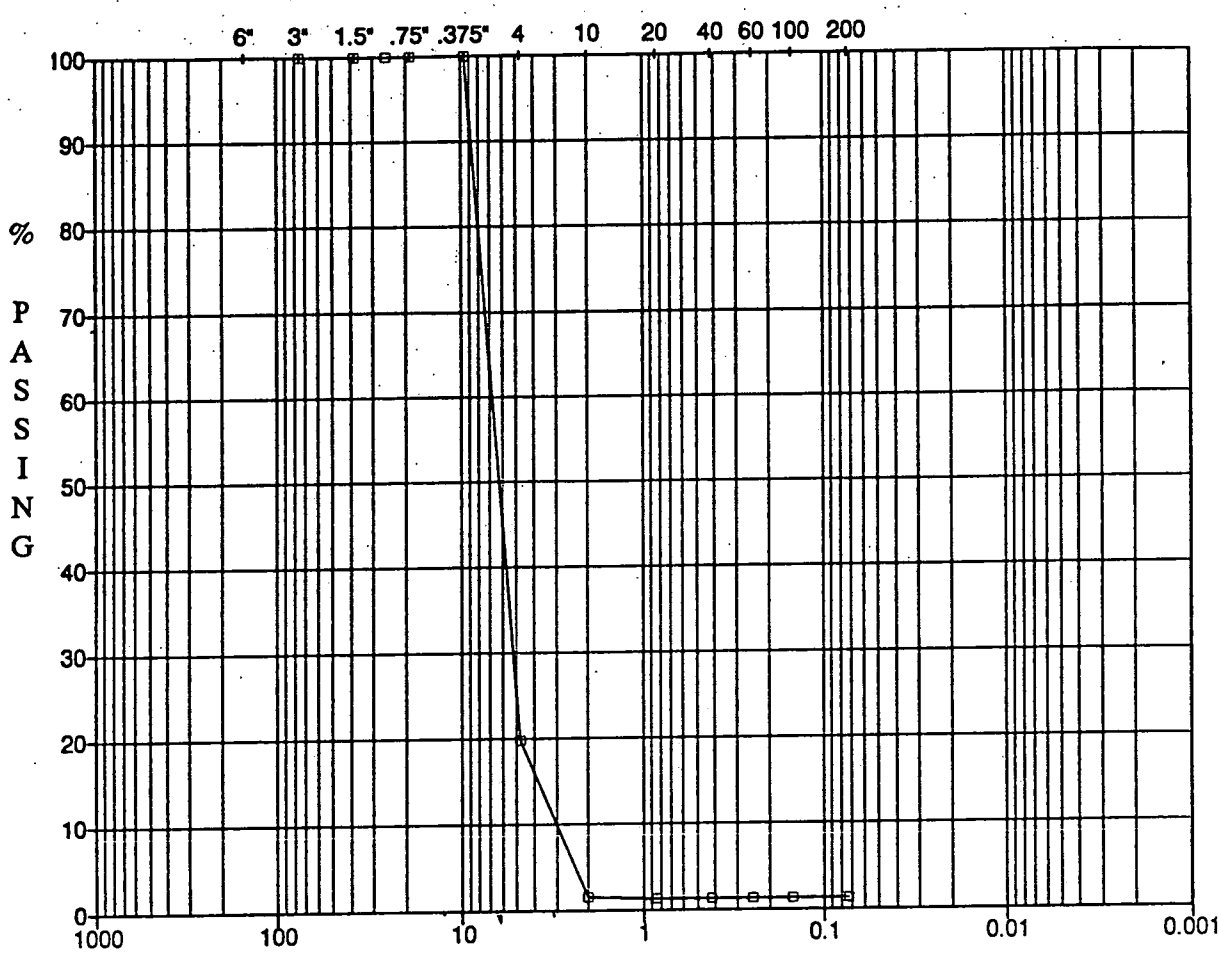
LL	
PL	
PI	
Gs	

TECH	BM
DATE	11/7/92
CHECKED	
REVIEWED	

GOLDER ASSOCIATES INC.
MT. LAUREL, NJ

PARTICLE SIZE DISTRIBUTION ASTM D-421 AND 422

US STANDARD SIEVE OPENING SIZES



COBBLES	Coarse	Fine	C	Med	Fine	FINES (Silt or Clay)
	GRAVEL		SAND			

SAMPLE ID	W%	LL	PL	PI	Gs	DESCRIPTION
STB-1	2.9					Variegated f GRAVEL, some c sand, trace fines
PRE CONSTRUCTION #1A STONE	DATE TESTED: 11/7/92					
TECHNICIAN: BM	DATE: 11/9/92		CHECKED:			REVIEWED:

TDS/CQA/OFFSITE
923-9055

GOLDER ASSOCIATES INC.
MT.LAUREL,NJ

USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA OFFSITE/NY	Sample ID.:	GSD	SA#1-5	—
PROJECT NUMBER:	923-9055.1A	Sample Type:	BAG		

WATER CONTENT (Delivered Moisture)		
Tare Number		
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample	
Wet Soil+Tare (gm) =	
Dry Soil+Tare (gm) =	
Tare Weight (gm) =	
Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture (W6)	
Weight Of Sample (gm)=	924.39
Tare Weight (gm) =	113.99
Total Wt. Dry (gm) =	810.40

SIEVE ANALYSIS

Tare Weight (gms) = 203.32

		Wt Ret +Tare	(Wt-Tare)	(%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	SIEVE	
coarse gravel	3.000	203.32	0.00	0.00		3.000	coarse gravel
	1.500	203.32	0.00	0.00		1.500	coarse gravel
	1.000	203.32	0.00	0.00		1.000	coarse gravel
fine gravel	0.750	203.32	0.00	0.00		0.750	fine gravel
	0.375	203.32	0.00	0.00	100.00	0.375	fine gravel
coarse sand	#4	578.13	374.81	46.25	53.75	#4	coarse sand
medium sand	#10	1009.99	806.67	99.54	0.46	#10	medium sand
	#20	1011.02	807.70	99.67	0.33	#20	medium sand
fine sand	#40	1011.60	808.28	99.74	0.26	#40	fine sand
	#60	1011.79	808.47	99.76	0.24	#60	fine sand
	#100	1011.95	808.63	99.78	0.22	#100	fine sand
fines	#200	1012.51	809.19	99.85	0.15	#200	fines
	PAN	1013.72	810.40	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	46.25
% C SAND	53.29
% M SAND	0.20
% F SAND	0.11
% FINES	0.15
% TOTAL	100.00

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	
PL	
PI	

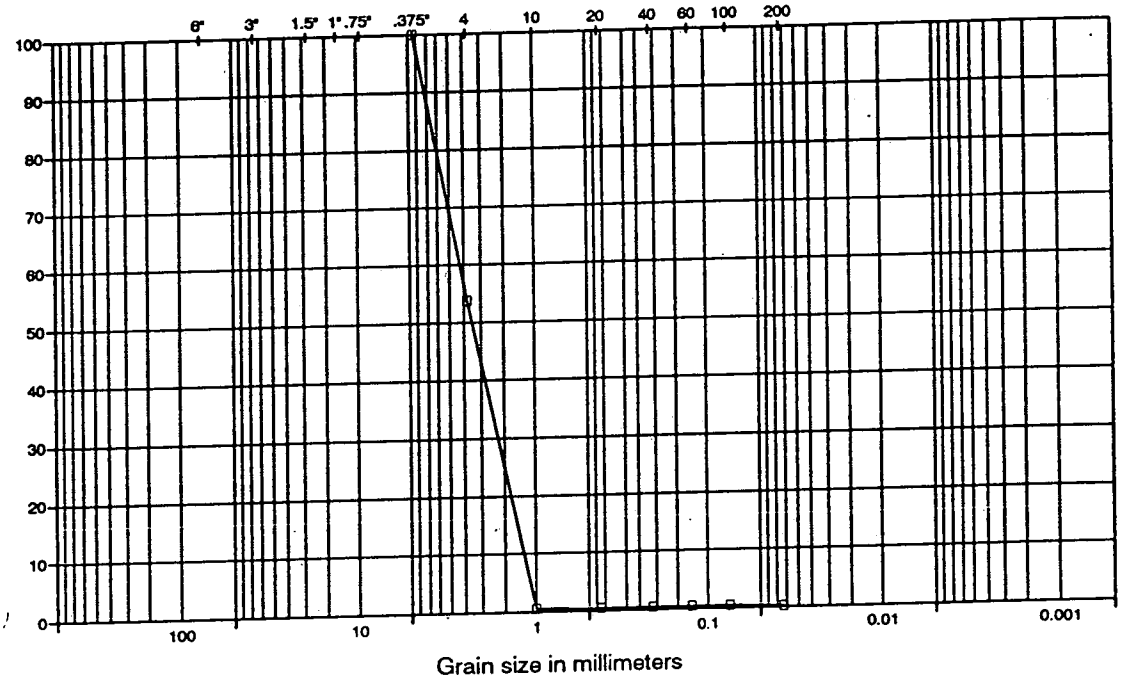
Description: Grey, C-SAND AND F-GRAVEL, trace silt.

USCS: (SP-GP)

TECH	JWE
DATE	12/07/92
CHECKED	
REVIEWED	

PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	Coarse	Fine	C	Med	Fine	FINES (Silt or Clay)
	GRAVEL		SAND			

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
GSD SA#1-5 ---						Grey, C-SAND AND F-GRAVEL, trace silt.
Sample Type: BAG						USCS: (SP-GP)

PROJECT TITLE: TDS/CQA OFFSITE/NY

PROJECT NUMBER: 923-9055.1A

COMPLETED : 12/07/92

CHECKED BY:

REVIEWED BY:

GOLDER ASSOCIATES INC.

USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA/NY	Sample ID.:	GSD	SA #5410	---
PROJECT NUMBER:	923-9055	Sample Type:	BAG	b	

WATER CONTENT (Delivered Moisture)		SQ10
Tare Number		
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample	
Wet Soil+Tare (gm) =	
Dry Soil+Tare (gm) =	
Tare Weight (gm) =	
Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture		
Weight Of Sample (gm)=		732.79
Tare Weight (gm) =		113.96
Total Wt. Dry (gm) =	(W6)	618.83

SIEVE ANALYSIS

		Wt Ret +Tare	(Wt-Tare)	(%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	SIEVE	
Tare Weight (gms) =		203.30					
coarse gravel	3.000	203.30	0.00	0.00		3.000	coarse gravel
	1.500	203.30	0.00	0.00		1.500	coarse gravel
	1.000	203.30	0.00	0.00		1.000	coarse gravel
fine gravel	0.750	203.30	0.00	0.00		0.750	fine gravel
	0.375	203.30	0.00	0.00	100.00	0.375	fine gravel
coarse sand	#4	408.75	205.45	33.20	66.80	#4	coarse sand
medium sand	#10	798.84	595.54	96.24	3.76	#10	medium sand
	#20	798.84	595.54	96.24	3.76	#20	medium sand
fine sand	#40	798.84	595.54	96.24	3.76	#40	fine sand
	#60	798.84	595.54	96.24	3.76	#60	fine sand
	#100	798.84	595.54	96.24	3.76	#100	fine sand
fines	#200	809.00	605.70	97.88	2.12	#200	fines
	PAN	822.13	618.83	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	33.20
% C SAND	63.04
% M SAND	0.00
% F SAND	1.64
% FINES	2.12
% TOTAL	100.00

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	
PL	
PI	

Description: Grey, COARSE SAND AND FINE GRAVEL, trace silt.

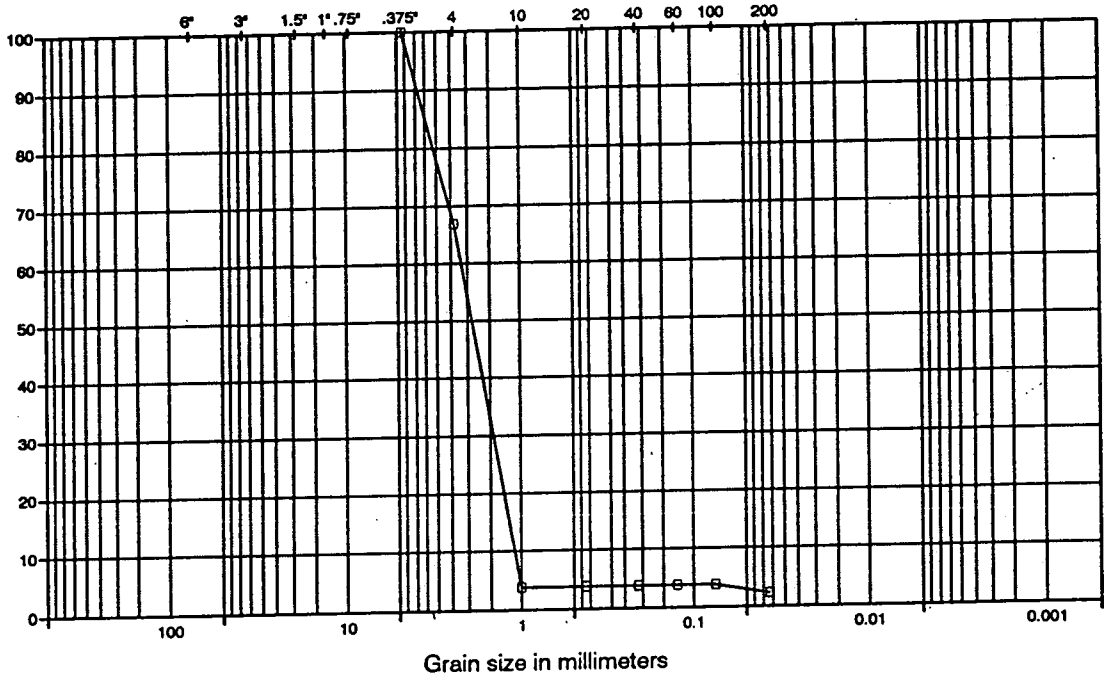
USCS: (SP-GP)

TECH	JWE
DATE	12/14/92
CHECKED	
REVIEWED	

GOLDER ASSOCIATES INC.

PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	GRAVEL		SAND			FINES (Silt or Clay)
	Coarse	Fine	C	Med	Fine	

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
GSD SA #5-10						Grey, COARSE SAND AND FINE GRAVEL, trace silt.
Sample Type: BAG						USCS: (SP-GP)

PROJECT TITLE: TDS/CQA/NY

PROJECT NUMBER: 923-9055

COMPLETED : 12/14/92

CHECKED BY:

REVIEWED BY:

GOLDER ASSOCIATES INC.

USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE: TDS/CQA/NY
PROJECT NUMBER: 923-9055
Sample ID.: GSD#1A | SA#~~14~~-20 | –
Sample Type: BAG | 16

WATER CONTENT (Delivered Moisture)

Tare Number		211
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample

Wet Soil+Tare (gm) =	
Dry Soil+Tare (gm) =	
Tare Weight (gm) =	
Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture (W6)

Weight Of Sample (gm)=	566.78
Tare Weight (gm) =	85.18
Total Wt. Dry (gm) =	481.60

SIEVE ANALYSIS

		Wt Ret +Tare	(Wt-Tare)	(%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	SIEVE	
Tare Weight (gms) =		203.29					
coarse gravel	3.000	203.29	0.00	0.00	100.00	3.000	coarse gravel
	1.500	203.29	0.00	0.00	100.00	1.500	coarse gravel
	1.000	203.29	0.00	0.00	100.00	1.000	coarse gravel
fine gravel	0.750	203.29	0.00	0.00	100.00	0.750	fine gravel
	0.375	203.29	0.00	0.00	100.00	0.375	fine gravel
coarse sand	#4	299.17	95.88	19.91	80.09	#4	coarse sand
medium sand	#10	649.41	446.12	92.63	7.37	#10	medium sand
	#20	662.94	459.65	95.44	4.56	#20	medium sand
fine sand	#40	666.17	462.88	96.11	3.89	#40	fine sand
	#60	669.03	465.74	96.71	3.29	#60	fine sand
	#100	673.68	470.39	97.67	2.33	#100	fine sand
fines	#200	682.35	479.06	99.47	0.53	#200	fines
	PAN	684.89	481.60	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	19.91
% C SAND	72.72
% M SAND	3.48
% F SAND	3.36
% FINES	0.53
% TOTAL	100.00

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	
PL	
PI	

Description: Grey, COARSE SAND, some f-gravel.

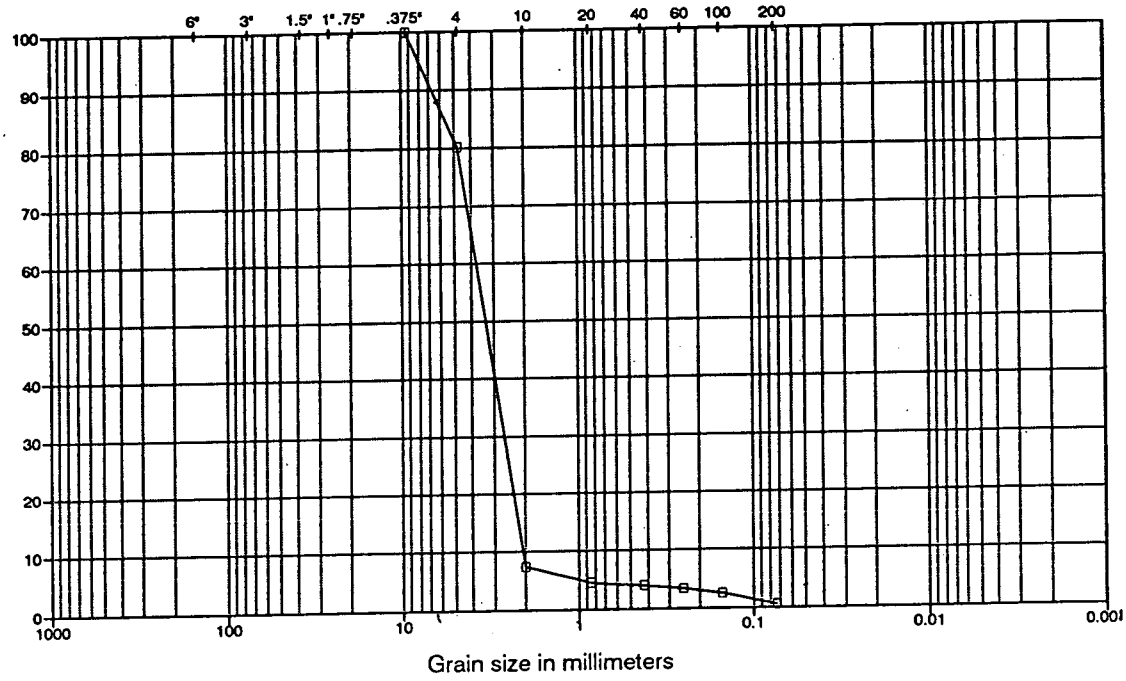
USCS: SP

TECH	JWE
DATE	01/05/93
CHECKED	
REVIEWED	

GOLDER ASSOCIATES INC.

PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	GRAVEL		SAND			FINES (Silt or Clay)
	Coarse	Fine	C	Med	Fine	

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
GSD#1A SA#~~14~~ 20 16						Grey, COARSE SAND, and f-gravel.
Sample Type: BAG						USCS: SP

PROJECT TITLE: TDS/CQA/NY

PROJECT NUMBER: 923-9055

COMPLETED : 01/05/93

CHECKED BY:

REVIEWED BY:

GOLDER ASSOCIATES INC.

USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA/NY	Sample ID.:	GSD#1A	SA#21-25	--
PROJECT NUMBER:	923-9055	Sample Type:	BAG		

WATER CONTENT (Delivered Moisture)		
Tare Number		
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample	
Wet Soil+Tare (gm) =	
Dry Soil+Tare (gm) =	
Tare Weight (gm) =	
Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture		
Weight Of Sample (gm)=		550.45
Tare Weight (gm) =		86.39
Total Wt. Dry (gm) =	(W6)	464.06

SIEVE ANALYSIS		Wt Ret +Tare	(Wt-Tare)	(%Retained)	% PASS	SIEVE	
Tare Weight (gms) =		203.29		{(wt ret/w6)*100}	(100-%ret)		
coarse gravel	3.000	203.29	0.00	0.00	100.00	3.000	coarse gravel
	1.500	203.29	0.00	0.00	100.00	1.500	coarse gravel
	1.000	203.29	0.00	0.00	100.00	1.000	coarse gravel
fine gravel	0.750	203.29	0.00	0.00	100.00	0.750	fine gravel
	0.375	203.29	0.00	0.00	100.00	0.375	fine gravel
coarse sand	#4	358.76	155.47	33.50	66.50	#4	coarse sand
medium sand	#10	645.01	441.72	95.19	4.81	#10	medium sand
	#20	652.64	449.35	96.83	3.17	#20	medium sand
fine sand	#40	654.37	451.08	97.20	2.80	#40	fine sand
	#60	656.31	453.02	97.62	2.38	#60	fine sand
	#100	659.43	456.14	98.29	1.71	#100	fine sand
fines	#200	665.15	461.86	99.53	0.47	#200	fines
	PAN	667.35	464.06	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	33.50
% C SAND	61.68
% M SAND	2.02
% F SAND	2.32
% FINES	0.47
% TOTAL	100.00

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	--
PL	--
PI	--

Description: Grey, COARSE SAND, and f-gravel.

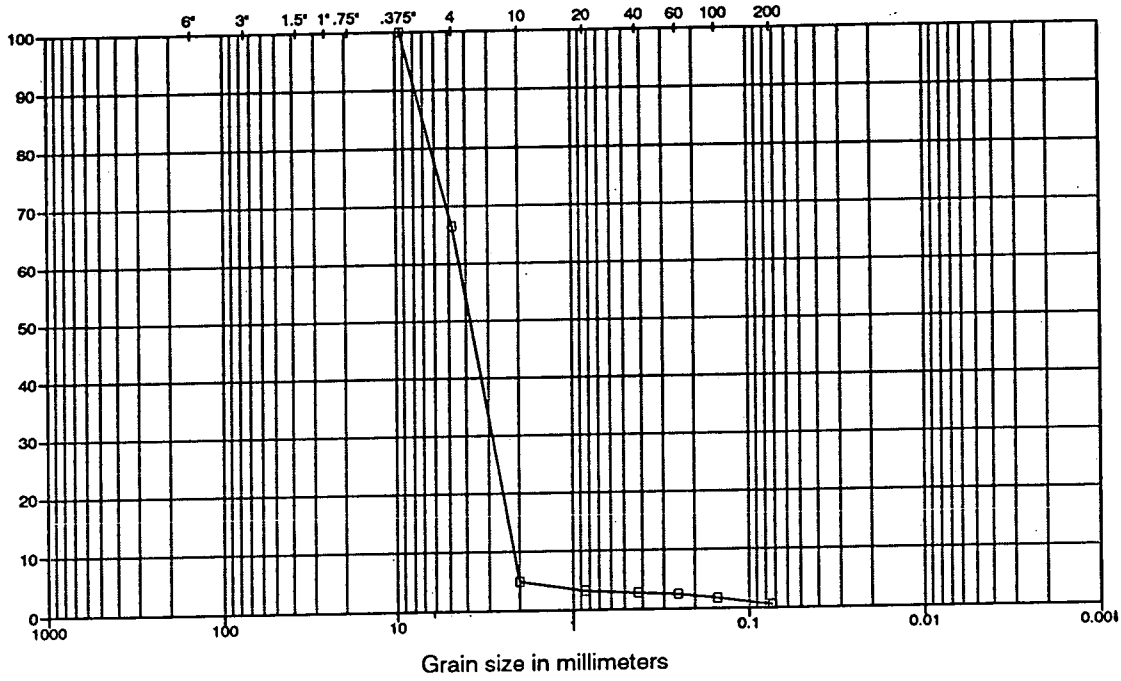
USCS: SP

TECH	JWE
DATE	01/05/93
CHECKED	
REVIEWED	

GOLDER ASSOCIATES INC.

PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	GRAVEL		SAND			FINES (Silt or Clay)
	Coarse	Fine	C	Med	Fine	

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
GSD#1A SA#21-25 --						Grey, COARSE SAND, and f-gravel.
Sample Type: BAG						USCS: SP

PROJECT TITLE: TDS/CQA/NY

PROJECT NUMBER: 923-9055

COMPLETED : 01/05/93

CHECKED BY:

REVIEWED BY:

GOLDER ASSOCIATES INC.

USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA/NY	Sample ID.:	GSD#1A	SA#11-15	--
PROJECT NUMBER:	923-9055	Sample Type:	BAG		

WATER CONTENT (Delivered Moisture)

Tare Number		J-1
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample

Wet Soil+Tare (gm) =	
Dry Soil+Tare (gm) =	
Tare Weight (gm) =	
Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture (W6)

Weight Of Sample (gm)=	583.31
Tare Weight (gm) =	85.08
Total Wt. Dry (gm) =	498.23

SIEVE ANALYSIS

		Wt Ret +Tare	(Wt-Tare)	(%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	SIEVE	
Tare Weight (gms) =		203.29					
coarse gravel	3.000	203.29	0.00	0.00	100.00	3.000	coarse gravel
	1.500	203.29	0.00	0.00	100.00	1.500	coarse gravel
	1.000	203.29	0.00	0.00	100.00	1.000	coarse gravel
fine gravel	0.750	203.29	0.00	0.00	100.00	0.750	fine gravel
	0.375	203.29	0.00	0.00	100.00	0.375	fine gravel
coarse sand	#4	316.05	112.76	22.63	77.37	#4	coarse sand
medium sand	#10	671.44	468.15	93.96	6.04	#10	medium sand
	#20	682.46	479.17	96.17	3.83	#20	medium sand
fine sand	#40	684.64	481.35	96.61	3.39	#40	fine sand
	#60	686.83	483.54	97.05	2.95	#60	fine sand
	#100	690.37	487.08	97.76	2.24	#100	fine sand
fines	#200	698.89	495.60	99.47	0.53	#200	fines
	PAN	701.52	498.23	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	22.63
% C SAND	71.33
% M SAND	2.65
% F SAND	2.86
% FINES	0.53
% TOTAL	100.00

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	
PL	
PI	

Description: Grey, COARSE SAND, some f-gravel.

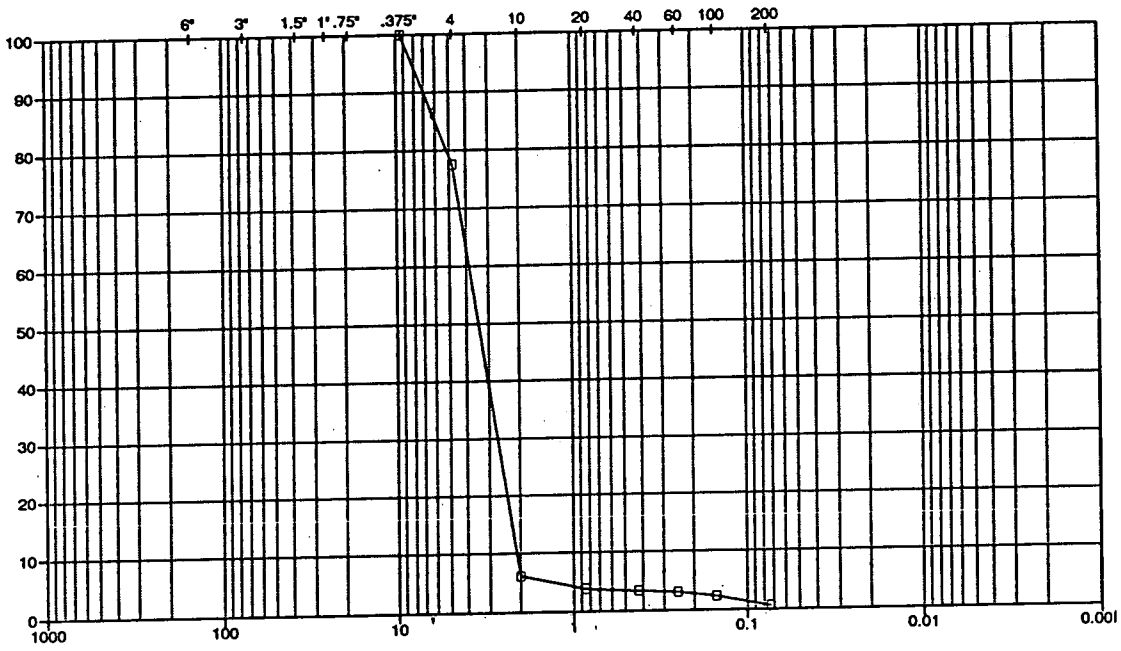
USCS: SP

TECH	JWE
DATE	01/06/93
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GOLDER ASSOCIATES INC.

PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	Coarse	Fine	C	Med	Fine	FINES (Silt or Clay)
	GRAVEL		SAND			

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
GSD#1A SA#11-15 --						Grey, COARSE SAND, some f-gravel.
Sample Type: BAG						USCS: SP

PROJECT TITLE: TDS/CQA/NY

PROJECT NUMBER: 923-9055

COMPLETED : 01/06/93

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USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA OFFSITE/NY	Sample ID.:	SA# 26-30	#1A Stone	--
PROJECT NUMBER:	923-9055.1A	Sample Type:	BAG		

WATER CONTENT (Delivered Moisture)		
Tare Number		
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample		
	Wet Soil+Tare (gm) =	
	Dry Soil+Tare (gm) =	
	Tare Weight (gm) =	
	Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture		
	Weight Of Sample (gm)=	558.45
	Tare Weight (gm) =	75.53
(W6)	Total Wt. Dry (gm) =	482.92

SIEVE ANALYSIS		Wt Ret +Tare	(Wt-Tare)	(%Retained)	% PASS	SIEVE	
Tare Weight (gms) =		203.33		{(wt ret/w6)*100}	(100-%ret)		
coarse gravel	3.000	203.33	0.00	0.00	100.00	3.000	coarse gravel
	1.500	203.33	0.00	0.00	100.00	1.500	coarse gravel
	1.000	203.33	0.00	0.00	100.00	1.000	coarse gravel
fine gravel	0.750	203.33	0.00	0.00	100.00	0.750	fine gravel
	0.375	203.33	0.00	0.00	100.00	0.375	fine gravel
coarse sand	#4	275.30	71.97	14.90	85.10	#4	coarse sand
medium sand	#10	597.56	394.23	81.63	18.37	#10	medium sand
	#20	634.78	431.45	89.34	10.66	#20	medium sand
fine sand	#40	646.41	443.08	91.75	8.25	#40	fine sand
	#60	654.69	451.36	93.46	6.54	#60	fine sand
	#100	662.77	459.44	95.14	4.86	#100	fine sand
fines	#200	678.60	475.27	98.42	1.58	#200	fines
	PAN	686.25	482.92	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	14.90
% C SAND	66.73
% M SAND	10.12
% F SAND	6.67
% FINES	1.58
% TOTAL	100.00

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	-
PL	-
PI	-
Gs	-

Description: Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.

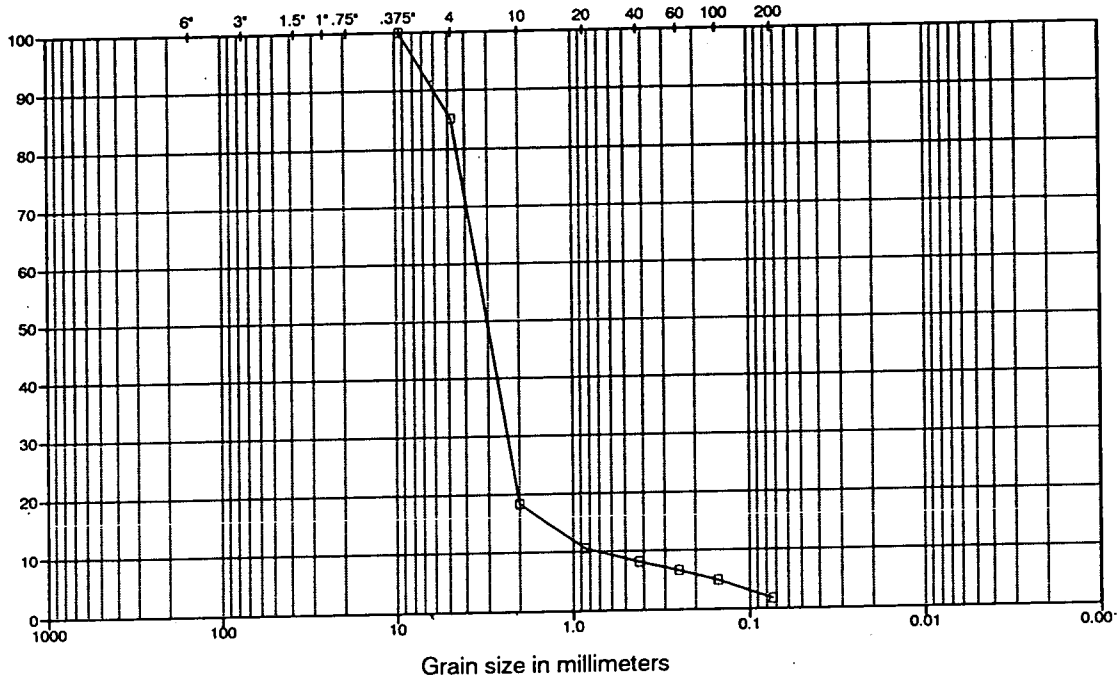
USCS: SP

TECH	JWE
DATE	02/03/93
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GOLDER ASSOCIATES INC.

PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	GRAVEL		SAND			FINES (Silt or Clay)
	Coarse	Fine	C	Med	Fine	

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
SA# 26-30 #1A Stone --	-	-	-	-	-	Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.
Sample Type: BAG						USCS: SP

PROJECT TITLE: TDS/CQA OFFSITE/NY

PROJECT NUMBER: 923-9055.1A

COMPLETED: 02/03/93

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USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA OFFSITE/NY	Sample ID.:	SA# 31-35	#1A Stone	--
PROJECT NUMBER:	923-9055.1A	Sample Type:	BAG		

WATER CONTENT (Delivered Moisture)		
Tare Number		
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample	
Wet Soil+Tare (gm) =	
Dry Soil+Tare (gm) =	
Tare Weight (gm) =	
Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture		
	Weight Of Sample (gm)=	623.80
	Tare Weight (gm) =	85.09
(W6)	Total Wt. Dry (gm) =	538.71

SIEVE ANALYSIS		Wt Ret +Tare	(Wt-Tare)	(%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	SIEVE	
Tare Weight (gms) =		203.33					
coarse gravel	3.000	203.33	0.00	0.00	100.00	3.000	coarse gravel
	1.500	203.33	0.00	0.00	100.00	1.500	coarse gravel
	1.000	203.33	0.00	0.00	100.00	1.000	coarse gravel
fine gravel	0.750	203.33	0.00	0.00	100.00	0.750	fine gravel
	0.375	203.33	0.00	0.00	100.00	0.375	fine gravel
coarse sand	#4	284.51	81.18	15.07	84.93	#4	coarse sand
medium sand	#10	655.08	451.75	83.86	16.14	#10	medium sand
	#20	690.17	486.84	90.37	9.63	#20	medium sand
fine sand	#40	699.50	496.17	92.10	7.90	#40	fine sand
	#60	705.57	502.24	93.23	6.77	#60	fine sand
	#100	711.21	507.88	94.28	5.72	#100	fine sand
fines	#200	732.38	529.05	98.21	1.79	#200	fines
	PAN	742.04	538.71	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	15.07
% C SAND	68.79
% M SAND	8.25
% F SAND	6.10
% FINES	1.79
% TOTAL	100.00

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	-
PL	-
PI	-
Gs	-

Description: Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.

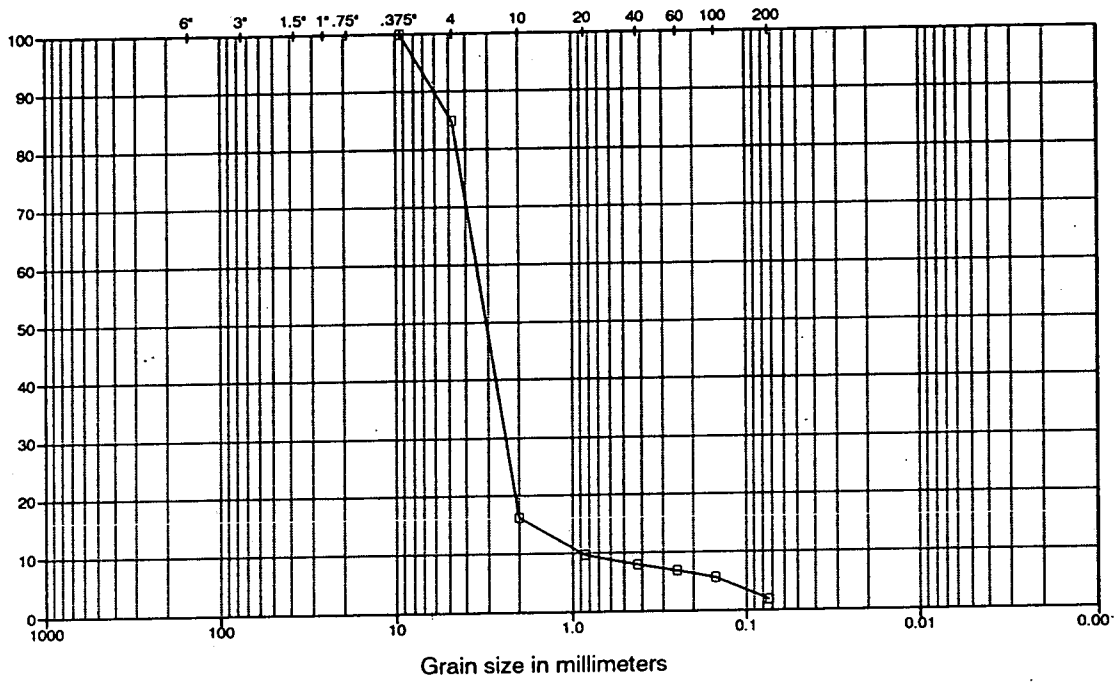
USCS: SP

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GOLDER ASSOCIATES INC.

PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	GRAVEL		SAND			FINES (Silt or Clay)
	Coarse	Fine	C	Med	Fine	

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
SA# 31-35 #1A Stone --	-	-	-	-	-	Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.
Sample Type: BAG						USCS: SP

PROJECT TITLE: TDS/CQA OFFSITE/NY

PROJECT NUMBER: 923-9055.1A

COMPLETED: 02/03/93

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USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA OFFSITE/NY	Sample ID.:	SA# 36-40	#1A Stone	--
PROJECT NUMBER:	923-9055.1A	Sample Type:	BAG		

WATER CONTENT (Delivered Moisture)

Tare Number		
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample

Wet Soil+Tare (gm) =	
Dry Soil+Tare (gm) =	
Tare Weight (gm) =	
Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture (W6)

Weight Of Sample (gm)=	762.04
Tare Weight (gm) =	86.39
Total Wt. Dry (gm) =	675.65

SIEVE ANALYSIS

		Wt Ret +Tare	(Wt-Tare)	(%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	SIEVE	
Tare Weight (gms) =		203.33					
coarse gravel	3.000	203.33	0.00	0.00	100.00	3.000	coarse gravel
	1.500	203.33	0.00	0.00	100.00	1.500	coarse gravel
	1.000	203.33	0.00	0.00	100.00	1.000	coarse gravel
fine gravel	0.750	203.33	0.00	0.00	100.00	0.750	fine gravel
	0.375	203.33	0.00	0.00	100.00	0.375	fine gravel
coarse sand	#4	307.71	104.38	15.45	84.55	#4	coarse sand
medium sand	#10	763.70	560.37	82.94	17.06	#10	medium sand
	#20	811.34	608.01	89.99	10.01	#20	medium sand
fine sand	#40	824.20	620.87	91.89	8.11	#40	fine sand
	#60	832.07	628.74	93.06	6.94	#60	fine sand
	#100	842.03	638.70	94.53	5.47	#100	fine sand
fines	#200	867.33	664.00	98.28	1.72	#200	fines
	PAN	878.98	675.65	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	15.45
% C SAND	67.49
% M SAND	8.95
% F SAND	6.38
% FINES	1.72
% TOTAL	100.00

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	-
PL	-
PI	-
Gs	-

Description: Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.

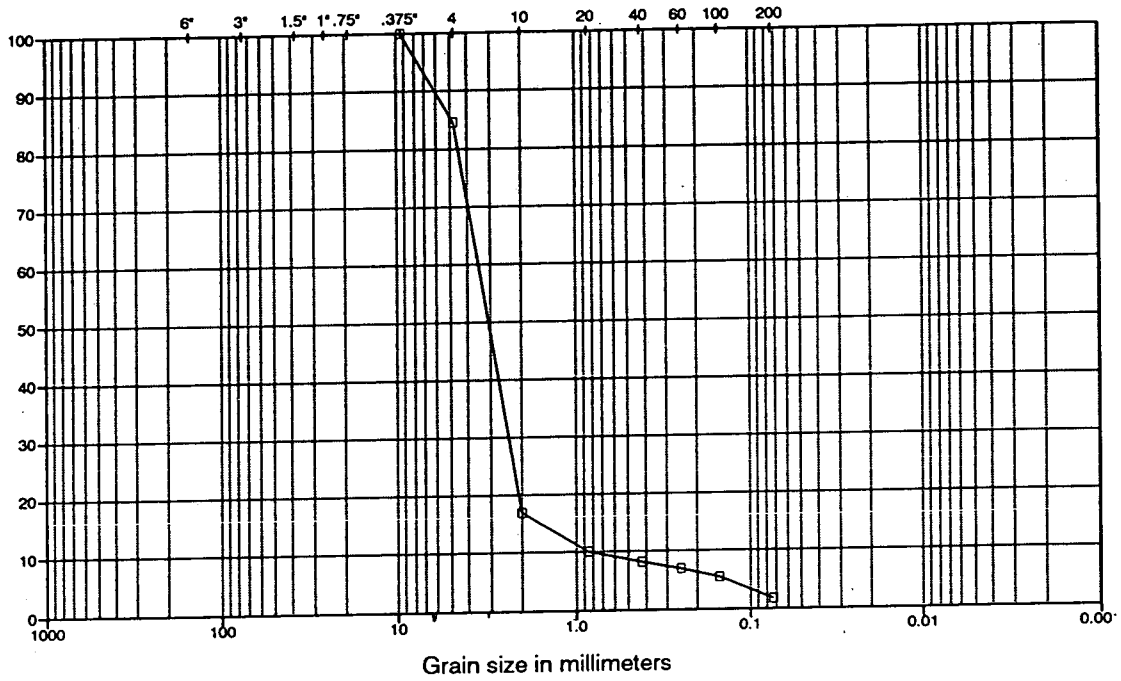
USCS: SP

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GOLDER ASSOCIATES INC.

PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	Coarse	Fine	C	Med	Fine	FINES (Silt or Clay)
	GRAVEL		SAND			

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
SA# 36-40 #1A Stone --	-	-	-	-	-	Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.
Sample Type: BAG						USCS: SP

PROJECT TITLE: TDS/CQA OFFSITE/NY

PROJECT NUMBER: 923-9055.1A

COMPLETED : 02/03/93

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USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA OFFSITE/NY	Sample ID.:	SA# 41-45	#1A Stone	--
PROJECT NUMBER:	923-9055.1A	Sample Type:	BAG		

WATER CONTENT (Delivered Moisture)

Tare Number		
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample

Wet Soil+Tare (gm) =	
Dry Soil+Tare (gm) =	
Tare Weight (gm) =	
Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture (W6)

Weight Of Sample (gm)=	704.85
Tare Weight (gm) =	85.64
Total Wt. Dry (gm) =	619.21

SIEVE ANALYSIS

		Wt Ret +Tare	(Wt-Tare)	(%Retained)	% PASS	SIEVE	
Tare Weight (gms) =		203.33		{(wt ret/w6)*100}	(100-%ret)		
coarse gravel	3.000	203.33	0.00	0.00	100.00	3.000	coarse gravel
	1.500	203.33	0.00	0.00	100.00	1.500	coarse gravel
	1.000	203.33	0.00	0.00	100.00	1.000	coarse gravel
fine gravel	0.750	203.33	0.00	0.00	100.00	0.750	fine gravel
	0.375	203.33	0.00	0.00	100.00	0.375	fine gravel
coarse sand	#4	290.64	87.31	14.10	85.90	#4	coarse sand
medium sand	#10	718.15	514.82	83.14	16.86	#10	medium sand
	#20	762.10	558.77	90.24	9.76	#20	medium sand
fine sand	#40	774.06	570.73	92.17	7.83	#40	fine sand
	#60	781.83	578.50	93.43	6.57	#60	fine sand
	#100	789.32	585.99	94.64	5.36	#100	fine sand
fines	#200	811.38	608.05	98.20	1.80	#200	fines
	PAN	822.54	619.21	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	14.10
% C SAND	69.04
% M SAND	9.03
% F SAND	6.03
% FINES	1.80
% TOTAL	100.00

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	-
PL	-
PI	-
Gs	-

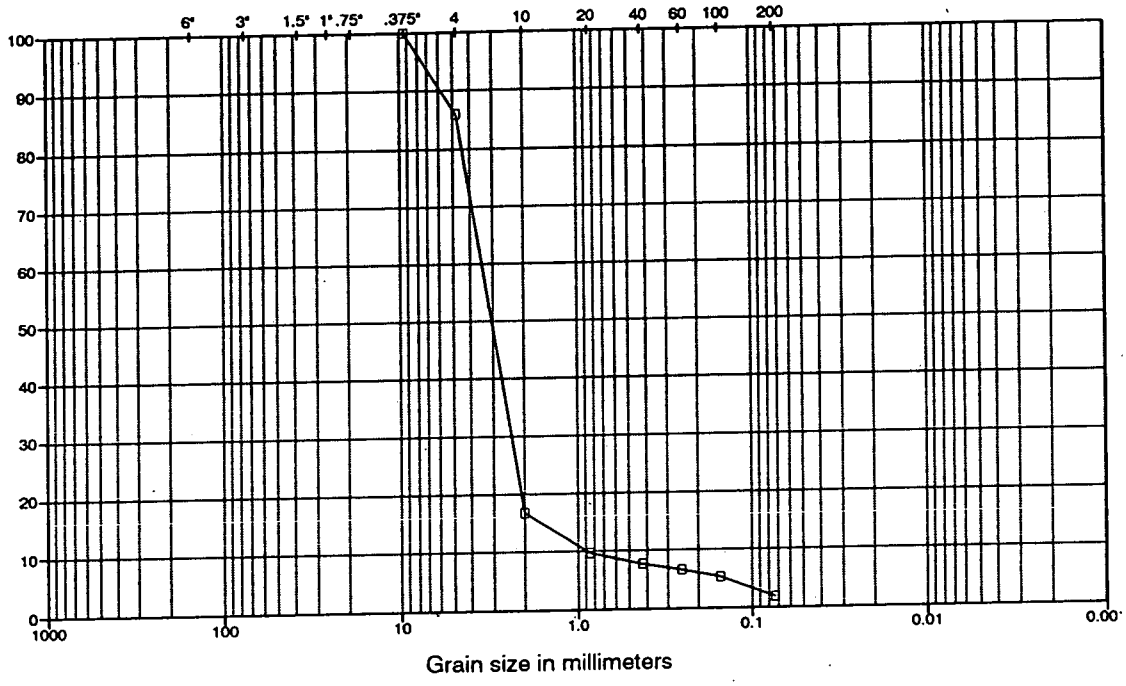
Description: Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.

USCS: SP

TECH	JWE
DATE	02/03/93
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PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	GRAVEL: Coarse	GRAVEL: Fine	SAND: C	SAND: Med	SAND: Fine	FINES (Silt or Clay)

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
SA# 41-45 #1A Stone --	-	-	-	-	-	Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.
Sample Type: BAG						USCS: SP

PROJECT TITLE: TDS/CQA OFFSITE/NY

PROJECT NUMBER: 923-9055.1A

COMPLETED : 02/03/93

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USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA OFFSITE/NY	Sample ID.:	SA# 46-50	#1A Stone	-
PROJECT NUMBER:	923-9055.1A	Sample Type:	BAG		

WATER CONTENT (Delivered Moisture)		
Tare Number		
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample	
Wet Soil+Tare (gm) =	
Dry Soil+Tare (gm) =	
Tare Weight (gm) =	
Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture		
Weight Of Sample (gm)=	(W6)	637.40
Tare Weight (gm) =		85.32
Total Wt. Dry (gm) =		552.08

SIEVE ANALYSIS

		Wt Ret +Tare	(Wt-Tare)	(%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	SIEVE	
Tare Weight (gms) =		203.33					
coarse gravel	3.000	203.33	0.00	0.00	100.00	3.000	coarse gravel
	1.500	203.33	0.00	0.00	100.00	1.500	coarse gravel
	1.000	203.33	0.00	0.00	100.00	1.000	coarse gravel
fine gravel	0.750	203.33	0.00	0.00	100.00	0.750	fine gravel
	0.375	203.33	0.00	0.00	100.00	0.375	fine gravel
coarse sand	#4	280.93	77.60	14.06	85.94	#4	coarse sand
medium sand	#10	661.88	458.55	83.06	16.94	#10	medium sand
	#20	701.79	498.46	90.29	9.71	#20	medium sand
fine sand	#40	711.67	508.34	92.08	7.92	#40	fine sand
	#60	716.92	513.59	93.03	6.97	#60	fine sand
	#100	722.28	518.95	94.00	6.00	#100	fine sand
fines	#200	740.22	536.89	97.25	2.75	#200	fines
	PAN	755.41	552.08	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	14.06
% C SAND	69.00
% M SAND	9.02
% F SAND	5.17
% FINES	2.75
% TOTAL	100.00

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	-
PL	-
PI	-
Gs	-

Description: Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.

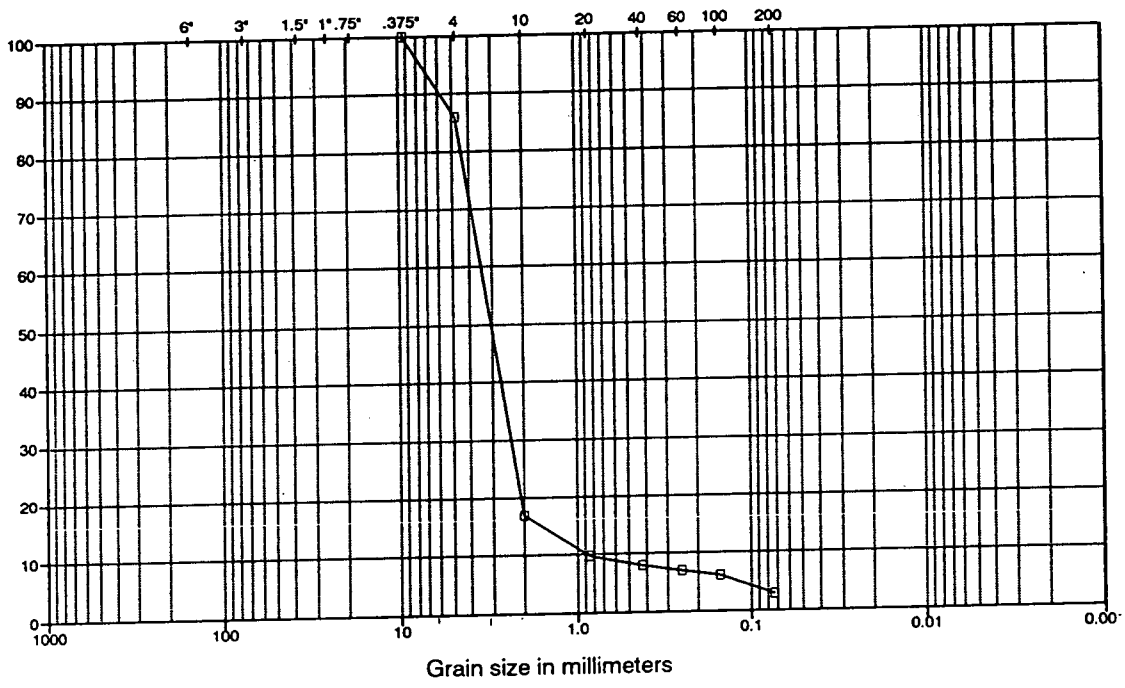
USCS: SP

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DATE	02/03/93
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PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	GRAVEL		SAND			FINES (Silt or Clay)
	Coarse	Fine	C	Med	Fine	

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
SA# 46-50 #1A Stone --	-	-	-	-	-	Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.
Sample Type: BAG						USCS: SP

PROJECT TITLE: TDS/CQA OFFSITE/NY

PROJECT NUMBER: 923-9055.1A

COMPLETED : 02/03/93

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USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA OFFSITE/NY	Sample ID.:	SA# 51-55	#1A Stone	--
PROJECT NUMBER:	923-9055.1A	Sample Type:	BAG		

WATER CONTENT (Delivered Moisture)

Tare Number		
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample

Wet Soil+Tare (gm) =	
Dry Soil+Tare (gm) =	
Tare Weight (gm) =	
Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture

	Weight Of Sample (gm)=	688.30
	Tare Weight (gm) =	84.58
(W6)	Total Wt. Dry (gm) =	603.72

SIEVE ANALYSIS

		Wt Ret +Tare	(Wt-Tare)	(%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	SIEVE	
Tare Weight (gms) =		203.33					
coarse gravel	3.000	203.33	0.00	0.00	100.00	3.000	coarse gravel
	1.500	203.33	0.00	0.00	100.00	1.500	coarse gravel
	1.000	203.33	0.00	0.00	100.00	1.000	coarse gravel
fine gravel	0.750	203.33	0.00	0.00	100.00	0.750	fine gravel
	0.375	203.33	0.00	0.00	100.00	0.375	fine gravel
coarse sand	#4	274.88	71.55	11.85	88.15	#4	coarse sand
medium sand	#10	674.49	471.16	78.04	21.96	#10	medium sand
	#20	730.51	527.18	87.32	12.68	#20	medium sand
fine sand	#40	746.91	543.58	90.04	9.96	#40	fine sand
	#60	755.78	552.45	91.51	8.49	#60	fine sand
	#100	765.74	562.41	93.16	6.84	#100	fine sand
fines	#200	790.52	587.19	97.26	2.74	#200	fines
	PAN	807.05	603.72	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	11.85
% C SAND	66.19
% M SAND	12.00
% F SAND	7.22
% FINES	2.74
% TOTAL	100.00

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	-
PL	-
PI	-
Gs	-

Description: Grey, COARSE TO MEDIUM SAND, little f-gravel, trace silt.

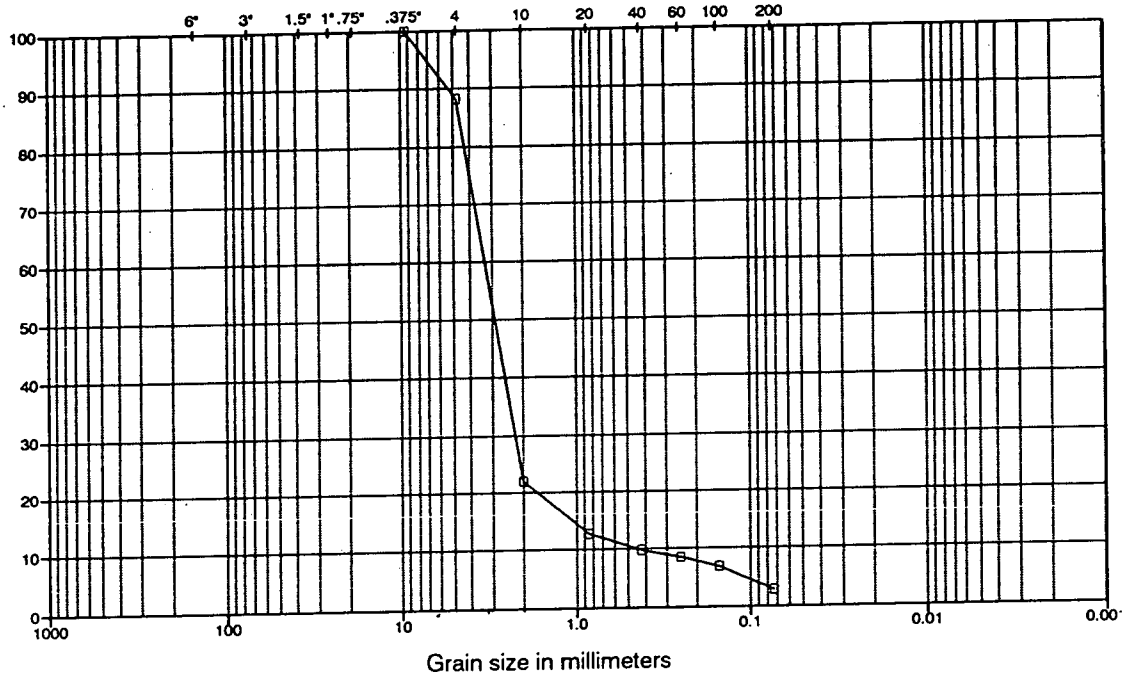
USCS: SP

TECH	JWE
DATE	02/03/93
CHECKED	
REVIEWED	

GOLDER ASSOCIATES INC.

PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	GRAVEL		SAND			FINES (Silt or Clay)
	Coarse	Fine	C	Med	Fine	

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
SA# 51-55 #1A Stone --	-	-	-	-	-	Grey, COARSE TO MEDIUM SAND, little f-gravel, trace silt.
Sample Type: BAG						USCS: SP

PROJECT TITLE: TDS/CQA OFFSITE/NY

PROJECT NUMBER: 923-9055.1A

COMPLETED: 02/03/93

CHECKED BY:

REVIEWED BY:

GOLDER ASSOCIATES INC.

USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA OFFSITE/NY	Sample ID.:	SA# 56-60	#1A Stone	--
PROJECT NUMBER:	923-9055.1A	Sample Type:	BAG		

WATER CONTENT (Delivered Moisture)

Tare Number		
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample

Wet Soil+Tare (gm) =	
Dry Soil+Tare (gm) =	
Tare Weight (gm) =	
Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture

	Weight Of Sample (gm)=	672.36
	Tare Weight (gm) =	85.13
(W6)	Total Wt. Dry (gm) =	587.23

SIEVE ANALYSIS

		Wt Ret +Tare	(Wt-Tare)	(%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	SIEVE	
Tare Weight (gms) =		203.33					
coarse gravel	3.000	203.33	0.00	0.00	100.00	3.000	coarse gravel
	1.500	203.33	0.00	0.00	100.00	1.500	coarse gravel
	1.000	203.33	0.00	0.00	100.00	1.000	coarse gravel
fine gravel	0.750	203.33	0.00	0.00	100.00	0.750	fine gravel
	0.375	204.88	1.55	0.26	99.74	0.375	fine gravel
coarse sand	#4	279.79	76.46	13.02	86.98	#4	coarse sand
medium sand	#10	668.40	465.07	79.20	20.80	#10	medium sand
	#20	717.97	514.64	87.64	12.36	#20	medium sand
fine sand	#40	733.70	530.37	90.32	9.68	#40	fine sand
	#60	742.66	539.33	91.84	8.16	#60	fine sand
	#100	754.96	551.63	93.94	6.06	#100	fine sand
fines	#200	777.00	573.67	97.69	2.31	#200	fines
	PAN	790.56	587.23	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	12.76
% C SAND	66.18
% M SAND	11.12
% F SAND	7.37
% FINES	2.31
% TOTAL	99.74

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	-
PL	-
PI	-
Gs	-

Description: Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.

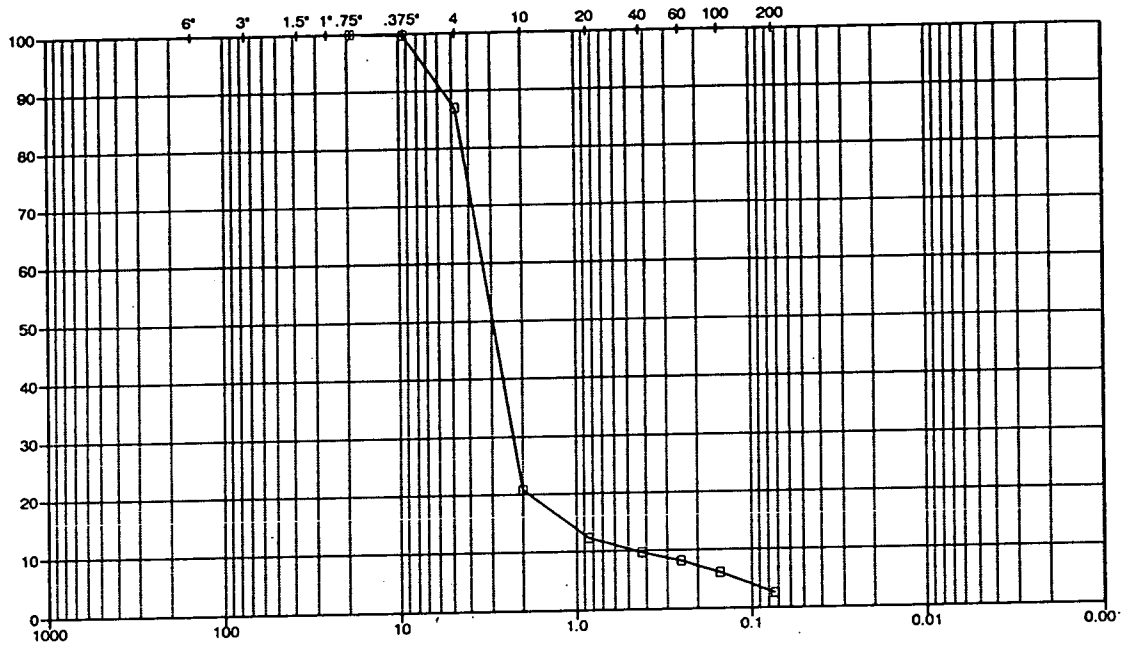
USCS: SP

TECH	JWE
DATE	02/03/93
CHECKED	
REVIEWED	

GOLDER ASSOCIATES INC.

PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	Coarse	Fine	C	Med	Fine	FINES (Silt or Clay)
	GRAVEL		SAND			

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
SA# 56-60 #1A Stone --	-	-	-	-	-	Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.
Sample Type: BAG						USCS: SP

PROJECT TITLE: TDS/CQA OFFSITE/NY

PROJECT NUMBER: 923-9055.1A

COMPLETED : 02/03/93

CHECKED BY:

REVIEWED BY:

GOLDER ASSOCIATES INC.

USCS

ASTM GRAIN SIZE ANALYSIS
MECHANICAL SIEVE
ASTM D421, D422, C136, D1140, D2216 and D2217

PROJECT TITLE:	TDS/CQA OFFSITE/NY	Sample ID.:	SA# 61 - 65	#1A Stone	-
PROJECT NUMBER:	923-9055.1A	Sample Type:	BAG		

WATER CONTENT (Delivered Moisture)		
Tare Number		
Wt Soil & Tare,Moist (gm)	(w1)	
Wt Soil & Tare,Dry (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil(gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	

Hygroscopic Moisture For Sieve Sample		
	Wet Soil+Tare (gm) =	
	Dry Soil+Tare (gm) =	
	Tare Weight (gm) =	
	Moisture Content(%)=	

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture		
	Weight Of Sample (gm)=	967.89
	Tare Weight (gm) =	113.79
(W6)	Total Wt. Dry (gm) =	854.10

SIEVE ANALYSIS		Wt Ret +Tare	(Wt-Tare)	(%Retained)	% PASS	SIEVE	
Tare Weight (gms) =		203.33		{(wt ret/w6)*100}	(100-%ret)		
coarse gravel	3.000	203.33	0.00	0.00	100.00	3.000	coarse gravel
	1.500	203.33	0.00	0.00	100.00	1.500	coarse gravel
	1.000	203.33	0.00	0.00	100.00	1.000	coarse gravel
fine gravel	0.750	203.33	0.00	0.00	100.00	0.750	fine gravel
	0.375	203.33	0.00	0.00	100.00	0.375	fine gravel
coarse sand	#4	373.62	170.29	19.94	80.06	#4	coarse sand
medium sand	#10	915.39	712.06	83.37	16.63	#10	medium sand
	#20	973.58	770.25	90.18	9.82	#20	medium sand
fine sand	#40	994.12	790.79	92.59	7.41	#40	fine sand
	#60	1006.89	803.56	94.08	5.92	#60	fine sand
	#100	1022.24	818.91	95.88	4.12	#100	fine sand
fines	#200	1044.60	841.27	98.50	1.50	#200	fines
	PAN	1057.43	854.10	100.00	0.00	PAN	

% C GRAVEL	0.00
% F GRAVEL	19.94
% C SAND	63.43
% M SAND	9.22
% F SAND	5.91
% FINES	1.50
% TOTAL	100.00

Descriptive Terms	
trace	0 to 5%
little	5 to 12%
some	12 to 30%
and	30 to 50%

> 10% mostly coarse (c)
> 10% mostly medium (m)
< 10% fine (c-m)
< 10% coarse (m-f)
< 10% coarse and fine (m)
< 10% coarse and medium (f)
> 10% equal amounts each (c-f)

LL	-
PL	-
PI	-
Gs	-

Description: Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.

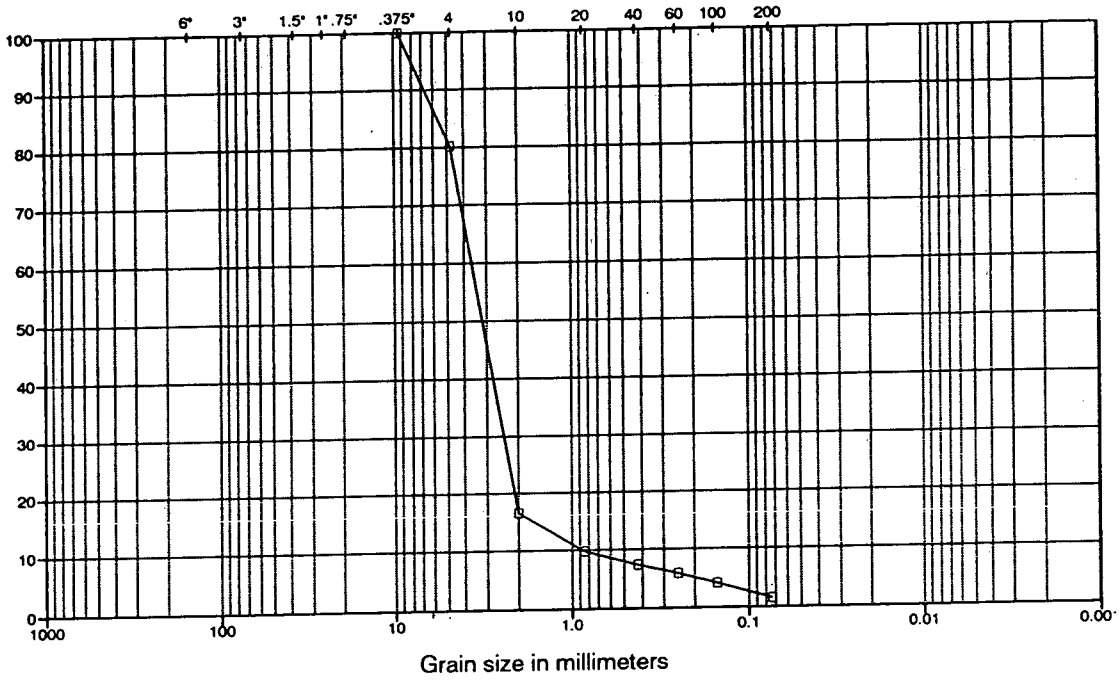
USCS: SP

TECH	AGO
DATE	02/08/93
CHECKED	
REVIEWED	

GOLDER ASSOCIATES INC.

PARTICLE SIZE DISTRIBUTION ASTM C136 AND D422

US STANDARD SIEVE OPENING SIZES



COBBLES	GRAVEL		SAND			FINES (Silt or Clay)
	Coarse	Fine	C	Med	Fine	

SAMPLE ID	Mc %	LL	PL	PI	Gs	Description
SA# 61 - 65 #1A Stone --	-	-	-	-	-	Grey, COARSE TO MEDIUM SAND, some f-gravel, trace silt.
Sample Type: BAG						USCS: SP

PROJECT TITLE: TDS/CQA OFFSITE/NY

PROJECT NUMBER: 923-9055.1A

COMPLETED : 02/08/93

CHECKED BY:

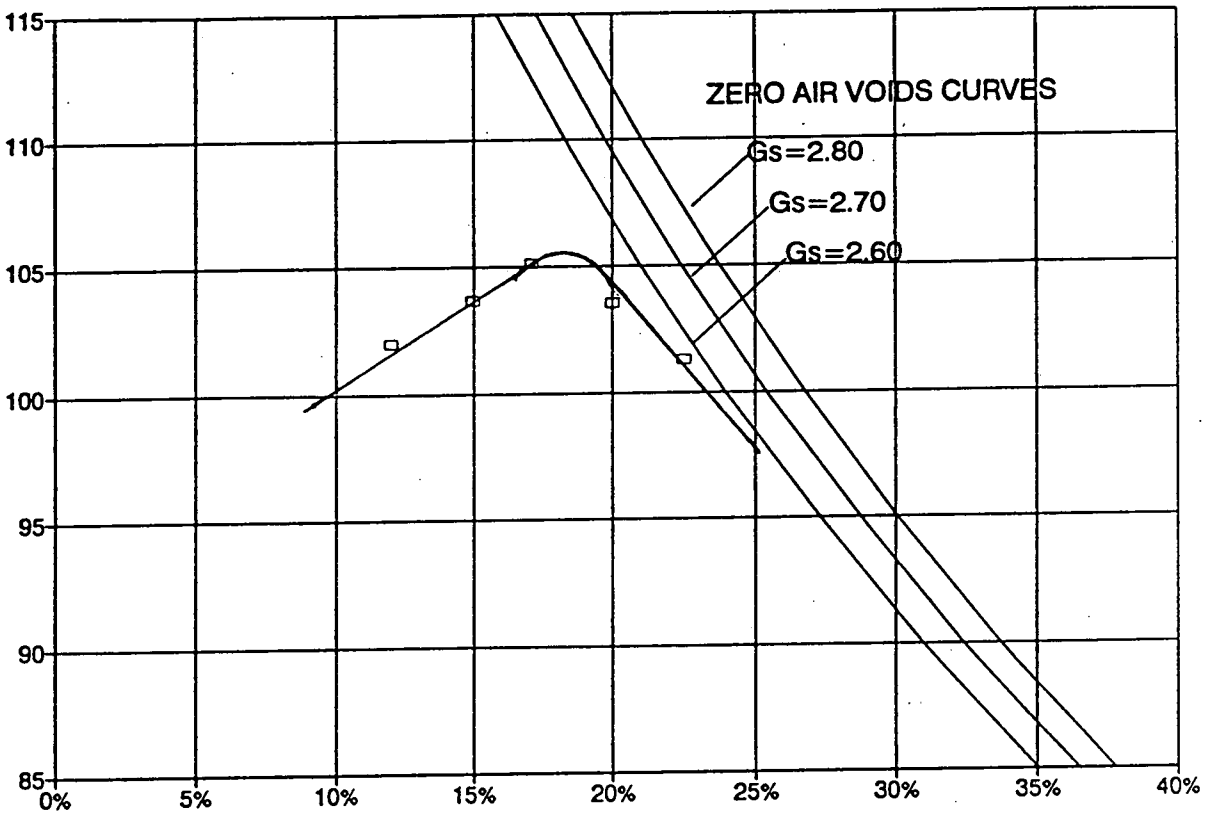
REVIEWED BY:

GOLDER ASSOCIATES INC.

APPENDIX I

NATIVE BACKFILL LABORATORY COMPACTION TEST RESULTS

MOISTURE/DRY DENSITY CURVE
ASTM D 698



SAMPLE IDENTITY	Wn(%)	LL	PL	PI	DESCRIPTION
11492 PRECONSTRUCTION TEST NO. 1	10.6				Dark greyish olive brown
	MAXIMUM DRY DENSITY (pcf): 105.4				
	OPTIMUM MOISTURE CONTENT: 17.8%				
SAMPLE TYPE: BULK			DATE TESTED: 11/4/92		

TECH: CH
DATE: 11/9/92
CHECKED:
REVIEWED:

TDS/CQA/OFFSITE
923-9055.1A

GOLDER ASSOCIATES,INC.
MT.LAUREL,NJ

COMPACTION TEST

Hammer Wt.,lb.	5.5	Project Number:	923-9055.1A
Drop Ht.,in.	12	Borehole Number:	Bag 1
No. Of Layers	3	Sample Number:	PR2
Blows Per Layer	25	Sample Depth:	—
Mold Number	3	Date Tested:	12/04/92
Mold Wt.,gm.	2076.60	Tested By:	JWE/BJP
Mold Ht.,in.	4.588	Calculated By:	ago
Mold Diam.,in.	3.996	Checked By:	
Mold Vol.,cu.ft.	0.033298		

Wt. Of Mold + Soil,gm.	3995.50	3927.60	4002.00	4058.00	4025.00
Wt. Of Mold,gm.	2076.60	2076.60	2076.60	2076.60	2076.60
Wt. Of Soil,gm.	1918.90	1851.00	1925.40	1981.40	1948.40
Wet Density,p.c.f.	127.05	122.55	127.48	131.18	129.00
Wet Wt. + Tare,gm.	399.07	414.25	344.86	406.25	434.57
Dry Wt. + Tare,gm.	338.10	377.01	309.40	356.42	372.94
Wt. Of Water,gm.	60.97	37.24	35.46	49.83	61.63
Tare Wt.,gm.	43.12	51.81	50.74	50.92	51.50
Wt. Of Dry Soil,gm.	294.98	325.20	258.66	305.50	321.44
Water Content, %	20.67	11.45	13.71	16.31	19.17
Dry Density,p.c.f.	105.28	109.96	112.11	112.79	108.24

MAXIMUM DRY DENSITY, p.c.f. = 113.0

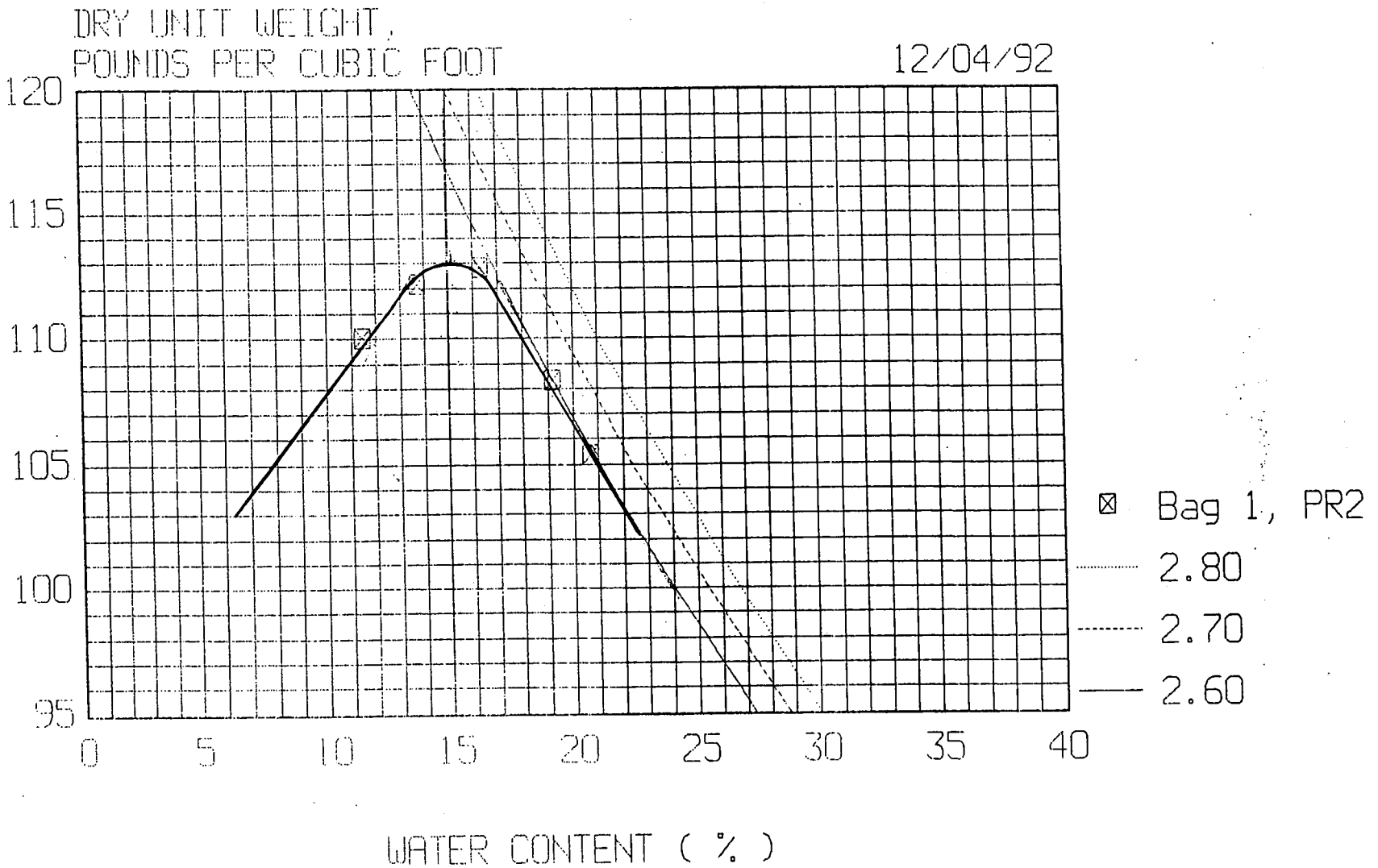
OPTIMUM MOISTURE CONTENT, (%) = 15.2

TYPE OF TEST: ASTM D-698-A

PRECONSTRUCTION
TEST NO. 2

DESCRIPTION: Brownish Tan, SILTY CLAY, little f-sand. (CL)

COMPACTION TEST



APPENDIX J

TWO-INCH RUN-OF-CRUSHER STONE LABORATORY COMPACTION TEST RESULTS

FRONTIER STONE, INC.

400 Hinman Road / P.O. Box 510
Lockport, New York 14094
Telephone (716) 434-8817
Or 1-800-244-4174
FAX (716) 434-9447

ASTM D1557-91 Laboratory Compaction
Characteristics of Soil Using Modified Effort

MATERIAL 2" ROC
SOURCE LOCKPORT DOLOMITE - LOCKPORT
TESTED BY TSB
DATE 7/20/92

COMPUTATION DATA SHEET

Original % $W_1 = \frac{(\text{Wet Wt} - \text{Dry Wt}) \times 100}{\text{Dry Wt}} = \frac{\quad}{\quad} = 5.0$ %

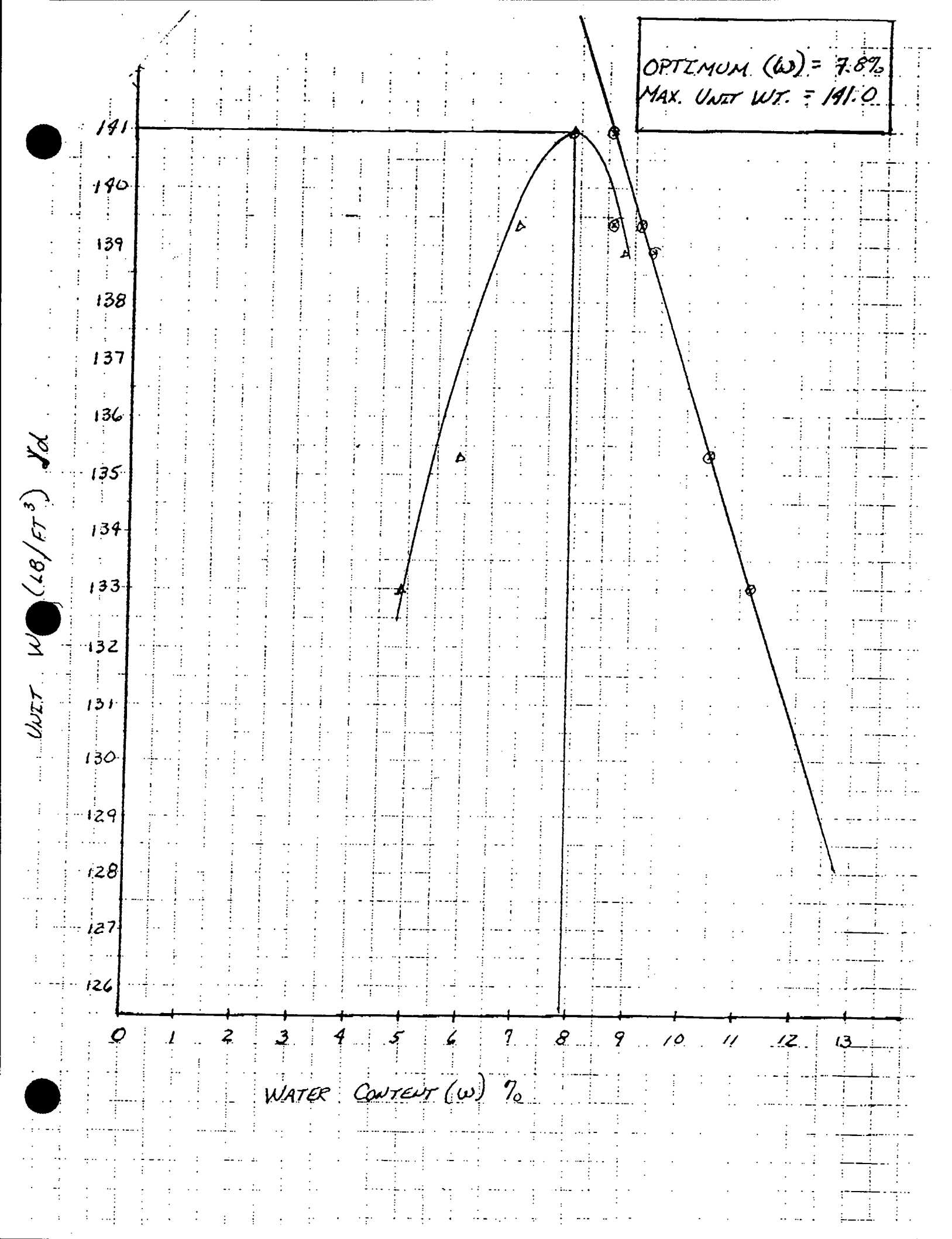
5 % W = 2500g x $(1 + \frac{W - W_1}{100})$ = 2500 g.

6 % W = 2500g x $(1 + \frac{W - W_1}{100})$ = 2525 g.

7 % W = 2500g x $(1 + \frac{W - W_1}{100})$ = 2580 g.

8 % W = 2500g x $(1 + \frac{W - W_1}{100})$ = 2575 g.

9 % W = 2500g x $(1 + \frac{W - W_1}{100})$ = 2600 g.


OPTIMUM (ω) = 7.8%
MAX. UNIT WT. = 141.0
UNIT WT. (LB/FT³) γd
141
140
139
138
137
136
135
134
133
132
131
130
129
128
127
126
0
1
2
3
4
5
6
7
8
9
10
11
12
13
WATER CONTENT (ω) %

APPENDIX K

#1A STONE LABORATORY COMPACTION TEST RESULTS

Huntingdon
Consulting Engineers Environmental Scientists

Empire Soils Investigations, Inc., Division
5-5167 South Park Avenue
Box 0913
Hamburg, New York 14075
(716)649-8110
Fax: (716)649-8051

PROJECT: TDS COA Offsite

CLIENT: Golder Associates, Inc.

DATE: November 13, 1992

PROJECT NO.: BT-92-194

REPORT NO.: 1

REPORT OF MATERIAL TESTING

MATERIAL: On site (GLSC) #1A Stone
Work order dated 11/6/92
E.S.I. Sample No. 92-297

MECHANICAL ANALYSIS:

Sieve Size	Percentage Passing
1/2"	100
1/4"	90.9
1/8"	3.9
#200	1.4

MAXIMUM/MINIMUM DENSITY ASTM D-4253 and D-4254

Maximum Index Density = 109.8 pcf
Minimúm Index Density = 92.2 pcf

Respectfully Submitted,
EMPIRE SOILS INVESTIGATIONS,INC.

Christopher Barton

Christopher Barton
Construction Services Manager

APPENDIX L

NUCLEAR DENSIMETER TEST RESULTS
#1A STONE, TWO-INCH RUN-OF-CRUSHER STONE, AND SOIL

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		1	2	3	4						
Layer		1	1	1	1						
Location Coordinates	Northing	V4 1+30	V4 0+93	V4 0+65	V4 0+35						
	Easting										
Lift		1	1	1	1						
Elevation											
Depth		6"	6"	6"	6"						
Density Count (DC)		—	—	—	—						
Wet Density (WD)		125.4	121.1	124.4	129.5						
Moisture Count (MC)		—	—	—	—						
Moisture (M#)		—	—	—	—						
Moisture (%)		19.53	16.3	18.4	24.2						
Dry Density, pcf (DD)		104.9	104.9	104.9	104.3						
Soil Source		#1A Stone	→	→	→						
Max. Dry Density, pcf		109.8	→	→	→						
Opt. Moisture Content, %		—	—								
Required % Compaction		95.0	→	→	→						
% Compaction		95.6	95.6	96.7	96.1						
Pass/Fail Density		P	P	P	P						
Window 80%/20%		—	—	—	—						

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 12/2/92

Tested By: CDM

Checked By: ALG

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/90 FN:\NUCGAUG.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		5	6	7	8	9					
Layer		2	2	2	1	2					
Location Coordinates	Northing	V4 0+50	V4 1+00	V4 1+40	V4 1+85	V4 1+85					
	Easting										
Lift		2	2	2	1	2					
Elevation											
Depth		6"	6"	6"	6"	6"					
Density Count (DC)		-	-								
Wet Density (WD)		108.9	107.7	108.8	111.1	109.6					
Moisture Count (MC)		-	-	-							
Moisture (M#)		-	-	-							
Moisture (%)		2.3	2.4	3.2	4.45	4.8					
Dry Density, pcf (DD)		106.4	105.1	105.4	106.4	104.5					
Soil Source		#1A Stone	→	→	→	→					
Max. Dry Density, pcf		109.8	→	→	→	→					
Opt. Moisture Content, %		-									
Required % Compaction		95.0	→	→	→	→					
% Compaction		96.93	95.74	95.98	96.89	95.21					
Pass/Fail Density		P	P	P	P	P					
Window 80%/20%		-									

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____
SERIAL NO. _____

Comments:

Date Tested: 12/4/92
Tested By: CDM
Checked By: AG

Job Number: 923-9055
Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/90 FN:\NUCGAUG.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		10	11	12	13						
Layer		1	2	3	4						
Location Coordinates	Northing	V4 2+50	V4 2+50	V4 2+50	V4 2+50						
	Easting										
Lift		1	2	3	4						
Elevation											
Depth		6"	6"	6"	6"						
Density Count (DC)		-	-	-	-						
Wet Density (WD)		111.3	111.3	108.3	110.4						
Moisture Count (MC)		-									
Moisture (M#)		-									
Moisture (%)		4.43	3.93	3.11	3.0						
Dry Density, pcf (DD)		106.6	107.0	105.0	107.1						
Soil Source		#1A stone	→	→	→						
Max. Dry Density, pcf		109.8	→	→	→						
Opt. Moisture Content, %		-									
Required % Compaction		95.0	→	→	→						
% Compaction		97.09	97.49	95.67	97.59						
Pass/Fail Density		P	P	P	P						
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 12/5/92

Tested By: CDM

Checked By: ALG

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/90 FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		14	15	16	17	18	19	20	21	22	
Layer		5	6	7	8	9	10	1	2	1	
Location Coordinates	Northing	V4 2+50	V4 2+50	V4 2+50	V4 2+50	V4 2+50	V4 2+50	V4 2+95	V4 2+95	V5 0+50	
	Easting										
Lift		5	6	7	8	9	10	1	2	1	
Elevation											
Depth		6"	6"	6"	6"	6"	6"	6"	6"	6"	
Density Count (DC)		-									
Wet Density (WD)		110.4	110.4	110.4	108.8	109.4	109.9	108.3	105.7	109.8	
Moisture Count (MC)		-									
Moisture (M#)		-									
Moisture (%)		3.49	3.97	4.96	2.81	3.03	3.02	2.54	0.53	2.63	
Dry Density, pcf (DD)		106.6	106.1	105.1	105.8	106.2	106.6	105.3	105.1	106.3	
Soil Source		#1A Stone	→	→	→	→	→	→	→	→	
Max. Dry Density, pcf		109.8	→	→	→	→	→	→	→	→	
Opt. Moisture Content, %		-									
Required % Compaction		95.0	→	→	→	→	→	→	→	→	
% Compaction		97.13	96.68	95.77	96.37	96.69	97.13	95.92	95.74	96.79	
Pass/Fail Density		P	P	P	P	P	P	P	P	P	
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 12/7/92

Tested By: CDM

Checked By: MM

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		23	24								
Layer		1	1								
Location Coordinates	Northing	VS 1+00	VS 1+45								
	Easting										
Lift		1	1								
Elevation											
Depth		6"	6"								
Density Count (DC)		-	-								
Wet Density (WD)		109.8	106.9								
Moisture Count (MC)		-	-								
Moisture (M#)		-	-								
Moisture (%)		2.8	1.02								
Dry Density, pcf (DD)		106.8	105.9								
Soil Source		#1A Stone	→								
Max. Dry Density, pcf		109.8	→								
Opt. Moisture Content, %		-									
Required % Compaction		95.0	→								
% Compaction		97.29	96.42								
Pass/Fail Density		P	P								
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 12/8/92

Tested By: CDM

Checked By: [signature]

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9X FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		25	26	27	28	29	30				
Layer		2	2	2	1	1	1				
Location Coordinates	Northing	V5 0+50	V5 1+00	V5 1+45	V5 2+00	V5-2+50	V5 2+95				
	Easting										
Lift		2	2	2	1	1	1				
Elevation											
Depth		6"	6"	6"	6"	6"	6"				
Density Count (DC)		-									
Wet Density (WD)		108.7	109.6	111.5	109.6	109.8	108.8				
Moisture Count (MC)		-	-	-	-	-	-				
Moisture (M#)		-	-	-	-	-	-				
Moisture (%)		2.05	1.59	2.92	3.72	4.28	1.03				
Dry Density, pcf (DD)		106.6	107.9	108.3	105.7	105.3	107.7				
Soil Source		#1A Stone	→	→	→	→	→				
Max. Dry Density, pcf		109.8	→	→	→	→	→				
Opt. Moisture Content, %		-									
Required % Compaction		95.0	→	→	→	→	→				
% Compaction		97.05	98.29	98.68	96.24	95.94	98.08				
Pass/Fail Density		P	P	P	P	P	P				
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 12/9/92

Tested By: CDM

Checked By: AM

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9K FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		31	32	33	34						
Layer		2	2	3	3						
Location Coordinates	Northing	V5- 2+00	V5- 2+50	V4 2+50	V4 2+95						
	Easting										
Lift		2	2	3	3						
Elevation											
Depth		6"	6"	6"	6"						
Density Count (DC)		-	-								
Wet Density (WD)		111.5	111.7	110.9	112.6						
Moisture Count (MC)		-	-	-	-						
Moisture (M#)		-	-	-	-						
Moisture (%)		5.63	5.82	4.4	6.61						
Dry Density, pcf (DD)		105.5	105.6	106.2	105.7						
Soil Source		#1A Stone	→	→	→						
Max. Dry Density, pcf		109.8	→	→	→						
Opt. Moisture Content, %		-									
Required % Compaction		95.0	→	→	→						
% Compaction		96.12	96.15	96.74	96.24						
Pass/Fail Density		P	P	P	P						
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 12/10/92

Tested By: CDM

Checked By: MW

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9C FN:NUCGAUG.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		35	36	37	38	39	40	41	42	43	44
Layer		1	1	1	1	1	2	2	3	3	4
Location Coordinates	Northing	V3 2+00	V3 2+50	V3 2+95	V4 2+50	V4 2+70	V4 2+70	V4 2+50	V4 2+70	V4 2+50	V4 2+70
	Easting										
Lift		1	1	1	1	1	2	2	3	3	4
Elevation											
Depth		6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
Density Count (DC)		-	-	-	-						
Wet Density (WD)		117.6	113.4	112.2	124.9	127.4	123.5	126.4	123.2	123.6	126.7
Moisture Count (MC)		[illegible]	-	-	-	-	-	-	-	-	-
Moisture (M#)		-	-	-	-	-	-	-	-	-	-
Moisture (%)		5.6	4.52	4.7	20.92	21.5	16.07	18.99	20.61	20.18	18.46
Dry Density, pcf (DD)		111.3	108.5	107.1	103.3	105.9	106.4	106.2	102.2	102.9	106.5
Soil Source		#1A Stone	→	→	Clay B.F.	→	→	→	→	→	→
Max. Dry Density, pcf		109.8	→	→	113.0	→	→	→	→	→	→
Opt. Moisture Content, %		-	-	-	15.2	→	→	→	→	→	→
Required % Compaction		95.0	→	→	90.0	→	→	→	→	→	→
% Compaction		101.4	98.83	97.57	91.44	93.75	94.18	94.0	90.41	91.03	94.25
Pass/Fail Density		P	P	P	P	P	P	P	P	P	P
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 12/15/92

Tested By: CDM

Checked By: AM

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/92 FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		45	46	47	48	49	50	51	52	53	54
Layer		4	3	3	3	3	3	1	1	2	2
Location Coordinates	Northing	V4 2+50	V5 0+50	V5 1+00	V5 1+50	V5 2+00	V5 2+50	V5 0+50	V5 1+00	V5 0+50	V5 1+00
	Easting										
Lift		4	3	3	3	3	3	1	1	2	2
Elevation											
Depth		6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
Density Count (DC)		-	-	-							
Wet Density (WD)		124.9	110.6	109.3	109.7	108.0	107.3	124.9	125.1	123.4	126.9
Moisture Count (MC)		-	-	-	-	-	-	-	-	-	-
Moisture (M#)		-	-	-	-	-	-	-	-	-	-
Moisture (%)		19.9	1.38	1.85	0.26	1.48	1.81	19.29	19.99	17.56	21.31
Dry Density, pcf (DD)		104.1	109.1	107.3	109.4	106.5	105.4	104.7	104.3	105.0	104.6
Soil Source		Clay B.F.	#1A Stone	→	→	→	→	~~113.0~~ Clay B.F.	→	→	→
Max. Dry Density, pcf		113.0	109.8	→	→	→	→	113.0	→	→	→
Opt. Moisture Content, %		15.2	-	-	-	-	-	15.2	→	→	→
Required % Compaction		90.0	95.0	→	→	→	→	90.0	→	→	→
% Compaction		92.16	99.4	97.69	99.62	98.78	96.01	92.64	92.3	92.93	92.59
Pass/Fail Density		P	P	P	P	P	P	P	P	P	P
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____
SERIAL NO. _____

Comments:

Date Tested: 12/15/92
Tested By: CDM
Checked By: [illegible]

Job Number: 923-9055
Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		55	56								
Layer		3	3								
Location Coordinates	Northing	V5 0+50	V5 1+00								
	Easting										
Lift		3	3								
Elevation											
Depth		6"	6"								
Density Count (DC)		-									
Wet Density (WD)		124.8	128.2								
Moisture Count (MC)		-	-								
Moisture (M#)		-	-								
Moisture (%)		19.5	21.49								
Dry Density, pcf (DD)		104.4	105.5								
Soil Source		Clay B.F.	→								
Max. Dry Density, pcf		113.0	→								
Opt. Moisture Content, %		15.2	→								
Required % Compaction		90.0	→								
% Compaction		92.43	93.37								
Pass/Fail Density		P	P								
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 12/15/92

Tested By: CDM

Checked By: AW

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/92 FN:\NUCGAUG.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		57	58	59	60	61	62	63	64	65	66
Layer		3	3	1	1	1	2	2	3	3	1
Location Coordinates	Northing	V4 2+00	V4 1+50	V4 1+50	V5 1+50	V5 2+00	V5 1+50	V5 2+00	V5 1+50	V5 2+00	V5 2+50
	Easting										
Lift		3	3	1	1	1	2	2	3	3	1
Elevation											
Depth		6"	6"	6"	6"	6"	6"	6"	6"	6"	9"
Density Count (DC)		-									
Wet Density (WD)		113.9	111.2	125.3	120.7	121.7	123.9	122.4	121.4	120.9	120.4
Moisture Count (MC)		-	-	-	-	-					
Moisture (M#)		-	-	-	-	-					
Moisture (%)		6.25	3.38	19.95	19.66	19.47	19.2	19.51	19.7	19.8	19.8
Dry Density, pcf (DD)		107.2	107.6	104.5	100.9	101.9	103.4	102.4	101.4	100.9	100.4
Soil Source		#1A stone	→	clay	→	→	→	→	→	→	→
Max. Dry Density, pcf		109.8	→	109.2	→	→	→	→	→	→	→
Opt. Moisture Content, %		-	-	15.2	→	→	→	→	→	→	→
Required % Compaction		95.0	→	90.0	→	→	→	→	→	→	→
% Compaction		97.66	97.99	95.68	92.36	93.28	95.17	93.79	92.88	92.42	91.96
Pass/Fail Density		P	P	P	P	P	P	P	P	P	P
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 12/17/92

Tested By: CDM

Checked By: DAS

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 6/9X FN:\NUCGAUG.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		67	68	69	70	71	72	73	74		
Layer		1	2	2	3	3	4	4	4		
Location	Northing	V5 2+95	V5 2+50	V5 2+95	V5 2+50	V5 2+95	V5 1+50	V5 2+00	V5 1+00		
Coordinates	Easting										
Lift		1	2	2	3	3	4	4	4		
Elevation											
Depth		9"	9"	9"	9"	9"	6"	6"	6"		
Density Count (DC)		-	-								
Wet Density (WD)		119.9	121.0	122.1	122.9	122.6	121.2	118.9	121.5		
Moisture Count (MC)		-	-								
Moisture (M#)		-	-								
Moisture (%)		20.0	21.98	22.12	22.93	23.28	23.19	19.78	23.2		
Dry Density, pcf (DD)		99.9	99.2	99.4	100.0	99.4	98.4	99.3	98.6		
Soil Source		Clay	→	→	→	→	→	→	→		
Max. Dry Density, pcf		109.2	→	→	→	→	→	→	→		
Opt. Moisture Content, %		15.2	→	→	→	→	→	→	→		
Required % Compaction		90.0	→	→	→	→	→	→	→		
% Compaction		91.5	90.86	91.53	91.55	91.06	90.09	90.91	90.28		
Pass/Fail Density		P	P	P	P	P	P	P	P		
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____
SERIAL NO. _____

Comments:

Date Tested: 12/17/92
Tested By: CDM
Checked By: [illegible]

Job Number: 923-9055
Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9X FN:NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		75	76	77	78	79	80	81	82	83	84
Layer		1	2	2	2	2	3	3	3	3	3
Location Coordinates	Northing	V4 2+00	V4 2+00	V3 2+00	V3 2+50	V3 2+95	V4 0+50	V4 1+00	V3 2+95	V3 2+50	V3 2+00
	Easting										
Lift		1	2	2	2	2	3	3	3	3	3
Elevation											
Depth		9"	9"	6"	6"	6"	6"	6"	6"	6"	6"
Density Count (DC)		-									
Wet Density (WD)		127.8	127.2	111.3	111.2	109.6	108.9	107.8	108.6	106.9	109.4
Moisture Count (MC)		-	-	-	-	-	-	-	-	-	-
Moisture (M#)		-	-	-	-	-	-	-	-	-	-
Moisture (%)		2.3	0.1	0.4	0.4	1.3	2.7	2.5	1.1	1.5	1.0
Dry Density, pcf (DD)		130.1	127.0	110.5	110.7	111.1	106.0	105.1	107.4	105.3	105.4
Soil Source		2" ROC	→	#1A stone	→	→	→	→	→	→	→
Max. Dry Density, pcf		141	→	109.8	→	→	→	→	→	→	→
Opt. Moisture Content, %		7.8	→	N.A.	→	→	—	→	→	→	→
Required % Compaction		90.0	→	95.0	→	→	—	→	→	→	→
% Compaction		92.3	90.1	100.7	101.8	99.8	96.6	95.7	97.8	95.4	96.0
Pass/Fail Density		P	P	P	P	P	P	P	P	P	P
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 12/18/92

Tested By: CDM

Checked By: AW

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 6/90 FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		85										
Layer		3										
Location Coordinates	Northing	V4 2+00										
	Easting											
Lift		3										
Elevation												
Depth		9"										
Density Count (DC)		-										
Wet Density (WD)		130.8										
Moisture Count (MC)		-										
Moisture (M#)		-										
Moisture (%)		2.2										
Dry Density, pcf (DD)		128.0										
Soil Source		2" ROC										
Max. Dry Density, pcf		141										
Opt. Moisture Content, %		7.8										
Required % Compaction		90.0										
% Compaction		90.8										
Pass/Fail Density		P										
Window 80%/20%												

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 12/18/92

Tested By: CPM

Checked By: AM

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9< FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		86	87									
Layer		1	2									
Location Coordinates	Northing	V4 1+00	V4 1+00									
	Easting											
Lift		1	2									
Elevation												
Depth		9"	9"									
Density Count (DC)		-										
Wet Density (WD)		130.6	131.1									
Moisture Count (MC)		-	-									
Moisture (M#)		-	-									
Moisture (%)		1.9	1.8									
Dry Density, pcf (DD)		128.1	128.8									
Soil Source		2" ROC	→									
Max. Dry Density, pcf		141	→									
Opt. Moisture Content, %		7.8	→									
Required % Compaction		90.0	→									
% Compaction		90.8	91.3									
Pass/Fail Density		P	P									
Window 80%/20%												

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 12/22/92

Tested By: CDM

Checked By: [signature]

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9X FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		88	89	90	91	92	93	94	95		
Layer		1	1	1	1	2	2	2	2		
Location	Northing	V2 2+95	V2 2+50	V2 2+00	V2 1+50	V2 2+95	V2 2+50	V2 2+00	V2 1+50		
Coordinates	Easting										
Lift		1	1	1	1	2	2	2	2		
Elevation											
Depth		6"	6"	6"	6"	6"	6"	6"	6"		
Density Count (DC)											
Wet Density (WD)		116.9	117.2	117.8	118.7	116.1	117.4	114.3	106.2		
Moisture Count (MC)											
Moisture (M#)											
Moisture (%)		5.6	5.5	5.6	7.6	7.1	6.4	6.4	0.7		
Dry Density, pcf (DD)		110.7	111.1	111.5	110.3	108.4	110.4	107.4	105.4		
Soil Source		#1A	→	→	→	→	→	→	→		
Max. Dry Density, pcf		109.8	→	→	→	→	→	→	→		
Opt. Moisture Content, %		NA	→	→	→	→	→	→	→		
Required % Compaction		95.0	→	→	→	→	→	→	→		
% Compaction		100.8	101.2	101.6	100.5	98.7	100.5	97.9	96.0		
Pass/Fail Density		P	P	P	P	P	P	P	P		
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____
SERIAL NO. _____

Comments:

Date Tested: 1/6/93
Tested By: CDM
Checked By: AA

Job Number: 923-9055
Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9X FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		96	97	98	99	100					
Layer		1	1	1	2	2					
Location Coordinates	Northing	V2 1+00	V2 0+50	V2 0+5	V2 1+00	V2 0+50					
	Easting										
Lift		1	1	1	2	2					
Elevation											
Depth		6"	6"	6"	6"	6"					
Density Count (DC)											
Wet Density (WD)		112.4	108.1	~~109.1~~ 111.4	113.2	107.7					
Moisture Count (MC)											
Moisture (M#)											
Moisture (%)		1.4	2.4	2.1	2.5	0.6					
Dry Density, pcf (DD)		110.9	105.6	109.1	110.4	107.1					
Soil Source		#1A	→	→	→	→					
Max. Dry Density, pcf		109.8	→	→	→	→					
Opt. Moisture Content, %		[illegible]	→	→	→	→					
Required % Compaction		95.0	→	→	→	→					
% Compaction		101.0	96.1	99.3	100.5	97.5					
Pass/Fail Density		P	P	P	P	P					
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 1/7/93

Tested By: CDM

Checked By: [signature]

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/90 FN:NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		101	102	103	104	105	106	107	108	109	110
Layer		2	1	3	3	3	3	3	3	1	2
Location Coordinates	Northing	V2 0+25	V1 2+95	V2 0+50	V2 1+00	V2 1+50	V2 2+00	V2 2+50	V2 2+80	V2 2+95	V2 2+95
	Easting										
Lift		2	1	3	3	3	3	3	3	1	2
Elevation											
Depth		6"	6"	6"	6"	6"	6"	6"	6"	9"	9"
Density Count (DC)		-									
Wet Density (WD)		108.4	107.1	107.7	109.1	107.5	108.0	107.5	108.0	118.0	119.9
Moisture Count (MC)		-	-	-							
Moisture (M#)		-	-	-							
Moisture (%)		0.7	0.6	1.3	2.2	0.5	0.6	0.8	0.7	19.2	21.0
Dry Density, pcf (DD)		107.7	106.4	106.4	106.8	107.0	107.4	106.7	107.2	99.0	99.0
Soil Source		#1A	-	-	-					clay	→
Max. Dry Density, pcf		109.8	-	-	-					109.2	→
Opt. Moisture Content, %		NA	-	-	-					15.2	→
Required % Compaction		95.0	-	-	-					90.0	→
% Compaction		98.1	96.9	96.9	97.3	97.4	97.8	97.2	97.7	90.6	90.7
Pass/Fail Density		P	P	P	P	P	P	P	P	P	P
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 1/8/93

Tested By: CJM

Checked By: [signature]

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9< FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		111	112	113	114	115	116				
Layer		3	1	2	3	4	4				
Location Coordinates	Northing	V2 2+95	V2 2+50	V2 2+50	V2 2+50	V2 2+50	V2 2+95				
	Easting										
Lift		3	1	2	3	4	4				
Elevation											
Depth		9"	9"	9"	9"	9"	9"				
Density Count (DC)		-									
Wet Density (WD)		121.2	120.1	122.4	121.3	120.2	120.2				
Moisture Count (MC)		-	-								
Moisture (M#)		-	-								
Moisture (%)		21.7	19.0	22.9	21.5	21.2	21.7				
Dry Density, pcf (DD)		~~100.6~~ 99.5	100.8	99.6	99.9	99.1	98.7				
Soil Source		Clay	→	-	-	-	-				
Max. Dry Density, pcf		109.2	-	-	-	-	-				
Opt. Moisture Content, %		15.2	-	-	-	-	-				
Required % Compaction		90.0	-	-	-	-	-				
% Compaction		91.1	92.3	91.2	91.4	90.7	90.4				
Pass/Fail Density		P	P	P	P	P	P				
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 1/19/93

Tested By: CDM

Checked By: AW

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/96 FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		117	118	119	120	121					
Layer		1	2	3	4	5					
Location Coordinates	Northing	V2 2+00	V2 2+00	V2 2+00	V2 2+00	V2 2+00					
	Easting										
Lift		1	2	3	4	5					
Elevation											
Depth		9"	9"	9"	9"	9"					
Density Count (DC)		-	-								
Wet Density (WD)		121.4	116.6	112.1	119.4	119.2					
Moisture Count (MC)		-	-	-	-						
Moisture (M#)		-	-	-	-						
Moisture (%)		23.1	27.7	23.6	20.3	22.6					
Dry Density, pcf (DD)		98.6	91.3	90.7	99.2	97.2					
Soil Source		clay	-								
Max. Dry Density, pcf		109.2	-								
Opt. Moisture Content, %		15.2	-								
Required % Compaction		90.0	-								
% Compaction		90.3	91.3	90.7	90.9	97.2					
Pass/Fail Density		P	P	P	P	P					
Window 80%/20%											

Standard Count			
Density	Moisture	TROXLER	MODEL NO. _____
			SERIAL NO. _____

Comments:

Date Tested: 1/11/93
Tested By: CDM
Checked By: AJW

Job Number: 923-9055
Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9X FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		122	123	124	125	126	127	128	129	130	131
Layer		1	1	1	2	2	2	2	1	1	1
Location Coordinates	Northing	V1 2+50	V1 2+00	V1 1+50	V1 2+95	V1 2+50	V1 2+00	V1 1+50	V1 1+00	V1 0+50	V2 1+50
	Easting										
Lift		1	1	1	2	2	2	2	1	1	1
Elevation											
Depth		6"	6"	6"	6"	6"	6"	6"	6"	6"	9"
Density Count (DC)											
Wet Density (WD)		107.0	107.0	106.3	106.5	106.3	106.2	106.7	106.1	106.1	136.5
Moisture Count (MC)											
Moisture (M#)											
Moisture (%)		1.0	1.4	0.3	0.7	0.9	1.2	0.9	1.0	1.1	3.6
Dry Density, pcf (DD)		105.9	105.4	106.0	105.8	105.4	105.0	105.8	105.1	105.0	131.8
Soil Source		#1A	→	—	—	—	—	—	—	—	2" ROC
Max. Dry Density, pcf		109.8	→	—	—	—	—	—	—	—	141
Opt. Moisture Content, %		NA	→	—	—	—	—	—	—	—	7.8
Required % Compaction		95.0	→	—	—	—	—	—	—	—	90.0
% Compaction		96.4	96.0	96.5	96.4	96.0	95.6	96.3	95.7	95.6	93.5
Pass/Fail Density		P	P	P	P	P	P	P	P	P	P
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____
SERIAL NO. _____

Comments:

Date Tested: 1/12/93
Tested By: CDM
Checked By: MM

Job Number: 923-9055
Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9X FN:\NUCGAUG.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		132	133	134	135	136					
Layer		1	2	2	3	3					
Location Coordinates	Northing	V2 0+50	V2 1+50	V2 0+50	V2 1+50	V2 0+50					
	Easting										
Lift		1	2	2	3	3					
Elevation											
Depth		9"	9"	9"	9"	9"					
Density Count (DC)											
Wet Density (WD)		136.5	128.7	128.7	129.0	129.8					
Moisture Count (MC)											
Moisture (M#)											
Moisture (%)		4.8	0.1	1.1	1.2	1.2					
Dry Density, pcf (DD)		130.3	128.5	127.3	127.5	128.3					
Soil Source		2" ROC	→	-	-	-					
Max. Dry Density, pcf		141	→	-	-	-					
Opt. Moisture Content, %		7.8	→	-	-	-					
Required % Compaction		90.0	→	-	-	-					
% Compaction		92.4	91.2	90.3	90.4	91.0					
Pass/Fail Density		P	P	P	P	P					
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 1/12/93

Tested By: CDM

Checked By: MD

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9C FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		137	138								
Layer		2	2								
Location Coordinates	Northing	V1 1+00	V1 0+50								
	Easting										
Lift		2	2								
Elevation											
Depth		6"	6"								
Density Count (DC)											
Wet Density (WD)		109.9	109.8								
Moisture Count (MC)											
Moisture (M#)											
Moisture (%)		1.3	4.6								
Dry Density, pcf (DD)		108.5	105.0								
Soil Source		#1A	→								
Max. Dry Density, pcf		109.8	→								
Opt. Moisture Content, %		NA	→								
Required % Compaction		95.0	→								
% Compaction		98.8	95.7								
Pass/Fail Density		P	P								
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____
SERIAL NO. _____

Comments:

Date Tested: 1/13/93
Tested By: CDM
Checked By: [signature]

Job Number: 923-9055
Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9X FN:\NUCGAUG.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		139	140	141	142	143	144	145	146		
Layer		3	3	3	3	1	2	1	1		
Location	Northing	V1 2+95	V1 2+50	V1 2+00	V1 1+50	V1 2+50	V1 2+50	V3 1+30	V3 1+00		
Coordinates	Easting										
Lift		3	3	3	3	1	2	1	1		
Elevation											
Depth		6"	6"	6"	6"	9"	9"	6"	6"		
Density Count (DC)											
Wet Density (WD)		111.9	112.0	106.9	106.9	127.1	127.9	113.3	114.5		
Moisture Count (MC)											
Moisture (M#)											
Moisture (%)		2.9	2.9	1.4	1.2	0.2	0.1	2.5	1.7		
Dry Density, pcf (DD)		108.7	108.8	105.3	105.6	126.9	127.0	110.6	112.6		
Soil Source		#1A	→	-	-	2" ROC.	→	#1A	→		
Max. Dry Density, pcf		109.8	→	-	-	141	→	109.8	→		
Opt. Moisture Content, %		NA	→	-	-	7.8	→	NA	→		
Required % Compaction		95.0	→	-	-	90.0	→	95.0	→		
% Compaction		99.0	99.1	95.9	96.1	90.0	90.0	100.7	102.5		
Pass/Fail Density		P	P	P	P	P	P	P	P		
Window 80%/20%											

Standard Count			
Density	Moisture	TROXLER	MODEL NO. _____
			SERIAL NO. _____

Comments:

Date Tested: 1/14/93

Tested By: cbm

Checked By: DM

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/9X FN:\NUCGAUG.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		147	148	149	150	151	152	153			
Layer		2	2	2	3	3	1	2			
Location Coordinates	Northing	V3 0+50	V3 1+00	V3 1+30	V3 0+50	V3 1+00	V3 0+75	V3 0+75			
	Easting										
Lift		2	2	2	3	3	1	2			
Elevation											
Depth		6"	6"	6"	6"	6"	9"	9"			
Density Count (DC)											
Wet Density (WD)		113.1	114.0	113.1	111.8	111.8	139.8	139.8			
Moisture Count (MC)											
Moisture (M#)											
Moisture (%)		2.3	1.8	1.7	0.8	1.8	8.0	5.9			
Dry Density, pcf (DD)		110.5	112.0	111.2	110.8	109.7	129.4	132.0			
Soil Source		#1A	#1A	#1A	→	—	2" Rock	→			
Max. Dry Density, pcf		109.8	→	→	—	—	141.0	→			
Opt. Moisture Content, %		NA	→	→	—	—	7.8	→			
Required % Compaction		95.0	→	→	—	—	90.0	→			
% Compaction		100.6	102.0	101.3	101.0	100.1	91.7	93.6			
Pass/Fail Density		P	P	P	P	P	P	P			
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 1/18/93

Tested By: CDM

Checked By: [illegible]

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 6/90 FN:\NUCGAUG.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		154	155	156	157	158	159	160	161	162	163
Layer		3	3	1	1	2	2	3	3	1	2
Location	Northing	V1 1+00	V1 0+50	V1 1+50	V1 1+00	V1 1+50	V1 1+00	V1 1+50	V1 1+00	V1 0+50	V1 0+50
Coordinates	Easting										
Lift		3	3	1	1	2	2	3	3	1	2
Elevation											
Depth		6"	6"	9"	9"	9"	9"	9"	9"	9"	9"
Density Count (DC)											
Wet Density (WD)		116.6	121.6	122.3	122.4	119.0	118.9	121.1	120.7	121.9	116.1
Moisture Count (MC)											
Moisture (M#)											
Moisture (%)		5.8	14.7	23.4	21.0	20.7	20.9	21.7	21.9	23.2	18.1
Dry Density, pcf (DD)		110.2	106.1	99.0	101.1	98.6	98.3	99.5	99.0	99.0	98.3
Soil Source		#1A	→	Clay	→	-	-	-	-	-	-
Max. Dry Density, pcf		109.8	→	109.2	→	-	-	-	-	-	-
Opt. Moisture Content, %		NA	→	16.5	→	-	-	-	-	-	-
Required % Compaction		95.0	→	90.0	→	-	-	-	-	-	-
% Compaction		100.4	97.1	90.7	92.6	90.3	90.1	91.2	90.7	90.6	90.0
Pass/Fail Density		P	P	P	P	P	P	P	P	P	P
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 1/19/93

Tested By: CDM

Checked By: AM

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/90 FN:\NUCGAUG.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		164										
Layer		3										
Location Coordinates	Northing	V1 0+50										
	Easting											
Lift		3										
Elevation												
Depth		9"										
Density Count (DC)												
Wet Density (WD)		114.9										
Moisture Count (MC)												
Moisture (M#)												
Moisture (%)		16.4										
Dry Density, pcf (DD)		98.6										
Soil Source		Clay										
Max. Dry Density, pcf		109.2										
Opt. Moisture Content, %		16.5										
Required % Compaction		90.0										
% Compaction		90.3										
Pass/Fail Density		P										
Window 80%/20%												

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 1/19/93

Tested By: CDM

Checked By: AW

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/90 FN:\NUCGAUG.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		165	166	167	168						
Layer		1	1	2	1						
Location Coordinates	Northing	V6 0+50	V6 1+00	V6 1+00	V6 1+50						
	Easting										
Lift		1	1	2	1						
Elevation											
Depth		6"	6"	6"	6"						
Density Count (DC)											
Wet Density (WD)		109.8	110.3	118.7	126.9						
Moisture Count (MC)											
Moisture (M#)											
Moisture (%)		4.5	0.5	8.5	16.2						
Dry Density, pcf (DD)		105.1	109.7	109.4	109.1						
Soil Source		#17 stone	-	-	-						
Max. Dry Density, pcf		109.8	-	-	-						
Opt. Moisture Content, %		N/A	-	-	-						
Required % Compaction		95.0	-	-	-						
% Compaction		95.7	100.0	99.6	99.4						
Pass/Fail Density		P	P	P	P						
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____

SERIAL NO. _____

Comments:

Date Tested: 2/2/93

Tested By: CDM

Checked By: AJA

Job Number: 923-9055

Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

12/89 Model City, N.Y.
Revised 5/92 FN:\NUCGAUC.WK1

NUCLEAR GAUGE IN-SITU DENSITY TEST

Test Number		169	170	171	172	173	174	175			
Layer		2	2	3	3	3	1	2			
Location Coordinates	Northing	V6 0+50	V6 1+50	V6 0+50	V6 1+00	V6 1+50	V6 1+00	V6 1+00			
	Easting										
Lift		2	2	3	3	3	1	2			
Elevation											
Depth		6"	6"	6"	6"	6"	12"	12"			
Density Count (DC)											
Wet Density (WD)		116.7	110.9	112.9	111.2	110.4	152.9	152.5			
Moisture Count (MC)											
Moisture (M#)											
Moisture (%)		2.9	4.9	3.7	2.5	2.4	8.3	9.2			
Dry Density, pcf (DD)		113.4	105.7	108.9	108.4	107.8	141.1	140.0			
Soil Source		#1A	-	-	-	-	2" ROC	→			
Max. Dry Density, pcf		109.8	-	-	-	-	141	→			
Opt. Moisture Content, %		NA	-	-	-	-	-	→			
Required % Compaction		95.0	-	-	-	-	90.0	→			
% Compaction		103.3	96.2	99.2	~~105.1~~ 98.7	98.2	100.1	99.2			
Pass/Fail Density		P	P	P	P	P	P	P			
Window 80%/20%											

Standard Count	
Density	Moisture

TROXLER MODEL NO. _____
SERIAL NO. _____

Comments:

Date Tested: 2/5/93
Tested By: CPP
Checked By: CDM

Job Number: 923-9055
Job Name: TDS/CQA OFF SITE/NY

GOLDER ASSOCIATES, INC.
210 JOHN GLENN DRIVE STE. 1
AMHERST, NEW YORK 14228

APPENDIX M

SURVEY DATA

NOTE: SURVEY DATA PROVIDED BY CLEAN HARBORS

CleanHarbors®
ENVIRONMENTAL SERVICES, INC.
1200 CROWN COLONY DRIVE, P.O. BOX 9137 • QUINCY, MA 02269-9137
(617) 849-1800

April 22, 1994

Golder Associates
210 John Glenn Drive, Suite 1
Amherst, NY 14228

Attn: Tony Grasso

Subj: **System Eleveations**
Bell Aerospace Textron
Wheatfield, NY

Dear Tony,

Please find the system eleveations in the table below. All elevations in the table below have been converted to relfect sea level elevations.

GROUNDWATER EXTRACTION SYSTEM ELEVATIONS

EW-1
VAULT TOP = 574.83
INVERT = 569.41
VAULT FLOOR = 568.87
MIDPOINT = 570.08

EW-2
VAULT TOP = 573.94
INVERT = 568.52
VAULT FLOOR = 567.98
MIDPOINT = 569.57

EW-3
VAULT TOP = 574.27
INVERT = 568.31
VAULT FLOOR = 569.39
MIDPOINT = 569.24

EW-4
VAULT TOP = 574.07
INVERT = 568.36
VAULT FLOOR = 569.90
MIDPOINT = 569.84

EW-5
VAULT TOP = 573.96
INVERT = 568.54
VAULT FLOOR = 568.00
MIDPOINT = 570.51

EW-6
VAULT TOP = 575.26
INVERT = 569.84
VAULT FLOOR = 569.30

Should you have any questions, please contact me at (617) 849-1800 ext. 1154 or (716) 731-3499.

Sincerely,

Gordon Fielding
Sr. Project Manager

cc: Brian Smith

BELL-TEXTRON
EXTRACTION SYSTEM ELEVATIONS

EW-1 TO EW-2

Invert= 569.41
0+10= 569.45
0+20= 569.49
0+30= 569.53
0+40= 569.57
0+50= 569.61
0+60= 569.65
0+70= 569.70
0+80= 569.74
0+90= 569.78
1+00= 569.82
1+10= 569.86
1+20= 569.90
1+30= 569.94
1+40= 569.98
Midpoint= 570.08
1+60= 569.98
1+70= 569.87
1+80= 569.77
1+90= 569.66
2+00= 569.56
2+10= 569.46
2+20= 569.35
2+30= 569.25
2+40= 569.14
2+50= 569.04
2+60= 568.94
2+70= 568.83
2+80= 568.73
2+90= 568.63
Invert= 568.52

EW-2 TO EW-3

Invert= 568.52
3+10= 568.59
3+20= 568.66
3+30= 568.73
3+40= 568.80
3+50= 568.87
3+60= 568.94
3+70= 569.01
3+80= 569.08
3+90= 569.15
4+00= 569.22
4+10= 569.29
4+20= 569.36
4+30= 569.43
4+40= 569.50
Midpoint= 569.57
4+60= 569.49
4+70= 569.40
4+80= 569.32
4+90= 569.23
5+00= 569.15
5+10= 569.07
5+20= 568.98
5+30= 568.90
5+40= 568.81
5+50= 568.73
5+60= 568.65
5+70= 568.56
5+80= 568.48
5+90= 568.39
Invert= 568.31

EW-3 TO EW-4

Invert= 568.31
6+10= 568.37
6+20= 568.43
6+30= 568.50
6+40= 568.56
6+50= 568.62
6+60= 568.68
6+70= 568.74
6+80= 568.81
6+90= 568.87
7+00= 568.93
7+60= 569.18
7+70= 569.12
7+80= 569.06
7+90= 569.00
8+00= 568.95
8+10= 568.89
8+20= 568.83
8+30= 568.77
8+40= 568.71
8+50= 568.65
8+60= 568.59

7+10= 568.99
7+20= 569.05
7+30= 569.12
7+40= 569.18
Midpoint= 569.24

8+70= 568.53
8+80= 568.47
8+90= 568.41
Invert= 568.36

EW-4 TO EW-5

Invert= 568.36
9+10= 568.46
9+20= 568.56
9+30= 568.66
9+40= 568.76
9+50= 568.86
9+60= 568.96
9+70= 569.05
9+80= 569.15
9+90= 569.25
10+00= 569.35
10+10= 569.45
10+20= 569.55
10+30= 569.65
10+40= 569.75
Midpoint= 569.84

10+60= 569.78
10+70= 569.67
10+80= 569.58
10+90= 569.49
11+00= 569.41
11+10= 569.32
11+20= 569.23
11+30= 569.14
11+40= 569.06
11+50= 568.97
11+60= 568.88
11+70= 568.80
11+80= 568.71
11+90= 568.62
Invert= 568.54

EW-5 TO EW-6

Invert= 568.54
12+10= 568.67
12+20= 568.80
12+30= 568.94
12+40= 569.07
12+50= 569.20
12+60= 569.33
12+70= 569.46
12+80= 569.60
12+90= 569.73
13+00= 569.86
13+10= 569.99
13+20= 570.12
13+30= 570.26
13+40= 570.39
Midpoint= 570.52

13+60= 570.48
13+70= 570.43
13+80= 570.39
13+90= 570.34
14+00= 570.30
14+10= 570.25
14+20= 570.21
14+30= 570.16
14+40= 570.12
14+50= 570.07
14+60= 570.03
14+70= 569.98
14+80= 569.94
14+90= 569.89
Invert= 569.85

EW-6 TO SEWER

Invert= 569.85
15+10= 569.90
15+20= 569.94
15+30= 569.99
15+40= 570.03
15+50= 570.08
15+60= 570.12
15+70= 570.17

15+80= 570.21
15+90= 570.26
16+00= 570.30
16+05= 570.35
Expansion Joint= 570.35
16+10= 570.28
16+20= 570.21
16+30= 570.14
16+40= 570.07
16+50= 570.00
16+60= 569.92
Invert @ Sewer= 569.85

MONITORING WELL ELEVATION

	Ground Surface	Top of Riser
93-01(1)	575.59	578.37
93-02(1)	576.39	579.05
93-03(1)	569.97	572.30

NOTE:

ON SHEET 1, TEST BORE LOCATIONS,

DATED MAY 13, 1993,

PREPARED BY DEBORAH A. NAYBOR, PLS, P.C.

ALL REFERENCES TO MONITORING

WELL DESIGNATION "92" SHOULD BE "93"

NOTE:
IN INSTANCES WHERE DIGITAL INFORMATION IS SUPPLIED TO A CLIENT ON MAGNETIC MEDIUM, WE CAN NOT BE RESPONSIBLE FOR THE ACCURACY OF ANY SUBSEQUENT COMPUTER GENERATED MAPPING, BEYOND THE ORIGINAL INTENDED MAP SCALE.

MON WELL
92-01(1)

STATE PLANE COORDINATES

STATION	NORTHING	EASTING
EW-1	1128515.428	408488.294
EW-2	1128189.243	408487.892
EW-3	1127866.869	408486.881
EW-4	1127565.950	408486.859
EW-5	1127265.022	408486.089
92-03(1)	1126667.149	408486.482
92-02(1)	1127959.016	408379.542
92-01(1)	1127971.797	407662.322
6'X6'PAD	1127710.319	408488.566
EW-6	1126966.869	408486.29

147.17-1-55

147.17-1-56

147.17-1-57

147.17-1-58

147.17-1-59

147.17-1-60.1

147.17-1-60.2

162.05-1-2

162.05-1-3

162.05-1-4

162.05-1-5

162.05-1-6

162.05-1-7

162.05-1-8

162.05-1-9

162.05-1-10

162.05-1-11

162.05-1-12

EW-1

EW-2

EW-3

EW-4

EW-5

EW-6

MON WELL
92-02(1)

6'X6' CONC PAD
W/TEL & ELEC PANEL

MON WELL
92-03(1)

WALMORF ROAD (49.5'WIDE)

N

NO BOUNDARY SURVEY WAS PERFORMED BY
DEBORAH A. NAYBOR PLS, PC.

WARNING: ALTERING THIS DOCUMENT IS IN VIOLATION OF THE LAW EXCEPTING AS PROVIDED IN SECTION 7209, PART 2 OF THE NEW YORK STATE EDUCATION LAW.

Deborah A Naybor

TEST BORE LOCATIONS

PART OF LOT 45 & 52
TOWN OF WHEATFIELD
NIAGARA COUNTY NEW YORK

DEBORAH A. NAYBOR PLS, PC.
3488 WALDEN AVENUE
DEPEW, NEW YORK 14043
(716) 685-2264

DATE : 5/13/1993 SHEET : 1 OF 1

JOB NO.: 92350 SCALE : 1" = 100'

APPENDIX N

PRESSURE TEST PROCEDURE AND PRESSURE TEST RESULTS

GEORGE FISCHER +GF+ 12/11/92

AYER SALES
WOBURN, MASS
MR DAVID AYER

CONSERVA-TECH
ENGINEERING SERVICES
WILLIAMSTOWN, NJ 08094

PRESSURE TESTING

CHECKED FEB - 5 1993

DEAR DAVID,

IN REFERENCE TO THE CLEAN HARBORS JOB. +GF+ RECOMMENDS THAT THE CONTAINMENT PIPING BE PRESSURE TESTED WITH AIR OR NITROGEN AT LOW PRESSURE AROUND 5PSI AND SOAP THE JOINTS FOR A CHECK.

THE POLYPRO CARRIER CAN BE PRESSURE TESTED ALSO AT AROUND 25-30 PSI. AN INITIAL PRESSURE LOSS WILL BE NOTICED YOU MUST WAIT FOR THE PIPE TO STABILIZE OR STOP EXPANDING. (NEXT DAY). RE-PRESSURIZE AND THAN WATCH THE GUAGE. BECAUSE THE PIPE EXPANDS, SMALL PRESSURE LOSSES INITIALLY MAY NOT MEAN A LEAK. PLEASE CALL VINCE SAUNDERS AT +GF+ TUSTIN, CA. 1-800-854-4090 IF YOU HAVE ADDITIONAL QUESTIONS.

BEST REGARDS,

ROB LUKE

+GF+

George Fischer Signet, Inc., 2882 Dow Avenue, Tustin, California 92680-7285
(714) 731-8800 Toll-free (800) 854-4090 Fax (714) 731-5701

JANUARY 1993

923-9055

BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

PIPE TEST CERTIFICATE

	Initial Test Status	Interim Test Status	Interim Test Status	Final Test Status	Duration
Date/Time:	1-15-93/16:30	1-19-93/8:30	1-19-93/9:45	1-19-93/13:00	20.5 hr
Temperature (Ambient):	38°	33°	33°	34°	-
Test Pressure (psig):	25	25	26	26	-

Test Medium: ( ) Water (X) Air ( ) Nitrogen ( ) _____

Test Specification: Pressurize to approximately 25–30 psi. Let stabilize overnight. Repressurize to approximately 25–30 psi and observe pressure over approximately 4 hours. Large drop indicates failure.

DESCRIPTION OF PIPELINE(S) TESTED

Location: TDS Off-Site System, Wheatfield, New York

Line Numbers: Primary system, 3" diameter carrier pipe Vault 4 to Vault 5

Portion of Line Tested: (X) All, or ( ) _____

Remarks: Test specifications as per manufacturer's recommendations.

Test Results: Pass X Fail _____

I certify that the above information is correct and that the pipeline described above was prepared and tested in my presence in accordance with the Specification indicated above.

Signed by _____ Contractor's Representative — Clean Harbors Env. Inc. Company — 2/3/93 Date

Test Witnessed by _____ Owner's Representative — Golder Associates Inc. Company — 2/3/93 Date

F/N: PIPTEST1.WK1

JANUARY 1993

923-9055

BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

PIPE TEST CERTIFICATE

	Initial Test Status	Interim Test Status	Interim Test Status	Final Test Status	Duration
Date/Time:	1-19-93/16:00	1-20-93/8:30	1-20-93/8:30	1-20-93/12:00	20.0 hr
Temperature (Ambient):	37°	35°	35°	37°	—
Test Pressure (psig):	26	25.5	25.5	25.5	—

Test Medium: ( ) Water (X) Air ( ) Nitrogen ( ) _____

Test Specification: Pressurize to approximately 25–30 psi. Let stabilize overnight. Repressurize to approximately 25–30 psi and observe pressure over approximately 4 hours. Large drop indicates failure.

DESCRIPTION OF PIPELINE(S) TESTED

Location: TDS Off-Site System, Wheatfield, New York

Line Numbers: Primary system, 3" diameter carrier pipe Vault 3 to Vault 4

Portion of Line Tested: (X) All, or ( ) _____

Remarks: Test specifications as per manufacturer's recommendations.

Test Results: Pass X Fail _____

I certify that the above information is correct and that the pipeline described above was prepared and tested in my presence in accordance with the Specification indicated above.

Signed by _____ Contractor's Representative — Clean Harbors Env Inc. Company — 2/3/93 Date

Test Witnessed by _____ Owner's Representative — Golder Associates Inc. Company — 2/3/93 Date

F:\S\PIPTEST1.WK1

JANUARY 1993

923-9055

BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

PIPE TEST CERTIFICATE

	Initial Test Status	Interim Test Status	Interim Test Status	Final Test Status	Duration
Date/Time:	1-19-93/13:00	1-20-93/8:30	1-20-93/8:45	1-20-93/12:00	23 hr
Temperature (Ambient):	38°	35°	35°	37°	-
Test Pressure (psig):	26	15	24.5	24.5	-

Test Medium: ( ) Water (X) Air ( ) Nitrogen ( ) _____

Test Specification: Pressurize to approximately 25–30 psi. Let stabilize overnight. Repressurize to approximately 25–30 psi and observe pressure over approximately 4 hours. Large drop indicates failure.

DESCRIPTION OF PIPELINE(S) TESTED

Location: TDS Off-Site System, Wheatfield, New York

Line Numbers: Primary system, 3" diameter carrier pipe Vault 5 to Vault 6

Portion of Line Tested: (X) All, or ( ) _____

Remarks: Test specifications as per manufacturer's recommendations.

Test Results: Pass X Fail _____

I certify that the above information is correct and that the pipeline described above was prepared and tested in my presence in accordance with the Specification indicated above.

Signed by Joseph Norton — Contractor's Representative — Clean Harbors Env Inc — Company — 2/3/93 — Date

Test Witnessed by Chris Martin — Owner's Representative — Golder Associates Inc — Company — 2/3/93 — Date

F:\N: PIPTEST1.WK1

BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

PIPE TEST CERTIFICATE

	Initial Test Status	Interim Test Status	Interim Test Status	Final Test Status	Duration
Date/Time:	1-20-93/13:00	1-21-93/8:00	1-21-93/10:30	1-21-93/16:30	27.5 hr
Temperature (Ambient):	37°	35°	35°	35°	-
Test Pressure (psig):	25	20	25	25	-

Test Medium: ( ) Water (X) Air ( ) Nitrogen ( ) _____

Test Specification: Pressurize to approximately 25–30 psi. Let stabilize overnight. Repressurize to approximately 25–30 psi and observe pressure over approximately 4 hours. Large drop indicates failure.

DESCRIPTION OF PIPELINE(S) TESTED

Location: TDS Off-Site System, Wheatfield, New York

Line Numbers: Primary system, 3" diameter carrier pipe Vault 2 to Vault 3

Portion of Line Tested: (X) All, or ( ) _____

Remarks: Test specifications as per manufacturer's recommendations.

Test Results: Pass X Fail _____

I certify that the above information is correct and that the pipeline described above was prepared and tested in my presence in accordance with the Specification indicated above.

Signed by _____ Contractor's Representative — Clean Harbors Env Inc Company — 2/3/93 Date

Test Witnessed by _____ Owner's Representative — Golder Associates Inc Company — 2/3/93 Date

F/N: PIPTEST1.WK1

JANUARY 1993

923-9055

BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

PIPE TEST CERTIFICATE

	Initial Test Status	Interim Test Status	Interim Test Status	Final Test Status	Duration
Date/Time:	1-21-93/15:30	1-22-93/8:30	1-22-93/9:30	1-22-93/13:30	22 hr
Temperature (Ambient):	40°	35°	35°	35°	
Test Pressure (psig):	6	5	5	5	

Test Medium: ( ) Water (X) Air ( ) Nitrogen ( ) _____

Test Specification: Pressurize to approximately 6–8 psi. Let stabilize overnight. Repressurize to approximately 6–8 psi and observe pressure over approximately 4 hours. Large drop indicates failure.

DESCRIPTION OF PIPELINE(S) TESTED

Location: TDS Off-Site System, Wheatfield, New York

Line Numbers: Secondary system, 8" containment pipe Vault 5 to Vault 6

Portion of Line Tested: (X) All, or ( ) _____

Remarks: Test specifications as per manufacturer's recommendations.

Test Results: Pass X Fail _____

I certify that the above information is correct and that the pipeline described above was prepared and tested in my presence in accordance with the Specification indicated above.

Signed by _____ Contractor's Representative — Clean Harbors Env Inc Company — 2/6/93 Date

Test Witnessed by _____ Owner's Representative — Golder Associates Inc Company — 2/6/93 Date

F/S: PIPTEST2.WK1

JANUARY 1993

923-9055

BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

PIPE TEST CERTIFICATE

	Initial Test Status	Interim Test Status	Interim Test Status	Final Test Status	Duration
Date/Time:	1-23-93/11:30	1-24-93/9:00	1-24-93/9:00	1-24-93/13:30	26 hr
Temperature (Ambient):	35°	35°	35°	35°	-
Test Pressure (psig):	5	5	5	5	-

Test Medium: ( ) Water (X) Air ( ) Nitrogen ( ) _____

Test Specification: Pressurize to approximately 6–8 psi. Let stabilize overnight. Repressurize to approximately 6–8 psi and observe pressure over approximately 4 hours. Large drop indicates failure.

DESCRIPTION OF PIPELINE(S) TESTED

Location: TDS Off-Site System, Wheatfield, New York

Line Numbers: Secondary system, 8" containment pipe Vault 2 to Vault 3

Portion of Line Tested: (X) All, or ( ) _____

Remarks: Test specifications as per manufacturer's recommendations.

Test Results: Pass X Fail _____

I certify that the above information is correct and that the pipeline described above was prepared and tested in my presence in accordance with the Specification indicated above.

Signed by Joseph Norton — Contractor's Representative — Clean Harbors ENJ Inc — Company — 2/6/93 — Date

Test Witnessed by Christine Martin — Owner's Representative — Golder Associates Inc — Company — 3/6/93 — Date

F/N: PIPTEST2.WK1

JANUARY 1993

923-9055

BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

PIPE TEST CERTIFICATE

	Initial Test Status	Interim Test Status	Interim Test Status	Final Test Status	Duration
Date/Time:	1-23-93/11:30	1-25-93/9:00	1-25-93/10:00	1-25-93/16:00	52.5 hr
Temperature (Ambient):	39°	40°	40°	41°	-
Test Pressure (psig):	20	15	25	25	-

Test Medium: ( ) Water (X) Air ( ) Nitrogen ( ) _____

Test Specification: Pressurize to approximately 25-30 psi. Let stabilize overnight. Repressurize to approximately 25-30 psi and observe pressure over approximately 4 hours. Large drop indicates failure.

DESCRIPTION OF PIPELINE(S) TESTED

Location: TDS Off-Site System, Wheatfield, New York

Line Numbers: Primary system, 3" diameter carrier pipe Vault 1 to Vault 2

Portion of Line Tested: (X) All, or ( ) _____

Remarks: Test specifications as per manufacturer's recommendations.

Test Results: Pass X Fail _____

I certify that the above information is correct and that the pipeline described above was prepared and tested in my presence in accordance with the Specification indicated above.

Signed by _____ Contractor's Representative — Clean Harbors Env. Inc Company — 2/3/93 Date

Test Witnessed by _____ Owner's Representative — Golder Associates Inc. Company — 2/3/93 Date

P/N: PIPTEST1.WK1

JANUARY 1993

923-9055

BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

PIPE TEST CERTIFICATE

	Initial Test Status	Interim Test Status	Interim Test Status	Final Test Status	Duration
Date/Time:	1-26-93/10:00	1-27-93/8:30	1-27-93/8:30	1-26-93/13:00	27 hr
Temperature (Ambient):	33°	33°	33°	34	-
Test Pressure (psig):	6	6	6	6	-

Test Medium: ( ) Water (X) Air ( ) Nitrogen ( ) _____

Test Specification: Pressurize to approximately 6-8 psi. Let stabilize overnight. Repressurize to approximately 6-8 psi and observe pressure over approximately 4 hours. Large drop indicates failure.

DESCRIPTION OF PIPELINE(S) TESTED

Location: TDS Off-Site System, Wheatfield, New York

Line Numbers: Secondary system, 8" containment pipe Vault 3 to Vault 4

Portion of Line Tested: (X) All, or ( ) _____

Remarks: Test specifications as per manufacturer's recommendations.

Test Results: Pass X Fail _____

I certify that the above information is correct and that the pipeline described above was prepared and tested in my presence in accordance with the Specification indicated above.

Signed by Joseph Norton — Contractor's Representative — Clean Harbors Env. Inc. — Company — 2/6/93 — Date

Test Witnessed by Chris Mott — Owner's Representative — Golder Associates Inc. — Company — 2/6/93 — Date

F/N: PIPTEST2.WK1

BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

PIPE TEST CERTIFICATE

	Initial Test Status	Interim Test Status	Interim Test Status	Final Test Status	Duration
Date/Time:	1-27-93/11:00	1-28-93/8:00	1-28-93/8:00	1-28-93/12:00	25hr
Temperature (Ambient):	32°	32°	32°	32°	-
Test Pressure (psig):	6	6	6	6	-

Test Medium: ( ) Water (X) Air ( ) Nitrogen ( ) _____

Test Specification: Pressurize to approximately 6-8 psi. Let stabilize overnight. Repressurize to approximately 6-8 psi and observe pressure over approximately 4 hours. Large drop indicates failure.

DESCRIPTION OF PIPELINE(S) TESTED

Location: TDS Off-Site System, Wheatfield, New York

Line Numbers: Secondary system, 8" containment pipe Vault 1 to Vault 2

Portion of Line Tested: (X) All, or ( ) _____

Remarks: Test specifications as per manufacturer's recommendations.

Test Results: Pass X Fail _____

I certify that the above information is correct and that the pipeline described above was prepared and tested in my presence in accordance with the Specification indicated above.

Signed by _____ Contractor's Representative — Clean Harbors Env Inc — Company — 2/6/93 — Date

Test Witnessed by _____ Owner's Representative — Golder Associates Inc — Company — 2/6/93 — Date

F/N: PIPTEST2.WK1

JANUARY 1993

923-9055

BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

PIPE TEST CERTIFICATE

	Initial Test Status	Interim Test Status	Interim Test Status	Final Test Status	Duration
Date/Time:	1-27-93/11:00	-	-	2-2-93/10:30	143.5 hr
Temperature (Ambient):	34°	-	-	33°	-
Test Pressure (psig):	6	-	-	6	-

Test Medium: ( ) Water (X) Air ( ) Nitrogen ( ) _____

Test Specification: Pressurize to approximately 6–8 psi. Let stabilize overnight. Repressurize to approximately 6–8 psi and observe pressure over approximately 4 hours. Large drop indicates failure.

DESCRIPTION OF PIPELINE(S) TESTED

Location: TDS Off-Site System, Wheatfield, New York

Line Numbers: Secondary system, 8" containment pipe Vault 4 to Vault 5

Portion of Line Tested: (X) All, or ( ) _____

Remarks: Test specifications as per manufacturer's recommendations.

Test Results: Pass X Fail _____

I certify that the above information is correct and that the pipeline described above was prepared and tested in my presence in accordance with the Specification indicated above.

Signed by _____ Contractor's Representative — Clean Harbors ENV Inc (Company) — 2/6/93 (Date)

Test Witnessed by _____ Owner's Representative — Golder Associates Inc (Company) — 2/6/93 (Date)

F:\N:\PIPTEST2.WK1

JANUARY 1993

BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

PIPE TEST CERTIFICATE

	Initial Test Status	Interim Test Status	Interim Test Status	Final Test Status	Duration
Date/Time:	3/2/93 / 9:45	3/2/93 / 13:00	3/3/93 11:30	3/2/93 14:55	5:10
Temperature (Ambient):	44°	48°	48°	48°	
Test Pressure (psig):	6	6	6	6	

Test Medium: ( ) Water (X) Air ( ) Nitrogen ( ) _____

Test Specification: Pressurize to approximately 6–8 psi. Let stabilize overnight. Repressurize to approximately 6–8 psi and observe pressure over approximately 4 hours. Large drop indicates failure.

DESCRIPTION OF PIPELINE(S) TESTED

Location: TDS Off-Site System, Wheatfield, New York

Line Numbers: Secondary system, 8" containment pipe

Portion of Line Tested: (X) All, or ( ) Vault 6 to Sump

Remarks: Test specifications as per manufacturer's recommendations.

Test Results: Pass X Fail _____

I certify that the above information is correct and that the pipeline described above was prepared and tested in my presence in accordance with the Specification indicated above.

Signed by _____ Contractor's Representative — Clean Harbors Env Inc (Company) — 3/2/93 (Date)

Test Witnessed by _____ Owner's Representative — Goldik Assoc. Inc (Company) — 3/2/93 (Date)

F/N: PIPTEST2.WK1

JANUARY 1993

923-9055

BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

PIPE TEST CERTIFICATE

	Initial Test Status	Interim Test Status	Interim Test Status	Final Test Status	Duration
Date/Time:	3/2/93 16:30	3/3/93 8:50	3/3/93 8:50	3/3/93 12:50	20h
Temperature (Ambient):	48°F	34°F	34°F	40°F	
Test Pressure (psig):	25	23	25	25	

Test Medium: ( ) Water (X) Air ( ) Nitrogen ( ) _____

Test Specification: Pressurize to approximately 25–30 psi. Let stabilize overnight. Repressurize to approximately 25–30 psi and observe pressure over approximately 4 hours. Large drop indicates failure.

DESCRIPTION OF PIPELINE(S) TESTED

Location: TDS Off-Site System, Wheatfield, New York

Line Numbers: Primary system, 3" diameter carrier pipe

Portion of Line Tested: (X) All, or ( ) Vault 1 to Sewer

Remarks: Test specifications as per manufacturer's recommendations.

Test Results: Pass X Fail _____

I certify that the above information is correct and that the pipeline described above was prepared and tested in my presence in accordance with the Specification indicated above.

Signed by	[signature]	Curtin Hydronics	3 MAR 93
	Contractor's Representative	Company	Date
Test Witnessed by	[signature]	Golder Assoc. Inc.	3/3/93
	Owner's Representative	Company	Date

F/N: PIPTEST1.WK1

APPENDIX O

AIR MONITORING FORMS

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/3/92 Sheet 1 of 2

Job Name TDS CQA OFFSITE Job Number 923-9055

Location EWS

Time In _____ Time Out _____ Weather Sun - Temp. 55° Wind D. NE V 5-10

Instrument Type MSA 361 / OVM 580A / Particulate PDM3 Serial No. 3085 / ATL0510 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____
and Concentration

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
930		361	20.8	O_2 - Calibration 20.8 %
930		361	36 ppm	Calibration - H_2S 40 ppm
931		361	51 %	Calibration - Cthy 50% LEL *
932		OVM	99.6 ppm	Calibration Isobutylene 99 ppm
933		PDM3	0.06	Calibration - background - air
215	Upwind EZ	361	20.8	O_2
	" "	361	0	H_2S
	" "	361	0	LEL
	" "	OVM	0	
	" "	PDM3	0.06	
216	Downwind EZ	361	20.8	O_2
	" "	361	0	H_2S
	" "	361	0	LEL
	" "	OVM	0	
	" "	PDM3	0.04	
217	BZ	361	20.8	O_2
	" "	361	0	H_2S
	" "	361	0	LEL
	" "	OVM	0	
	" "	PDM3	0.06	
225	BZ	OVM	0	

Recommendations

* Instrument factory calibrated on 50% LEL Pentane

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/3/92 Sheet 2 of 2

Job Name TDS CQA OFFSITE Job Number 923-9055

Location EWS

Time In _____ Time Out _____ Weather Sun Temp. 55° Wind D. NE V 5-10

Instrument Type MSA 361 / OVM 580A / Particulate PDM-3 Serial No. 3085 / ATL 0510 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____
and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
230	BZ	OVM	0	
230	Hole	OVM	0	
235	Hole	361	20.7	O2
235	Hole	361	0	H2S
235	Hole	361	0	LEL
255	Hole	OVM	0	
255	BZ	PDM3	.06	
0305	Hole	OVM	0	

Recommendations

David Wehn
Printed Name

Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/4/92 Sheet 1 of 2

Job Name TDS CAA OFFSITE Job Number 923-9055

Location EW4

Time In _____ Time Out _____ Weather Rain Temp. 58 Wind D. NNE V 5-10

Instrument Type MSA 361 / OVM 580 A / Part. PDM-3 Serial No. 3085 / ALTOS10 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
845	-	361	55%	Calibrate LEL (CH_4) - 50% LEL METHANE
845	-	361	20.8 %	Calibrate O_2 - 20.8 %
846	-	361	37 ppm	Calibrate H_2S - 40 ppm
850	-	OVM	99 ppm	Calibrate Isobutylene - 99 ppm
855	-	PDM-3	.06 ug/m³	Calibrate - air - background
1230	Upwind EZ	361	0	LEL
" "	" "	361	20.7	O_2
" "	" "	361	0	H_2S
" "	" "	OVM	0	
" "	" "	PDM-3	.04	
1232	Downwind EZ	361	0	LEL
" "	" "	361	20.8	O_2
" "	" "	361	0	H_2S
" "	" "	PDM-3	.06	
" "	" "	OVM	0	
1240	BZ	361	0	LEL
" "	" "	361	20.7	O_2
" "	" "	361	0	H_2S
" "	" "	OVM	0	
" "	" "	PDM-3	.06	

Recommendations

1 Instrument factory calibrated on 50% LEL Pentane

DAVID WEHN
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/4/92 Sheet 2 of 2

Job Name TDS COA OFFSITE Job Number 923-9055

Location EW-4

Time In _____ Time Out _____ Weather Rain Temp. 58° Wind D. NNE V 5-10

Instrument Type MSA 361 / OVM 580 A / Part. PDM-3 Serial No. 3085 / ALT 0510 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____
and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
1240	Hole	361	0	LEL
" "	Hole	361	20.8	O_2
" "	" "	361	0	H_2S
" "	" "	OVM	0	
" "	" "	PDM-3	0.06	
1250	Hole	OVM	0	
1300	Hole	OVM	0	Hole bottomed at 16'

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/6/92 Sheet 1 of 3

Job Name TDS CQA OFFSITE Job Number 923-9055

Location EW-4

Time In _____ Time Out _____ Weather Cloudy Temp. 50° Wind D. NNE V 2-5

Instrument Type MSA 361 / OVM 580A / Particulate PDM-3 Serial No. 3085 / ATL 0510 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____
and Concentration

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
		361	20.6	O_2 Calibration 20.8%
		361	30 ppm	H_2S Calibration 40 ppm
		361	45%	Iso CH_4 Calibration 50% LEL *
0820		OVM	99.1	Calibration Isobutylene 99 ppm
		PDM-3	.02	Calibration - background air mg/m^3
1150	Upwind EZ	361	20.9	O_2
	" "	361	0	H_2S
	" "	361	0	CH_4 (LEL)
	" "	OVM	0	
	" "	PDM-3	.10	
1155	Downwind EZ	361	20.8	O_2
		361	0	H_2S
		361	0	LEL
		OVM	0	
		PDM-3	0.75	
1205	BZ	OVM	0	
1205	BZ	PDM-3	1.83	
1220	BZ	OVM	0	
1230	BZ	OVM	0	Hole reamed 3' into rock

Recommendations

Instrument Factory calibrated on 50% LEL Pentane

David Wehn
Printed Name

David C Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/10/92 Sheet 2 of 3

Job Name TDS CQA OFFSITE Job Number 923-9655

Location EW-6

Time In _____ Time Out _____ Weather Cloudy Temp. 50° Wind D. NNE V 2-5

Instrument Type MSA 361 / PID / Particulate PDM-3 Serial No. 3085 / 92302 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
845		361	20.6	Calibration – O_2 20.8%
		361	36 ppm	Calibration - H_2S 40 ppm
		361	45%	Calibration - CH_4 50% LEL
		PID	99	Calibration - Isobutylene 99 ppm
		PDM-3	.02	Calibration - background air
930	Downwind E2	361	20.8	O_2
		361	0	H_2S
		362	0	CH_4 (LEL)
		PID	0	
		PDM-3	.02	
940	Upwind E2	361	20.8	O_2
		361	0	H_2S
		361	0	CH_4
		PID	0	
		PDM-3	0	
945	Top of augers	PID	0	
955	top of augers	PID	2.7 ppm	
1005	top of augers	PID		auger removal

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/10/92 Sheet 3 of 3

Job Name TDS - CQA OFFSITE Job Number 923-9055

Location EW-5

Time In _____ Time Out _____ Weather Cloudy Temp. 50 Wind D. N V 3-7

Instrument Type MSA 361 / OVM 580A / Particulate PDM-3 Serial No. 3085 / ATL 0510 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
1520	Upwind EZ	361	20.7	O_2
	" "	361	0	H_2S
	" "	361	0	LEL
	" "	OVM	0	
	" "	PDM-3	.23	
1525	Downwind EZ	361	20.8	O_2
	" "	361	0	H_2S
	" "	361	0	LEL
	" "	OVM	0	
	" "	PDM-3	.51	
1535	BZ	361	20.7	O_2
	" "	361	0	H_2S
	" "	361	0	LEL
	" "	OVM	0	
	" "	PDM-3	1.58	
1540	BZ	OVM	0	
1540	BZ	PDM-3	.42	
1550	BZ	OVM	0	
1610	BZ	OVM	0	

Recommendations

David Wehr
Printed Name

Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/11/92 Sheet 1 of 3

Job Name TDS / COA / OFFSITE Job Number 923-9055

Location EW-6

Time In _____ Time Out _____ Weather Rain Temp. 45° Wind D. ENE V 5-10

Instrument Type MSA 361 / OVM 580A / Particulate PDM-3 Serial No. 3085 / ATL0510 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____
and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
815	-	361	20.8	Calibration - O_2 20.8
	-	361	36 ppm	Calibration H_2S 40 ppm
	-	361	54%	Calibration CH_4 (LEL) 50%
	-	OVM	96 ppm	Calibration Isobutylene 99 ppm
	-	PDM-3	0.20	Calibration - Air Background
1105	Downwind E2	361	20.7	
	" "	361	0	
	" "	361	0	
	" "	OVM	0	
	" "	PDM-3	0.15	
1110	Upwind E2	361	20.8	
	" "	361	0	
	" "	361	0	
	" "	OVM	0	
	" "	PDM-3	0.17	
1115	B2	OVM	0	
	B2	OVM	0	

Recommendations

David Wehn
Printed Name

Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/11/92 Sheet 2 of 3

Job Name TDS 1 CQA 1 OFF SITE Job Number 923-9055

Location EW-4

Time In _____ Time Out _____ Weather Rain Temp. 45° Wind D. _____ V _____

Instrument Type MSA 361 / OVM 580A / Particulate PDM-3 Serial No. 3085 / AH0510 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____
and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
1202	Downwind EZ	361	20.8	O_2
	" "	361	0	H_2S
	" "	361	0	LEL
	" "	OVM	0	
	" "	PDM-3	7.35	
1205	Upwind EZ	361	20.8	O_2
	" "	361	0	H_2S
	" "	361	0	LEL
	" "	OVM	0	
	" "	PDM-3	0.25	
1210	BZ	OVM	0	
1211	BZ	OVM	6	
1211	BZ	PDM-3	10.7	
1215	Downwind EZ	PDM-3	43.6	
1235	Downwind EZ	361	20.9	O_2
		361	0	H_2S
		361	0%	LEL
		OVM	0	
		PDM-3	2.25	

Recommendations

Daniel Weha
Printed Name

Daniel Weha
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/11/92 Sheet 3 of 3

Job Name TDS COA OFFSITE Job Number 923-9055

Location EW-4

Time In _____ Time Out _____ Weather Cloudy Temp. 50 Wind D. NE V 5-10

Instrument Type MSA 361 / OVM 580A / Particulate PDM-3 Serial No. 3085 / ALT 0510 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
1415	BZ	361	20.8	O2
		361	0	H2S
		361	0	LEL
		OVM	0	
		PDM-3	0.25	
1500	BZ	361	20.8	O2
		361	0	H2S
		361	0	LEL
		OVM	0	
		PDM-3	0.27	
1530	BZ	OVM	0	
1600	BZ	OVM	0	

Recommendations

David Walsh
Printed Name

David Walsh
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/12/92 Sheet 1 of 2

Job Name TDS CQA OFFSITE Job Number 923-9055

Location EW-5

Time In _____ Time Out _____ Weather Cloudy Temp. 60° Wind D. N V 5-15

Instrument Type MSA 361 / OVM 580A / Particulate Serial No. 3085 / ATL 0510 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
0815		361	20.9	Calibration O2 20.8 %
0815		361	35 ppm	Calibration H_2S 40 ppm
0815		361	54%	Calibration CH_4 50% LEL
0820		OVM	97.3	Calibration Isobutylene 99 ppm
		PDM3		Calibration - background air
1100	Downwind EZ	361	20.7	O_2 coring
	" "	361	0	H_2S
	" "	361	0	CH_4
	" "	OVM	0	
	" "	PDM-3	1.10	
1115	Upwind EZ	361	20.7	O_2 coring
	" "	361	0	H_2S
	" "	361	0	CH_4 (LEL)
	" "	OVM	0	
	" "	PDM-3	0.84	
1130	BZ	OVM	0	coring

Recommendations

David Wohn
Printed Name

David Wohn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/12/92 Sheet 2 of 2

Job Name TDS/CGH Offsite/MY Job Number 923-9055

Location

Time In ____ Time Out ____ Weather Overcast Temp. 50° Wind D. Calm V —

Instrument Type MSA 361/OVM 580B/Particulate PDM 3 Serial No. 3085/5703-3705-1-243/5403

Calibration Gas and Concentration ____ Instrument Reading ____ Span/Gain/RF Setting ____

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
0415	Calibration	361	20.9	Calibrate O_2 20.8%
0815	↓	361	35 ppm	" H_2S 40 ppm
0815		361	54%	" CH_4 50% LEL
0815		OVM	98 ppm	Calibrate @ 99 ppm Isobutylene
		PDM3		
0955	Hole #6-BZ	OVM	.6	Installing temp steel casing
1006	"	OVM	.6	While air flushing out hole
1007	downwind hole 6	OVM	.6	" "
1010	upwind hole 6	OVM	.6	" "
1017	@ hole #6	OVM	1.9	" "
1017	hole 6 BZ	OVM	.6-1.3	" "
1022	" "	OVM	1.9-2.6	" "
1035	" "	"	1.9-2.6	While air flushing water out of hole
1055	" "	"	1.3-1.9	" "
1100	upwind Hole 6	"	1.3-1.9	" "
1105	downwind hole 6	"	1.3-1.9	" "

Recommendations

Christopher P. Prucha
Printed Name

Christopher P. Prucha
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/19/92 Sheet 1 of 1

Job Name TDS CQA OFFSITE Job Number 923-9065

Location EW-4

Time In _____ Time Out _____ Weather P Cloudy Temp. 35° Wind D. W V 1-3

Instrument Type OVM 580 A Serial No. ATL 0510

Calibration Gas 99 ppm Isobutylene Instrument Reading 98.3 Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
1430	-	OVM	98.3	Calibrate 99 ppm Isobutylene
1530	Downwind BZ	OVM	0	
1530	Upwind EZ	OVM	0	
1530	BZ	OVM	0	
1600	BZ	OVM	0	

Recommendations

David Wehn
Printed Name

Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/20/92 Sheet 1 of 1

Job Name TDS COA OFFSITE Job Number 923-9055

Location EW-6

Time In _____ Time Out _____ Weather Clear Temp. 28° Wind D. NW V 2-6

Instrument Type MSA 361 / OVM 580B / Particulate PDM-3 Serial No. 3085 / 243 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
830	—	361		Calibrate O_2 20.8 %
	—	361	36 ppm	Calibrate H_2S 40 ppm
	—	361	52 %	Calibrate CH_4 (LEL 50%)
	—	OVM	100	Calibrate Isobutylene 99 ppm
	—	PDM	.23	Calibrate - background - air mg/m³
1000	Upwind EZ	361	20.8	O_2
	" "	361	0	H_2S
	" "	361	6	LEL
	" "	OVM	0	
	" "	PDM	.20	
1005	Downwind EZ	361		O_2
	" "	361		H_2S
	" "	361		LEL
	" "	OVM	0	
	" "	PDM	30.2	
1010	BZ	OVM	0	
		361	20.7	O_2
		361	0	H_2S
		361	0	LEL
		PDM	43.0	
1040	BZ	OVM	0	
1130	BZ	OVM	0	

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/23/92 Sheet 1 of 1

Job Name TDS - Cat OFFSITE Job Number 923-9055

Location

Time In _____ Time Out _____ Weather Rain Temp. 45 Wind D. - V -

Instrument Type MSA 361 / OVM 580B / Particulate PDM-3 Serial No. 3085 / 243 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
820		20.8	.361	Calibrate O_2 20.8%
		36	.361	" " H_2S 40 ppm
		55	.361	" " CH_4 (LEL) 50%
		97	OVM	" " Isobutylene 99 ppm
		.10	PDM-3	" " background - air ug/M³
935	Upwind EZ	361	20.7	O_2
"	" "	361	0	H_2S
"	" "	361	0	LEL
"	" "	OVM	0	
"	" "	PDM-	.19	
935	Downwind EZ	361	20.8	O_2
"	" "	361	0	H_2S
"	" "	361	0	LEL
"	" "	OVM	0	
"	" "	PDM	3.20	
940	BZ	361	20.8	O_2
"	"	361	0	H_2S
"	" "	361	0	LEL
"	" "	OVM	0	
"	" "	PDM	6.40	
1015	BZ	OVM	0	
	BZ	OVM		

Recommendations

David Wohn
Printed Name

David Wohn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/24/92 Sheet 1 of 2

Job Name TDS CQA OFFSITE Job Number 923-9055

Location EW-5 / EW-3

Time In _____ Time Out _____ Weather _____ Temp. _____ Wind D. _____ V _____

Instrument Type MSA 361 / OVM 580 B / Portable PDM-3 Serial No. 3085 / 243 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
830		361	20.8	Calibrate O_2 20.8%
		361	36 ppm	H_2S 40 ppm
		361	53 %	CH_4 (LEL 50%)
		OVM	100	Isobutylene 101 ppm
		PDM	.23	background - air mg/m³
900	Downwind EZ	361	20.7	O_2 %
	" "	361	0	H_2S ppm
	" "	361	0	LEL %
	" "	OVM	0	
	" "	PDM	51.2	
901	Upwind EZ	361	20.8	O_2 %
	" "	361	0	H_2S ppm
	" "	361	0	LEL %
	" "	OVM	0	
	" "	PDM	.46	
915	BZ	OVM	0	ppm
920	BZ	OVM	0	ppm
920	BZ	PDM	7.65	mg/m³
1000	BZ	OVM	0	
1030	BZ	OVM	0	
1100	BZ	OVM	0	
1100	BZ	OVM	0	while augering EW-3

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/24/92 Sheet 1 of 2

Job Name TDS CAA OFFSITE Job Number 923-9055

Location

Time In ____ Time Out ____ Weather Cloudy Temp. 45° Wind D. ____ V ____

Instrument Type OVM 580 A Serial No. AT20510

Calibration Gas and Concentration 101 ppm Isobutylene Instrument Reading 102.3 Span/Gain/RF Setting ____

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
1034	EW-6	OVM	0	Background prior to Reaming
1115	"	"	.4	While Reaming (BZ)
1125	"	"	.1	" (BZ)
1135	"	"	0	" "
1145	"	"	0	" "
1455	EW-5	OVM	0	Background - prior to Reaming
1505	"	"	0	Reaming EW-5 (BZ)
1517	"	"	.1	" "

Recommendations

Chris Procha
Printed Name

Christopher P. Park
Signature

Golder Associates Inc.

MONITORING DATA SHEET

Date 11/30/92 Sheet 1 of 1

Job Name TDS CGA OFFSITE Job Number 923-9055

Location EW-3

Time In _____ Time Out _____ Weather Cloudy Temp. 36° Wind D. NNE V 5-15

Instrument Type MSA 361 / OVM 580 B / Particle PDM-3 Serial No. 3085 / 243 / 5405

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
900		361	20.8	Calibrate O_2 - 20.8%
		361	36	" " H_2S - 40 ppm
		361	52%	" " CH_4 (50% LEL)
		OVM	101.6 ppm	" " 101 ppm Isobutylene
		PDM	.19	" " background air ug/m³.
1030	BZ	361	20.8	O_2 - While collecting
	" "	361	0	H_2S
	" "	361	0	LEL
	" "	OVM	11.2 *	
	" "	PDM	.25	
1150	BZ	OVM	0	

Recommendations

* Exceeds action level of 5ppm - source is APG engine exhaust - no action taken except to move monitoring position. coring

David Wehn
Printed Name

Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/1/92 Sheet 1 of 1

Job Name BAT / COA off-site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out _____ Weather Snow Temp. 32 Wind D. S V 5mph

Instrument Type MSA 361 / OVM 580A / Particulate PDM-3 Serial No. 3085 / ATL 0510 / 5903

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:20		OVM	100.8	Calibrate 101 ppm ISO
10:00	Volt #4	PDM	0.15	DCW calibrated MSA361, PDM-3
10:00	Volt #4	OVM	0.0	up wind ~~(Jack hammering Rock)~~
		%LEL	000	Excavating Volt #4
		%O2	20.5	
		%TOX	000	
		OVM	0.1	Down wind ~~(Jack hammering Rock)~~
		%LEL	000	Excavating Volt #4
		%O2	20.6	
		TOX	000	
		PDM	0.13	
		OVM	0.1	Work Area ~~(Jack hammering Rock)~~
		LEL	000	Excavating Volt #4
		O2	20.5	
		TOX	000	
		PDM	0.15	
11:30		OVM	0.0	
		PDM	0.13	
12:30		OVM	0.0	Down wind (Jack hammering Rock)
		PDM	0.99	
		OVM	0.0	Up Wind " " "
		PDM	0.15	
		OVM	0.1	Work Area " " "
		PDM	13.0	* Advised Operator of hammer to use Respirator.

Recommendations

1:30	OVM	0.0	Placing gravel in Volt hole
	PDM	0.13	
2:30	OVM	0.0	Placing Volt #4
	PDM	0.15	
3:30	OVM	0.0	PDM 0.13

Chris Muth
Printed Name

Chris Muth
Signature

Golder Associates Inc.

Air MONITORING DATA SHEET

Date 12/2/92 Sheet 1 of 2

Job Name BAT/CQA off-site/NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 5:00 Weather Rain/snow Temp. 32-40 Wind D. V. Smpl

Instrument Type Serial No.

Calibration Gas and Concentration Instrument Reading Span/Gain/RF Setting

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
		361	20.8	Calibrate O_2
		361	34	" " H_2S
		361	53%	" " CH_4 (LEL 50%)
		BBM	~~[illegible]~~	" " 101 ppm Isobutylene
		PDM		" " background air
10:00	Valt 4 to 5	OVM	0.0	Cleaning Trench bottom
		PDM	0.15	
		361	O_2=20.5, TOX>000, LEL=000	
11:00		OVM	0.0	cleaning Trench Bottom
		PDM	0.15	
1:00		OVM	0.0	checking elevations in Trench
		PDM	0.15	
3:00		OVM	0.0	Placing gravel in Trench
		PDM	0.15	
4:00		OVM	0.0	Compacting gravel in Trench
		PDM	0.13	

Recommendations

Chris Muth
Printed Name

Chris Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/2/92 Sheet 2 of 2

Job Name TOS COA OFFSITE Job Number 923-9055

Location EW-3

Time In _____ Time Out _____ Weather 35°F Cloudy Temp. 35° Wind D. NNW V 5-10

Instrument Type MSA 361 / OVM 580 B / Particulate PDM-3 Serial No. 3085 / -243 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:30		361	20.8	Calibrate O2 20.8
		361	34	" " H2S 40 ppm
		361	53%	" " CH4 (LEL 50%)
		OVM	101.4	" " 101 ppm Isobutylene
		PDM	.20	" " background - air - mg/m3
930	Downward EZ	361	20.3	O2 - While driving 6" casing
		361	0	H2S
		361	0	LEL
		OVM	0	
		PDM	.29	
1000	BZ	OVM	0	Driving 6" Casing
1030	BZ	OVM	0	"
130	BZ	361	20.8	O2 During Coring
		361	0	H2S " "
		361	0	CH4 " "
		OVM	0	" "
		PDM	.43	" "
1400	BZ	OVM	0	" "
1500	BZ	OVM	0	" "

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHE

Date 12/3/92 Sheet 1 of

Job Name BAT / CQA off-site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 6:30 Weather Rain / snow Temp. 32 Wind D. S V 5

Instrument Type Serial No.

Calibration Gas Instrument Reading Span/Gain/RF Setting

and Concentration * If more than one instrument is used, document calibration procedures and results for each additional instrument recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observatio

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
		361	20.8	Calibrate O_2 20.8%
8:00		361	35 ppm	" " H_2S 40 ppm
		361	53%	" " CH_4 (LEL) 50%
		OVM		" " 101 ppm Isobutylene
		PDM		" "
9:00	V4-1+00	OVM	0.0	Cleaning trench sides
10:30	V4-0+50	OVM	0.0	" " "
12:00	V4-0+50	OVM	0.0	welding pipe
2:00	V4-0+50	OVM	0.0	" "
3:00	V4-0+25	OVM	0.0	" "
4:30	V4-0+50	OVM	0.0	" "

Recommendations

Chris Muth
Printed Name

Chris Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/3/92 Sheet 2 of 2

Job Name TDS CQA OFFSITE Job Number 923-9055

Location EW-3 / BW-3

Time In _____ Time Out _____ Weather Cloudy Temp. 35°F Wind D. E V 5-10

Instrument Type MSA 361 / OVM 580B / Particulate PDM-3 Serial No. 3085 / -243 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
800		361	20.8 %	Calibrate O_2 20.8 %
		361	35 ppm	" " H_2S 40 ppm
		361	53%	" " CH_4 (LEL 50%)
		OVM	97 ppm	" " 101 ppm Isobutylene
		PDM	.10	" background air
900	Downwind EZ	361	20.8	O_2 - While coring EW-3
		361	0	H_2S " "
		361	0	CH_4 (LEL) " "
		OVM	0	" "
		PDM	.40	" "
1100	BZ	OVM	0	During coring EW-3
1200	BZ	361	20.8	O_2 During 5' purge EW-3
		361	0	H_2S
		361	0 %	LFL
		OVM	0	
		PDM	.33	
1250	BZ	OVM	0	During 5' purge EW-3
1410	Downwind EZ	361		During Augering of EW-3
		361		" "
		361		" "
		OVM	0	" "
		PDM	.31	" "

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

Air MONITORING DATA SHEET

Date 12/4/92 Sheet 1 of 2

Job Name BAT/coA off-site /M4 Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out _____ Weather Cloudy/Flurries Temp. 32° Wind D. E V 5-10 mph

Instrument Type _____ Serial No. _____

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:00		OVM	100.0	101 ppm Isobutylene
		361	36 ppm	H_2S 40 ppm
		361	53%	CH4 (LEL 50%)
		PDM	0.23	background
11:00	V4 1+65	OVM	0.0	Excavating Trench
		361	TOX=000, O_2=20.5, LEL=000	
		PDM	0.15	
1:30	V4 1+65	OVM	0.0	Backfilling Trench
		PDM	0.13	
		361	TOX=000, O_2=20.6, LEL=000	
4:00	V4 1+75	OVM	0.0	Backfilling Pipe
		PDM	0.15	
		361	TOX=000, O_2=20.5, LEL=000	

Recommendations

Chris Muth
Printed Name

Chris Muth
Signature

Golder Associates Inc.

Air MONITORING DATA SHEET

Date 12/4/92 Sheet 2 of 2

Job Name TDS / CCA OFFSITE / NM Job Number 923-4055

Location EW-2

Time In _____ Time Out _____ Weather Cloudy Temp. 30° Wind D. NW V light

Instrument Type MSA 361 / OVM 580B / Particulate PDM-3 Serial No. 3085 / -243 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
830		361	20.8	Calibration - O_2 - 20.8%
		361	36 ppm	" " - H_2S 40ppm
		361	53%	" " CH_4 (LEL 50%)
		OVM	100 ppm	" " 101 ppm Isobutylene
		PDM	.23	" " background air
73:	Dashwood EZ	361	20.7	O_2 During 12¼" rock sorting
		361	0	H_2S "
		361	0	LEL "
		OVM	0	"
		PDM	.76	"
1000	B2	OVM	0	During sorting

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

Air MONITORING DATA SHEET

Date 12/7/92 Sheet 1 of 2

Job Name TDS COA OFFSITE Job Number 923-9055

Location EW-2

Time In _____ Time Out _____ Weather Sunny Temp. 30°F Wind D. NNE V 5-10

Instrument Type MSA 361/OVM 580B/Particulate PDM-3 Serial No. 8085/-243/5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:30		361	20.8	Calibrate O_2 20.8%
		361	36 ppm	" " H_2S 40ppm
		361	53%	" " CH_4 (50% LEL)
		OVM	101.9	" " 101 ppm Isobutylene
		PDM	.31	" " background air ug/m³
1030	Downwind EZ	361	20.8	O_2 While driving 6" casing
		361	0	H_2S
		361	0	LEL
		OVM	0.4	
		PDM	2.33	
1100	BZ	361	20.8	O_2 While driving 6" casing
		361	0	H_2S " "
		361	0	LEL " "
		OVM	0	" "
		PDM	.53	" "
1130	BZ	OVM	0	While driving 6" casing
1300	BZ	361	20.7	O_2 While coring
		361	0	H_2S "
		361	0	LEL "
		OVM		"
		PDM	7.03	"
		Recommendations		
1400		OVM	0	While coring "
1430		OVM	0	

David Wehn
Printed Name

Dave Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/7/92 Sheet 2 of 2

Job Name TDS/CBA off-Site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 10:30 Weather Snow Temp. 27° Wind D. 3-5 V S

Instrument Type OVM Serial No.

Calibration Gas and Concentration Instrument Reading Span/Gain/RF Setting

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:30		OVM	100.6	101 ppm Isobutylene/calibration
		PDM	0.06	Calibration - background Air
		361	20.8%	O_2 /calibration
		361	36 ppm	H_2S /calibration
		361	53%	CH_4 / calibration
9:30	V4 2+75	OVM	0.0 ppm	Excavation of trench
		PDM	0.13	" " "
		361	20.6%	O_2
		361	000%	LEL
		361	000%	TOX
1:30	V5 0+50	OVM	0.0 ppm	Gravel Backfilling
		PDM	0.17	" "
		361	20.5	O_2 "
		361	000%	LEL "
		361	000%	TOX "

Recommendations

No Dust because of Snow/Rain, very Wet Conditions

Chris Muth
Printed Name

Chris Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/8/92 Sheet 1 of 2

Job Number 923-9055

Job Name TDS COA OFFSITE

Location

Time In ____ Time Out ____ Weather Cloudy Temp. 30°F Wind D. WSW V. weak

Instrument Type MSA 361 / OVM 580 B / Particulate PDM-3 Serial No. 3085 / -243 / 8405

Calibration Gas and Concentration ____ Instrument Reading ____ Span/Gain/RF Setting ____

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
815		361	20.8	Calibrate O_2 20.8 %
		361	35	" " H_2S 40 ppm
		361	54 %	" " CH_4 (50% LEL)
		OVM	101.9	" " 101 ppm Isobutylene
		PDM	.10	" " background air
900	Downwind EZ	361	20.5	O_2 - While coring EW-2
		361	C	H_2S
		361	C	LEL
		OVM	0	
		PDM	.25	
930	BZ	OVM	0	While coring EW-2
1000	BZ	OVM	0	" "
1030	BZ	OVM	0	" "
1130	BZ	OVM	0	
1440	BZ	OVM	0	While augering EW-1
1500	BZ	OVM	0	"
1520	Open Hole	OVM	0	At bottom (12.4 ft BGS)

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/8/92 Sheet 2 of 2

Job Name TDS / CRA off-Site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out _____ Weather Snow Temp. 26° Wind D. 0-7 V S

Instrument Type _____ Serial No. _____

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:15		361	35 ppm	H_2S / Calibration
		361	5.4%	LEL /
		361	20.8	O_2 / Calibration
		PDM	.20	Background / calibration
		OVM	101.9	
10:00	V5 1+25	OVM	0.0	Trench Excavation
		PDM	0.17	"
		361	20.6	O_2 "
		361	000	LEL "
		361	000	TOX "

Recommendations

Very wet conditions - No Dust visable Durring any activities

Chris Muth
Printed Name

Chris Muth
Signature

Golder Associates Inc.

Air MONITORING DATA SHEET

Date 12/9/92 Sheet 1 of 2

Job Name TDS / CQA off-site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 6:00 Weather clear Temp. 23° Wind D. 3-5 V. S

Instrument Type _____ Serial No. _____

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:30		361	20.8%	O_2 / calibration
		361	35	H_2S / calibration
		361	5%	CH_4 / calibration
		OVM	101.2	Isobutylene / calibration
		PDM	0.21	Background / Calibration
3:30		361	O_2 = 20.4	Placing Vault / Backfilling Stone
		361	LEL = 000	"
		361	TOX = 001	"
		OVM	0.00	"
		PDM	0.31	"

Recommendations

Very wet conditions. No dust visable. during any activities.

Chris Muth
Printed Name

Chris Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/9/92 Sheet 2 of 2

Job Name TDS QA OFFSITE Job Number 923-9055

Location EW-2

Time In _____ Time Out _____ Weather _____ Temp. _____ Wind D. _____ V. _____

Instrument Type MSA 361 / OVM 580A / Particulate PDM-3 Serial No. 3035 / ATL 0510 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
1320		361	20.8	Calibrate O_2 20.8 %
		361	35 ppm	" " H_2S 40 ppm
		361	54 %	" " CH_4 (50% LEL)
		OVM	101.2	" " 101 ppm Isobutylene
		PDM	.15	" " background air
1430		361	20.7	O_2 while 5' reading
		361	0	H_2S "
		361	0	LEL "
		OVM	0	" "
		PDM	.27	" "
1440		OVM	0	" "

Recommendations

David Weha
Printed Name

David Weha
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/10/92 Sheet 1 of 1

Job Name TDS CGA OFFSITE Job Number

Location

Time In Time Out Weather Temp. Wind D. V

Instrument Type MSA 361 / OVM 580A / Particulate PDM-3 Serial No. 30851 ATL 0510 5403

Calibration Gas and Concentration Instrument Reading Span/Gain/RF Setting

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
830		361	20.8	Calibrate O_2 20.8%
		361	34 ppm	" " H_2S 40 ppm
		361	54 %	" " CH_4 (50% LEL)
		OVM	101.2	" " 101 ppm Isobutylene
		PDM	.20	" " background air
1115	Downwind EZ	361	20.8	O_2 While 12" "sockering"
		361	0	H_2S "
		361	0	CH_4 " "
		OVM	0	" "
		PDM	6.65	" "

Recommendations

David Wehn
Printed Name

Signature

Golder Associat[illegible] Inc.

A[illegible] MONITORING DATA SHEET

Date 12/14/92 Sheet 1 of 1

Job Name TDS CQA OFFSITE Job Number 923-9055

Location EW-1

Time In _____ Time Out _____ Weather Sunny Temp. 35° Wind D. SE V light

Instrument Type MSA 361 / OVM 580A / Particulate PDM-3 Serial No. 3085 / ATL 0510 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration • If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.•	Reading	Procedure/Observations/Comments
830		361	20.8	Calibrate O_2 20.8%
		361	34 ppm	" " H_2S 40 ppm
		361	55 %	" " CH_4 (50% LEL)
		OVM	101.2	" " 101 ppm Isobutylene
		PDM	.05	" " background air
1240	Downwind E2	361	20.8	O_2
		361	0	H_2S
		361	0	LEL
		OVM	0	
		PDM	.155	
1400	B2	361	20.8	O_2
		361	0	H_2S
		361	0	LEL
		OVM	0	
		PDM	.110	
1430	B2	OVM	0	
1500	B2	OVM	0	
1530	B2	OVM	0	

Recommendations

David Wehn
Printed Name

Dave Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/15/93 Sheet 1 of 1

Job Name TDS CCA OFF SITE Job Number 923-9055

Location EW-1

Time In _____ Time Out _____ Weather P Cloudy Temp. 30 Wind D. SE V Light

Instrument Type MSA 361 / OVM 580A / Particulate PDM-3 Serial No. 3085 / ATL 0510 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____
and Concentration

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
800		361	20.8	Calibrate O_2 20.8 %
		361	35 ppm	" " H_2S - 90 ppm
		361	55 %	" " CH_4 (50% LEL)
		OVM	101.8	" " 101 ppm Isobutylene
		PDM-3	.25	" " background air
545		361	20.8	O_2 - White coring EW-1
		361	0	H_2S " "
		361	0	% LEL " "
		OVM	0	" " "
		PDM-3	.47	" " "
915	BZ	~~PDM~~ OVM	0	" "
1000	BZ	OVM	0	" "
1100	BZ	OVM	0	" "
1300	BZ	OVM	0	" "

Recommendations

David Lidsky
Printed Name

David Lidsky
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/16/92 Sheet 1 of 2

Job Name TDS CQA OFFSITE Job Number 923-9055

Location FW-1

Time In _____ Time Out _____ Weather P Cloudy Temp. 48° Wind D. SE V 5-15

Instrument Type MSA 361 / OVM 580A / Particulate PDM3 Serial No. 3085 / ATL0510 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
820		361	20.8	Calibrate O_2
		361	39	" " H_2S 40 ppm
		361	58 %	" " CH_4 (50% LEL)
		OVM	101.0	" " 101 ppm Isobutylene
		PDM	.25	" " background air
1335	Downwind EZ	361	20.8	O_2
		361	0	H_2S
		361	0	LEL
		OVM	0	
		PDM	.32	
1400	BZ	OVM	0	
1430	BZ	OVM	0	

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/16/92 Sheet 2 of 2

Job Name TDS / CQA off-site / NY Job Number

Location Niagara Falls

Time In 8:00 Time Out 5:30 Weather overcast Temp. 38° Wind D. N V. Smpl.

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3065 / ATL 0510 / 5V03

Calibration Gas and Concentration Instrument Reading Span/Gain/RF Setting

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:00		361	20.8	Calibrate O_2 20.8%
		361	35 PPM	" H_2S 40 PPM
		361	50%	" CH_4 (50% LEL)
		OVM	101.8	" 101 PPM Isobutylene
		PDM	0.25	" Background Air
9:00		361	20.8	O_2 Backfilling trench
		361	000	H_2S " "
		361	000	LEL " "
		OVM	0.00	" "
		PDM	0.3	" "
2:00		361	20.7	O_2 by Vault 4
		361	000	H_2S "
		361	000	LEL "
		OVM	0.00	"
		PDM	0.8	"

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/15/92 Sheet 1 of 1

Job Name TDS/CQA off-site/NY Job Number 923-4055

Location Niagara Falls

Time In 8:00 Time Out 5:30 Weather Rain Temp. 40° Wind D. NE V 10

Instrument Type MSA 361/OVM 580A/PDM-3 Serial No. 3085/ATL 0570/5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:00		361	20.8	calibrate O_2 20.8
		361	35 ppm	" H_2S 40 ppm
		361	50%	" CH_4 (50%) LEL
		OVM	101.1	" 101 Isobutylene
		PDM	0.31	" Background Air
10:00		361	20.6	O_2 Backfilling VS 2+50
		361	000	H_2S " "
		361	000	LEL " "
		OVM	0.00	" "
		PDM	0.15	" "

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 12/19/92 Sheet 1 of 1

Job Name TDS / CQA off-site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 1:00 Weather clear Temp. 40° Wind D. N V 5

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085 / AIR 0510 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:15		361	20.8	Calibrate O_2 20.8
		361	36 ppm	" H_2S 40 ppm
		361	50%	" C_4H_4 50% LEL
		OVM	101.2	" 101 ppm 50 butylene
		PDM	0.25	" Background Air
9:30	V4	361	20.6	O_2 by Vault 4
		361	000	H_2S "
		361	000	LEL "
		OVM	0.00	"
		PDM	0.28	"

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 11/22/92 Sheet 1 of 1

Job Name TDS / CQA off-site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 1:00 Weather clear Temp. 45 Wind D. N V 5

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085 / ATC 0510/5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:30		361	20.8	Calibrate O_2 20.8
		361	39 ppm	" H_2S 40 ppm
		361	50%	" CH_4 50% LEL
		OVM	101.1	" 101 Isobutylene
		PDM	0.19	" Background Air
9:00	V3 1+50	361	20.7	Placing electrical conduit (O_2)
		361	000	" " " H_2S
		361	000	" " " LEL
		OVM	0.01	" " "
		PDM	0.23	" " "

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/6/93 Sheet 1 of 1

Job Name TDS / CQA off-site / NY Job Number 923-9055

Location Niagara Falls

Time In 12:00 Time Out 4:30 Weather Light Snow Temp. 30° Wind D. NE V 5.

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085 / ATL 0510* / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
1:30		361	20.8	calibrate O_2 20.8%
		361	35 ppm	" H_2S 40 ppm
		361	50%	" CH_4 50% LEL
		OVM	101.6	" 101 Isobutylene
		PDM	0.21	" Background Air
3:00	Vault 3	361	20.7	Backfilling pipe (O_2)
	Down Wind	361	0.0	" " (H_2S)
	" "	361	0.0	" " (LEL)
	" "	OVM	0.1	" "
	" "	PDM	0.36	" "

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/7/93 Sheet 1 of 1

Job Name TDS / CQA off-site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out _____ Weather Overcast Temp. 32° Wind D. N V 5

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085 / ATL 0510 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:00		361	20.8	Calibrate O_2 20.8%
		361	39 ppm	" H_2S 40 ppm
		361	50%	" CH_4 50% LEL
		OVM	100.5	" 101 Isobutylene
		PDM	0.46	" Background Air
8:30	Down Wind	361	20.7	O_2 Vault 4
	"	361	000	H_2S "
	"	361	000	LEL "
	"	OVM	0.00	"
	"	PDM	0.39	"
10:00	Working area	OVM	0.00 ppm	Vaults ~~#2~~, 3, 4, 5, 6
11:00	Down Wind	OVM	0.00	Excavating Trench ~~to~~ Vault 2
		PDM	0.23	" " STA V2 ~~0~~ 1+25
1:00	Working area	OVM	0.00 ppm	" " ~~STA~~ STA ~~0~~ 0+25
3:00	Down Wind	OVM	0.00 ppm	" " Vault 2
5:00	Down Wind	OVM	0.00	Backfilling with stone STA V2 1+00

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/8/93 Sheet 1 of 1

Job Name TDS / off-site EQA / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out _____ Weather Overcast Temp. 31° Wind D. N V 5

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3065 / ATL 0570 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:00		361	20.8	Calibrate O_2 20.8%
		361	38 ppm	" H_2S 40 ppm
		361	50%	" CH_4 50% LEL
		OVM	101.5	" 101 Isobutylene
		PDM	0.46	" Background Air
				Vaults 6, 5, 4, 3, 2
9:00	Working Area	361	20.6	O_2 " " " " " "
		361	000	H_2S " " " " " "
		361	008	CH_4 " " " " " "
		OVM	0.00	" " " " " "

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/9/93 Sheet 1 of 1

Job Name TDS/CQA off-site/NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 1:00 Weather Snow Temp. 32 Wind D. W V 10

Instrument Type MSA 361/OVA 580A/PDM-3 Serial No. 3485/ATL 0510/5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:30		361	20.8%	calibrate O_2 20.8% O_2
		361	39 ppm	" H_2S 40 ppm TOX
		361	50%	" CH_4 50% LEL
		OVM	—	Charging Battery
		PDM	0.31	Background Air
9:30	down Wind	361	20.6	O_2 Vault 3
		361	000	TOX "
		361	000	LEL "
		PDM	0.38	"
10:00	Working area	361	20.6	O_2 Vault 4
		361	000	TOX "
		361	000	LEL "
		PDM	0.35	"

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/11/93 Sheet 1 of 1

Job Name TDS / COA off-site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 4:00 Weather Snow Temp. 17° Wind D. N V 10

Instrument Type MSA 361 / OVM 560A / PDM-3 Serial No. 3085 / 25205 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:00		361	20.8	Calibrate O_2 20.8%
		361	39	" H_2S 40ppm TOX
		361	50%	" CH_4 50% LEL
		OVM	100.5	" 101 Isobutylene
		PDM	0.30	Background Air
9:00	Working Area	361	20.6	O_2 Backfilling Clay
	Sta V2 2+00	361	000	TOX
		361	000	LEL
		OVM	0.01	
		PDM	0.36	
1:00	down wind	361	20.6	Vault 2 Backfilling #1A Stone
	Sta V1 3+00	361	000	TOX "
		361	000	LEL "
		OVM	0.00	"
		PDM	0.29	"

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associa[illegible] Inc.

A[illegible] MONITORING DATA SHEET

Date 1/12/93 Sheet 1 of 1

Job Name TDS / CQA off-Site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 5:30 Weather Overcast Temp. 32 Wind D. N V 5-10 mp

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085/25205/5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration • If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.•	Reading	Procedure/Observations/Comments
8:00		361	20.8	calibrate O_2 20.8%
		361	38	" H_2S 40 ppm TOX
		361	50%	" CH4 50% LEL
		OVM	101.8	" 101 Isobutylene
		PDM	0.31	Background Air
				Vaults 2, 3, 4, 5, 6
9:00	Vaults 2+6	361	O_2	20.6 20.5 20.6 20.6 20.5
		361	TOX	00 00 00 00 00
		361	LEL	00 00 01 01 00
		OVM		0.01 0.00 0.00 0.01 0.01
11:00	Down Wind	361	20.6 O_2	Excavating trench V1 1+50 - 0+00
		361	000	TOX
		361	001	LEL
		OVM	0.01	
		PDM	0.51	
3:00	Down Wind	361	20.5 O_2	Backfilling V1 1+50 - 0+00
		361	0.00	TOX
		361	000	LEL
		OVM	0.00 ppm	
		PDM	0.25	

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/14/93 Sheet 1 of 1

Job Name TDS / CQA off-Site / HY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 5:30 Weather Overcast Temp. 32 Wind D. N V 5-10

Instrument Type MSA 361 / OVM 580 A / PDM-3 Serial No. 7085 / 25205 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:30		361	20.8	Calibrate O_2 20.8%
		361	39	" H_2S 40 ppm TOX
		361	50%	" CH_4 50% LEL
		OVM	102	" 101 ppm Isobutylene
		PDM	0.16	Background ; Air
10:30	Vaults 2, 4	361	20.6	O_2
		361	001	TOX
		361	000	LEL
		OVM	001	
11:00	Down Wind & Working area	361	20.6 O_2	Excavating Trench STA 1+25 - 0+80 V3
		361	000	TOX
		361	000	LEL
		OVM	000	
		PDM	0.39	
2:00	Down Wind & Working area	361	20.5 O_2	Backfilling trench
		361	000	TOX
		361	000	LEL
		OVM	0.00	
		PDM	0.37	

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/15/93 Sheet 1 of 1

Job Name TDS / CQA offsite / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 3:00 Weather Light Rain Temp. 35° Wind D. NE V 10mph

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085 / 35205 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:20		361	20.8	Calibrate O_2 20.8
		361	39	" H_2S 40ppm TOX
		361	50%	" CH_4 50% LEL
		OVM	100.0	" 101 Isobutylene
		PDM	0.29	Background Air
9:30	Down Wind & Working Area	361	20.6	O_2 Excavating trench
		361	000	TOX STA V3: 0+80 - 0+00
		361	000	LEL
		OVM	0.01	
		PDM	0.27	
2:00	Down Wind & Working Area	361	20.5	O_2 Backfilling STA V3 0+80-0+00
		361	001	TOX
		361	000	LEL
		OVM	0.01	
		PDM	0.22	

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/18/93 Sheet 1 of 1

Job Name TDS/CQA off-site/NY Job Number 923-9055

Location Niagara Falls

Time In 11:00 Time Out 4:30 Weather Clear Temp. 40° Wind D. N V 5

Instrument Type MSA 361/OVM 580A/PDM-3 Serial No. 3085/25205/5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:10		361	20.8 %	Calibrate O_2 20.8 %
		361	39 ppm	" H_2S 40 ppm TOX
		361	50%	" 50% CH_4 LEL
		OVM	100.7	" 101 Isobutylene
		PDM	0.31	Background Air
8:20	Vaults 4,5,6	~~361~~		Vault 4 , 5 , 6
	working area	361	O_2	20.5 20.6 20.5
		361	TOX	000 001 000
		~~361~~ 361	LEL	000 000 000
		OVM		0.01 0.01 0.01
1:30	Vaults 4,5,6			V4 V5 V6
	working area	361	O_2	20.6 20.6 20.6
		361	TOX	000 000 000
		361	LEL	000 000 000
		OVM		0.00 0.01 0.01
3:30	Vaults 4,5,6	361	O_2	20.6 20.5 20.6
	working area	361	TOX	001 000 000
		361	LEL	000 000 000
		OVM		0.01 000 0.01

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/19/93 Sheet 1 of 1

Job Name TDS / CQA off-Site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 5:00 Weather Overcast Temp. 39° Wind D. NE V 5mph

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085 / 25205 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
9:30		361	20.8%	Calibrate O_2 20.8%
		361	39 ppm	" H_2S 40 ppm TOX
		361	50%	" CH_4 50% LEL
		OVM	101.1	" 101 Isobutylene
		PDM	0.23	Background Air
				Vaults
				2 , 4 , 5 , 6
9:30-4:00	Working Area	361	O_2	20.6 , 20.6 , 20.5 , 20.6
	inside Vaults	361	TOX	000 , 000 , 000 , 000
		361	LEL	000 , 000 , 000 , 000
		OVM		0.00 , 0.00 , 0.00 , 0.00
		PDM		0.21 , 0.23 , 0.22 , 0.21

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/20/93 Sheet 1 of 1

Job Name TDS/CQA off-site /NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 4:00 Weather Clear Temp. 40° Wind D. W V 5mph

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085 / 25205 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:30		361	20.8%	Calibrate O_2 20.8%
		361	38ppm	" H_2S 40ppm TOX
		361	50%	" Elty 50% LEL
		OVM	100.5	" 101ppm Isobutylene
		PDM	0.31	Background Air
8:30-4:30	Working Area in Vaults			Vaults
				1, 2, 3, 4, 5, 6
		361	O_2	20.6 20.6 20.6 20.5 20.6 20.6
		361	TOX	000 000 000 000 000 000
		361	LEL	000 000 000 000 000 000
		OVM		0.00 0.00 0.01 0.00 0.00 0.01
		PDM		0.26 0.27 0.15 0.16 0.25 0.19

Recommendations

Chris Muth
Printed Name

Chris Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/21/93 Sheet 1 of 1

Job Name TDS/CQA off-Site /NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 5:00 Weather Rain Temp. 42 Wind D. NE V 10mph

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085 / 25205 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:30		361	20.8	Calibrate O_2 20.8%
		361	39ppm	" H_2S 40ppm TOX
		361	50%	" CH_4 50% LEL
		OVM	100.3	" 101ppm Isobutylene
		PDM	0.23	Background Air
8:30-4:30	Working Area in Vaults			Vaults
				1 2 3 4 5 6
		361	O_2	20.6 20.6 20.5 20.6 20.6 20.6
		361	TOX	000 000 000 000 000 000
		361	LEL	000 000 000 000 000 000
		OVM		0.01 0.01 0.00 0.01 0.00 0.00
		PDM		0.21 0.22 0.21 0.19 0.25 0.27

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/23/93 Sheet 1 of 1

Job Name TDS / LaA off-Site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:30 Time Out 5:00 Weather Clear Temp. 37° Wind D. N V 5

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085 / 25205 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
9:00		361	20.8%	Calibrate O_2 20.8%
		361	38 ppm	" H_2S 40 ppm TOX
		361	50%	" CH_4 50% LEL
		OVM	101.9 ppm	" 101 ppm Isobutylene
		PDM	0.29	Background Air
9:30-4:30	Working Area			Vaults
	In Vaults			1, 2, 3, 4, 5, 6
		361	O_2	20.6 20.6 20.5 20.6 20.5 20.6
		361	TOX	000 000 000 000 000 000
		361	LEL	000 000 000 000 000 000
		OVM		0.00 0.00 0.00 0.00 0.00 0.00
		PDM		0.31 0.29 0.30 0.35 0.27 0.29

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/25/93 Sheet 1 of 1

Job Name TDS / CoA off-site / NY Job Number 923-9055

Location Niagara Falls

Time In 8:00 Time Out 3:30 Weather Clear Temp. 27° Wind D. N V 5 mph

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085 / 25205 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:30		361	20.8%	Calibrate O_2 20.8%
		361	39 ppm	" H_2S 40 ppm TOX
		361	50%	" CH_4 50% LEL
		OVM	101.3 ppm	" 101 ppm Isobutylene
		PDM	0.28	Background Air
9:00-3:00	Working Area in Vaults			Vaults
				1 2 3 4 5 6
		361		20.6 20.6 20.6 20.5 20.6 20.5
		361		000 000 000 000 000 000
		361		000 001 000 001 000 000
		OVM		0.00 0.00 0.01 0.00 0.00 0.00
		PDM		0.31 0.28 0.19 0.27 0.30 0.28

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/26/93 Sheet 1 of 1

Job Name TDS / CQA off-site / NY Job Number 923-5055

Location Niagara Falls

Time In 9:00 Time Out 2:00 Weather Clear Temp. 39° Wind D. NE V 5

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085 / 25205 / 5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
9:30		361	20.8%	Calibrate O_2 20.8%
		361	38 ppm	" H_2S 40 ppm TOX
		361	50%	" CH_4 50% LEL
		OVM	101.7 ppm	" 101 ppm Isobutylene
		PDM	0.26	Background Air
10:00-2:30	Working Area in Vaults			Vaults 1 2 3 4 5 6
		361	O_2	20.6 20.6 20.5 20.5 20.5 20.6
		361	TOX	000 000 000 000 000 000
		361	LEL	000 000 000 001 000 001
		OVM		0.01 0.00 0.00 0.01 0.00 0.01
		PDM		0.29 0.31 0.29 0.27 0.31 0.29

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/27/93 Sheet 1 of 2

Job Name TDS/COA off-site /HY Job Number 923-9055

Location Niagara Falls

Time In 8:30 Time Out 2:00 Weather Rain Temp. 40° Wind D. NE V 10mph

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. 3085/25205/5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration • If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.•	Reading	Procedure/Observations/Comments
9:00		361	20.8	Calibrate O_2 20.8%
		361	39ppm	" H_2S 40ppm TOX
		361	50%	" CH_4 50% LEL
		OVM	101.5ppm	" 101ppm Isobutylene
		PDM	0.20	Background Air
9:30-1:30	Working Area in Vaults			Vaults
				1 2 3 4 5 6
		361	O_2	20.6 20.6 20.5 20.5 20.6 20.6
		361	TOX	000 000 000 000 000 000
		361	LEL	000 000 000 000 000 000
		OVM		0.01 0.00 0.00 0.00 0.00 0.00
		PDM		0.23 0.31 0.21 0.23 0.25 0.28

Recommendations

Christopher Muth
Printed Name

Christopher Muth
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/27/93 Sheet 2 of 2

Job Name TDS CQA OFFSITE Job Number 923-9055

Location 923-9055 MW 93-02(1)

Time In _____ Time Out _____ Weather Cloudy Temp. 30° Wind D. E V 2-10

Instrument Type MSA 361 / OVM 580 A / PDM-3 Particulate Serial No. _____

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
845		361	20.8	Calibrate 20.8%
		361	45%	" " 50% LEL - Methane
		361	34	" " 40 ppm H_2S
		OVM	100.6	" " 101 ppm isobutylene
		PDM	.46	" " background air mg/m³
1000		361	20.8	O_2 while augering
		361	0	LEL
		361	0	H_2S
		OVM	0	
		PDM	.46	
1100		361	20.8	O_2 While augering
		361	0	LEL
		361	0	H_2S
		OVM	0	
		PDM	.40	
1530		361	20.7	O_2 While coring
		361	0	LEL
		361	0	H_2S
		OVM	0	
		PDM	7.71	
1555		PDM	51.6	While coring
		OVM	0	

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/28/93 Sheet 1 of 1

Job Name TDS CQA OFFSITE Job Number 923-9055

Location WHEATFIELD MW-93-02(1)

Time In ____ Time Out ____ Weather Cloudy Temp. 33° Wind D. N V 2-5

Instrument Type MSA 361 / OVM 58A / PDM-3 Particulate Serial No. 3085 / -219 / 5403

Calibration Gas ____ Instrument Reading ____ Span/Gain/RF Setting ____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
930		361	~~Set~~	Calibrate
		361	~~Set~~	" "
		361	~~Set~~	" "
		OVM		" "
		PDM	.46	" "
1215	Downwind B2	361	20.9	O2 - While coring
		361	0	11.5
		361	0	LEL
		OVM	0	
		PDM	1.2	
1330	" "	361	20.8	
		361	0	
		361	0	
		OVM	0	
		PDM	-	Battery dead - no visible dust

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 1/29/93 Sheet 1 of 1

Job Name TDS CQA OFFSITE Job Number 923-9055

Location WHEATFIELD MW-93-02(1)

Time In _____ Time Out _____ Weather P. Sunny Temp. 22° Wind D. SE V. 5-10

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. _____

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
900		361	20.8	Calibrate O_2 20.8 %
		361	38	" " H_2S 40 ppm
		361	45%	" " LEL 50 % Methane
		OVM	100.8	" "
		PDM		" " Batt Dead
1100		361	20.8	
		361	0	
		361	0	
		OVM	0	
		PDM	-	Batt. Dead No visible dust
1315		361	20.7	
		361	0	
		361	0	
		OVM	0	
		PDM	-	See above

Recommendations

David Mehn
Printed Name

David Mehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/6/93 Sheet 1 of 1

Job Name IDS CGA OFFSITE Job Number 923-9655

Location WHEATFIELD / MW-93-02(1)

Time In _____ Time Out _____ Weather Sunny Clear Temp. 8°F Wind D. _____ V _____

Instrument Type MSA 361 / OVM 580A / PDM-3 Serial No. _____

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
845		361	20.8	C= Calibrate
		361	34	H_2S " " 40 ppm
		361	35 *	LEL " " 50% (Methane)
		OVM	99	Isobutylene " " 101 ppm
		PDM1	.45	Background air *
1200	Downwind EZ	361	20.8	while -4" roaming top of hole
		361	0	
		361	0	
		OVM	0	
		PDM	.51	
1320	" "	361	20.8	While coring
		361	C	
		361	C	
		OVM	C	
		PDM	.44	

Recommendations

* Cylinder pressure low

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/3/93 Sheet 1 of 1

Job Name TDS CQA OFFSITE Job Number 923-9055

Location WHEATFIELD - MW 93-02(1)

Time In _____ Time Out _____ Weather Sun Temp. 34° Wind D. N V 3-10

Instrument Type MSA 361 / OVM 580A / PDM-3 Particulate Serial No. 3085 / -219 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration • If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.•	Reading	Procedure/Observations/Comments
8:30	"	361	20.8	Calibrate O_2 - 20.8%
	"	361	34	" " H_2S 40ppm
	"	361	24%*	" " LEL 50% (Methane)
	"	OVM	98.0	" " Isobutylene 101 ppm
	"	PDM	1.39	" " background air
9:45	Downwind EZ	361	20.8	O_2 while coring
	" "	361	0	H_2S " "
	" "	361	0	LEL " "
	" "	OVM	0	" "
	" "	PDM	1.44	
11:00	" "	361	20.9	O_2 while 4" reaming
	" "	361	0	H_2S " "
	" "	361	0	LEL " "
	" "	OVM	0	" "
	" "	PDM	1.42	
11:10	Tank	OVM	0	In poly tank.
11:50	Downwind EZ	OVM	0	while coring "
12:20	" "	OVM	0	" "
14:40	"	OVM	0	" "
14:40	" "	PDM	1.44	" "
15:15	" "	OVM	0	

Recommendations

* Cylinder pressure low

David Wehn
Printed Name

Dave Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/4/93 Sheet 1 of 1

Job Name TDS COA OFFSITE Job Number 923-9055

Location WHEATFIELD

Time In _____ Time Out _____ Weather P. Cloudy Temp. 28°F Wind D. SE V 0-2

Instrument Type MSA 361 / OVM 580 A / PDM-3 Portable Serial No. 3085 / -219 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
830	-	361	20.8	Calibrate O_2 20.8%
	-	361	37	" " H_2S 40 ppm
	-	361	45%	" " LEL 50% (Methane)
	-	OVM	96	" " Isobutylene 101 ppm
	-	PDM	1.63	" " background air
1000	Downwind E2	361	20.8	
		361	C	
		361	6	
		OVM		Displ. / ton cld. Bank
		PDM	1.55	
1120	" "	OVM	0	Instrument warmed.

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/5/93 Sheet 1 of 1

Job Name TDS CGA OFFSITE Job Number 923-9055

Location WHEATFIELD

Time In _____ Time Out _____ Weather Clear Temp. 30°F Wind D. E V 25

Instrument Type MSA 361/OVM 580A/PDM-3 Particulate Serial No. 3055/-219/5403

Calibration Gas and Concentration _____ Instrument Reading _____ Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
		361	20.8	Calibrate O_2 - 20.8%
		361	35	" " H_2S - 40 ppm
		361	45 %	" " LEL 50% (Methane)
		OVM	98	" " 101 ppm Isobutylene
		PDM	1.63	" " background air
1200	Top of augers	361	20.8	O_2 - White auguring
		361	0	H_2S 93-01 (1)
		361	0	LEL
		OVM	0	
		PDM	1.60	
1230	Top of augers	361	20.8	
		361	0	
		361	0	
		OVM	0	
		PDM	1.4	
1400	Trench	OVM	0	Sec from Vb to manhole

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/8/93 Sheet 1 of 2

Job Name TDS CGA OFFSITE Job Number 923-9055

Location WHEATFIELD - MW 93-01(1)

Time In ____ Time Out ____ Weather Cloudy Temp. 31° Wind D. ESE V 0-2

Instrument Type MSA 361 / OVM 580A / PDM-3 Particulate Serial No. 3085 / -219 / 5403

Calibration Gas and Concentration ____ Instrument Reading ____ Span/Gain/RF Setting ____

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
845		361	20.8	Calibrate O_2
		361	34	" " H_2S 40 ppm
		361	45%	" " LEL 50% (Methane)
		OVM	99.0	" " 101 ppm isobutylene
		PDM	1.55	" "
950	DOWNWIND E2	361	20.8	O_2 - while driving
		361	0	H_2S 4" casing
		361	0	LEL
		OVM	0	
		PDM	2.09	
1010	" "	OVM	0	While driving
				4" casing
1030	" "	OVM	0.4*	" "
1100	" "	OVM	0	While casing
	" "	PDM	17.1	" "
1110		PDM	9.16	" "
1140	" "	OVM	0	" "
	" "	PDM	2.72	" "
1200	" "	OVM	0	" "

Recommendations

* Due to my gasoline engine exhaust.

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/8/93 Sheet 2 of 2

Job Name TDS CGA OFFSITE Job Number 923-9055

Location WHEATFIELD MW 9301(1)

Time In _____ Time Out _____ Weather Cloudy Temp. 31° Wind D. ESE V 0-2

Instrument Type MSA 361 | OVM 580A | PDM-3 Particulate Serial No. 3085 | -219 | 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
1350	DOWNWIND FZ	361	20.8	O_2 While coring
		361	0	H_2S
		361	0	LEL
		OVM	0	
		PDM	1.04	
1430	" "	OVM	0	" "
1500	" "	OVM	0	" "

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/9/93 Sheet 1 of 1

Job Name TDS CGA OFFSITE Job Number 923-9055

Location WHEAT FIELD

Time In _____ Time Out _____ Weather P. Cloudy Temp. 20° Wind D. NW V 0-2

Instrument Type MSA 361/OVM 580A/PDM-3 Particulate Serial No. 3085/-219/5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration *If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
830		361	20.8%	Calibrate O_2 20.8
		361	35	" " H_2S 40 ppm
		361	45 %	" " LEL 50% (Methane)
		OVM	97	" " 101 ppm Isobutylene
		PDM	1.60	" " background air
950	DOWNWIND EZ	361	20.5	O_2 While Coring
		361	0	H_2S
		361	0	LFL
		OVM	0	
		PDM	1.63	
1050	" "	OVM	0	" "
1130	" "	OVM	0	" "
1330	" "	OVM	0	" "
1500	" "	OVM	0	While 4" reaming
1530	" "	OVM	0	" "

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/10/93 Sheet 1 of 1

Job Name TDS CQA OFFSITE Job Number 923-9055

Location WHEATFIELD - MW 93-01(1)

Time In _____ Time Out _____ Weather Cloudy Temp. 36° Wind D. SE V 2-5

Instrument Type MSA 361 / OVM 580 1 / PDM-3 Particulate Serial No. 3085 / -219 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
840		361	20.8 %	Calibrate O_2 20.8 %
		361	35	" " H_2S 40 ppm
		361	44 %	" " LEL 50% (Methane)
		OVM	100.4	" " 101 ppm Isobutylene
		PDM	1.75	" " background air
950	DOWNWIND E2	OVM	0	While 4" reaming
		PDM	184	

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/11/93 Sheet 1 of 2

Job Name TDS CQA OFFSITE Job Number 923-9055

Location WHEAT FIELD

Time In _____ Time Out _____ Weather P. Cloudy Temp. 20° Wind D. E V 25

Instrument Type OVM 580A / PDM3- Particulate Serial No. -219 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
820		OVM	100.7	Calibrate 101 ppm Isobutylene
		PDM	1.81	Calibrate - background air
950		OVM	0	While coring 93-03(1)
		PDM	1.26	
1030		OVM	0	" "
		PDM	1.53	
1130		OVM	0	While 4" reaming
		PDM	1.57	
1200		OVM	0	" "

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/11/93 Sheet 2 of 2

Job Name TDS CQ1 OFFSITE Job Number 923-9055

Location WHEATFIELD - 93-03(1)

Time In _____ Time Out _____ Weather Cloudy Temp. 20° Wind D. SSW V 5-15

Instrument Type MSA 361 / OVM 580A / PDM-3 Particulate Serial No. 3085 / -219 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
		361	20.8 %	Calibrate O_2 20.8 %
		361	35	" " H_2S 40 ppm
		361	44 %	" " LEL 50% (Methane)
		OVM	100.8	" " 101 ppm Isobutylene
		PDM		" " background air
13 15	BP TEP WELLS	OVM	0	
13 45	" "	OVM	0	
14 15	" "	OVM	0	

Recommendations

David Wehn
Printed Name

Dave Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/12/93 Sheet 1 of 1

Job Name TDS CGA OFFSITE Job Number 923-9055

Location WHEATFIELD

Time In _____ Time Out _____ Weather Cloudy Temp. 30° Wind D. W V 5-10

Instrument Type OVM 580 A / PDM-3 Particulate Serial No. -219 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
1045		OVM	99.8	Calibrate 101 ppm Isobutylene
		PDM	1.64	" " background air
1100	DOWNWIND EZ	OVM	0	While driving 11" casing
		PDM	1.71	
1145	" "	OVM	0	While coring
		PDM	1.73	
1230		OVM	0	" "
		PDM	1.71	

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/16/93 Sheet 1 of 1

Job Name TDS CCA OFFSITE Job Number 923-9055

Location WHEATFIELD

Time In _____ Time Out _____ Weather Snow Temp. 30° Wind D. W V 2-4

Instrument Type OVM 580 A / PDM-3 Particulate Serial No. -219 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
845		OVM	100.8	Calibrate 101 ppm isobutylene
		PDM	1.56	" " background air
930	DOWNWIND E2	OVM	0	While coring 93-C3(1)
		PDM	1.56	
1030	" "	OVM	0	" "
		PDM	1.55	
1100	" "	OVM	0	" "
1130	" "	OVM	0	" "

Recommendations

David Wehn
Printed Name

Dave Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 2/19/93 Sheet 1 of 1

Job Name TDS COA OFFSITE Job Number 923-9055

Location WHEATFIELD

Time In _____ Time Out _____ Weather P. Cloudy Temp. 10°F Wind D. N V 2-3

Instrument Type OVM 580A / PDM-3 Particulate Serial No. -219 / 5403

Calibration Gas _____ Instrument Reading _____ Span/Gain/RF Setting _____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
900		OVM	100.8	Calibrate 101 ppm Isobutylene
		PDM	1.81	Background air
1000		OVM	0	While coring 93-03(1)
		PDM	1.56	
1030		OVM	0	" "
		PDM	1.82	
1130		OVM	0	While reaming 93-03(1)
		PDM	1.81	

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 3/29/93 Sheet 1 of 1

Job Name TDS CQA OFFSITE Job Number 923-9055

Location 6683 Walmer Rd - Wheatfield 89-11(1)

Time In ____ Time Out ____ Weather Cloudy Temp. 45° Wind D. S V 0-5

Instrument Type OVM 580A Serial No. -219

Calibration Gas 101 ppm Isobutylene Instrument Reading 99.0 Span/Gain/RF Setting ____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
1350	Top of rods	OVM	0	During 3" overdrilling
14:05	" "	" "	0	" "
14:30	" "	" "	0	" "
14:50	" "	" "	0	" "
15:15	" "	" "	0	" "

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 3/30/93 Sheet 1 of 1

Job Name TDS CGA OFFSITE Job Number 923-9055

Location 6683 Walmore Rd. - Wheatfield 89-11(1)

Time In _____ Time Out _____ Weather Sunny Temp. 50° Wind D. E V 0-2

Instrument Type OVM 580 A Serial No. -219

Calibration Gas 101 ppm Isobutylene Instrument Reading 100.0 Span/Gain/RF Setting _____
and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
9:20	auger cuttings	OVM	0	While by augering
9:30	"	"	0	" @ 10'
9:45	"	"	0	while w/ 4" augering
10:30	Drilling water	"	0	Drilling with diamond bit
10:50	"	"	0	"
11:15	"	"	0.1	Bottom of hole

Recommendations

David Wohn
Printed Name

Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 3/3/93 Sheet 1 of 1

Job Name TDS COX OFFSITE Job Number 923-9055

Location 6683 Walmore Rd. Wheatfield 89-20(3)

Time In ____ Time Out ____ Weather P. Sunny Temp. 60 Wind D. E V 5-15

Instrument Type OVM 580 A Serial No. -219

Calibration Gas 101 ppm Isobutylene Instrument Reading 99.5 Span/Gain/RF Setting ____

and Concentration

*If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
8:25	89-20(3)	OVM	0	TOJ of well when cap was remove
8:45	"	"	0	coring w/ 3" diamond Drill
9:00	"	"	0	"
9:30	"	"	0	added new drill rod
10:30	"	"	0	working on drill rig (welding)
12:00	"	"	0	using a grinder Bit
1:30	"	"	0	using a 6¼" coreing bit
2:45	"	"	0	"

Recommendations

David Wehn
Printed Name

David Wehn
Signature

Golder Associates Inc.

AIR MONITORING DATA SHEET

Date 4/6/93 Sheet 1 of 1

Job Name TDS CQA OFFSITE Job Number 923-9055

Location 6683 Walmore Rd. - Wheatfield 89-20(3)

Time In _____ Time Out _____ Weather Rain Temp. 38° Wind D. SE V 5-10

Instrument Type OVM 580A Serial No. - 219

Calibration Gas and Concentration 101 ppm Isobutylene Instrument Reading 99.0 Span/Gain/RF Setting _____

* If more than one instrument is used, document calibration procedures and results for each additional instrument in recommendations section below and indicate the instrument used (eg. OVA, 361, OVM, etc.) for each observation.

Time	Station	Instr.*	Reading	Procedure/Observations/Comments
12:40	Pit	~~35~~ OVM	0	While excavating
12:55	" "	OVM	0	" "
13:05	" "	OVM	0	" "
13:10	" "	OVM	0	" "
13:15	Riser	OVM	0	Before cutting riser

Recommendations

David Wehr
Printed Name

Dave Wehr
Signature

APPENDIX P

DESIGN MODIFICATION/CLARIFICATION FORMS

SPECIFICATION / DESIGN CLARIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 1

LOCATION / REFERENCE OF CLARIFICATION: Drawing A-3, Detail A-3, Detail B-B'; and Drawing A-5, Detail 2.

CLARIFICATION MADE: Two separate conduit lines shall be provided from the control panel in the vault to the well head; one conduit line for the power wire and one conduit line for the control wire. Maintain a 6-inch separation between the power wire and control wire routed down the well shaft.

APPROVED BY DESIGNER: Russell Healey (NAME) | Conserva-Tech Engineering (COMPANY) | 11/19/92 (DATE)

OWNER NOTIFIED OF CLARIFICATION: [X] YES [ ] NO

John Devic (NAME) | Bell Aerospace Textron (COMPANY) | 11/20/92 (DATE)

REMARKS: Separation of power wire from control wire will minimize potential for interference.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russel Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN CLARIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 2

LOCATION / REFERENCE OF CLARIFICATION: Sampling port(s) at Extraction Wells 1 through 6. Extraction Wells 1 through 5 will have one sampling port that extends from the 2-inch diameter carrier pipe. Extraction Well 6 will have one sampling port that extends from the 2-inch diameter carrier pipe and one sampling port that extends from the 3-inch diameter carrier pipe. In addition, Extraction Well 6 will have a sampling port for an auto-sampler (see Design Modification No. 13). See Details 2 and 4 on Drawing A-3 and Details 4 and 5 on Drawing A-4 of the Construction Drawing Package.

CLARIFICATION MADE: Sampling ports shall be installed in accordance with the dimensions shown on Figure 1. The material of construction for the sampling ports is also shown on Figure 1. The sampling port must be accessible from outside of the vault through the manhole opening in the vault top so that the wells can be sampled without entering the vaults. The sampling ports must be positioned so that the ports do not obstruct the entranceway into the vaults. Each sampling port must be heat traced and insulated from the ball valve to the carrier pipe. Contractor shall submit construction details prior to installation.

APPROVED BY DESIGNER:	Russell Healey	Conserva-Tech Engineering	1/18/93
	NAME	COMPANY	DATE

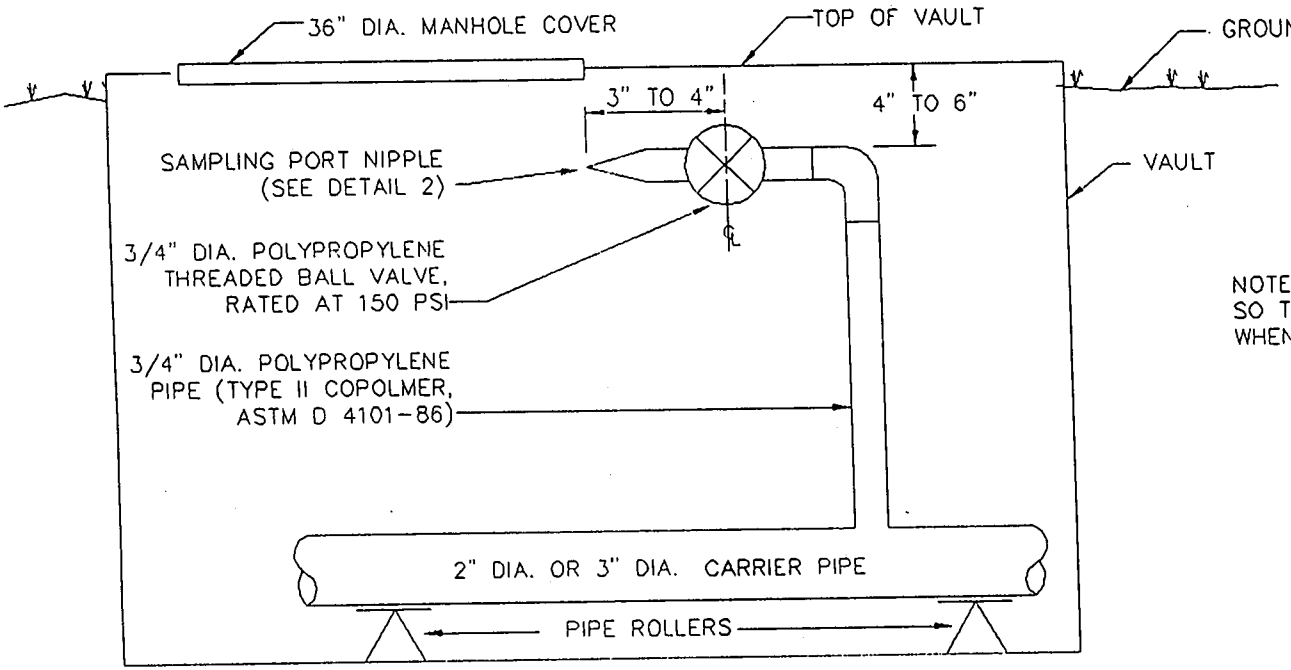
OWNER NOTIFIED OF CLARIFICATION:
[X] YES
[ ] NO

	Brian Smith	Textron Defense Systems	1/14/93
	NAME	COMPANY	DATE

REMARKS: None.

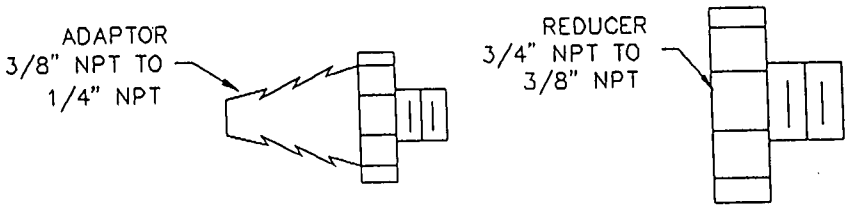
ATTACHMENTS:
Figure 1.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russel Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel



DETAIL 1
SAMPLING PORT PROFILE VIEW
N.T.S.

NOTE: SLOPE SAMPLING PORT NIPPLE DOWNWARD SO THAT WATER WILL DRAIN FROM NIPPLE WHEN THE BALL VALVE IS CLOSED.



DETAIL 2
SUGGESTED SAMPLING PORT NIPPLE CONFIGURATION
N.T.S.

MATERIAL OF CONSTRUCTION
REDUCER, TEFLON®, 3/4" NPT (MALE) TO 3/8" NPT (FEMALE)
ADAPTER, TEFLON®, 3/8" NPT (MALE) TO 1/4" ID TUBING BARB.

NOTES:
1. CONNECT ADAPTER TO REDUCER AND CONNECT REDUCER DIRECTLY INTO BALL VALVE.
2. OTHER CONFIGURATIONS ACCEPTABLE, SUBJECT TO APPROVAL.

SPECIFICATION/DESIGN CLARIFICATION No.2

CLIENT/PROJECT: BELL AREOSPACE TEXTRON			Golder Associates Buffalo, New York			TITLE: SAMPLING PORT DETAIL	
DRAWN: EAH	CHECKED: R. HEALEY	REVIEWED: ALG	DATE: 1/16/93	SCALE: AS SHOWN	FILE NO.: 913-9014	JOB NO.: 923-9055.01B	DWG NO./REV.NO.: 20	FIGURE: 1

SPECIFICATION / DESIGN CLARIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 3

LOCATION / REFERENCE OF CLARIFICATION: Pipeline south of Extraction Well 6. See Specification/Design Modification Form No. 5.

CLARIFICATION MADE: Pipeline shall be installed to provide a 0.5-percent slope (minimum) toward Extraction Well 6 and toward the sewer inlet, making the expansion loop the high point of this section of pipeline. The minimum allowable invert elevation difference of the 3-inch diameter carrier pipe at the expansion loop and at Extraction Well 6 (at the flow totalizer) shall be 6-inches.

APPROVED BY DESIGNER: Russell Healey (NAME) Conserva-Tech Engineering (COMPANY) 1/18/93 (DATE)

OWNER NOTIFIED OF CLARIFICATION:
[ ] YES
[X] NO

_____ (NAME) _____ (COMPANY) _____ (DATE)

REMARKS: None.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russel Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN CLARIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 4

LOCATION / REFERENCE OF CLARIFICATION: Installation procedure for pump riser pipe and stilling well riser pipe.

CLARIFICATION MADE: Construction of riser pipe sections will require a minimum of 10 ft./lb. of torque to be applied at each pipe joint.

APPROVED BY DESIGNER: Anthony L. Grasso (NAME) Golder Associates Inc. (COMPANY) 1/26/93 (DATE)

OWNER NOTIFIED OF CLARIFICATION:
[ ] YES
[X] NO

_____ (NAME) _____ (COMPANY) _____ (DATE)

REMARKS: Clarification based on pump manufacturers' recommendation.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN CLARIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 5

LOCATION / REFERENCE OF CLARIFICATION: Extraction well vaults.

CLARIFICATION MADE: Install leak detection cable under the piping insulation in the vaults as per the original design except as modified by the specification/design modification form Number 21. This shall include removal of temporarily installed insulation. Upon installation of final insulation, maintain the integrity of the vapor barrier to prevent migration of condensing vapor to the pipe surface through the insulation.

APPROVED BY DESIGNER:	Russell Healey	Conserva-Tech Engineering	5/17/93
	NAME	COMPANY	DATE

OWNER NOTIFIED OF CLARIFICATION: [X] YES [ ] NO

	Brian Smith	Textron Defense Systems	5/17/93
	NAME	COMPANY	DATE

REMARKS: None.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN CLARIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 6

LOCATION / REFERENCE OF CLARIFICATION: New York State Department of Transportation (NYSDOT) #A stone used as backfill material for the piping system.

CLARIFICATION MADE: Intent of the design specification for backfill material was to provide a stone with proper gradation to support piping and to allow for a maximum wheel load of H20 as required by the land owner, Niagara Mohawk Power Corporation.

APPROVED BY DESIGNER:	Russell Healey	Conserva-Tech Engineering	11/92 through 02/93
	NAME	COMPANY	DATE

OWNER NOTIFIED OF CLARIFICATION: [X] YES [ ] NO

	Brian Smith	Textron Defense Systems	6/93
	NAME	COMPANY	DATE

REMARKS:

Construction Quality Assurance/Quality Control (CQA/QC) testing of the backfill material indicates that the #1A stone tested does not meet the gradation specification of

Sieve Size	Percent Passing by Weight
1/2"	100
1/4"	100 - 90
1/8"	0 - 15
No. 200	0 - 1.0

This specification was obtained from NYSDOT for #1A stone.

Results of the testing indicated that the #1A stone tested was generally finer than specified. The critical criteria of this specification is that all material is to be smaller than 1/2" and to have no greather than 12-percent fine material passing the 200 sieve. All samples tested met these two criteria. Considering the slight deviation from the design specification, the Designer concludes that the #1A stone is in substantial compliance with the design and could be used as backfill material for the trench.

ATTACHMENTS:

None.

DISTRIBUTION:

Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN CLARIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 7

LOCATION / REFERENCE OF CLARIFICATION: Pressure testing of carrier and containment pipe.

CLARIFICATION MADE: Pressure testing procedure, prepared by the pipe manufacturer, George Fisher, and submitted by Clean Harbors, for the testing of the carrier and containment pipe. Intent of pressure test is to verify the integrity of installed piping system.

APPROVED BY DESIGNER: Russell Healey (NAME) | Conserva-Tech Engineering (COMPANY) | 02/05/93 (DATE)

OWNER NOTIFIED OF CLARIFICATION:
[X] YES
[ ] NO

Brian Smith (NAME) | Textron Defense Systems (COMPANY) | 02/93 (DATE)

REMARKS: Designer accepted proposed pressure test from Clean Harbors as being in substantial compliance with intent of design.

ATTACHMENTS:
Accepted pressure test procedure.

DISTRIBUTION:
Brian Smith – Textron Defense Systems
John Devic – Bell Aerospace Textron
Russell Healey – Conserva-Tech Engineering
Gordon Fielding – Clean Harbors
Robert McNamara – Wendel

GEORGE FISCHER +GF+ 12/11/92

AYER SALES
WOBURN, MASS
MR DAVID AYER

CONSERVA-TECH
ENGINEERING SERVICES
WILLIAMSTOWN, NJ 08094

PRESSURE TESTING

CHECKED FEB - 5 1993

DEAR DAVID,

IN REFERENCE TO THE CLEAN HARBORS JOB. +GF+ RECOMMENDS THAT THE CONTAINMENT PIPING BE PRESSURE TESTED WITH AIR OR NITROGEN AT LOW PRESSURE AROUND 5PSI AND SOAP THE JOINTS FOR A CHECK.

THE POLYPRO CARRIER CAN BE PRESSURE TESTED ALSO AT AROUND 25-30 PSI. AN INITIAL PRESSURE LOSS WILL BE NOTICED YOU MUST WAIT FOR THE PIPE TO STABILIZE OR STOP EXPANDING. (NEXT DAY). RE-PRESSURIZE AND THAN WATCH THE GUAGE. BECAUSE THE PIPE EXPANDS, SMALL PRESSURE LOSSES INITIALLY MAY NOT MEAN A LEAK. PLEASE CALL VINCE SAUNDERS AT +GF+ TUSTIN, CA. 1-800-854-4090 IF YOU HAVE ADDITIONAL QUESTIONS

BEST REGARDS,

ROB LUKE

+GF+

George Fischer Signet, Inc., 2882 Dow Avenue, Tustin, California 92680-7285
(714) 731-8800. Toll-free (1001) 854-4090. Fax (714) 731-6201

SPECIFICATION / DESIGN CLARIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 8

LOCATION / REFERENCE OF CLARIFICATION: Pump control settings at Extraction Well Numbers 1 through 6.

CLARIFICATION MADE: Initial pump control settings provided to contractor. See attached letter dated January 27, 1993, from the Designer (Golder Associates Inc.).

APPROVED BY DESIGNER: Anthony L. Grasso (NAME) Golder Associates Inc. (COMPANY) 01/27/93 (DATE)

OWNER NOTIFIED OF CLARIFICATION: [X] YES [ ] NO

Brian Smith (NAME) Textron Defense Systems (COMPANY) 01/27/93 (DATE)

REMARKS: As per the design, the initial pump control settings were determined by the Designer after the extraction wells were installed in order to account for in-situ conditions (i.e. well depth and water level elevation).

ATTACHMENTS:
Letter dated January 27, 1993, from Golder Associates Inc. to Clean Harbors.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

Golder Associates Inc.

210 John Glenn Drive, Suite 1
Amherst, NY USA 14228
Telephone (716) 691-1156
Fax (716) 691-5109

Golder Associates

January 27, 1993

923-9055

Mr. Gordon Fielding
Clean Harbors
Environmental Services Companies
325 Wood Road
Braintree, Massachusetts 02184

RE: INITIAL PUMP CONTROL SETTINGS
OFF-SITE GROUND WATER EXTRACTION SYSTEM
BELL AEROSPACE TEXTRON
WHEATFIELD, NEW YORK

Dear Gordon:

Please find attached Table 1 presenting the initial pump control settings for the extraction wells (EX-1 through EX-6) associated with the Off-Site Ground Water Extraction System at the Bell Aerospace Textron, Wheatfield Facility. These control settings include the "pump on" setting, "pump off" setting, "high alarm" setting, and "low alarm" setting and correspond to an elevation at each well. Table 1 also presents the depth to install the transducer, which will be programmed with the pump control settings, at each well. The transducer will transmit an electronic signal which will activate (pump on) or deactivate the pump (pump off), or signal an alarm status (high or low alarm), based on the water level in the well, in conjunction with each control setting (see Table 1). These initial pump control settings may need to be modified based on the performance of the extraction system as determined during start-up of the system. If you have any questions concerning this letter, please call.

Very truly yours,

GOLDER ASSOCIATES INC.

Anthony L. Grasso, P.G.
Senior Hydrogeologist

ALG:dml

Attachment

CC: Mr. Brian Smith, Textron Defense Systems
Mr. Russell Healey, Conserva-Tech Engineering
Mr. Robert McNamara, Wendel Engineers, P.C.
Mr. Raymond Burnham, Burnham Process Control Services, Inc.

F/N: FIELDING.L2

BELL AEROSPACE TEXTRON
OFF-SITE GROUND WATER EXTRACTION SYSTEM
INITIAL PUMP CONTROL SETTINGS

WELL NO.	DEPTH OF TRANSDUCER (FT. BTOC)	HIGH ALARM SETTING (FT. BTOC)	PUMP ON SETTING (FT. BTOC)	PUMP OFF SETTING (FT. BTOC)	LOW ALARM SETTING (FT. BTOC)
EW-1	23.8	10.9	12.9	16.9	18.9
EW-2	24.6	12.4	14.4	18.4	20.4
EW-3	29.0	13.2	15.2	19.2	21.2
EW-4	28.4	13.4	15.4	19.4	21.4
EW-5	28.6	13.0	15.0	19.0	21.0
EW-6	33.3	11.9	13.9	17.9	19.9

NOTE:

FT. BTOC = Feet below top of casing in vault.

F/N: INIT-SET.WK1

SPECIFICATION / DESIGN CLARIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 9

LOCATION / REFERENCE OF CLARIFICATION: Survey data as presented in letter dated April 22, 1994, from Clean Harbors (see Appendix M) and the design requirement that the pipeline should slope toward the vaults from the midpoint between vaults and from the expansion loop.

CLARIFICATION MADE:
The survey data presented by Clean Harbors was not under the seal of a professional land surveyor nor were coordinates provided along the pipeline. This design requirement was waived by Bell Aerospace Textron and the survey data provided by Clean Harbors were therefore considered acceptable.

Based on the survey data provided by Clean Harbors, the pipeline does not meet the design requirement of a minimum of 0.5% slope, at two locations: from midpoint between EW-1 and EW-2 toward EW-1 and from midpoint between EW-5 and EW-6 toward EW-6. The pipeline slope is approximately 0.4% at these two locations. The requirement for a minimum slope of 0.5% is viewed as a nominal requirement. Therefore the Designer concludes that the slope of the pipeline is acceptable and is in substantial compliance with the intent of the design.

APPROVED BY DESIGNER:	Anthony Grasso	Golder Associates Inc.	04/21/94
	NAME	COMPANY	DATE

OWNER NOTIFIED OF CLARIFICATION:
[X] YES
[ ] NO

	Brian Smith	Textron Defense Systems	04/21/94
	NAME	COMPANY	DATE

REMARKS: None.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 1

LOCATION / REFERENCE OF MODIFICATION: Drawing E-1 Detail 2, Drawing E-2 Panel Schedule and Drawing E-3 Detail 1, and the Specifications

MODIFICATION MADE:

1. All references to 120/208 v in specifications and drawings shall be changed to 120/240 v.
2. The service voltage shall be 120/240 v, single phase.
3. Panel "MDP" shall be single phase, 3W, 120/240 v.
4. Well pumps EW-1 through EW-6 shall be 240 v, single phase.

APPROVED BY DESIGNER: Russell J. Healey (NAME) Conserva-Tech Engineering (COMPANY) 11/2/92 (DATE)

OWNER NOTIFIED OF MODIFICATION: [X] YES [ ] NO

Brian Smith (NAME) Textron Defense Systems (COMPANY) 10/29/92 (DATE)

REMARKS: Design modification is a result of a change in power supply from Niagara Mohawk.

ATTACHMENTS:
None

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 2

LOCATION / REFERENCE OF MODIFICATION: Drawing A-5, Specifications Page 6 and 7 - Vaults

MODIFICATION MADE: Provide watertight concrete vaults of the same nominal dimensions. The access to the vaults shall be via a 36-inch diameter manhole that fits flush into the vault cover. The manhole shall be located on center of the long dimension of the vault and offset to the side of the vault to align over the well. The entire assembly including the vault top, the manhole cover, and the manhole frame shall be capable of withstanding an H20 wheel load.

APPROVED BY DESIGNER: Russell Healey (NAME) | Conserva-Tech Engineering (COMPANY) | 11/5/92 (DATE)

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

Brian Smith (NAME) | Textron Defense Systems (COMPANY) | 11/9/92 (DATE)

REMARKS: Design modification made to provide an H20 wheel load capability for the vaults, as required by Niagara Mohawk.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 3

LOCATION / REFERENCE OF MODIFICATION: Extraction Wells 5 and 6.

MODIFICATION MADE: Extend 10-inch diameter surface casing five feet into the top of Zone 1, instead of three feet.

APPROVED BY DESIGNER: Anthony Grasso (NAME) | Golder Associates Inc. (COMPANY) | 11/19/92 (DATE)

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

John Devic (NAME) | Bell Aerospace Textron (COMPANY) | 11/18/92 (DATE)

REMARKS: Modification made due to weathered/fractured zone present within upper two to three feet of Zone 1 at wells 5 and 6. A competent seal of the surface casing may not be achieved within this weathered/fractured zone. Also, recommend 5-foot installation of 10-inch casing into the top of Zone 1 for future extraction well installations if similar conditions are encountered.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 4

LOCATION / REFERENCE OF MODIFICATION: Addendum No. 1 to the Off-Site Ground Water Extraction System, dated September 17, 1992. Attachment A, Revised Construction Specifications, Page A-2, Level Control Switches.

MODIFICATION MADE: The transducer pressure range shall be 0 to 15 psig, not 0 to 30 psig, with an accurancy of ±0.5% F.S. or better. In addition, provide a 50-foot transducer cable length instead of a 40-foot length.

APPROVED BY DESIGNER: Russell Healey (NAME) Conserva-Tech Engineering (COMPANY) 11/19/92 (DATE)

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

John Devic (NAME) Bell Aerospace Textron (COMPANY) 11/20/92 (DATE)

REMARKS: Modification of pressure range will result in better accuracy for the transducer and extra cable will assure adequate cable length at the well head.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 5

LOCATION / REFERENCE OF MODIFICATION: Pipeline south of EW-6; Drawing A-2, Detail 1; Sheet A-4, Detail 2.

MODIFICATION MADE: Install expansion loop at mid-point in the pipeline that extends in the eastern-western direction between Extraction Well 6 and the sewer inlet; see Figure 1 for the modification made to the piping layout south of EW-6 and for expansion loop details. In addition, Detail 2 on Drawing A-4 has been modified by eliminating the seal between the containment and carrier pipe and replacing the the seal with spider clips.

APPROVED BY DESIGNER:	Russell Healey	Conserva-Tech Engineering	11/20/92
	NAME	COMPANY	DATE

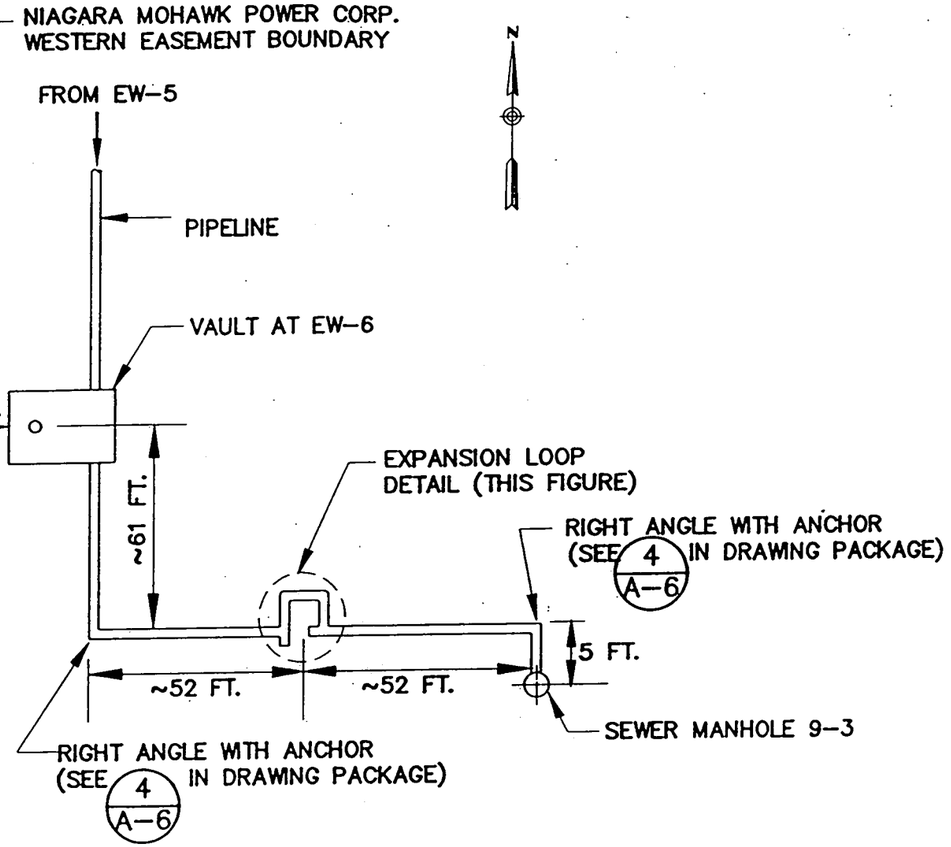
OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

	John Devic	Bell Aerospace Textron	11/20/92
	NAME	COMPANY	DATE

REMARKS: Expansion loop necessary to allow for expansion/contraction of pipeline that extends in eastern-western direction. Elimination of seal at sewer inlet will allow for drainage in annulus between containment and carrier pipe.

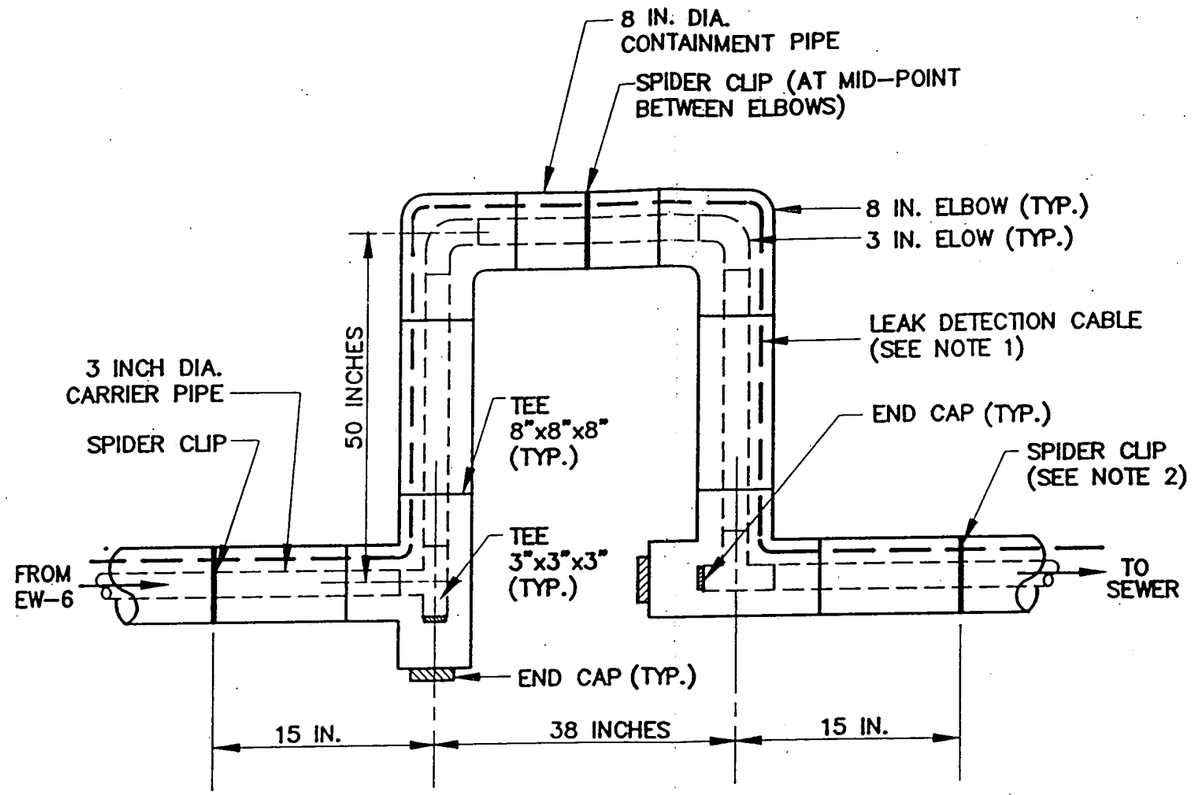
ATTACHMENTS:
Figure 1.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel



PLAN VIEW - PIPING LAYOUT

NOT TO SCALE



EXPANSION LOOP DETAIL

NOT TO SCALE

NOTES:

1. LEAK DETECTION CABLE TO BE INSTALLED AT CENTERLINE ALONG BASE OF 8 IN. CONTAINMENT PIPE.
2. SPIDER CLIP TO BE PLACED 59 IN. APART IN REMAINING PORTION OF PIPELINE.

Golder Associates — Buffalo, New York

CLIENT/PROJECT: BELL AEROSPACE TEXTRON

TITLE: PIPING LAYOUT AND EXPANSION LOOP DETAIL

DRAWN	EAH	DATE	11/20/92	JOB NO.	913-9014
CHECKED	RJH	SCALE	AS SHOWN	DWG. NO./REV. NO.	18
REVIEWED	ALG	FILE NO.	913-9014	FIGURE NO.	1

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 5R

LOCATION / REFERENCE OF MODIFICATION: Revision to Specification/Design Modification Number 5.

MODIFICATION MADE: Install seal between carrier pipe and containment pipe as shown on Sheet A-4, Detail 2.

APPROVED BY DESIGNER:	Russell J. Healey	Conserva-Tech Engineering	2/9/93
	NAME	COMPANY	DATE

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

	Brian Smith	Textron Defense Systems	2/17/93
	NAME	COMPANY	DATE

REMARKS: Install seal to minimize potential for gas migration from the sewer vaults via pipeline. Seal may be temporarily removed to allow for drainage in the event of a pipe failure.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith – Textron Defense Systems
John Devic – Bell Aerospace Textron
Russell Healey – Conserva-Tech Engineering
Gordon Fielding – Clean Harbors
Robert McNamara – Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 6

LOCATION / REFERENCE OF MODIFICATION: Drawing A-3, Details B-B', 4, 5, and 6.

MODIFICATION MADE: Invert of containment pipe shall be 6 inches above base of vault floor instead of 3 inches as shown on the Construction Drawings. This shall place the invert of the containment pipe approximately 63.5 inches below the top of the vault. Further, the invert of the 3-inch diameter carrier pipe at the vault shall be a nominal 8½ inches above the base of the vault and the invert elevation of the 2-inch diameter pipe shall be a nominal 17 inches above the base of the vault. Given these dimensions, the invert of the containment pipe at the high point along the pipeline shall not exceed 50 inches below ground surface.

APPROVED BY DESIGNER:	Anthony Grasso	Golder Associates Inc.	11/20/92
	NAME	COMPANY	DATE

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

	John Devic	Bell Aerospace Textron	11/20/92
	NAME	COMPANY	DATE

REMARKS: Modifications made to provide for additional working space in vault.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 7

LOCATION / REFERENCE OF MODIFICATION: Drawing A-3, Section B-B'; Drawing E-1, Detail E-1; and Specifications.

MODIFICATION MADE: An additional leak detection device may be installed for the off-site system in the future. This additional device will be capable of detecting standing water in the vault. In order to provide for the potential installation of this leak detection system, replace the 1½-inch and 2-inch diameter PVC (schedule 40) conduits for the power wire with 2½-inch diameter PVC (schedule 40) conduit. Install a pull wire in the conduit, along with the specified power wire, to facilitate the installation of additional power wires for the leak detection device in the future. Further, the 10-inch diameter polypropylene surface casing should be installed with a 2-inch stick-up above the base of the vault and not flush with the base as shown.

APPROVED BY DESIGNER: Russell Healey (NAME) | Conserva-Tech Engineering (COMPANY) | 12/9/92 (DATE)

OWNER NOTIFIED OF MODIFICATION: [X] YES [ ] NO

John Devic (NAME) | Bell Aerospace Textron (COMPANY) | 12/9/92 (DATE)

REMARKS: None.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith – Textron Defense Systems
John Devic – Bell Aerospace Textron
Russell Healey – Conserva-Tech Engineering
Gordon Fielding – Clean Harbors
Robert McNamara – Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 7R

LOCATION / REFERENCE OF MODIFICATION: Revision to Specification/Design Modification Form Number 7.

MODIFICATION MADE: Replace the 1½-inch diameter PVC power conduit originally specified with 2-inch diameter PVC conduit. Replace the 2-inch diameter PVC power conduit originally specified with 2½-inch diameter PVC conduit.

APPROVED BY DESIGNER:	Russell Healey	Conserva-Tech Engineering	12/10/92
	NAME	COMPANY	DATE

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

	John Devic	Bell Aerospace Textron	12/11/92
	NAME	COMPANY	DATE

REMARKS: Specification/Design Modification Form Number 7, which stated that all the power conduit originally specified was to be replaced with 2½-inch conduit, was deemed unnecessary. The other modifications presented in Specification/Design Modification Form Number 7 remain in effect, as stated.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 8

LOCATION / REFERENCE OF MODIFICATION: Section of double walled piping beneath drainage ditch between vaults 3 and 4; see Drawing A-2, Section A-A'.

MODIFICATION MADE: Install a 15-inch diameter (nominal) reinforced concrete pipe sleeve over pipe section that cross directly beneath the drainage ditch between vaults 3 and 4. The pipe sleeve should extend beyond the width of the drainage ditch. Three concrete sections, each 7½ feet in length, are anticipated to be used to traverse the ditch. The pipe connections should be made water tight. Also, final placement of the concrete pipe sleeve should not obstruct drainage in the ditch.

APPROVED BY DESIGNER: Russell Healey (NAME) | Conserva-Tech Engineering (COMPANY) | 12/02/92 (DATE)

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

Brian Smith (NAME) | Textron Defense Systems (COMPANY) | 12/03/92 (DATE)

REMARKS: Design modification made due to shallow burial of pipe beneath drainage ditch, to allow for anticipated wheel loadings.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 9

LOCATION / REFERENCE OF MODIFICATION: Thirty foot wide section of trench between vaults 4 and 5 that crosses the access road from Walmore Road; see Drawing A-2, Section A-A'.

MODIFICATION MADE: Install pipe bedding stone to within one foot below ground surface in trench section that crosses the access road. Place geotextile over stone and cover trench with one foot of compacted soil.

APPROVED BY DESIGNER: Anthony Grasso (NAME) Golder Associates Inc. (COMPANY) 12/03/92 (DATE)

OWNER NOTIFIED OF MODIFICATION: [X] YES [ ] NO

Brian Smith (NAME) Textron Defense Systems (COMPANY) 12/03/92 (DATE)

REMARKS: Design modification made at road crossing due to high traffic area; additional stone will reduce maintenance requirements of cover material over trench in this area.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 10

LOCATION / REFERENCE OF MODIFICATION: Drawing A-3, Section B-B' of Drawing Package.

MODIFICATION MADE: Reduce thickness requirement of gravel beneath vault from 12 inches to 6 inches minimum.

APPROVED BY DESIGNER: Anthony Grasso (NAME) Golder Associates Inc. (COMPANY) 12/01/92 (DATE)

OWNER NOTIFIED OF MODIFICATION: [X] YES [ ] NO

John Devic (NAME) Bell Aerospace Textron (COMPANY) 12/9/92 (DATE)

REMARKS: During excavation for placement of vaults, the soil conditions encountered at the base of the vault are well compacted and firm and thus warrant use of less stone than originally specified.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 11

LOCATION / REFERENCE OF MODIFICATION: Soil Backfill Specifications as presented in the Construction Specifications for Off-Site Ground Water Extraction System.

MODIFICATION MADE: Compact soil backfill in trench to a minimum of 90-percent of the maximum dry density (average value) as determined by Standard Proctor testing performed in accordance with ASTM D-698, not to a minimum of 95-percent of the maximum dry density, as originally specified. Moisture content must be consistent with 90-percent compaction.

APPROVED BY DESIGNER: Anthony Grasso (NAME) Golder Associates Inc. (COMPANY) 12/14/92 (DATE)

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

Brian Smith (NAME) Textron Defense Systems (COMPANY) 12/14/92 (DATE)

REMARKS: Modification made is due to wet field conditions and inability to compact soil backfill to a minimum of 95-percent of the maximum dry density. Relaxation of the soil compaction criteria may result in localized settlement in trench in the future and surface rutting of soil backfill induced by passing vehicles. Thus, future maintenance of trench surface may be required.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 12

LOCATION / REFERENCE OF MODIFICATION: Approximately 400-foot section of trench between the access road (located approximately 100 feet north of EW-5) to a point approximately 20 feet north of the communication pad (located between vaults EW-3 and EW-4). See Drawing A-2, Section A-A'; Also, soil backfill specifications.

MODIFICATION MADE: For the trench section specified above, substitute soil backfill with 2-inch Run of Crusher (2-inch ROC) stone. Install 2-inch ROC above pipe bedding stone (#1A stone) to within one foot below ground surface. At locations along pipeline where the depth to the top of pipe from ground surface is less than 50 inches, place styrofoam over centerline of pipe, directly underneath the geotextile separating the pipe bedding stone (#1A) from the 2-inch ROC. Styrofoam shall be type HI-40, two inches thick, two feet wide. Native soil backfill shall be placed on top of 2-inch ROC to ground surface.

APPROVED BY DESIGNER:	Anthony L. Grasso	Golder Associates Inc.	12/18/92
	NAME	COMPANY	DATE

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

	Brian Smith	Textron Defense Systems	12/17/92
	NAME	COMPANY	DATE

REMARKS: Modification made is due to wet field conditions and inability to compact soil backfill to required compaction criteria. Styrofoam will provide as a barrier to frost penetration through the 2-inch ROC stone.

ATTACHMENTS:
See Attachment A for Compaction Specifications of 2-inch ROC stone and soil backfill above 2-inch ROC.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION/DESIGN MODIFICATION NUMBER 12

ATTACHMENT A

BACKFILL AND COMPACTION

Stone Backfill (2-inch ROC)

- Place in 9-inch lifts before compaction;
- Compact stone to a dry density of at least 90-percent of the maximum dry density as determined in accordance with ASTM D1557-91; and
- Quality control tested following ASTM D2922 or other method as approved by the Owner's Representative at the frequency of at least one test per 100 feet.

Soil Backfill

- Placed in lifts less than 9 inches thick before compaction;
- Compact backfill using a 120-pound Jumping Jack or a trackhoe bucket;
- Each lift shall be compacted with a minimum of three passes; and
- The compacted backfill shall be broken up or sorted so that the maximum aggregate particle size does not exceed 3 inches.

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 13

LOCATION / REFERENCE OF MODIFICATION: Extraction Well 6. See Detail 5 on Drawing A-4 of the Construction Drawing Package.

MODIFICATION MADE: Install additional sampling port in the 3-inch diameter carrier pipe in the vault that houses Extraction Well 6. This additional sampling port is to be installed at the location shown on Figure 1 (referenced as the "sampling port for auto-sampler"). Also shown on Figure 1 is the suggested sampling port configuration. The sampling port must be accessible from outside of the vault through the manhole opening in the vault top so that sampling equipment can be accessed without entering the vault. Table 1 presents the Material of Construction for the sampling port.

APPROVED BY DESIGNER: Russell Healey (NAME) | Conserva-Tech Engineering (COMPANY) | 1/18/93 (DATE)

OWNER NOTIFIED OF MODIFICATION: [X] YES [ ] NO

Brian Smith (NAME) | Textron Defense Systems (COMPANY) | 1/14/93 (DATE)

REMARKS: Installation of this sampling port will facilitate the use of an auto-sampler. Use of an auto-sampler is anticipated for monitoring of ground water discharge to the sewer.

ATTACHMENTS:
Table 1 and Figure 1.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

ANUARY 1993

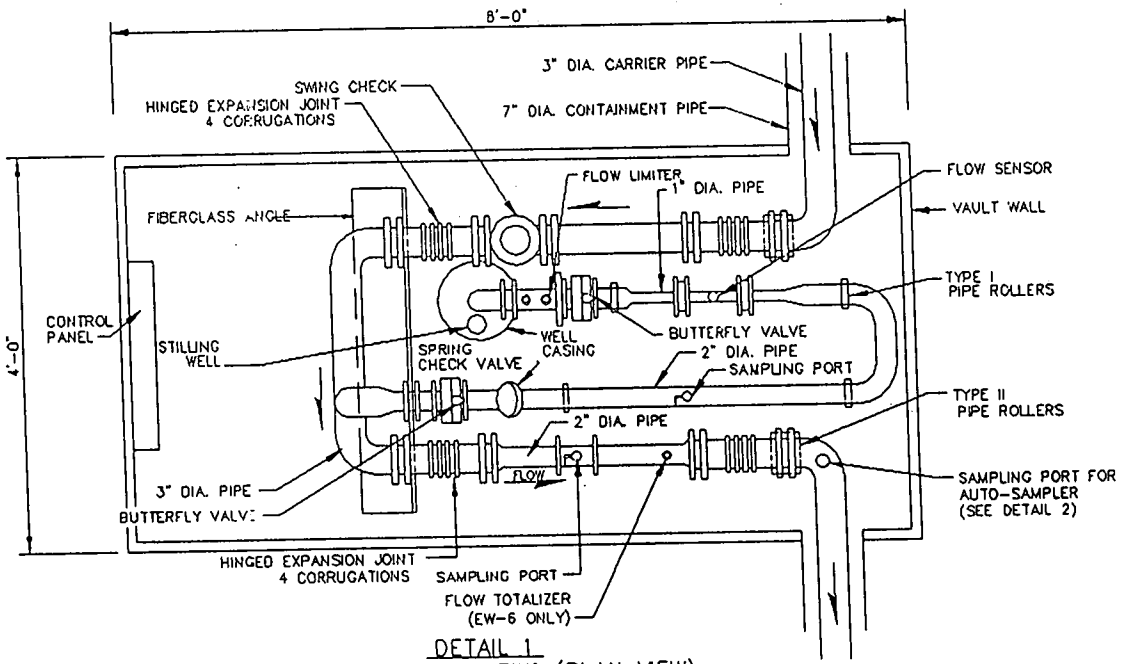
TABLE 1
MATERIAL OF CONSTRUCTION
(SPECIFICATION/DESIGN MODIFICATION NO. 13)

Item	Description	Quantity	Catalog Part No. and Page (1)
Male Connector with Compression Fitting	316 stainless steel 3/8-inch tube OD x 3/8-inch NPT	1	L-03301-10, p. 330
Tubing	Polyethylene, 3/8-inch OD, 1/4-inch ID	100 ft.	L-06407-06, p. 1117
Female Coupler	Delrin, 3/8-inch tube OD, panel mount with compression fitting and automatic shut off valve	1	L-06360-50, p. 348
Male Coupler	Delrin, straight through with 1/4-inch ID hose barb	1	L-06360-82, p. 348

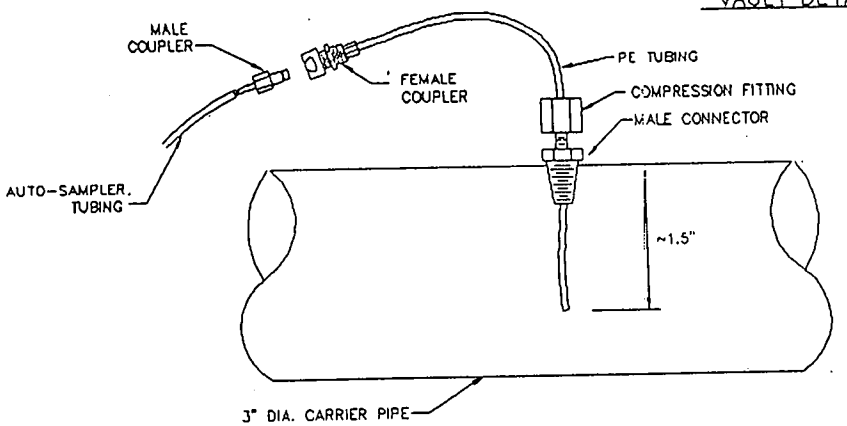
NOTE:

(1) From Cole-Parmer Catalog 1991/1992.

F/N: MOD13-T1.WK1



DETAIL 1
VAULT DETAIL EW6 (PLAN VIEW)
N.T.S.



DETAIL 2
SAMPLING PORT FOR AUTO-SAMPLER
N.T.S.

NOTES:
1. EXTEND PE TUBING FROM 3" DIA. CARRIER PIPE AND ATTACH TO MANUAL SAMPLING PORT AT TOP OF VAULT.
2. WRAP TEFLON TAPE AROUND THREADS OF MALE CONNECTOR PRIOR TO INSTALLING CONNECTOR INTO CARRIER PIPE.

SPECIFIATION/DESIGN MODIFICATION No. 13

Golder Associates Buffalo, New York

CLIENT/PROJECT
BELL AREOSPACE TEXTRON

TITLE
SAMPLING PORT FOR
AUTO-SAMPLER

DRAWN	EAH	DATE 1/16/93	JOB NO. 923-9055.018
CHECKED	R. HEALEY	SCALE AS SHOWN	DSG. NO./REV. NO. 22
APPROVED	ALG	FILE NO. 913-9014	PICTURE NO. 1

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 14

LOCATION / REFERENCE OF MODIFICATION: Approximately 200-foot section of trench from midpoint between Extraction Wells 1 and 2 to midpoint between Extraction Wells 2 and 3. Also, approximately 100-foot section of trench from the communication pad to Extraction Well 3. See Drawing A-2, Section A-A'; also, Soil Backfill Specifications.

MODIFICATION MADE: For the trench sections specified above, substitute soil backfill with 2-inch Run of Crusher (2-inch ROC) stone. Install 2-inch ROC above pipe bedding stone (#1A stone) to within one foot below ground surface. At locations along pipeline where the depth to the top of pipe from ground surface is less than 50 inches, place styrofoam over centerline of pipe, directly underneath the geotextile separating the pipe bedding stone (#1A) from the 2-inch ROC. Styrofoam shall be type HI-40, two inches thick, two feet wide. Native soil backfill shall be placed on top of 2-inch ROC to ground surface.

APPROVED BY DESIGNER: Anthony L. Grasso (NAME) Golder Associates Inc. (COMPANY) 1/11/93 (DATE)

OWNER NOTIFIED OF MODIFICATION: [X] YES [ ] NO

Brian Smith (NAME) Textron Defense Systems (COMPANY) 1/11/93 (DATE)

REMARKS: Modification made is due to wet field conditions and inability to compact soil backfill to required criteria. Styrofoam will provide as a barrier to frost penetration through the 2-inch ROC stone. See Specification/Design Modification No. 12 for compaction specifications of 2-inch ROC stone and soil backfill above 2-inch ROC.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 15

LOCATION / REFERENCE OF MODIFICATION: Proposed monitoring well 93-02(1) and existing monitoring well 89-17(1). See Drawing A-2, Detail 1, and Appendix A of the Specifications. Note: Monitoring well 89-17(1) is located 3,000 feet southeast of the Bell Aerospace Textron facility, behind the parking lot of Shipman Printing located on Niagara Falls Boulevard.

MODIFICATION MADE: (1) Install lockable 12-inch diameter steel protective casing at proposed monitoring well 93-02(1) instead of lockable 4-inch diameter steel protective casing. The installation procedures specified apply, except provide 6-inch clearance from top of monitoring well riser to top of protective casing.

(2) Install lockable 12-inch diameter PVC protective casing over existing monitoring well 89-17(1); refer to Figure 1 for construction details. The materials of construction and the installation procedures for the PVC protective casing are presented in Table 1.

APPROVED BY DESIGNER:	Anthony L. Grasso	Golder Associates Inc.	1/20/93
	NAME	COMPANY	DATE

OWNER NOTIFIED OF MODIFICATION: [X] YES [ ] NO

	Brian Smith	Textron Defense Systems	1/20/93
	NAME	COMPANY	DATE

REMARKS: Modifications made to provide access for data loggers.

ATTACHMENTS:
Figure 1, Table 1.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

TABLE 1

MATERIALS OF CONSTRUCTION AND INSTALLATION PROCEDURES
PVC PROTECTIVE CASING AT MONITORING WELL 89-17(1)
SPECIFICATION/DESIGN MODIFICATION NO. 15

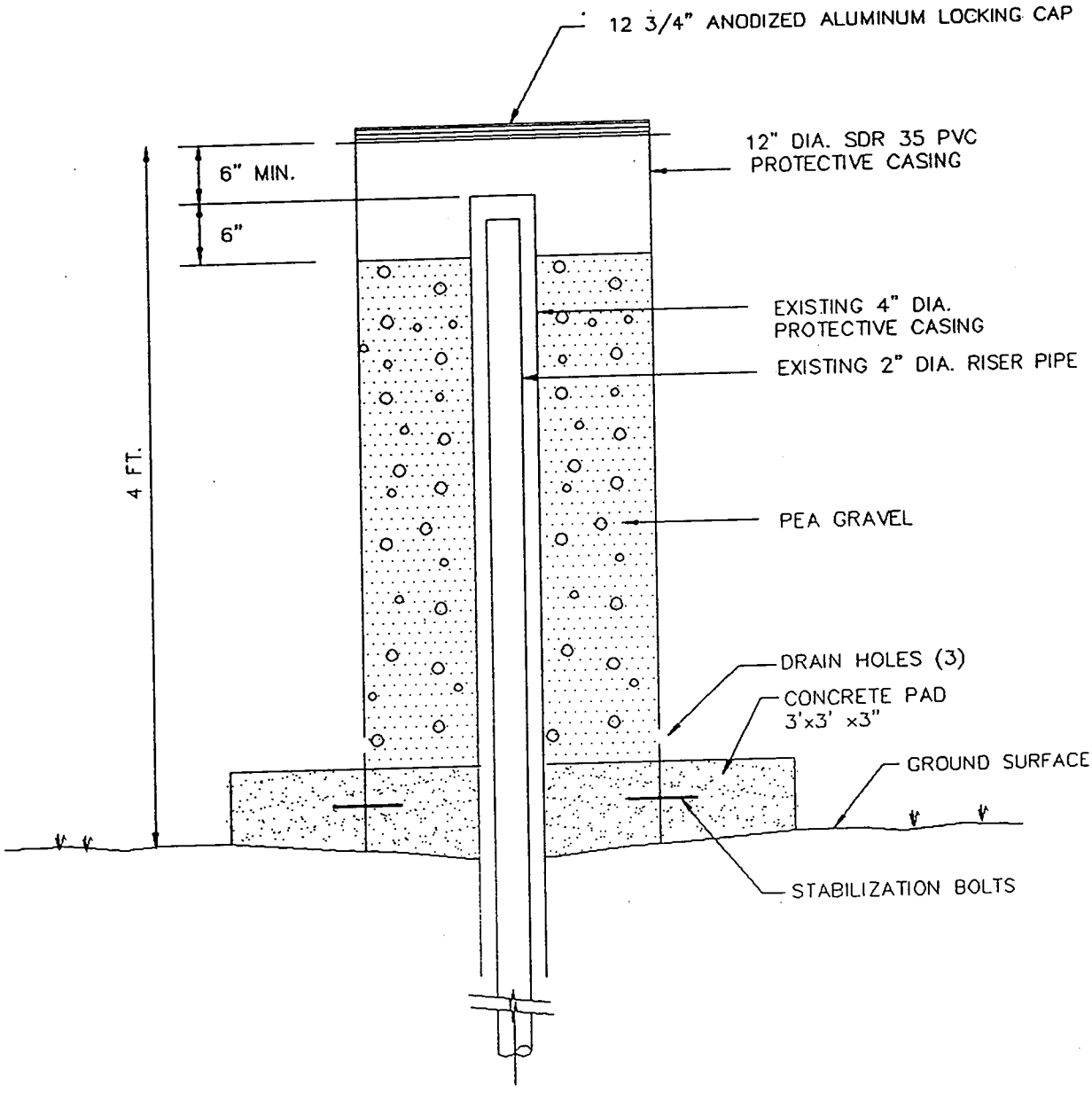
MATERIALS:

Quantity	Description
1	~4'-section, 12" diameter SDR35 PVC, or equivalent
3	½" x 4" Stainless Steel Bolts with Nuts
1	Anodized Aluminum Locking Cap, 12¾" diameter (nominal) as manufactured by Royer Quality Castings, Inc., or equivalent
----	Concrete
----	Pea Gravel
12'	2" x 4" Stud
1	Yellow Paint
1	Pad Lock (provided by Bell Aerospace Textron)

INSTALLATION PROCEDURES (See Figure 1):

- Drill three (3) ½" holes 1½" from bottom of 12" PVC casing. Install and secure stabilization bolts in casing with nuts;
- Drill three (3) ¼" drain holes approximately 4" from bottom of PVC casing;
- Paint PVC casing yellow;
- Secure anodized aluminum locking cap to top of PVC casing;
- Form 2" x 4" stud and pour 3' x 3' x 3" concrete pad around existing well;
- Place PVC casing over existing well setting stabilization bolts in concrete and ensuring drain holes are not covered;
- Place pea gravel inside PVC casing around existing casing to 6" below existing 4" diameter casing; and
- Install lock.

F/N: MOD15-T1



SPECIFICATION/DESIGN MODIFICATION No.15

Golder Associates Buffalo, New York

CLIENT/PROJECT

BELL AREOSPACE TEXTRON

TITLE

TYPICAL 12" DIA. PROTECTIVE CASING CONSTRUCTION

DRAWN EAH	DATE 1/21/93	JOB NO. 923-9055.018
CHECKED	SCALE NOT TO SCALE	DWG NO./REV. NO. 23
REVIEWED	FILE NO. 913-9014	FIGURE NO. 1

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 16

LOCATION / REFERENCE OF MODIFICATION: Extraction Wells 1 through 6, Drawing A-3, Details 1 and 4.

MODIFICATION MADE:
(1) Install three (3) stainless steel bolts in steel plate in accordance with configuration shown on Figure 1;
(2) Install one (1) stainless steel bolt in steel plate in accordance with configuration shown on Figure 1;
(3) Attach stainless steel cable to eye bolt in stainless steel plate and to submersible pump, in accordance with configuration shown on Figure 1;
(4) Materials of Construction and a Schedule of Lengths for the pump riser pipe, stilling well riser pipe, and stainless steel cable for each extraction well is presented in Tables 1 and 2, respectively.

NOTE: Figure 1 also presents recommended installation locations and dimensions in the stainless steel plate for the pump riser pipe, the stilling well, and drain holes.

	NAME	COMPANY	DATE
APPROVED BY DESIGNER:	Russell J. Healey	Conserva-Tech Engineering	1/26/93
APPROVED BY DESIGNER:	Anthony L. Grasso	Golder Associates Inc.	1/26/93

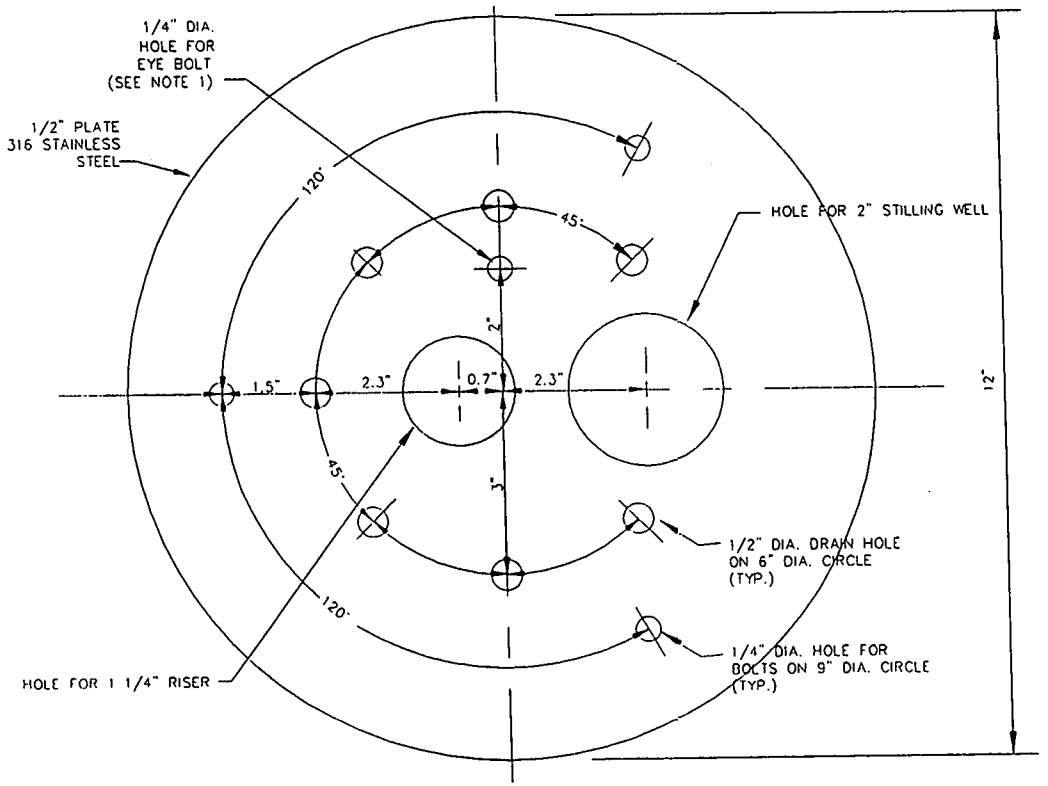
OWNER NOTIFIED OF MODIFICATION: [X] YES [ ] NO

	NAME	COMPANY	DATE
	Brian Smith	Textron Defense Systems	1/21/93

REMARKS: (1) Three (3) straight bolts at steel plate designed to restrict lateral movement at the well head; and
(2) Stainless steel cable to serve as a safety pump retrieval cable.

ATTACHMENTS:
Figure 1, Table 1, and Table 2.

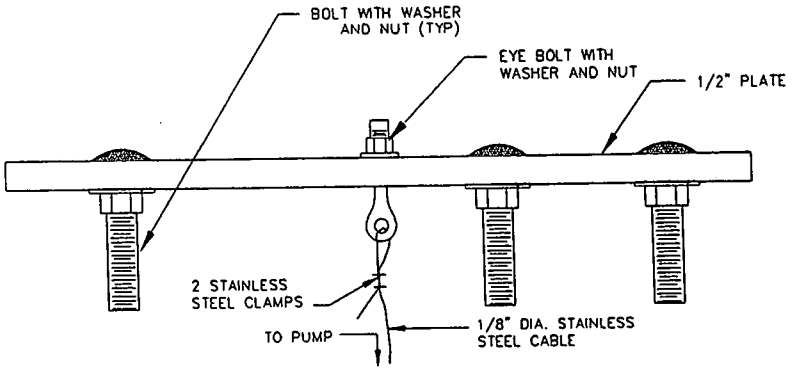
DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel



PLAN VIEW – STAINLESS STEEL WELL PLATE

2 0 2

scale inches



PROFILE VIEW – STAINLESS STEEL WELL PLATE

N.T.S.

NOTES:

1) ATTACH 1/8" DIA. STAINLESS STEEL CABLE TO EYE BOLT AT THE STEEL PLATE AND TO THE PUMP HOOK AT THE PUMP USING TWO (2) CABLE CLAMPS AT EACH CONNECTION.
2) LOCATION AND DIA. OF TRANSDUCER AND PUMP POWER CABLE HOLES TO BE INSTALLED IN ACCORDANCE WITH SPECIFICATION CLARIFICATION FORM No. 1 (I.E. TRANSDUCER AND POWER CABLE SHALL BE INSTALLED TO MAINTAIN A FOUR TO SIX INCH SEPARATION IN THE WELL BORE).
3) SPOT WELD NUTS TO BOLTS.

DESIGN MODIFICATION No. 16

Golder Associates Buffalo, New York

TITLE: STAINLESS STEEL PLATE DETAIL

CLIENT/PROJECT: BELL AREOSPACE TEXTRON

DRAWN EAH	DATE 1/22/93	JOB NO 923-9055.018
CHECKED DCW	SCALE AS SHOWN	DWG. NO./REV. NO. 24
REVIEWED ALG	FILE NO. 913-9014	FIGURE NO. 1

TABLE 1
MATERIALS OF CONSTRUCTION
SPECIFICATION/DESIGN MODIFICATION NO. 16

ITEM	QUANTITY	
1/4" Diameter Stainless Steel Bolt	18	
1/4" Diameter Stainless Steel Washer	24	
1/4" Diameter Stainless Steel Nut	24	
1/4" Diameter Stainless Steel Eye Bolt	6	
1/8" Diameter Stainless Steel Cable	~200	Ft. (1)
Stainless Steel Cable Clamps	24	

(1) See Table 2.

F/N: MOD16-T1.WK1

TABLE 2
SCHEDULE OF PIPE AND CABLE LENGTHS
SPECIFICATION/DESIGN MODIFICATION NO. 16

Well No.	Total Length of 1¼" Diameter Riser Pipe (FT BTOC) (1)	Total Length of 2" Diameter Stilling Well Pipe (FT BTOC) (1)	Total Length of Stainless Steel Cable (2) (feet)
EX-1	25.8	25.3	28.5
EX-2	26.6	26.1	28.7
EX-3	31.0	30.5	33.2
EX-4	30.4	29.9	33.4
EX-5	30.6	30.1	33.0
EX-6	35.3	34.8	37.9

NOTES:

(1) FT BTOC = Feet below top of casing.
(2) Slack in cable should be removed by securing cable to pump riser pipe at well head using plastic ties.

F/N: MOD16-T2.WK1

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 17

LOCATION / REFERENCE OF MODIFICATION: Drawing A-5, Details 1 and 6 (Ladder in vaults) and Drawing A-3, Detail 2 and Drawing A-4, Detail 4 and 5 (Control Panel in vaults).

MODIFICATION MADE:
(1) Install ladder on north vault wall instead of south vault wall. Maintain a distance of approximately 36" from the west vault wall to the ladder.
(2) Install control panel on north vault wall in northwest corner instead of on west vault wall.

APPROVED BY DESIGNER: Russell J. Healey (NAME) Conserva-Tech Engineering (COMPANY) 1/28/93 (DATE)

OWNER NOTIFIED OF MODIFICATION:
[ ] YES
[X] NO

NAME COMPANY DATE

REMARKS: (1) Relocated ladder to provide better access into vault; and
(2) Relocated control panel to minimize potential interference with piping in vault when door to control panel is opened/closed.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 18

LOCATION / REFERENCE OF MODIFICATION:
(1) Vent pipe on vault top; Sheet A-3, Detail B-B'; Sheet A-5, Detail 6;
(2) Pipe bracket at sewer inlet; Sheet A-4, Detail 1; and
(3) Null pipe/ground temperature; Specifications.

MODIFICATION MADE:
(1) Eliminate vent pipe at vault from design;
(2) Eliminate pipe bracket at sewer inlet from design; and
(3) Change null pipe/ground temperature from 63.5 degrees F to 50 degrees F.

APPROVED BY DESIGNER:	Russell J. Healey	Conserva-Tech Engineering	2/9/93
	NAME	COMPANY	DATE

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

	Brian Smith	Textron Defense Systems	2/17/93
	NAME	COMPANY	DATE

REMARKS: (1) Vent pipe eliminated because pipe was viewed as target for potential vandalism. Concentration of vapors in vaults is not anticipated to be significant. Air monitoring and venting of vaults is required before entry;
(2) Pipe bracket eliminated to allow for contraction/expansion of carrier pipe at sewer inlet; and
(3) Modification of null temperature made to more accurately reflect the anticipated average temperature of the extracted ground water during operation of the system.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 19

LOCATION / REFERENCE OF MODIFICATION: Approximately 160-foot section of trench between vault EW-6 and the sewer inlet. See Drawing A-2, Detail 1; Also, Soil Backfill Specifications.

MODIFICATION MADE: For the trench section specified above, substitute soil backfill with 2-inch Run of Crusher (2-inch ROC) stone. Install 2-inch ROC above pipe bedding stone (#1A stone) to within one foot below ground surface. At locations along pipeline where the depth to the top of pipe from ground surface is less than 50 inches, place styrofoam over centerline of pipe, directly underneath the geotextile separating the pipe bedding stone (#1A) from the 2-inch ROC. Styrofoam shall be type HI-40, two inches thick, two feet wide. Native soil backfill shall be placed on top of 2-inch ROC to ground surface.

APPROVED BY DESIGNER:	Anthony L. Grasso	Golder Associates Inc.	2/2/93
	NAME	COMPANY	DATE

OWNER NOTIFIED OF MODIFICATION: [X] YES [ ] NO

	Brian Smith	Textron Defense Systems	2/2/93
	NAME	COMPANY	DATE

REMARKS: Modification made is due to wet field conditions and inability to compact soil backfill to required compaction criteria. Styrofoam will provide as a barrier to frost penetration through the 2-inch ROC stone.

ATTACHMENTS:
See Specification/Design Modification No. 12 for Compaction Specifications of 2-inch ROC stone and soil backfill above 2-inch ROC.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 20

LOCATION / REFERENCE OF MODIFICATION: Fiberglass grating, Drawing A-3, Section B-B'.

MODIFICATION MADE: Omit grating and supports.

APPROVED BY DESIGNER: Russell J. Healey (NAME) | Conserva-Tech Engineering (COMPANY) | 3/3/93 (DATE)

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

Brian Smith (NAME) | Textron Defense Systems (COMPANY) | 3/3/93 (DATE)

REMARKS: Access to vault interior is improved by deleting the grate.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 21

LOCATION / REFERENCE OF MODIFICATION: Double wall piping annular space entering vault.

MODIFICATION MADE: 1) Install a minimum 1-inch wide layer of silica gel desiccant in porous sock sandwiched in between two 2-inch wide layers of fiberglass insulation. Each layer shall totally fill the annular space for the listed thickness.
2) Leak detection cable shall be installed with a 12-inch jumper at the entrance to each vault (two per vault). The piping insulation in the vault shall terminate (with proper vapor barrier sealed to the pipe) 6 inches from the vault wall to permit access to change desiccant. Leak detection cable in vault shall be covered by insulation.

APPROVED BY DESIGNER:	Russell Healey	Conserva-Tech Engineering	5/17/93
	NAME	COMPANY	DATE

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

	Brian Smith	Textron Defense Systems	5/17/93
	NAME	COMPANY	DATE

REMARKS: Installation of fiberglass insulation and desiccant materials at piping annular space entering vault based on manufacturer's recommendation.

ATTACHMENTS:
None.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
OWNER: Textron Defense Systems
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

PROJECT TITLE TDS/CQA Off-Site/NY
CONTRACTOR: Clean Harbors

FORM NUMBER 22

LOCATION / REFERENCE OF MODIFICATION: Extraction Wells No. 1 and No. 2 (EW-1 and EW-2).

MODIFICATION MADE: Replace existing submersible pumps (capacity 5 gallons per minute (gpm) to 14 gpm) with larger capacity pumps (capacity 18 gpm to 32 gpm). Place 1½-inch to 1¼-inch NPT, stainless steel reducer on pump discharge port to connect to existing 1¼-inch diameter pump riser pipe. Replace existing flow limiter valves (rated at 14 gpm) with flow limiter valves rated at 32 gpm. See attached Schedule of Materials.

APPROVED BY DESIGNER:	Russell Healey	Conserva-Tech Engineering	03/25/93
	NAME	COMPANY	DATE

OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

	Brian Smith	Textron Defense Systems	03/25/93
	NAME	COMPANY	DATE

REMARKS: Modification made based on lack of hydraulic response to pumping of existing pumps at EW-1 and EW-2 during system start-up.

ATTACHMENTS:
Schedule of Materials

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION/DESIGN MODIFICATION NUMBER 22

SCHEDULE OF MATERIALS

ITEM	QUANTITY
Grundfos, Redi-Flow, Environmental Submersible Pump, Model Number 25E3, powered by ½ horsepower, Grundfos Environmental Submersible Motor. Service shall be 230V, single phase, 3 wire and ground. Pump shall be of stainless steel and Teflon® construction.	2
1½ inch to 1¼ inch NTP, stainless steel reducer (place on pump discharge port prior to connection of pump sleeve and 1¼ inch diameter pump riser pipe).	2
Cartridge for flow limiting valve: Stainless steel, Model Number 3541LA, as manufactured by Griswold, pressure psid 1.3 to 20, flow rate at 32 gpm.	2

F/N: MOD-22.SCH

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
PROJECT TITLE: TDS/CQA Off-Site/NY
OWNER: Textron Defense Systems
CONTRACTOR: Clean Harbors
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

FORM NUMBER: 23

LOCATION / REFERENCE OF MODIFICATION: Extraction Well No. 1 (EW-1)

MODIFICATION MADE: Remove pump, riser pipe, stilling well, and transducer in EW-1 and plug well.

APPROVED BY DESIGNER:

Anthony Grasso	Golder Associates Inc.	03/29/93
NAME	COMPANY	DATE

OWNER NOTIFIED OF MODIFICATION:

[X] YES
[ ] NO

Brian Smith	Textron Defense Systems	03/29/93
NAME	COMPANY	DATE

REMARKS: During system start-up, high water levels from Zone 1 caused flooding in vault 1. Ground water was pumped from EW-1, using the existing submersible pump at a rate of 12 gallons per minute (gpm). In addition, a trash pump was paced in vault 1 and pumpted at a rate of 28 gpm. Thus, a total of 40 gpm were being pumped from vault 1 and the vault was still flooded. Due to the unusually high permeability (hydraulic conductivity) of the Zone 1 bedrock at EW-1, recommendation is to plug the well. A pump of much larger pumping capacity (greater than 40 gpm) would need to be installed at EW-1 to produce a drawdown at the well, but is deemed as not necessary at this time. The designer recommends observing the hydraulic performance due to pumping of the Off-Site System using only EW-2 through EW-6, before a decision is made to re-install a pump at EW-1.

ATTACHMENTS:
None

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Gordon Fielding - Clean Harbors
Robert McNamara - Wendel

SPECIFICATION / DESIGN MODIFICATION FORM

PROJECT NUMBER: 923-9055
PROJECT TITLE TDS/CQA Off-Site/NY
OWNER: Textron Defense Systems
CONTRACTOR:
LOCATION: Bell Aerospace Textron
Wheatfield, New York Facility

FORM NUMBER 24

LOCATION / REFERENCE OF MODIFICATION: Off-Site extraction well nos. 1 through 6 (EW-1 through EW-6).

MODIFICATION MADE:

1) Remove existing leak detection cable in containment pipe annulus between vaults EW-1 through EW-6.
2) Install "catch basins" under containment piping in vaults EW-2 through EW-6 in accordance with Figures 1 and 2 and specifications in Table 1.
3) Install jumper cable wiring within electrical conduit between vaults EW-2 through EW-6. A pull wire is existing in the electrical conduit which can be used to facilitate installation.
4) Install float sensor within each catch basin installed in vaults EW-2 through EW-6 (except not in catch basin on north end of vault EW-2) in accordance with specifications in Table 1.
5) Connect float sensor to wiring between vaults (see Figure 1).
6) Connect wiring to existing leak detection positions on control panel located between vaults EW-3 and EW-4.
7) Set each float to activate contact closure at 3½ inches from base of catch basin. Program leak detection system so that when float contact is activated the power to the pumps in each vault is terminated, the location at leak detection control panel is indicated, and the leak detection alarm is processed.

APPROVED BY DESIGNER:	Russell Healey	Conserva-Tech Engineering	09/28/93
	NAME	COMPANY	DATE

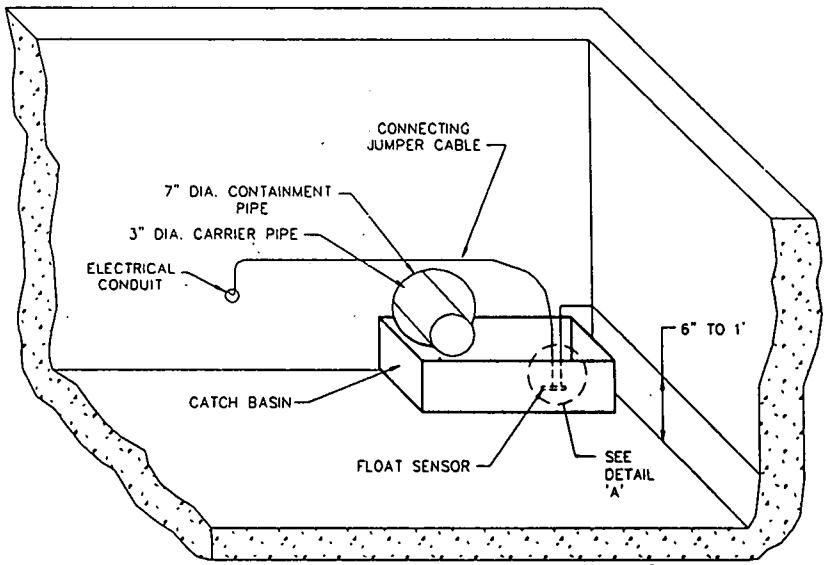
OWNER NOTIFIED OF MODIFICATION:
[X] YES
[ ] NO

	Brian Smith	Textron Defense Systems	09/28/93
	NAME	COMPANY	DATE

REMARKS: Float switch connections must be compatible with existing Ray Chem control panel. Table 2 provides a tabulation of measurements within vaults EW-2 through EW-6 for the Contractor's use. This Specification/Design Modification voids the requirement for the installation of the fiberglass insulation and silicon gel dessicant "sandwich" in the containment piping annular space entering vault as stated in Specification/Design Modification No. 21.

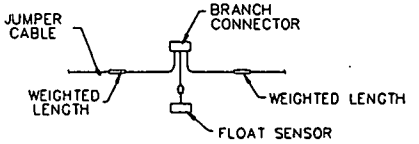
ATTACHMENTS:
Figures 1 and 2; Tables 1 and 2.

DISTRIBUTION:
Brian Smith - Textron Defense Systems
John Devic - Bell Aerospace Textron
Russell Healey - Conserva-Tech Engineering
Robert McNamara - Wendel



TYPICAL CATCH BASIN AND FLOAT SENSOR (INSIDE VAULT)

NOT TO SCALE



DETAIL 'A'

NOT TO SCALE

SPECIFIATION/DESIGN MODIFICATION No. 24

Golder Associates Buffalo, New York

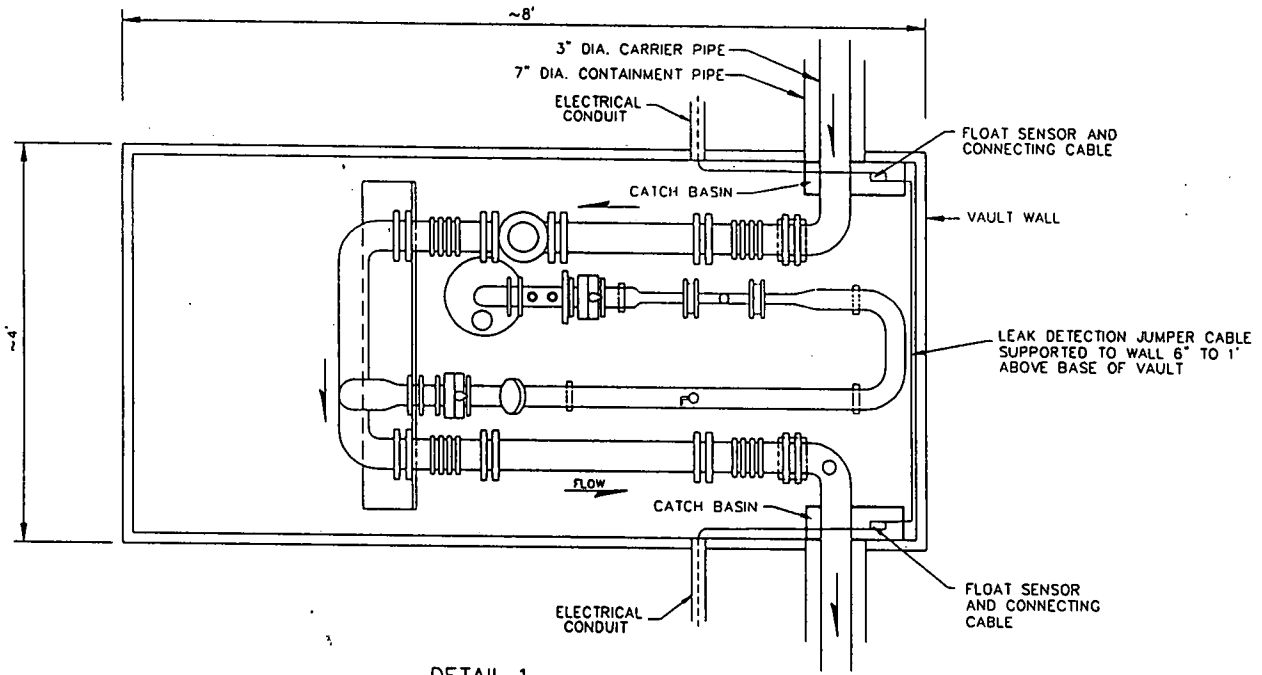
CLIENT/PROJECT

BELL AEROSPACE TEXTRON

TITLE

CATCH BASIN AND FLOAT SENSOR LEAK DETECTION SYSTEM DETAIL

DRAWN	BEC	DATE	9/27/93	JOB NO.	923-9055.018
CHECKED		SCALE	AS SHOWN	DWG. NO./REV. NO.	BELL38
REVIEWED	ALG	FILE NO.	913-9014	FIGURE NO.	2



DETAIL 1
(TYP.) VAULT DETAIL (PLAN VIEW)
N.T.S.

SPECIFIATION/DESIGN MODIFICATION No. 24

Golder Associates Buffalo, New York

CLIENT/PROJECT
BELL AEROSPACE TEXTRON

TITLE
CATCH BASIN AND FLOAT SENSOR LEAK DETECTION SYSTEM

DRAWN BEC	DATE 9/27/93	JOB NO. 923-9055.01B	
CHECKED R. HEALEY	SCALE AS SHOWN	DWG. NO./REV. NO. BELL37	
REVIEWED ALG	FILE NO. 913-9014	FIGURE NO. 1	

TABLE 1
MATERIALS OF CONSTRUCTION AND INSTALLATION PROCEDURES
FLOAT SWITCH LEAK DETECTION SYSTEM
VAULTS EW-1 THROUGH EW-6
SPECIFICATION/DESIGN MODIFICATION NUMBER 24

MATERIALS:

QUANTITY	DESCRIPTION
10	LDPE Catch Basin (Rubbermaid® No. 2213) 3 gallon capacity, 16 inches x 10.75 inches x 7 inches.
18	Weighted length metal connectors (15-foot resistance)(Ray Chem-TraceTek 3000, Model No. TT-WL-15-MC or equivalent).
9	Sensor with Form "C" type contact, capable of detecting 1 inch to 5 inches of standing water in catch basin.
9	Branching connectors (Ray Chem-TraceTek 3000, Model No. TT-MBC-MC or equivalent).
20	Concrete anchors with stainless steel bolts and washers.
~1300 feet	Cold lead jumper cable (Ray Chem-TraceTek 3000, Model No. TT-MJC-x-MC or equivalent).

INSTALLATION PROCEDURES (SEE FIGURES 1 AND 2)

- Smooth concrete surface of vault walls to allow flush mounting of catch basins to wall of vaults;
- Cut side of catch basin to allow for fit under containment pipe (see Figure 2). Catch basin must sit directly under containment pipe. Apply silicon seal between catch basin and containment pipe;
- Align and drill holes and anchor catch basins to side of vault with cement anchors and stainless steel bolts and washers. Bolts shall be installed a minimum of 4 inches above base of catch basin and space 6 to 8 inches apart;
- Install float monitoring system as listed above with 15-foot resistance lead weighted length metal connectors before and after contact;
- Install four ¼-inch diameter holes into existing casing stickup in vaults EW-2 through EW-6 (not vault EW-1). Install these four holes 90-degrees apart from each other at the base of the vault to facilitate drainage into the casing from water in the vault. Care must be taken so that drill cuttings are not dropped into well casing during installation; and
- After system is installed, Contractor must test system to ensure it is working properly and provide operation and maintenance information on the system. Contractor must arrange testing of system with Bell Aerospace Textron personnel.

NOTE: CONTRACTOR MUST SUBMIT SHOP DRAWING FOR APPROVAL PRIOR TO INSTALLATION.

TABLE 2
VAULT LEAK DETECTION SYSTEM MEASUREMENTS
SPECIFICATION/DESIGN MODIFICATION NUMBER 24

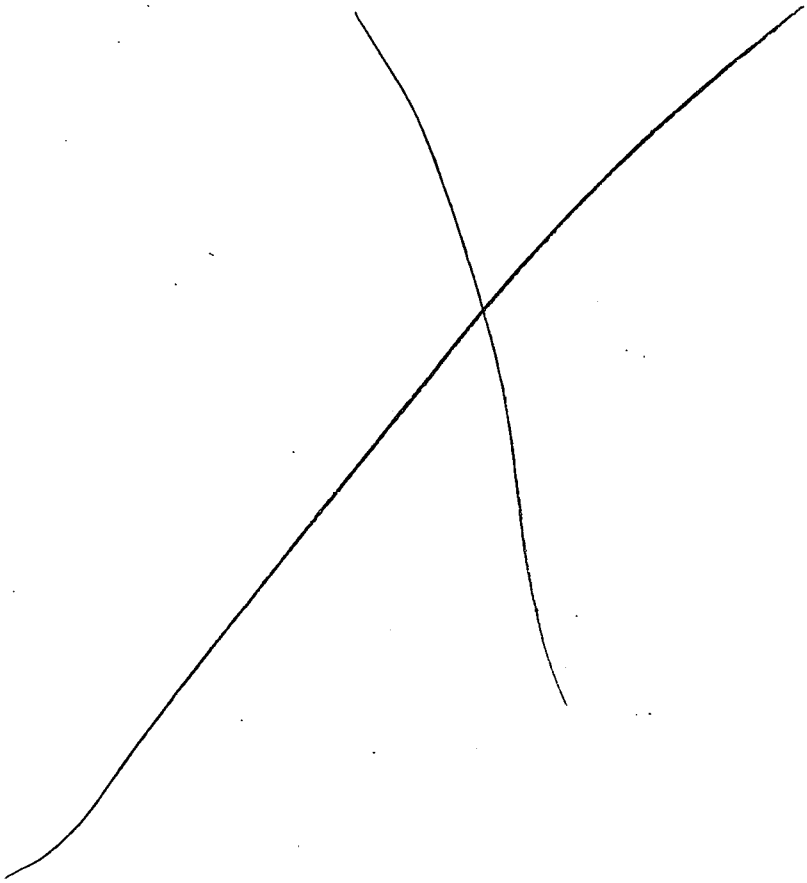
LOCATION IN VAULT	APPROXIMATE DISTANCE FROM VAULT FLOOR TO CONTAINMENT PIPE (INCHES)
EW-2 North	7
EW-2 South	6 3/8
EW-3 North	5 1/2
EW-3 South	5 7/8
EW-4 North	5 1/8
EW-4 South	5 3/4
EW-5 North	5 5/8
EW-5 South	5 1/2
EW-6 North	5 1/4
EW-6 South	5 1/2

NOTES:

(1) Ridges on cement wall adjacent to annular space opening must be smoothed to allow for catch basin adhesion.
(2) Floor/wall corner not 90-degrees due to rough floor surface.
(3) Containment pipe extends into vaults from wall face a variable distance of between 0 inch to 1/2 inch.

F/N: MOD24-T2.WK1

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