

OPERATION AND MAINTENANCE PLAN
BARRETT LANDFILL
21001 Coffee Road
New Berlin, Wisconsin

July, 2017

Prepared by Wisconsin DNR

Table of Contents

INTRODUCTION.....	1
1.1 OBJECTIVE AND SCOPE	1
1.2 SITE LOCATION & BACKGROUND INFORMATION	1
1.3 SUMMARY OF DEPARTMENT ACTIONS.....	2
1.4 ELEMENTS OF THE O&M PLAN	3
1.5 ROLES AND RESPONSIBILITIES	3
1.6 HEALTH AND SAFETY	3
OPERATION AND MAINTENANCE ACTIVITIES	4
2.1 LANDFILL FINAL COVER.....	4
2.2 SECURITY FENCE & ACCESS ROADS.....	6
2.3 STORMWATER MANAGEMENT SYSTEM.....	6
2.4 LANDFILL GAS VENTING SYSTEM	7
2.5 GROUNDWATER MONITORING AND WELL INSPECTION & REPAIR.....	9
2.6 LEACHATE MANAGEMENT SYSTEM.....	11
DOCUMENTATION AND SUBMITTALS.....	13
3.1. ANNUAL INSPECTION REPORT	13
3.2. GROUNDWATER MONITORING AND GAS PROBE REPORT.....	13
3.3. DRAWINGS.....	14
3.4. STORAGE AND DISPOSTION OF RECORDS.....	14
Figure 1.1 Site Location Map with Nearby Addresses.....	14
Figure 1.2 Site Topo Map.....	14
Figure 1.3 Site Monitoring Points Map (2005).....	14
Figure 1.4 Site Monitoring Points, Features, Waste Extent Detailed Map (2011).....	14
Figure 1.5 Site Monitoring Points	14
Figure 1.6 Site Private Wells Map and Monitoring Table (2005).....	14
GEMS ID Information.....	14
Gas Probe Monitoring Report.....	15

SECTION 1 **INTRODUCTION**

1.1 OBJECTIVE AND SCOPE

The objective of this Operation and Maintenance (O&M) Plan is to describe the inspection, operation and maintenance activities required to maintain the effectiveness of the landfill cover and associated management and monitoring systems for the duration of the contract.

This plan will be followed by the O&M Contractor (also referred to as the Contractor) selected by the Wisconsin Department of Natural Resources (WDNR) to perform the O&M work and is considered part of the Scope of Work for the O&M work. The O&M Plan is intended to be used in conjunction with a Sampling and Analysis Plan (SAP) and a Health and Safety Plan (HASP), prepared by the Contractor after the Contractor receives a notice to proceed from the WDNR.

The Contractor shall be responsible for recommending any needed repairs and materials for repairs. Methods and material types for use in conducting any maintenance and restoration activities will be approved by the WDNR in advance. The Contractor will not be responsible for carrying out any recommended repairs, except as specifically identified in this O&M Plan as being the responsibility of the Contractor as part of the O&M contract.

Simple repairs and routine maintenance identified in this document are the responsibility of the Contractor. The WDNR will contract with a Repair Contractor separately for recommended repairs on a cost and materials basis, as identified in this O&M Plan wherever the Repair Contractor is shown to have the responsibility. However, all bidders are allotted a fixed \$5,000 per year contingency for repairs in the bid price sheet to be used for repairs as the designated Repair Contractor, if directed to proceed with any such repairs by WDNR. This contingency includes variable costs such as replacing belts and flexible hosing but does not include imminent and periodic costs such as replacing oil and air filters.

1.2 SITE LOCATION & BACKGROUND INFORMATION

The Barrett Landfill is located in the western portion of the City of New Berlin, in Waukesha County, Wisconsin. Figure 1-1, from the Waukesha County interactive GIS web site, shows the location of the landfill and addresses of nearby parcels. Figure 1-2, also from the GIS site, shows topography. The site can be accessed from two separate locations on Coffee Road and Swartz Road and has the following WDNR associated identification numbers:

21001 Coffee Road, New Berlin Wisconsin 53151
3601 S. Swartz Road, New Berlin, Wisconsin 53151
FID (Facility Identification Number): 268134130
BRRTS Number: 09-68-534609
Solid Waste License Number: 1940

Figures 3 through 6 show locations of monitoring points in 2005 (Fig. 3), the extent of the permitted waste disposal area, site features, topography and monitoring points (Fig 4), the hand drawn approximate locations of on-site gas probes and monitoring wells to help the Contractor locate them in the field (Fig. 5) and locations of adjacent private wells as inventoried in 2005 (Fig.6).

The following three paragraphs and the next section are based on an interview with the previous WDNR Project Manager and are considered accurate only to the extent of that person's recollection.

The 39 acre property was a gravel mining pit that was filled with waste once mining operations ceased. When operational, the landfill accepted a variety of wastes including industrial, construction and demolition, ash, foundry sand, asbestos, vehicle shredding fluff and tannery hides. Some waste was open burned.

A leachate collection system was installed in a portion of the filled area. The extent of this system was not documented nor was it constructed over an engineered liner, but likely over less permeable soils. Leachate from the system collects in a sump/lift station and is pumped to a collection tank near the main entrance on S. Swartz Road.

Several years ago, the buried force main that carries leachate from the lift station to the collection tank broke at the connection to the lift station. A temporary pipe at the surface is now used in warmer months only. The temporary pipe must be disconnected, drained and sealed each fall and reconnected each spring. The necessary parts, tools and equipment for connection are currently located in the WDNR cold storage building located at 2000 Pewaukee Road, Suite J, near the Waukesha County Airport.

1.3 SUMMARY OF DEPARTMENT ACTIONS

Existing buildings at the site were demolished and placed in the fill area. A landfill multilayer composite soil cover system was constructed starting in May 1999 and completed in November 2000. Some minor grading and seeding was done in 2001. The final cover system meets the requirements of the Wisconsin Administrative Code (WAC) NR 504.07 regulations on cover systems for solid waste disposal facilities.

The cover consists of a grading layer, a 2-foot clay barrier layer, a 40 mil HDPE membrane, a drainage layer, a 1.5-foot vegetative support and frost protection layer (in one phase this was reduced to 1 foot), and a 0.5-foot topsoil layer. A passive landfill gas vent system was installed to vent gas from beneath the cover.

Site access roads were constructed on the west, south and east perimeters of the site. There are some areas between the roads and the property boundary that were filled with waste but apparently aren't covered with the multilayer cover.

A chain link fence surrounds the entire site with a gate at each of the access locations. The fence is placed inside of the property line by 12 to 24 inches to allow some access without intruding on neighboring properties.

1.4 ELEMENTS OF THE O&M PLAN

This plan generally consists of the following elements:

- Description of main remedial components to include the final cover system, leachate collection system, storm water management system, and the passive landfill gas venting system
- Frequency of inspection and monitoring tasks
- Identification of potential problems and corrective actions to be implemented by the O&M Contractor
- Description of safety precautions and recommendations
- Description of record-keeping and documentation requirements

1.5 ROLES AND RESPONSIBILITIES

Successful implementation of this O&M Plan will depend on a clear understanding of the roles and responsibilities of each member of the O&M team. The team consists of members responsible for implementing, operating, and overseeing the completion of the remediation of the site. The Contractor will work with key team members from each organization listed below:

The WDNR Project Manager will coordinate contracting the O&M work following this O&M plan:

Name: Mr. Jason Lowery

Address: PO 7921, 101 S. Webster St. RR/5 Madison, WI 53707

Phone: (608) 267-7570

Email: Jason.lowery@wisconsin.gov

A Special On-Site Assistant to the WDNR Project Manager may be another WDNR staff person in the Southeast Region or a person hired by the WDNR to assist the Project Manager. Local coordination may be necessary due to the location of the Project Manager's office relative to the site.

1.6 HEALTH AND SAFETY

Inspection and maintenance activities shall be conducted in accordance with a site-specific Health and Safety Plan (HASP) to be prepared by the O&M Contractor. The HASP shall be prepared in accordance with all state and federal regulations, and shall conform with applicable USEPA and Occupational Health and Safety Administration (OSHA) construction safety standards including 29 Code of Federal Regulations (CFR) 1910.120. The HASP shall be submitted to the WDNR prior to starting any work at the site.

SECTION 2

OPERATION AND MAINTENANCE ACTIVITIES

Many of the inspection, operation and maintenance activities at the site will be performed directly by the Contractor. Other activities will only require coordination and oversight by the Contractor, as directed by the WDNR. The Bid Price Sheet specifies which activities will be the direct responsibility of the Contractor and which will only require coordination by the Contractor. The DNR will contract directly and separately from this contract for all work coordinated by the Contractor. Coordination will include obtaining bids, training (if necessary), oversight of work performed and reporting results to the DNR Project Manager.

2.1 LANDFILL FINAL COVER

The objective of this activity is to maintain the integrity of the cover system to ensure the performance objectives defined in WAC NR 504 are being met.

The final cover is intended to reduce the volume of liquid entering the landfill from precipitation that falls within the landfill limits. During the inspection process, the contractor shall document the quality of the cover system and areas where the performance objectives are not being maintained.

If erosion or vegetation repair is an ongoing problem, then sufficient topsoil, seed and mulch shall be stockpiled at the site for repairs. Specifications for materials used for repair shall be proposed by the contractor prior to use. Material types for use in conducting any maintenance and restoration activities will be approved by WDNR in advance. Once material types are approved for a specific repair purpose, the same materials need not be approved again if they are to be used for the same purpose.

2.1.1 Landfill Final Cover Inspection and Repair

The landfill cover shall be inspected once a year, in September or October. The inspection will coincide with the groundwater sampling in 2017. During the inspection process evaluate the quality of the vegetative cover across the landfill surface. A satisfactory area of vegetation shall be defined as an area of 10,000 square feet that has:

- No bare spots larger than 3 square feet.
- Not more than 10 percent of area with bare spots larger than 1 square foot.

Areas that show signs of erosion, animal burrows or sparse vegetation will be repaired by the contractor. The surface will be graded and/or filled to match the surrounding grade with topsoil material. The area will then be reseeded, mulched and sufficiently watered to restore vegetation to an acceptable level.

The cover system will be inspected for areas of significant erosion. Significant erosion is defined as an erosion gully 6 inches deep or loss of vegetation and multiple gullies 3 inches deep. If significant erosion is discovered the area will be backfilled with protective cover soil and topsoil, seeded, mulched and sufficiently watered to re-establish vegetation.

The final cover will be inspected for signs of settlement or subsidence. Areas showing signs of potential ponding or continued settlement will be backfilled with protective cover soil and topsoil, seeded, mulched and sufficiently watered to re-establish vegetation.

The areas around features such as gas vents or monitoring wells will be inspected for large rooty vegetation. Such vegetation will be removed and the area restored. The surface will be graded and/or filled to match the surrounding grade with topsoil material. The area will then be reseeded, mulched and sufficiently watered to restore vegetation to an acceptable level.

Damaged areas of the final cover will be documented to include method and scope of the repairs conducted. The locations and suppliers of materials will be included in the documentation.

2.1.2 Mowing

The vegetated areas of the final composite cover will be mowed at least once per year in the months of August or September. Areas outside the cover and access roads will not be mowed. The estimated total surface area to be mowed is 30 acres.

Mowing activities shall be conducted to maintain a vegetation height of 6 inches and no less. In drier years, mowing may be conducted to maintain a vegetation height of 12 inches and no less, as specified by WDNR.

Mowing of the final cover will also inhibit the growth of deep-rooted vegetation that could impact the efficiency and integrity of the clay barrier layer. Any tall vegetation next to monitoring wells and gas vents will be cut down at the time of mowing or during the annual inspection without causing damage to any of these features.

It should be noted that some areas have fairly steep side slopes that may affect how mowing and other maintenance and removal activities are performed. Established trees and deeper rooting plants on the cover, and especially on the side slopes, are expected to be removed before this contract is implemented. A machine suited to this purpose will be required, as cutting by hand may be too difficult. A skid steer or larger tractor with a Fecon head could be used. Once this task has been accomplished, it is expected that regular mowing of the entire cover will control the deeper rooting plants and trees.

2.1.3 Large Tree and Brush Removal along Perimeter Fence

In August of every other year, starting in 2017, an inspection of the large trees along the fence line shall be performed by the WDNR Project Manager and/or Special On-Site Assistant Manager or designee. Trees whose condition and/or potential to cause damage to the fence, adjacent property and/or block the access roads will be considered for removal or maintenance. The WDNR Project Manager, Special On-Site Assistant Manager or designee will make the final determination on which trees will be removed.

Brush from both sides of the fence will be removed during mowing or large tree removal. The WDNR Project Manager and/or Special On-Site Assistant Manager or designee will distribute a notice to the adjacent properties prior to brush and large tree removal with the following wording or alternate wording approved in advance by the WDNR Project Manager:

Dear Neighbors of the Barrett Landfill,

During the week of _____, a contractor hired by the Wisconsin Department of Natural Resources (WDNR) will be performing landscape maintenance on the landfill and its perimeter. This will include trimming and removing brush and trees along the fence and landfill property line which have been identified as potential issues for the long term maintenance and integrity of the landfill. We ask that you not store any items within 2 feet of the fence and keep the area clear of brush and trees. Thank you in advance for your cooperation.

Should you have any questions or concerns, please contact Jason Lowery, WDNR Project Manager at (608) 267-7570, or Contractor Name of Company Name at (###) ###-####.

2.2 SECURITY FENCE & ACCESS ROADS

Chain-link fencing around the perimeter of the property and waste disposal area reduces the potential for public contact with covered waste materials and leachate, and exposure to vented landfill gas. In addition, the fencing provides protection for site features including the cover system, gas vent risers, monitoring wells and the leachate collection system. Excessive vehicle or recreational use without appropriate maintenance can compromise the integrity of these features.

The site has two access gates. The Swartz Road gate is the main access point featuring a paved area for access to the leachate collection system, while the Coffee Road gate at the NW corner of the site allows access to the unpaved access road on the western perimeter.

The fence and gates will be inspected annually, at the same time the other systems are inspected. Check the fence for serviceability and signs of tampering. The chain-link fence fabric shall be securely attached to each post and end rail. The posts shall be solidly installed in concrete pads with the necessary support posts and top rails. Any damaged or missing material will be replaced with new material.

Access roads on the west, south and east perimeters of the site will be inspected for erosion, excessive vegetation and any barriers which may limit access to any portion of the site. Any damaged areas will be repaired using methods and materials in accordance with construction specifications for that element of work. All barriers will be removed and disposed of appropriately to restore and maintain access to the site.

2.3 STORM WATER MANAGEMENT SYSTEM

The storm water management system is intended to provide control of runoff generated from precipitation events. The system consists of perimeter drainage channels directing storm water away from the property or to the 2 storm water ponds on the property. Each pond is equipped with an overflow structure. The NE pond (Pond 1) typically has some water in it while the NW pond (Pond 2) is typically dry.

2.3.1 Storm Water Management System Inspection and Repair

Inspect each component of the storm water management system during the annual landfill cover inspection in September or October.

Visually inspect the drainage channels for excessive erosion or lack of suitable vegetation. Erosion gullies must be backfilled, seeded, and mulched. Additional straw bale barriers may be required to protect the repaired area until vegetation is reestablished. The presence of cattails or other pond-type vegetation signifies that appropriate drainage through that length of channel is not occurring.

Regrading and backfilling may be required to repair erosion and correct slopes along the channel lengths. Materials used for backfilling and restoration will be in accordance with the construction specifications for that element of work. Areas demonstrating continual erosion must be evaluated and a determination made for a permanent and appropriate erosion control structure (e.g. riprap).

Inspect culverts and overflow structures for damage or erosion at points of entry and exit. Riprap will be replaced as necessary and any debris will be removed to maintain free-flowing conditions.

2.4 LANDFILL GAS VENTING SYSTEM

The landfill gas venting system is designed to allow gases generated through natural biological activity and decomposition of waste materials to be safely released from under the composite landfill cover.

The primary components of landfill gas are methane and carbon dioxide. A venting system that malfunctions can lead to increasing gas pressure within the landfill and migration of methane gas to structures outside the landfill limits. The hazards associated with landfill gases can pose serious threats to human health and the environment. Given the nature of the waste this site accepted and historical observations, it is possible the amount of methane and carbon dioxide generated may be minimal.

2.4.1 Landfill Gas Venting System Inspection and Repair

Inspect the gas venting system for its overall condition and operational effectiveness during the annual inspection. Each vent pipe shall be individually inspected. Vent screens that limit entry of foreign objects should be installed securely and maintained. Maintain unobstructed gas flow from each vent by clearing any objects that block flow. Inspect the riser for damage. If the riser is damaged and needs to be removed, excavate and repair the riser with like materials and workmanship, and repair the final cover in accordance with Subsection 2.1 of this O&M Plan.

2.4.2 Landfill Gas Probe Monitoring

Monitoring of the 12 landfill gas probes, GP-1 through GP-12 at the edge of the site will be conducted once in September or October, 2017 and then biennially in September or October in odd number years. Some of the probes have more than one gas monitoring point at multiple depths (S=Shallow, M=Medium, D=Deep). Information on each of the probes can be found in Table 1- Gas Probe Monitoring Points.

The objective of the monitoring program is to monitor the concentration of the landfill gases at the site boundary to ensure that gas migration away from the site and towards nearby buildings does not pose a risk. All the probes shall be tested in 2017 and subsequently every two years at the time of groundwater monitoring.

The probes shall be tested for percent LEL as methane, percent oxygen, percent carbon dioxide, air temperature and atmospheric pressure. The PID instrument must be capable of minimizing interference from methane.

Table 1 Gas Probe Monitoring Points

GAS PROBE	GEMS ID	ANALYSIS
GP-1	280	Barometric Pressure Temperature CO2 (%) % LEL as CH4 O2 (%)
GP-2S	284	
GP-2D	286	
GP-3S	287	
GP-3M	288	
GP-3D	289	
GP-4	290	
GP-5S	294	
GP-5M	295	
GP-5D	296	
GP-6S	297	
GP-6M	298	
GP-6D	299	
GP-7	300	
GP-8S	264	
GP-8M	265	
GP-8D	266	
GP-9S	267	
GP-9M	268	
GP-9D	269	
GP-10S	270	
GP-10M	271	
GP-10D	272	
GP-11S	273	
GP-11M	274	
GP-11D	275	
GP-12S	276	
GP-12M	277	
GP-12D	278	

2.5 GROUNDWATER MONITORING AND WELL INSPECTION & REPAIR

2.5.1 Groundwater Monitoring

Groundwater monitoring will be conducted once in September or October, 2017 and then biennially in September or October in odd number years (see Tables 2 & 3 below).

Monitoring shall be in accordance with DNR Groundwater Sampling Field Manual (DG038, available at <http://dnr.wi.gov/files/PDF/pubs/rr/DG038.pdf>) and DNR Groundwater Sampling Desk Reference (DG037a.pdf, DG037b.pdf, available at <http://dnr.wi.gov/files/PDF/pubs/rr/DG037a.pdf>/ and <http://dnr.wi.gov/files/PDF/pubs/rr/DG037b.pdf>).

Use Chapter NR 149 approved laboratory for all groundwater sample analyses. Analyses shall be in accordance with SW846 – SW8260B.

U.S. EPA CLP level lab data is not required (level 3). Chapter NR 140 level 2 methods will be utilized.

Table 2 Groundwater Monitoring Wells

MONITORING WELLS	GEMS ID	ANALYSIS
B-96-13A	911	Field Conductivity (25°C)
B-94-14A	903	Field pH
B-94-14R	902	Field Temperature
B-15	225	Field Turbidity
B-15A	251	Water Elevation (MSL)
B-96-17	913	Arsenic dissolved
B-96-17A	914	Chloride
B-96-18A	915	Total Kjeldahl Nitrogen
B-96-18B	916	Lead
B-94-19A	904	Nickel
B-21	252	Manganese, dissolved
B-21A	253	Nitrate plus Nitrite
W-23	259	Sulfates
W-23A	260	Magnesium, total
W-24	263	Chromium, total
B-94-25	905	Field filter as necessary per the DNR Groundwater Sampling Field Manual and DNR Groundwater Sampling Desk Reference (low flow sampling method)
B-94-25A	906	

B = Barrett Landfill; Intermediate number = 1994 or 1996 installation year if recorded on well number

Contact all private well owners in advance and make arrangements for all sampling events. Samples will be taken from an appropriate sampling hose tap or bib located as close as possible downstream from the well pump. All sampling procedures, including the amount of time to run water and flush the system

shall be in accordance with the DNR Groundwater Sampling Field Manual and DNR Groundwater Sampling Desk Reference, listed above.

Sampling procedures shall be documented at each location and submitted with the monitoring report. Samples from groundwater monitoring wells shall be collected by low-flow sampling techniques. Manage the purge and development water with the leachate as described in this plan.

If a subcontractor is used for groundwater monitoring, the contractor shall develop their own SAP. For development cost purposes, the selected lab must submit their own analytical SOPs; they may not simply reference SW846. The selected lab shall prepare an entire data package, complete with QC information and will retain and have available for distribution, the data package for a minimum of five years, in the event WDNR requests that the data be validated.

Duplicate samples should be analyzed at a rate of one for every 10 samples collected for both the monitoring and private wells. In addition, collect three (3) QA/QC samples including a trip blank, field blank and duplicate and analyze for Arsenic, Chloride, Lead, Chromium (total), Manganese, Magnesium (total), Nitrate plus nitrite

Table 3 Private Water Supply Well Sampling Locations

PRIVATE WATER SUPPLY WELLS	GEMS ID	OWNER NAME & ADDRESS IF DIFFERENT (2016 WAUKESHA COUNTY GIS MAP)	ANALYSIS
3540 S. Canary Road	246	Eugenia Kowis	(Unfiltered)
3600 S. Canary Road	245	Holbrook Catherine M	Field Conductivity-25°C
3620 S. Canary Road	244	Werning Kimberly D	Field Ph
3630 S. Canary Road	243	Kelly M Wyszowski	Field Temperature
3640 S. Canary Road	242	Christine Whitehaus	Field Turbidity
3540 S. Woodland Ct.	240	Beauvais Holly 2230 Oxford Ct Apt 4, Plover Wi 54467	Arsenic
3551 S Woodland Ct.	953	Barba Christiansen	Chloride
3561 S. Woodland Ct.	241	Heun Paul A & Peggy A Rev Livi	Lead
20770 W. Coffee Road	236	Rebecca Sanfelippo	Chromium, Total
20745 W. Coffee Road	237	Beverly Hardy & Charlotte Behr	Manganese
3690 S. Racine Avenue	238	Meyer Brian K	Magnesium, Total
3720 S. Racine Avenue	951	Sanchez Luciano C	Nitrate Plus Nitrite
3730 S. Racine Avenue	239	Servi Jeffrey M & Mary Ann	
3770 S. Racine Avenue	952	Schmidt Janet L	
Little Grove School (3700 Swartz Road)	950	Jayas Narayanan 2721 Minot Ln., Waukesha Wi 53188	

2.5.4 Monitoring Well, Gas Probe, Leachate Head Well and Leachate Pumping System Inspection and Repair

Monitoring wells, gas probes and leachate head wells shall be inspected at least once a year during the annual inspection and when sampled. Note the need for any repairs. Replace any missing, damaged or corroded locks. Repair any damage to the casing or well cover.

2.5.5 Licensed Survey of Monitoring Wells, Gas Probes and Leachate Head Wells

A professional survey of monitoring wells, gas probes and leachate head wells will be conducted in 2017. Monitoring well data will include casing elevations to 0.01 ft, ground surface elevations to 0.1 ft, and horizontal coordinates. All other wells will be surveyed for ground surface elevations to 0.1 ft and horizontal coordinates. This information must be submitted to the WDNR in electronic and map format. The Contractor will incorporate this information into future groundwater contour maps.

2.6 LEACHATE MANAGEMENT SYSTEM

The leachate pumping system electrical controls, leachate level controls, panels, pumps, load out area and piping will be visually inspected and tested at least once a year. Note the need for any repairs.

2.6.1 Leachate Removal System Commissioning and Decommissioning

Commission or activate the leachate pumping system preferably during the first week of April but no later than the first week of May. This includes making the necessary connections to the above ground force main pipe and testing all aspects of the system.

Obtain access to the WDNR cold storage building located on Pewaukee Rd. near the Waukesha County Airport to obtain all parts, tools and equipment necessary to activate the system. Enter the site's main entrance and paved access area closest to the leachate collection system at 21001 Coffee Road in New Berlin. Once the system has been activated, return all tools and equipment to the cold storage building.

Test the system by turning on and evaluating all pumps and electrical controls. A certified and registered vacuum truck must be at the site during the startup to test the pump from the lift station and collect the first load. Repair any leaking pipes within 2 days of the test. If any equipment fails, diagnose the problem and make recommendations and arrangements for repairs.

During the last week of October, obtain the parts, tools and equipment necessary to disconnect the above ground force main and winterize the system. Return all parts, equipment and tools to the WDNR cold storage building. Electric utility expenses are paid directly by the WDNR.

A summary of leachate system commissioning, operation and de-commissioning procedures is provided below. Detailed instructions and training information will be provided at the mandatory pre-bid inspection meeting and when the Contractor is hired.

2.6.2 Leachate Collection System Management, Hauling and Disposal

Consistent operation, maintenance and monitoring of the leachate collection system is important throughout its six months of operation. If the system is not systematically monitored, the Contractor will either pump too much, too little or no leachate at all some weeks. The amount of leachate varies year to year and has been declining at Barrett Landfill because of the composite cap installed in 1992 and aggressive leachate management since 2009.

At the beginning of the season, monitoring is necessary to establish the baseline leachate level. The most important measurement is the height of the leachate in the lift station. After establishing the baseline level, this measurement must be done every two to four weeks. Leachate Head wells (LHW) must be monitored once a month to provide information on the leachate volume and flow in the collection system.

Production data provides information on the volume of leachate stored in the waste mass. Once a month or more often if necessary, record the time required to fill the collection tank and the lift station. This will vary throughout the season and normally increases from 1.5 hours initially to 24 -72 hours by August or September. The operator must reduce pumping frequency as the season progresses.

The Contractor is required to train leachate haulers before working at this site. During site commissioning in April or May, the hauler must be on site to connect pipes at the loading pad, collection tank and lift station and haul leachate as directed by the Contractor. Subsequent hauling will be performed on dates specified and the hauler must be available to collect additional loads with less than one day's notice.

During site decommissioning in late September or early October, the Contractor will direct the leachate hauler to prepare the site for closure during colder months. After pumping the last leachate for the season, the hauler will remove liquid from the overland force main and 10 feet of liquid from vertical pipe in the lift station. All pipes must be capped, the main switches on the electrical panel turned off and all flexible pipes must be removed, drained and returned to the DNR cold storage facility.

2.6.3 Leachate Line Cleaning

The gravity leachate collection lines must be water pressure cleaned (water "jetted") and television inspected in fall, 2017 and at least every five years afterwards. Information from and recommendations regarding the line cleaning will be included in the annual inspection report.

SECTION 3

DOCUMENTATION AND SUBMITTALS

This section describes the documentation and submittals that will be used to document the O&M activities performed.

3.1. ANNUAL INSPECTION REPORT

Document and submit the annual inspection within 30 days after the date of the inspection, using the report form provided below or a report form that is approved in advance by WDNR. The annual inspection report shall contain a narrative summarizing the results of the work, recommendations for follow up or repairs, and the completed form. Take photographs of all problems noted and provide them in the inspection report. All photographs taken must be recorded on a photograph documentation log that will include, at a minimum, the following information:

- A unique identifying number for cross referencing and document control.
- Date, time, location, and current weather conditions at the time the photograph was taken.
- Purpose or intent of the photograph.
- Signature of the photographer.

Two copies of the annual report shall be submitted to WDNR. A single electronic copy in Portable Document Format (.pdf) shall also be submitted to WDNR on a CD or USB flash drive.

3.2. GROUNDWATER MONITORING AND GAS PROBE REPORT

Document and submit biennial groundwater monitoring results within 60 days of the date of the September/October groundwater sampling in a narrative report as well as tabular data presentation format. The report will identify any results that exceed Ch. NR 140 groundwater Preventative Action Limits (PALs) or Enforcement Standards (ESs). The tabular format shall be described in the SAP and subject to prior approval by WDNR. The results shall also be submitted in proper electronic form on a CD or single floppy disk to WDNR for entry into the WDNR Waste Management Program GEMS system. Two copies of the groundwater monitoring report shall be submitted to WDNR. A single electronic copy of the narrative report and tables in Portable Document Format (.pdf) shall also be submitted to WDNR on a CD or USB flash drive, along with summarized sample analysis results in Excel table format with the comparison to Wisconsin Administrative Code Ch. NR 140 Preventative Action Limits (PALs) and Enforcement Standards (ESs).

Document and submit the results of the gas probe sampling with the groundwater report using the report form provided or a report form that is approved in advance by WDNR.

A link to a GEMS printout at the end of this document shows the GEMS ID information.

3.3. DRAWINGS

The Waste Management Program site file is located in the Waukesha Service Center, 141 NW Barstow St, Room 180, Waukesha WI, 53188. The O&M Contractor may wish to make copies of site drawings to help understand site features. The WDNR Project Manager or Special On-Site Assistant to the WDNR Project Manager may be available to assist in locating drawings showing the key site features.

3.4. STORAGE AND DISPOSTION OF RECORDS

During post-closure activities, the O&M contractor will be responsible for maintaining a complete set of analytical data, and inspection reports. The O&M contractor shall transfer all changes to the record documents following each maintenance activity at the site.

The sampling contractor will maintain a complete set of all laboratory quality assurance documentation produced as a function of each sampling event. The documents will be maintained at the O&M contractor's home office, in accordance with approved document control methods.

The following documents are included in this document. File names are listed.

Figure 1.1 Site Location Map with Nearby Addresses

Fig_1_1_GIS_Addresess_Barrett.pdf

Figure 1.2 Site Topo Map

Fig_1_2_GIS_Topo_Barrett.pdf

Figure 1.3 Site Monitoring Points Map (2005)

Fig_1_3_Monitoring_Points_2005.pdf

Figure 1.4 Site Monitoring Points, Features, Waste Extent Detailed Map (2011)

Fig_1_4_monitoring_points_features_topo_waste_limits_2011_400dpi.pdf

Figure 1.5 Site Monitoring Points

Fig_1_5_rough_monitoring_points_locations.pdf

Figure 1.6 Site Private Wells Map and Monitoring Table (2005)

Fig_1_6_Topo_Private_Wells_Well_Table_2005.pdf

GEMS ID Information

GEMS 2016 Report: Barrett_Lic_1940_GEMS_Points_Report.pdf

Gas Probe Monitoring Report
Barrett Landfill, New Berlin, Wisconsin

Probe	GEMS ID	%LEL (as methane)	% Oxygen	%CO2	PID (ppm)	Pressure (inches of water)
GP-1	280					
GP-2S	284					
GP-2D	286					
GP-3S	287					
GP-3M	288					
GP-3D	289					
GP-4	290					
GP-5S	294					
GP-5M	295					
GP-5D	296					
GP-6S	297					
GP-6M	298					
GP-6D	299					
GP-7	300					
GP-8S	264					
GP-8M	265					
GP-8D	266					
GP-9S	267					
GP-9M	268					
GP-9D	269					
GP-10S	270					
GP-10M	271					
GP-10D	272					
GP-11S	273					
GP-11M	274					
GP-11D	275					
GP-12S	276					
GP-12M	277					
GP-12D	278					

Instruments Used: _____

Operator: _____ Date: _____

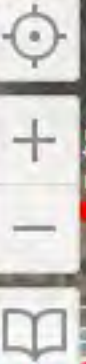
Weather Conditions:

Barometric Pressure (inches of Hg): _____ Temperature (Degrees F): _____

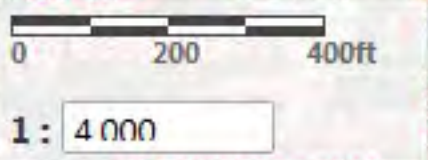
Relative Humidity (%): _____ Dewpoint (Degrees F): _____ Wind: _____

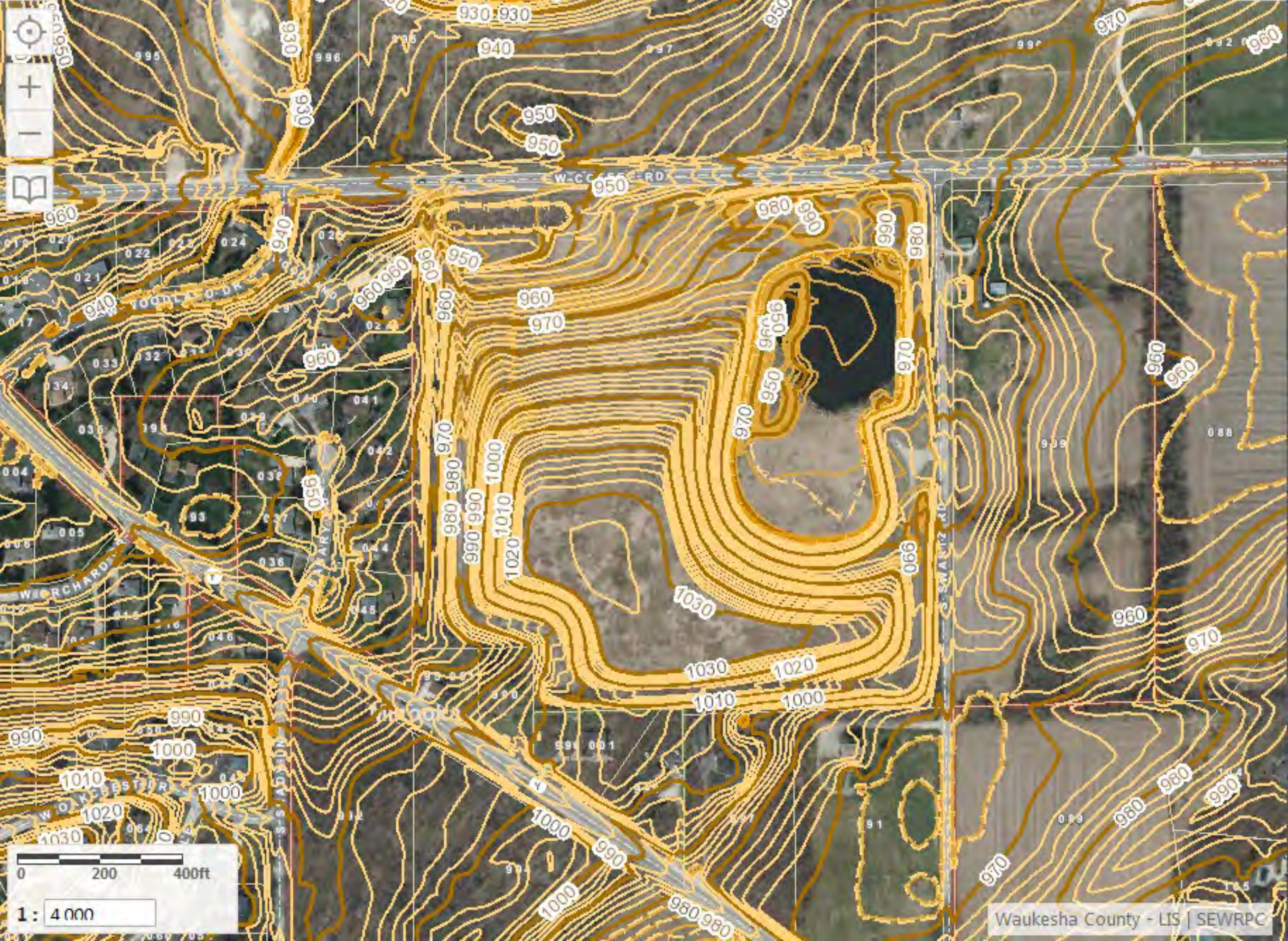
Sky Conditions: _____

Ground Conditions: _____ Snow _____ No Snow _____ Frozen Ground/Frost



21230 W COFFEE RD
 21350 W COFFEE RD
 20770 W COFFEE RD
 20745 W COFFEE RD
 21430 W WOODLAND DR
 3520 S WOODLAND CT
 21310 W WOODLAND DR
 3530 S WOODLAND CT
 21521 W WOODLAND DR
 3561 S WOODLAND CT
 3540 S WOODLAND CT
 21431 W WOODLAND DR
 21001 W COFFEE RD
 3636 S RACINE AVE
 3601 S CANARY RD
 3600 S RACINE AVE
 3620 S CANARY RD
 3600 S CANARY RD
 21500 W ORCHARD DR
 3641 S CANARY RD
 3625 S CANARY RD
 3630 S CANARY RD
 21423 W ORCHARD DR
 3655 S RACINE AVE
 3640 S CANARY RD
 21431 W ORCHARD DR
 3665 S SHADY LN
 3690 S RACINE AVE
 3683 S SHADY LN
 3720 S RACINE AVE
 3730 S RACINE AVE
 3800 S RACINE AVE
 21490 W OAKCREST DR
 21334 W OAKCREST DR
 3770 S RACINE AVE
 21391 W OAKCREST DR
 21331 W OAKCREST DR
 3767 S SHADY LN







New Pz-14 deep

New Wt-19 and Pz-19 deep

New Pz-13 deep

B-94-14R

B-94-25A

B-94-19A

B-96-13A

B-94-13

New Pz-25 deep

B-94-14A

B-15A

LHW94-2

LHW94-3

B-21B-21A

LHW94-4

LHW1

New Pz-17 deep

B-96

B-96-17A

LHW94-5

New Wt-26

New Pz-18 deep

LHW94-6

W24

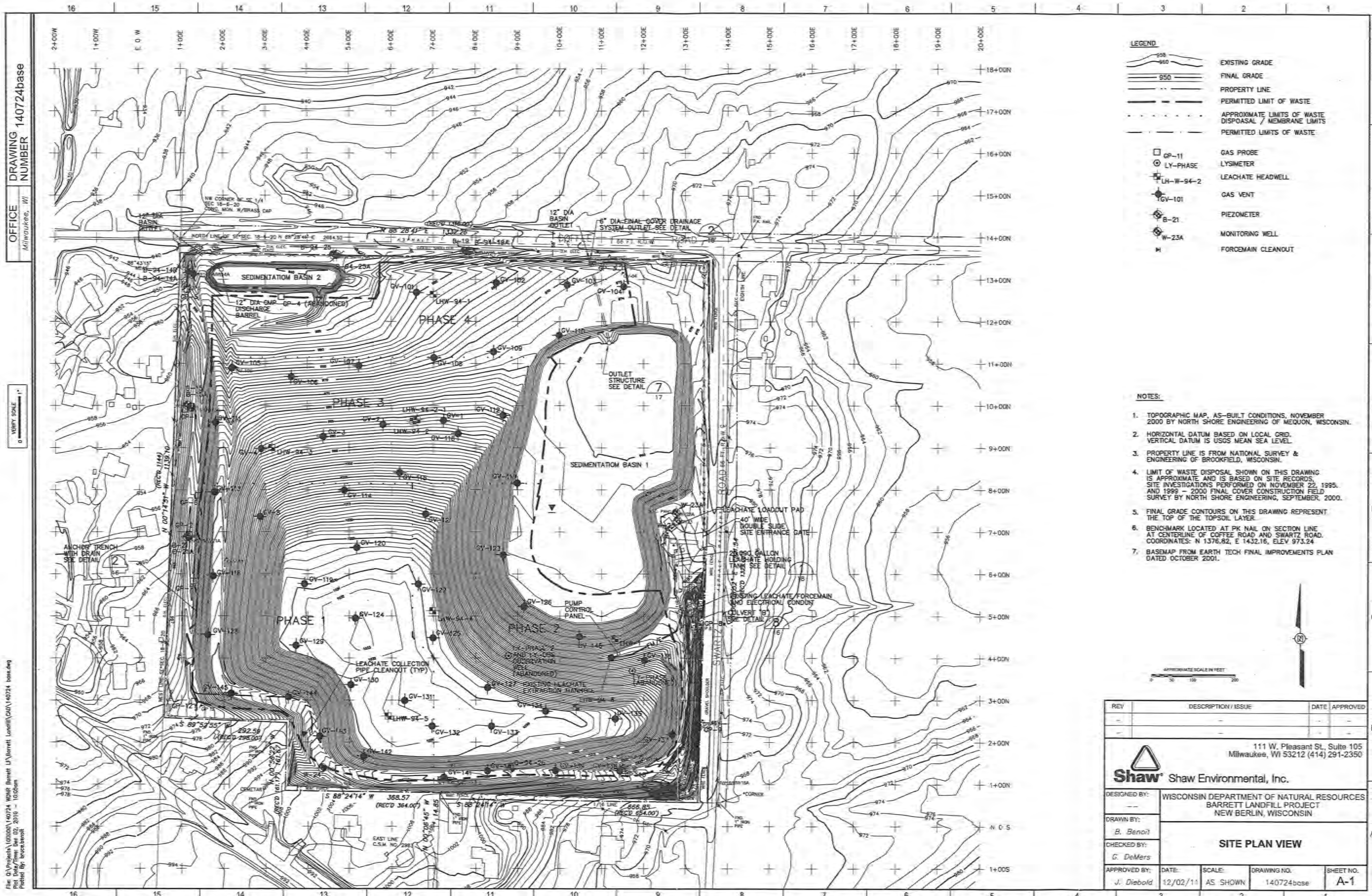
New Pz-24

B-94

B-96-18A

B-96-18B

100 0 100 200 300 400 Feet



OFFICE DRAWING NUMBER
Milwaukee, WI 140724base

VERTICAL SCALE
0 1" = 10'

File: C:\Program Files\AutoCAD\140724 base.dwg
Plot: 140724base.dwg
Plot Date: 12/02/11 10:00am

LEGEND

	EXISTING GRADE
	FINAL GRADE
	PROPERTY LINE
	PERMITTED LIMIT OF WASTE
	APPROXIMATE LIMITS OF WASTE DISPOSAL / MEMBRANE LIMITS
	PERMITTED LIMITS OF WASTE
	GP-11 GAS PROBE
	LY-PHASE LYSIMETER
	LH-W-94-2 LEACHATE HEADWELL
	GV-101 GAS VENT
	B-21 PIEZOMETER
	W-23A MONITORING WELL
	M FOREMAN CLEANOUT

- NOTES:**
1. TOPOGRAPHIC MAP, AS-BUILT CONDITIONS, NOVEMBER 2000 BY NORTH SHORE ENGINEERING OF MEQUON, WISCONSIN.
 2. HORIZONTAL DATUM BASED ON LOCAL GRID. VERTICAL DATUM IS USGS MEAN SEA LEVEL.
 3. PROPERTY LINE IS FROM NATIONAL SURVEY & ENGINEERING OF BROOKFIELD, WISCONSIN.
 4. LIMIT OF WASTE DISPOSAL SHOWN ON THIS DRAWING IS APPROXIMATE AND IS BASED ON SITE RECORDS, SITE INVESTIGATIONS PERFORMED ON NOVEMBER 22, 1995, AND 1999 - 2000 FINAL COVER CONSTRUCTION FIELD SURVEY BY NORTH SHORE ENGINEERING, SEPTEMBER, 2000.
 5. FINAL GRADE CONTOURS ON THIS DRAWING REPRESENT THE TOP OF THE TOPSOIL LAYER.
 6. BENCHMARK LOCATED AT PK NAIL ON SECTION LINE AT CENTERLINE OF COFFEE ROAD AND SWARTZ ROAD. COORDINATES: N 1376.82, E 1432.16, ELEV 973.24
 7. BASEMAP FROM EARTH TECH FINAL IMPROVEMENTS PLAN DATED OCTOBER 2001.

REV	DESCRIPTION / ISSUE	DATE	APPROVED
-	-	-	-
-	-	-	-

111 W. Pleasant St., Suite 105
Milwaukee, WI 53212 (414) 291-2350

Shaw Shaw Environmental, Inc.

DESIGNED BY:	WISCONSIN DEPARTMENT OF NATURAL RESOURCES BARRETT LANDFILL PROJECT NEW BERLIN, WISCONSIN
DRAWN BY:	B. Benoit
CHECKED BY:	G. DeMers
APPROVED BY:	J. Diebold

SITE PLAN VIEW

DATE:	SCALE:	DRAWING NO.:	SHEET NO.:
12/02/11	AS SHOWN	140724base	A-1

COFFEE RD

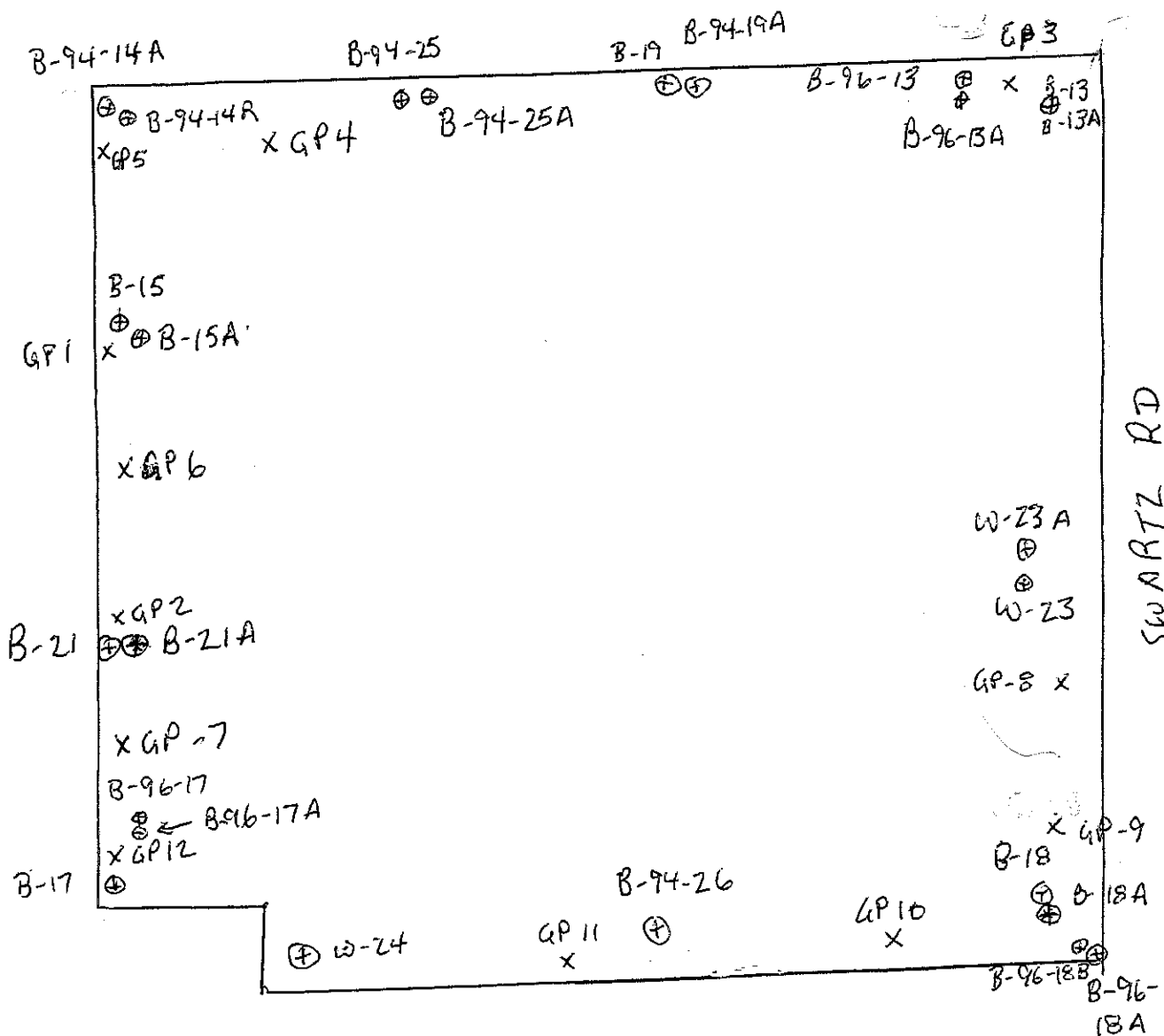
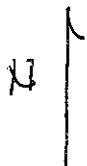


Figure 1-5
 Rough Locations On-Property
 Monitoring Points
 Barrett Landfill

⊕ = MW
 X = GP



Private Well Map Key

Map_number	Id_point	Location	Ownernamed	2005nameup	Welladres	Status	Wellconstr	Wisconsinu
201	236	NE	Poeppel/Zalewski	Zalewski	20770 W. Coffee Roa	Active		
502	951	SSW	Roberts	Sanchez	3720 Racine Avenue	Active	Yes	
503	239	S	Servi	Servi	3730 Racine Avenue	Active	No	
504	952	S	Swartz/Murray	Murray	3770 Racine Avenue	Active	Yes	
505	950	SE	New Berlin Schoo	New Berlin Schoo	3705 Swartz Road	Active	Yes	FG171
310	237	NE	Hanke	Hanke	20745 W. Coffee Roa	Active	No	EF728
501	238	SW	Banishkek/Hart/Ai	Meyer	3690 Racine Avenue	Active		
705	242	SW	Whitehouse	Whitehouse	3640 Canary Drive	Active		
706	243	W	Nagel	Brown	3630 Canary	Active	No	EF729
707	244	W	Van de Ven	Bronkowski/Gahl	3620 Canary	Active	Yes	FG756
708	245	W	Bergeson	Holbrook	3600 Canary	Active	No	
709	246	W	Kowis	Kowis	3540 Canary	Active	No	EF272
702	240	WNW	Deprey	Swensen	3540 S Woodland	Active	Yes	EF726
703	953	WNW	Green	Christensen	3551 Woodland Ct	Active	Yes	FG172

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FID: 268134130 County: Waukesha City: NEW BERLIN, WI

DNR Point ID	Point Name	Point Type	Point Status	WUWN	Linked	Gradient
201	P1	11 WT Obs Well-Non Sub D	I	BU998		
202	P2	12 Piezometer-Non Sub D Well	I	BU999		
203	P3	12 Piezometer-Non Sub D Well	I	BV000		
204	P4	12 Piezometer-Non Sub D Well	I	BV001		
205	P5	12 Piezometer-Non Sub D Well	I	BV002		
206	P6	12 Piezometer-Non Sub D Well	I	BV003		
207	P7	12 Piezometer-Non Sub D Well	I	BV004		
208	P8	12 Piezometer-Non Sub D Well	I	BV005		
209	B9	11 WT Obs Well-Non Sub D	I	BV006		
210	B10	11 WT Obs Well-Non Sub D	I	BV007		
211	B11	11 WT Obs Well-Non Sub D	I	BV008		
212	B12	11 WT Obs Well-Non Sub D	I	BV009		
213	POND	22 Surface Water	I			
214	DITCH	21 Flow or Seep	I			
215	GRND-WTR SUMP	23 Leachate Collection Sys	I			
216	WELL (BARRETT?)	13 Private Well - Potable	A	BV013		
217	GRAVEL PIT	35 Impounded	I			
218	FARM (HANKE?)	13 Private Well - Potable	A	BV015		
219	HOUSE - SOUTH	13 Private Well - Potable	A	BV016		
220	HOUSE - WEST	13 Private Well - Potable	A	BV017		

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DNR Point ID	Point Name	Point Type	Point Status	WUWN	Linked	Gradient
221	DITCH	21 Flow or Seep	I			
222	B-13	11 WT Obs Well-Non Sub D	I	BV019		
223	B-13A	12 Piezometer-Non Sub D Well	I	BV020		
224	B-14	11 WT Obs Well-Non Sub D	P	BV021		
225	B-15	11 WT Obs Well-Non Sub D	A	BV022		
226	B-16A	12 Piezometer-Non Sub D Well	I	BV023		
227	B-16B	12 Piezometer-Non Sub D Well	I	BV024		
228	B-16C	12 Piezometer-Non Sub D Well	I	BV025		
229	B-17	11 WT Obs Well-Non Sub D	I	BV026		
230	B-18	11 WT Obs Well-Non Sub D	I	BV027		
231	B-18A	12 Piezometer-Non Sub D Well	I	BV028		
232	B-19	11 WT Obs Well-Non Sub D	A	BV029		
233	B-20L	11 WT Obs Well-Non Sub D	I	BV030		
234	B-20P	12 Piezometer-Non Sub D Well	I	BV031		
235	BARRETT 003	13 Private Well - Potable	A	BV032		
236	ZALEWSKI (201)	13 Private Well - Potable	A	BV033		
237	HANKE 301	13 Private Well - Potable	A	BV034		
238	MEYER (501)	13 Private Well - Potable	A	BV035		
239	SERVI 503	13 Private Well - Potable	A	BV036		
240	SWENSON (702)	13 Private Well - Potable	A	BV037		

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DNR Point ID	Point Name	Point Type	Point Status	WUWN	Linked	Gradient
241	HEUN 704	13 Private Well - Potable	A	BV038		
242	WHITEHAUS (705)	13 Private Well - Potable	A	BV039		
243	BROWN (706)	13 Private Well - Potable	A	BV040		
244	GEHL (707)	13 Private Well - Potable	A	BV041		
245	HOLBROOK (708)	13 Private Well - Potable	A	BV042		
246	KOWIS (709)	13 Private Well - Potable	A	BV043		
247	ALF 710	13 Private Well - Potable	A	BV044		
248	POLIAK 721	13 Private Well - Potable	A	BV045		
249	YAEGER 801	13 Private Well - Potable	I	BV046		
250	YAEGER SHOP 802	13 Private Well - Potable	A	BV047		
251	B-15A	12 Piezometer-Non Sub D Well	A	BV048		
252	B-21	11 WT Obs Well-Non Sub D	A	BV049		
253	B-21A	12 Piezometer-Non Sub D Well	A	BV050		
254	B-22	14 Lysimeter	I			
255	LYSIMETER I	14 Lysimeter	A			
256	SUMP A	21 Flow or Seep	A			
257	SUMP B	21 Flow or Seep	A			
258	LEACHATE	23 Leachate Collection Sys	A			
259	W-23	11 WT Obs Well-Non Sub D	A	BV056		
260	W-23A	12 Piezometer-Non Sub D Well	A	BV057		

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DNR Point ID	Point Name	Point Type	Point Status	WUWN	Linked	Gradient
261	B-13B	11 WT Obs Well-Non Sub D	I	BY868		
262	LYSIMETER L-1	14 Lysimeter	A			
263	W-24	11 WT Obs Well-Non Sub D	A	GN368		
264	GP-8S	51 Gas Probe	A			
265	GP-8M	51 Gas Probe	A			
266	GP-8D	51 Gas Probe	A			
267	GP-9S	51 Gas Probe	A			
268	GP-9M	51 Gas Probe	A			
269	GP-9D	51 Gas Probe	A			
270	GP-10S	51 Gas Probe	A			
271	GP-10M	51 Gas Probe	A			
272	GP-10D	51 Gas Probe	A			
273	GP-11S	51 Gas Probe	A			
274	GP-11M	51 Gas Probe	A			
275	GP-11D	51 Gas Probe	A			
276	GP-12S	51 Gas Probe	A			
277	GP-12M	51 Gas Probe	A			
278	GP-12D	51 Gas Probe	A			
280	GP-1	51 Gas Probe	A			
284	GP-2S	51 Gas Probe	A			

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DNR Point ID	Point Name	Point Type	Point Status	WUWN	Linked	Gradient
286	GP-2D	51 Gas Probe	A			
287	GP-3S	51 Gas Probe	A			
288	GP-3M	51 Gas Probe	A			
289	GP-3D	51 Gas Probe	A			
290	GP-4	51 Gas Probe	A			
294	GP-5S	51 Gas Probe	A			
295	GP-5M	51 Gas Probe	A			
296	GP-5D	51 Gas Probe	A			
297	GP-6S	51 Gas Probe	A			
298	GP-6M	51 Gas Probe	A			
299	GP-6D	51 Gas Probe	A			
300	GP-7	51 Gas Probe	A			
902	B-94-14R	11 WT Obs Well-Non Sub D	A	RY928		
903	B-94-14A	12 Piezometer-Non Sub D Well	A	RY929		
904	B-94-19A	12 Piezometer-Non Sub D Well	A	RY930		
905	B-94-25	11 WT Obs Well-Non Sub D	A	RY931		
906	B-94-25A	12 Piezometer-Non Sub D Well	A	RY932		
907	B-94-26	11 WT Obs Well-Non Sub D	A	RY933		
911	B-96-13A	12 Piezometer-Non Sub D Well	A	LO371		
912	B-96-13	11 WT Obs Well-Non Sub D	A	LO370		

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DNR Point ID	Point Name	Point Type	Point Status	WUWN	Linked	Gradient
913	B-96-17	11 WT Obs Well-Non Sub D	A	LO372		
914	B-96-17A	12 Piezometer-Non Sub D Well	A	LO373		
915	B-96-18A	11 WT Obs Well-Non Sub D	A	LO374		
916	B-96-18B	12 Piezometer-Non Sub D Well	A	LO375		
950	LITTLE GROVE	13 Private Well - Potable	A	FG171		
951	SANCHEZ	13 Private Well - Potable	A	GO798		
952	MURRAY	13 Private Well - Potable	A	DK960		
953	CHRISTIANSEN	13 Private Well - Potable	A	FG172		
970	LHW-1	24 Leachate Head Well	A			
971	LHW-94-1	24 Leachate Head Well	A			
972	LHW-94-2	24 Leachate Head Well	A			
973	LHW-94-3	24 Leachate Head Well	A			
974	LHW-94-4	24 Leachate Head Well	A			
975	LHW-94-5	24 Leachate Head Well	A			
976	LHW-94-6	24 Leachate Head Well	A			
991	TRIP BLANK	99 Other	A			
992	EQ BLK BLDDR PP	99 Other	A			
993	EQ BLK BAILER	99 Other	A			
996	BLANK #1	99 Other	A			
997	FIELD BLANK	99 Other	A			

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DNR Point ID	Point Name	Point Type	Point Status	WUWN	Linked	Gradient
999	TRIP BLANKS	99 Other	A			