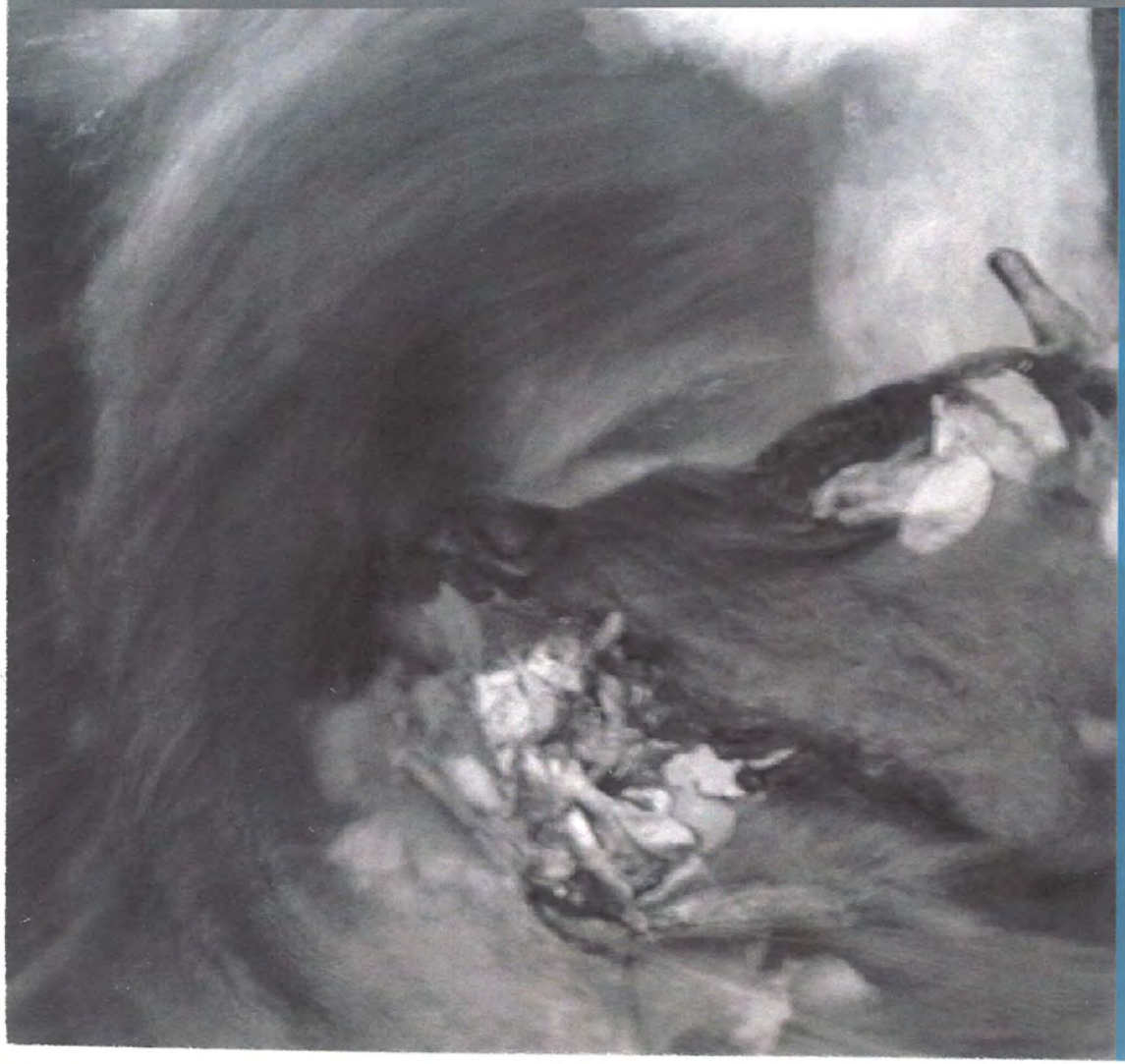
Volume II: WDI Operating License Application
Master Cells VI F & G



Wayne Disposal, Inc. - Site No. 2
MC VI - F & G (Woodlot) Development

Prepared For:
Wayne Disposal, Inc.
Belleville, MI

NTH Project No. 13-060921-03
February 2011
Revised September 2011

NTH Consultants, Ltd.
41780 Six Mile Road,
Northville, Michigan 48168

PHASE DESIGNATION
CROSS-REFERENCE TABLE

REVISED CELL & PHASE DESIGNATION (FROM ENGINEERING DRAWINGS)	**PREVIOUS PHASE DESIGNATION** (IN ENGINEERING DRAWINGS & REPORTS FROM SUPPLEMENT TO APPLICATION: 6/10/11)	**ORIGINAL PHASE DESIGNATION** (FROM INITIAL SUBMISSION IN MARCH 2011)
CELL 6F – PHASE 1 (SUBCELL F1 & F2)	CELL 6F – PHASE 1	CELL 6F – PHASE 2
CELL 6F – PHASE 2 (SUBCELL F3 & F4)	CELL 6F – PHASE 2	CELL 6F – PHASE 1
CELL 6G – PHASE 1 (SUBCELL G1)	CELL 6G – PHASE 1	CELL 6G – PHASE 1 / PHASE 3
CELL 6G – PHASE 2 (SUBCELL G2 & G3)	CELL 6G – PHASE 2	CELL 6G – PHASE 1 / PHASE 2
CELL 6G – PHASE 3 (SUBCELLG4)	CELL 6G – PHASE 3	CELL 6G – PHASE 4
CELL 6G – PHASE 4 (SUBCELL G5)	CELL 6G – PHASE 4	CELL 6G – PHASE 5
CELL 6G – PHASE 5 (SUBCELL G6)	CELL 6G – PHASE 5	CELL 6G – PHASE 6
CELL 6G – PHASE 6 (SUBCELL G7)	CELL 6G – PHASE 6	CELL 6G – PHASE 7

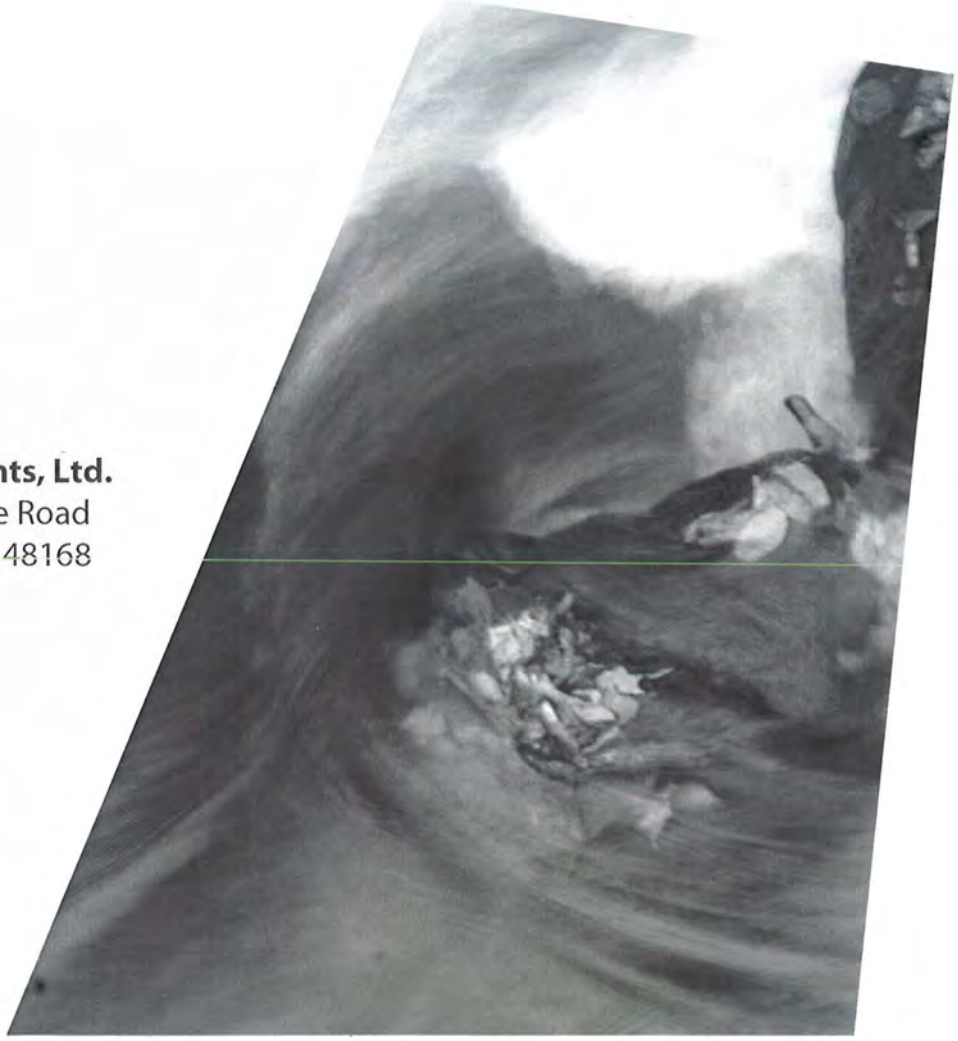
Volume II - WDI Operating License Application Master Cells VI F & G

Wayne Disposal, Inc. - Site No. 2

NTH Project No. 13-060921-03

February 2011

Revised September 2011



NTH Consultants, Ltd.
41780 Six Mile Road
Northville, MI 48168

PART 111 - WDI OPERATING LICENSE APPLICATION - 2011

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APPENDICIES

A	Wayne Disposal, Inc. Site No. 2, Master Cell VI-F&G Engineering Design Drawings
B	Draft Report on RCRA Facility Investigation, Phase II, Release Assessment for Wayne Disposal Site No. 1 Landfill (provided on compact disk)
C	Report on Host Community Engagement in Support of Operating License Application for Wayne Disposal, Inc.

FORM EQP 5111 ATTACHMENT TEMPLATE B5
ENVIRONMENTAL MONITORING PROGRAMS

This document is an attachment to the Michigan Department of Natural Resources and Environment's *Form EQP 5111, Construction Permit and Operating License Applications, Hazardous Waste Treatment Storage and Disposal Facilities.* See the instructions for Form EQP 5111 for details on how to use this attachment. All references to Title 40 of the Code of Federal Regulations (40 CFR) citations specified herein are adopted by reference in R 299.11003.

The administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), R 299.9611 establishes requirements for the environmental monitoring programs for hazardous waste management facilities. Owners and operators of hazardous waste treatment, storage, or disposal facilities must develop an environmental monitoring program capable of detecting a release of hazardous waste or hazardous waste constituents from the facility to groundwater, air, or soil.

This license application template addresses requirements for an environmental monitoring program for hazardous waste management units and the hazardous waste management facility for the Wayne Disposal, Inc. facility. The template includes either a monitoring program description or a demonstration for a waiver from the monitoring requirements in accordance with R 299.9611(3)(a) and (b) and R 299.9611(4) as indicated below:

Groundwater Monitoring Program *(Check as appropriate)*

☒ R 299.9612 compliance monitoring program and sampling and analysis plan for one or more units
☐ Waiver for one or more units

Ambient Air Monitoring Program (Check as appropriate)

☒ Monitoring program and sampling and analysis plan

☐ Waiver

Semi-Annual Soil Monitoring Program (Check as appropriate)

☒ Monitoring program and sampling and analysis plan

☐ Waiver

This template is organized as follows:

B5.A GROUNDWATER MONITORING PROGRAM
- B5.A.1 Unit-Specific Groundwater Monitoring Program
- B5.A.3 General Groundwater Monitoring Requirements
  - B5.A.3(a) Sampling and Analysis Plan
  - B5.A.3(b) Description of Wells

B5.A.3(c) Procedure for Establishing Background Quality
B5.A.3(d) Statistical Procudrues
B5.A.4 Detection Monitoring Program
B5.A.4(a) Indicator Parameters, Waste Constituents, and Reaction Products
B5.A.4(b) Groundwater Monitoring System
B5.A.4(c) Background Concentration Values for Proposed Parameters
B5.A.4(d) Proposed Sampling and Analysis Procedures

B5.B AMBIENT AIR MONITORING PROGRAM
B5.B.1 Sampling and Analysis Plan
B5.C SEMI-ANNUAL SOIL MONITORING PROGRAM
B5.C.1 Sampling and Analysis Plan
B5.D LEAK DETECTION COLLECTION & REMOVAL SYSTEM MONITORING PROGRAM
B5.D.1 Sampling and Analysis Plan
B5.E LYSIMETER MONITORING PROGRAM
B5.E.1 Sampling and Analysis Plan
B5.F SURFACE WATER MONITORING PROGRAM
B5.F.1 Sampling and Analysis Plan
B5.G SEDIMENTATION BASIN MONITORING PROGRAM
B5.G.1 Sampling and Analysis Plan

B5.A GROUNDWATER MONITORING PROGRAM

[R 299.9611(2)(b) and (3), R 299.9612, and R 299.9629 and 40 CFR, Part 264, Subpart F, except 40 CFR §§264.94(a)(2) and (3), (b), and (c), 264.100, and 264.101]

Section 27 of the Operating License Application describes the facility's unit-specific groundwater monitoring program. The basis for determining the groundwater monitoring program for each unit described below is provided in the Section 24, Hydrogeological Report, attached separately to this application, which was prepared in accordance with R 299.9506.

B5.A.3 General Groundwater Monitoring Requirements

[R 299.9612 and 40 CFR §§264.97 and 264.91(b)]

The WDI facility will comply with the requirements for a groundwater monitoring program by implementing the program developed to satisfy the requirements of R 299.9612 and R 299.9629 and 40 CFR §§264.98 and 264.99, except 40 CFR §§264.94(a)(2) and (3) and 264.94(b) and (c). The basis for determining the groundwater monitoring program for each unit is provided in Section 24, Hydrogeologic Report, of this application that was prepared in accordance with R 299.9506.

B5.A.3(a) Sampling and Analysis Plan

[R 299.9611(2)(a)]

A sampling and analysis plan (SAP) for groundwater monitoring at WDI is included in the Section 27 of the License Application. The sampling and analysis plan was prepared in accordance with the requirements specified in R 299.9611(2)(a). All sampling and analysis performed pursuant to this application will be consistent with the SAP. All samples for the purpose of environmental monitoring will be collected, transported, stored, and disposed by trained and qualified individuals in accordance with the SAP.

B5.A.3(b) Description of Wells

[R 299.9612 and 40 CFR §264.97(a), (b), and (c)]

The Hydrogeological Report provides documentation that the groundwater monitoring program contains a sufficient number of wells, installed at appropriate depths to yield groundwater samples from the uppermost aquifer that (1) represent the quality of background water that has not be affected by leakage from a regulated unit; (2) represent the quality of groundwater passing the point of compliance; and (3) allow for detection of contamination when hazardous constituents have migrated from the waste management area to the upper aquifer.

B5.A.3(c) Procedure for Establishing Background Quality

[R 299.9612 and 40 CFR §264.97(a)(1) and (g)]

Procedures for establishing background groundwater quality are described in Section 27 of the Operating License application, Groundwater Sampling & Analysis Plan.

B5.A.3(d) Statistical Procedures

[R 299.9612 and 40 CFR §§264.97(h) and 264.97(i)(1), (5), and (6)]

Statistical procedures for evaluating groundwater quality are described in Section 27 of the Operating License application, Groundwater Sampling & Analysis Plan

B5.A.4 Detection Monitoring Program
[R 299.9612 and 40 CFR §§264.91(a)(4) and 264.98]

The basis for determining the detection monitoring program for each unit is provided in Section 24, Hydrogeologic Report, of this application that was prepared in accordance with R 299.9506.

B5.A.4(a) Indicator Parameters, Waste Constituents, and Reaction Products
[R 299.9506(3)(a) and (f), R 299.9506(4)(a), and R 299.9612 and 40 CFR §264.98(a)]

The monitoring parameter list is provided in Section 24, Hydrogeologic Report, of this application.

B5.A.4(b) Groundwater Monitoring System
[R 299.9612 and 40 CFR §§264.97(a)(2), (b), and (c) and 264.98(b)]

Refer to Section B5.A.3(a)

B5.A.4(c) Background Concentration Values for Proposed Parameters
[R 299.9612 and 40 CFR §§264.98(c) and 264.97(g)(1) and (2)]

Refer to Sections B5.A.3(b) and (c)

B5.A.4(d) Proposed Sampling and Analysis Procedures
[R 299.9506(3)(e) and R 299.9612 and 40 CFR §§264.97(d), (e), and (f) and 264.98(d), (e), and (f)]

Refer to Section B5.A.3(a) and (b)

B5.B AMBIENT AIR MONITORING PROGRAM
[R 299.9611(2)(c) and (4)]

B5.B.1 Sampling and Analysis Plan
[R 299.9611(2)(a)]

A sampling and analysis plan for ambient air monitoring is included in Section 26 of the Operating License Application, which was prepared in accordance with the requirements specified in R 299.9611(2)(a). All sampling and analysis performed pursuant to this application will be consistent with the Ambient Air Monitoring Plan.

The WDI facility will conduct ambient air monitoring to detect violations of the provisions of Part 55 of Act 451.

B5.C SEMI-ANNUAL SOIL MONITORING PROGRAM
[R 299.9611(2)(d) and (4)]

B5.C.1 Sampling and Analysis Plan
[R 299.9611(2)(a)]

A sampling and analysis plan (SM SAP) for semi-annual soil monitoring for WDI is included in Section 22 of the Operating License Application. The sampling and analysis plan was prepared in accordance with the requirements specified in R 299.9611(2)(a). All sampling and analysis performed pursuant to this application will be consistent with SM SAP.

B5.D LEAK DETECTION COLLECTION & REMOVAL SYSTEM MONITORING PROGRAM

B5.D.1 Sampling and Analysis Plan

A sampling and analysis plan (LCDRS SAP) for quarterly LDCRS monitoring for WDI is included in Section 29 of the Operating License Application. All sampling and analysis performed pursuant to this application will be consistent with LDCRS SAP.

B5.E LYSIMETER MONITORING PROGRAM

B5.E.1 Sampling and Analysis Plan

A lysimeter sampling and analysis plan (SAP) for annual lysimeter monitoring for WDI is included in Section 30 of the Operating License Application. All sampling and analysis performed pursuant to this application will be consistent with the lysimeter SAP

B5.F SURFACE WATER MONITORING PROGRAM

B5.F.1 Sampling and Analysis Plan

A sampling and analysis plan (SW SAP) for quarterly surface water monitoring for WDI is included in Section 32 of the Operating License Application. All sampling and analysis performed pursuant to this application will be consistent with the SW SAP

B5.G SEDIMENTATION BASIN MONITORING PROGRAM

B5.G.1 Sampling and Analysis Plan

A sampling and analysis plan (SB SAP) for annual sedimentation basin monitoring for WDI is included in Section 31 of the Operating License Application. All sampling and analysis performed pursuant to this application will be consistent with the SB SAP

Section 26. Ambient Air Monitoring Plan

SITE 2

WAYNE DISPOSAL, IN C. (WDI)
&
MICHIGAN DISPOSAL WASTE TREATMENT PLANT (MDWTP)

BELLEVILLE, MI

AMBIENT AIR MONITORING PROGRAM

MI ACT 451, Part 111

Rule 299.9611

AMBIENT AIR MONITORING PROGRAM

MI Act 451, Part 111

Rule 299.9611

(Wayne Disposal – attachment #15) (Michigan Disposal – attachment # 14)

INTRODUCTION:

In accordance to the Michigan Department of Environmental Quality (MDEQ), Waste and Hazardous Materials Division (WHMD) Part 111, ambient air monitoring will be conducted as a requirement of the Hazardous Waste License. The ambient air monitoring plan is an attachment to the license and a stand alone document. The ambient air quality will be monitored at six stations around the perimeter of the site. These locations are noted on the attached Figure 1. The ambient air monitoring program described will be used to characterize the air quality associated with both Michigan Disposal Waste Treatment Plant (MID 000724831) and Wayne Disposal, Inc. (MID 048090633) Site #2. All six sites are monitored for Polychlorinated Biphenyls (PCBs) using a polyurethane foam (PUF) sampler, metals using a high volume Total Suspended Particulate (TSP) sampler, and Volatile Organic Compounds (VOCs) using a sorbent tube sampler. Site 9 (82983) is a collocated site that has pairs of each sampling device. The AQD and WHMD recently approved the discontinuation of sampling for PM10 (particulate with a diameter of 10 microns and less). The sampling for all parameters will be conducted in accordance to the methods specified by the United States Environmental Protection Agency (USEPA) in Title 40 of the Code of Federal Regulations (CFR) Parts 50, 53, 58 and the Toxic Organic Compendium Method, TO-17 for solid sorbent tubes. The sampling will be conducted on the prescribed sample days as determined by the (USEPA).

SAMPLING

Sampling for PCB's will be conducted with a high volume PUF sampler. Samples collected from the PUF sampler are analyzed and reported as total PCBs. Sampling for the PCB compounds will be conducted in adherence to the USEPA's Toxic Organic Compendium Methods TO-4A or TO-10A. The PUF samplers will operate every 12th day for a 24 hour period at an air sampling rate of approximately 200 to 280 lpm.

Metal concentrations will be determined from the samples collected in a reference method high volume TSP sampler. The sampling for multi-metals will adhere to the requirements of 40 CFR Part 50, Appendix G for the determination of lead. All sections referenced by Part 50, Appendix G will likewise be followed. Thenalysis will be performed using USEPA Reference Methods for lead and the other metals listed in the attached table to this monitoring plan. Quality control and assurance requirements specified in the method will be incorporated in the sampling protocol. Samples will be collected every 12 days for a twenty-four (24) hour period with a nominal flow rate of 50 cfm ± 10 cfm.

VOC's will be sampled utilizing a system of sorbent tubes capable of effectively collecting the listed compounds in the attached table. A constant flow sampling pump is operated at approximately 0.10 liters per minute (lpm). Samples will be collected at a flow rate adequate to reach the required limits of detection. Sampling will be conducted in adherence to the

USEPA's Toxic Organic Compendium Method, TO-17 for solid sorbent tubes. Sampling will be conducted on an every 12 – day schedule.

QUALITY ASSURANCE

On each run day, samples from the collocated site shall be analyzed and reported to the MDEQ, AQD for the assessment of sampler precision. One sample day per month, one blank sorbent tube and metals filter shall accompany the samples to the collocated site , not have air pulled through it, then submitted to the laboratory as a "trip blanks". All laboratory quality assurance, such as the analysis of blanks and standards, shall be made available to the MDEQ upon request for the determination of accuracy. If any parameter that is analyzed by the laboratory and determined to be non-detectable, the value of the method detection limit for that compound divided by 2 (MDL/2) shall be reported. Staff from the MDEQ AQD and WHMD may audit the ambient air monitoring program, files, and samplers at their discretion.

REPORTING

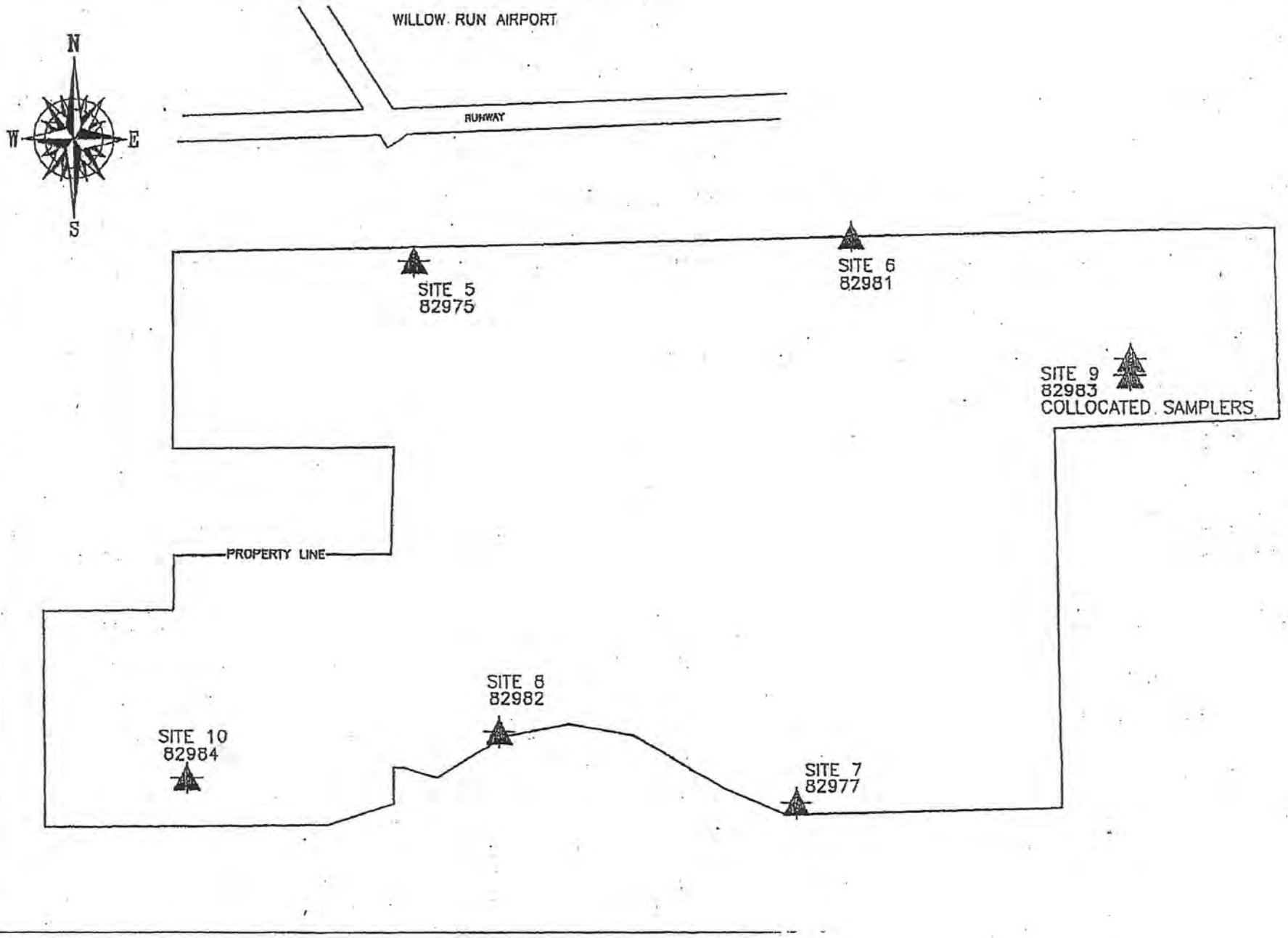
Within 60 days after the end of the month in which it was collected, all ambient air monitoring data will be reported in an acceptable electronic format to the MDEQ, AQD. The facility will keep copies of all ambient air data on-site for at least 3 years. A request can be made to the Chief of the WHMD to modify the monitoring plan if one year of sampling events show non-detectable levels of that parameter. The determination to alter the ambient air monitoring plan shall be made by staff from both the WHMD and the AQD. The final approval letter regarding any changes to the ambient air monitoring plan will be issued by the WHMD.

SITE 2 – AMBIENT AIR - MONITORING PARAMETERS (METALS and PARTICULATES)

COMPOUND	DETECTION LIMIT (ug/m^3)
CADMIUM	0.005
CHROMIUM	0.009
LEAD	0.025

SITE 2 – AMBIENT AIR - MONITORING PARAMETERS (ORGANIC COMPOUNDS)

COMPOUND	DETECTION LIMIT (ug/m^3)
BENZENE	0.04
CARBON TETRACHLORIDE	0.25
CHLOROFORM	0.05
ETHYLBENZENE	1.0
METHYLENE CHLORIDE	1.0
1,1-DICHLOROETHANE	1.0
1,1,1-TRICHLOROETHANE	1.0
TETRACHLOROETHENE	0.1
TRICHLOROETHENE	0.1
TOLUENE	1.0
XYLENE (TOTAL)	1.0
PCBs (TOTAL)	0.02



THE ENVIRONMENTAL QUALITY COMPANY

LOCATION: WAYNE DISPOSAL SITE NO.2 LANDFILL

TITLE: SITE LOCATIONS
MICHIGAN DISPOSAL WASTE TREATMENT PLANT

SCALE: 1" = 800'

DATE: 02/16/01

FILENAME: S2AWCS1

Section 27. Ground Water Monitoring Plan

Section 27

Groundwater Sampling and Analysis Plan
Wayne Disposal Inc.

MID 048 090 633

I. INTRODUCTION

40 CFR, Part 264.97 requires the owner or operator of a hazardous waste facility to develop and follow a consistent program of groundwater sampling and analysis procedures. The program must include procedures and techniques for:

1) sample collection;
2) sample preservation and shipment;
3) analytical procedures; and
4) chain of custody control.

This document has been developed to direct the efforts of Wayne Disposal, Inc.'s (WDI) groundwater monitoring personnel and thereby meet the requirement of the rule referenced above.

II. GENERAL DESCRIPTION

The current groundwater monitoring system for WDI consists of 22 wells, numbered 18, 19R, 20 through 22, 23AR, 24, 25, 26A, 27A, 28 through 30, 31AR, 32, 34A, 35A, 36 through 39 AND 40R. Wells numbered 1A through 17, 26, 27, 31 and 41 through 47 also exist at the site but do not form a part of the groundwater monitoring sampling network for the hazardous waste management area of WDI. Wells OB-21, OB-23R, OB-24, OB 34R and OB-40R are also monitored under the Toxic Substances Control Act (TSCA) per conditions contained in 40CFR 761.75. Well locations are shown on Attachment A.

For Cell VI-F&G, a two-phase monitoring system will be implemented to supplement the current monitoring program. Construction of the MC VI-F&G area is expected to begin with the

Woodlot (MC VI-G Phase 1 and Phase 2) and then proceed into the northernmost cells (MC VI-F, Phase I and Phase 2). During this initial monitoring phase, a line of wells will be established south of the Woodlot (MC VI-G, Phase I and Phase 2, to monitor these cells. As shown on Attachment A, this initial set of wells has been designated as OB-48 through OB-52. -. Observation well W-1, which was installed as part of the hydrogeologic investigation, will be re-designated as OB-48. This initial set of wells will also include four new wells (OB-49, and OB-50 through OB-52). Three wells (OB-50, OB-51 and OB-52) will be installed to monitor the lower sand aquifer and one (OB-49) will be installed to monitor the bedrock. Note that existing wells OB-34A and OB-35A will also serve to monitor the MC VI-F area.

When the next phase of construction begins on the next cell further south (MC VI-G, Phase 3 through 6), the initial wells will be abandoned, and additional wells will be installed (or re-designated) at the downgradient (i.e., south) side of MC 1, which will be incorporated into the Part 111 groundwater monitoring program for MC VI-F&G. This second set of wells will include existing observation well W-10S (to be re-designated as OB-53), existing wells OB-6, OB-8, OB-12R, and OB-13 (to be re-designated as dual Part 111/115 monitoring wells), and four new monitoring wells (OB-54, OB-55, OB-58 and OB-59).

Proposed monitoring wells installed for the initial Phase I monitoring sequencing (OB-50, OB-51, and OB-52) are contingent upon identifying a suitable location along the MC 1 dike which does not go through the MC VI-G liner. Additionally, because the area in which these wells can be installed will be in the way during construction, installation will be completed following construction of the south slope of MC VI-G Phase I.

With the exception of wells OB-50, OB-51 and OB-52, well installation for each of the phase will be completed at least one year prior to the placement of waste so that "background sample collection" can be implemented. For wells OB-50, OB-51, and OB-52, the background sample collection may be completed on an excellerated schedule due to the need to install these wells post construction.

Copies of the well logs for all of WDI's wells are included in Attachment B. As new wells are added or abandoned, Attachment A and Attachment B must updated and the updates submitted to the MDEQ.

III. LABORATORY

Analyses of samples from the wells are conducted by a contract laboratory, TriMatrix Laboratories, Inc. (TriMatrix) of Grand Rapids, MI. Analytical arrangements and sample bottle preparation can be ordered in advance by calling TriMatrix. Request all analyses when calling for bottles so the laboratory personnel can properly prepare the containers.
If WDI decides to contract analysis of groundwater samples to another laboratory, the change will be made only after at least two concurrent sampling/analysis events show adequate correlation of analysis results of the existing and proposed contract laboratories.

IV. REQUIRED DOCUMENTATION

Documentation required for this monitoring program include:
a) A field notebook must be utilized to record all pertinent field data and sampling information during every sampling event. This must include the name(s) of sampling personnel, sample date, sample time, sample location, depth to standing water in the well, calculations for determining the volume of water to be purged from the well prior to sampling, results of any field measurements on groundwater samples and observations of sample characteristics or the sampling environment. Any odors, colors, sheens or other unusual characteristics of the samples must be described in detail. Copies of these field data notes must be included in reports sent to MDEQ.

b) During each sampling event, a Monitoring Well Inspection/Damage Report must be filled out and sent to the QEHS Department. A copy of this form is included as Attachment C-2. This

report must be filled out to note any conditions of the monitoring wells or surrounding area that needs maintenance or repairs.

c) An equipment inventory, repair and calibration log is maintained in the Engineering field office. This log is used to list the inventory (by serial number) of all sampling apparatus and field measurement devices. Any changes of equipment or repairs to equipment must be noted in this log, as well as daily instrument calibrations, etc.

d) Also required for the sampling process are standard chain of custody forms from TriMatrix. A sample copy of this record is included herein as Attachment C-1. This sheet must be filled out fully for each sample submitted for analysis as described in Section X.

V. STANDING WATER LEVEL MEASUREMENTS

The sampling schedule for the uppermost aquifer wells is generally arranged such that the wells are sampled the month immediately following that in which Wells 1A through 17 are sampled. To obtain the best picture of static water levels for the site, 1) the levels must be obtained for all wells listed on Attachment E before any water is removed for purging or sampling, and 2) the levels must be obtained for all wells in as short a time as possible on the same day, due to barometric pressure effects. This means that static water levels for the wells are generally determined at least 30 days in advance of their sampling. This is the only case where purging and sampling does not immediately follow the water level observations.

The depth to standing water within the well casing is measured from the top of casing (TOC). The top of the well casing is exposed by removing the white plastic Well Wizard™ well heads. The surveyed point on the casing is always at the edge on the north side of the casing. Additionally, there is a permanent mark on the north side of the casing which marks the edge from which water levels are to be taken. The TOC elevations shall be surveyed at least once every two years to verify accuracy. Removal of the well head is necessary for determination of

the standing water level. The depth to water is measured using an electric water level indicator. Attachment D describes the operating procedures for the water level indicator, which is used for this purpose.

When using the water level indicator, make certain that the probe and submersed portion of the cable are cleaned with distilled water and a clean cloth, followed by a distilled water rinse. This prevents cross contamination between wells. Lower the probe into the casing slowly while watching for the light. Carefully determine the water level by raising and lowering the probe at the water surface, and monitoring the light and buzzer. Record the distance from the point on the cable at TOC to the nearest marking on the cable within the well casing. The markings on the cable are scaled in 0.01 foot intervals. Record the measurement to the nearest 0.01 foot. The depth to standing water is then the distance from the probe tip at the water level to the marking on the cable. Record this depth in the field notebook.

VI. WELL PURGING

Before purging a well, it is necessary to determine the quantity of water contained within the well casing. This is done by subtracting the depth to standing water from the depth to the well screen. The depth to standing water must be determined just prior to beginning sample collection. The depth to the well screen for each existing well is listed on Attachment E. The difference between screen depth and water level depth is the height of water standing within the well. Multiply this height of water by 0.17 gallons per foot (for 2 inch diameter well casing). Multiply that product by 3, the number of standing volumes to be purged, which is the minimum recommended by MDEQ. The resultant product is the total quantity to be purged from the well, in gallons. Once again,

Amt. purged (in gallons) = (Ht. of standing water) x 0.17 x 3

Record these calculations in the field notebook.

The depth to the well screen should be confirmed every four years by removing the dedicated pump assemblies and lowering the water level indicator probe to the very bottom of the well casing for a determination of the clear depth of the well (make sure that the indicator cable is cleaned between each well). In addition, well depths should be checked if a change in well yield or sample appearance (i.e. turbidity) is noted. It is very important to ensure that the pump and tubing are kept clean when removed from the well (i.e. do not place equipment on ground, rather, wrap in plastic sheeting).

Once three standing well volumes have been removed, measure and record the pH and specific conductance of the water coming from the well. Continue to record these values at a rate of once every 10 minutes. After three values of pH and specific conductance have been obtained in this manner, compare the highest and lowest values. If the difference between the highest and lowest pH value is 0.07 su or less, then the well is considered stabilized with respect to pH. If the difference between the highest and lowest specific conductance values is 18 μmhos/cm or less, then well stabilization with respect to this parameter is considered complete. If the difference between the highest and lowest values for either parameter exceeds this criteria, pump the well another 10 minutes and recheck both parameters. Perform the comparison again, using only the last three monitored values of pH and specific conductance. Once the criteria are satisfied for any three consecutive monitored values of both pH and specific conductance, then consider the well fully stabilized and proceed with sampling. Measure and record well water temperature at this time as well. Record in the field notebook all the data obtained to establish well stabilization. In the cases where an individual well cannot be purged to stabilization in a manner described above because the well becomes fully dewatered, then sample the well after completely dewatering (evacuating) the well four times. For each sampling event, the second, third and fourth well evacuations should be performed within three days of the previous well evacuation. Sampling should be accomplished as soon after the fourth well evacuation as possible, depending upon the rate at which the water level in the well recovers. Measure and record pH, specific conductance and temperature in the field at the time the sample is obtained from such a well. Fully record in the field notebook all instances of well evacuation.

At Site II, we employ the "Well Wizard"™ system of dedicated pumps. This means that each well has a submersible pump within it, generally located at the well screen. The control unit and cylinders of compressed nitrogen are the other components that complete this system. Because sampling immediately follows the purging step in nearly all cases, the sampling box is always included during well purging. The sample box is discussed in greater detail in the Sample Collection portion of this document.

Prior to a sampling round for the wells, replace the sampling box discharge tube. To set up the Well Wizard™ system for operation, connect the nitrogen cylinder hose to the supply port on the controller unit. Connect one end of the coiled tubing within the controller unit to the Drive Air Out port on the unit, and the other end to the smaller of the two ports on the well head assembly. Connect the water sample line from the larger of the two well head ports to the back of the sampling box. Make certain that the valve on the rear of the box directs flow out of the box and through the discharge tube, until well purging is completed.

To initiate purging, begin the flow of nitrogen from the cylinder. Measure the quantity of water purged from the well using the graduated 3 gallon bucket kept with this equipment. Note that all purged water should be discharged on the ground away from the well. Do not allow the purged water to re-enter the well or the well protective casing nor should you allow ponding of the water around the well. Further background on Well Wizard™ operation can be gained by referring to Attachment F. Report any problems with equipment function to the Regulatory Affairs Department.

VII. SAMPLE COLLECTION

Upon completion of the well purging step, or upon return to a well which has been evacuated four times for purging, you are ready to take samples. Make sure each sample bottle for a given monitoring well has a label (affixed by the analytical laboratory personnel) which contains our

facility name, the monitoring well number, the date and the sampler's initials. If a preservative has been included by the laboratory, such a note should appear on the label.

In the past sampling programs, it has been shown that airborne artifacts from disposal operations and engine exhaust can affect the number of detected constituents and their concentrations within groundwater samples. For this reason, a controlled-atmosphere sampling box was constructed for use in the collection of groundwater samples. Nitrogen, under positive pressure, is used as the sampling atmosphere within the box, thereby minimizing the probability of impacts to sample quality by airborne artifacts. All groundwater samples taken from WDI wells using dedicated pumps shall be taken within the sampling box.

In preparation for sampling, connect the nitrogen cylinder to the sampling box and purge the box atmosphere with nitrogen for 20 to 30 minutes. Make certain that all sample bottles to be used at a given location are placed within the box prior to purging the box atmosphere. Remove the caps from the bottles during the purging process to expose the interior of the bottles to the nitrogen environment. A new laboratory grade tygon tube connecting the wellhead to the sampling box must be used for the collection of samples from each location. When all is ready, turn the valve on the rear of the sampling box, diverting the flow of water from the discharge tube to the sampling tube within the box.

Samples for volatile organic compounds will be filled first. No headspace is permitted in the small glass vials. This may require several attempts but it can and must be done. Make certain not to touch the inside of bottle necks or caps with your hands. Next, fill the bottles for total organic carbon, total phenolics, metals and then other miscellaneous parameters, in this order. Fill each sample bottle to the very top and allow minimal headspace (air bubbles when capped and tipped) and take care not to spill any of the preservatives. Record the number and type of samples taken and the time of sampling on the chain of custody record.

Trip blanks (VOC vials filled with laboratory "clean" water) shall accompany the sample containers every day that samples are collected. A trip blank is provided by the laboratory for

each batch of sample bottles (usually one for each cooler). These remain unopened throughout the sampling day and are submitted with the sample bottles. A field blank shall also be collected at each well sampled. A field blank is an empty (except for preservative) VOC vial that is opened in the nitrogen sampling box and filled with laboratory provided "clean" water while that well is being sampled. The purpose is to replicate the sampling environment in all ways except for the source of water in the container. Both kinds of blanks should be preserved, handled and shipped exactly as the well samples are. All of the trip blanks and a minimum of one field blank for each ten samples will be analyzed on a random basis for the primary parameters. However, if a positive result for any primary parameter is noted in a given well, the matching field blanks will immediately be analyzed for the offending parameter(s). A complete replicate sample shall be obtained from one well, chosen randomly, during each sampling round and will be analyzed for the same parameters as the sample it replicates.

VIII. SAMPLE PRESERVATION AND SHIPMENT

Attachment G is a tabulation of sample preservation procedures for TriMatrix. The samples must be preserved in accordance with the procedures outlined in this attachment. For all samples the laboratory provides clean, pre-preserved bottles (where necessary). Samples to be analyzed for dissolved metals must be field filtered with a 0.45 μm in-line filter cartridge and preserved with a couple of drops of reagent grade HNO_3 to a pH of less than 2. If the samples cannot be field filtered for any reason they must be filtered and preserved immediately upon delivery to the laboratory.

When the sample collection step is completed, open the sampling box, transfer all sample bottles to a cooler and pack the cooler with ice. Make sure that after each well sampling is completed that the tubing for the sampling box, is replaced with new tubing and the chain of custody record is completed.

All collected samples and blanks must be stored in a secure location until delivery to the contract laboratory personnel. This means within site of sampling personnel or locked in a secure location. Chain of custody records must accompany the samples at all times. The handling of these forms is covered in the Chain of Custody Control portion of this document.

IX. ANALYTICAL PROCEDURES

The parameters to be tested for as part of the monitoring program for the uppermost aquifer wells are shown in Attachment H.

Specific analytical procedures and target detection limits, consistent with the current WHMD Operational Memo Gen-8, and used by TriMatrix for this monitoring program are tabulated in Attachment I. However, when changes to analytical methods or to the detection limits contained within MDEQ WHMD Operational Memo Gen-8 are published and made available, the contents of Attachment I must be updated accordingly. Further, this attachment should be reviewed periodically to determine if the laboratory has made changes that should be reflected in the attachment. QA/QC frequencies, and precision and accuracy calculations are included in Trimatrix's QA/QC manual. Changes made to detection limits, analytical methods or QA/QC in response to regulatory requirements can be utilized in this monitoring program without changing the plan, but must be included in updated sampling and analysis plans.

Field measurements of specific conductance, pH and temperature will be performed using the equipment and procedures described in Attachment J. The instruments must be calibrated prior to each day of use and the appropriate notation made in the Equipment Inventory, Repair and Calibration Log described in Section IV.

TriMatrix's Quality Assurance Manual is included as Attachment K. This manual describes the internal policies, guidelines and procedures of TriMatrix. This manual is not intended to describe the specific details of this particular monitoring program. Rather, we are to use this

document as a guideline in evaluating TriMatrix's QA/QC and standard operating procedures to ensure that generally acceptable practices are employed.

X. CHAIN OF CUSTODY CONTROL

Chain of Custody refers to the record of individuals and external conditions of sample handling through the time of laboratory analysis. The chain of custody record included as Attachment C is the principal document of this record. These sheets must be fully filled in with sampling information as well as the persons involved and shipment conditions during transport to the analytical laboratory. These sheets must accompany the samples to the laboratory.

When the samples are surrendered at the laboratory, each chain of custody record must be signed by the person transporting the samples as well as a representative of the receiving laboratory. The lab will make a copy of each sheet for us and keep the originals. The copy must be maintained in the files. Upon completion of a full round of sampling, transmit depth to standing water information, field monitoring data and all chain of custody records to the EQ Quality Environmental Health & Safety (QEHS) Department.

XI. EQUIPMENT AND WELL MAINTENANCE

Equipment used for the collection and analysis of groundwater samples must be maintained in working order and replaced or repaired promptly when necessary. Electrodes for pH and specific conductance should be replaced annually, or sooner if they become difficult to calibrate or appear to malfunction. The dedicated Well Wizard™ pumps and associated equipment require no routine maintenance but should be promptly replaced or repaired in the event of a malfunction. Any pump removed from a well should be thoroughly cleaned before replacement. Tubing removed from the well should be packaged and stored to prevent contamination or replaced. As outlined in Section IV, records of instrument calibration and any equipment replacement or repair must be kept in the Equipment Log maintained at the Engineering field office.

The well casings, protective covers, and Well Wizard™ pump heads should be inspected for damage at the time of each well sampling. Any damage should be noted in the field notebook and a Monitoring Well Inspection/Damage Report must be filled out and sent to the Regulatory Affairs Department. A copy of this form is included as Attachment C-2. Also note any surface erosion, standing water at the well or evidence of a damaged grout seal around the well.

In the event any damage requiring well repair becomes necessary, a Damage Incident Report will be prepared by the QEHS Department. A copy of this report will be placed in the site Operating Log and the Groundwater Monitoring Operating Log. A proposed method of well repair will be prepared and submitted to the MDEQ for approval. Repair efforts will be undertaken after approval by the MDEQ is received. The MDEQ shall then be notified at least 24 hours prior to initiating the repair efforts. Following completion of the well repairs, as-built documentation of the repair efforts will be prepared. A copy of this will be placed in the site Operating Log and the Groundwater Monitoring Operating Log. A copy will also be sent to the MDEQ.

XII. Statistical Evaluation and Reporting Requirements

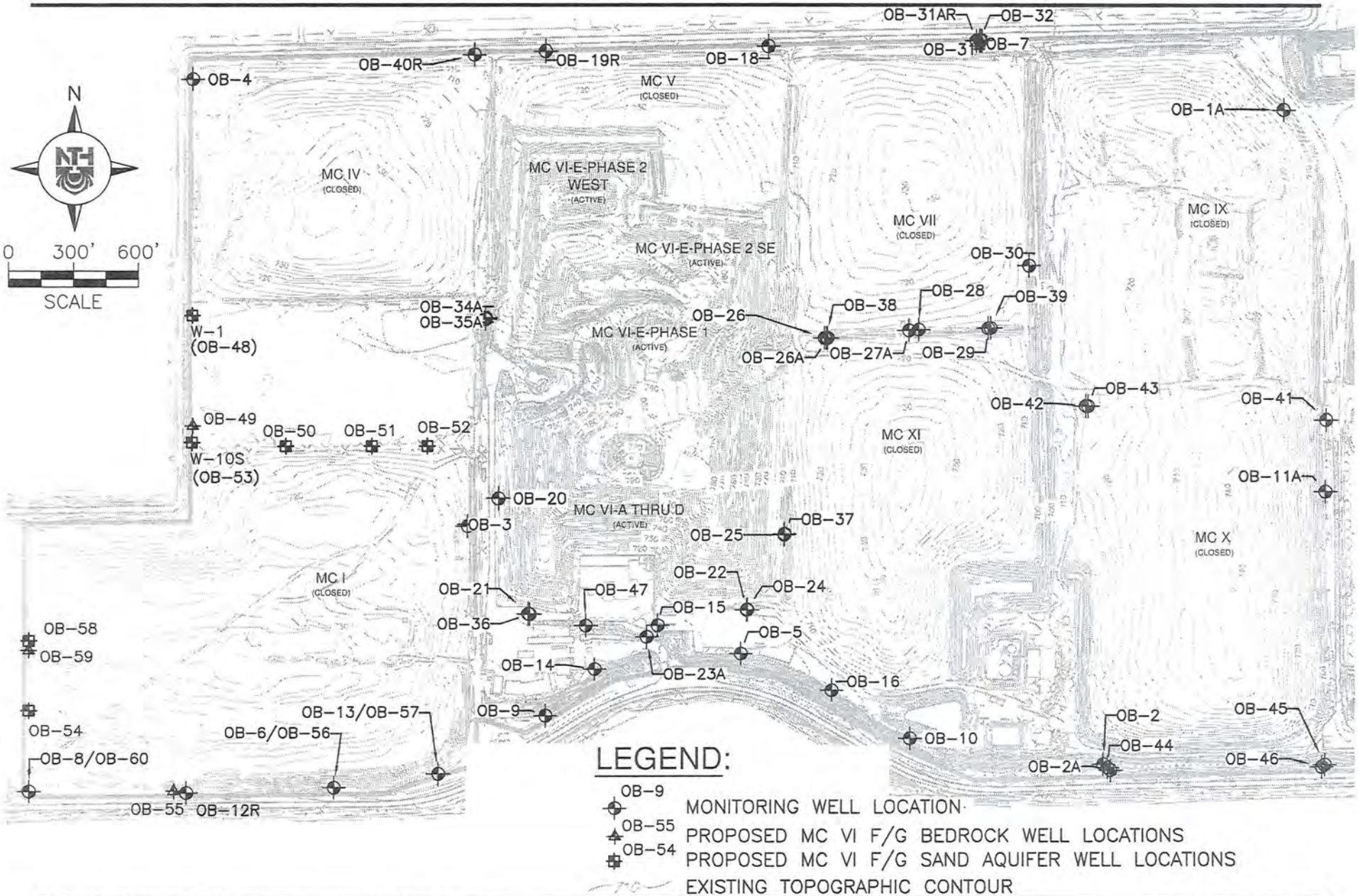
All ground water analyses for the uppermost aquifer wells must be analyzed for evidence of statistically significant increases in concentrations of all primary and secondary monitoring parameters as described in Attachment L

The analytical reports, the records of the field procedures and a report of the statistical analyses (narrative and tubular) must be submitted to the MDEQ within 60 days after each calendar quarter. This report will also include a summary of the review of QA/QC data, a narrative of the sampling event including dates and sampling personnel, and a description of any unusual events or conditions encountered. Copies of the analysis and report must be maintained in designated files at the administration office at the site. In addition, an annual report summarizing the results of groundwater monitoring results and which evaluates groundwater flow directions and rates for the uppermost aquifer must be submitted to MDEQ by March 1 of the following year.

Attachment A

Well Location Map

(Site II - WDI/MDWTP)



NTH PROJECT No.: 13060921-06	DESIGNED BY: DLP	CHECKED BY: DLP	DRAWING SCALE: AS SHOWN	NTH Consultants, Ltd. Infrastructure Engineering and Environmental Services	WAYNE DISPOSAL, INC. SITE NO. 2	GROUNDWATER MONITORING WELL LOCATION MAP	ATTACHMENT: A
CAD FILE NAME: 060921-WLM	DRAWN BY: KRO	INCEPTION DATE: 11/16/09	PLOT DATE: 10/4/2011		VAN BUREN TWP., WAYNE COUNTY, MICHIGAN		

J:\62\62080376\Production Sets\Env\WLM\060921-WLM.dwg

Attachment B

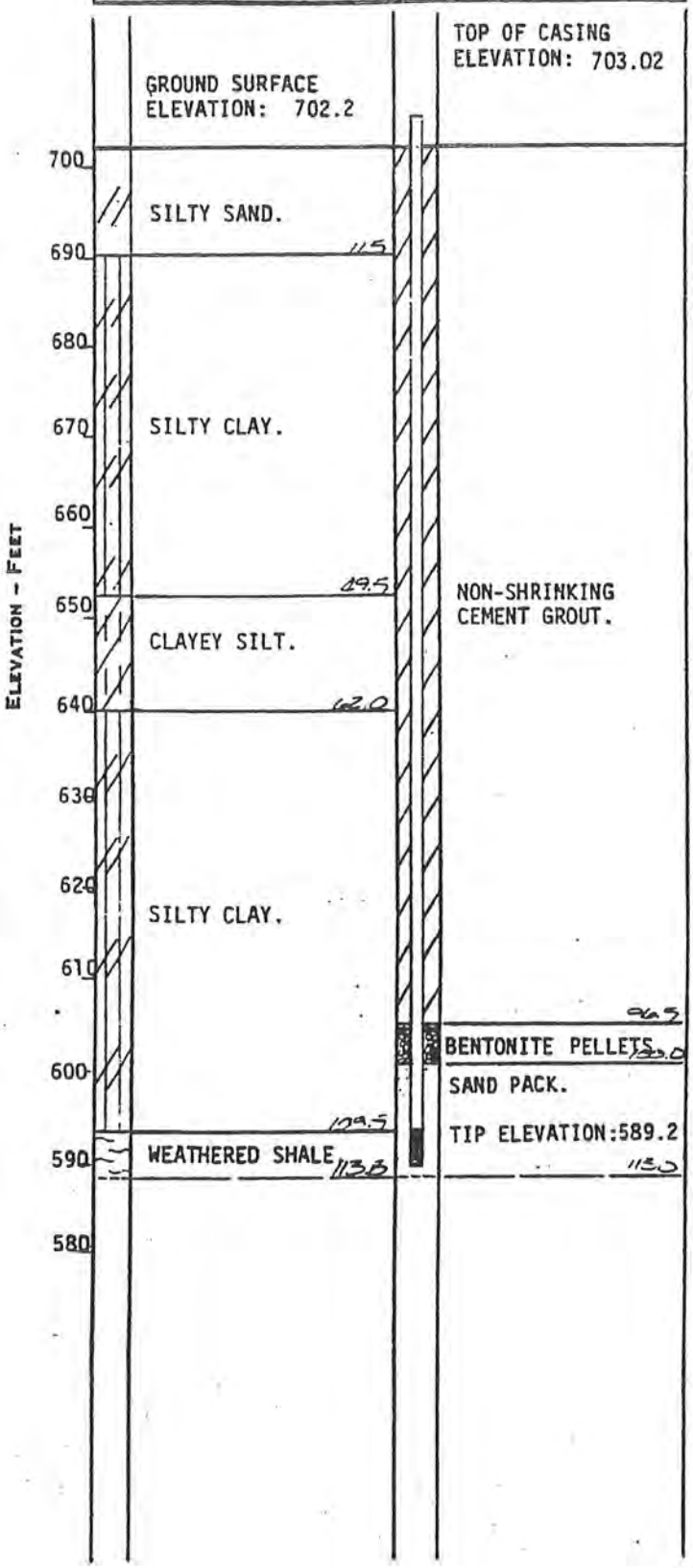
WDI Ground Water Monitoring Well Logs

(WDI)

LOG OF GROUNDWATER MONITORING WELL

CLASSIFICATIONS BY:
NEYER, TISEO & HINDO, LTD.

GENERALIZED SUBSURFACE PROFILE | WELL SCHEMATIC



GROUNDWATER DATA

DATE	GROUND-WATER ELEV. (FEET)	COMMENTS
9-24-84	654.69	
10-22-84	653.22	

CASING – DIAMETER: 2.0"
– LENGTH: 108.0'
– MATERIAL: PVC

SCREEN – DIAMETER: 2.0"
– LENGTH: 5.0"
– MESH: .006" slot
– MATERIAL: PVC

WELL STARTED: 9-11-84
WELL COMPLETED: 9-11-84
INSPECTOR: J. Serwik
DRILLER: J. Blank
CONTRACTOR: American Drilling
EQUIPMENT: CME-75

NOTES:
1. For details of the subsurface strata see Log of Test Boring No. OB-18.
2. Top of casing elevations and ground surface elevations provided by Wayne Disposal, Inc.

NEYER, TISEO & HINDO, LTD.
CONSULTING ENGINEERS

GROUNDWATER MONITORING WELL NO. OB-18

WAYNE DISPOSAL LANDFILL SITE NO. 2

NTH Consultants, Ltd.

MONITORING WELL NO. OB-19R

Project Name: WAYNE DISPOSAL LANDFILL - SITE NO. 2 — NTH Proj. No: 13-3051 01

Project Location: VAN BUREN TWP., WAYNE COUNTY, MICHIGAN — Checked By: ACE

LOG OF MONITORING WELL

Generalized Subsurface Profile

ELEV. (FT) | PROFILE | GROUND SURFACE ELEVATION: 706.1

705, 700, 695, 690, 685, 680, 675, 670, 665, 660, 655, 650, 645, 640, 635, 630, 625, 620, 615, 610, 605, 600, 595, 590, 585

- SILTY MEDIUM SAND — 7.5
- SILTY SAND — 14.8
- SILTY CLAY — 62.0
- SILTY CLAY — 69.0
- CLAYEY SILT — 87.0
- SILTY CLAY — 92.5
- SILT — 97.0
- SANDY CLAY — 101.0
- SILT — 107.5
- BEDROCK: WEATHERED SHALE — 121.0
- END OF BORING

Installation Schematic

TOP OF WELL CASING ELEVATION: 709.12

- "PURE GOLD" GROUT — 103.5
- HYDRATED BENTONITE PELLETS — 107.5
- SAND — 121.0

TIP ELEVATION: 585.6

GROUNDWATER DATA

Date	Ground-water Elev. (ft)	Comments
12/01/94	654.50	Before Development

NOTES:

[1] FOR DETAILS OF SUBSURFACE STRATA FROM 0-90', SEE LOG OF TEST BORING OB-19; FOR 90-121', SEE LOG OF TEST BORING OB-19R

[2] TOP OF CASING & GROUND SURFACE ELEVATIONS PROVIDED BY WAYNE DISPOSAL, INC

[3] WELL LOCATION: 8873.2 N, 5324.4 E

Started: 11/22/94
Completed: 11/22/94
Inspector: R. LEE
Driller: G. QUALLS
Contractor: GEO-TEK, INC.
Equipment: CME-850 ALL-TERRAIN DRILL RIG
Well Type: MONITORING

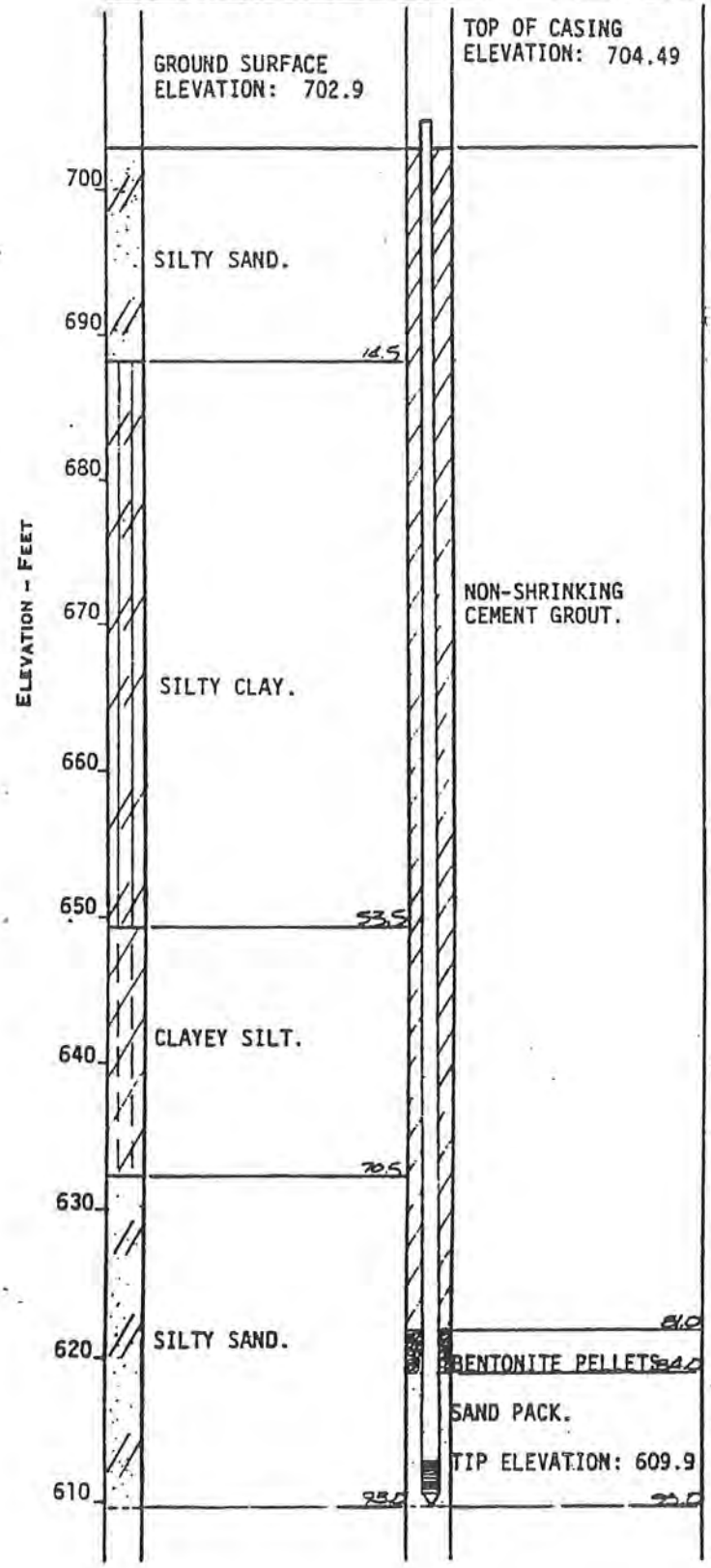
Casing Diameter: 2.0"
Casing Length: 118.0'
Casing Type: STAINLESS STEEL
Screen Diameter: 2.0"
Screen Length: 5.0'
Screen Mesh: 0.010"
Screen Type: STAINLESS STEEL

Figure No. A-2

LOG OF GROUNDWATER MONITORING WELL

CLASSIFICATIONS BY:
NEYER, TISEO & HINDO, LTD.

GENERALIZED SUBSURFACE PROFILE	WELL SCHEMATIC



GROUNDWATER DATA

DATE	GROUND-WATER ELEV. (FEET)	COMMENTS
9-12-84	653.24	
9-24-84	653.13	

CASING - DIAMETER: 2.0"
- LENGTH: 90.0'
- MATERIAL: Galvanized

SCREEN - DIAMETER: 2.0"
- LENGTH: 3.0'
- MESH: .007" slot
- MATERIAL: Stainless Steel

WELL STARTED: 8-1-84
WELL COMPLETED: 8-2-84
INSPECTOR: J. Serwik
DRILLER: J. Blank
CONTRACTOR: American Drilling
EQUIPMENT: CME-75

NOTES:
1. For details of the subsurface stra see Log of Test Boring No. OB-20.
2. Top of casing elevations and groun surface elevations provided by Way Disposal, Inc.

NEYER, TISEO & HINDO, LTD.
CONSULTING ENGINEERS

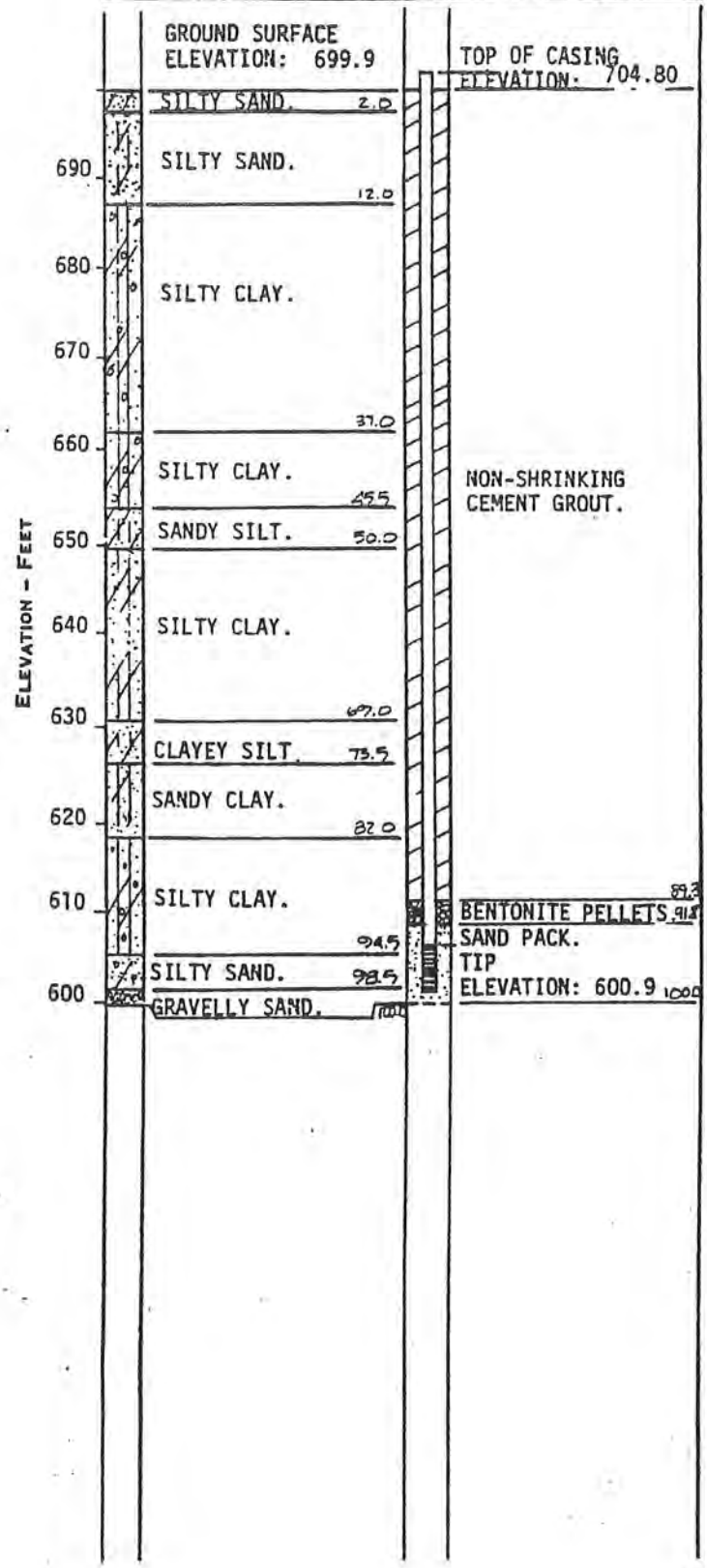
GROUNDWATER MONITORING WELL No. OB-20

WAYNE DISPOSAL LANDFILL SITE NO. 2
VAN BUREN TOWNSHIP

LOG OF GROUNDWATER MONITORING WELL

CLASSIFICATIONS BY:
NEYER, TISEO & HINDO, LTD.

GENERALIZED SUBSURFACE PROFILE	WELL SCHEMATIC



GROUNDWATER DATA

DATE	GROUND-WATER ELEV. (FEET)	COMMENTS
9-12-84	652.64	
9-24-84	652.64	
10-22-84	652.44	

CASING	- DIAMETER:	2.0"
	- LENGTH:	94.0'
	- MATERIAL:	PVC
SCREEN	- DIAMETER:	2.0"
	- LENGTH:	5.0'
	- MESH:	.006" slot
	- MATERIAL:	PVC

WELL STARTED: 7-23-84
WELL COMPLETED: 7-24-84
INSPECTOR: J. Serwik
DRILLER: J. Blank
CONTRACTOR: American Drilling
EQUIPMENT: CME-75

NOTES:
1. For details of the subsurface strat see Log of Test Boring No. OB-21.
2. Top casing elevations and ground surface elevations provided by Wayn Disposal, Inc.

NEYER, TISEO & HINDO, LTD.
CONSULTING ENGINEERS

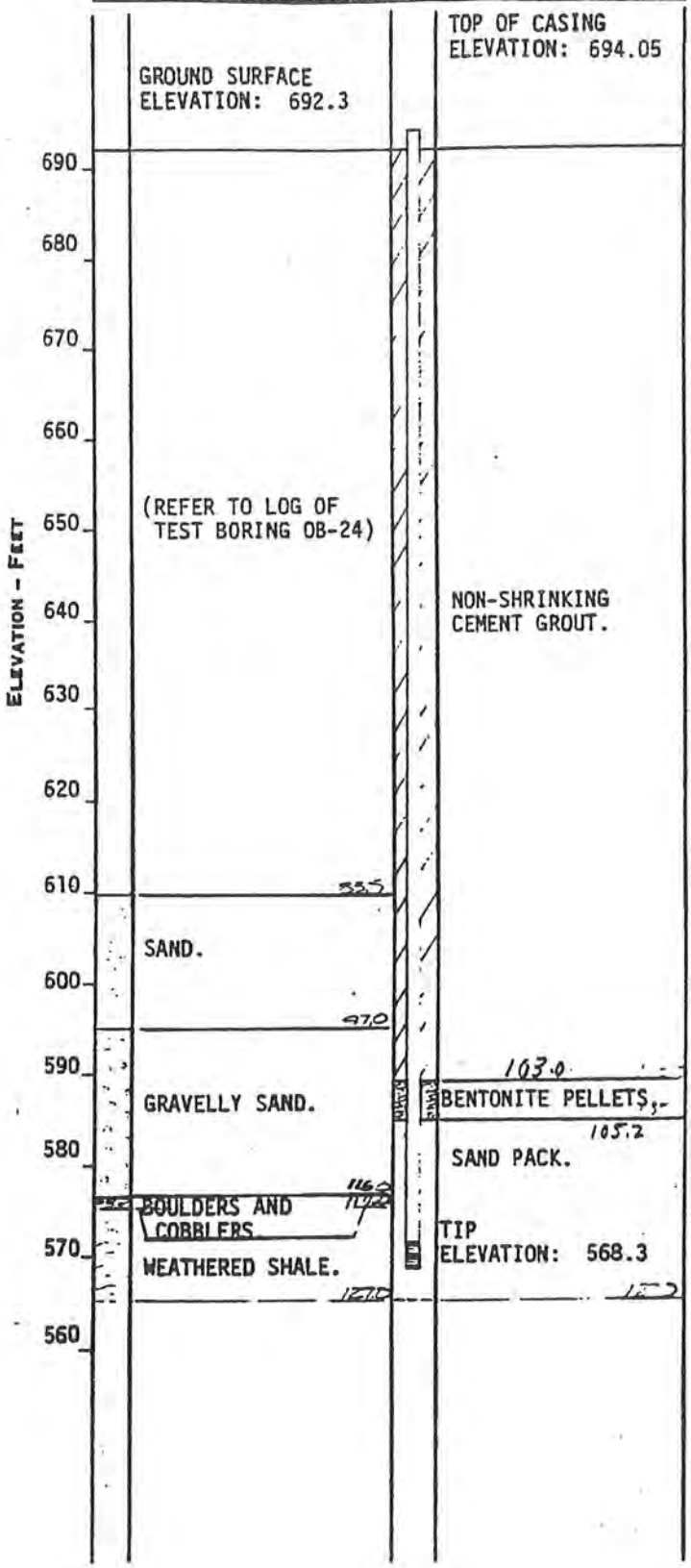
GROUNDWATER MONITORING WELL NO. OB-21

WAYNE DISPOSAL LANDFILL SITE NO. 2
VAN BUREN TOWNSHIP

LOG OF GROUNDWATER MONITORING WELL

CLASSIFICATIONS BY:
NEYER, TISEO & HINDO, LTD.

GENERALIZED SUBSURFACE PROFILE	WELL SCHEMATIC



GROUNDWATER DATA

DATE	GROUND-WATER ELEV. (FEET)	COMMENTS
9-24-84	654.24	
10-22-84	653.32	

CASING - DIAMETER: 2.0"
- LENGTH: 119.0
- MATERIAL: PVC

SCREEN - DIAMETER: 2.0"
- LENGTH: 5.0'
- MESH: .006" slot
- MATERIAL: PVC

WELL STARTED: 9-14-84
WELL COMPLETED: 9-14-84
INSPECTOR: J. Serwik
DRILLER: J. Blank
CONTRACTOR: American
EQUIPMENT: CME-75

NOTES:
1. For details of the subsurface strat see Log of Test Boring No. OB-22.
2. Top of casing elevations and grounc surface elevations provided by Wayr Disposal, Inc.

NEYER, TISEO & HINDO, LTD.
CONSULTING ENGINEERS

GROUNDWATER MONITORING WELL No. OB-22

WAYNE DISPOSAL LANDFILL SITE NO. 2
VAN BUREN TOWNSHIP
WAYNE COUNTY, MICHIGAN

Project No:

Project: Well Re-Location

Client: Wayne Disposal, Inc.

Location: Site No. 2 Belleville, MI

Well ID: OB-23A

Enclosure:

Engineer: M. Takacs

SUBSURFACE PROFILE				Well Construction	Remarks
Depth	Symbol	Description	Depth/Elev		
0		Ground Surface	0		
5		***sand:*** fine gray, silty with trace gravel and clay	700		
10			12		
15		***Clay:*** gray, silty with trace sand and gravel	688		
20					
25					
30					
35					
40					
45					
50					Casing 2" Stainless Steel
55					
60					
65					
70					
75					
80					
85					
90					
95			95		
100		***Sand:*** gray, medium to coarse with trace gravel	605		
105					
110					Annular Space pH neutral grout
115					
120					Screen 5 foot 2" diameter
125		***Shale:*** gray, weathered	125		Stainless Steel 7 Slot
130			571		

Drilled By: American Drilling

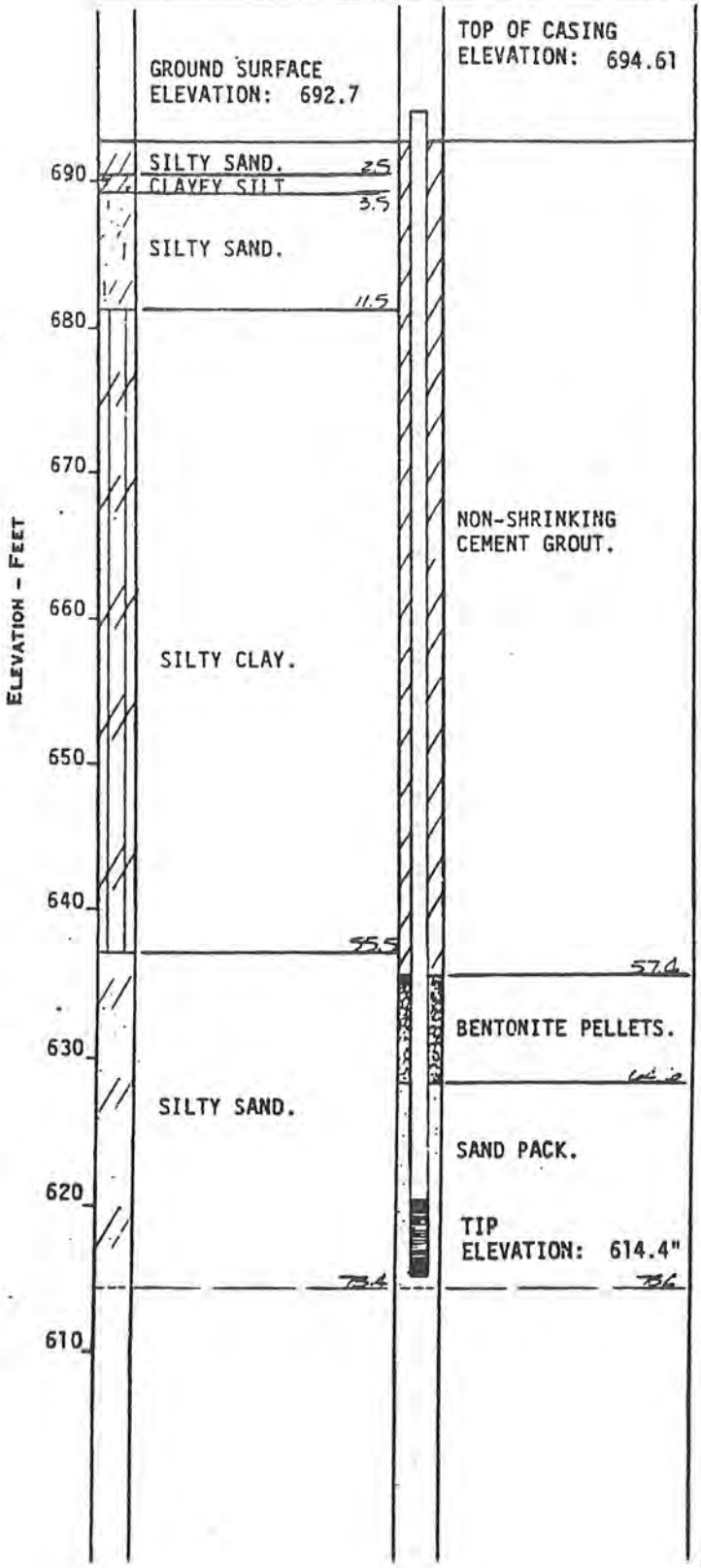
Drill Method: 6.25 inch HSA to EOB

Sheet: 1 of 1

LOG OF GROUNDWATER MONITORING WELL

CLASSIFICATIONS BY:
NEYER, TISEO & HINDO, LTD.

GENERALIZED SUBSURFACE PROFILE	WELL SCHEMATIC



GROUNDWATER DATA

DATE	GROUND-WATER ELEV. (FEET)	COMMENTS
9-12-84	653.62	
9-24-84	653.67	
10-22-84	653.30	

CASING	- DIAMETER:	2.0"
	- LENGTH:	73.3'
	- MATERIAL:	PVC
SCREEN	- DIAMETER:	2.0"
	- LENGTH:	5.0'
	- MESH:	.006" slot
	- MATERIAL:	PVC

WELL STARTED:	7-24-84
WELL COMPLETED:	7-24-84
INSPECTOR:	J. Serwik
DRILLER:	J. Blank
CONTRACTOR:	American Drilling
EQUIPMENT:	CME-75

NOTES:
1. For details of the subsurface strat see Log of Test Boring No. OB-24.
2. Top of casing elevations and ground surface elevations provided by Wayn Disposal, Inc.

NEYER, TISEO & HINDO, LTD.
CONSULTING ENGINEERS

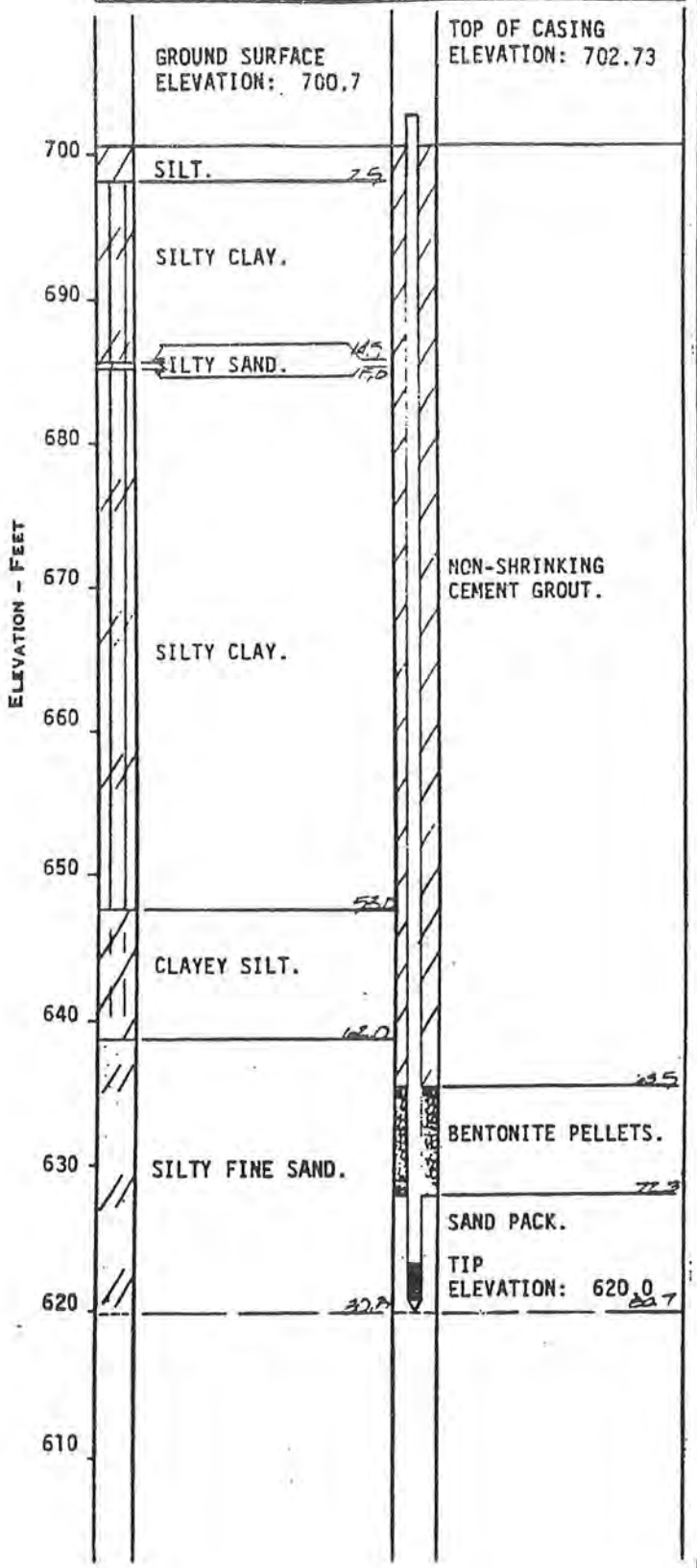
GROUNDWATER MONITORING WELL No. OB-24

WAYNE DISPOSAL LANDFILL SITE NO. 2
VAN BUREN TOWNSHIP

LOG OF GROUNDWATER MONITORING WELL

CLASSIFICATIONS BY:
NEYER, TISEO & HINDO, LTD.

GENERALIZED SUBSURFACE PROFILE	WELL SCHEMATIC



GROUNDWATER DATA

DATE	GROUND-WATER ELEV. (FEET)	COMMENTS
9-12-84	653.50	
9-24-84	653.86	
10-22-84	653.51	

CASING - DIAMETER: 2.0"
- LENGTH: 77.7
- MATERIAL: Galvanized

SCREEN - DIAMETER: 2.0"
- LENGTH: 3.0'
- MESH: .007" slot
- MATERIAL: Stainless Steel

WELL STARTED: 8-25-84
WELL COMPLETED: 8-25-84
INSPECTOR: J. Serwik
DRILLER: J. Blank
CONTRACTOR: American Drilling
EQUIPMENT: CME-75

NOTES:
1. For details of the subsurface strat. see Log of Test Boring No. OB-25.
2. Top of casing elevations and ground surface elevations provided by Wayne Disposal, Inc.

NEYER, TISEO & HINDO, LTD.
CONSULTING ENGINEERS

GROUNDWATER MONITORING WELL No. OB-25

WAYNE DISPOSAL LANDFILL SITE NO. 2
VAN BUREN TOWNSHIP
WAYNE COUNTY MICHIGAN

NEYER, TISEO & HINDO, LTD.

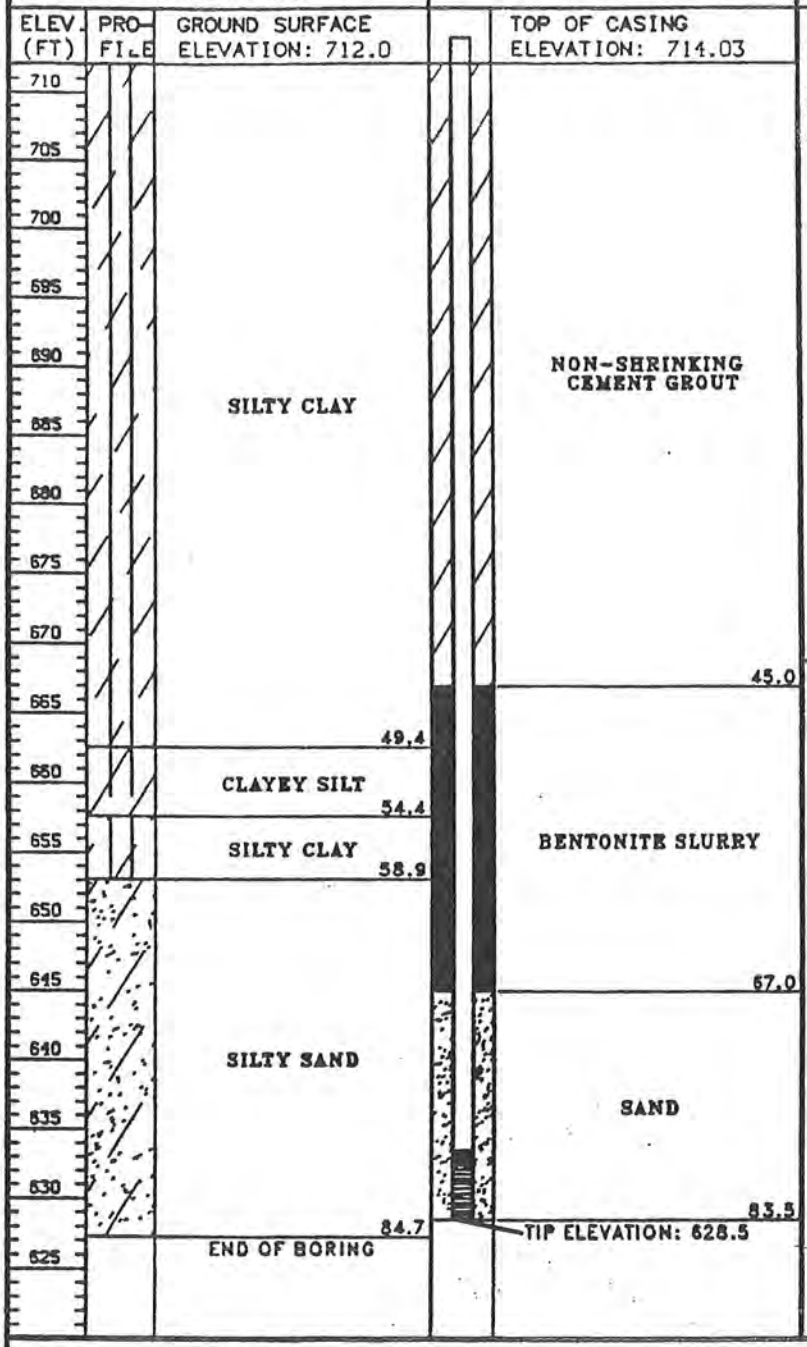
MONITOR WELL NO. OB-26A

Project Name: WAYNE DISPOSAL LANDFILL – SITE NO. 2
Project Location: VAN BUREN TWP., WAYNE COUNTY, MICHIGAN

NTH Pro. No. 94315 OW
Chk. By: RLB

LOG OF MONITOR INSTALLATION

Generalized Subsurface Profile | Schematic



GROUNDWATER DATA

Date	Ground-water Elev. (ft)	Comments
9/23/87	650.69	
9/24/87	650.62	
9/25/87	650.42	
9/28/87	650.58	

NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATA, SEE LOG OF TEST BORING NO. OB-26
[2] TOP OF CASING AND GROUND SURFACE ELEVATIONS PROVIDED BY WAYNE DISPOSAL, INC.

Started: 9/18/87
Completed: 9/21/87
Inspector: R. BURNS
Driller: S REMPALSKI
Contractor: MATECO DRILLING COMPANY
Equipment: CME-550
Observation Type: MONITORING WELL

Casing Diam.: 2"
Casing Length: 80.5'
Casing Type: 60.5' GALV. / 20' SS
Screen Diam.: 2"
Screen Length: 5'
Screen Mesh: 0.01"
Screen Type: STAINLESS STEEL

Figure No. 9

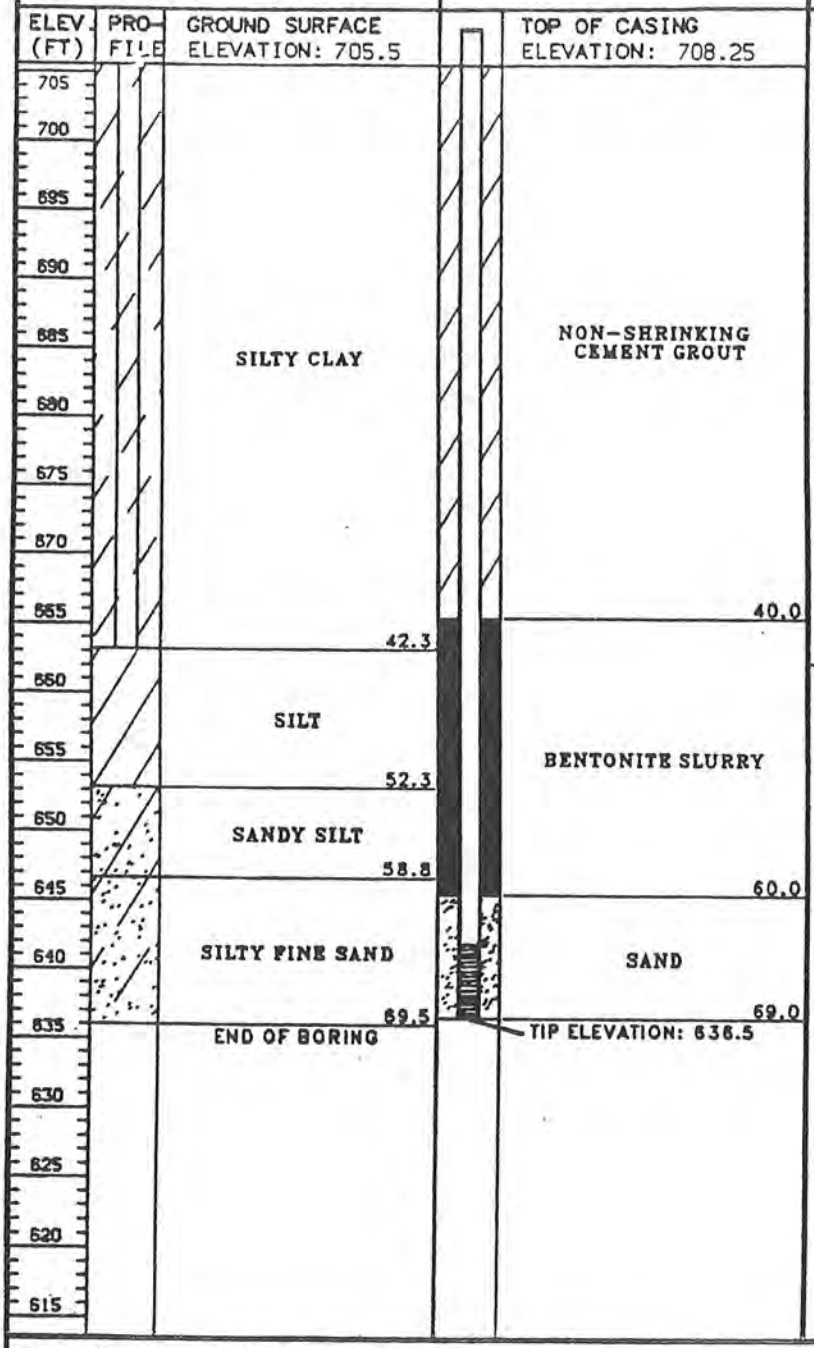
NEYER, TISEO & HINDO, LTD.

MONITOR WELL NO. OB-27A

Project Name: WAYNE DISPOSAL LANDFILL – SITE NO. 2 — NTH Pro. No. 94315 OW
Project Location: VAN BUREN TWP., WAYNE COUNTY, MICHIGAN — Chk. By: RLB

LOG OF MONITOR INSTALLATION

Generalized Subsurface Profile — Schematic



GROUNDWATER DATA

Date	Ground-water Elev. (ft)	Comments
10/7/87	658.75	
10/23/87	650.49	

NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATA, SEE LOG OF TEST BORING NO. OB-27
[2] TOP OF CASING AND GROUND SURFACE ELEVATIONS PROVIDED BY WAYNE DISPOSAL, INC.

Started: 10/5/87
Completed: 10/5/87
Inspector: R. BURNS
Driller: S. REMPALSKI
Contractor: MATECO DRILLING COMPANY
Equipment: CME-550
Observation Type: MONITORING WELL

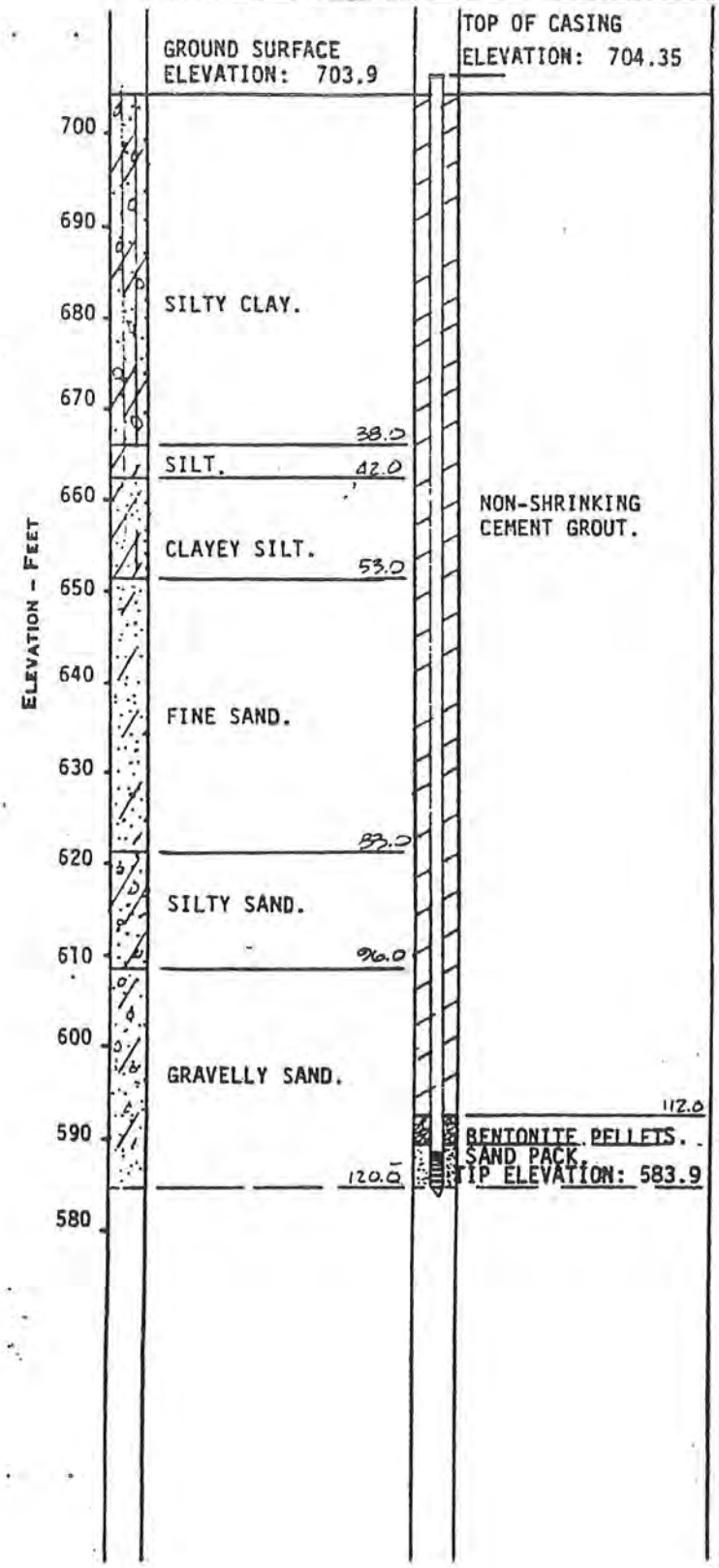
Casing Diam.: 2"
Casing Length: 67'
Casing Type: 47' GALV. / 20' SS
Screen Diam.: 2"
Screen Length: 5'
Screen Mesh: 0.01"
Screen Type: STAINLESS STEEL

Figure No. 10

LOG OF GROUNDWATER MONITORING WELL

CLASSIFICATIONS BY:
NEYER, TISEO & HINDO, LTD.

GENERALIZED SUBSURFACE PROFILE	WELL SCHEMATIC



GROUNDWATER DATA

DATE	GROUND-WATER ELEV. (FEET)	COMMENTS
9-12-84	653.60	
9-24-84	653.69	
10-22-84	653.54	

CASING - DIAMETER: 2.0"
- LENGTH: 117.0
- MATERIAL: Galvanized

SCREEN - DIAMETER: 2.0"
- LENGTH: 3.0'
- MESH: .007" slot
- MATERIAL: Stainless Steel

WELL STARTED: 8-13-84
WELL COMPLETED: 8-14-84
INSPECTOR: J. Serwik
DRILLER: J. Blank
CONTRACTOR: American Drilling
EQUIPMENT: CME-75

NOTES:
1. For details of the subsurface stra see Log of Test Boring No. 28.
2. Top of casing elevations and grour surface elevations provided by Way Disposal, Inc.

115?

NEYER, TISEO & HINDO, LTD.
CONSULTING ENGINEERS

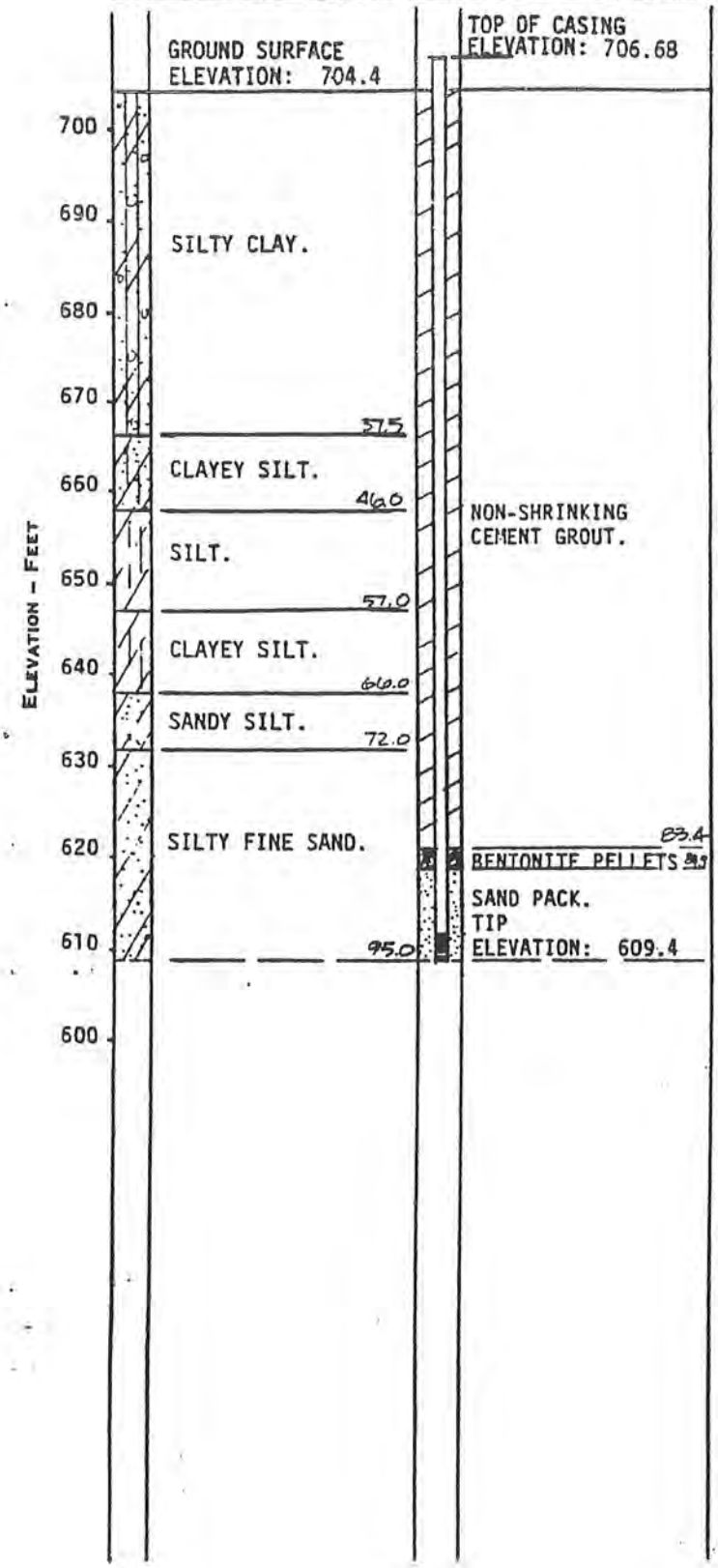
GROUNDWATER MONITORING WELL NO. DB-28

WAYNE DISPOSAL LANDFILL SITE NO. 2
VAN BUREN TOWNSHIP
WAYNE COUNTY, MICHIGAN

LOG OF GROUNDWATER MONITORING WELL

CLASSIFICATIONS BY:
NEYER, TISEO & HINDO, LTD.

GENERALIZED SUBSURFACE PROFILE	WELL SCHEMATIC



GROUNDWATER DATA

DATE	GROUND-WATER ELEV. (FEET)	COMMENTS
9-12-84	653.61	
9-24-84	653.63	
10-22-84	653.36	

CASING - DIAMETER: 2.0"
- LENGTH: 90.0'
- MATERIAL: PVC

SCREEN - DIAMETER: 2.0"
- LENGTH: 5.0'
- MESH: .006" slot
- MATERIAL: PVC

WELL STARTED: 7-30-84
WELL COMPLETED: 7-30-84
INSPECTOR: J. Serwik
DRILLER: J. Blank
CONTRACTOR: American Drilling
EQUIPMENT: CME-75

NOTES:
1. For details of the subsurface stra see Log of Test Boring No. OB-29.
2. Top of casing elevations and grour surface elevations provided by Way Disposal, Inc.

NEYER, TISEO & HINDO, LTD.
CONSULTING ENGINEERS

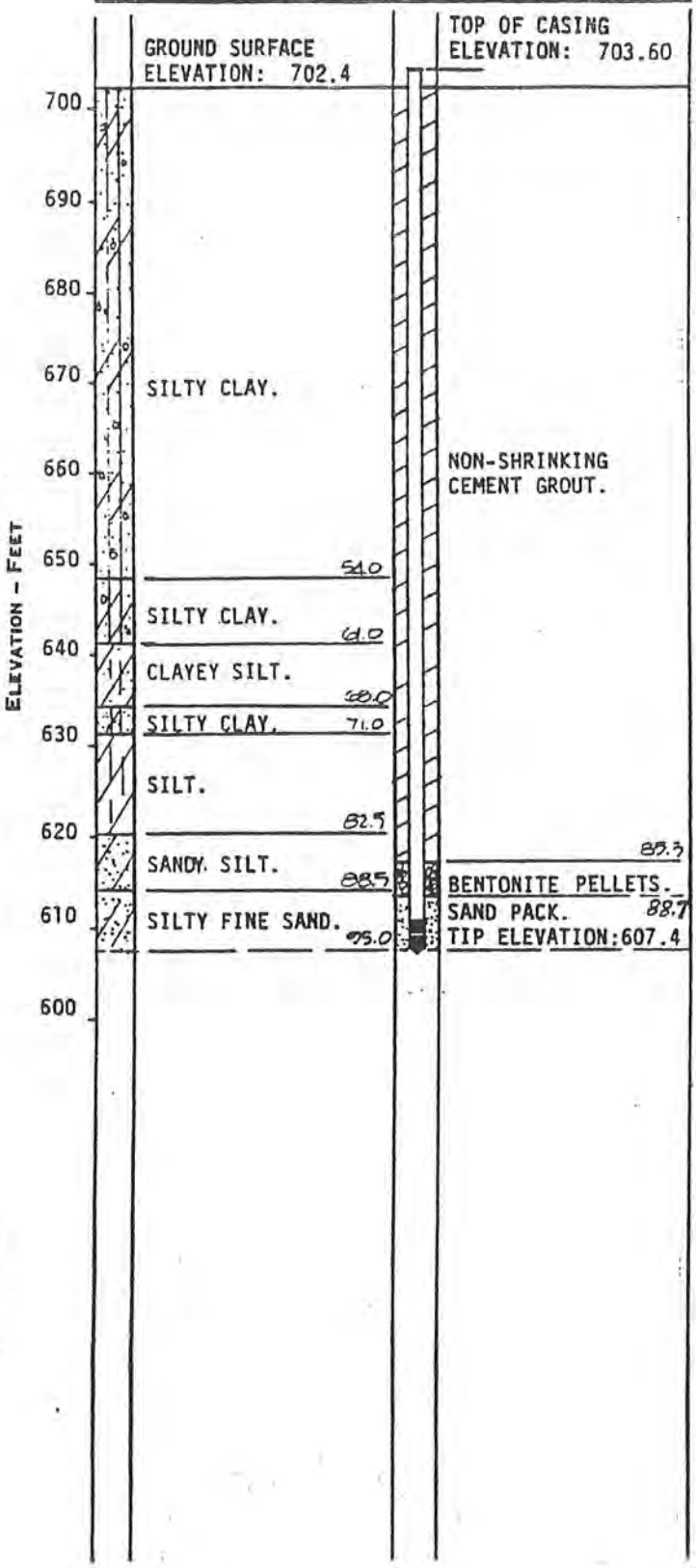
GROUNDWATER MONITORING WELL No. OB-29

WAYNE DISPOSAL LANDFILL SITE NO. 2
VAN BUREN TOWNSHIP
WAYNE COUNTY, MICHIGAN

LOG OF GROUNDWATER MONITORING WELL

CLASSIFICATIONS BY:
NEYER, TISEO & HINDO, LTD.

GENERALIZED SUBSURFACE PROFILE	WELL SCHEMATIC



GROUNDWATER DATA

DATE	GROUND-WATER ELEV. (FEET)	COMMENTS
9-12-84	653.61	
9-24-84	653.81	
10-22-84	653.38	

CASING - DIAMETER: 2.0"
- LENGTH: 92.0'
- MATERIAL: Galvanized

SCREEN - DIAMETER: 2.0"
- LENGTH: 3.0'
- MESH: .007" slot
- MATERIAL: Stainless Steel

WELL STARTED: 8-29-84
WELL COMPLETED: 8-29-84
INSPECTOR: J. Serwik
DRILLER: J. Blank
CONTRACTOR: American Drilling
EQUIPMENT: CME-75

NOTES:
1. For details of the subsurface stra see Log of Test Boring No. OB-30.
2. Top of casing elevations and grour surface elevations provided by Way Disposal, Inc.

NEYER, TISEO & HINDO, LTD.
CONSULTING ENGINEERS

GROUNDWATER MONITORING WELL No. OB-30

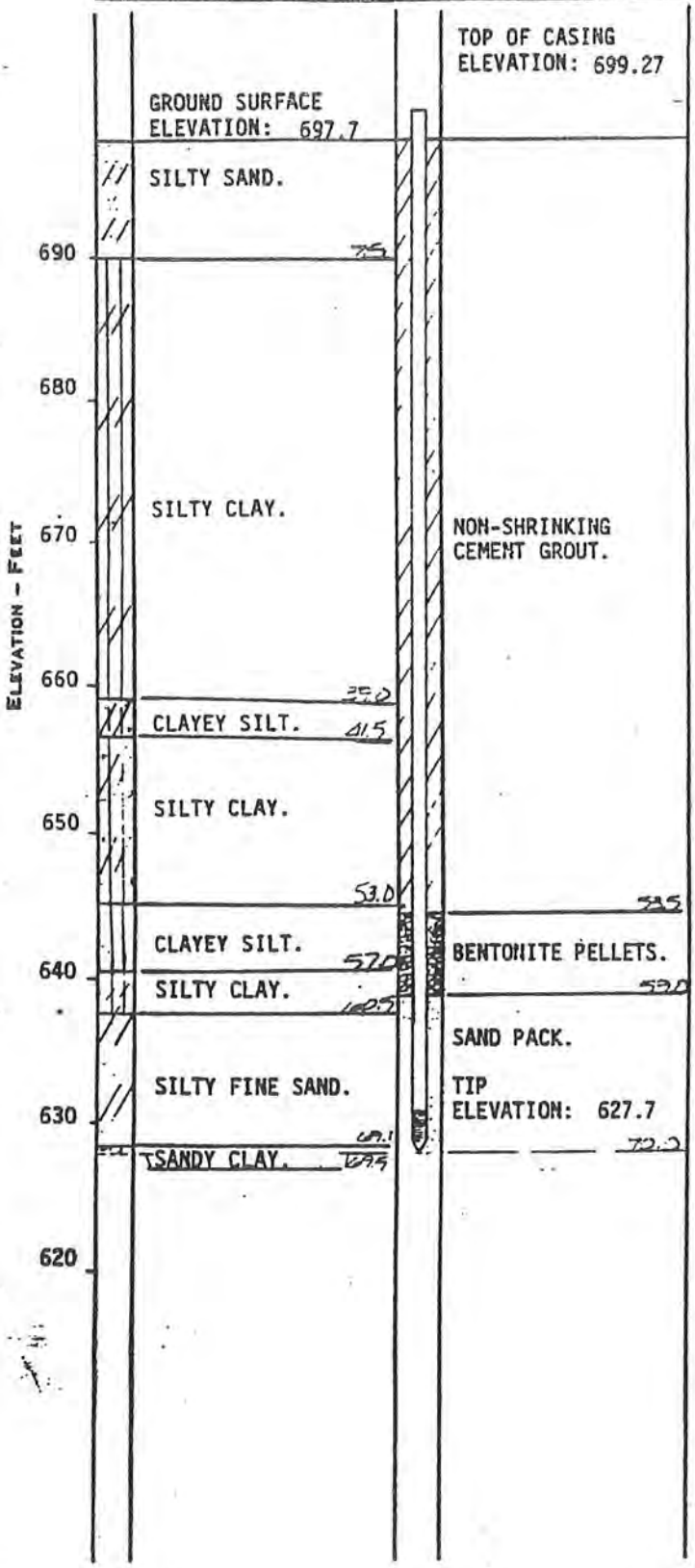
WAYNE DISPOSAL LANDFILL SITE NO. 2
VAN BUREN TOWNSHIP
WAYNE COUNTY, MICHIGAN

APPROVED BY: MRS | DATE: 10-8-84

LOG OF GROUNDWATER MONITORING WELL

CLASSIFICATIONS BY:
NEYER, TISEO & HINDO, LTD.

GENERALIZED SUBSURFACE PROFILE	WELL SCHEMATIC



GROUNDWATER DATA

DATE	GROUND-WATER ELEV. (FEET)	COMMENTS
9-24-84	655.60	
10-22-84	655.25	

CASING - DIAMETER: 2.0"
- LENGTH: 67.0'
- MATERIAL: Galvanized

SCREEN - DIAMETER: 2.0"
- LENGTH: 3.0'
- MESH: .007" slot
- MATERIAL: Stainless Steel

WELL STARTED: 9-18-84
WELL COMPLETED: 9-18-84
INSPECTOR: J. Serwik
DRILLER: J. Blank
CONTRACTOR: American Drilling
EQUIPMENT: CME-75

NOTES:
1. For details of the subsurface strat. see Log of Test Boring No. OB-31.
2. Top of casing elevations and ground surface elevations provided by Wayne Disposal, Inc.

NEYER, TISEO & HINDO, LTD.
CONSULTING ENGINEERS

GROUNDWATER MONITORING WELL No. OB-31

WAYNE DISPOSAL LANDFILL SITE NO. 2
VAN BUREN TOWNSHIP
WAYNE COUNTY, MICHIGAN

NTH Consultants, Ltd.

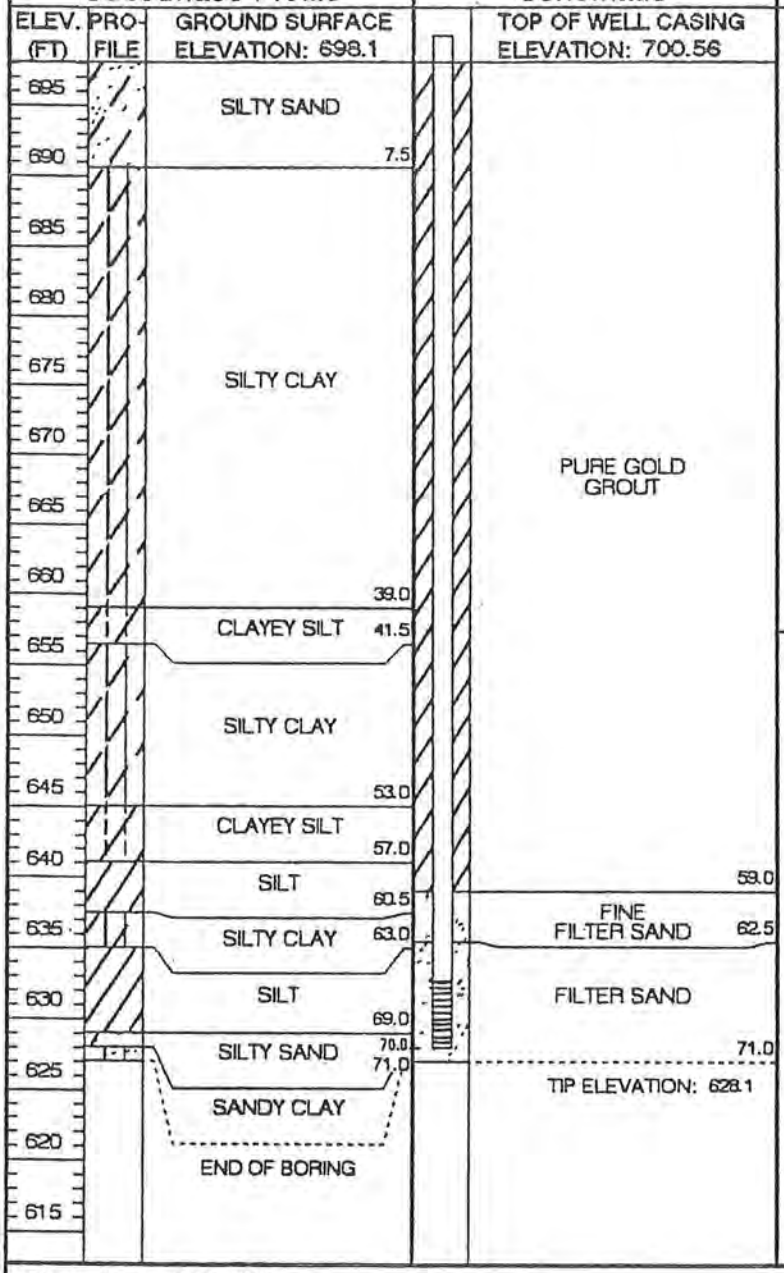
MONITORING WELL NO. OB-31AR

Project Name : WAYNE DISPOSAL, INC. - SITE NO. 2 — NTH Proj. No: 13-3051 00

Project Location : VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN — Checked By : ACE

LOG OF MONITORING WELL

Generalized Subsurface Profile — Installation Schematic



GROUNDWATER DATA

Date	Ground-water Elev. (ft)	Comments
02/03/93	653.91	BEFORE DEVELOPMENT
02/09/93	656.36	BEFORE DEVELOPMENT
02/25/93	656.19	

NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATA, SEE LOG OF TEST BORING NO. OB-31AR.

[2] TOP OF CASING & GROUND SURFACE ELEVATIONS PROVIDED BY WAYNE DISPOSAL, INC.

[3] WELL INSTALLED TO REPLACE MONITORING WELL NO. OB-31A.

[4] CENTRALIZERS WERE USED TO MAINTAIN THE VERTICALITY OF THE WELL ASSEMBLY IN THE BOREHOLE.

FIELD MEASUREMENTS DURING DRILLING:

pH: 8.53
SPEC. COND: 361 µmhos/cm

FIELD MEASUREMENTS AFTER DEVELOPMENT:

pH: 8.21
SPEC. COND: 309 µmhos/cm

Started: 02/02/93
Completed: 02/03/93
Inspector: C. ENDLER
Driller: G. QUALLS
Contractor: GEO-TEK, INC.
Equipment: CME-750 ALL-TERRAIN DRILLING RIG
Well Type: MONITORING

Casing Diameter: 2.0"
Casing Length: 67.5'
Casing Type: STAINLESS STEEL
Screen Diameter: 2.0"
Screen Length: 5.0'
Screen Mesh: 0.007"
Screen Type: STAINLESS STEEL

Figure No. A-4

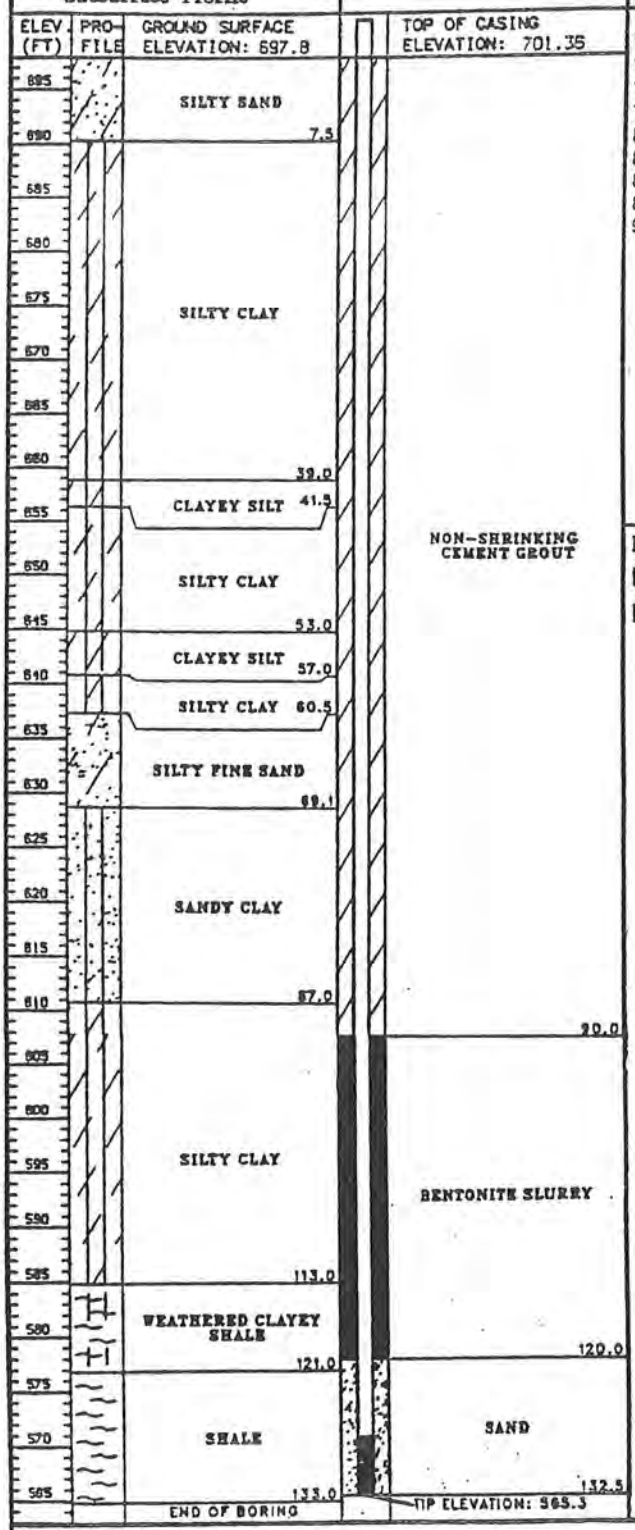
NEYER, TISEO & HINDO, LTD.

MONITOR WELL NO. OB-32

Project Name: WAYNE DISPOSAL LANDFILL - SITE NO. 2 — NTH Pro. No. 94315 OW
Project Location: VAN BUREN TWP., WAYNE COUNTY, MICHIGAN — Chk. By: RLB

LOG OF MONITOR INSTALLATION

Generalized Subsurface Profile — Schematic



GROUNDWATER DATA

Date	Ground-water Elev. (ft)	Comments
7/23/87	655.70	
7/28/87	651.35	
7/29/87	651.25	
7/31/87	651.15	
8/18/87	651.00	
8/21/87	650.72	
8/25/87	650.77	
8/31/87	651.10	
9/4/87	650.78	

NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATA, SEE LOG OF TEST BORING NO. OB-32.
[2] TOP OF CASING AND GROUND SURFACE ELEVATIONS PROVIDED BY WAYNE DISPOSAL, INC.

Started: 7/21/87
Completed: 7/21/87
Inspector: R. BURNS / M. TAKACS
Driller: S. REMPALSKI
Contractor: MATECO DRILLING COMPANY
Equipment: CME-550
Observation Type: MONITORING WELL

Casing Diam.: 2"
Casing Length: 127'
Casing Type: 107.5' GALV. / 20' SS
Screen Diam.: 2"
Screen Length: 5'
Screen Mesh: 0.007"
Screen Type: STAINLESS STEEL

Figure No. 12

MONITORING WELL NO: OB-34A

NTH CONSULTANTS, LTD.

Project Name: *WAYNE DISPOSAL, INC.*

Project Location: *BELLEVILLE, MICHIGAN*

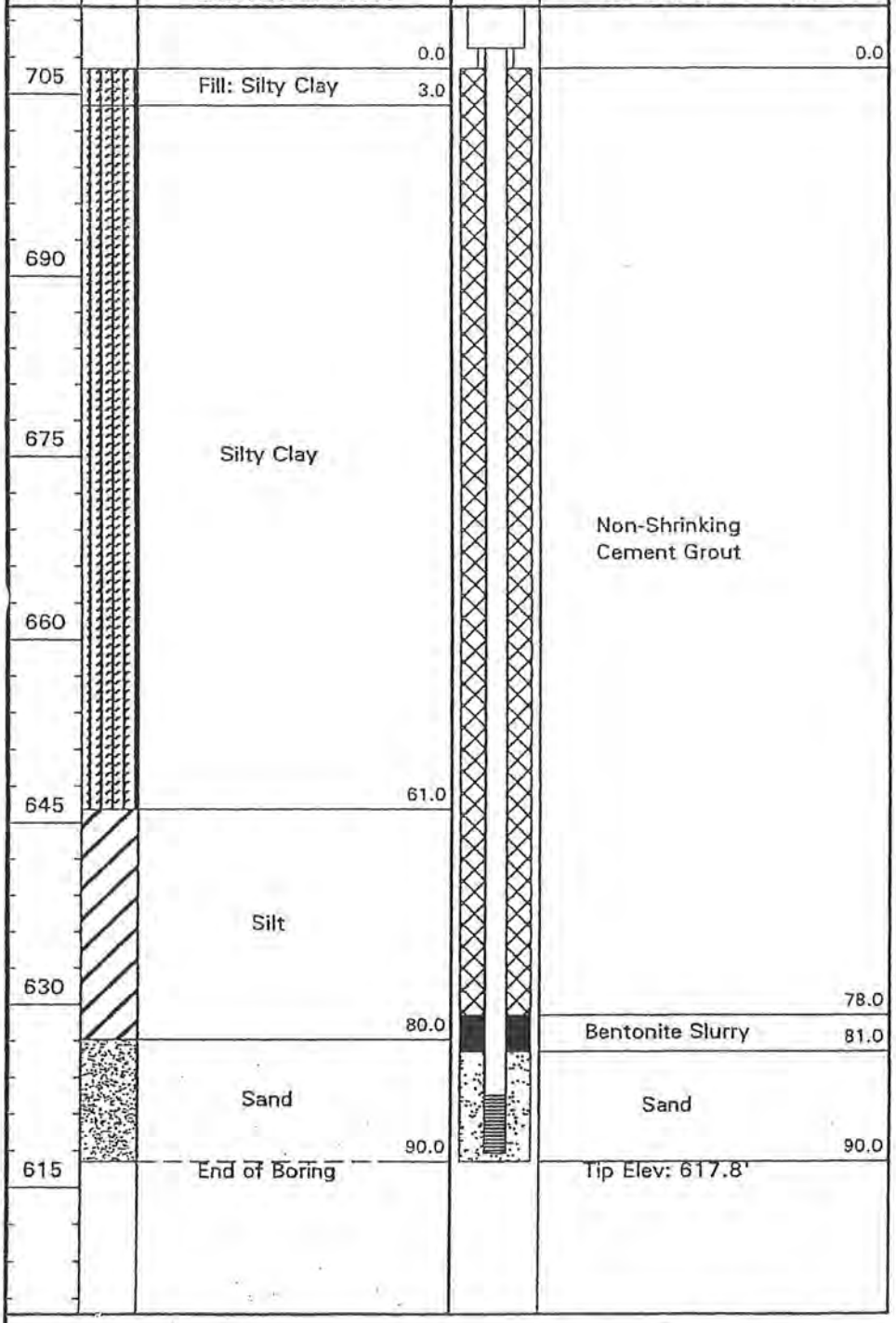
NTH Proj. No: *13-020395-01*

Checked By: RBM

LOG OF MONITORING WELL

Generalized Subsurface Profile | Installation Schematic

ELEV. (FT) | PRO-FILE | GROUND SURFACE ELEVATION: 707.1 | WELL DETAIL | TOP OF WELL CASING ELEVATION: 712.05



GROUNDWATER DATA

DATE	ELEV. (ft.)	COMMENTS
06-24-03	n/a	due to use of drilling fluids

NOTES

[1] For details of subsurface strata, see Log of Test Boring OB-34A.

Started:	*06/23/03*	Casing Diameter:	*2.0 in*
Completed:	*06/24/03*	Casing Length:	*89.25 ft*
Inspector:	*K. Warning*	Casing Type:	*Stainless Steel*
Contractor:	*American Drilling & Testing Co.*	Screen Diameter:	*2.0 in*
Driller:	*R. Rumptz / H. Pace*	Screen Length:	*5.0 ft*
Equipment:	*CME-750 & CME-550*	Screen Mesh:	*0.007 in*
Well Type:	*Monitoring*	Screen Type:	*Stainless Steel*

FIGURE NO.

MONITORING WELL NO: OB-35A

NTH CONSULTANTS, LTD.

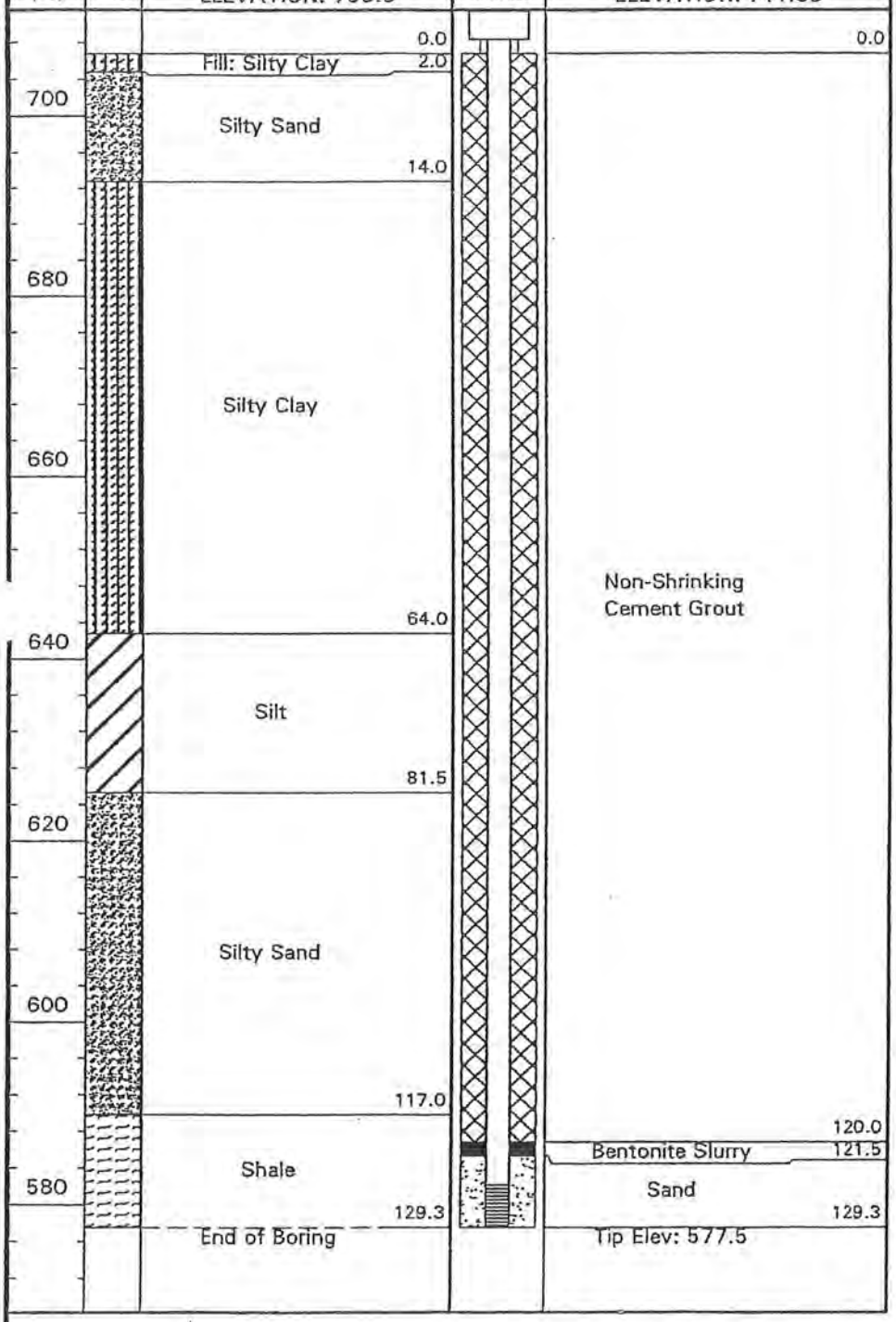
Project Name: *WAYNE DISPOSAL, INC.*

Project Location: *BELLEVILLE, MICHIGAN*

NTH Proj. No: *13-020395-01*

Checked By: RBM

LOG OF MONITORING WELL



GROUNDWATER DATA

DATE	ELEV. (ft.)	COMMENTS
06-24-03	n/a	due to use of drilling fluids

NOTES

[1] For details of subsurface strata, see Log of Test Boring OB-35A.

Started:	*06/19/03*	Casing Diameter:	*2.0 in*
Completed:	*06/20/03*	Casing Length:	*128.89 ft*
Inspector:	*K. Warning*	Casing Type:	*Stainless Steel*
Contractor:	*American Drilling & Testing Co.*	Screen Diameter:	*2.0 in*
Driller:	*R. Rumptz / H. Pace*	Screen Length:	*5.0 ft*
Equipment:	*CME-750 & CME-550*	Screen Mesh:	*0.007 in*
Well Type:	*Monitoring*	Screen Type:	*Stainless Steel*

FIGURE NO.

NEYER, TISEO & HINDO, LTD.

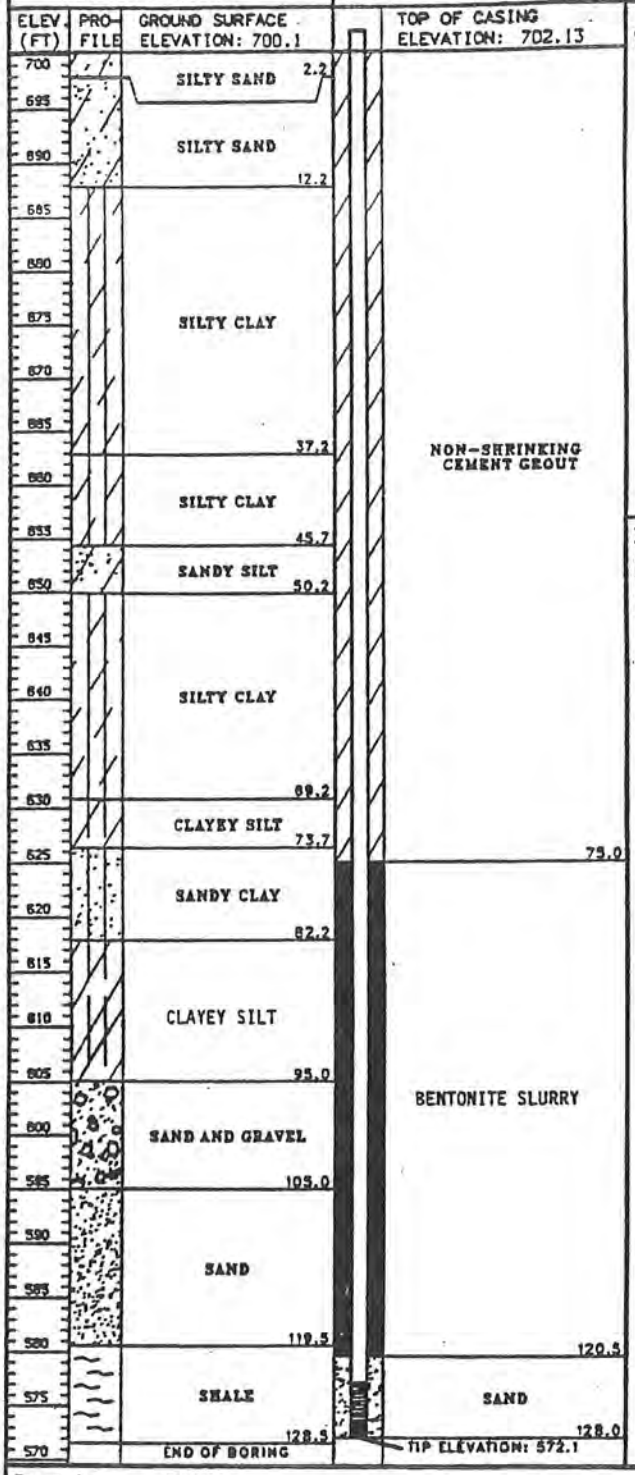
MONITOR WELL NO. OB-36

Project Name: WAYNE DISPOSAL LANDFILL – SITE NO. 2 — NTH Pro. No. 94315 OW

Project Location: VAN BUREN TWP., WAYNE COUNTY, MICHIGAN — Chk. By: RLB

LOG OF MONITOR INSTALLATION

Generalized Subsurface Profile — Schematic



GROUNDWATER DATA

Date	Ground-water Elev. (ft)	Comments
10/22/87	649.70	

NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATA, SEE LOG OF TEST BORING NO. OB-36

[2] TOP OF CASING AND GROUND SURFACE ELEVATIONS PROVIDED BY WAYNE DISPOSAL, INC.

Started:	10/1/87
Completed:	10/1/87
Inspector:	M. TAKACS / R. BURNS
Driller:	S. REMPALSKI
Contractor:	MATECO DRILLING COMPANY
Equipment:	CME-550
Observation Type:	MONITORING WELL

Casing Diam.:	2"
Casing Length:	125'
Casing Type:	70' GAVL. / 55' SS
Screen Diam.:	2"
Screen Length:	5'
Screen Mesh:	0.007"
Screen Type:	STAINLESS STEEL

Figure No. 15

NEYER, TISEO & HINDO, LTD.

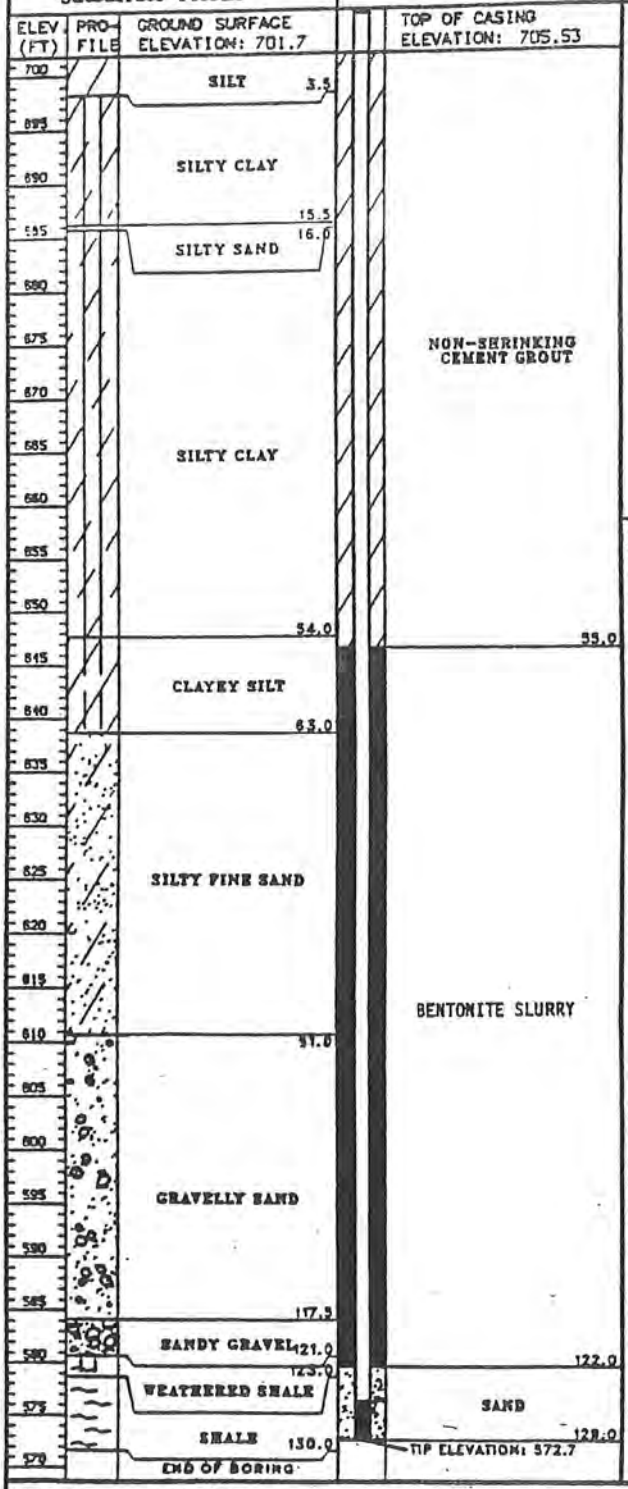
MONITOR WELL NO. OB-37

Project Name: WAYNE DISPOSAL LANDFILL – SITE NO. 2
Project Location: VAN BUREN TWP., WAYNE COUNTY, MICHIGAN

NTH Pro. No. 94315 OW
Chk. By: RLB

LOG OF MONITOR INSTALLATION

Generalized Subsurface Profile



GROUNDWATER DATA

Date	Ground-water Elev. (ft)	Comments
7/25/87	663.21	
7/28/87	652.10	

NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATA, SEE LOG OF TEST BORING NO. OB-37
[2] TOP OF CASING AND GROUND SURFACE ELEVATIONS PROVIDED BY WAYNE DISPOSAL, INC.

Started: 8/23/87
Completed: 8/24/87
Inspector: R. BURNS
Driller: S. REMPALSKI
Contractor: MATECO DRILLING COMPANY
Equipment: CME-550
Observation Type: MONITORING WELL

Casing Diam.: 2"
Casing Length: 128.3'
Casing Type: 54.3' GALV. / 73' SS
Screen Diam.: 2"
Screen Length: 3.5'
Screen Mesh: 0.01"
Screen Type: STAINLESS STEEL

Figure No. 16

NEYER, TISEO & HINDO, LTD.

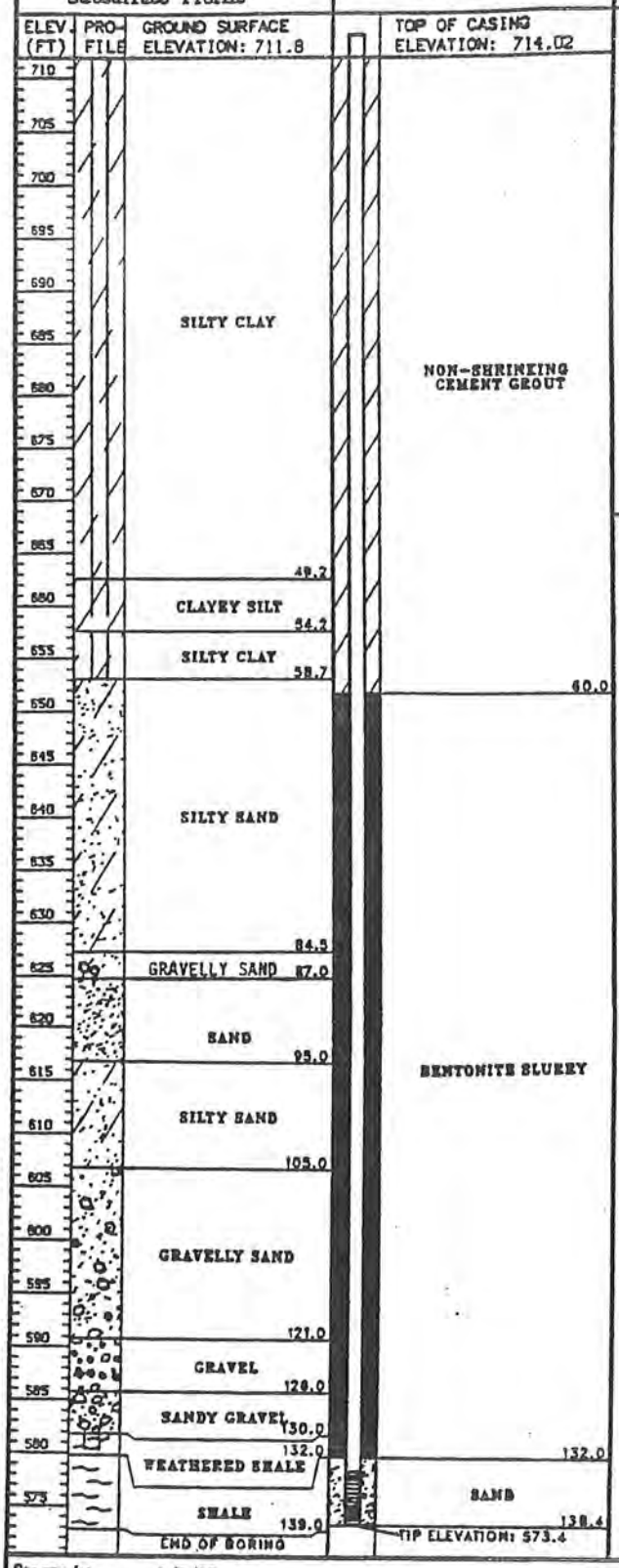
MONITOR WELL NO. OB-38

Project Name: WAYNE DISPOSAL LANDFILL - SITE NO. 2 — NTH Pro. No. 94315 OW

Project Location: VAN BUREN TWP., WAYNE COUNTY, MICHIGAN — Chk. By: RLB

LOG OF MONITOR INSTALLATION

Generalized Subsurface Profile — Schematic



GROUNDWATER DATA

Date	Ground-water Elev. (ft)	Comments
9/18/87	653.12	
9/23/87	651.13	
9/24/87	651.02	
9/25/87	650.86	
9/28/87	650.70	

NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATA, SEE LOG OF TEST BORING NO. OB-39

[2] TOP OF CASING AND GROUND SURFACE ELEVATIONS PROVIDED BY WAYNE DISPOSAL, INC.

Started: 9/9/87
Completed: 9/10/87
Inspector: R. BURNS / M. TAKACS
Driller: S. REMPALSKI
Contractor: MATECO DRILLING COMPANY
Equipment: CME-550
Observation Type: MONITORING WELL

Casing Diam.: 2"
Casing Length: 137.1'
Casing Type: 50.1' GALV. / 87' SS
Screen Diam.: 2"
Screen Length: 3.5'
Screen Mesh: 0.01"
Screen Type: STAINLESS STEEL

Figure No. 17

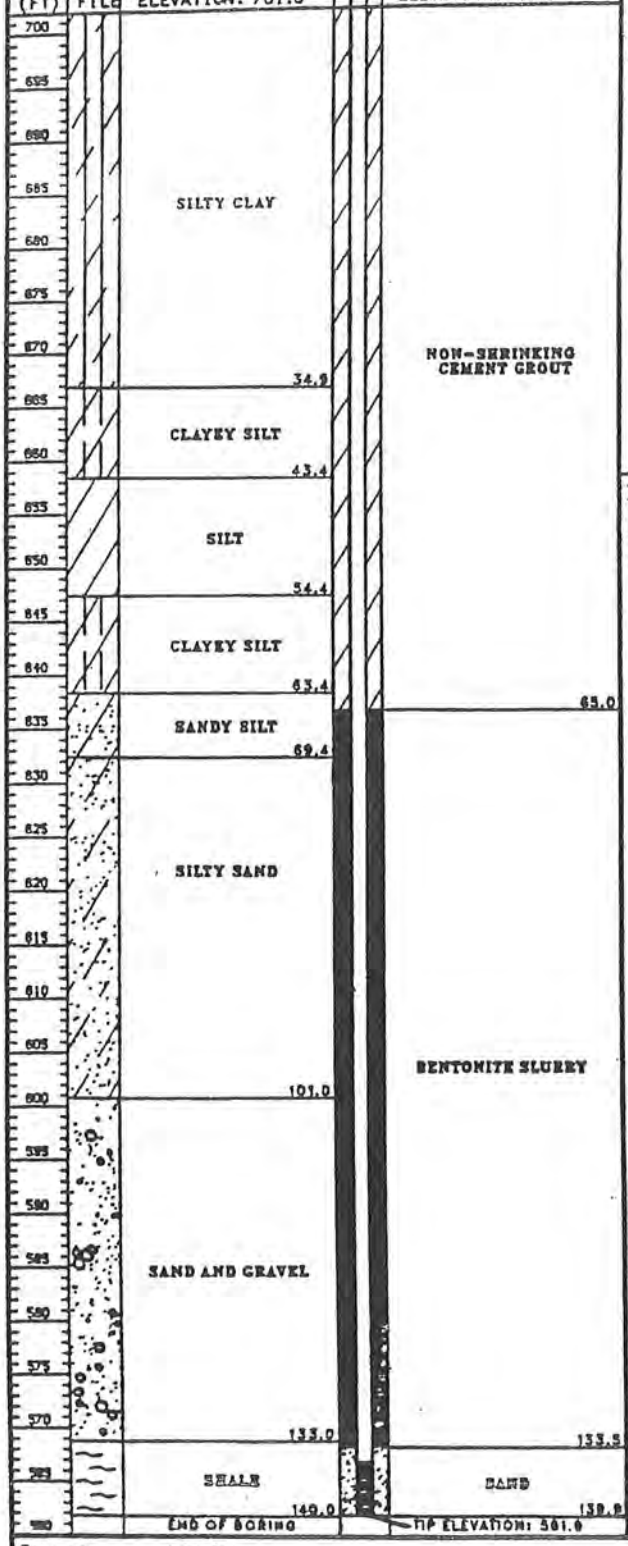
NEYER, TISEO & HINDO, LTD.

MONITOR WELL NO. OB-39

Project Name: WAYNE DISPOSAL LANDFILL – SITE NO. 2 NTH Fre. No. 94315 OW
Project Location: VAN BUREN TWP., WAYNE COUNTY, MICHIGAN Chk. By: RLB

LOG OF MONITOR INSTALLATION

Generalized Subsurface Profile



GROUNDWATER DATA

Date	Ground-water Elev. (ft)	Comments
9/1/87	652.28	
9/4/87	651.50	
9/9/87	650.88	
9/22/87	650.50	

NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATA, SEE LOG OF TEST BORING NO. OB-39

[2] TOP OF CASING AND GROUND SURFACE ELEVATIONS PROVIDED BY WAYNE DISPOSAL, INC.

Started: 8/31/87
Completed: 9/1/87
Inspector: R. BURNS
Driller: S. REMPALSKI
Contractor: MATECO DRILLING COMPANY
Equipment: CME-550
Observation Type: MONITORING WELL

Casing Diam.: 2"
Casing Length: 140.4'
Casing Type: 65.4' GALV. / 75' SS
Screen Diam.: 2"
Screen Length: 5'
Screen Mesh: 0.007"
Screen Type: STAINLESS STEEL

Figure No. 18

NTH Consultants, Ltd.

MONITORING WELL NO. OB-40R

Project Name : WAYNE DISPOSAL, INC. - SITE NO. 2 — NTH Proj. No: 13-3051 00

Project Location : VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN — Checked By : ACE

LOG OF MONITORING WELL

ELEV. (FT)	PRO-FILE	Generalized Subsurface Profile	Installation Schematic
		GROUND SURFACE ELEVATION: 706.2	TOP OF WELL CASING ELEVATION: 708.72
705		SILTY SAND	
700			
695			
690		17.0	
685		SILTY CLAY	PURE GOLD GROUT
680			
675			
670			
665			
660			
655			
650			
645			
640			
635			
630			
625			
		CONTINUED ON NEXT SHEET	CONTINUED ON NEXT SHEET

GROUNDWATER DATA

Date	Ground-water Elev. (ft)	Comments
02/01/93	659.72	BEFORE DEVELOPMENT
02/09/93	658.14	BEFORE DEVELOPMENT
02/25/93	656.69	

NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATA, SEE LOG OF TEST BORING NO. OB-40R.

[2] TOP OF CASING & GROUND SURFACE ELEVATIONS PROVIDED BY WAYNE DISPOSAL, INC.

[3] WELL INSTALLED TO REPLACE MONITORING WELL NO. OB-40.

[4] CENTRALIZERS WERE USED TO MAINTAIN THE VERTICALITY OF THE WELL ASSEMBLY IN THE BOREHOLE.

FIELD MEASUREMENTS DURING DRILLING:

pH: 8.10
SPEC. COND: 310 μmhos/cm

FIELD MEASUREMENTS AFTER DEVELOPMENT:

pH: 8.03
SPEC. COND: 302 μmhos/cm

Started: 01/29/93
Completed: 02/01/93
Inspector: C. ENDLER
Driller: G. QUALLS
Contractor: GEO-TEK, INC.
Equipment: CME-750 ALL-TERRAIN DRILLING RIG
Well Type: MONITORING

Casing Diameter: 2.0"
Casing Length: 93.5'
Casing Type: STAINLESS STEEL
Screen Diameter: 2.0"
Screen Length: 5.0'
Screen Mesh: 0.007"
Screen Type: STAINLESS STEEL

Figure No. A-6a

NTH Consultants, Ltd.

MONITORING WELL NO. OB-40R

Project Name : WAYNE DISPOSAL, INC. - SITE NO. 2 — NTH Proj. No: 13-3051 00

Project Location : VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN — Checked By : ACE

LOG OF MONITORING WELL

Generalized Subsurface Profile

ELEV. (FT) | PRO-FILE | GROUND SURFACE ELEVATION: 706.2

- SILTY CLAY — 82.0
- SILT — 87.0
- SILTY SAND — 89.8, 90.5, 92.5
- SILTY CLAY — 95.5, 96.0
- SILT
- SILTY SAND
- SANDY CLAY
- END OF BORING

Installation Schematic

TOP OF WELL CASING ELEVATION: 708.72

- PURE GOLD GROUT — 87.0
- FINE FILTER SAND — 89.0
- FILTER SAND — 93.0
- TIP ELEVATION: 610.2

GROUNDWATER DATA

Date	Ground-water Elev.(ft)	Comments
02/01/93	659.72	BEFORE DEVELOPMENT
02/09/93	658.14	BEFORE DEVELOPMENT
02/25/93	656.69	

NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATA, SEE LOG OF TEST BORING NO. OB-40R.

[2] TOP OF CASING & GROUND SURFACE ELEVATIONS PROVIDED BY WAYNE DISPOSAL, INC.

[3] WELL INSTALLED TO REPLACE MONITORING WELL NO. OB-40.

[4] CENTRALIZERS WERE USED TO MAINTAIN THE VERTICALITY OF THE WELL ASSEMBLY IN THE BOREHOLE.

FIELD MEASUREMENTS DURING DRILLING:

pH: 8.10
SPEC. COND: 310 µmhos/cm

FIELD MEASUREMENTS AFTER DEVELOPMENT:

pH: 8.03
SPEC. COND: 302 µmhos/cm

Started: 01/29/93
Completed: 02/01/93
Inspector: C. ENDLER
Driller: G. QUALLS
Contractor: GEO-TEK, INC.
Equipment: CME-750 ALL-TERRAIN DRILLING RIG
Well Type: MONITORING

Casing Diameter: 2.0"
Casing Length: 93.5'
Casing Type: STAINLESS STEEL
Screen Diameter: 2.0"
Screen Length: 5.0'
Screen Mesh: 0.007"
Screen Type: STAINLESS STEEL

Figure No. A-6b

NTH Consultants, Ltd.

MONITORING WELL NO. OB-47

Project Name : MICHIGAN DISPOSAL, INCORPORATED — NTH Proj. No: 90323 OW

Project Location : VAN BUREN TWP, WAYNE COUNTY, MICHIGAN — Check By :

LOG OF MONITORING WELL

Generalized Subsurface Profile

ELEV. (FT) | PROFILE | GROUND SURFACE ELEVATION: 699.9

695 — FILL: SAND — 4.2

690, 685 — SAND — 15.5

680, 675, 670, 665, 660 — SILTY CLAY — 40.5

655, 650, 645 — SILTY CLAY — 55.8

640, 635, 630, 625, 620 — SILTY CLAY — 78.8

CLAYEY SILT — 80.0

CONTINUED ON THE NEXT SHEET

Installation Schematic

TOP OF WELL CASING ELEVATION: 702.57

CEMENT GROUT — 73.0

BENTONITE SLURRY — 80.0

CONTINUED ON THE NEXT SHEET

GROUNDWATER DATA

Date	Ground-water Elev. (ft)	Comments
07/12/90	652.96	
07/16/90	652.95	

NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATIGRAPHY, SEE LOG OF TEST BORING OB-47.

[2] WELL DEVELOPED WITH COMPRESSED AIR ON 07/16/90.

[3] TOP OF CASING AND GROUND SURFACE ELEVATIONS DETERMINED BY WDI PERSONNEL.

[4] DEPTH TO FIRST COUPLING IS 0.3 FEET BELOW GROUND SURFACE; SECOND COUPLING IS 10.3 FEET BELOW GROUND SURFACE.

Started: 07/02/90
Completed: 07/12/90
Inspector: G. CROCKFORD
Driller: M. PUFFPAFF
Contractor: ENVIRONMENTAL DRILLING & SERVICES, INC.
Equipment: FAILING F-7
Well Type: MONITORING WELL

Casing Diameter: 2" I.D.
Casing Length: 103 FT
Casing Type: 60' STAINLESS/43' GALVANIZED
Screen Diameter: 2"
Screen Length: 5'
Screen Mesh: .007
Screen Type: STAINLESS STEEL

Figure No. 2

NTH Consultants, Ltd.

MONITORING WELL NO. OB-47

Project Name : MICHIGAN DISPOSAL, INCORPORATED — NTH Proj. No: 90323 OW

Project Location : VAN BUREN TWP, WAYNE COUNTY, MICHIGAN — Check By :

LOG OF MONITORING WELL

ELEV. (FT)	PROFILE	Generalized Subsurface Profile	Installation Schematic
		GROUND SURFACE ELEVATION: 699.9	TOP OF WELL CASING ELEVATION: 702.57
615		CLAYEY SILT 84.2	BENTONITE SLURRY 89.7
610			
605		SILTY FINE SAND	SILICA SAND
600			
595		105.5	105.8
590		SAND	
585		115.0	
580		SAND AND GRAVEL 122.2	CAVED MATERIAL
575		BROKEN SHALE	
570		130.2	130.2
565		END OF BORING	TIP ELEVATION: 594.3
560			
555			
550			
545			
540			

GROUNDWATER DATA

Date	Ground-water Elev. (ft)	Comments
07/12/90	652.96	
07/16/90	652.95	

NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATIGRAPHY, SEE LOG OF TEST BORING OB-47.

[2] WELL DEVELOPED WITH COMPRESSED AIR ON 07/16/90.

[3] TOP OF CASING AND GROUND SURFACE ELEVATIONS DETERMINED BY WDI PERSONNEL.

[4] DEPTH TO FIRST COUPLING IS 0.3 FEET BELOW GROUND SURFACE; SECOND COUPLING IS 10.3 FEET BELOW GROUND SURFACE.

Started: 07/02/90
Completed: 07/12/90
Inspector: G. CROCKFORD
Driller: M. PUFFPAFF
Contractor: ENVIRONMENTAL DRILLING & SERVICES, INC.
Equipment: FAILING F-7
Well Type: MONITORING WELL

Casing Diameter: 2" I.D.
Casing Length: 103 FT
Casing Type: 60' STAINLESS/43' GALVANIZED
Screen Diameter: 2"
Screen Length: 5'
Screen Mesh: .007
Screen Type: STAINLESS STEEL

Figure No. 2

Attachment C

Chain of Custody &
Monitoring Well Damage Report

TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 115809

Page ____ of ____

For Lab Use Only

Cart

VOA Rack/Tray

Receipt Log No.

Project Chemist

Laboratory Project No.

Client Name	Project Name
Address	Client Project No. / P.O. No.
	Invoice To ☐ Client ☐ Other (comments)
Phone	Contact/Report To
Fax	

Analyses Requested

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Container Type (corresponds to Container Packing List)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted										Total	Sample Comments
			1																			
			2																			
			3																			
			4																			
			5																			
			6																			
			7																			
			8																			
			9																			
			10																			

Sampled By (print)

Sampler's Signature

How Shipped? Hand Carrier_____

Tracking No.

Comments

Company

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

MONITORING WELL INSPECTION/DAMAGE REPORT

DATE: _____

NAME: _____

SITE: _____

***Place a check-mark for any of the items that are not acceptable and provide comments below.**

WELL ID	LOCK	Annular Seal	Protective Casing	Markings	Dedicated Pump	Casing
OB-1A						
OB-2A						
OB-3						
OB-4						
OB-5						
OB-6						
OB-7						
OB-8						
OB-9						
OB-10						
OB-11A						
OB-12						
OB-13						
OB-14						
OB-15						
OB-16						
OB-17						
OB-18						
OB-19R						
OB-20						
OB-21						
OB-22						
OB-23A						
OB-24						
OB-25						
OB-26A						
OB-27A						
OB-28						
OB-29						
OB-30						
OB-31AR						
OB-32						
OB-34A						
OB-35A						
OB-36						
OB-37						
OB-38						
OB-39						

WELL ID	LOCK	Annular Seal	Protective Casing	Markings	Dedicated Pump	Casing
OB-40R						
OB-41						
OB-42						
OB-43						
OB-44						
OB-45						
OB-46						
OB-47						

DETAILS OF PROBLEM(S) ENCOUNTERED: _____

_____

_____

_____

_____

_____

_____

ACTIONS REQUIRED TO REMEDY THE PROBLEM(S): _____

_____

_____

_____

_____

_____

SUBMIT THIS FORM IMMEDIATELY TO THE SITE MANAGER AND THE REGULATORY AFFAIRS MANAGER OR THEIR DESIGNEE

Attachment D

Operating Procedures for the Water Level Indicator

INSTRUCTION MANUAL

ET-89

ELECTRIC TAPE

Attachment D

KECK INSTRUMENTS, INC.

KECK TAPE GUARD

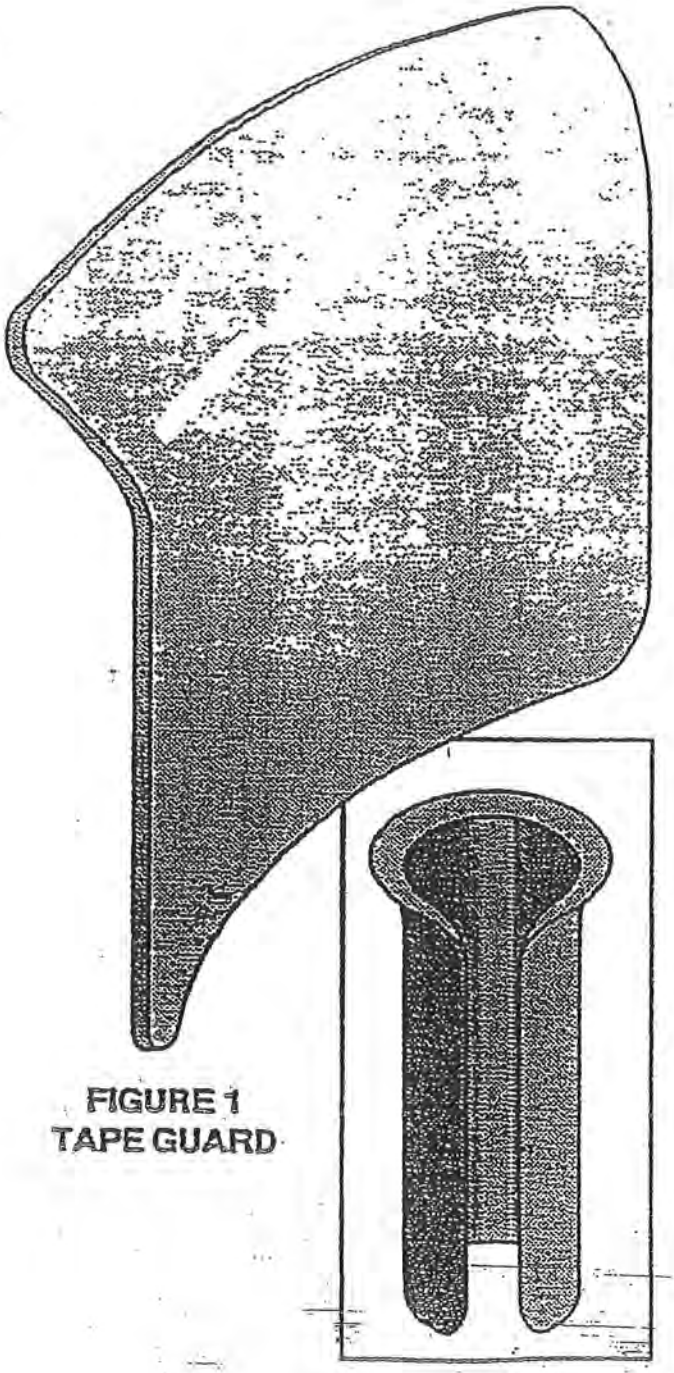


FIGURE 1
TAPE GUARD

The Keck "Tape Guard" was developed to protect instrumentation, tapes and sample tubing from the wearing edges of well casing. Made of smooth flexible polystyrene, the "Tape Guard" easily adapts to any 2" or 4" well.

Instructions

Simply compress the "Tape Guard" and insert

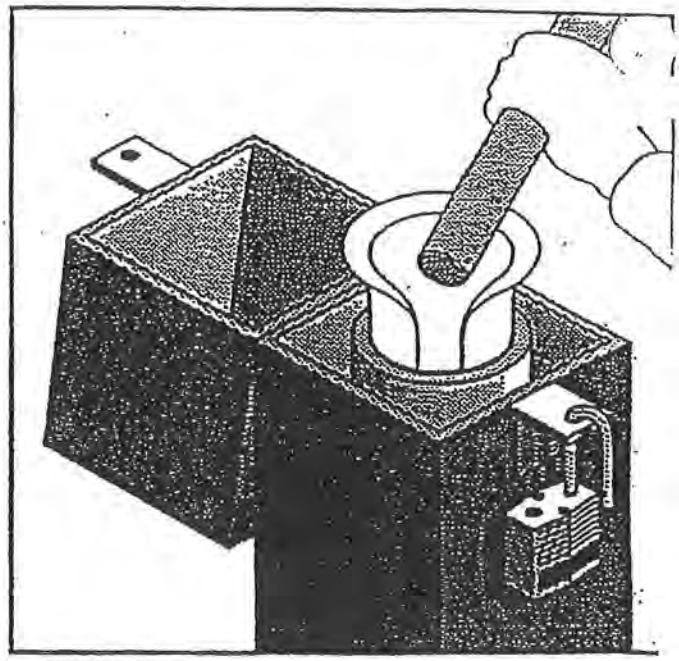


FIGURE 2
TAPE GUARD USAGE

into the opening of any 2" to 4" well pipe. Allow instrumentation, tubing or tape to ride on the smooth surface of the "Tape Guard" to prevent wear.

ET-89

The Keck Instruments ET-89 is a portable reel mounted device used to accurately measure water levels in a borehole. Water levels are detected by a 5/8" O.D. stainless steel probe attached to a 100 FT. Tefzel coated engineer's tape. The tape is graduated in 100ths of a foot with metric divisions on the reverse side. The ET-89 relies on fluid conductivity to determine the presence of water and emits on audible signal with light. Controls include a sensitivity adjustment to eliminate false readings due to cascading water or casing effect and a battery test switch.

Operational Procedure

1. Turn the instrument "On" and check the battery voltage by pressing the "Batt Test" button. A dim red light indicates a low battery and should be replaced.
2. Lower the probe down the well to the water surface, the light and buzzer should be activated. At this point adjust the probe sensitivity counter-clockwise until the light and buzzer turn off.
3. With the probe still in contact with the water, adjust the probe sensitivity until the light and buzzer barely activate. In this setting the probe will detect water level and not be effected by condensation from the casing well.
4. Water level measurements can now be taken from the top of the casing.
5. After completion of water level measurements the device should be properly stored.

Maintenance and Cleaning Procedures

1. Remove the three faceplate screws.
2. Release the faceplate using the sensitivity knob to pull the components out of the reel.
3. Make note of the battery location on the circuit board and the position in reel cavity.
4. Remove the 9 volt battery from the connector by grasping the battery and the black connector. Replace with new battery.
5. Position the battery in the notch of the circuit board and align the battery with the recessed slot in the reel.
6. Place the faceplate in the reel and replace the three retaining screws. Do not over tighten these screws.

Decontamination and Cleaning

The ET-89 can be cleaned with any detergent or lab soap such as Liquinox that does not effect polypropylene. The reel should not be submerged at any time but can be wiped with a damp cloth.

Please call our technical staff if further assistance is required at 1-800-542-5681.

Attachment E

Summary of Monitoring Well Information

Attachment E

MONITORING WELL INFORMATION
WAYNE DISPOSAL SITE #2 LANDFILL

WELL ID	PROGRAM(S)	T.O.C. ELEV.	SCREEN ELEV.	WELL DEPTH	DESIG.	STRATUM SCREENED	WELL PAIR
OB-1A	Part 115	705.99	579.9	126	UG	SILT/ROCK	--
OB-2A	Part 115/MCIX	701.30	587.8	114	DG	SAND	OB-44
OB-3	Part 115	708.99	577.9	131	DG	SAND	--
OB-4	Part 115	712.59	638.9	74	UG	SAND	--
OB-5	Part 115	705.20	603.8	101	DG	SAND	--
OB-6/OB-56	Part 115/Part 111	704.75	627.1	78	DG	SAND	--
OB-7	Part 115/MCIX	703.58	627	77	UG	SILT/SAND	OB-32
OB-8/OB-60	Part 115/Part 111	707.58	629	79	DG	SAND	--
OB-9	Part 115	701.20	614.1	87	DG	SAND	--
OB-10	Part 115	707.80	621	87	DG	SAND	--
OB-11A	Part 115/MCIX	698.99	611.4	88	DG	SAND	--
OB-12R	Part 115	707.84	620.6	87	DG	SAND	OB-55
OB-13/OB-57	Part 115/Part 111	703.27	619.9	83	DG	SAND	--
OB-14	Part 115	702.10	600.1	102	DG	SAND	--
OB-15	Part 115	707.63	617.3	90	DG	SAND	--
OB-16	Part 115	700.83	596.5	104	DG	SAND	--
OB-17/OB-51	Part 115/Part 111	708.28	626.2	82	DG	SAND	--
OB-18	Part 111 (MDWTP)	703.11	589.2	114	UG	CLAY/ROCK	--
OB-19R	Part 111 (MDWTP)	709.17	585.6	124	UG	ROCK	--
OB-20	Part 111/TSCA	706.28	609.9	96	DG	SAND	--
OB-21	Part 111(MDWTP)/TSCA	705.00	600.9	104	DG	SAND	OB-36
OB-22	Part 111	704.00	568.3	136	DG	SAND/ROCK	OB-24
OB-23A	Part 111(MDWTP)/TSCA	702.67	577.5	125	DG	SAND	--
OB-24	Part 111(MDWTP)/TSCA	704.59	614.4	90	DG	SAND	OB-22
OB-25	Part 111/TSCA	711.00	620	91	DG	SAND	OB-37
OB-26A	Part 111/TSCA	714.15	628.5	86	DG	SAND	OB-38
OB-27A	Part 111	708.27	636.5	72	DG	SAND	OB-28
OB-28	Part 111	709.00	583.9	125	DG	SAND	OB-27A
OB-29	Part 111	705.53	609.4	96	DG	SAND	OB-39
OB-30	Part 111	703.92	607.4	97	DG	SAND	--
OB-31AR	Part 111/MCIX	700.65	628.1	73	UG	SAND	OB-32
OB-32	Part 111/MCIX	701.49	565.3	136	UG	ROCK	OB-31A
OB-34A	Part 111/TSCA	712.04	617.8	94	DG	SAND	
OB-35A	Part 111	711.36	577.5	134	DG	ROCK	
OB-36	Part 111 (MDWTP)	702.13	572.1	130	DG	ROCK	OB-21
OB-37	Part 111	711.30	572.7	139	DG	ROCK	OB-25
OB-38	Part 111	714.10	573.4	141	DG	ROCK	OB-26A
OB-39	Part 111	707.55	561.9	146	DG	ROCK	OB-29
OB-40R	Part 111/TSCA	708.84	610.2	99	UG	SILT/SAND	--
OB-41	MCIX	701.89	562	140	DG	ROCK	--
OB-42	MCIX	717.25	624.4	93	DG	SAND	OB-43
OB-43	MCIX	717.46	595.1	122	DG	SAND	OB-42
OB-44	MCIX	701.27	639.5	62	DG	SAND	OB-2
OB-45	Part 115/MCIX	701.31	628	73	DG	SAND	OB-46
OB-46	MCIX	701.19	600	101	DG	SAND	OB-45
OB-47	Part 111 (MDWTP)	702.70	594.3	108	DG	SAND	--
OB-48	Part 111	708.70	614.2	94.5	DG	SAND	OB-49
OB-49	Part 111	To be installed				ROCK	OB-48
OB-50	Part 111	To be installed				SAND	
OB-51	Part 111	To be installed				SAND	
OB-52	Part 111	To be installed				SAND	
OB-53	Part 111	707.01	600.8	106.21	DG	SAND	
OB-54	Part 111	To be installed				SAND	
OB-55	Part 111	To be installed				ROCK	OB-12R
OB-58	Part 111	To be installed				SAND	OB-59
OB-59	Part 111	To be installed				ROCK	OB-58

UG = Upgradient Well DG = Downgradient Well

Attachment F

WELL WIZARD
Dedicated Sampling Systems

Installation, Operation and Maintenance User's Guide
Part No 34999

(This manual is on file at MDEQ-WHMD, Lansing, at Site II & enclosed via CD.)

Attachment G

Sample Container and Preservation Procedures

Attachment G.
Handling Requirements of Monitoring Parameters

Parameter	Perservation	Holding Time	Bottle Type	Minimum Volume
Total Phenolics	1,2	28 Days	Glass	0.5 L
Sulfate	2	28 Days	Plastic	50 ml*
Total Alkalinity	2	14 Days	Plastic	100 ml*
Fluoride	2	28 Days	Plastic	300 ml*
Chloride	2	28 Days	Plastic	50 ml*
Nitrate/Nitrite	1,2	48 Hrs	Plastic	0.5 L
Arsenic	3,5	6 Mos	Plastic	200 ml**
Cadmium	3,5	6 Mos	Plastic	200 ml**
Calcium	3,5	6 Mos	Plastic	200 ml**
Chromium	3,5	6 Mos	Plastic	200 ml**
Iron	3,5	6 Mos	Plastic	200 ml**
Potassium	3,5	6 Mos	Plastic	200 ml**
Lead	3,5	6 Mos	Plastic	200 ml**
Magnesium	2,3,5	6 Mos	Plastic	200 ml**
Manganese	2,3,5	6 Mos	Plastic	200 ml**
Molybdenum	2,3,5	6 Mos	Plastic	200 ml**
Nickel	2,3,5	6 Mos	Plastic	200 ml**
Sodium	3,5	6 Mos	Plastic	200 ml**
Zinc	3,5	6 Mos	Plastic	200 ml**
Cyanide	2,4	14 Days	Plastic	500 ml
Copper	3,5	6 Mos	Plastic	200 ml**
pH		Immediate	Plastic	25 ml
Bicarbonate	2	14 Days	Plastic	100 ml*
Carbonate	2	14 Days	Plastic	100 ml*
TOC	2,7	28 Days	Glass	100 ml
Specific Conductivity	2	28 Days	Plastic	100 ml
Volatile Organics	2,6	14 Days	Glass	2x40 ml

1) pH<2 with concentrated Sulfuric Acid
2) Store at 4 degrees Centigrade
3) pH<2 with nitric acid
4) pH>12 with sodium hydroxide
5) Filtered in the field using 0.45 micron membrane filters on the time of collection
6) 4 drops HCL, no headspace
7) pH<2 with hydrochloric acid

* Note: One liter for all of these parameters stored similarily
** Note: One liter for all of these parameters stored similarily

Attachment H

Ground Water Monitoring Parameter List

Attachment H

Ground Water Monitoring Parameter List

A. Primary Parameters

Benzene	1,2 Dichlorobenzene	Xylene
1,2 Dichloroethane	1,2 Dichloroethene	Ethylbenzene
Methylene Chloride	Toluene	Trichloroethene
1,1,1 Trichloroethane	Vinyl Chloride	1,1 Dichloroethane

PCB-1016[1]	**PCB-1221[1]**	**PCB-1231[1]**
PCB-1242[1]	**PCB-1248[1]**	**PCB-1254[1]**
PCB-1260[1]		

B. Secondary Parameters

Potassium	Sodium	Nickel
Chromium(t)	Lead	Molybdenum
Sulfate	Chloride	Bicarbonate
Carbonate	Arsenic	Cyanide[4]
Nitrate	Nitrite	Fluoride
Total Phenolics	Total Organic Carbon	Iron

C. Tertiary Parameters

Calcium[2]	Magnesium[2]	Copper[2]
Manganese[2]	Zinc[2]	Cadmium[2]
Silver	Mercury	Selenium
Barium	2,4-D	Endrin
Silvex	Methoxychlor	Toxaphene

D. Field Monitoring Parameters[3]

Specific Conductance Temperature pH

Notes:

1	PCB's to be analyzed in samples from wells OB-21, OB-23, OB-24, OB-34R and OBN-40R only.
2	Tertiary parameter that will be measured during detection monitoring.
3.	Parameter to be measured in field for all samples collected
4.	Amenable cyanide to be analyzed if cyanide is detected

Attachment I

Analytical Methods and Target Detection Limits

Attachment I

VOC Parameter	Detection Limit ppm (mg/l)	Method Reference
1,1-Dichloroethane	0.001	8260/8021
1,2-Dichloroethane	0.001	8260/8021
1,2-Dichloroethene	0.001	8260/8021
1,1,1-Trichloroethane	0.001	8260/8021
Trichloroethene	0.001	8260/8021
Vinyl Chloride	0.001	8260/8021
Methylene Chloride	0.005	8260/8021
1,2-Dichlorobenzene	0.001	8260/8021
Benzene	0.001	8260/8021
Toluene	0.001	8260/8021
Ethylbenzene	0.001	8260/8021
Xylenes (Total)	0.003	8260/8021
Indicator Parameter	**Detection Limit ppm (mg/l)**	**Method Reference**
Alkalinity (Total)	20	2320B
Bicarbonate Alkalinity	10	2320B
Carbonate Alkalinity	10	2320B
Chloride	1	4500-Cl E
Cyanide (Total)	0.005	4500-CN G
Fluoride	0.1	340.2
Nitrate/Nitrite	0.01	4500-NO3 F
pH	N/A	4500-H B
Phenolics (Total)	0.01	420.4/9066
Specific Conductivity	5(mmhos/cm)	2510B
Sulfate	2	ASTM D516-90
TOC	0.5	5310C
Metals	**Detection Limit ppm (mg/l)**	**Method Reference**
Arsenic	0.001	200.8/6020
Cadmium	0.0002	200.8/6020
Calcium	1	200.7/6010B
Chromium	0.001	200.8/6020
Copper	0.001	200.7/6010B
Iron	0.02	200.7/6010B
Lead	0.001	200.8/6020
Magnesium	1	242.1/7450
Manganese	0.005	200.8/6020
Molybdenum	0.025	200.7/6010B
Nickel	0.025	200.7/6010B
Potassium	0.1	200.7/6010B
Sodium	1	200.7/6010B
Zinc	0.01	200.7/6010B
PCB	**Detection Limit ppm (mg/l)**	**Method Reference**
PCB-1016	0.0001	8082
PCB-1221	0.0001	8082
PCB-1232	0.0001	8082
PCB-1242	0.0001	8082
PCB-1248	0.0001	8082
PCB-1254	0.0001	8082
PCB-1260	0.0001	8082

Methods referenced from:

1 Test Methods for Evaluating Solid Waste, USEPA SW-846
2 Standard Methods for the Examination of Water & Wastewater
3 USEPA Methods for Chemical Analysis of Water & Wastewater
4 Methods for Organic Analysis of Municipal & Industrial Wastewater
WHMD Operational Memo Gen-8, Revision 8, 12/22/06

Attachment I QA/QC Frequencies

Type	Description	Inorganics	Organics
Blank	Method or preparation	Minimum one per analytical batch*	Minimum one per analytical batch*
Duplicate (Inorganics)	Field and/or duplicate of sample	Minimum one per analytical batch	---
Laboratory Control Sample	Analyte fortified blank	Minimum one per analytical batch	Minimum one per analytical batch
Laboratory Control Sample Duplicate (if requested)	Analyte fortified blank	Minimum one per analytical batch	Minimum one per analytical batch
Matrix Spike	Analyte fortified blank	Minimum one per analytical batch	Minimum one per analytical batch
Matrix Spike	Duplicate of analyte fortified sample	---	Minimum one per analytical batch

The above is a general summary of quality control frequency.
A more complete definition of the above plus additional QC specific to each department will be found in the analytical method SOPs.

* Note: Maximum of 20 samples per analytical batch or monthly, whichever is more frequent.

Attachment J

Field Measurement Equipment and Procedures
Yellow Springs Instrument Co (YSI) Equipments Instructions
(pH, specific conductivity & temperature)

(This manual is on file at MDEQ-WHMD, Lansing & at Site II – enclosed via CD)

Attachment K

Current Laboratory's Quality Assurance Manual

(This manual is on file at Site II - & enclosed via CD)

Statistical Procedures for Ground Water Monitoring Program
Wayne Disposal, Inc

1.0 Introduction

The following statistical procedures are used to analyze the statistical significance of measured concentrations of ground water monitoring parameters at Wayne Disposal, Inc (WDI). This program was developed in accordance to meet the requirements of 40 CFR 264.97 and Rule 506 of the Administrative Rules for Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1995 PA 451, as amended.

2.0 Overview of Statistical Procedures

The statistical evaluation program for WDI is designed to signal statistically significant concentrations of monitoring parameters measured in samples collected quarterly or semi-annually from the wells in the monitoring well network. Different statistical techniques are used for different monitoring parameters depending on the nature of the data. The statistical comparisons are either intrawell (each well is compared to its own background) or based on the detection limit, which is generally the standard laboratory detection limit. When intrawell statistical comparisons are used, the statistical procedure is selected based on the degree that the background data are censored.

The monitoring parameters measured during each analysis are divided into four categories: primary parameters, secondary parameters, tertiary parameters, and field parameters (see Figure 1). The list of primary parameters is comprised of volatile organic compounds that are known to present within the waste. As these compounds do not generally occur in nature at measurable concentrations, a confirmed concentration above a statistically based detection limit for any single parameter will result in a statistically significant increase as defined by the operating license.

The secondary monitoring parameters are mainly inorganic parameters that are found in elevated concentrations within the leachate. As these parameters are naturally occurring, their presence in ground water may or may not be an indication of a release and it is often necessary to determine the significance of changes in concentration relative to estimates of the true background concentrations. In this program secondary parameters are used to detect a possible release in the following ways. First, a confirmed statistically significant change in the concentration of any two (or more) secondary parameters in a single well will result in a statistically significant increase as defined by the operating license. This approach is designed to detect relatively subtle changes in ground water quality as evidenced by several parameters at once. In addition, a confirmed, order of magnitude increase (10 times the background concentration) in the concentration any single parameter will also result in a statistically significant increase. This will ensure that a large increase in one secondary parameter is appropriately investigated.

The tertiary parameters are those parameters for which background has already been established. The tertiary parameters in this program are further subdivided into two groups: parameters that have an already established background but will not be measured during detection monitoring, and parameters that will continue to be measured during detection monitoring but will not be subjected to the statistical analyses described below. The former group is not being analyzed because they do not appear to be useful monitoring parameters. The analytical results from the latter group will be used to evaluate potential non-release related ground water quality changes, such as might be caused by well corrosion and grout contamination. These parameters will not be analyzed statistically because they are poor indicators of a release.

Field parameters are those parameters measured in the field during sample collection, mainly for the purpose of showing that ground water quality has stabilized during well purging. These parameters will not be analyzed statistically.

3.0 Description of Statistics for Detection Monitoring

The statistical tests to be used for all detection monitoring events are described in the following section. This section includes the definition and procedures for calculating "background", and the procedures for conducting the statistical analyses.

3.1 Parameters

The parameter list for the ground water monitoring program is presented on Figure 1. The following descriptions of background calculation and statistical analyses are presented separately for the primary and secondary parameters, respectively.

3.2 Background

The background statistics for all monitoring parameters are to be calculated using the methods described below. The recalculation of the moving background for secondary parameters, as described below, will also follow these procedures. For new wells, or replacement wells that cannot utilize the data from the replaced well, an interim background as defined in section 3.3 will be used for applicable secondary parameters until eight samples are collected. Then the background described below will apply.

Primary Parameters - The decision of whether or not there is a statistically significant increase in a primary parameter is essentially the decision of whether or not the parameter is present in the ground water. For all of the primary parameters the occurrence of the parameter above the laboratory's reported detection limit is considered to be a statistically significant event and re-sampling must be initiated to confirm or refute the occurrence.

Secondary Parameters - Determination of the initial intrawell background statistics was completed utilizing the first eight sampling events beginning in 1988. However, beginning at the end of 1995, each time four new analyses were completed, the oldest four measurements have been dropped from the database, the next four added, and the background statistics recomputed. This is repeated each year keeping about a six year lag between the background period and the detection monitoring samples.

If the program moves to semi-annual monitoring (such as in post-closure), the background will be updated every year until the moving background reaches the point where years with semi-annual sampling are to be included. Then the background will be updated every two years (after four new samples have been collected) and thus the moving background window will continue to lag at least six years behind.

The nature of the background statistics and the method of calculation of these statistics for the secondary parameters is based on the degree of censorship of each parameter at each well. The secondary parameter list includes parameters which are highly censored (at least half of the values are below detection limits), those which are moderately censored (more than half the values are above detection) and those which are essentially

all above method detection limits (the method detection limits are defined in the operating license). Some parameters exhibit varying degrees of censorship at different wells.

If the background data for a parameter contains at least five detectable background values, but contains some non-detects, the non-detects will be alternately assigned values of zero and the detection limit. If all of the background values are above detection, the background statistics will be calculated from the background data as is. The mean and standard deviations will be calculated using the standard statistical equations for these quantities and the data will be analyzed using control charts as described below. In no case will a standard deviation of less than 10 percent of the mean be used in a statistical test. If the calculated background standard deviation is less than 10 percent of the mean, then 10 percent of the mean will be substituted for the background standard deviation.

If half or more of the intrawell background measurements are below detection limits (4 or more BDL values), then the background statistics will be calculated based on the proportion of values above method detection limits. This quantity will be used to conduct a test of proportions as described below.

3.3 Performance of Statistical Tests

The methods to be used for statistical analyses of all primary and secondary parameters that have a background as defined in Section 3.2 are described below. For new wells, the primary parameters will be evaluated as described below but the secondary parameters will be evaluated using the "interim" statistical procedures contained in Appendix A. For replacement wells, a decision must be made as to whether the existing background from the well replaced is appropriate for the new well. If it is, such as might be expected when a damaged well is replaced by a well screened in the same stratum, then the existing background can be used with the statistical tests described below. If the replacement well can not be placed in the same strata, or the old well is believed to have yielded unrepresentative results, then the replacement well is considered a new well for the purposes of statistical analyses and will be handled as described above.

Primary Parameters - For the primary parameters, any measured concentration of any parameter which is above the laboratory reported detection limit will initiate quadruplicate re-sampling for confirmation of the affected parameter(s), in accordance with the operating license. If the statistical failure is repeated, then a statistically significant increase is confirmed. If the apparent increase is not confirmed, then normal detection monitoring will be resumed.

Secondary Parameters - The statistical analysis of secondary parameters will be conducted by one of two statistical tests depending on the degree that the intrawell background data are censored. If more than half the data are above method detection limits then a control chart approach will be used. If at least half the background data are below detection limits, a test of proportions will be used to analyze the data. There is

also a default provision to investigate a dramatic increase in any single parameter regardless of the results of outcome of the statistics.

If there are statistically significant increases for any two secondary parameters at any single well, and the increases represent less than a ten-fold increase over background, then WDI shall undertake the procedures identified in the operating license, including re-sampling in quadruplicate. In this case, both failures must be verified by re-sampling in order to confirm the statistical increase. If any single secondary parameter exhibits a ten-fold increase over background, then this occurrence must be verified by quadruplicate re-sampling. If the increase is confirmed then a statistically significant increase has occurred.

The statistical evaluation of moderately censored or uncensored secondary parameters will be conducted using intrawell statistical comparisons via a control chart approach. The combined Shewhart-CUSUM control chart will be used to analyze the statistical significance of the measured concentrations of secondary parameters. This approach consists of two statistical tests designed to detect different types of evidence of a release. The Shewhart limit is designed to detect a sharp increase in the concentration of a monitoring parameter in a single sample. The CUSUM limit is designed to detect gradual increases in the concentration of a parameter over time. The two techniques will be used as separate statistical tests. That is, failure of either test alone (or both) will signal a statistically significant increase for a given parameter. Therefore, if one parameter fails the CUSUM test and another exceeds the Shewhart limit, then an apparent statistically significant increase will have occurred and confirmation of both failures must be undertaken. Confirmation of an apparent failure of one of the two tests must be confirmed by an additional failure of that particular test.

The Shewhart control chart compares a detection monitoring concentration of a parameter to the intrawell background mean plus a selected number of standard deviations. The test is performed by calculating the standardized mean, Z, for the detection monitoring concentration. As individual samples are collected during each detection monitoring event, the standardized mean for each measured parameter is calculated by:

$$Z = (x_m - x_b)/s_b$$

where: x_b is the intrawell background mean

x_m is the measured concentration during detection monitoring

s_b is the standard deviation of the intrawell background

The value of Z is then simply compared to a selected value, U, which represents the number of standard deviations from the intrawell mean. The Shewhart limit (U), or upper control limit will be 4.5, as recommended in the Interim Final Guidance for Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities (USEPA, 1989). The

statistical test is performed by simply comparing the value of Z to the value of U. If Z is greater than U then it is concluded that a statistically significant increase has occurred.

The Shewhart control chart will be used in the following manner. If a secondary parameter(s) exceeds the Shewhart limit and at least two secondary parameters fail a statistical test at any given well during a given sampling event, the well would be re-sampled in quadruplicate for the offending parameters, and the mean(s) of the quadruplicate analyses would be used to confirm whether the Shewhart limit(s) is exceeded. If there is confirmation, then it would be concluded that there has been a statistically significant increase. If the increase is not confirmed, any unconfirmed measurements would be dropped from the control chart and replaced with the means of the quadruplicates.

The CUSUM control chart is designed to detect a trend of increasing concentrations over time, regardless of whether the Shewhart limit is exceeded or not. In the CUSUM procedure, the cumulative sum of the values for Z - k are tabulated over time, each time a round of samples are analyzed. The value for Z is computed as described above, and k is a selected parameter. During each analysis subsequent to the background determination period, a value for Z - k is computed and added to the previous total. As long as the cumulative total of Z - k is a negative number the cumulative sum (S) remains zero. As positive values accumulate, the value for S is compared to a selected value, h. If S is greater than h, then a statistically significant event has occurred. The values used for k and h will be k = 1 and h = 5, respectively, as recommended (USEPA ,1989).

The CUSUM limit will be utilized in conjunction to the Shewhart limit and proportions test as follows. If the CUSUM limit is exceeded and at least two or more secondary parameters have failed a statistical test at any given well during any given sampling period, quadruplicate re-sampling of the well in question will be initiated. The mean values of the quadruplicate sample will then be used to re-compute S. If S again exceeds h, then the increase is confirmed. If the increase is not confirmed then the mean values of the quadruplicate sampling replace the results of the anomalous (unconfirmed) values within the CUSUM statistic for future analyses. These non-confirmed exceedances must be removed from the CUSUM control chart because their inclusion may cause additional false positive results when subsequent sample results are added to the cumulative sum.

For parameters that contain at least half non-detectable concentrations in the intrawell background database, a statistical test to determine the significance of the proportion of detectable occurrences during detection monitoring will be used. The test of proportions, which is based on the binomial distribution, is statistical test suited to this purpose. This statistical procedure analyzes the significance of an increase in the rate of detectable occurrences over time.

To implement the test of proportions, the proportion of detectable occurrences during the 8 background samples will be compared to the rate of detectable occurrences in the most recent 4 detection monitoring samples. The statistic is computed by the equation:

$$Z^* = \frac{P_m - P_b}{[\,p(1-p)(1/N_m + 1/N_b)]^{0.5}}$$

where: P_m = proportion of detectable concentrations in the last four detection monitoring samples

P_b = proportion of detectable concentrations in the eight intrawell background samples

N_m = number of detection monitoring samples (4)

N_b = number of background samples (8)

p = weighted proportion defined as:

$$p = \frac{n_m + n_b}{N_m + N_b}$$

where: n_m = number of detection monitoring samples above method detection limits

n_b = number of background samples above method detection limits

The value of Z^* is then simple compared to a critical value, Z_c, obtained from standard tables for the normal variant, Z, at the desired level of significance. The test will be conducted at the 0.05 level of significance, therefore Z_c is equal to 1.645. Any value of Z^* greater than Z_c signals a statistical failure for that parameter.

Each time a new detection monitoring sample is collected, the result would be added to the previous three samples for determining the proportion of detectable occurrences. Thus, both the background and detection monitoring proportions involve a moving window, with the background lagging at least six years behind the window of detection monitoring. If detection limits are lowered during the monitoring program, the proportion of detectable occurrences will be the proportion of results above the older background detection limit until the background is updated to include the new lower detection limits. For example, if the old detection limit was 20 and the new detection limit is 10, then only concentrations above 20 (even though a concentration of 11 or above is now "detectable") will be considered detectable until the moving background window is based on samples with a detection limit of 10.

WDI will use the proportions test as follows. If there is a statistically significant increase in any two secondary parameters at a particular monitoring well (i.e. two failures of the test of proportions or a combination of control chart and proportions test failures), then re-sampling in quadruplicate would be initiated to confirm the suspected increase. Confirmation would be completed if both failures are repeated.

To guard against the unlikely possibility of a large increase in a single secondary parameter going unflagged by the above statistical program, WDI will consider any concentration of a secondary parameter that is greater than 10 times the background concentration (or the reported detection limit for highly censored parameters) as a default violation of the statistical tests described above. This will ensure that clearly anomalous data are evaluated even if only a single secondary parameter is affected.

Section 28. Leachate Monitoring Plan

Section 28

LEACHATE MONITORING SAMPLING & ANALYSIS PLAN

WAYNE DISPOSAL, INC. SITE #2
MID 048 090 633

SAMPLING AND ANALYSIS PLAN FOR THE MONITORING OF LEACHATE AND LEACHATE LEVELS

WAYNE DISPOSAL, INC. SITE #2
MID 048 090 633

REVISION 3, MARCH 1996
REVISION 3.1, MAY 1999
REVISION 3.2, AUGUST 1999
REVISION 3.3, OCTOBER 2000
REVISION 3.4, FEBRUARY 2001
REVISON 3.5, MARCH 2001
REVISION 3.6, SEPTEMBER 2006
REVISION 3.7, NOVEMBER 2009
REVISION 3.8, FEBRUARY 2011

1.0 INTRODUCTION

The purpose of this document is to outline the procedures for monitoring leachate in compliance with current license and permit conditions and applicable regulations. Leachate monitoring includes the collection and analysis of leachate samples and monitoring leachate levels for the purpose of ensuring that leachate is effectively removed from operating and closed hazardous waste landfill cells.

Collection and analysis of leachate samples is conducted in order to characterize the leachate for the purpose of developing appropriate monitoring parameter lists for other monitoring programs such as groundwater and leak detection. Further, the composition of the leachate over time is an indication of the degree of stabilization of the wastes within the landfill.

Leachate level monitoring is necessary to ensure that leachate collection systems are functioning properly so as to limit the leachate head on the liner system. CFR 40 264.301(2) states that "The Regional Administrator will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 cm (1 foot)". Wayne Disposal, Inc. Site #2 monitors the volume of leachate pumped from each active and closed cell at the facility. The volume of leachate pumped from each cell per month is recorded in the operating log.

The following SAP describes how EQ maintains compliance with the conditions outlined above.

2.0 DESCRIPTION OF LEACHATE COLLECTION SYSTEMS

Leachate level control is a function of the design and operation of the leachate collection systems (LCS). Each LCS at WDI is designed to transmit leachate to the sump at rates sufficient to permit removal of leachate so that levels do not build up on the primary liner to a depth greater than one foot. The slope of the cell floor, permeability of granular materials, and the size and spacing of collector pipes are all taken into consideration in the design transmissivity of the LCS.

Once the leachate is conveyed to the collection sump, it must be removed at a rate sufficient to prevent leachate from backing up into the collection system to levels higher than one foot. The pumps are set within the sump beneath the level where the leachate conveyance pipes enter the sump (see Figure 1.). These 4" or 6" diameter HDPE pipes are directly on top of the liner. The pumps are set up on an automatic switch which turns the pump on when the leachate level in the sump rises to a certain level which is below the elevation of the pipes. As long as the pumps

keep the leachate levels in the sump below the top of the leachate collection system, then compliance with the one foot head rule is maintained. Therefore, the key to compliance is maintaining an operating collection system in each cell. Frequent inspection and swift repairs of these systems are necessary to ensure that any mechanical problems are remedied in a timely manner.

The volume of leachate pumped out of each sump is recorded on a totalizing flow meter which is placed in line in the discharge line from the pump. Leachate is conveyed to the wastewater pretreatment plant on site.

3.0 LEACHATE LEVEL AND VOLUME MEASUREMENTS

The keys to maintaining compliance with leachate level and volume record keeping requirements are frequency of inspection and maintenance of each system. To ensure proper performance of the leachate collection system, weekly inspections of the sump areas must be conducted. Figure 2 is a checklist form for recording the results of this weekly inspection. The main components of this inspection are determining leachate levels in the sump, whether the pump/meter is operating correctly and the monthly volume of leachate. An outline of these procedures in the form of a flow chart is included on Figure 3. The procedures for the weekly inspection are as follows:

Step #1. PUMP/METER FUNCTION

a. Take meter reading from flowmeter and record on form. If the meter has moved since the last reading then proceed to Step 2. If not, then proceed to step 1.b.

b. Change pump switch to "hand" position listen for the sound of the pump turning on and check for meter advancement. Then change pump switch back to "auto" position.

c. If the meter moves then proceed to step 2.

d. If meter does not move then:

i. Determine if pump intake is below leachate level in sump. This is done by visual inspection (can you see the pump above the leachate) and by sound (the pump makes a distinctive noise when trying to draw in air). If the levels are down, then the inspection is completed and the results should be noted on the form.

ii. If the pump intake is below the leachate level then further investigation is necessary. These next steps must be conducted in accordance with a confined space permit issued by the QEHS Affairs Department. Record the apparent malfunction on the inspection form and report results to the Site Manager or his/her designee and proceed with steps 2 and 3.

Step #2. LEVEL MEASUREMENT

a. Measure the leachate level in sump from the top of the sump with an electronic water level sounding device.

b. Compare the depth to leachate with the minimum allowable depth listed on Figure 2. Determine whether the level is in compliance.

c. Record the result on the weekly inspection form.

d. Notify the Landfill or QEHS Manager immediately if the levels are found to be above the allowable level.

Step #3. REPAIRS

a. Unless a specific problem is evident from the inspection (e.g. the pump doesn't turn on), the following steps should be conducted:

i. Remove the meter, switch back to "hand" position and check for flow.

ii. If there is flow, then field clean the meter, replace and check for meter advancement. If the meter advances, then switch back to "auto" position. If not, take the meter in for repair or replacement.

iii. If there is no flow, then disconnect power to pump and remove pump and pump switch from the sump. Inspect the electrical cord and the pump switch. Replace the pump and test functions. If the pump or the switch still doesn't work, remove the pump, have it power washed and get it repaired/replaced.

iv. If the pump and meter are functional but no flow is observed then arrangements must be made to clean out the pipes.

v. All actions taken and any repairs/replacements conducted must be reported to the Landfill or QEHS Manager.

Note that pumping must continue as needed to keep leachate levels down even if the flow meter or the automatic pump switch is not functioning. If the meter is broken, note the time period in which there is no meter on line so that the missing volume data can be estimated. If the switch is bad, then the pump must be operated manually until the switch is fixed. The sump should be inspected daily to determine if pumping is required until the switch is fixed or until a pumping schedule suitable for maintaining the leachate level for that sump has been determined. If the pump itself is not working, then immediate steps must be made to replace and/or repair the pump. Spare parts and spare pumps must be kept in stock on site if they are not readily available from a reliable vendor.

The weekly inspection checklist forms are to be filed in the Landfill Manager's office. Also, the sumps must be inspected on a weekly basis for evidence of deterioration, etc. Any conditions noted that would require maintenance or repair should be noted on the weekly inspection form

(Figure 2) and reported to the Landfill Manager. Any repairs required on the sump or pump that is necessary to keep leachate levels in compliance must be given the highest priority.

On a monthly basis, the total volume recorded on the flow meters from each sump is summarized from the Weekly Inspection Checklist for Leachate Collection Systems onto an electronic spread sheet.

In addition to these inspections, periodic maintenance of the LCS is required. In particular, leachate clean-out pipes, where present, must be jetted once every two years unless experience indicates that a more or less frequent jetting program is necessary or adequate

4.0 LEACHATE SAMPLING AND ANALYSIS

Leachate samples are to be collected annually from each of the 16 currently collection sumps within Master Cells V, VI and VII as shown on Figure 4. When additional cells VI-E-NE, VI-F and VI-G are constructed and put into operation the leachate must be sampled in accordance with this plan as well. The samples are collected during the third quarter of each year. Samples are collected by lowering a clean stainless steel sampling bucket (or disposable bailer) down into the sump and retrieving a sample. New (or dedicated) nylon rope is used each time a sump is sampled. The stainless steel bucket must be decontaminated between each sample location with cleaning solution and a distilled water rinse.

The sample is then carefully decanted into appropriate sampling containers. Samples for VOC's are collected first while ensuring that no headspace is present within the sampling vials. Additional samples are then collected in order of decreasing volatility, semi-volatiles then total

organic carbon then phenolics and finally metals and indicator parameters. Appropriate sample handling and container requirements are summarized on Figure 5. Metals are analyzed as "total metals" quantity; no filtration is required.

Protective gloves must be worn during sample collection and care should be taken to prevent spills on skin or clothing. Each sample container must be carefully labeled with the sampling location, time and date, identity of preservatives contained within and the sampler's initials. After collection, the samples shall be stored in a clean cooler containing ice or ice packs. The coolers containing samples must be stored in a secure location, on-site, until they are transported to the laboratory.

Field Quality Assurance/Quality Control samples must include:

- One trip blank for every ten samples collected. The trip blank must be stored in the cooler utilized for storing and shipping samples. The trip blank must be analyzed for VOCs.
- One field blank for each ten samples collected. The field blank samples are to be collected by filling an identical set of sample bottles at a given location with clean deionized water. The field blank samples must be analyzed VOCs.
- One blind duplicate for each sampling event. The duplicate must be collected by filling an identical set of sample bottles at a given location and submitting them for an identical analysis.
- One equipment blank per sampling day for each piece of non-dedicated sampling equipment utilized in the sampling process (i.e. the stainless steel bucket. The equipment

blank must be collected by pouring clean deionized water over the decontaminated piece of equipment and collecting the rinsate in the appropriate jar for analysis. The equipment blank must be analyzed for VOCs.

A sample collection log (Figure 6) must be filled out at each sampling location. The log must be filled out to include the location, date, time, identity of sampler and a description of any unusual conditions encountered must be noted. A chain of custody form must be filled out for each sampling event. This form must be filled out fully for each sample submitted for analysis and each person responsible for the handling of these samples must sign and date the form. When the samples are delivered to the laboratory and the lab has signed for their receipt, a copy of this form must be retained on site in the operating record and another copy forwarded to QEHS Department.

Except as described below, each sample must be analyzed for the parameters listed on Figure 7, which also contains the analytical methods and targeted method detection limits. Exceptions to this are as follows: 1) The PCB's listed on Figure 5 are only analyzed in samples from Master Cell VI. and 2) In order to fully characterize the leachate, each of the leachate sumps in MC V, MC VI-A (AN & AS) through VI-E and MC VII must be analyzed for a modified list of 40 CFR 264 Appendix IX parameters on a rotating basis. The list is considered "modified" as dioxins and furans are analyzed at screening levels as opposed to a breakdown of the specific cogeners. Analysis of the cogeners requires the use of a specialty laboratory and the ultra-low detection limits have no practical use in this leachate characterization. Each year, two of the leachate samples must be analyzed for the modified list of Appendix IX parameters. The two cells

sampled will change each year until all are sampled and then the process will be repeated throughout the operation of the facility. New cells will not be analyzed for the Appendix IX constituents until they have been producing leachate for at least one year. A list of Appendix IX parameters along with corresponding analytical methods and detection limits are presented on Figure 8. It is recognized that in most cases the detection limits shown on Figures 7 and 8 will not be attained due to sample dilutions and matrix effects.

Laboratory Quality control frequencies and precision/accuracy requirements are provided in the Groundwater Sampling and Analysis Plan for this facility, which includes the Quality Assurance Manual for the contract laboratory. This manual describes the internal policies, guidelines and procedures of Trimatrix and is not intended to describe the specific details of this particular monitoring program. Rather, we use this document as a guideline in evaluating Trimatrix's QA/QC and standard operating procedures to ensure that generally acceptable practices are employed.

5.0 REPORTING REQUIREMENTS

Within 60 days after each sampling event is completed, the analytical results must be submitted to MDEQ along with a summary of QA/QC data and the sampling documentation forms. The monthly leachate volumes as well as a summary of the leachate level data should be included in this submittal. In addition to the reporting requirements described above, an annual leachate report must be filed with the MDEQ by March 1 of the following year. In this report, annual leachate production rates, leachate head levels and leachate analytical results are to be evaluated and summarized. This summary must also include a description of any non-compliances and

associated corrective actions and of any major maintenance activities (such as jetting of leachate lines).

The leachate analytical data must be evaluated with respect to the need to refine secondary collection and groundwater monitoring programs by summarizing, in table form, the rate of detection and concentration of leachate monitoring parameters. The results of this summary will be compared to groundwater and leak detection parameter lists. Any parameter that is found in more than 50% of the leachate samples and/or in concentrations greater than 1 mg/L will be considered for inclusion in the leak detection and/or groundwater monitoring program(s). WDI will recommend whether to include such a parameter based on its chemical properties and any other relevant information.

Leachate volume and head level information must be evaluated in graphical and/or tabular form, respectively. Monthly and annual volumes for each cell must be plotted to determine if there are increases in production rates that should be evaluated. The head levels must be presented to show the dates and results of head measurements and identify any periods where heads exceed the 1 foot limit as well as the duration of the exceedance and the cause and correction of the exceedance.

SCHEMATIC OF LEACHATE COLLECTION SUMP ARRANGEMENT
WAYNE DISPOSAL SITE #2 HAZARDOUS WASTE LANDFILL

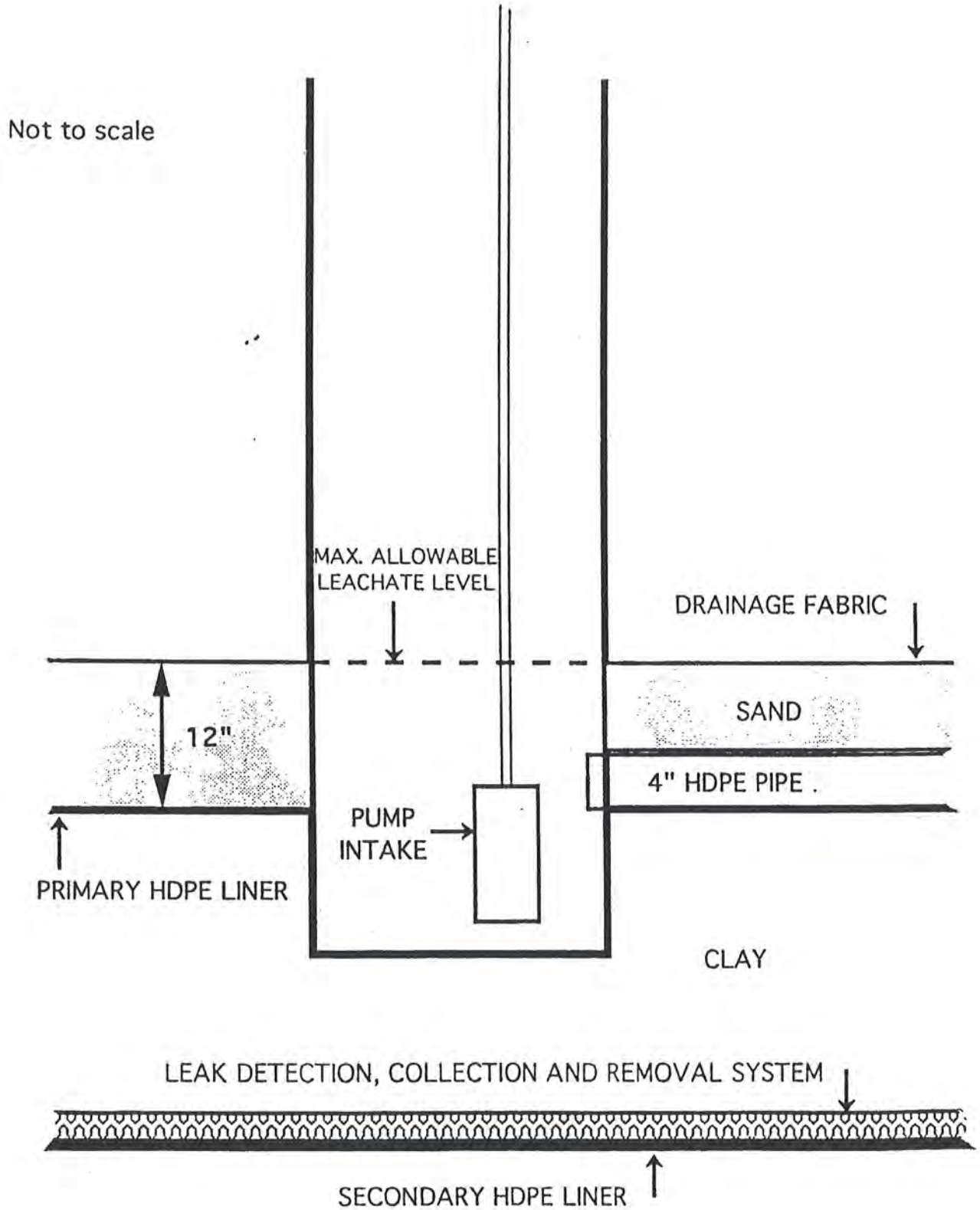


Figure 1

WEEKLY INSPECTION CHECKLIST FOR LEACHATE COLLECTION SYSTEMS
WAYNE DISPOSAL, INC. SITE #2 HAZARDOUS WASTE LANDFILL MASTER CELLS

Inspector: _____

Date: _____

CELL	METER READING	METER ADVANCE?		COMPLIANCE DEPTH TO LEACHATE (FT)	ACTUAL DEPTH TO LEACHATE (FT)	LEVEL IN COMPLIANCE?		PUMP FUNCTIONING?		METER FUNCTIONING?	
		Y	N			Y	N	Y	N	Y	N
V-A				68.8							
V-B				62.5							
V-C				55.9							
V-E				61.2							
VI-AS				127.0							
VI-AN				128.3							
VI-B				135.2							
VI-C				102.12							
VI-D				130.9							
VI-ENE				Not Yet Constructed							
VI-ENW				80							
VI-ESW				26							
VI-ESE				37							
VI-CONTACT											
VII-A				37.5							
VII-BN				49.3							
VII-BS				51.8							
VII-C				46.2							

COMMENTS/ACTIONS TAKEN: _____

NOTE: REPORT ITEMS NEEDING IMMEDIATE ATTENTION TO THE SITE MANAGER

Leachate Compliance Levels updated on 9/27/06 for MC-VI based upon top of manhole elevations

Leachate Inspection Rev. #2 9/06

FIGURE 2

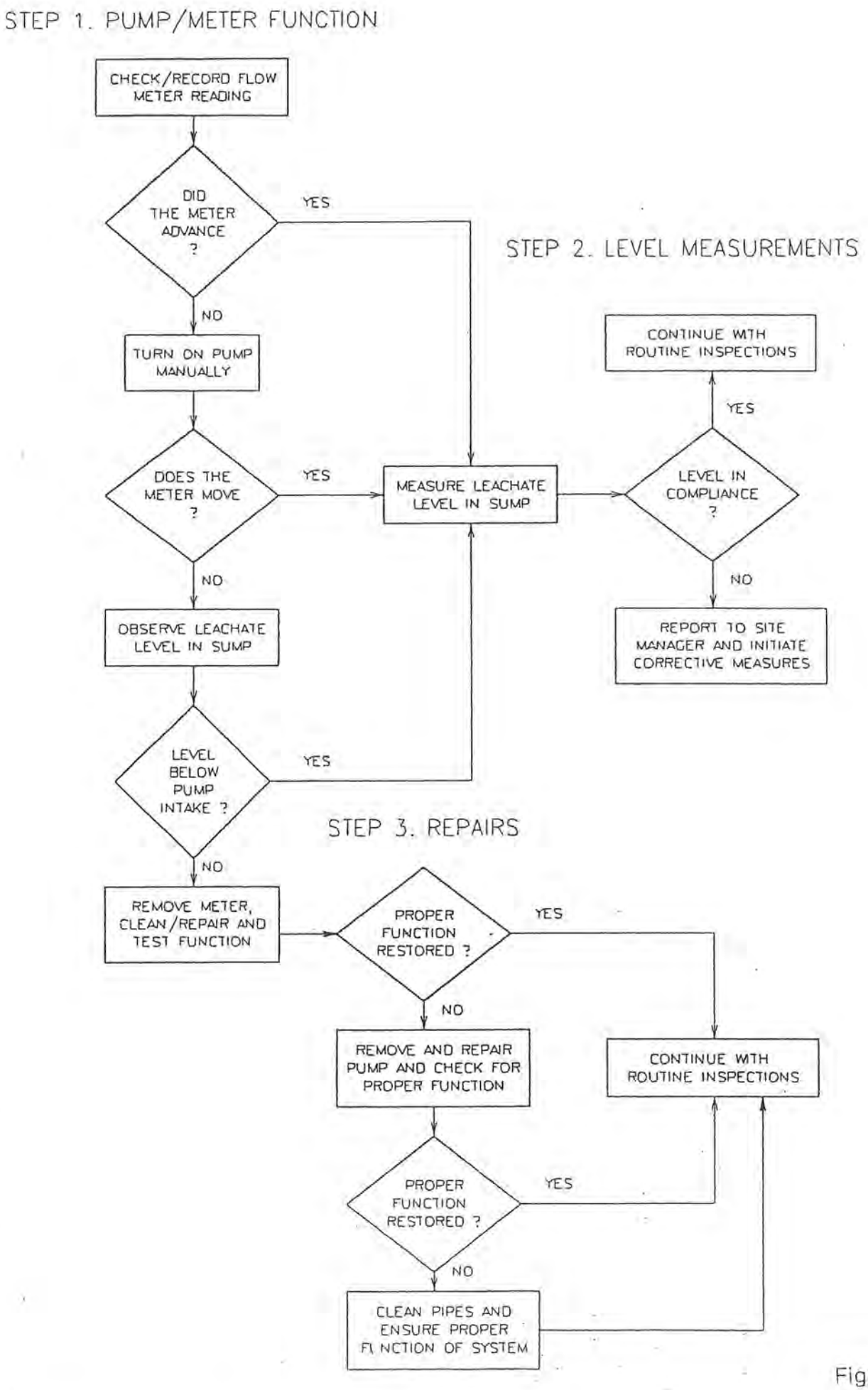
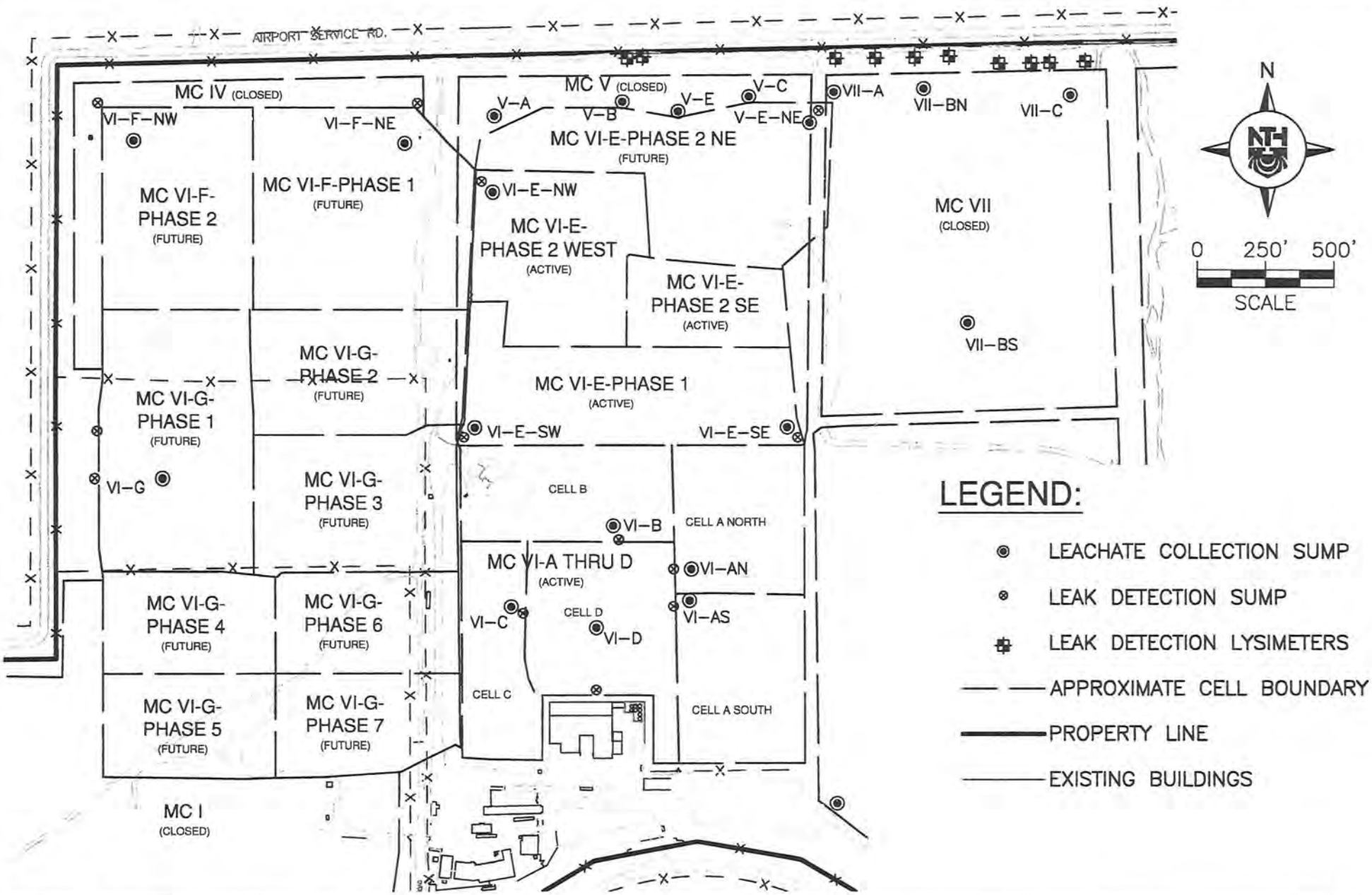

STEP 1. PUMP/METER FUNCTION
CHECK/RECORD FLOW METER READING
DID THE METER ADVANCE ?
YES
NO
TURN ON PUMP MANUALLY
DOES THE METER MOVE ?
YES
NO
OBSERVE LEACHATE LEVEL IN SUMP
LEVEL BELOW PUMP INTAKE ?
YES
NO
STEP 2. LEVEL MEASUREMENTS
MEASURE LEACHATE LEVEL IN SUMP
LEVEL IN COMPLIANCE ?
YES
CONTINUE WITH ROUTINE INSPECTIONS
NO
REPORT TO SITE MANAGER AND INITIATE CORRECTIVE MEASURES
STEP 3. REPAIRS
REMOVE METER, CLEAN/REPAIR AND TEST FUNCTION
PROPER FUNCTION RESTORED ?
YES
NO
REMOVE AND REPAIR PUMP AND CHECK FOR PROPER FUNCTION
CONTINUE WITH ROUTINE INSPECTIONS
PROPER FUNCTION RESTORED ?
YES
NO
CLEAN PIPES AND ENSURE PROPER FUNCTION OF SYSTEM

Figure 3.

J:\62\62080376\Reports\Env\LIC\080376-LCS.dwg



NTH PROJECT No.:	DESIGNED BY:	CHECKED BY:	DRAWING SCALE:	NTH Consultants, Ltd. Infrastructure Engineering and Environmental Services	LEACHATE COLLECTION & LEAK DETECTION LOCATIONS	FIGURE:
62-080376-00	KRO	DLP	AS SHOWN		WAYNE DISPOSAL, INC. SITE NO. 2 VAN BUREN TWP., WAYNE COUNTY, MICHIGAN	4
CAD FILE NAME:	DRAWN BY:	INCEPTION DATE:	PLOT DATE:			
080376-LCS	KRO	1/27/2011	2/8/11			

Figure 5. Handling Requirements of Monitoring Parameters

Parameter	Perservation	Holding Time	Bottle Type	Minimum Volume
Total Phenolics	1,2	28 Days	Glass	500 ml
Sulfate	2	28 Days	Plastic	50 ml*
Alkalinity	2	14 Days	Plastic	100 ml*
Chloride	2	28 Days	Plastic	50 ml*
Total Phosphorus	1,2	28 Days	Plastic	200 ml***
Total Cyanide	4	14 Days	Plastic	500 ml
Nitrate/Nitrite	1,2	48 Hours	Plastic	500 ml
Kjeldahl Nitrogen	1,2	28 Days	Plastic	200 ml***
Aluminum	3,5	6 Mos	Plastic	200 ml**
Antimony	3,5	6 Mos	Plastic	200 ml**
Arsenic	3,5	6 Mos	Plastic	200 ml**
Barium	3,5	6 Mos	Plastic	200 ml**
Beryllium	3,5	6 Mos	Plastic	200 ml**
Cadmium	3,5	6 Mos	Plastic	200 ml**
Calcium	3,5	6 Mos	Plastic	200 ml**
Chromium	3,5	6 Mos	Plastic	200 ml**
Chromium, Hexavalent	2,5	24 Hrs	Plastic	100 ml
Cobalt	3,5	6 Mos	Plastic	200 ml**
Copper	3,5	6 Mos	Plastic	200 ml**
Iron	3,5	6 Mos	Plastic	200 ml**
Potassium	3,5	6 Mos	Plastic	200 ml**
Lead	3,5	6 Mos	Plastic	200 ml**
Magnesium	3,5	6 Mos	Plastic	200 ml**
Manganese	3,5	6 Mos	Plastic	200 ml**
Mercury	3,5	6 Mos	Plastic	200 ml**
Molybdenum	3,5	6 Mos	Plastic	200 ml**
Nickel	3,5	6 Mos	Plastic	200 ml**
Selenium	3,5	6 Mos	Plastic	200 ml**
Silver	3,5	6 Mos	Plastic	200 ml**
Sodium	3,5	6 Mos	Plastic	200 ml**
Thallium	3,5	6 Mos	Plastic	200 ml**
Tin	3,5	6 Mos	Plastic	200 ml**
Vanadium	3,5	6 Mos	Plastic	200 ml**
Zinc	3,5	6 Mos	Plastic	200 ml**
pH		Immediate	Plastic	25 ml
Bicarbonate	2	14 Days	Plastic	100 ml*
Carbonate	2	14 Days	Plastic	100 ml*
Total Organic Carbon	1,7	28 Days	Glass	100 ml
Chemical Oxygen Demand	1,2	28 Days	Glass	250 ml
Specific Conductivity	2	28 Days	Plastic	100 ml
Semi-Volatile Organics	2	14 Days	Glass/Teflon	1000 ml
Volatile Organics	2,6	14 Days	Glass/Teflon	2x40 ml
PCBs	2	7 Days-Extraction	Glass	2 L
	2	40 Days-Analysis	Glass	40 ml

1) pH<2 with concentrated Sulfuric Acid
2) Store at 4 degrees Centigrade
3) pH<2 with nitric acid
4) pH>12 with sodium hydroxide
5) Filtered in the field or lab using 0.45 micron membrane filters on the daily of sample collection
6) 4 drops HCL, no headspace
7) pH<2 with hydrochloric acid

* Note: One liter for all these parameters stored similarily
** Note: One liter for all these parameters stored similarily
*** Note: One liter for all these parmeters stored similarily

Figure 6. Sample Collection Log for Leachate - WDI Site #2

Sample ID:	Sample Date:	Sample Time:
Sample Location:	Sampling Method:	Sampler:
Observations/Comments*:		

Sample ID:	Sample Date:	Sample Time:
Sample Location:	Sampling Method:	Sampler:
Observations/Comments*:		

Sample ID:	Sample Date:	Sample Time:
Sample Location:	Sampling Method:	Sampler:
Observations/Comments*:		

Sample ID:	Sample Date:	Sample Time:
Sample Location:	Sampling Method:	Sampler:
Observations/Comments*:		

Sample ID:	Sample Date:	Sample Time:
Sample Location:	Sampling Method:	Sampler:
Observations/Comments*:		

* Note anything unusual in the sample or conditions of or near the riser pipe

FIGURE 7 ORGANIC COMPOUNDS FOR LEACHATE MONITORING

VOLATILE ORGANIC PARAMETERS (8260)	MDL (mg/L)	SEMI-VOLATILE ORGANIC PARMETERS (8270)			
			MDL		MDL
Acetone	0.010	Acenapthene	0.010	Hexachlorobenzene	0.010
Bromodichloromethane	0.001	Acenapthylene	0.010	Hexachlorobutadiene	0.010
Bromoform	0.001	Anthracene	0.010	Hexachlorocyclopentadiene	0.010
Bromomethane	0.005	Benzidene	0.080	Hexachloroethane	0.010
Carbon Tetrachloride	0.001	Benzo(a)anthracene	0.010	Indeno (1,2,3-cd) pyrene	0.010
Chlorobenzene	0.001	Benzo(b)fluoranthene	0.010	Isophorone	0.010
Chloroethane	0.005	Benzo(k)fluoranthene	0.010	2-Methylnapthalene	0.010
2-Chloroethylvinyl Ether	0.010	Benzo(ghi)perylene	0.010	Napthalene	0.010
Chloroform	0.001	Benzoic Acid	0.050	2-Nitroaniline	0.050
Chloromethane	0.001	Benzo(a)pyrene	0.010	3-Nitoraniline	0.050
Dibromodifluoromethane	0.001	Benzyl alcohol	0.010	4-Nitroaniline	0.050
1,2 Dichlorobenzene	0.001	Bis (2-chloroethoxy) methane	0.010	Nitrobenzene	0.010
1,3 Dichlorobenzene	0.001	Bis (2-chloroethyl) ether	0.010	N-Nitrosodiphenylamine	0.010
1,4 Dichlorobenzene	0.001	Bis (2)chloroisopropyl) ether	0.010	N-Nitroso-di-n-propylamine	0.010
Dichlorodifluoromethane	0.001	Bis (2-ethylhexyl) phthalate	0.010	Phenanathrene	0.010
1,1-Dichloroethane	0.001	4-Bromo phenyl ether	0.010	Pyrene	0.010
1,2-Dichloroethane	0.001	Butyl benzyl phthalate	0.010	1,2,4-Trichlorobenzene	0.010
1,1-Dichloroethene	0.001	4-Chloroaniline	0.010	4-Chloro-3-methylphenol	0.010
1,2-Dichloroethene	0.001	2-chloronapthene	0.010	2-Chlorophenol	0.010
1,2 Dichloropropane	0.001	4-Chlorophenyl phenyl ether	0.010	2,4-Dichlorophenol	0.010
1,3 Dichloropropene	0.001	Chrysene	0.010	2,4-Dimethylphenol	0.010
1,1,2,2 Tetrachloroethane	0.001	Dibenz (a,h) anthracene	0.010	4,6-Dinitro-2-methylphenol	0.050
Tetrachloroethane	0.001	Dibenzofuran	0.010	2,4-Dinitrophenol	0.050
Tetrachloroethene	0.001	Di-n-butyl phthalate	0.010	2-Methylphenol	0.010
1,1,2-Trichloroethane	0.001	1,2-Dichlorobenzene	0.010	3-Methylphenol	0.010
1,1,1-Trichloroethane	0.001	1,3-Dichlorobenzene	0.010	4-Methylphenol	0.010
Trichloroethene	0.001	1,4-Dichlorobenzene	0.010	2-Nitrophenol	0.010
Trichlorofluoromethane	0.005	3,3'-Dichlorobenzene	0.020	4-Nitrophenol	0.050
Vinyl Chloride	0.005	Diethyl pthalate	0.010	Pentachlorophenol	0.050
Methylene Chloride	0.005	Dimethyl pthalate	0.010	Phenol	0.010
Methyl Ethyl Ketone	0.050	2,4-Dinitrotoluene	0.010	2,4,5-Trichlorophenol	0.010
Benzene	0.001	2,6-Dinitrotoluene	0.010	2,4,6-Trichlorophenol	0.010
Toluene	0.001	Di-n-octyl phthalate	0.010		
Ethylbenzene	0.001	Fluoranthene	0.010		
Total Xylenes	0.003	Fluorene	0.010		
4-Methyl-2-Pentanone	0.005				
Isobutyl Alcohol	1.000				
1,4-Dioxane	0.020				
PCB's (Method 8082)					
PCB-1016	0.0001	PCB-1232	0.0001	PCB-1248	0.0001
PCB-1221	0.0001	PCB-1242	0.0001	PCB-1254	0.0001
PCB-1260	0.0001				

FIGURE 7. METHODS AND DETECTION LIMITS

PARAMETER	MDL (mg/L)	METHOD
TOTAL PHENOLICS	0.05	9066
SULFATE	2	ASTM D516-90
TOTAL ALKALINITY	10	2320B
CHLORIDE	1.0	4500-Cl E
KJELDAHL NITROGEN	20.0	351.2
NITRATE/NITRITE	0.05	4500-NO3 F
TOTAL PHOSPHORUS	0.05	4500-P E
TOTAL CYANIDE	0.01	4500-CN G
ALUMINUM	0.2	6010/6020
ANTIMONY	0.05	6020
ARSENIC	0.002	6020
BARIUM	0.02	6010/6020
BERYLLIUM	0.005	6010/6020
CADMIUM	0.005	6020
CALCIUM	0.5	6010
CHROMIUM	0.02	6010/6020
HEX. CHROMIUM	0.25	7196
COBALT	0.02	6010/6020
COPPER	0.02	6010/6020
IRON	0.02	6010
LEAD	0.04	6020
MAGNESIUM	0.5	6010
MANGANESE	0.005	6010/6020
MERCURY	0.0002	7470
MOLYBDENUM	0.10	6010/6020
NICKEL	0.02	6010/6020
POTASSIUM	0.2	6010
SELENIUM	0.002	7741/6020
SILVER	0.01	6020/7760
SODIUM	0.5	6010
THALLIUM	0.05	6020/7841
TIN	0.5	6020
VANADIUM	0.02	6010/6020
ZINC	0.02	6010/6020
pH	N/A	4500-H B
BICARBONATE	5.0	2320B
CARBONATE	5.0	2320B
TOTAL ORGANIC CARBON	0.2	5310C
CHEMICAL OXYGEN DEMAN	10.0	5220D
SPEC. CONDUCTANCE	5.0	2510B
SEMI-VOLATILE ORGANICS*	**	8270
VOLATILE ORGANICS*	**	8260
PCB's	**	8082

* see attached lists of compounds

** detection limits are compound dependent

FIGURE 8. METHODS AND DETECTION LIMITS FOR APPENDIX IX PARAMETERS

Constituent	Method	Detection Limit	Unit
Cyanide, Total	9012	0.01	mg/L
Sulfide	9030	10	mg/L
Antimony	6010/6020	0.05	mg/L
Arsenic	7061	0.002	mg/L
Barium	6010	0.02	mg/L
Beryllium	6010	0.005	mg/L
Cadmium	6010	0.005	mg/L
Chromium	6010	0.02	mg/L
Cobalt	6010	0.02	mg/L
Copper	6010	0.02	mg/L
Lead	6010	0.04	mg/L
Mercury	7470	0.0002	mg/L
Nickel	6010/6020	0.02	mg/L
Selenium	7741	0.002	mg/L
Silver	6010	0.01	mg/L
Thallium	6010	0.05	mg/L
Tin	6010	0.20	mg/L
Vanadium	6010	0.02	mg/L
Zinc	6010	0.02	mg/L
Aldrin	8081	0.05	ug/L
alpha-BHC	8081	0.05	ug/L
beta-BHC	8081	0.05	ug/L
delta-BHC	8081	0.05	ug/L
gamma-BHC (Lindane)	8081	0.05	ug/L
Chlordane	8081	0.50	ug/L
4,4'-DDD	8081	0.10	ug/L
4,4'-DDE	8081	0.10	ug/L
4,4'-DDT	8081	0.10	ug/L
Dieldrin	8081	0.10	ug/L
alpha-Endosulfan	8081	0.05	ug/L
beta-Endosulfan	8081	0.10	ug/L
Endosulfan sulfate	8081	0.10	ug/L
Endrin	8081	0.10	ug/L
Endrin aldehyde	8081	0.10	ug/L
Heptachlor	8081	0.05	ug/L
Heptachler epoxide	8081	0.05	ug/L
Isodrin	8081	0.05	ug/L
Kepone	8081	0.10	ug/L
Methoxychlor	8081	0.05	ug/L
Toxaphene	8081	1.0	ug/L
PCB-1016	8082	0.50	ug/L
PCB-1221	8082	0.50	ug/L
PCB-1232	8082	0.50	ug/L
PCB-1242	8082	0.50	ug/L
PCB-1248	8082	0.50	ug/L
PCB-1254	8082	0.50	ug/L
PCB-1260	8082	0.50	ug/L
Disulfoton	8270	2.00	ug/L
Methyl parathion	8270	0.50	ug/L
Thionazin*	8270	10.0	ug/L
Parathion	8270	0.50	ug/L
Phorate	8140	2.00	ug/L

FIGURE 8. METHODS AND DETECTION LIMITS FOR APPENDIX IX PARAMETERS

Constituent	Method	Detection Limit	Unit
2,4-dichlorophenoxy-acetic acid	8150	0.50	ug/L
2,4,5-TP (Silvex)	8150	0.50	ug/L
2,4,5-T	8150	0.50	ug/L
Acetone	8260	0.010	mg/L
Benzene	8260	0.001	mg/L
Bromodichloromethane	8260	0.001	mg/L
Bromoform	8260	0.001	mg/L
Bromomethane	8260	0.001	mg/L
2-Butanone	8260	0.050	mg/L
Carbon disulfide	8260	0.050	mg/L
Carbon Tetrachloride	8260	0.001	mg/L
Chlorobenzene	8260	0.001	mg/L
Chloroethane	8260	0.001	mg/L
2-Chloroethylvinyl ether	8260	0.010	mg/L
Chlormethane	8260	0.001	mg/L
Dibromochloromethane	8260	0.001	mg/L
1,2-Dichlorobenzene	8260	0.001	mg/L
1,3-Dichlorobenzene	8260	0.001	mg/L
1,4-Dichlorobenzene	8260	0.001	mg/L
1,1-Dichloroethane	8260	0.001	mg/L
1,2-Dichloroethane	8260	0.001	mg/L
1,1-Dichloroethene	8260	0.001	mg/L
1,2-Dichloroethene (total)	8260	0.001	mg/L
1,2-Dichloropropane	8260	0.001	mg/L
cis-1,3-Dichloropropene	8260	0.001	mg/L
trans-1,3-Dichloropropene	8260	0.001	mg/L
Ethylbenzene	8260	0.001	mg/L
2-Hexanone	8260	0.050	mg/L
Methlene Chloride	8260	0.005	mg/L
4-Methyl-2-pentanone	8260	0.050	mg/L
Styrene	8260	0.001	mg/L
1,1,2,2-Tetrachloroethane	8260	0.001	mg/L
Toluene	8260	0.001	mg/L
1,1,1-Trichloroethane	8260	0.001	mg/L
1,1,2-Trichloroethane	8260	0.001	mg/L
Trichloroethene	8260	0.001	mg/L
Vinyl acetate	8260	0.050	mg/L
Vinyl chloride	8260	0.001	mg/L
Xylenes (total)	8260	0.003	mg/L
Acetonitrile	8260	0.050	mg/L
Acrolein	8260	0.100	mg/L
Acrylonitrile	8260	0.050	mg/L
2-Chloro-1,3-butadiene (Chloroprene)	8260	0.050	mg/L
3-Chloropropene(Allyl Chloride)	8260	0.010	mg/L
1,2-Dibromo-3-chloropropane	8260	0.010	mg/L
1,2-Dibromomethane	8260	0.001	mg/L
trans-1,4-Dichloro-2-butene	8260	0.005	mg/L
Dichlorodifluoromethane	8260	0.010	mg/L
1,4-dioxane	8260	0.020	mg/L
Ethyl methacrylate	8260	0.300	mg/L
Iodomethane	8260	0.050	mg/L
Isobutyl alcohol	8260	1.0	mg/L

FIGURE 8. METHODS AND DETECTION LIMITS FOR APPENDIX IX PARAMETERS

Constituent	Method	Detection Limit	Unit
Methacrylonitrile	8260	0.010	mg/L
Methyl methacrylate	8260	0.010	mg/L
Propionitrile	8260	0.100	mg/L
1,1,1,2-Tetrachloroethane	8260	0.001	mg/L
Trichlorofluoromethane	8260	0.001	mg/L
1,2,3-Trichloropropane	8260	0.001	mg/L
Acetopheneone	8270	0.010	mg/L
2-Acetylaminofluorene	8270	0.010	mg/L
4-Aminobiphenyl	8270	0.010	mg/L
Aniline	8270	0.010	mg/L
Aramite	8270	0.010	mg/L
Chlorobenzilate	8270	0.010	mg/L
Diallate	8270	0.010	mg/L
Dimethoate	8270	0.010	mg/L
p-(Dimethylamino)azobenzene	8270	0.010	mg/L
7,12-Dimethylbenz[a]anthracene	8270	0.010	mg/L
3,3'-Dimethylbenzidine	8270	0.040	mg/L
alpha, alpha-Dimethyphenethlamine	8270	0.100	mg/L
1,3-Dinitrobenzene	8270	0.010	mg/L
Diphenylamine*	8270	0.010	mg/L
Ethyl methanesulfonate	8270	0.010	mg/L
Farmphur	8270	0.010	mg/L
Hexachlorodibenofurans	8270	0.010	mg/L
Hexachlorodibenzo-p-dioxins	8270	0.010	mg/L
Hexachloropropene	8270	P/A	mg/L
Isosafrole	8270	0.010	mg/L
Methapyrilene	8270	0.010	mg/L
3-Methylcholanthrene	8270	0.080	mg/L
Methyl methanesulfonate	8270	0.040	mg/L
1,4-Naphthoquinone	8270	0.010	mg/L
1-Naphthylamine	8270	0.010	mg/L
2-Naphthylamine	8270	0.010	mg/L
5-Nitro-o-toluidine	8270	0.010	mg/L
4-Nitroquinoline-1-oxide	8270	0.010	mg/L
N-Nitroso-di-n-butylamine	8270	0.010	mg/L
N-Nitrosodiethylamine	8270	0.010	mg/L
N-Nitrosodimethylamine	8270	0.010	mg/L
N-Nitrosomethylethlamine	8270	0.010	mg/L
N-Nitrosomorpholine	8270	0.010	mg/L
N-Nitrosopyrrolidine	8270	0.010	mg/L
N-Nitrosopiperdine	8270	0.010	mg/L
Pentachlorobenzene	8270	0.010	mg/L
Pentachlorodibenzofurans	8270	0.010	mg/L
Pentachlorodibenzo-p-dioxins	8270	0.010	mg/L
Pentachloroethane	8270	0.010	mg/L
Pentachloronitrobenzene	8270	0.010	mg/L
Phenacetin	8270	0.010	mg/L
p-Phenylene diamine	8270	0.010	mg/L
2-Picoline	8270	0.080	mg/L
Pronamide	8270	0.080	mg/L
Pyridine	8270	0.130	mg/L
Safrole	8270	0.010	mg/L

FIGURE 8. METHODS AND DETECTION LIMITS FOR APPENDIX IX PARAMETERS

Constituent	Method	Detection Limit	Unit
Sulfotepp**	8270	0.010	mg/L
1,2,4,5-Tetrachlorobezene	8270	0.010	mg/L
Tetrachlorodibenzofurans	8270	0.010	mg/L
Tetrachloroibenzo-p-dioxins	8270	0.010	mg/L
o-Toluidine	8270	0.010	mg/L
o,o,o,-Triethylphosphorothioate	8270	0.010	mg/L
1,3,5-Trinitrobenzene	8270	0.010	mg/L
Tris (2,3-dibromopropyl) phosphate	8270	0.200	mg/L
2,6-Dichlorophenol	8270	0.010	mg/L
Dinoseb	8270	0.020	mg/L
Hexachlorophene	8270	0.080	mg/L
3-Methylphenol	8270	0.010	mg/L
2, 3,4,6-Tetrachlorophenol	8270	0.010	mg/L
Acenaphthene	8270	0.010	mg/L
Acenaphthylene	8270	0.010	mg/L
Anthracene	8270	0.010	mg/L
Benzidine	8270	0.080	mg/L
Benzo (a) anthracene	8270	0.010	mg/L
Benzo (b) fluoranthene	8270	0.010	mg/L
Benzo (k) fluoranthene	8270	0.010	mg/L
Benzo (ghi) perylene	8270	0.010	mg/L
Benzoic acid	8270	0.050	mg/L
Benzo (a) pyrene	8270	0.010	mg/L
Benzyl alcohol	8270	0.010	mg/L
Bis (2-chloroethoxy) methane	8270	0.010	mg/L
Bis (2-chloroethyl) ether	8270	0.010	mg/L
Bis (2-chloroisopropyl) ether	8270	0.010	mg/L
Bis (2-ethylhexyl) phthalate	8270	0.010	mg/L
4-Bromophenyl phenyl ether	8270	0.100	mg/L
Butyl benzyl phthalate	8270	0.010	mg/L
4-Chloroaniline	8270	0.010	mg/L
2-Chloroaphthalene	8270	0.010	mg/L
4-Chlorophenyl phenyl ether	8270	0.010	mg/L
Chrysene	8270	0.010	mg/L
Dibenz (a,h)anthracene	8270	0.010	mg/L
Dibenzofuran	8270	0.010	mg/L
Di-n-butyl phthalate	8270	0.010	mg/L
1,2-Dichlorobenzene	8270	0.010	mg/L
1,3-Dichlorobenzene	8270	0.010	mg/L
1,4-Dichlorobenzene	8270	0.010	mg/L
3,3'-Dichlorobenzidine	8270	0.020	mg/L
Diethyl phthalate	8270	0.010	mg/L
Dimethyl phthalate	8270	0.010	mg/L
2,4-Dinitrotoluene	8270	0.010	mg/L
2,6-Dintrotoluene	8270	0.010	mg/L
Di-n-octyl phthalate	8270	0.010	mg/L
Fluoranthene	8270	0.010	mg/L
Fluorene	8270	0.010	mg/L
Hexachlorobenzene	8270	0.010	mg/L
Hexachlorobutadiene	8270	0.010	mg/L
Hexachlorocyclopentadiene	8270	0.010	mg/L
Hexachloroethane	8270	0.010	mg/L

FIGURE 8. METHODS AND DETECTION LIMITS FOR APPENDIX IX PARAMETERS

Constituent	Method	Detection Limit	Unit
Indeno (1,2,3-cd) pyrene	8270	0.010	mg/L
Isophorone	8270	0.010	mg/L
2-Methylnaphthalene	8270	0.010	mg/L
Naphthalene	8270	0.010	mg/L
2-Nitroaniline	8270	0.050	mg/L
3-Nitroaniline	8270	0.050	mg/L
4-Nitroaniline	8270	0.050	mg/L
Nitrobenzene	8270	0.010	mg/L
N-Nitrosodiphenylamine*	8270	0.010	mg/L
N-Nitroso-di-n-propylamine	8270	0.010	mg/L
Phenanthrene	8270	0.010	mg/L
Pyrene	8270	0.010	mg/L
1,2,4-Trichlorobenzene	8270	0.010	mg/L
4-Chloro-3-methylphenol	8270	0.010	mg/L
2-Chlorophenol	8270	0.010	mg/L
2,4-Dichlorophenol	8270	0.010	mg/L
2,4-Dimethylphenol	8270	0.010	mg/L
4,6-Dinitro-o-cresol	8270	0.050	mg/L
2,4-Dinitrophenol	8270	0.010	mg/L
2-Methylphenol	8270	0.010	mg/L
4-Methylphenol	8270	0.010	mg/L
2-Nitrophenol	8270	0.010	mg/L
4-Nitrophenol	8270	0.050	mg/L
Pentachlorophenol	8270	0.010	mg/L
Phenol	8270	0.010	mg/L
2,4,5-Trichlorophenol	8270	0.010	mg/L
2,4,6-Trichlorophenol	8270	0.010	mg/L

Section 29. LDCRS Sampling & Analysis Plan

Section 29

LEAK DETECTION, COLLECTION AND REMOVAL SYSTEMS SAMPLING & ANALYSIS PLAN

MASTER CELL VI
WAYNE DISPOSAL, INC. SITE #2
MID 048 090 633

SAMPLING AND ANALYSIS PLAN FOR LEAK DETECTION, COLLECTION AND REMOVAL SYSTEMS

MASTER CELL VI
WAYNE DISPOSAL, INC. SITE #2
MID 048 090 633

REVISION 4.1, MAY 1999
REVISION 4.2, AUGUST 1999
REVISION 4.3, OCTOBER 2000
REVISION 4.4, FEBRUARY 2001
REVISION 4.5, MARCH 2001
REVISION 4.6, SEPTEMBER 2006
REVISION 4.7, OCTOBER 2009
REVISION 4.8, FEBRUARY 2011

1.0 INTRODUCTION

The following sampling and analysis plan outlines the standard procedures for measuring flow volumes and for the collection and analysis of samples of the liquids collected from the leak detection, collection and removal system (LDCRS) in Master Cell VI. There are currently eight LDCRS sumps, one for each for five of the cells within Master Cell VI: VI-A South, VI-A North, VI-B, VI-C and VI-D, and three in MC VI-E (VI-E-SE, VI-E-SW and VI-E-NW). The locations of these sumps are shown on Attachment A. Five additional LDCRS sumps will located in MC VI-E (VI-E-NW), MC-VI-F and MC-G however these will not be operational until these cells are constructed and begin to receive waste.

This document has been prepared to direct the efforts of monitoring personnel in the collection of samples and volume measurements so as to meet the requirements of the Operating Licnese issued under Part 111 of Michigan Act 451 for the facility and to ensure sound practices for the collection of these data.

This plan must be revised if there are any changes to the equipment or procedures contained herein. All proposed changes must be submitted to the Waste and Hazardous Materials Division (WHMD) of the Michigan Department of Environmental Quality (MDEQ) for review and approval prior to implementation.

2.0 PUMPING/SAMPLING EQUIPMENT

Each LDCRS sump must be equipped with a Grundfos Redi-Flo2™ submersible pump with a Redi-Flo2 controller package and totalizing flow meter, or alternative pumping equipment that is approved by the WHMD. The installation and operating instructions for this system are included in Attachment B. These pumps were selected for the following attributes: 1) they are composed of stainless steel and Teflon and thus have low potential to impact the quality of environmental samples, 2) the pumps are designed to collect groundwater samples with minimal aeration or perturbation of the sample and, 3) with the controller package the pumping rates are adjustable with high rates for removing liquids from the sump and low rates for sampling. Any alternative pump system installed in the LDCRS should have similar attributes for pumping and for collecting samples.

The reinforcement of the LDCRS in Master Cell VI subcell A-North completed in August, 2006 required the installation of a Black Hawk Model 101 pump system. This system was selected for its ability to draw water from a suction tube that extends through the 1-inch diameter slipline. The installation and operating instructions for this system are included in Attachment B.

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The discharge tube for the pumps is composed of HDPE. At the surface, this tube is connected to a stainless steel or PVC discharge tube with the flow meter in line. The opening at the top of each LSCRS riser must be tightly covered with a cap in which the discharge tube and electrical cable penetrate through sealed ports. The discharge tube and electrical cable must be configured such that it does not come into contact with the ground surface and such that the end hava a valve that is protected. Any changes to the configuration of the LDCRS riser pipe as the waste surface ascends must ensure that the sampling tube is not susceptible to contamination.

3.0 VOLUME AND FIELD MEASUREMENTS

The volume of liquids removed from each LDCRS must be recorded weekly on Attachment C. The volume readings from the flow meters are generally collected during the weekly inspection. At the end of each month, Attachment C must be submitted to the QEHS Department for recording and evaluation. The weekly volume data must be evaluated each month to determine the average flow rate produced on a gallons-per-acre-per day basis..

In addition to the weekly volume recording, each LDCRS must be inspected on a weekly basis to ensure that there is no evidence of damage or tampering that could allow waste or waste constituents to have entered the system. The weekly/after storm inspection form in the Inspection Plan is used for documenting these inspections. This form must be fully completed with evidence of malfunctioning equipment or other potential problems described in detail.

Once per month, a sample of the water from each LDCRS sump must be field tested for pH and specific conductivity. These values must be recorded on Attachment C. The monthly volume data and field parameter data must be submitted to the QEHS Department at the end of each month.

4.0 COLLECTION OF SAMPLES

Unless there is an insufficient amount of liquid generated by a LDCRS during a month's time (time between monthly purging/volume recording events), samples must be collected for analysis on a quarterly basis from each LDCRS sump. In addition, any sump which yields volumes above the maximum expected volume (see Section 7.1) during a monthly purging/volume recording event must be sampled and analyzed for the quarterly parameter list. Further, any time a monthly field specific conductivity value exceeds the maximum expected value (see Section 7.1) a sample must be collected and analyzed for quarterly parameters, unless the conductivity measurement was made during the collection of the quarterly sample for that sump.

Prior to collecting the samples, the sump must be pumped until a minimum of 20 gallons are removed in order to ensure that the lines have been flushed (this is approximately 3 tubing volumes) unless the production rate of the sump indicates that less than 20 gallons will be available. Prior to sampling the flow rate of the pump must be throttled back to the minimum deliverable flow rate and then the samples are collected. The sump then must be pumped until dry.

Samples are collected within Wayne Disposal, Inc, nitrogen glove box. Prior to sampling, the glove box is purged with nitrogen for approximately 20 minutes. The sample containers are placed within the box during purging. The glove box is connected to the LDCRS pumps with a fitting that allows new Tygon tubing to be used for each sample. At the time of sampling, the flow from the LDCRS is diverted into the glove box by turning the valve on the back of the box. All containers are then filled within the box while under positive pressure from the nitrogen. All containers are closed before opening the glove box to remove them.

During the sample event, specific conductance and pH of the liquid must be measured on a sample of the liquid. The volume purge data and pH/conductance data for each sump must be recorded on the Attachment C.

Samples for VOC's are collected first while ensuring that no headspace is present within the sampling vials. Next, fill the bottles for total organic carbon, total phenolics and dissolved metals in that order. Finally, collect the remaining miscellaneous samples (e.g. sulfate, chloride, etc.). All samples are to be collected in the appropriate containers with the appropriate preservatives as outlined on Attachment D, "Handling Requirements of Monitoring Parameters." Care must be taken to ensure that preservatives are not spilled during sampling. Samples for dissolved metals may be field filtered with an in-line 0.45 micron filter cartridge and acidified to pH < 2 with HNO3, or, filtered and preserved at the laboratory upon delivery.

A trip blankand a field blank for VOC analyses must be maintained and submitted for analysis for each 10 samples collected and/or for each day samples are collected. In addition, one blind duplicate samples must be submitted for complete analyses for every other sampling event (two per year). Each sample container must be carefully labeled with the sampling location, time and date, identity of preservatives contained within and the sampler's initials. After collection, the samples shall be stored in a clean cooler containing ice or ice packs. The coolers containing samples must be stored in a secure location until transport to the laboratory.

5.0 ANALYTICAL PROCEDURES

Each sample is to be analyzed for the parameters listed on Attachment E, "Method Detection Limits for Organic and Inorganic Parameters." The analytical methods and targeted method detection limits must be those specified in WHMD Operational Memo Gen-8. If a revised Memo Gen-8 is published Attachment E must be modified (if necessary) to be consistent with the revisions. Laboratory Quality control frequencies and precision/accuracy requirements are provided in the Quality Assurance Manual for the current contract laboratory, TriMatrix, which is contained in the Groundwater Sampling and Analysis Plan for this facility. This manual describes the internal policies, guidelines and procedures of Trimatrix. This manual is not intended to describe the specific details of this particular monitoring program. Rather, we are to use this document as a guideline in evaluating Trimatrix's QA/QC and standard operating procedures to ensure that generally acceptable practices are employed.

6.0 RECORD KEEPING

In addition to the inspection/volume measurement forms contained in Attachment C and the weekly inspections, there are three other items required to ensure adequate record keeping for the LDCRS monitoring program. First, a field notebook must be maintained during sampling which includes, at a minimum, the identity of sampling personnel, the dates and time when samples are collected, a description of the sampling event (i.e. routine monthly, etc.), volume meter readings, and any pertinent observations of sample characteristics or sampling environment. Second, an equipment inventory, repair and maintenance log must be maintained in the Engineering Field Office at the site. This log shall contain the serial numbers of all sampling equipment and a record of any repairs, maintenance, calibration or replacement of this equipment. Finally, a chain of custody form must be filled out for each sampling event. A sample copy is included as Attachment F. This form must be filled out fully for each sample submitted for analysis and each person responsible for the handling of these samples must sign and date the form. When the samples are delivered to the laboratory and the lab has signed for their receipt, a copy of this form must be retained. Copies of these forms must then be transmitted to the QEHS Department along with volume records.

7.0 DATA ANALYSIS AND REPORTING

Data analysis and reporting are required for both the volume data and the analytical data. Both volume and analytical data are evaluated statistically to determine if there has been a significant change.

7.1 Volume Rate Analysis

Volume data must be evaluated monthly to determine an average daily flow rate in gallons-per-acre-per-day (gpad). This is done by utilizing the following formula:

Flow Rate (gpad) = (Total Volume (gal)/Time (days))/Area of LDCRS (acres)

Areas, in acres, for the seven LDCRS are as follows: VI-AS (7.65), VI-AN (5.83), VI-B (6.13), VI-C (4.87) VI-D (7.24), VI-ESE (8.9), VI-ESW (4.6) and VI-ENW (9.4). Areas, in acres, for the future LDCRS for VI-ENE is expected to be 3.8. Areas for Cells VI-F and VI-G will be calculated based on final design drawings.

Experience with LDCRS volume rate data suggest the following behaviors are expected: 1) volume rates generally decrease over time, 2) the rates are dependent on filling rates and initial moisture content of the compacted clay component of the area being filled, and 3) short term fluctuations in rates (e.g. weekly or daily) may be large compared to average monthly rates. Evaluating the volume rate data as an indication of performance of the primary liner must take into account the expected behavior of LDCRS.

The volume data for each individual LDCRS are evaluated by comparing each monthly rate to a maximum expected rate which is based on a moving window to account for trends or fluctuations. The maximum expected rate is defined as the mean plus three standard deviations calculated from the previous two years data for each sump individually. It must be noted that an exceedance of the maximum expected rate may be a normal response to an increase in the filling rate or the return to active filling over an area which has not received waste for a period of time. The volume data must be routinely reported to MDEQ with the quarterly analytical data. However, if the monthly volume yields a rate greater than the maximum expected rate then a sample must be collected and analyzed for the parameters listed on Attachment E as soon as

practical (allowing time for sump to recharge). The MDEQ must be notified of the nature of the exceedance and the intention to sample. Steps should also be taken to determine if increases in flow rate corresponds to filling rates or filling location as these may apply to the affected cell.

7.2 Evaluation of Field Specific Conductance Data

The monthly specific conductance data from each LDCRS sump must be evaluated for increases compared to recent data. This is done by comparing the measured specific conductance to the mean plus three standard deviations calculated from the previous eight conductance measurements from that sump. If the measured conductance exceeds this quantity then a sample must be collected and analyzed for the parameters listed on Attachment E as soon as practical unless the conductance measurement was collected at the time of the quarterly sample collection. The MDEQ must be notified of the nature of the exceedance and the intention to sample.

7.3 Analytical Data Evaluation

All quarterly analytical results must be evaluated statistically and reported to the Waste and Hazardous Materials Division of the MDEQ within 60 days of the completion of each sampling event. The statistical program for the LDCRS monitoring results is presented in Attachment G. In addition to the use of statistics to evaluate the occurrence of organic compounds, WDI also tracks the concentrations of all other monitoring parameters within a database. This database should be updated upon receipt of each set of analytical results and observed for unusual data points or trends. The quarterly report must also include a description of the sampling events, a

table of the volume measurements and a summary of the QA/QC information both field and laboratory.

7.4 Annual Report

An annual report describing the sampling events, a summary of the QA/QC information, sampling documentation, an evaluation of the volume records (graphical and tabular) and analytical results and a summary of any non-compliance or maintenance items that occurred during the previous year must be prepared. This annual report must be submitted to MDEQ by March 1 of the following year.

8.0 DECONTAMINATION PROCEDURES

While the landfill cells are in operation, sampling of the LDCRS requires that the sampling vehicle drive into active cells and, in some cases onto the waste. For this reason, it is important that the sampling vehicle and equipment are properly decontaminated after sampling. The sampling vehicle must be power-washed by the mobile decon unit both outside and inside prior to leaving the cell area. All disposable PPE used by sampling personnel should be removed and disposed of in an appropriate receptacle at this time as well. The glove box should be cleaned with TSP or other non-organic detergent both inside and out on at least a quarterly basis.

ATTACHMENT A

Sump Location

ATTACHMENT B

Installation & Operating Instructions

For Gundfs & Blackhawk

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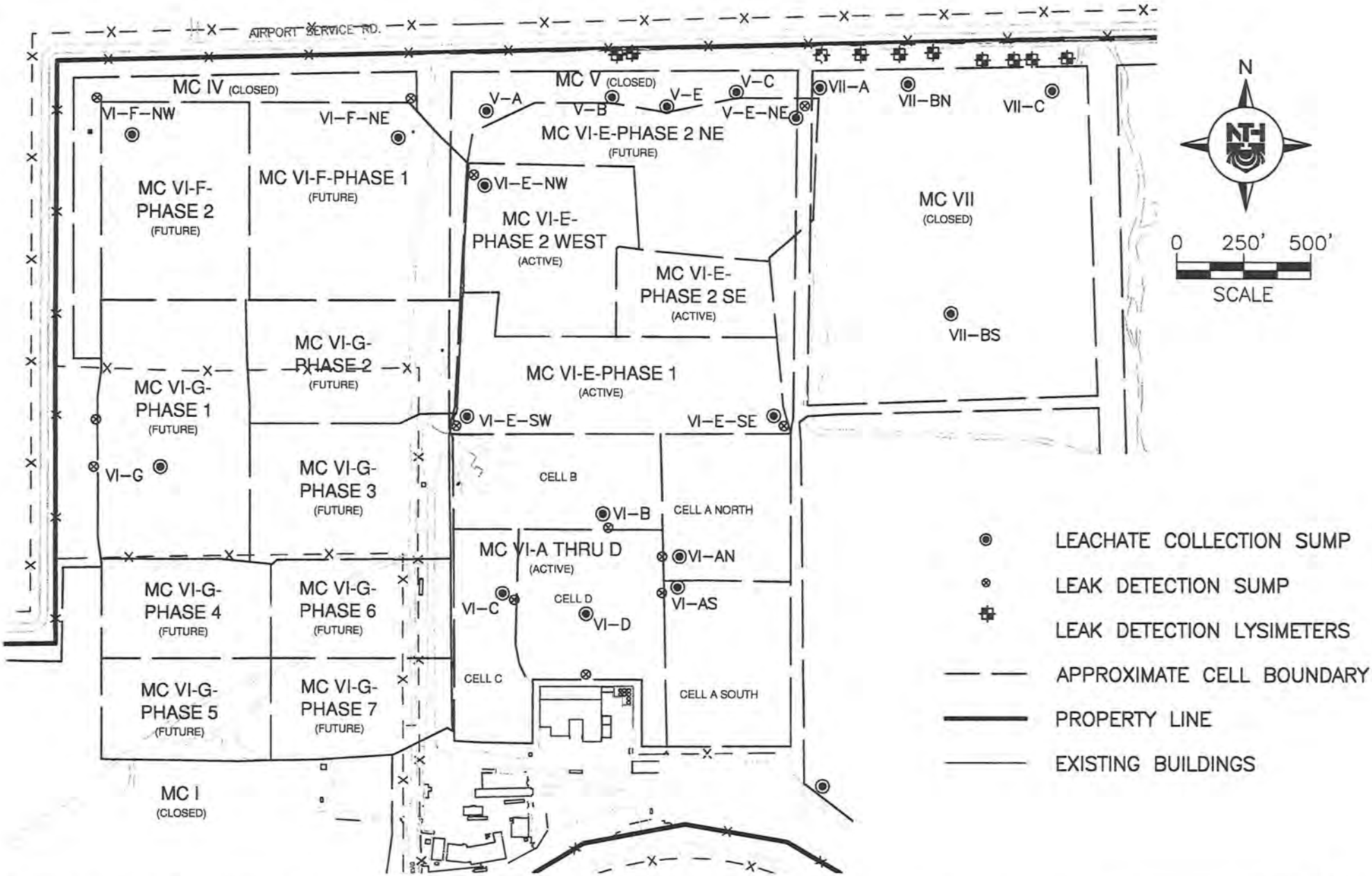
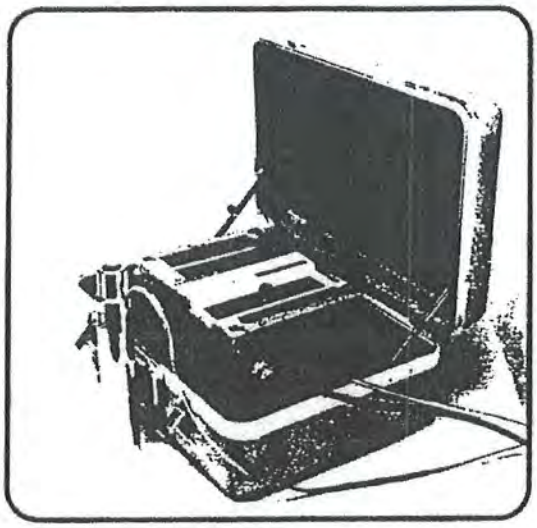


NTH PROJECT No.:	DESIGNED BY:	CHECKED BY:	DRAWING SCALE:	NTH Consultants, Ltd.	LEACHATE COLLECTION & LEAK DETECTION LOCATIONS	ATTACHMENT:
62-080376-00	KRO	DLP	AS SHOWN	Infrastructure Engineering and Environmental Services	WAYNE DISPOSAL, INC. SITE NO. 2	A
CAD FILE NAME:	DRAWN BY:	INCEPTION DATE:	PLOT DATE:		VAN BUREN TWP., WAYNE COUNTY, MICHIGAN	
080376-LCS	KRO	1/27/2011	2/8/11			

Redi-Flo2



Installation and Operating Instructions

GRUNDFOS

SAFETY WARNING

Adherence To Environmental Regulations

When handling and operating the Redi-Flo2 system, all environmental regulations covering the handling of hazardous material must be observed. When the pump is taken out of operation, great care should be taken to ensure that the pump contains no hazardous material that might cause injury to human health or to the environment.

Motor Fluid

The pump motor is filled with approximately .85 ounces (25 milliliters) of contaminant-free water. During operation, it is possible that a very small portion of this water could be replaced by the fluid being pumped. Therefore, there is a potential risk for cross contamination if used in portable applications. A filling syringe is provided with each pump to simplify the replacement of this water with clean water.

Returning A Pump For Service

Only pumps that are certified as uncontaminated will be accepted by GRUNDFOS for servicing. GRUNDFOS must receive this certification prior to receiving the pump. If not, GRUNDFOS will refuse to accept delivery of the pump. In these cases, all costs incurred in returning the product to the customer will be paid by the customer.

Electrical Hazards

The Redi-Flo2 pumping system is not approved for Class I, Division I, Group D locations as specified by the National Electrical Code (NEC). Consult local authorities and regulations if you have any doubt about its suitability for a specific application.

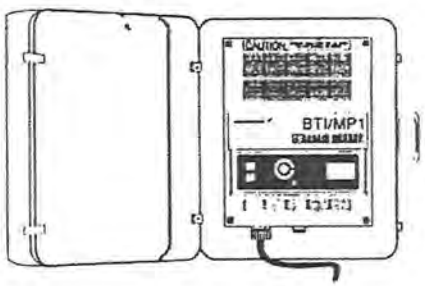
PRE-INSTALLATION CHECKLIST

Components of Your Redi-Flo2

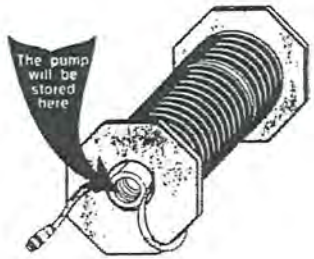
Your Redi-Flo2 Environmental Pumping system should contain the following components:

A. Converter in a protective carrying case
B. MP1 pump and motor with motor lead

A



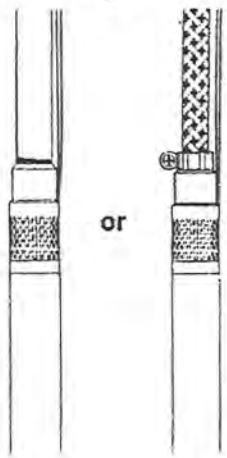
B



To operate the system you will also need:

C. Hose or pipe to connect to the pump and lower it into the well
D. An electrical plug to connect the converter power cord to your portable generator (or other power source)
E. Some type of safety cable (and attachments) for lowering and lifting the pump

C



D

(The exact type of plug used will depend upon your generator).

E

ASSEMBLING THE Redi-Flo2

Assembly Instructions

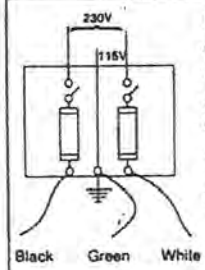
All electrical work should be performed by a qualified electrician in accordance with the latest edition of the National Electrical Code, local codes and regulations.

1

Unpack the components of the Redi-Flo2 system. The MP1 pump will be packed in the center of the motor lead roll.

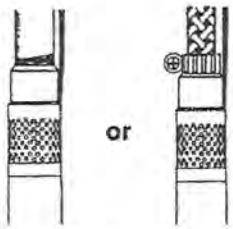
2

Strip the cord jacket and insulation from the ends of the converter power cord. Consult your local electrician to connect the leads to the electrical plug. (The ground wire should be connected to the elongated plug terminal and single phase 230 volt power should be measured across the black and white leads.)



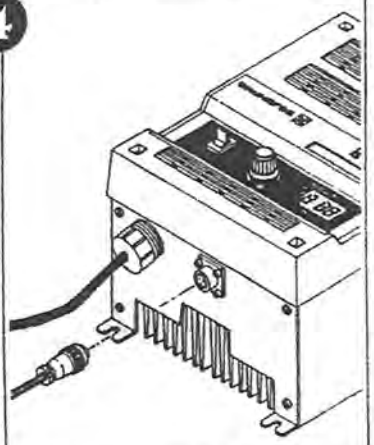
If the converter connects directly to a permanent power supply, consult your local electrician to connect the wires as shown.

3



Connect the MP1 pump to the pipe or hose through which the fluid will be pumped. If a hose is connected, a compression coupling should be used to ensure a strong, watertight fit. A safety cable may be attached to the pump (using a special bracket), as well as a plastic spiral flex clamp to secure the wire. A check valve may also be fitted to prevent liquid from flowing back into the pump after it is turned off (backflow prevention).

4



Fit the motor lead plug into the converter. Fit the converter plug into the generator (or other power source).

OPERATING THE Redi-Flo2

Starting

The Redi-Flo2 is easy to operate. Simply:

1. Submerge the pump in water.
2. Start the generator (or other power source).
3. If the generator has a circuit breaker, turn it on.
4. Check the frequency display on the front of the converter. It should read "0" (zero). If it doesn't, refer to the Troubleshooting section on pages 13-14.
5. If this is the first time the converter is being used or it has not been used for more than six months, leave the converter on for at least 15 minutes before proceeding to step 6.
6. Set the converter's speed dial near the middle of the dial (12 o'clock position).
7. Start the pump by pressing the **Start/Stop** switch into the "Start" position.
8. Adjust the pump performance by turning the speed dial.

Stopping

To stop the pump, press the **Start/Stop** switch on the converter to the "Stop" position. There is no need to reduce the pump speed first. Turn the POWER OFF at the generator ***BEFORE*** removing the motor lead from the converter.

Operating Conditions

To ensure the Redi-Flo2 operates properly, follow these guidelines:

- The MP1 pump must be installed vertically with the discharge end pointing upwards.
- The electrical voltage to the converter must always be between 190 and 253 volts (single phase, AC).
- The motor and pump must always be completely submerged in fluid to ensure lubrication of the shaft seal and cooling of the motor.
- While the pump is pumping, the distance down from the ground level to the level of the water in the well must not be greater than 270 feet.
- If the pump is used in a well larger than 4" in diameter, a shroud should be used around it to ensure proper motor cooling.
- The temperature of the water being pumped should be between 34°F and 86°F (1°C and 30°C).

Purging A Well

If the pump is being used to purge a well, start it at the maximum speed. Do not stop the pump until the pumped water contains no visible particles (to avoid blockage within the pump).

Thawing A Frozen Pump

If the liquid in the pump is frozen so the motor shaft cannot rotate, lower it into water and start it at the slowest speed. Continue to operate the pump at this speed for about 10 minutes, at which time it will be thawed and ready for operation.

MAINTENANCE AND CARE

Dismantling & Reassembling

The MP1 pump can be dismantled and reassembled quickly and easily by referring to the diagram on page 11 and following these steps:

DISMANTLING

1. Shut the pump off using the converter's Start/Stop switch.
2. Turn the generator (or other power supply) OFF.
3. Disconnect the motor lead from the converter.
4. Remove the pipe or hose connected to the pump (OPTIONAL).
5. Remove the Set Screw (position 12 in the diagram on page 11). Grasp the Inlet Screen (position 1) and slowly but forcefully pull it up over the Pump Housing (position 2).

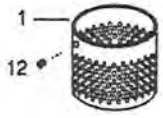
DO NOT ALLOW THE INLET SCREEN TO SCRAPE THE INSULATION FROM THE MOTOR LEADS.

5. Unscrew and remove the Pump Housing (counterclockwise when viewed from the top). This will expose the impeller assembly (guide vanes, wear rings, etc.), which can now be removed by hand for extended cleaning or replacement.

REASSEMBLY

To reassemble the MP1 pump, refer to the diagram on page 11 and:

1. Make sure the motor lead is not connected to the converter.
2. Return the impeller assembly components (guide vanes, wear rings, etc.) to the shaft in the proper order.
3. Screw the Pump Housing (position 2) back onto the top of the pump. If all of the impellers and chambers were replaced correctly, the Pump Housing should screw on easily. Hand tighten.
4. Slip the Inlet Screen (position 1) back over the Pump Housing. Screw the Set Screw (position 12) back into the Inlet Screen.



MAKE SURE YOU LINE UP THE MOTOR LEAD WITH THE RECESSED AREA IN THE PUMP HOUSING TO AVOID SCRAPING THE INSULATION FROM THE LEADS

Replacement Of Motor Fluid

If the pump is moved from well to well, it should be thoroughly decontaminated prior to being installed in the next well. In addition to cleaning the individual components inside and outside, the water in the pump motor should be replaced using the syringe that came with your pump. This can be accomplished through the following steps:

1. Shut the pump off using the converter's Start/Stop switch.
2. Turn the generator (or other power supply) OFF
3. Unplug the pump from the converter.
4. Turn the pump and motor upside down.

5. Use a flat screwdriver to remove the filling screw on the bottom of the motor.

6. Empty the water from the motor and refill it using contaminant-free water and the syringe that came with your MP1 pump. The water level should be even with the bottom edge of the screw hole.
7. Replace and tighten the filling screw.
8. Turn the pump over several times, then remove the filling screw again to let any trapped air escape (if air is left inside the motor, the life of the motor will be shortened). Add more water, if necessary.
9. Replace and tighten the filling screw.

Replacing the Motor Lead

To replace the motor lead, refer to the diagram on page 11 and follow these steps:

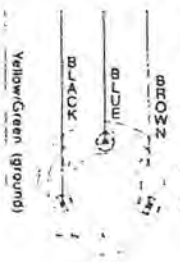
REMOVING THE OLD MOTOR LEAD

1. Make sure the power is turned **OFF**, the converter is turned **OFF**, and the motor lead is not connected to the converter.
2. Loosen and remove the Set Screw (position 12) from the Inlet Screen (position 1).
3. Slide the Inlet Screen off the pump. If you plan to use this motor lead again, be careful not to scrape insulation from it as the Inlet Screen is removed.
4. Loosen and remove the Pump Housing (position 2). Remove the impeller assembly (impellers, guide vanes, etc.).
5. Refer to the illustration on page 8. Use the special Motor Lead Screwdriver (shown at right) that came with your new motor lead to loosen and remove the Motor Lead Screw (position 14) for the ground lead (green/yellow wire).
6. Pull up on the ground lead to remove it. Using a small screwdriver and precision electronics pliers, pry up and remove the Teflon® Washer (position 15) and Brass Washers (position 16) from inside the enlarged Ground Motor Screw (position 13). Remove the Ground Motor Screw.
7. Use an allen wrench (2.5 mm) to remove the two Motor Screws (position 19) holding the Suction Interconnector (position 10) in place. Remove the Suction Interconnector but be very careful to note which of its slots is lined up with which motor lead -- this will be very helpful during reassembly. You may wish to scratch a mark on both the Suction Interconnector and the motor to aid in matching them up later.
8. Refer to the illustration at the bottom of this page. Use the special Motor Lead Screwdriver to loosen and remove the remaining Motor Lead Screws (position 14).
9. Pull up on each of the leads to remove them. Make a note which color conductor comes out of each hole -- **this is a MUST** when installing the new motor lead. Using a small screwdriver and precision electronics pliers, unscrew and remove the Teflon ® Washer (position 15) and the Grommet (position 17).

INSTALLING THE NEW MOTOR LEAD

10. Ensure the motor lead holes are clean and free of moisture.
11. String the Inlet Screen (position 1) onto the motor lead.
12. String the motor lead components (shown at right) onto the end of each motor lead wire (except the yellow/green ground wire).
13. For each wire, place the Crimped Pin (position 18) down into the motor lead hole. Press the Grommet (position 17) and Teflon ® Washer (position 15) down around the lead.

Motor Leads



Be sure to reconnect the lead wires in their previous pattern so that in clockwise order they are **black-blue-brown** as shown at left.

Power Conducting Motor Leads

14. While pushing the lead down into the motor lead hole, use the special Motor Lead Screwdriver to tighten the Motor Lead Screw (position 14) into place. Repeat for the other two lead wires.
15. Replace the Suction Interconnector (position 10). Replace the Ground Motor Screw (position 13). Since the ground wire will be attached to this screw, you will want to put it into the hole that will cause the least amount of twisting to the wire.
16. Replace and tighten the two Motor Screws (position 19) with an allen wrench.
17. Repeat steps 12-14 for the ground motor lead. Note on the illustration (at right) that the ground lead uses two Brass Washers (position 16) instead of a Grommet and Crimped Pin.
18. Return the impeller assembly to the top of the Suction Interconnector (position 10). Refer to the diagram on page 11 for the proper sequence.
19. Screw the Pump Housing (position 2) back onto the Suction Interconnector.
20. Position the motor lead in the recessed area of the Pump Housing.
21. Carefully push the Inlet Screen (position 1) over the Pump Housing and the Suction Interconnector.

Ground Motor Lead

BE VERY CAREFUL TO AVOID SCRAPING THE INSULATION FROM THE MOTOR LEAD AS THE INLET SCREEN IS FITTED.

22. Line up the screw hole in the Inlet Screen with the screw hole in the Pump Housing. Fit and tighten the Set Screw (position 12).
23. Connect the motor lead to the converter and test the rotation of the pump. Submerge the pump in water, start it at its slowest speed and make sure the pump shaft is turning counterclockwise (when viewed from the top). If the rotation is incorrect, switching any two power leads (with POWER OFF) will correct the problem.

24. Reconnect the hose or pipe.

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Periodic Motor Inspection

If the pump is operating at a decreased capacity and the impeller assembly components (impellers, guide vanes, etc.) do not appear to be the cause, the motor should be checked. A checklist of things to examine includes:

- ❑ Check the fluid level inside the motor (refer to page 6). Replace and refill as necessary.
- ❑ Inspect the outside of the motor for cracks, dents, etc.
- ❑ Remove the Inlet Screen (position 1), Pump Housing (position 2), and the impeller assembly (guide vanes, wear rings, etc.). Try to spin the motor shaft by hand. It should spin freely. If it does not, the motor must be replaced.
- ❑ Check the winding and insulation resistance of the motor and lead.

Winding Resistance

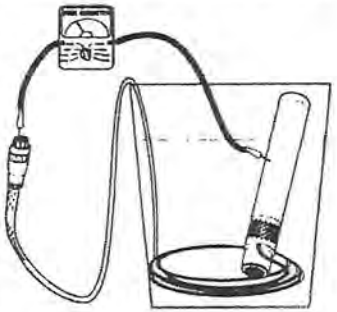
Turn off the power and disconnect the motor lead from the converter. Using an ohmmeter, set the scale to R X 1. Zero-adjust the meter and measure the resistance between any two power conducting leads (prongs on the motor lead plug).

If the ohm value is too low, the motor may be shorted. If too high, the motor windings or the leads may be open.

Lead Length	Ohm Value
0 feet	3.0 - 3.5 Ω
50 ft	3.6 - 4.1 Ω
75 ft	3.9 - 4.4 Ω
100 ft	4.2 - 4.7 Ω
125 ft	4.5 - 5.0 Ω
150 ft	4.8 - 5.3 Ω
175 ft	5.1 - 5.6 Ω
200 ft	5.4 - 5.9 Ω
250 ft	6.0 - 6.5 Ω
300 ft	6.6 - 7.1 Ω

Insulation Resistance

Turn the power off and disconnect the motor lead from the converter. Use a **meg**ohmmeter or megger (1 Meg = 1 M = 1 million). Zero-adjust the meter and measure the resistance between any power conducting leads (prongs on the motor lead plug) and ground. A good way to accomplish this (as shown at right) is to submerge the motor lead and MP1 pump in a bucket of water. Touch one lead of the megohmmeter to the pump and one to a motor lead.

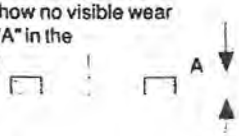


If the ohm value is lower than 2MΩ, the motor is defective and must be replaced.

Checking Components For Wear

The pump components should be periodically checked to ensure they are still within their minimum operating tolerances (illustrated below).

Impeller (position 5) ..... The impellers should show no visible wear.
Guide Vane (position 3) ..... The guide vanes should show no visible wear
Wear Ring (position 4) ..... The minimum thickness ("A" in the illustration) should never be less than 1.0 mm



In addition, visually check all components for cracks, corrosion, or wear

Storage Requirements

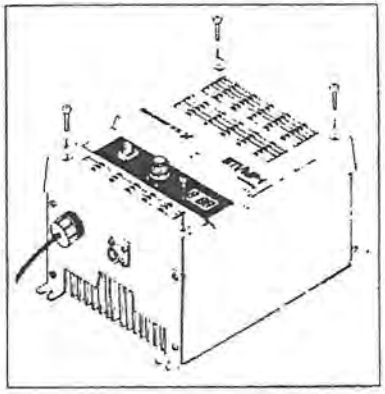
The pump should be thoroughly cleaned before storage to ensure no contamination is present. Both the pump and the converter should be stored in a clean and dry area in the following temperature range:

-20°C to +50°C
or
0°F to 120°F

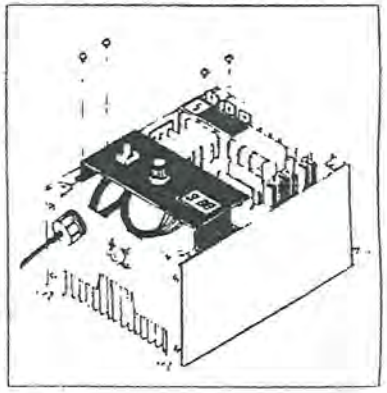
Replacing the Converter Fuses

The converter fuses can be replaced by following these steps:

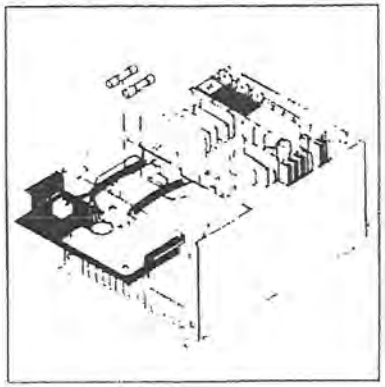
1. Turn the **POWER OFF.**
2. Disconnect the converter from the power source.
3. Wait at least 3 minutes to give the capacitors time to discharge any remaining voltage.
4. Remove the four screws holding the front cover of the converter in place and remove the front cover.



5. Remove the four screws holding the speed dial panel in place.



6. Replace the fuses as shown.



NOTE:
The BTI/MP1 converter uses two T30A, type FERRAZ fuses.

PARTS LIST

Pump Components

Position No.	Part Description	Number Used
1	Inlet Screen	1
2	Pump Housing	1
3	Guide Vane	2
4	Wear Ring	2
5	Impeller	2
6	Spacer Ring	2
7	Wear Plate	2
8	Motor Lead Assembly	4
9	Shaft	1
10	Suction Interconnector	1
11	Stator Housing	1
12	Set Screw	1
13	Ground Motor Screw	1
14	Motor Lead Screw	4
15	Teflon®Washer	4
16	Brass Washer	2
17	Grommet	3
18	Crimped Pin	3
19	Motor Screw	3

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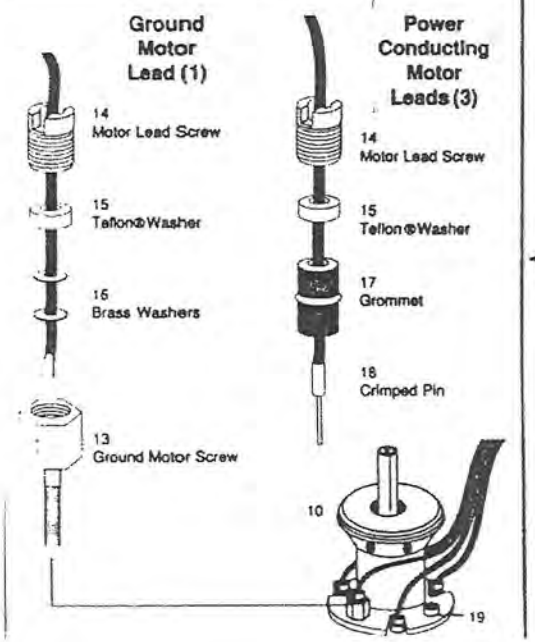
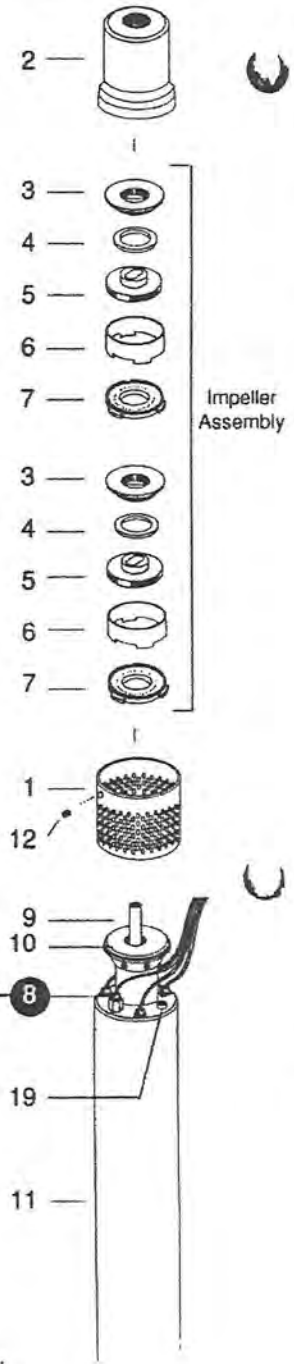
MOTOR LEAD ASSEMBLY (position 8)





Service Kits, Service Tools, and Motor Leads

Replacement parts, service tools, and motor leads are available using the following part numbers:

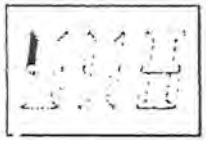
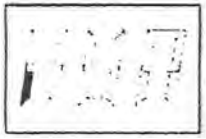
Service Kits			Part Number
Position No. In Diagram	Part Description	No. In Kit	
3	Guide Vane	2	125061
4	Wear Ring	2	
5	Impeller	2	
6	Spacer Ring	2	
7	Wear Plate	2	

Service Tools	Part Number
Special Motor Lead Screwdriver	SV0370
Syringe (to refill motor)	ID6066

Motor Leads		Part Number
All motor leads come with a Converter Plug attached and a special Motor Lead Screwdriver	50 foot length	1A 5081
	75 " "	1A 5082
	100 " "	1A 5083
	125 " "	1A 5084
	150 " "	1A 5085
	175 " "	1A 5086
	200 " "	1A 5087
	250 " "	1A 5088
	300 " "	1A 5089

TROUBLESHOOTING

The converter will shut itself off if any major faults occur, and signal (on the converter display) the cause of the fault. These include:

If the display shows this:	The fault is:	Which is caused by:	To correct, simply:
	Function Loss	· A thermal cut-out or shutdown	Wait until the motor has cooled to a normal temperature. Restart the motor using the on/off switch on the converter.
		· Defective motor lead or pump · Momentary problem (transient fault)	1. Reset the converter and restart it. If it shuts down again, then ... 2. Switch off the power supply. Turn the power supply back on and restart the converter. If the converter shuts down again, the pump or the motor lead may be defective. If the converter **doesn't** shut down again, it was probably a transient fault (momentary power surge, etc.). **IF ALL CHECKS INDICATE THAT THE PUMP IS O.K., THEN THE CONVERTER MAY BE DEFECTIVE**
	**Overvoltage**	· The input voltage is too high · There was a momentary power surge	1. Reset the converter and restart it. If it shuts down again, then ... 2. Reduce the voltage coming into the converter (refer to the "Technical Data" section on the following pages for operating ranges).
	**Low Line**	· The input voltage is too low · There was a momentary voltage drop	1. Reset the converter and restart it. If it shuts down again, then ... 2. Increase the voltage coming into the converter (refer to the "Technical Data" section on the following pages for operating ranges).
	Power Supply	The power supply is defective	Check the voltage of the incoming power supply (should be between 190-253 V).
	Pump Problem (if numbers climb only to about 50 - 130)	· The pump shaft is locked · One of the 3 motor leads is not making contact with the motor	1. Turn the speed dial to maximum frequency. If this results in a **Function Loss**, follow the troubleshooting instructions listed above. 2. If you **don't** get a Function Loss, the problem is with the converter.
	No Display = No Power	· The converter is not being supplied with power · The power being supplied is a very low voltage · The internal fuses are defective	1. Check the amount of the incoming voltage. If it is within allowable limits (190 - 253 V), then ... 2. Flip the generator circuit breaker (if it has one) to the "ON" position. Reset the converter and restart it. If the converter still shows no display, then ... 3. Switch the power supply off. Check the fuses in the converter and replace if necessary. If the fuses are OK, then ... 4. Check the electrical plugs to ensure all connections are made properly.

TECHNICAL SPECIFICATIONS

Converter Specifications

Power

Supplied By Generator/Power Supply

Voltage:	Single phase, 230 volt (+ or - 10%)
Frequency:	50-60 Hz (+ or - 2%)
Maximum Current:	10 amps

Produced By Converter

Output Voltage:	3 phase 25 volts to 3 phase 220 volt
Frequency:	46 - 400 Hz
Maximum Current:	5.5 amps
Internal Fuse:	2 each of T 30 A, type FERRAZ

Connections

Motor Lead Connector:	AMP CPC Plug, Type 206429-1
Power Cable:	Type SJOW, 14 AWG, 10' long

Dimensions and Weight

Dimensions:	Case is 9"x14"x18.5"
Net Weight:	25 lbs

Operating Conditions

Ambient Temperature:	32°F to 104°F (0° to 40° C)
Relative Air Humidity:	Maximum 95%
Radio Noise Filter:	Noise may occur when the converter is connected to the municipal electrical supply. It can be eliminated by adding a filter, such as a Siemens filter, type B 84112-B-A 120/20 A.

Storage Conditions

Ambient Temperature:	-13°F to 149°F (-25° to 65°C)
Relative Air Humidity:	Maximum 50% at 104°F (40°C) unlimited Maximum 90% at 68°F (20°C) for periods not exceeding 30 days per year. 75% annual average Non-condensing

Performance

Acceleration Time:	0 to 400 Hz in 10 seconds
Deceleration Time:	400 to 0 Hz in 10 seconds

Motor/Pump Specifications

Power

Input Power:	1.5 Kw (2 Horsepower)
Voltage:	3 phase, 220 volts at 400 Hz
Maximum Current:	5.5 amps
Motor Protection:	Thermal overload - Thermik Geratebau, Series SY6 Disconnect Temperature: 176°F (80°C) Rate Current: 5 amps Current Overload - Incorporated into converter

Connections

Discharge Port:	1/2" Female NPT
Net Weight:	5.5 lbs (includes pump)
Available Lead Lengths:	50, 75, 100, 125, 150, 175, 200, 250, and 300 feet

Operating Conditions

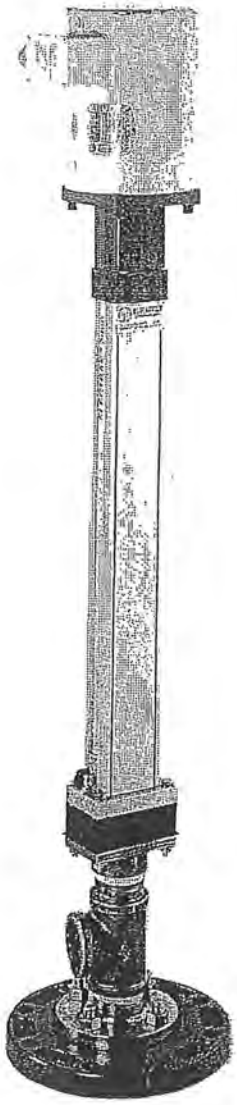
Max. Fluid Temp.:	86°F (30°C)
Min. Fluid Temp.:	34°F (1°C)

Dimensions and Weight

Dimensions:	(Including pump and motor) 11.3"x1.81" diameter
Net Weight:	5.5 lbs.

Installation and Operation Guide

Anchor Electric Piston Pump®



Section 1 *Shipment Inspection* — *Page 1*

Section 2 *Pre-Installation Checklist* — *Page 2*

Section 3 *Installation* — *Page 3*

Section 4 *Power Supply* — *Page 9*

Section 5 *Startup* — *Page 9*

Section 6 *Operation* — *Page 11*

Section 7 *Drive Motor Assembly* — *Page 12*

Section 8 *Drive Piston Parts* — *Page 13*

Section 9 *Troubleshooting* — *Page 13*

Section 10 *Warranty* — *Page 17*

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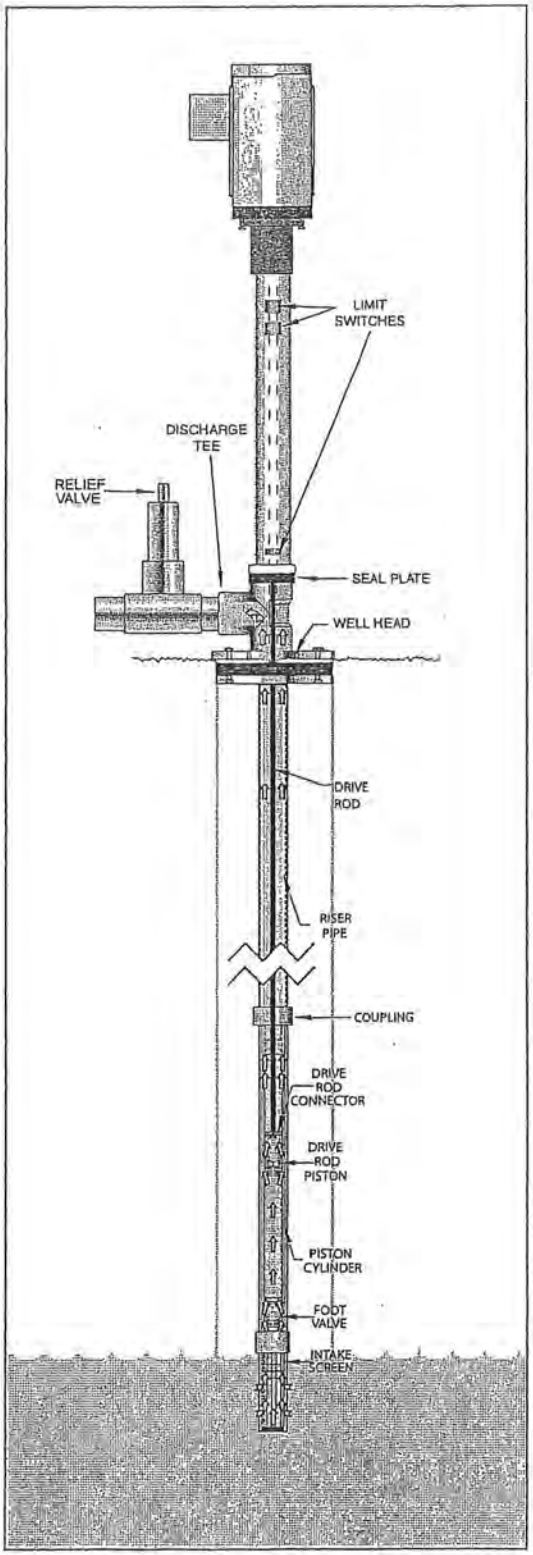
AEPP 12-05

SECTION 1

SHIPMENT INSPECTION

Take an inventory of the components; pump cylinder, top head drive motor assembly, drive rod and piston. This Anchor Pump® should remain in it's shipping carton until it is ready to be installed. You will find a separate pump control box. It should be securely mounted at or near the well.



Installation Materials

1. 10′ rise pipe, NPT Thread on each end

   or

   HDPE riser pipe with stainless steel NPT transition fitting
2. Stainless steel couplings
3. Hoisting cable
4. 12″ Pipe nipple for transition at well seal and discharge tee

Tools for Installation

1. Chained channel lock
2. Pipe wrenches
3. Vice grips
4. 1/2″ Wrench
5. 11/16″ Wrench
6. 5/8″ Wrench
7. Tape measure
8. Water level indicator
9. Hacksaw
10. File and sand paper

SECTION 2

PRE-INSTALLATION CHECKLIST

Before beginning installation, the following checks should be made.

A Condition of the well.

If the pump is to be installed in a new well, the well should be fully developed and bailed or blown free of drill cuttings and pipe casing debris. The construction of the Anchor Pump® makes it resistant to abrasion; however no pump, made of any material, can forever withstand the destructive wear that occurs when constantly pumping sandy fluid. Determine the actual depth of the well, the static water level in the well, and the draw down level at the pumps maximum capacity. The pump selection and setting depth should be based on this data. The inside diameter of the well casing should be checked to ensure that it is not smaller than the pump.

B Condition of the fluid.

Anchor Pumps® are designed for fluids up to 200°F (PVC pipe up to 140° and steel pipe up to 200°. Fluids can be viscous up to #6 fuel oil, have tar pitch consistency or contain gas.

C Installation Depth.

Place pump one (1) foot above the bottom of the well. Remember not to block pump intake.

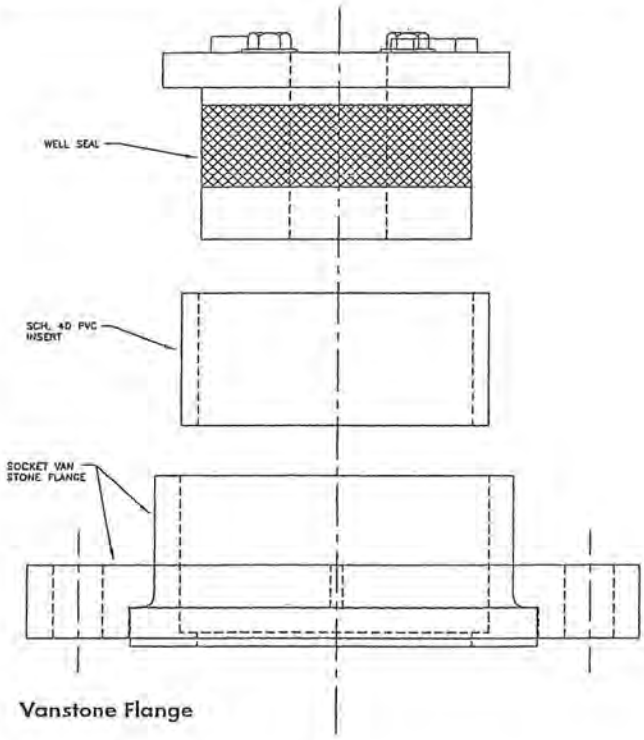
D Power supply.

The drive motor power demand is noted on the name plate of the Anchor Pump® electric motor. Power supply can be 115V, 230V, 1HP or 220V/460V, 3HP. Power is converted by the VFD control to either 230V, 3hp or 460V, 3HP power to run the drive motor.

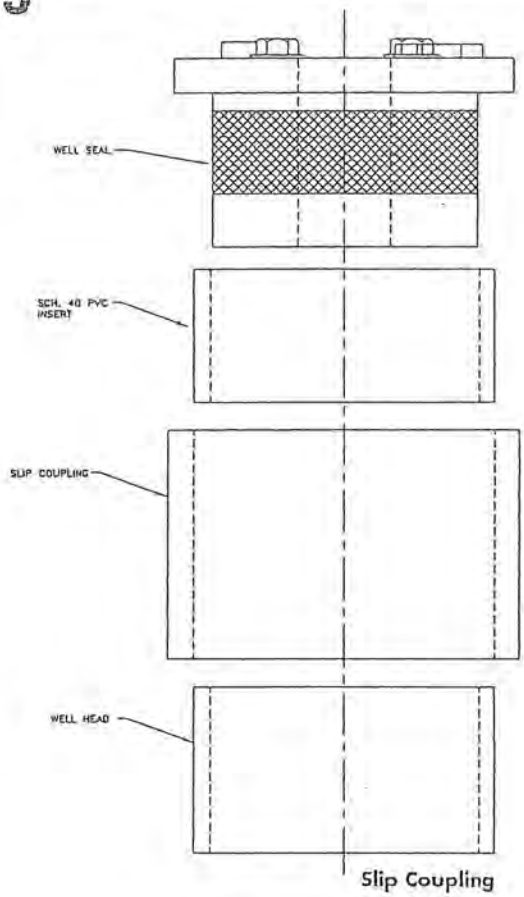
INSTALLATION

Step 1

Wellhead Preparation: Three Choices of Wellheads



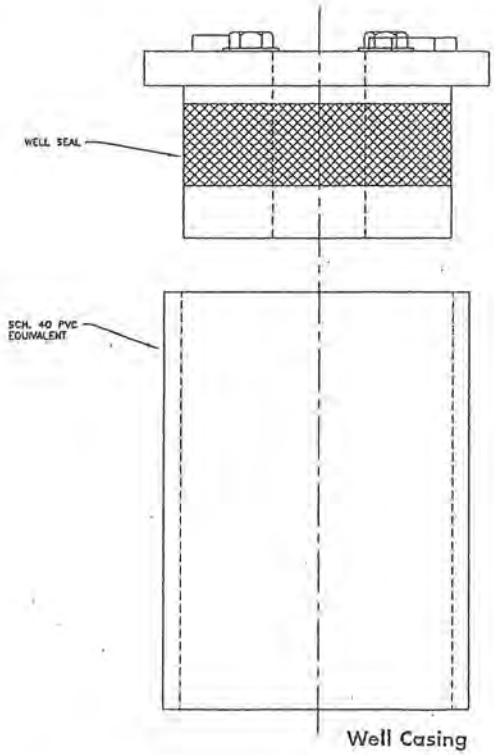
Vanstone Flange



Slip Coupling

Prepare top head well casing by removing all debris, caps or other closures, thus opening well, tank or sump for pump installation. Three typical well casing completions.

*Well casings may be vertical or horizontal.



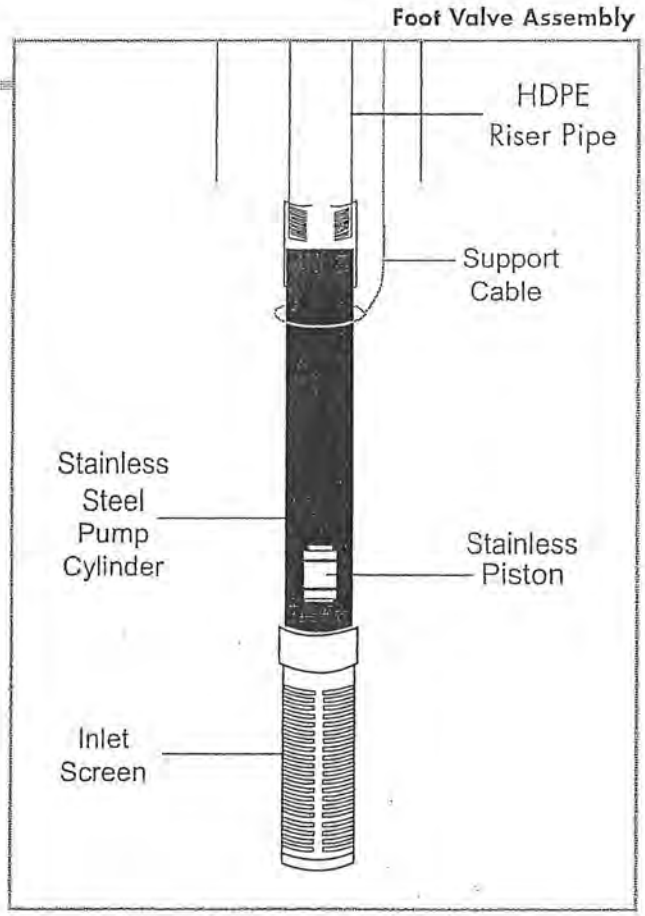
Well Casing

INSTALLATION CONT.

Step 2

ANCHOR PUMP FOOT VALVE CYLINDER INSTALLATION

- Attach foot valve cylinder assembly to bottom section of riser pipe.
- **Note:** Recommend attaching a support cable.
- **Note:** If using liquid level control device refer to separate installation sheet.



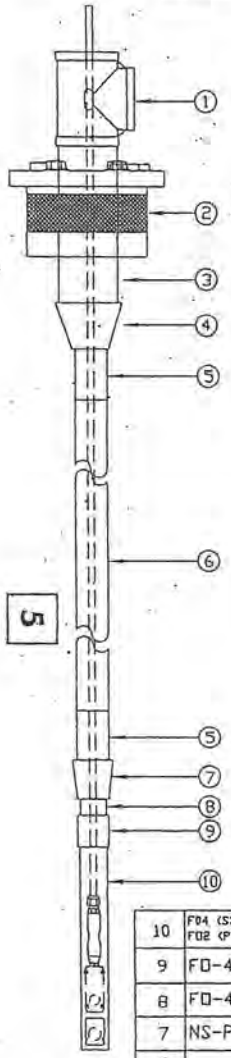
NOTE: When using HDPE, make sure the pistons are put in before attaching foot valve to HDPE pipe.

INSTALLATION CONT.

Step 3

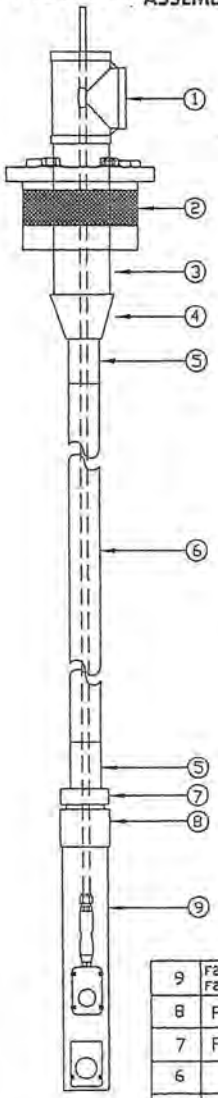
ANCHOR PUMP RISER PIPE INSTALLATION

F125E HDPE PIPE ASSEMBLY



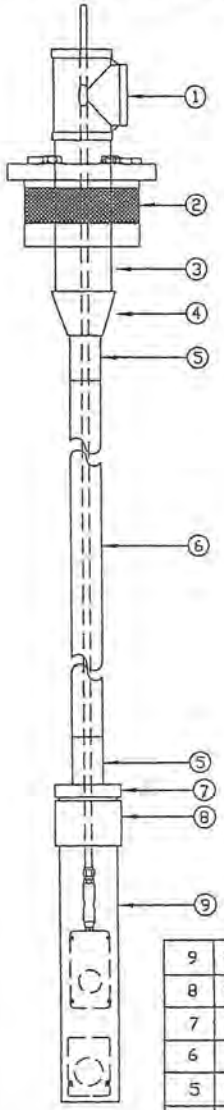
ITEM	PART NUMBER	DESCRIPTION
10	F04 (SS) F02 (PVC)	SS 1 1/4" FOOT VALVE ASSEMBLY PVC 1 1/4" FOOT VALVE ASSEMBLY
9	FO-40-7003	1 1/4" SS COUPLING (SUPPLIED WITH FOOT VALVE)
8	FO-40-7017	1 1/4" SS CLOSE NIPPLE (SUPPLIED WITH HDPE KIT)
7	NS-PD001	1 1/2" X 1 1/4" SS RED COUPLING (SUPPLIED WITH HDPE KIT)
6		1 1/2" HDPE PIPE (NOT SUPPLIED)
5	FO-40-8055	1 1/2" SS HDPE TRANSITION FITTING (SUPPLIED WITH HDPE KIT)
4	FO-40-8056	2" X 1 1/2" SS RED COUPLING (SUPPLIED WITH HDPE KIT)
3	SE-40-7002	2" X 15" SS PIPE (SUPPLIED WITH HDPE KIT)
2		WELL SEAL SIZE VARIES
1	SA-40-7001	SS 2" TEE

F200E HDPE PIPE ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION
9	F24 (SS) F22 (PVC)	SS 2" FOOT VALVE ASSEMBLY PVC 2" FOOT VALVE ASSEMBLY
8	FO-40-7000	2" SS COUPLING (SUPPLIED WITH FOOT VALVE)
7	FO-40-8057	2" X 1 1/2" SS REDUCING BUSHING (SUPPLIED WITH HDPE KIT)
6		1 1/2" HDPE PIPE (NOT SUPPLIED)
5	FO-40-8055	1 1/2" SS HDPE TRANSITION FITTING (SUPPLIED WITH HDPE KIT)
4	FO-40-8056	2" X 1 1/2" SS RED COUPLING (SUPPLIED WITH HDPE KIT)
3	SE-40-7002	2" X 15" SS NIPPLE (SUPPLIED WITH HDPE KIT)
2		WELL SEAL SIZE VARIES
1	SA-40-7001	SS 2" TEE

F300E HDPE PIPE ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION
9	F34 (SS)	SS 3" FOOT VALVE ASSEMBLY
8	FO-40-7004	3" SS COUPLING (SUPPLIED WITH FOOT VALVE)
7	FO-40-8058	3" X 1 1/2" SS REDUCING BUSHING (SUPPLIED WITH HDPE KIT)
6		1 1/2" HDPE PIPE (NOT SUPPLIED)
5	FO-40-8055	1 1/2" SS HDPE TRANSITION FITTING (SUPPLIED WITH HDPE KIT)
4	FO-40-8056	2" X 1 1/2" SS RED COUPLING (SUPPLIED WITH HDPE KIT)
3	SE-40-7002	2" X 15" SS NIPPLE (SUPPLIED WITH HDPE KIT)
2		WELL SEAL SIZE VARIES
1	SA-40-7001	SS 2" TEE

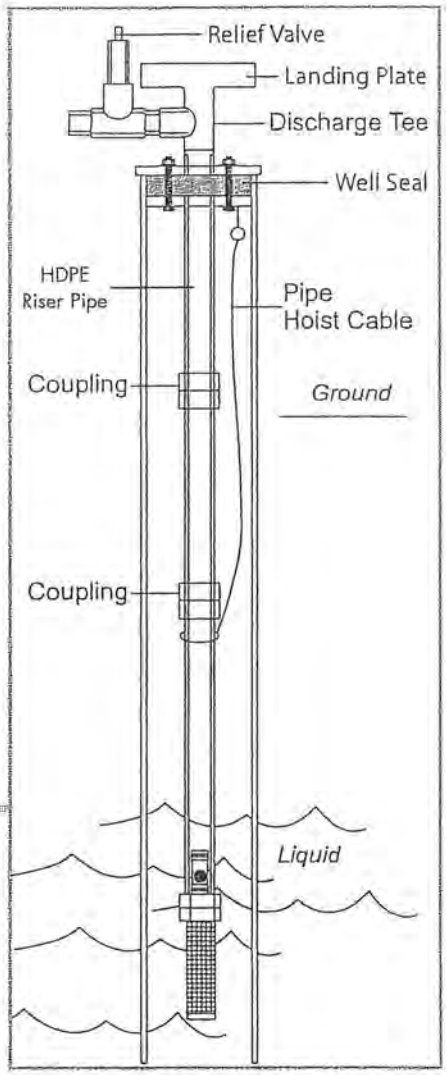
INSTALLATION CONT.

Step 4

ANCHOR PUMP RISER PIPE & WELL CAP INSTALLATION

a. Install all riser pipe until inlet screen is at specified depth and attach well cap onto riser pipe.
b. Attach cable to the bottom of the well cap.
c. Attach well cap to top of wellhead.
d. This riser pipe is to be suspended from the well head, not to be standing on bottom of well, tank or sump.

If using hard riser pipe it is recommended that maximum 10′ pipe lengths with NPT Threads on both ends and threaded stainless steel couplings to be used for riser pipe.



Step 5

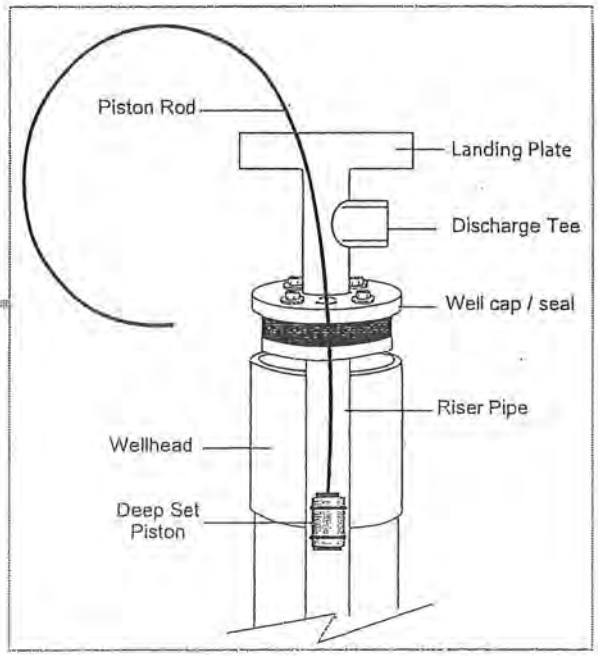
DRIVE ROD/PISTON INSTALLATION

A. Uncoil piston-rod-assembly
(Lay coil out in open area.)
(Caution: Coil under tension!)

B. Attach Drive Piston

C. Slide drive piston down riser pipe to bottom.

Note: Piston will have much more resistance for the final 2-3 ft. of install.

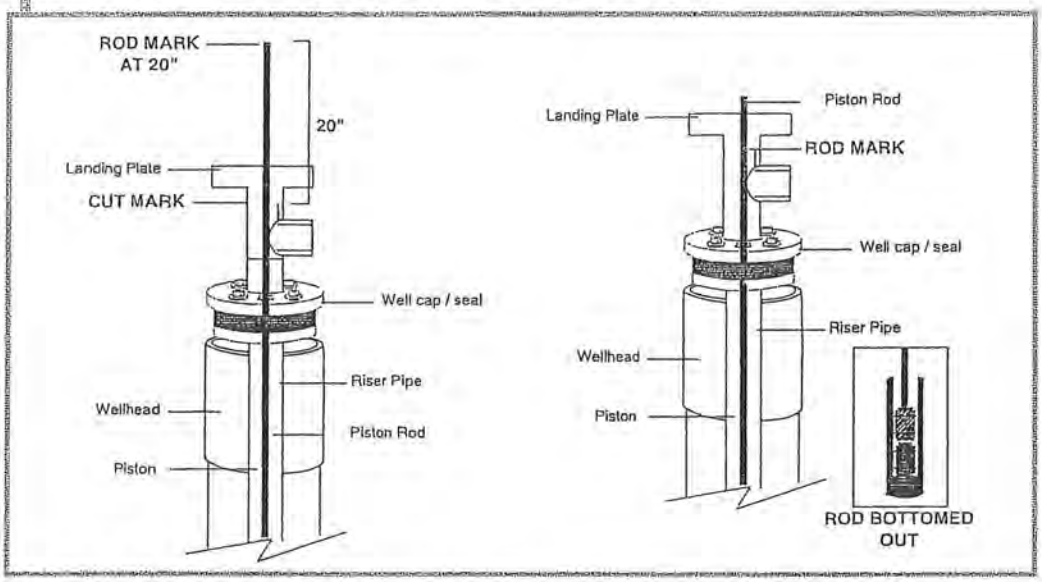


INSTALLATION CONT.

Step 6

CONNECTION OF ROD TO TOP HEAD DRIVE MOTOR ASSEMBLY

Hand pump well by moving the fiberglass drive rod up and down in the downhole foot valve cylinder assembly to ensure that the pump is pumping liquid.



A. Rod bottomed out – Mark rod at top of discharge tee. Clean and sand rod.

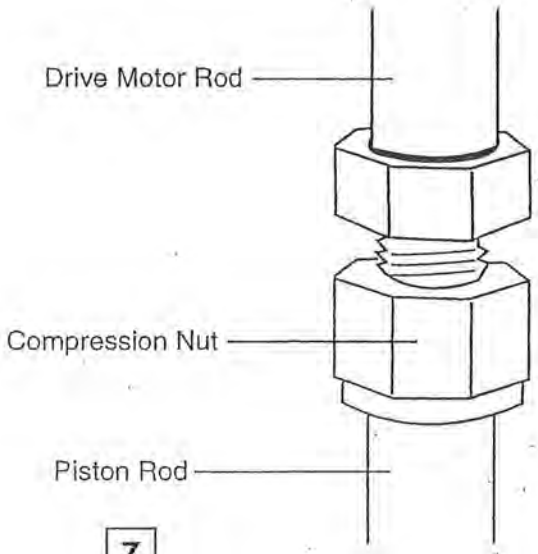
B. Lift rod up and cut 20" below mark.

Step 7

ATTACH COMPRESSION FITTING TO CUT END OF ROD AND SCREW INTO DRIVE MOTOR ROD

Attach ferrule and compression fitting to squared cut end of fiberglass rod. Make sure fiberglass compression ferrule digs deep into fiberglass drive rod to secure fiberglass piston.

A. Cut and square rod.
B. Rough-up finish with sandpaper.
C. Attach compression fitting to cut end of rod and screw into drive motor rod.
D. Excessively tighten nut.
E. Loosen nut to check that ferrule has crimped into rod.
F. Reattach to motor.



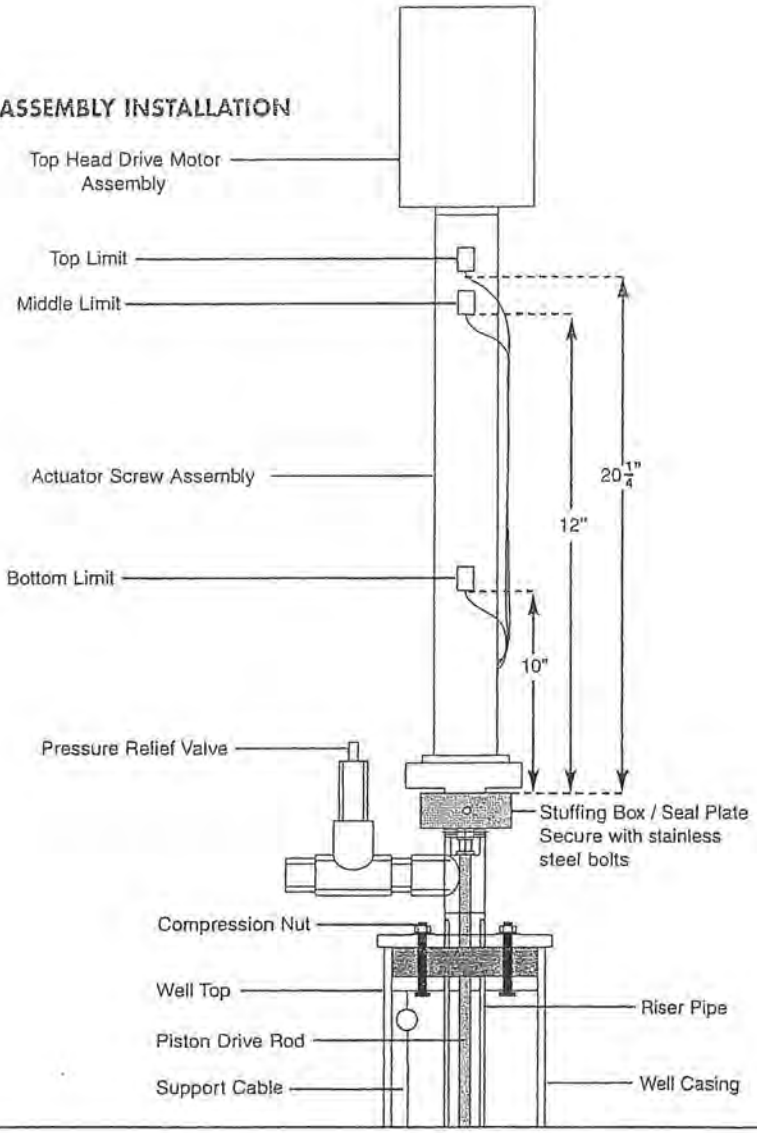
INSTALLATION CONT.

ANCHOR PUMP® TOP HEAD DRIVE MOTOR ASSEMBLY INSTALLATION

Step 8

Note: Before installing drive motor into well, refer to Electrical Control Panel Instructions (Section 5-7).

A. Install top head drive motor assembly onto well top.
B. Secure the well head landing plate with 4 bolts.
C. Attach Power supply/control panel.



SCM SUB-MICRO DRIVE INSTALLATION

LIMIT SWITCH SETUP

LIMIT SWITCH (NOTE 1)	TYPE	DISTANCE FROM TOP OF BASE PLATE TO BOTTOM OF SWITCH	TERMINAL CONNECTION
Bottom	Normally Open	10"	13E
Middle	Normally Open	12"	13A
Top	Normally Open	20.25"	13A

PARAMETER SETTINGS

SPEED	101gpm	102gpm	103gpm	SPM (Strokes per Min.)
60	1.35	3.27	7.37	20.06
50	1.19	2.89	6.53	19.98
40	1.02	2.47	5.58	19.03
30	0.82	1.98	4.47	16.75
20	0.58	1.40	3.16	12.75
10	0.30	0.73	1.65	6.97

SECTION 4

POWER SUPPLY

There are Five Typical Electric Drive Motor Control Panels.

–ELECTRIC DRIVE MOTOR REFER TO SECTION 5 FOR SEPARATE INSTALLATION AND OPERATION SHEET OF THE DRIVE MOTOR AND CONTROL PANEL SUPPLIED FOR JOB.

1. VFD Control only
2. NEMA 4 enclosure - Stop / Start
3. NEMA 4 enclosure - Auto restart, (start on power up.)
4. NEMA 4 enclosure - Auto restart, Level Control, Stroke Counter.
5. NEMA 4 enclosure - Auto restart, High Level Tank Shut Off, Stroke Delay Timer.

*Control Panels can be customized to application.

SECTION 5

ANCHOR ELECTRIC STARTUP

MOTOR ROTATION IS VERY IMPORTANT

Drive Unit not installed yet (The easiest and best way to check for rotation)

1. Set the drive on the ground with at least two feet of room for the rod to move in and out.
2. Pull the rod out by hand at least one foot. If you can not pull the rod out by hand turn the motor counterclockwise till it is extended at least one foot.
3. Make sure power feed is disconnected and wire up the feed and the motor as shown on the schematics. Be sure to connect the feed and motor ground to the drive.
4. Turn the power and drive switch on.
5. If the motor does not move. Read the LOGO! screen:
   - If the screen says **"ALARM HIGH TANK LEVEL"** it will not pump until the high tank level signal is removed.
   - If the screen says **"STROKE DELAY"** see "Changing LOGO! Stroke Delay and Stroke Dwell Time" sheet and set Parameter 11, "TH" to 00:00.
   - If the screen says **"STROKE DWELL"** turn the stroke dwell switch to **OFF**.
   - If the screen says **"LOW LEVEL"** set the Auto/Hand selector switch to Hand mode. This will bypass the level control and the screen should now display **"HAND RUN"**
5. The rod should move in toward the motor first and then cycle out and in. The motor should first rotate clockwise as seen from above the motor.
6. If the rod moves in toward the motor first the rotation is correct. Go to step #9

continued

7. If the rod moves out away from the motor first the rotation is wrong. Turn the drive switch and the power off. **WAIT THREE MINUTES** Switch two of the motor leads, either at the motor T1 and T3 or U and W at the SUB-Micro (AC Tech). **Do not switch the power feed wires or L1, L2, L3 this will not reverse the rotation.**
8. Return to step #4
9. Turn the drive switch and power off. Connect the sucker rod and install drive unit on the well.
10. If the Auto/Hand selector switch was set to Hand mode reselect the Auto mode. The level control can not work unless the Auto/Hand selector switch is in the Auto mode.

Drive Unit installed on well

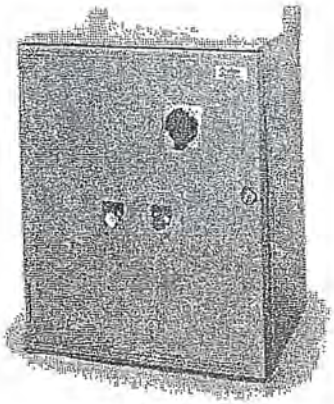
(We do not recommend checking for rotation with the drive Unit installed.)

1. Make sure power feed is disconnected and wire up the feed and the motor as shown on the schematics. Be sure to connect the feed and motor ground to the drive.
2. If it is not possible to see motor rotation, remove any piping from the discharge tee. You will be able to see the rod moving inside the tee.
3. Turn the power and drive switch on. The motor should first rotate clockwise as seen from above the motor.
4. If the motor does not move. Read the LOGO! screen:
   - If the screen says **"ALARM HIGH TANK LEVEL"** it will not pump until the high tank level signal is removed.
   - If the screen says **"STROKE DELAY"** see "Changing LOGO! Stroke Delay and Stroke Dwell Time" sheet and set Parameter 11, "TH" to 00:00.
   - If the screen says **"STROKE DWELL"** turn the stroke dwell switch to **OFF**.
   - If the screen says **"LOW LEVEL"** set the Auto/Hand selector switch to Hand mode. This will bypass the level control and the screen should now display **"HAND RUN"**
5. If the rod moves up first or clockwise the rotation is correct. Go to step #8
6. If the rod moves down first or counter clockwise the rotation is wrong. Turn the drive switch and the power off. **WAIT THREE MINUTES** Switch two of the motor leads, either at the motor T1 and T3 or U and W at the SUB-Micro (AC Tech). **Do not switch the power feed wires or L1, L2, L3 this will not reverse the rotation.**
7. Return to step #3
8. Turn the drive switch and power off.
9. If the Auto/Hand selector switch was set to Hand mode reselect the Auto mode. The level control can not work unless the Auto/Hand selector switch is in the Auto mode.

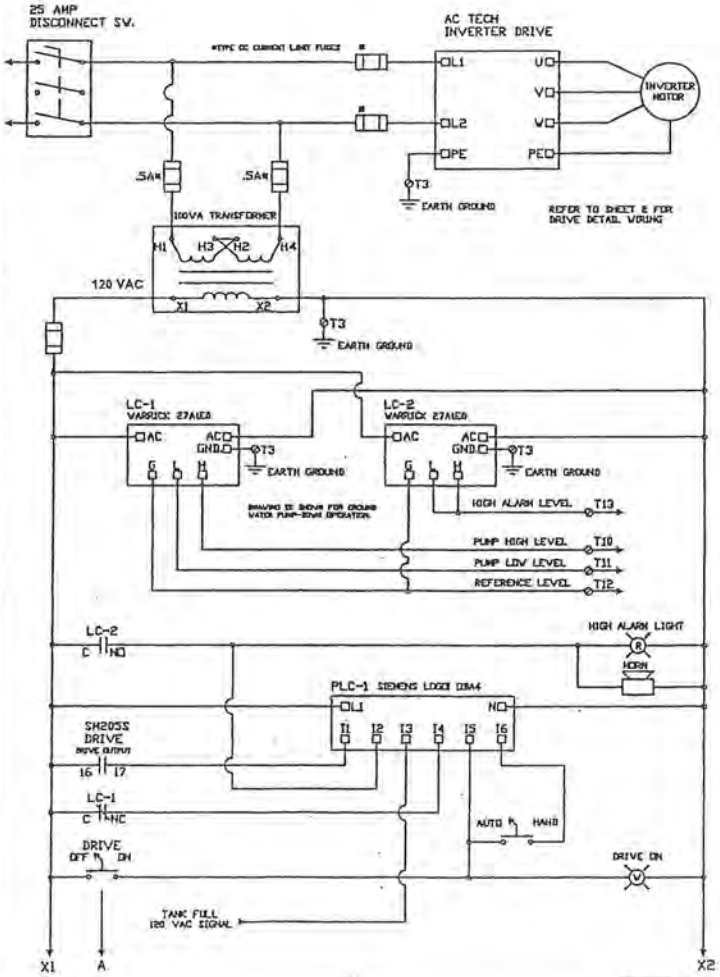
OPERATION

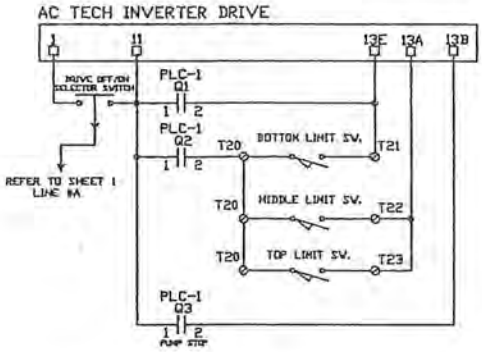
The Anchor Pump® and system should be periodically checked for fluid quality, pressure, drawdown, cycle rate, and performance of the stuffing box.

1. Visually inspect Anchor Pump® operation.
2. Check liquid discharge.
3. Check power connections.
4. Check seal plate relief ports.
5. Check piston seal.
   - Turn off power.
   - Remove power line from drive motor.
   - Disconnect pump driver from wellhead.
   - Disconnect pump driver from drive rod.
   - Extract piston rod from well.
   - Inspect piston seal and, if worn replace.
   - Reinstall.

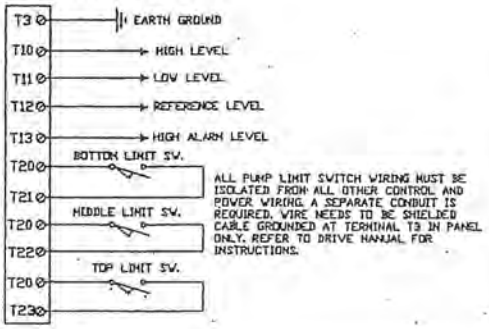


Control Panel

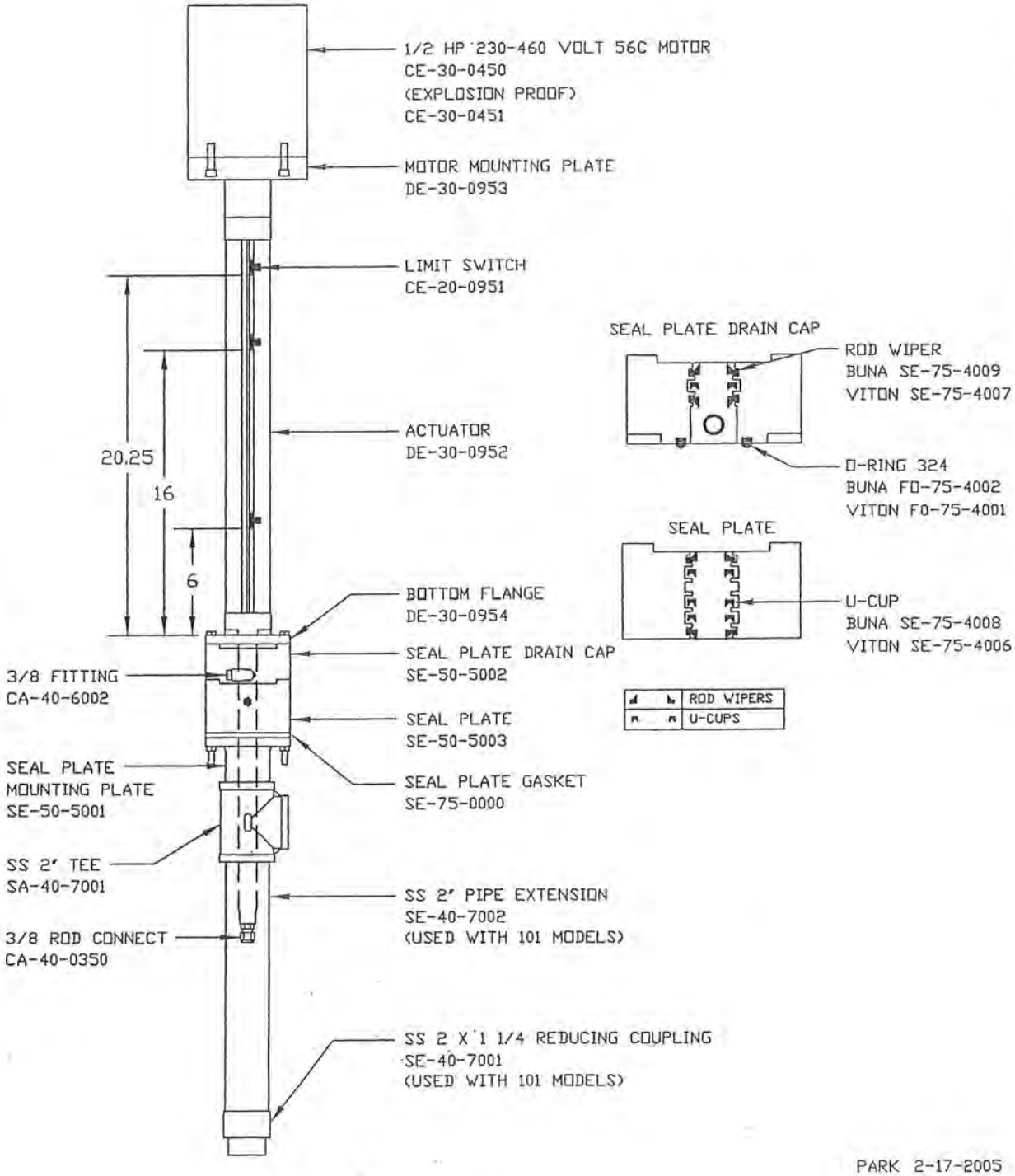




FIELD TERMINAL STRIP CONNECTION SUMMARY



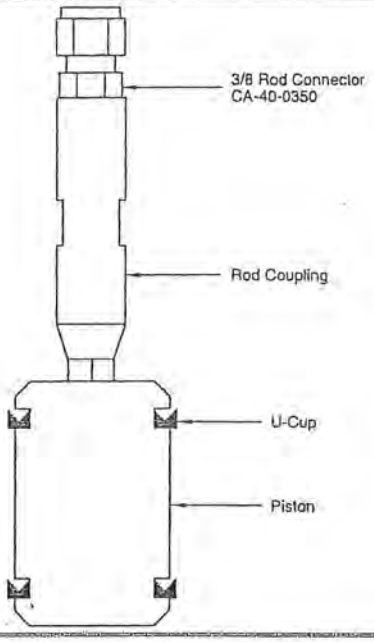
DRIVE MOTOR ASSEMBLY



SECTION 8

DRIVE PISTON ASSEMBLY PARTS - SEAL KIT

CHK	ASSEMBLY TYPE	SEAL KIT NUMBER
	101 BUNA	P01DSB
	101 VITON	P01DSV
	102 BUNA	P02DSB
	102 VITON	P02DSV
	103 BUNA	P03DSB
	103 VITON	P03DSV



SECTION 9

Anchor Pump Troubleshooting Guide

OBSERVATION	CAUSE	SOLUTION
- Pump not operating	- No power	- Check to see that power supply is on, and that all connections are sound.
	- Variable Frequency Drive (VFD) fault	- Check VFD fault description in VFD booklet. If unable to get pump operating based upon booklet instructions.
- Electric driver not cycling properly	- Parameter settings or limit switch settings incorrect	- Remove electric driver from discharge tee (or well top). Disconnect down hole drive rod. Lay driver in dry flat space with room for rod to cycle in and out. Run system with provided control panel. If not cycling properly, check the limit switch positions and parameter settings on VFD and adjust if necessary.
- Pump driver operating (cycling), but not pumping liquid	- Restricted liquid discharge - Intake Plug - Piston drive disconnected - Drive piston not in pump cylinder	- Check for closed valve, clogged discharge, or any other obstruction. Remove obstruction and restart pump. - Reconnect down hole drive rod to electric drive rod. If separated at compression fitting, a replacement drive rod ferrule will be required. (Ferrules cannot be re-crimped.)

continued

Anchor Pump Troubleshooting Guide continued

OBSERVATION	CAUSE	SOLUTION
	- Down hole drive rod may have been cut incorrectly - Riser pipe string may have a leak - No liquid at pump intake (down hole) to pump	- Perform inflation (glove) test. Disconnect liquid discharge hose/pipe from pumps discharge tee. Hold latex glove (or other inflatable object) over discharge tee mouth. Seal with a tight grip. Allow pump to operate. - Remove and re-cut or adjust rod length as per installation instructions. - Check pipe connections and check for cracks or leaks. Repair or replace compromised pipe or fittings. - Check to make sure that there is liquid to pump.
- *With drive rod and drive piston out of riser pipe, fill riser pipe with water.* Water drains out quickly	- Foot valve assembly/pipe string not water tight	- Remove riser pipe and footvalve assembly and inspect, replace, and/or repair.
- Water stays in riser pipe *(and drive rod and drive piston have been deemed OK)*	- Foot valve assembly/pump intake may be clogged	- Use drive rod extension poker to displace footvalve check ball and thus back flush foot valve and intake area. - If back flushing does not work, then remove riser pipe and footvalve assembly and inspect, replace, and/or repair.
- Drive rod / drive piston assembly tough to remove from footvalve assembly / riser pipe.	- Pump intake may be clogged	- Follow directions for clogged intake foot valve.
- Pump driver moving erratically when operating.	- Loose connections - Down hole drive rod length incorrect	- Check all connections to be sure they are tight. - Check rod length and adjust as per installation instructions.
- Pumped liquid in driver - Stuffing box drain port leakage.	- Pump driver exposed (submersed) to water - Stuffing box seals worn	- Replace stuffing box seals.

continued

CHANGING LOGO! STROKE DELAY AND STROKE DWELL TIME

Stroke delay allows the pump to be off for a time than on for a time (B11; TH and TL). Stroke dwell stops the pump at each up stroke for a given time it is selected by a Short, Medium and Long selector switch.

1. Press the "DOWN ARROW" once or twice to show the date and time.
2. Press "ESC".
3. Press "DOWN ARROW" to select "Set Param".
4. Press "OK".
5. Use the "UP ARROW" and "DOWN ARROW" to select:
   a) "B11" for stroke delay.
   b) "B33", "B34" and "B35" for short, medium or long dwell.
   c) Press "OK".
   d) For stroke delay use the "LEFT ARROW" and "RIGHT ARROW" to move between "TH" (time stopped) and "TL" (time running). Use the "UP ARROW" and "DOWN ARROW" to change the times. The time to the left of the ":" is hours and the numbers to the right of ":" is minutes. "Ta" should be ignored. If you do not wish to use stroke delay set "TH" to 00:00 and "TL" to 99:00.
   e) For stroke dwell use the arrows to move the cursor on "T", the numbers to the left of the ":" are minutes and the number to the right are seconds.
6. Press "OK" when finished.
7. Press "ESC" to get to main screen
8. Press "ESC" again.
9. Press the "UP ARROW" arrow to return to the message screen.

TROUBLESHOOTING SCM ELECTRIC DRIVE

1. Turn on the power and make sure that the LOGO! "Q1" momentary closes 3 seconds after being powered up. "Q2" closes after 4 seconds and "Q3" opens after 5 seconds. If "Q3" does not open after 7 seconds see below:
2. Read the LOGO! screen. If the screen says "ALARM HIGH TANK LEVEL" it will not pump until the high tank level is removed. This can be forced by removing the LOGO! I3 wire. Otherwise if the switch is turned to hand it will run. The LOGO! screen will say what condition the pump is in.
3. If the LOGO! screen says "STROKE DELAY" see "Changing LOGO! Stroke Delay and Stroke Dwell Time" sheet and set Parameter 11, "TH" to 00:00.
4. If the LOGO! screen says "STROKE DWELL" turn the stroke dwell switch to OFF.
5. If the LOGO! screen says "LOW LEVEL", at the Warrick Level control short "G", "L", and "H" together it should run now and it was not running because the water level was not high enough.

continued

TROUBLESHOOTING SCM CONTROL PANELS

Troubleshooting SCM Control Panels

1. Check Motor rotation. The power disconnect to the panel needs to be turned off for three minutes before each test. The correct rotation is clockwise looking at the motor from the top. See "ELECTRIC ANCHOR STARTUP" for details.
2. Turn on the power and make sure the drive switch is on.
3. If there is a wire connected to LOGO! I3 make sure there is not a 110 volt signal to it. This is the TANK FULL input. On panels with OBA4 LOGO!'s they will display "TANK FULL" when there is a signal. If there is a 110 volt signal the pump will not pump until the tank is emptied or the signal removed.
4. If there is a wire connected to LOGO! I4 make sure there is not a 110 volt signal to it. This is the LOW LEVEL input. On panels with OBA4 LOGO!'s they will display "LOW LEVEL" when there is a signal. If there is a 110 volt signal see step 10 for details.
5. Check limit switches for conductivity. Remove wires from terminal blocks in panel and test wires that come from the limit switches. The switches are normally open and close with a signal from a magnet. If limits have conductivity without a signal from a magnet or sporadic conductivity with a signal from a magnet replace limit switches. See actuator drawings for part numbers.
6. Check for 12 VDC at AC-Tech 1, 11, 13E, 13A, and 13B. AC-Tech 2 is the common lead.
7. If there is 12 VDC at 13B the pump will not run. That is the stop signal which comes from LOGO! Q3. Look at LOGO! Inputs.
8. If there is 12 VDC at 13E and 13A the pump will not run. Check limit switch conductivity again. 13E is the start signal from the LOGO! Q1 and the reverse signal from the bottom limit switch. 13A is the reverse signal from the middle and top limit switches. The AC-Tech can not run with two reverse signals.
9. To test the AC-Tech. Turn off the power disconnect to the panel. Label and remove the motor leads from the AC-Tech U, V, W, and PE. Label and remove 13E, 13A, and 13B. Turn on the power disconnect and the drive switch. Using a jumper wire touch 11 to 13E. The AC-Tech should display speed. Using a jumper wire touch 11 to 13A. The AC-Tech should count down then back up to speed. If the AC-Tech tests good turn off power disconnect and reconnect all wires.
10. To test Warrick. Label and remove probe wires from terminals T10, T11, and T12. The NC contact should be sending a 110 volt signal to LOGO! I4. On panels with OBA4 LOGO!'s they will display "LOW LEVEL" when there is a signal. Make sure power and drive switch are on. Jumper terminals on lower part of Warrick G, L, and H all together. The 110 volt signal now should not be at LOGO! I4. Remove the jumper going to H and the signal should still not be at LOGO! I4. Remove the jumper going to L and signal should now be back to LOGO! I4. If the Warrick tests good and Level control does not work properly there is a problem with the probes.

If you still have problems call Blackhawk at 630-469-4916.

SECTION 10

LIMITED WARRANTY

Anchor Pumps® manufactured by Blackhawk Environmental Company (Blackhawk) are warranted to the original user only to be free of defects in material and workmanship for a period of 12 months from date of manufacture.
Blackhawk's liability under this warranty shall be limited to repairing or replacing at Blackhawk's option, without charge, F.O.B. Blackhawk's factory, any product of Blackhawk manufacture. Blackhawk will not be liable for any costs of removal, installation, transportation, or any other charges which arise in connection with a warranty claim. Products which are sold but not manufactured by Blackhawk are subject to the warranty provided by the manufacturer of said products and not by Blackhawk's warranty. Blackhawk will not be liable for damage or wear to said products by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair, or if the product was not installed in accordance with Blackhawk's printed installation and operating instructions.

To obtain service under this warranty, the defective product must be returned to Blackhawk together with proof of purchase and installation date, failure date, and supporting installation data. Unless otherwise provided, contact will be made to Blackhawk for instructions prior to return of defective product. Any defective product to be returned to Blackhawk must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Material Authorization must be included if so instructed.

Blackhawk will not be liable for any incidental or consequential damages, losses, or expenses arising from installation, use or any other causes. There are not expressed or implied warranties, including merchantability or fitness for a particular purpose, which extend beyond those warranties described or referred to above.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages and some jurisdictions do not allow limitations on how long implied warranties may last. Therefore, the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from jurisdiction to jurisdiction.

Anchor Electric Piston Pump®

Model 101E

Patented Top-Head-Drive Piston Pump

Patented, Electric Top-Head-Drive Motor

Customizable Downhole Pump

Flow Range
0-1.35 US GPM 5.1 LPM
Operational Depth
804 Ft. 245 M with 1 hp motor
Well Casing Size
Minimum 2 In. 4.85 CM

Description

The Anchor Electric Piston Pump Model 101E is powered by electricity. The control motor is located at surface grade for easy installation and maintenance. Power to the pump is direct from grade through the sucker rod assembly. The pump removes water and product (e.g. oil, solvents, leachate) from a two (2) inch (4.85 cm) diameter well casing or greater to depths of 804 feet (245 meters) with a 1 hp motor. The fluid inlet is located at the bottom of the pump intake cylinder and removes water or product to 0 submergence depth.

Performance and Technical Data

Performance	
Operational Depth	804'
Flow Range	0 to 1.35 US GPM/ 5.1 LPM 1,900 US GPD/ 7,300 LPD
Discharge per Stroke	.05 US Gallons per stroke Note: flow does not vary with depth
Motor	1/2 or 1 hp
Power Supply	120 or 230 Volt Single Phase or 230 or 460 Volt Three Phase
Maximum Discharge Pressure	348 PSI
Maximum Lift	804 feet of water or 348 PSIG Variable speed (stroke) control adjusts to well conditions; liquid drawn down to top of strainer.
Technical	
Stroke Length	12" (30.48 cm)
Maximum External Diameter	2.9" (7.37 cm)
Total Cylinder Length	30" (76.2 cm)
Connection of Riser Pipe	1-1/4" (3.18 cm)
Connection to Sucker Rod	7/16" - 20
Recommended Internal Diameter of Bore Hole	2-3" (4.85 - 7.62 cm) or greater diameter
Weight of Cylinder	8 lbs.
Discharge Size	2" NPT
Installation	Unit can be installed vertically or horizontally
Driver Weight	40 lbs.
Driver Rod Weight	12 lbs./100'
Foot Valve Assembly Weight	8 lbs.
Minimum Well Casing Size	2"

* Up to 1000 feet.

Anchor Electric Piston Pump®

Model 101E

Materials of Construction:
(Materials of construction can be modified to meet specific applications)

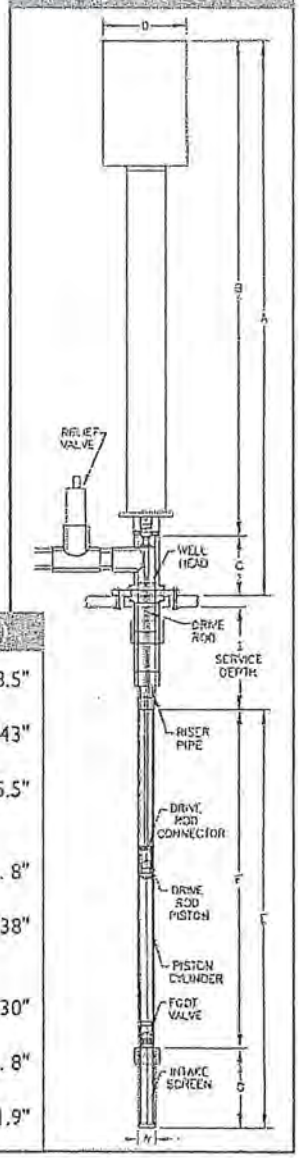
Above Ground

Drive Motor	Stainless Steel/ Aluminum
Seal Plate	Delrin®
Seal Plate Seals	Nitrile/Viton
Relief Valve	Stainless Steel
Discharge Tee	PVC
Well Head	Steel

Downhole

Drive Rod	Fiberglass
Drive Rod Connector	Stainless Steel
Drive Piston Seal	Nitrile/Viton
Drive Piston Check Ball	Stainless Steel
Drive Piston	Delrin®
Piston Cylinder	Stainless Steel/PVC
Foot Valve Check Ball	Stainless Steel
Foot Valve	Stainless Steel
Intake Screen	Stainless Steel/PVC

Pump Dimensions



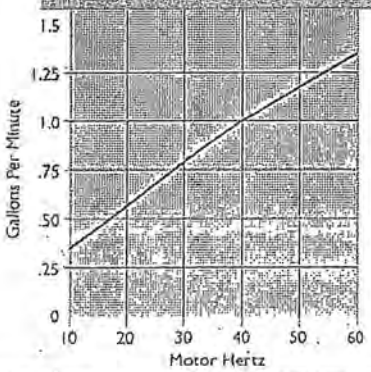
Dimensions (in inches)

A Above Well Height	48.5"
B Driver Height	43"
C Discharge Tee & Well Seal Height	5.5"
D Driver Diameter	8"
E Foot Valve Assembly Length	38"
F Foot Valve Length	30"
G Intake Screen Length	8"
H Downhole Diameter	1.9"

Available Options

- ✓ Level Control Systems
- ✓ Hazardous Duty Components
- ✓ Metered Flow Control
- ✓ Flow Measurement
- ✓ Variable Frequency Drive
- ✓ SCADA Capability

Anchor 101E Electric Pump Flow Performance



* Up to 1000 feet

ATTACHMENT C

Monthly Volume & pH/Conductance Data Form

WAYNE DISPOSAL SITE #2

LEAK DETECTION SYSTEM PUMPING AND SAMPLING RECORD

DATE:_____

MASTER CELL:_____ CELL: _____

NAME:_____

DATE OF LAST READING:_____

METER READING PRIOR TO PUMPING:_____

METER READING AFTER PUMPING:_____

SUMP PUMPED DRY? YES_____ NO_____

VOLUME PUMPED (gallons):_____

SPECIFIC CONDUCTANCE:_____ pH_____

CONDITION OF SUMP/METER: _____

_____

_____

_____

OTHER COMMENTS (INCLUDE DESCRIPTION OF SAMPLE IF ANY UNUSUAL CHARACTERISTICS ARE OBSERVED) :_____

_____

_____

_____

_____

NOTE: THIS RECORD MUST BE FILED IN QEHS FILES

ATTACHMENT D

Handling Requirements of Monitoring Parameters

Handling Requirements of Monitoring Parameters

Parameter	Code	Perservation	Holding Time	Bottle Type	Minimum Volume
Total Phenolics	PHN	1,2	28 Days	Glass	0.5 L
Sulfate	SO4	2	28 Days	Plastic	50 ml*
Alkalinity	ALK	2	14 Days	Plastic	100 ml*
Chloride	CL-	2	28 Days	Plastic	50 ml*
Nitrate/Nitrite	NPN	1,2	48 Hrs	Plastic	0.5 L
Aluminum	AL	3,5	6 Mos	Plastic	200 ml**
Antimony	SB	3,5	6 Mos	Plastic	200 ml**
Arsenic	AS	3,5	6 Mos	Plastic	200 ml**
Barium	BA	3,5	6 Mos	Plastic	200 ml**
Beryllium	BE	3,5	6 Mos	Plastic	200 ml**
Cadmium	CD	3,5	6 Mos	Plastic	200 ml**
Calcium	CA	3,5	6 Mos	Plastic	200 ml**
Chromium	CR	3,5	6 Mos	Plastic	200 ml**
Chromium, Hexavalent	CR6	2,5	24 Hrs	Plastic	100 ml
Cobalt	CON	3,5	6 Mos	Plastic	200 ml**
Copper	CU	3,5	6 Mos	Plastic	200 ml**
Iron	FE	3,5	6 Mos	Plastic	200 ml**
Potassium	K	3,5	6 Mos	Plastic	200 ml**
Lead	PB	3,5	6 Mos	Plastic	200 ml**
Magnesium	MG	2,3,5	6 Mos	Plastic	200 ml**
Manganese	MN	2,3,5	6 Mos	Plastic	200 ml**
Mercury	HG	3,5	6 Mos	Plastic	200 ml**
Molybdenum	MO	2,3,5	6 Mos	Plastic	200 ml**
Nickel	NI	2,3,5	6 Mos	Plastic	200 ml**
Selenium	SE	3,5	6 Mos	Plastic	200 ml**
Silver	AG	3,5	6 Mos	Plastic	200 ml**
Sodium	NA	3,5	6 Mos	Plastic	200 ml**
Thallium	TL	3,5	6 Mos	Plastic	200 ml**
Tin	SN	3,5	6 Mos	Plastic	200 ml**
Vanadium	VA	3,5	6 Mos	Plastic	200 ml**
Zinc	ZN	3,5	6 Mos	Plastic	200 ml**
pH	pH		Immediate	Plastic	25 ml
Bicarbonate	BAL	2	14 Days	Plastic	100 ml*
Carbonate	CAL	2	14 Days	Plastic	100 ml*
TOC	TOC	7	28 Days	Glass	100 ml
Specific Conductivity	CON	2	28 Days	Plastic	100 ml
Total Cyanide	TCN	2,4	14 Days	Plastic	500 ml
Amenable Cyanide	ACN	2,4	14 Days	Plastic	500 ml
Volatile Organics	VOC	2,6	14 Days	Glass	2x40 ml
PCBs	PCB	2	7 Days-Extraction	Glass	2 L
		2	40 Days-Analysis	Glass	40 ml

1) pH<2 with concentrated Sulfuric Acid
2) Store at 4 degrees centigrade
3) pH<2 with nitric acid
4) pH>12 with sodium hydroxide
5) Filtered in the field using 0.45 micron membrane filters on the time of collection
6) 4 drops HCL, no headspace
7) pH<2 with hydrochloric acid

* Note: One liter for all of these parameters stored similarily
** Note: One liter for all of these parameters stored similarily

ATTACHMENT E

Method Detection Limits for Organic & Inorganic Parameters

METHOD DETECTION LIMITS FOR INORGANIC PARAMETERS

PARAMETER	MDL (mg/L)	METHOD REFERENCE
TOTAL PHENOLICS	0.01	9066
SULFATE	2	ASTM D516-90
TOTAL ALKALINITY	10	2320B
CHLORIDE	1.0	4500-Cl E
NITRATE/NITRITE	0.01	4500-NO3 F
ALUMINUM	0.05	6020/202.2
ANTIMONY	0.001	6020/7041
ARSENIC	0.001	7061/6020
BARIUM	0.005	6010/6020
BERYLLIUM	0.001	6010/6020
CADMIUM	0.0002	6020/7131
CALCIUM	1.0	6010
CHROMIUM	0.001	6010/6020
HEX. CHROMIUM	0.005	7196
COBALT	0.015	6020/6010
COPPER	0.01	6010/6020
IRON	0.02	6010
LEAD	0.001	7421/6020
MAGNESIUM	1.0	6010
MANGANESE	0.005	6010/6020
MERCURY	0.0002	7470
MOLYBDENUM	0.025	6010/6020
NICKEL	0.002	6010/6020
POTASSIUM	0.1	6010
SELENIUM	0.001	7741/6020
SILVER	0.0002	6020/7760
SODIUM	1.0	6010
THALLIUM	0.002	6020/7841
TIN	0.2	6010/6020
VANADIUM	0.002	6010/6020
ZINC	0.01	6010/6020
pH	N/A	150.1
BICARBONATE	10	2320B
CARBONATE	10	2320B
TOTAL CYANIDE	0.005	4500-CN G
CYANIDE	0.005	4500-CN G
TOTAL ORGANIC CARBON	0.2	5310C
SPEC. CONDUCTANCE	5 (umhos/cm)	2510B

Note: Detection limits meet those in MDEQ Operational Memo Gen-8 Revision 8 - 12/22/06. This table should be revised in the event Op Memo Gen-8 is updated

References:
Methods referenced from TEST METHODS FOR EVALUATING SOLID WASTE, USEPA SW-846, STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, 20th Edition, and USEPA METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTEWATER, 3/83 and METHODS FOR ORGANIC ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, 10/84

METHOD DETECTION LIMITS - ORGANIC ANALYSIS

Parameter	Method Reference	Detection Limit (mg/l)
Acetone	8260B	0.020
Bromodichloromethane	8260B	0.001
Bromoform	8260B	0.001
Bromomethane	8260B	0.005
Carbon tetrachloride	8260B	0.001
Chlorobenzene	8260B	0.001
Chloroethane	8260B	0.005
2-Chloroethylvinyl Ether	8260B	0.010
Chloroform	8260B	0.001
Chloromethane	8260B	0.001
Dibromodifluoromethane	8260B	0.001
1,2 Dichlorobenzene	8260B	0.001
1,3 Dichlorobenzene	8260B	0.001
1,4 Dichlorobenzene	8260B	0.001
Dichlorodifluoromethane	8260B	0.001
1,1-Dichloroethane	8260B	0.001
1,2-Dichloroethane	8260B	0.001
1,1-Dichloroethene	8260B	0.001
1,2-Dichloroethene	8260B	0.001
1,2 Dichloropropane	8260B	0.001
cis-1,3 Dichloropropene	8260B	0.001
trans-1,3 Dichloropropene	8260B	0.001
1,1,1,2, Tetrachloroethane	8260B	0.001
1,1,2,2, Tetrachloroethane	8260B	0.001
Tetrachloroethene	8260B	0.001
1,1,2-Trichloroethane	8260B	0.001
1,1,1-Trichloroethane	8260B	0.001
Trichloroethene	8260B	0.001
Trichlorofluoromethane	8260B	0.001
Vinyl Chloride	8260B	0.001
Methylene Chloride	8260B	0.005
2- Butanone (MEK)	8260B	0.005
Benzene	8260B	0.001
Toluene	8260B	0.001
Ethylbenzene	8260B	0.001
Total Xylenes	8260B	0.003
PCB-1016	8082	0.0001
PCB-1221	8082	0.0001
PCB-1232	8082	0.0001
PCB-1242	8082	0.0001
PCB-1248	8082	0.0001
PCB-1254	8082	0.0001
PCB-1260	8082	0.0001

Note: Detection limits meet those in MDEQ Operational Memo Gen-8 Revision 8 - 12/22/06. This table should be revised in the event Op Memo Gen-8 is updated

Reference: Methods referenced from TEST METHODS FOR EVALUTION SOLIDS WASTE, USEPA SW-846

ATTACHMENT F

Chain-of-Custody

Tr. iatrix Laboratories, Inc.
5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 15809

Page ____ of ____

For Lab Use Only	
Cart	
VOA Rack/Tray	
Receipt Log No.	
Project Chemist	
Laboratory Project No.	

Client Name	Project Name
Address	Client Project No. / P.O. No.
	Invoice To ☐ Client ☐ Other (comments)
Phone	Contact/Report To
Fax	

Analyses Requested

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List) / Number of Containers Submitted	Total	Sample Comments
			1										
			2										
			3										
			4										
			5										
			6										
			7										
			8										
			9										
			10										

Sampled By (print)	How Shipped? Hand Carrier_____	Comments		
Sampler's Signature	Tracking No.			
Company	1. Relinquished By / Date / Time	2. Relinquished By / Date / Time	3. Relinquished By / Date / Time	
	1. Received By / Date / Time	2. Received By / Date / Time	3. Received For Lab By / Date / Time	

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

ATTACHMENT G

Statistical Program for the LDCRS

STATISTICAL EVALUATION

The statistical program for LDCRS monitoring utilizes Nonparametric Prediction Limits (NPPLs) to evaluate the monitoring data. In order to balance false positive and statistical power with this test, resamples are used, the number of which are determined by the number of sampling points and the number of background observations. Since there is no "upgradient" in the LDCRS system, and there was no substantial pre-waste disposal sampling program, the definition of background is not defined in a traditional sense. Thus the use of resamples is selected somewhat arbitrarily (see below).

The NPPL is defined as the highest concentration of a monitoring parameter detected in a background sample. For parameters that are never detected in the background, the NPPL is defined as the reported detection limit. Since the parameters to be analyzed statistically are all organic compounds, the reported detection limit, as listed on Attachment E of the LDCRS Sampling and Analysis Plan are the NPPLs. Therefore, any reported concentration of an Attachment E parameter at or above these limits is considered an apparent statistically significant increase.

If an Attachment E compound is detected, then the NPPL been exceeded and WDI will immediately notify the Waste Management Division (WMD) of the Michigan Department of Environmental Quality (MDEQ) and arrange resampling as soon as possible to confirm or refute

the apparent statistically significant increase. Quadruplicate samples will be collected for confirmation purposes and analyzed for the offending parameter(s). Since these quadruplicates are not independent samples, it does not constitute a multiple resampling as defined by the NPPL test. Thus the quadruplicate samples constitute a single resampling. If three of the four quadruplicate samples are clean, then the statistical increase is not confirmed. If two or more of the quadruplicates contain the compound of interest the apparent increase will be deemed confirmed and WDI shall respond in accordance with the current Operating License.

Section 30. Lysimeter Sampling & Analysis Plan

Section 30

LYSIMETER MONITORING SAMPLING AND ANALYSIS PLAN

WAYNE DISPOSAL SITE #2 HAZARDOUS WASTE LANDFILL
MID 048 090 633

REVISION 2.0 – January, 1995
REVISION 2.1 – May, 1999
REVISION 2.2- October 2000
REVISION 2.3 – October 2009

LYSIMETER MONITORING SAMPLING AND ANALYSIS PLAN

WAYNE DISPOSAL SITE #2 HAZARDOUS WASTE LANDFILL
MID 048 090 633

REVISION 2.0 – January, 1995
REVISION 2.1 – May, 1999
REVISION 2.2- October 2000
REVISION 2.3 – October 2009

1.0 INTRODUCTION

The following sampling and analysis plan outlines the procedures to be used for the collection and analysis of samples from the suction lysimeters present beneath the hazardous waste management areas (HWMA) of Master Cells V and VII at Wayne Disposal Site #2 Hazardous Waste Landfill. The lysimeter monitoring program functions as an early leak detection program beneath the lowest point (leachate collection sumps) of the HWMA subcells within these Master Cells. There are ten lysimeters in place. They were installed as five pairs so that adequate volume could be extracted for samples at each location. Pairs are located beneath cells V-B, VII-A, VII-B and VII-C (2 pairs identified as VII-C west and VII-C east). The locations of the lysimeters are shown on Figure 1.

This sampling and analysis plan has been prepared to direct the efforts of monitoring personnel in the collection and analysis of samples so as to meet the requirements of Michigan Act 451, Part 111 for the facility and to ensure sound practices for the collection of these data. This plan must be revised if there are any changes to the procedures contained herein. Any proposed changes must be submitted to the Waste & Hazardous Materials Division (WHMD) of the Michigan Department of Environmental Quality (MDEQ) for review and approval before the changes are implemented..

2.0 DESCRIPTION OF EQUIPMENT

The lysimeters were placed beneath the cell by angle drilling at an angle of approximately 65° from vertical to a depth approximately 50 feet below ground surface and at least 5 feet below the lowest point of the bottom of the cell. A drawing of a typical installation is shown on Figure 2. The suction lysimeter system consists of a lysimeter, which takes in the moisture from the surrounding soil, vacuum tubing, and because of the depth, a transfer vessel at mid-depth. The lysimeters were manufactured by Timco Manufacturing and are composed entirely of Teflon™, as is the tubing and transfer vessel. There is a 2-inch PVC casing attached to the transfer vessel. The "sand-pack" placed around the lysimeter is a silica flour slurry. The whole system is cased in a 6-inch steel casing to within four feet of the lysimeter assembly. Bentonite pellets were used to seal the lysimeter and silica pack from possible seepage from above. At the surface there are three lines with stop-cocks: (one with a pressure gauge) for pressurizing the lysimeter, one to pressurize the transfer vessel and one for transmitting the sample.

3.0 SAMPLE COLLECTION PROCEDURES

Samples of the water collected by the lysimeters are collected on a semi-annual basis. The sampling process involves applying a vacuum to the system to draw moisture into the lysimeter, transferring the water from the lysimeter to the transfer vessel and then applying pressure to the transfer vessel to drive the sample to the surface. This is generally a 3-day process. During the first day, check to make sure the gauge is in working order. Then, set the initial vacuum by opening the stop-cock on the line with the pressure gauge and applying 10-20 psi using a hand pump. Close the stop-cock. On the second day, repeat this process. To sample the system on

the third day, hook-up a breathable quality compressed air tank or nitrogen tank to the line with the gauge. Open the stop-cocks on each line. Apply about 8-10 psi for 2-3 minutes. Hook-up the compressed gas tank to the transfer vessel pressure line and apply 25-30 psi. The sample will be discharged from the sample line. Collect the samples and close the stopcocks. Samples from pairs may be composited if insufficient sample is collected from a single lysimeter.

Protective gloves must be worn during sample collection and care should be taken to ensure minimal agitation/aeration of the samples. The vials must be filled completely with zero head-space. Each sample container must be carefully labeled with the sampling location, time and date, and the sampler's initials. After collection, the samples must be stored in a clean cooler containing ice or ice packs. The coolers containing samples must be stored in a secure location until transport to the laboratory.

A field blank must be collected with each lysimeter sample collected. A trip blank must be maintained for each day the lysimeters are sampled. Due to the difficulty in getting enough sample for analysis, duplicate samples are not collected for the lysimeter monitoring program.

A chain of custody form must be filled out for each sampling event. This form must be filled out fully for each sample submitted for analysis and each person responsible for the handling of these samples must sign and date the form. When the samples are delivered to the laboratory and the lab has signed for their receipt, a copy of this form must be forwarded to the QEHS Department.

4.0 SAMPLE ANALYSIS

Each sample must be analyzed for the parameters listed on Figure 3, which also contains the analytical methods and targeted method detection limits. Laboratory Quality control frequencies and precision/accuracy requirements are provided in the Quality Assurance Manual for the current contract laboratory, TriMatrix Laboratories, which is contained in the Groundwater Sampling and Analysis Plan for this facility. This manual describes the internal policies, guidelines and procedures of TriMatrix. This manual is not intended to describe the specific details of this particular monitoring program. Rather, we are to use this document as a guideline in evaluating the current laboratory's QA/QC and standard operating procedures to ensure that generally acceptable practices are employed.

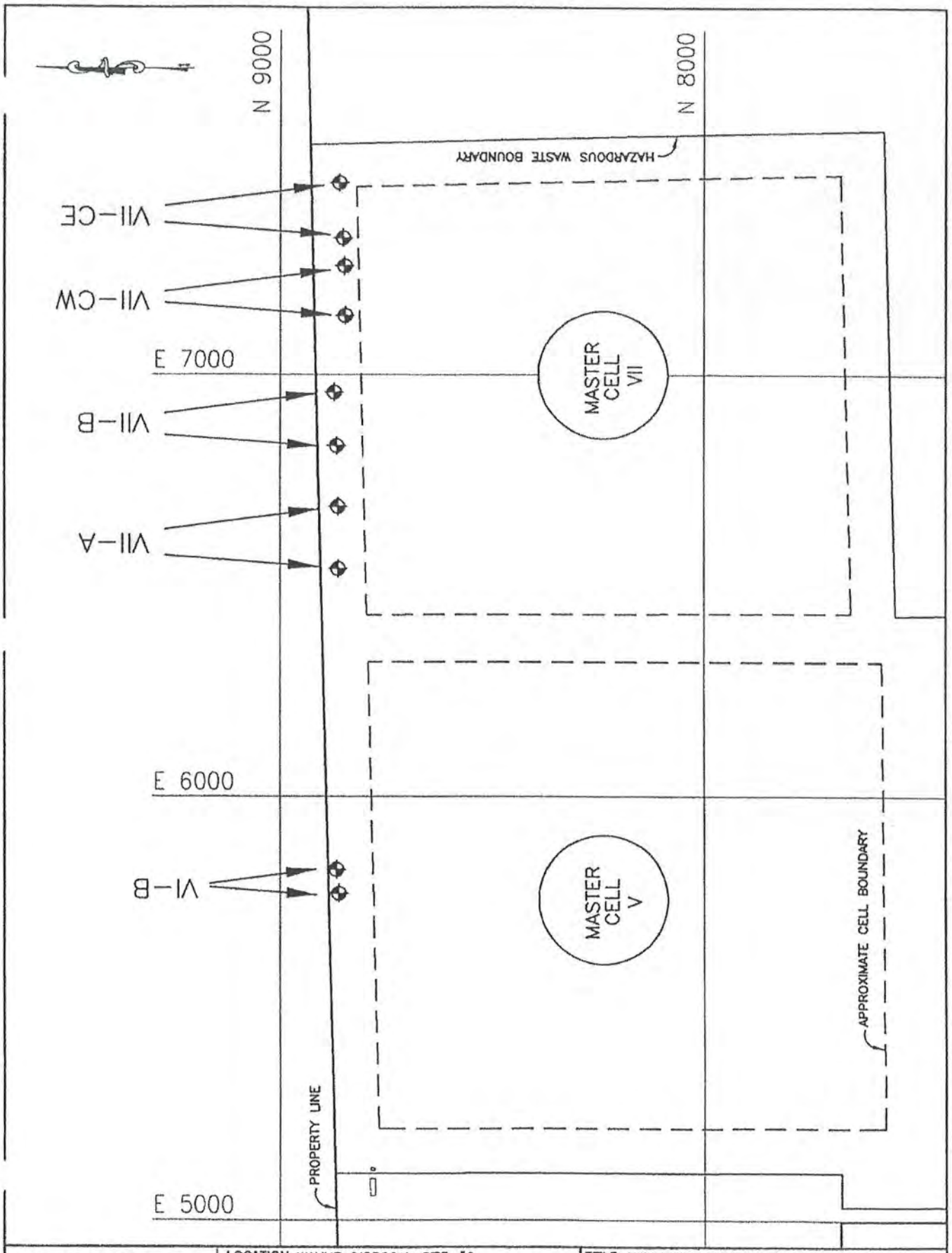
5.0 RECORD KEEPING AND INSPECTION REQUIREMENTS

There are two items required to ensure adequate record keeping for the lysimeter monitoring program. First, the lysimeter sampling and inspection log (Figure 4) must be filled out at each sampling location during each sampling event. The log must include the identity of sampling personnel, the dates and time when samples are collected, a description of the sampling event, and any pertinent observations of sample characteristics or sampling environment. In addition, this form must be used to record an inspection of the lysimeter outlet including the pressure gauges, stopcocks and the outer protective casing. Second, a chain of custody form must be filled out for each sampling event, as described above. This form must be filled out fully for each sample submitted for analysis and each person responsible for the handling of these samples must sign and date the form.

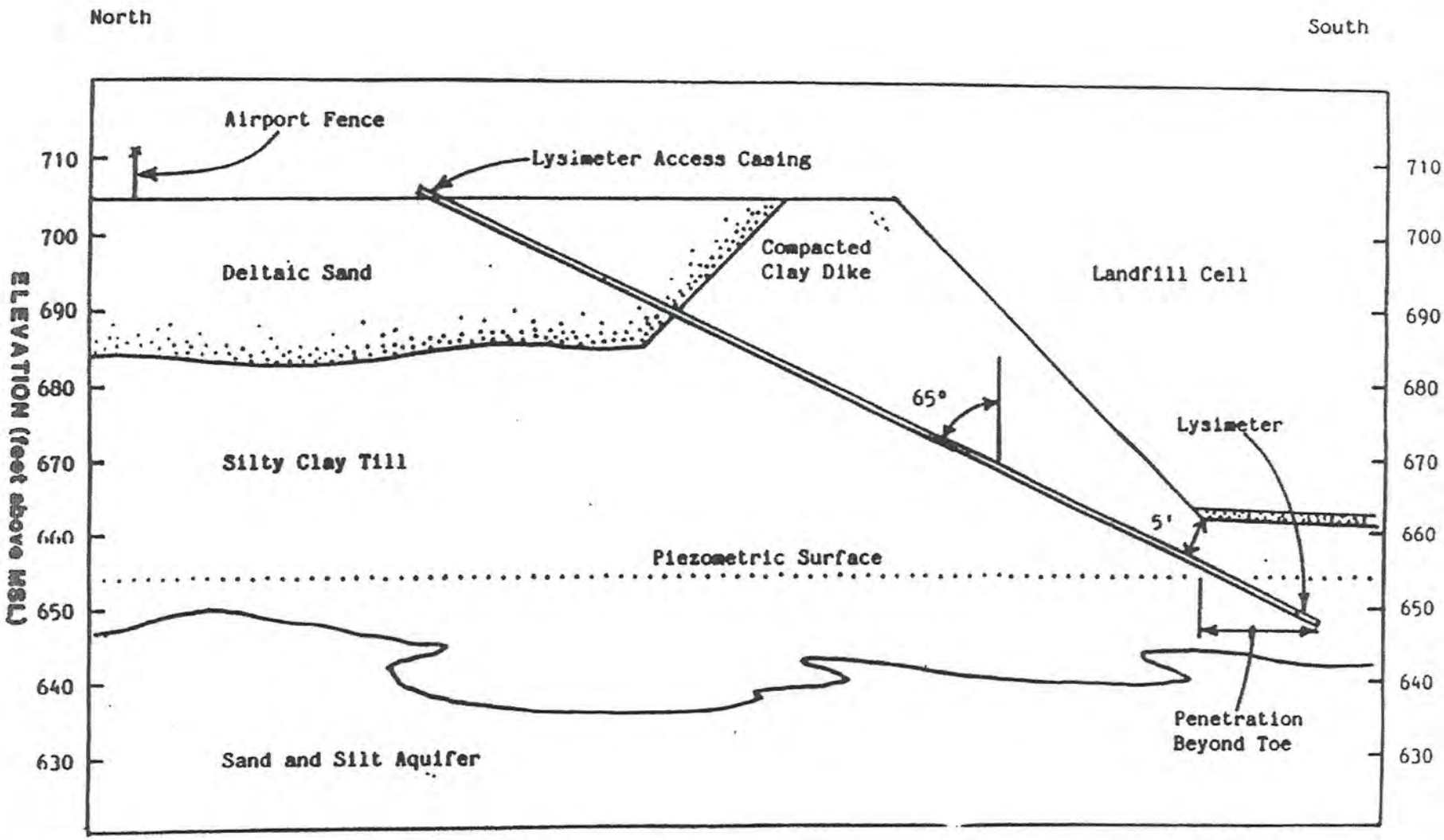
6.0 DATA EVALUATION AND REPORTING REQUIREMENTS

The data must be received from the laboratory, evaluated and transmitted to the MDEQ within 60 days of sampling. The statistical analysis of the data is identical to that for the LDCRS monitoring program and is provided as Attachment A. An apparent statistically significant increase identified by the statistical test must be reported to MDEQ within 24 hours. An apparent statistically significant increase must be confirmed or refuted by resampling. In general, the lysimeters do not recharge for at least several months. Any lysimeter yielding an apparent statistically significant must be resampled within 3 months unless insufficient sample can be collected. If there is insufficient sample within 3 months this result must be reported to MDEQ along with a schedule for attempting the next sample. . Confirmed statistically significant increases must also be transmitted immediately to the MDEQ.

The semi-annual reports must include a description of the sampling event, a summary of field and laboratory QA/AC information, the field logs and a summary of any non-compliances or maintenance performed.



THE ENVIRONMENTAL QUALITY COMPANY	LOCATION: WAYNE DISPOSAL SITE #2		TITLE: LYSIMETER LOCATION PLAN
	SCALE: 1" = 300'	DATE: 10/11/95	FILENAME: WDS2LYS



Lysimeter Installation Geometry at Wayne Disposal.

(HORIZONTAL NOT TO SCALE)

Figure 2

FIGURE 3. METHOD DETECTION LIMITS - ORGANIC ANALYSIS

Parameter	Method Reference	Detection Limit (mg/l)
Acetone	8260B	0.020
Bromodichloromethane	8260B	0.001
Bromoform	8260B	0.001
Bromomethane	8260B	0.005
Carbon tetrachloride	8260B	0.001
Chlorobenzene	8260B	0.001
Chloroethane	8260B	0.005
2-Chloroethylvinyl Ether	8260B	0.010
Chloroform	8260B	0.001
Chloromethane	8260B	0.001
Dibromodifluoromethane	8260B	0.001
1,2 Dichlorobenzene	8260B	0.001
1,3 Dichlorobenzene	8260B	0.001
1,4 Dichlorobenzene	8260B	0.001
Dichlorodifluoromethane	8260B	0.001
1,1-Dichloroethane	8260B	0.001
1,2-Dichloroethane	8260B	0.001
1,1-Dichloroethene	8260B	0.001
1,2-Dichloroethene	8260B	0.001
1,2 Dichloropropane	8260B	0.001
cis-1,3 Dichloropropene	8260B	0.001
trans-1,3 Dichloropropene	8260B	0.001
1,1,1,2, Tetrachloroethane	8260B	0.001
1,1,2,2, Tetrachloroethane	8260B	0.001
Tetrachloroethene	8260B	0.001
1,1,2-Trichloroethane	8260B	0.001
1,1,1-Trichloroethane	8260B	0.001
Trichloroethene	8260B	0.001
Trichlorofluoromethane	8260B	0.001
Vinyl Chloride	8260B	0.001
Methylene Chloride	8260B	0.005
2- Butanone (MEK)	8260B	0.005
Benzene	8260B	0.001
Toluene	8260B	0.001
Ethylbenzene	8260B	0.001
Total Xylenes	8260B	0.003

Note: Detection limits meet those in MDEQ Operational Memo Gen-8 Revision 8 - 12/22/06. This table should be revised in the event Op Memo Gen-8 is updated

Reference: Methods referenced from TEST METHODS FOR EVALUTION SOLIDS WASTE, USEPA SW-846

Figure 4. Lysimeter Sample Collection and Inspection Log - WDI Site #2

Sample ID:	**Sample Date:**	**Sample Time:**
Sample Location:	**Sampling Method:**	**Sampler:**
Sample Description/Comments*:		
Inspection Items: (indicate by checkmark if OK, comment if not)		
Pro-Casing:_____	**Gauge:**_____	**Stopcocks:**_____

Sample ID:	**Sample Date:**	**Sample Time:**
Sample Location:	**Sampling Method:**	**Sampler:**
Sample Description/Comments*:		
Inspection Items: (indicate by checkmark if OK, comment if not)		
Pro-Casing:_____	**Gauge:**_____	**Stopcocks:**_____

Sample ID:	**Sample Date:**	**Sample Time:**
Sample Location:	**Sampling Method:**	**Sampler:**
Sample Description/Comments*:		
Inspection Items: (indicate by checkmark if OK, comment if not)		
Pro-Casing:_____	**Gauge:**_____	**Stopcocks:**_____

Sample ID:	**Sample Date:**	**Sample Time:**
Sample Location:	**Sampling Method:**	**Sampler:**
Sample Description/Comments*:		
Inspection Items: (indicate by checkmark if OK, comment if not)		
Pro-Casing:_____	**Gauge:**_____	**Stopcocks:**_____

* Note clarity of samples and any color, sheen, odor or other relevant characteristics of the sample

Attachment A
Statistical Analysis

Attachment A – Lysimeter Statistical Monitoring Plan

INTRODUCTION

The following statistical monitoring plan provides a description of the statistical procedures used for identifying a statistically significant increase of monitoring parameters in the lysimeter monitoring program at WDI. The program is intended to provide an early warning that hazardous waste constituents may be penetrating the liner systems of cells V-B, VII-A, VII-B and VII-C East and VII-C West.

STATISTICAL EVALUATION

The statistical program for lysimeter monitoring utilizes Nonparametric Prediction Limits (NPPLs) to evaluate the monitoring data. In order to balance false positive and statistical power with this test, resamples are used, the number of which are determined by the number of sampling points and the number of background observations. Since there is no "upgradient" in the lysimeter network, and there were pre-waste disposal samples collected from these devices, the definition of background is not defined in a traditional sense. Thus the use of resamples is selected somewhat arbitrarily (see below).

The NPPL is defined as the highest concentration of a monitoring parameter detected in a background sample. For parameters that are never detected in the background, the NPPL is defined as the reported detection limit. Since the parameters to be analyzed statistically are all

volatile organic compounds, the reported detection limit, as listed on Figure 3 of the Lysimeter Sampling and Analysis Plan are the NPPLs. Therefore, any reported concentration of a Figure 3 parameter at or above these limits is considered an apparent statistically significant increase.

If a Figure 3 compound is detected, then the NPPL been exceeded and WDI will immediately notify the Waste Management Division (WMD) of the Michigan Department of Environmental Quality (MDEQ) and arrange resampling as soon as possible to confirm or refute the apparent statistically significant increase. Quadruplicate samples, if there is sufficient volume, will be collected for confirmation purposes and analyzed for the offending parameter(s). Since these quadruplicates are not independent samples, it does not constitute a multiple resampling as defined by the NPPL test. Thus the quadruplicate samples constitute a single resampling. If three of the four quadruplicate samples are clean, then the statistical increase is not confirmed. If two or more of the quadruplicates contain the compound of interest the apparent increase will be deemed confirmed and WDI shall respond in accordance with the current Operating License.

Section 31. Sedimentation Basin Monitoring Plan

Section 31

SEDIMENTATION BASIN SAMPLING AND ANALYSIS PLAN

WAYNE DISPOSAL, INC., SITE #2 MID 048 090 633

REVISION 3.0 – MARCH, 1996
REVISION 3.1 – MAY, 1999
REVISION 3.2 – OCTOBER 2000
REVISION 3.3 – MARCH 2001
REVISION 3.4-JULY 2002
REVISION 3.5 – DECEMBER 2008
REVISION 3.6 – SEPTEMBER 2011

SEDIMENTATION BASIN SAMPLING AND ANALYSIS PLAN

WAYNE DISPOSAL, INC., SITE #2 MID 048 090 633

1.0 INTRODUCTION

This Sedimentation Basin Sampling and Analysis (SB SAP) plan identifies the procedures to be used for monitoring sediment samples from the north sedimentation basin (NSB), the south sedimentation basin (SSB), and, after it is constructed, the northwest sedimentation basin (NWSB) at Wayne Disposal, Inc. (WDI), Site 2. The sedimentation basins receive on-site surface water (storm water) run-off primarily from unpaved areas and final cover systems of the facility via a network of open ditches and subsurface pipes. The sedimentation basins do not receive run-off from active hazardous waste disposal cells. All surface water collected in the sedimentation basins is treated by sedimentation, filtration and activated carbon adsorption prior to discharge to Quirk Drain. The effluent from this treatment process is discharged into Quirk Drain in accordance with a National Pollutant Discharge Elimination System (NPDES) permit. This monitoring program is one of the checks on the engineered controls and operational procedures employed by WDI to detect an on-site release of hazardous waste or hazardous waste constituents as early as possible and allow WDI to initiate efforts to locate and control the source and prevent the off-site release of hazardous waste or waste constituents.

The monitoring program described in this SB SAP is designed to monitor the chemical quality of the sediments that have accumulated in the bottom of each basin over time. Monitoring the composition of certain parameters within the sediment is done to determine if hazardous waste or

hazardous waste constituents are present. This monitoring program is one of the checks on the engineered controls and operational procedures employed by WDI to detect an on-site release of hazardous waste or hazardous waste constituents as early as possible and allow WDI to initiate efforts to locate and control the source and prevent the off-site release of hazardous waste or hazardous waste constituents. The SB SAP, in addition to describing the monitoring program prompts notification and response actions that WDI must take if an apparent or confirmed significant increase in a monitored parameter occurs.

2.0 REVISION

WDI may revise this SB SAP and submit the revised plan to the Chief of the Waste and Hazardous Materials Division of the Michigan Department of Environmental Quality (WHMD/MDEQ) for review and approval prior to implementation.

3.0 SAMPLE LOCATIONS

Each sedimentation basin is divided into six sections as shown in Figures 1, 2 and 3 for the SSB, NSB and NWSB, respectively. One grab sample is collected at random locations within each section of each basin during each sampling event. The locations for each sampling point are to be measured using a GPS or equivalent method and the coordinates listed on the sample log (Figure 3) included in this plan.

4.0 SAMPLE FREQUENCY

All sedimentation basins are to be sampled on an annual basis. The sampling event will include the SSB, NSB and the NWSB (after construction) and should be scheduled in the spring at approximately the same time each year.

5.0 SAMPLE COLLECTION

For each basin, a grab sample is to be collected from each section of each basin shown in Figures 1, 2, and 3. In addition, a representative composite sample from each basin is to be created by combining equal portions from each grab sample from the basin. Sufficient volume of sediment must be collected at each grab sample location such that there is adequate volume to 1) perform the required grab sample analysis, 2) contribute a portion to the composite sample and 3) have enough left over sample to used by the laboratory for a confirmation of an apparent statistically significant increase of PCBs, if necessary. Confirmation procedures are specified in Section 8.0 of this document.

The individual grab samples from each section of each basin are to be collected from a small rowboat utilizing a Ponar grab-type sampler or an auger sampler with an extension. The person conducting the sampling will position the boat at one of the sampling locations, lower the sampling device and retrieve a sample. The sample will then be removed from the sampler and placed directly into the appropriate container using a clean Teflon hand trowel. The composite sample from each respective basin is to be collected by placing equal volumes of collected sediment from each individual grab sample location within the respective basin into a stainless steel bowl or disposable foil pan. After equal portions from all grab sample locations from the

respective basin have been collected and placed into the bowl/pan, the sediment in the bowl is to be gently mixed to homogenize the sample, and then placed into an appropriate container.

Clean protective gloves must be worn during sample collection and clean gloves must be used at each sample location. Care should be taken at all times when handling the samples to avoid sample cross-contamination. Each sample container must be labeled with the sampling location, the time and date of the sampling event, and the sampler's initials. The sample collection log (Figure4) is to be filled out at each sampling location and any unusual conditions (e.g. odors, sheens) encountered are to be noted. In addition, a chain of custody (COC) form is to be filled out for each sampling event. The COC is to be filled out fully for each sample submitted for analysis and each person handling the samples must sign and date the form. When the samples are delivered to the laboratory and the laboratory has signed for their receipt, a copy of this form is to be retained on site in the Quality, Environment, Health and Safety (QEHS) Department records. After collection, the samples are to be stored in a clean cooler containing ice or ice packs. The coolers containing samples are to be stored in a secure location, until being transported to the laboratory.

All non-dedicated sampling equipment is to be thoroughly cleaned and decontaminated between sample locations by scrubbing with a brush and rinsing with de-ionized water to remove all visible soil/sediment material.

Field Quality Assurance/Quality Control samples collected for each sampling event, including

confirmation sampling events, include:

- One trip blank for each cooler utilized for storing and shipping PCB samples. The trip blank is to be analyzed for PCBs.
- One blind duplicate for each sampling event. The duplicate sample is to be analyzed for the identical set of parameters as the samples. The duplicate is to be collected by filling an identical set of sample containers at a given location and submitting them for an identical analysis.
- One equipment blank per sampling day for each piece of non-dedicated sampling equipment utilized in the sampling process (i.e. sample collection tool/ponar and/or composite sample collection bowl/foil pan). The equipment blank is to be collected by pouring clean de-ionized water over the decontaminated piece of equipment and collecting the rinsate in the appropriate container for analysis. The equipment blank is to be analyzed for the identical set of parameters as the samples.

6.0 SAMPLE ANALYSIS

Each grab sample from the SSB, NSB and NWSB is to be analyzed for the parameters listed in Table 1 identified as grab sample parameters. The analytical methods and method detection limits specified are also listed on Table 1. Each composite sample from each basin is to be analyzed for all of the PCB aroclors listed on Table 1 using the analytical methods and method detection limits specified. In addition, all grab samples must also be extracted for PCB analyses but only analyzed if necessary as confirmation samples per Section 8.0. In some cases, the laboratory may not attain the method detection limits specified due to sample dilutions and

matrix effects. If this is the case, the laboratory report must include an explanation for not achieving the specified method detection limits.

The laboratory quality control/quality assurance manual (QA/QC Manual) describing the required internal policies, guidelines and procedures of any WDI contract lab is contained in the Groundwater Sampling and Analysis Plan (GW SAP). WDI is to use this QA/QC Manual in evaluating the QA/QC standard operating procedures of any contract laboratory utilized for the purposes of this SB SAP and ensure that the laboratory employs generally acceptable practices that meet the specifications of the QA/QC Manual in the GW SAP.

7.0 DATA EVALUATION

The analytical data from the sedimentation basin samples is to be evaluated as follows:

- For a SSB or NWSB PCB composite sample, an apparent statistically significant increase (ASSI) has occurred if the total concentration of the PCB compounds listed in Table 1 is greater than or equal to 1 mg/kg on a dry-weight basis.
- For a NSB PCB composite sample, an ASSI has occurred if the total concentration of the PCB compounds listed in Table 1 is greater than or equal to the method detection limit.
- For metals, phenols (all sedimentation basins), and total and amenable cyanide (south and northwest sedimentation basins only), the data will be evaluated using graphical trend analysis. An ASSI for any parameter has occurred if increasing concentrations are noted for any individual parameter in four consecutive sampling events and/or a ten-fold increase in concentration is noted in any parameter between sampling events in any of the

individual grab samples. If four consecutive samples show increasing concentrations, WDI must determine the difference between the first and fourth sample concentrations and determine if this quantity is greater than 10 percent of the mean of the concentration of those four measurements for that parameter. If the difference is greater than 10 percent of the mean then an ASSI is reported. If the difference is less than 10 percent of the mean then no ASSI will be reported.

8.0 RESPONSE ACTIONS

In the event of an ASSI, WDI is to verbally notify WHMD/MDEQ, Hazardous Waste Program Section staff immediately, give them an opportunity to split confirmation samples, and implement the procedures identified below to confirm the ASSI. Confirmation samples must be collected and submitted for analysis within 7 days of providing notification of an ASSI.

- For the composite PCB samples, procedures to determine if a CSSI has occurred are as follows. The additional grab samples collected in each section of the basin that were sent to the lab and extracted are to be analyzed for PCBs. If any of the grab samples for which PCBs are detected are above the action levels defined in Section 7.0 (i.e. the ASSI is repeated), then a CSSI will have been confirmed for that section of the basin that the grab sample represented.
- For the metals, total and amenable cyanide, and phenols grab samples, procedures to determine if a confirmed statistically significant increase (CSSI) has occurred are as follows. Any section of the basins for which an ASSI is reported for metals, total and

amenable cyanide, and/or phenols is to be resampled by collecting four additional samples within the section of the basin with the ASSI. If the concentrations in two of the four confirmation samples are equal to or greater than the original sample, then the increase is a confirmed statistically significant increase (CSSI).

In the event an ASSI is not repeated, WDI will resume routine monitoring. In the event an ASSI is repeated upon analyzing the second sample, a confirmed statistically significant increase (CSSI) has occurred. In the event a CSSI has occurred, WDI must notify WHMD/MDEQ in accordance with the General Operating Conditions of the Operating License for reporting noncompliance that may endanger human health or the environment. Further, within 30 days of becoming aware of a CSSI, WDI must implement the following actions depending upon the CSSI parameter and the CSSI location:

- For a metals CSSI in either basin and/or a phenolics, total cyanide, or amenable cyanide CSSI in the SSB or NWSB, submit a work plan for WHMD review and approval to delineate the extent of contamination in the basin, identify and eliminate the source of the contamination, and determine if concentrations are sufficiently elevated to require removal of sediments from the impacted basin. Guidance regarding determining whether or not removal of contaminated sediments is required is provided in Attachment 3 of the Remediation and Redevelopment Division's (RRD) Operational Memorandum No 4.
- For a PCB CSSI in the SSB or NWSB, submit a work plan to delineate and/or remove sediments from the impacted basin for the WHMD/MDEQ review and approval.

- For a PCB CSSI in the NSB, immediately implement a source assessment program by collecting quarterly grab samples for PCB analysis from each respective section of the basin for a minimum of one year and perform a trend analysis using the data.
    - If PCBs are detected above a concentration of 1 mg/kg in any individual sediment grab sample during any quarterly sampling event, submit a work plan within 30 days of the detection to delineate and/or remove sediments in the impacted basin for WHMD review and approval. In addition, WDI will submit to the WHMD/MDEQ for review and approval a work plan that provides for additional storm water sampling and analysis to identify the source of the PCBs in the NSB sediments and, depending upon the results from the additional storm water monitoring, recommend actions to eliminate the source and/or conduct additional source investigation.
    - If the PCB results from the required quarterly sampling are less than 1 mg/kg, continue to collect quarterly sediment grab samples for PCB analysis from each respective section of the basin until the one year period and the trend analysis of the data is complete. If PCBs are detected subsequent to the CSSI in any two grab samples from the basin, WDI will submit to the WHMD/MDEQ for review and approval within 30 days of the second detection a work plan that provides for additional storm water sampling and analysis to identify the source of the PCBs in the NSB sediments and, depending upon the results from the additional storm water monitoring, recommend actions to eliminate the source and/or conduct additional source investigation and removal.

WDI may voluntarily remove sediments from any sedimentation basin without WHMD/MDEQ approval if WDI verbally notifies WHMD/MDEQ, Hazardous Waste Program Section staff of the removal at least five days in advance of the removal and performs the removal in compliance with all applicable laws. In the event WDI chooses to voluntarily remove sediments from either basin in response to an ASSI or CSSI, all source investigation and removal requirements defined above shall still be implemented.

9.0 REPORTING REQUIREMENTS

A final SB SAP Report (Report) documenting the annual sampling under this plan, including the data received from the laboratory, is to be submitted to the WHMD/MDEQ within 60 days of each sampling event. All Reports must include a narrative description of the sampling event, a map of each respective basin showing each location sampled, copies of the sampling logs, a tabular summary and discussion of the data, the trend analysis calculations and discussion of the trend analysis results, a description of any ASSI and/or CSSI, as applicable, and any resampling conducted, and/or any additional actions required and/or recommended as a result of the Report findings. In addition to this report, an annual summary report of sedimentation basin monitoring results must be submitted to RMD/MDEQ by March 1 of the following year

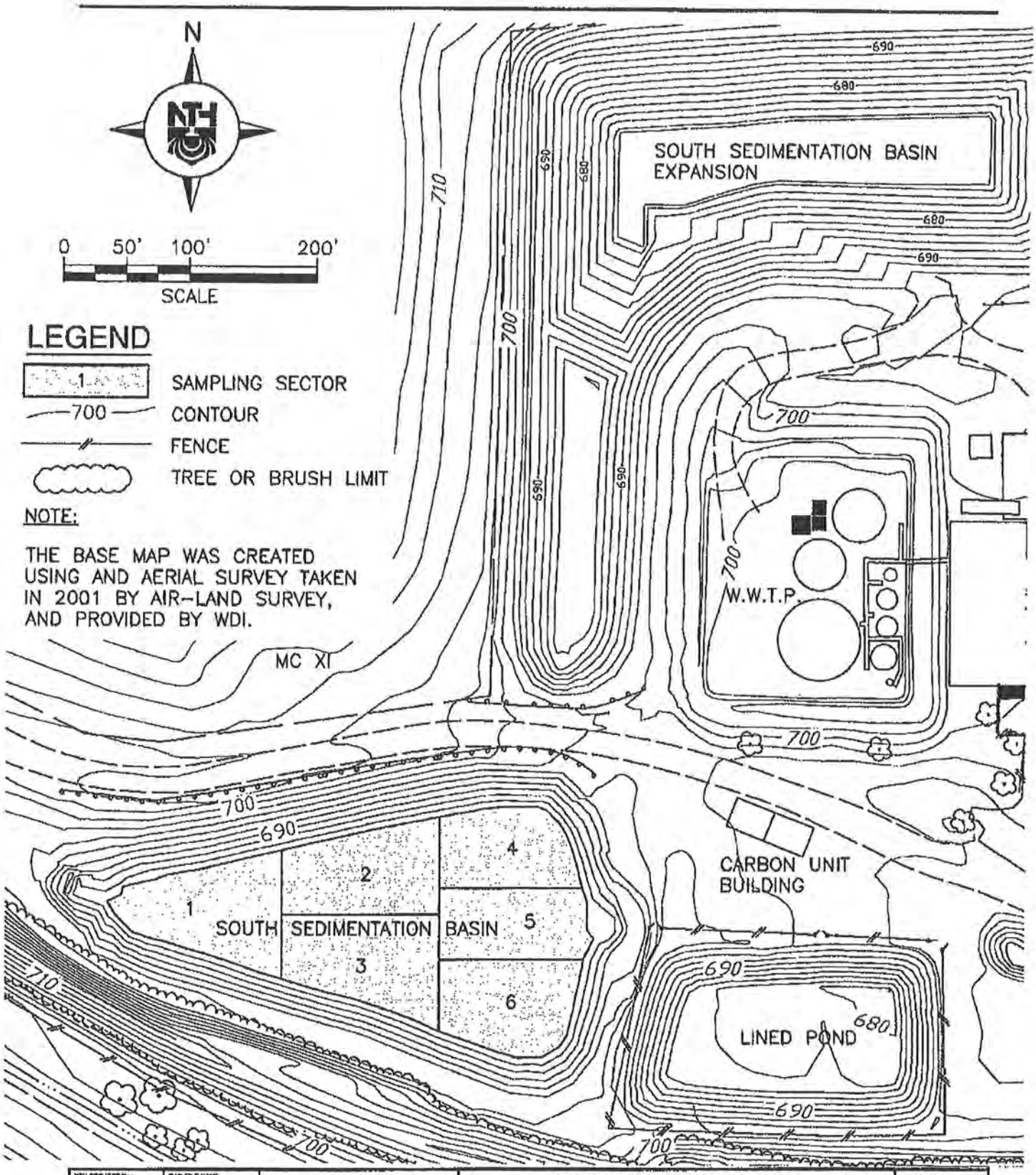
10.0 RECORD KEEPING REQUIREMENTS

All analytical data and Reports generated under this SB SAP must be stored on site within the QEHS filing system and be available to MDEQ staff for inspection.

Table 1. Sedimentation Basin monitoring Parameters

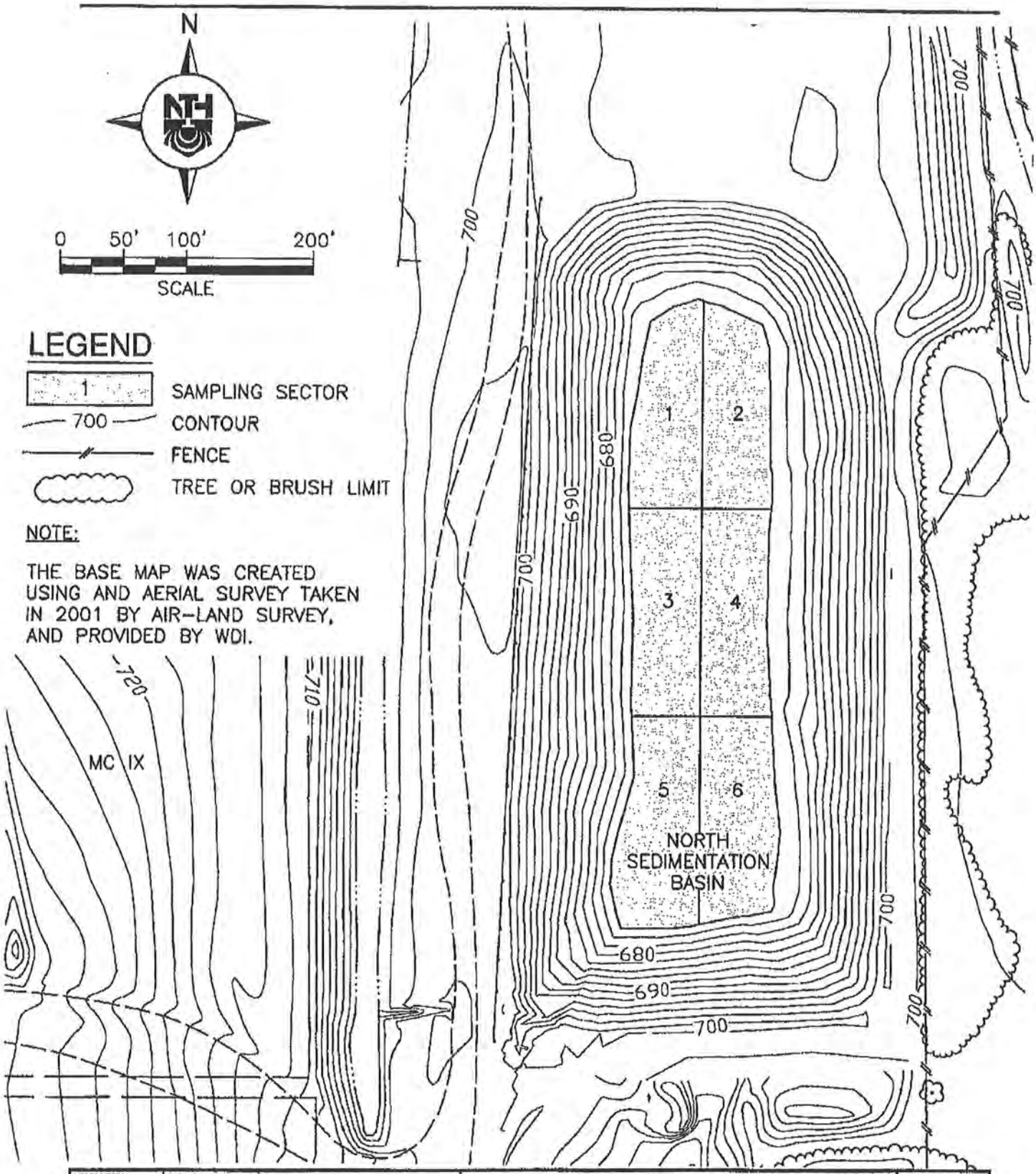
Grab Sample Parameters	RL[1] (mg/Kg)[2]	Approved Method[3]
Arsenic	0.5	6020
Barium	1	6020
Cadmium	2	6010
Chromium (total)	1	6010
Cobalt	2	6010/6020
Copper	1	6010/6020
Iron	5	6010
Lead	5	6010/6020
Mercury	0.05	7471
Molybdenum	5	6010/6020
Nickel	5	6010/6020
Selenium	0.2	6020
Silver	0.1	6010
Vanadium	1	6010/6020
Zinc	5	6010/6020
Total Phenolics[5]	0.4[4]	9066
Total Cyanide[5]	0.1[4]	9012
Amenable Cyanide[5]	NA	9012
Composite Sample Parameters		
PCB-1016	0.1	8082
PCB-1221	0.1	8082
PCB-1232	0.1	8082
PCB-1242	0.1	8082
PCB-1248	0.1	8082
PCB-1254	0.1	8082
PCB-1260	0.1	8082

1 - Reporting Limits from Operational Memo Gen-8 Revision 8
2 - Dry Weight Basis
3 - Test Methods For Evaluating Solid Waste, USEPA SW-846
4 - Target Detection Limits from RRD Operational Memorandum No. 2
5 - South Sedimentation Basin Only



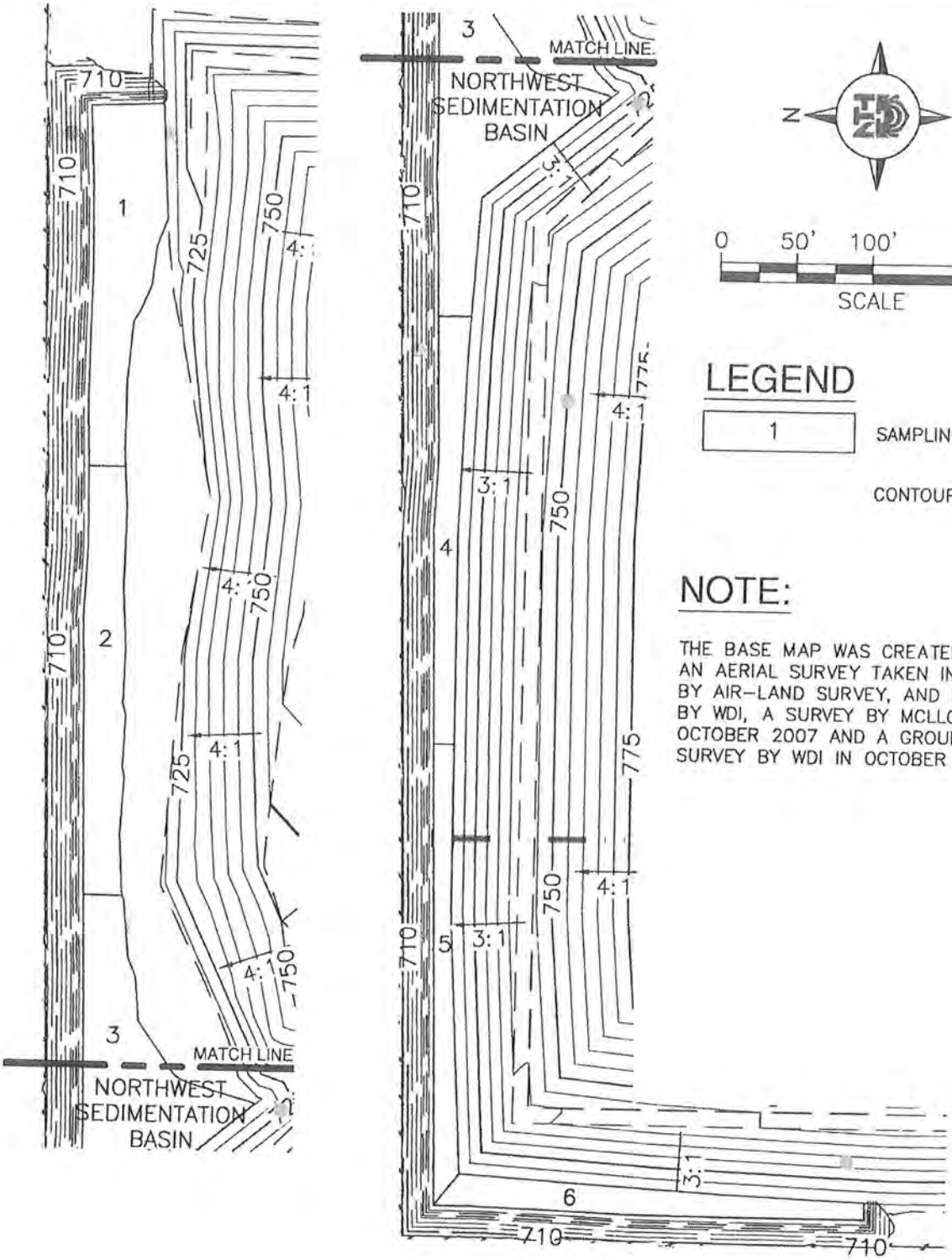
NTH PROJECT No.: 13-060921-07	CAD FILE NAME:	NTH Consultants, Ltd. Infrastructure Engineering and Environmental Services	SOUTH SEDIMENTATION BASIN MONITORING SAMPLE SECTORS	FIGURE 1
DESIGNED BY: KRO	PLOT DATE: 10/31/08			
DRAWN BY: KRO	DRAWING SCALE: AS SHOWN		WAYNE DISPOSAL SITE NO. 2 BELLEVILLE, MICHIGAN	
CHECKED BY: RBM	INCEPTION DATE: 10/30/08			

J:\Cad\13\Site 2 - SWMP\SAMPLING LOCATIONS\FIGURE 1-2 SED.dwg



NTH PROJECT No: 13-060921-07	CAD FILE NAME:	NTH Consultants, Ltd. Infrastructure Engineering and Environmental Services	NORTH SEDIMENTATION BASIN MONITORING SAMPLE SECTORS	FIGURE 2
DESIGNED BY: KRO	PLOT DATE: 10/31/08			
DRAWN BY: KRO	DRAWING SCALE: AS SHOWN		WAYNE DISPOSAL SITE NO. 2 BELLEVILLE, MICHIGAN	
CHECKED BY: RBM	INCEPTION DATE: 10/30/08			

J:\Cad\13\Site 2 - SWMP\SAMPLING LOCATIONS\FIGURE 1-2 SED.dwg



LEGEND

1	SAMPLING SECTOR
	CONTOUR

NOTE:

THE BASE MAP WAS CREATED USING AN AERIAL SURVEY TAKEN IN 2001 BY AIR–LAND SURVEY, AND PROVIDED BY WDI, A SURVEY BY MCLLC IN OCTOBER 2007 AND A GROUND SURVEY BY WDI IN OCTOBER 2008.

NTH PROJECT No: 13–080921–03	CAD FILE NAME: FIGURE 3 SED	NTH Consultants, Ltd. Infrastructure Engineering and Environmental Services	NORTHWEST SEDIMENTATION BASIN MONITORING SAMPLE SECTORS
DESIGNED BY: DC	PLOT DATE: 9/21/2011		WAYNE DISPOSAL, INC. SITE NO. 2 - MC VI F&G VAN BUREN TWP., WAYNE COUNTY, MICHIGAN
DRAWN BY: RMLII	DRAWING SCALE: AS SHOWN		FIGURE: 3
CHECKED BY: DC	INCEPTION DATE: 02/16/09		

J:\13\Site 2 – SWMP\SAMPLING LOCATIONS\FIGURE 3 SED.dwg

Sample Collection Log for Sediments - WDI Site #2

Sample ID: (Basin, Sector #)	Sample Date:	Sample Time:
Sample Location: (x,y coordinates)	Sampling Method:	Sampler:
Sample Description/Comments*:		

Sample ID: (Basin, Sector #)	Sample Date:	Sample Time:
Sample Location: (x,y coordinates)	Sampling Method:	Sampler:
Sample Description/Comments*:		

Sample ID: (Basin, Sector #)	Sample Date:	Sample Time:
Sample Location: (x,y coordinates)	Sampling Method:	Sampler:
Sample Description/Comments*:		

Sample ID: (Basin, Sector #)	Sample Date:	Sample Time:
Sample Location: (x,y coordinates)	Sampling Method:	Sampler:
Sample Description/Comments*:		

* Include any unusual characteristics such as color, sheen, odor, etc.

Figure 4.

32: Surface Water Monitoring

Section 32. Surface Water Monitoring Plan

Section 32

SURFACE WATER SAMPLING AND ANALYSIS PLAN

REVISION 3.0 – MARCH, 1996
REVISION 3.1- MAY, 1999
REVISION 3.2 – OCTOBER, 1999
REVISION 3.3 – OCTOBER, 2000
REVISION 3.4 – MARCH, 2001
REVISION 3.5 - JULY 2002
REVISION 3.6 – DECEMBER 2008
REVISION 3.7 – FEBRUARY 2011

SURFACE WATER SAMPLING AND ANALYSIS PLAN

WAYNE DISPOSAL, INC. SITE #2
MID 048 090 633

REVISION 3.0 – MARCH, 1996
REVISION 3.1- MAY, 1999
REVISION 3.2 – OCTOBER, 1999
REVISION 3.3 – OCTOBER, 2000
REVISION 3.4 – MARCH, 2001
REVISION 3.5 - JULY 2002
REVISION 3.6 – DECEMBER 2008
REVISION 3.7 – FEBRUARY 2011

1.0 INTRODUCTION

This Surface Water Sampling and Analysis Plan (SW SAP) identifies the procedures to be used for monitoring on-site surface water (storm water) samples from the perimeter ditches that convey on-site surface water run-off at Wayne Disposal, Inc. (WDI), Site 2 to the North and South Sedimentation Basins. All surface water collected in the two sedimentation basins is treated by sedimentation, filtration and activated carbon adsorption prior to discharge to Quirk Drain. The effluent from this treatment process is discharged into Quirk Drain in accordance with an effective National Pollutant Discharge Elimination System (NPDES) permit.

The surface water monitoring program described by this SW SAP is designed to test the quality of the on-site surface water to determine if hazardous waste or hazardous waste constituents are

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present within the surface water and prompt notification and response actions that WDI must take if an apparent or confirmed significant increase in a monitored parameter occurs. This monitoring program is one of the checks on the engineered controls and operational procedures employed by WDI to detect an on-site release of hazardous waste or hazardous waste constituents as early as possible and allow WDI to initiate efforts to locate and control the source and prevent the off-site release of hazardous waste or hazardous waste constituents.

2.0 REVISIONS

WDI may revise this SW SAP and submit the revised plan to the Chief of the Waste and Hazardous Materials Division of the Michigan Department of Environmental Quality (WHMD/MDEQ) for review and approval prior to implementation.

3.0 SAMPLE LOCATIONS

Surface water grab samples are currently collected from each of the six permanent locations shown on Figure 1 designated as SS-1, SS-2, SS-5, SS-6, SS-7, and SS-8. SS-3 is the effluent from the treatment system and is monitored in accordance with an effective NPDES permit for the facility. SS-4 was abandoned due to changes to the drainage system at the site. Location SS-8 will be abandoned during the construction of MC VI-F. Locations SS-9 and SS-10 will be added to the program MC-VI-F is constructed. Locations SS-11 and SS-12 will be added to the program when MC-VI-G is constructed. A description of each location, including its location with respect to being in "Area A" or Area B , is included on Table 1.

4.0 SAMPLE FREQUENCY

Each surface water sample location in the program are to be sampled quarterly following a rain event (defined as a 0.5 inches or more in 24 hours) when surface water is present within the ditches. Surface water samples will not be collected within the calendar quarter if there are no significant rain events that allow for the sampling to be completed.

5.0 SAMPLE COLLECTION

Surface water grab samples for each of the required parameters are to be collected from each of the six sampling locations. Samples for volatile organic compounds (VOCs) are to be collected first and require zero headspace (no air bubbles) and minimal agitation of the water sample. Samples for PCBs are collected next followed by total phenolics and then the remaining parameters. Duplicate samples must be collected at each sample location for VOCs, PCBs and metals. . The duplicate samples are to be held by the laboratory as potential confirmation samples to be analyzed in the event of an apparent statistically significant increase (ASSI) using the criteria defined in Section 7.0 of this SW SAP. The duplicate sample for PCBs must be extracted when it arrives at the laboratory and the extract held in case a confirmation analysis is required.

Samples are to be collected by dipping the bottles provided by the laboratory into the water and directly filling the containers. If site conditions do not allow for the bottles to be hand lowered

into the surface water, the bottles can be inserted into a Teflon dipper and lowered, via the Teflon Dipper, into the surface water to collect the sample. If a Teflon dipper is used for sample collection, the dipper must be properly decontaminated between locations by washing the device with a laboratory grade non-phosphate detergent and rinsing thoroughly with clean deionized water. Care must be taken to ensure that any preservatives in the bottles are not spilled during sample collection. Field measurements of pH, specific conductance, temperature and dissolved oxygen are collected with calibrated field instruments at the time of sampling. WDI is to use the instructions for the use and maintenance of these instruments contained in the Groundwater Sampling and Analysis Plan for equipment used to collect field measurements under this SW SAP.

Protective gloves must be worn during sample collection and clean gloves must be used at each sample location.. Care should be taken at all times when handling the samples. Samples to be analyzed for volatile organic compounds require zero-headspace, no air bubbles and minimal agitation of the sample. Samples collected for metals analyses are not to be filtered as the metals analyses are "totals" analyses. Each sample container must be carefully labeled with the sampling location, time and date, and the sampler's initials. Field Quality Assurance/Quality Control samples must include:

- One trip blank in each cooler utilized for storing and shipping samples. The trip blank must be analyzed for VOCs and PCBs.

- One field blank for each day in which samples are collected. The field blank samples are to be collected by filling an identical set of sample bottles at a given location with clean deionized water. The field blank samples must be analyzed VOCs and PCB.
- One blind duplicate for each sampling event. The duplicate must be collected by filling an identical set of sample bottles at a given location and submitting them for an identical analysis.
- One equipment blank per sampling day for each piece of non-dedicated sampling equipment utilized in the sampling process (i.e. the Teflon dipper). The equipment blank must be collected by pouring clean deionized water over the decontaminated piece of equipment and collecting the rinsate in the appropriate jar for analysis. The equipment blank must be analyzed for VOCs and PCBs.

After collection, the samples must be stored in a clean cooler containing ice or ice packs. The coolers containing samples must be stored in a secure location until being transported to the laboratory.

A sample collection log (Figure 2) must be filled out at each sampling location and any unusual conditions (e.g. odors, sheens) encountered must be noted. A chain of custody (COC) form that lists each sample submitted to the laboratory must be fully filled out for each sampling event and each person who has custody of the samples, from sample collection through sample check-in, must sign and date the form. When the samples are delivered to the laboratory and the laboratory

has signed for their receipt, a copy of this form must be retained on site in the Quality, Environment, Health and Safety (QEHS) Department records.

6.0 SAMPLE ANALYSIS

One surface water grab sample from each of the required sampling locations must be analyzed for the parameters listed on Table 2 using the analytical methods and method detection limits specified in Table 2. The potential confirmation duplicate samples from each location must be retained at the laboratory but need only be analyzed if an ASSI is detected in the first sample using the criteria described in Section 7.0 of this SW SAP.

In some cases the laboratory may not be able to attain the method detection limits specified due to factors such as sample dilution or matrix effects. If this is the case, the laboratory report must include an explanation for not achieving the specified method detection limits.

The laboratory quality control/quality assurance manual (QA/QC Manual) describing the required internal policies, guidelines and procedures of any WDI contract lab is contained in the WDI Groundwater Sampling and Analysis Plan (GW SAP). WDI is to use this QA/QC Manual in evaluating the QA/QC standard operating procedures of any contract laboratory utilized for the purposes of this SW SAP and ensure that the laboratory employs generally acceptable practices that meet the specifications of the QA/QC Manual in the GW SAP

7.0 DATA EVALUATION

The analytical data from the surface water samples is to be evaluated as follows:

- For VOCs, any reported concentration at or above the method detection limit is an apparent statistically significant increase (ASSI).

- For PCBs, the data will be evaluated as follows:
  - For samples obtained from Area B, any reported concentration at or above the method detection limit is an ASSI.
  - For samples obtained from Area A, any reported concentration at or above 0.5 mg/L is an ASSI.

- For metals, inorganic parameters, and pH, the data will be evaluated using the sign test as described in Attachment A. In addition, if a ten-fold increase in concentration is noted in any metal or inorganic parameter between sampling events in any of the individual grab samples, then there has been an ASSI.

8.0 RESPONSE ACTIONS

In the event of an ASSI, WDI must verbally notify the WHMD/MDEQ, Hazardous Waste Program Section staff immediately in accordance with the Environmental Monitoring Conditions of the Operating License and implement the procedures identified below to confirm the ASSI.

- If a VOC is present in a sample above its method detection limit, the duplicate sample must be analyzed.
- If a metal in any grab sample has met or exceeded ten times increase criteria identified in Section 7.0, an ASSI has occurred and the duplicate sample must be analyzed for the offending parameter(s) .
- If PCBs have met or exceeded the criteria identified in Section 7.0, an ASSI has occurred and the duplicate sample extract must be analyzed.
- If the sign test fails at any location then the sample location must be inspected closely and resampled as soon as there is water to sample and analyzed for all sign test procedures.

If the holding time for any sample or sample extract has been exceeded, the location where the ASSI sample was collected must be resampled as soon as there is water in the sample location and the sample must be analyzed.

If an ASSI is not repeated ,WDI will resume routine monitoring. If the ASSI is repeated upon analyzing the second sample, a confirmed statistically significant increase (CSSI) has occurred. In the event of a CSSI, WDI must notify the WHMD/MDEQ in accordance with the General Operating Conditions of the Operating License for Reporting Noncompliance that may endanger human health or the environment. Further, in the event of a CSSI, within 30 days of becoming aware of a CSSI, WDI must:

- Determine whether a discharge of hazardous waste and/or hazardous waste constituents to off-site surface waters is occurring, determine the source, and take immediate steps to eliminate and prevent any such discharge. WDI may demonstrate a source other than the licensed facility caused the CSSI or that the CSSI resulted from error in sampling, analysis or evaluation.
- Submit a report to the WHMD/MDEQ documenting WDI's investigation, response, and any further response actions proposed.

9.0 REPORTING REQUIREMENTS

For quarterly reports, the final data must be received from the laboratory, evaluated and the report transmitted to the WHMD/MDEQ within 60 days of sampling. The report must include a narrative description of the sampling event, a map showing the locations sampled, copies of the sampling logs, a tabular summary and discussion of the analytical data and the data statistics, a discussion of field and laboratory QA/QC, the field measurements collected (pH, specific conductance, temperature and dissolved oxygen), a description of any statistically significant events (i.e. ASSI and/or CSSI), any resampling or additional sampling conducted as a result of a CSSI, and any additional actions proposed as a result of the reported data.

In addition to the quarterly reports, an annual summary report of surface water monitoring results must be submitted to the WHMD/MDEQ by March 1 of the following year. At a minimum, the annual report must contain a map showing all locations sampled, a tabular summary and

discussion of the analytical data collected during the previous year, a description of any statistically significant events (i.e. ASSI and/or CSSI), any resampling of additional sampling conducted as a result of a CSSI, and any additional actions proposed as a result of the reported data.

10.0 RECORD KEEPING REQUIREMENTS

All analytical data and quarterly and annual monitoring reports must be stored on site within the QEHS filing system and be available for inspection as required.

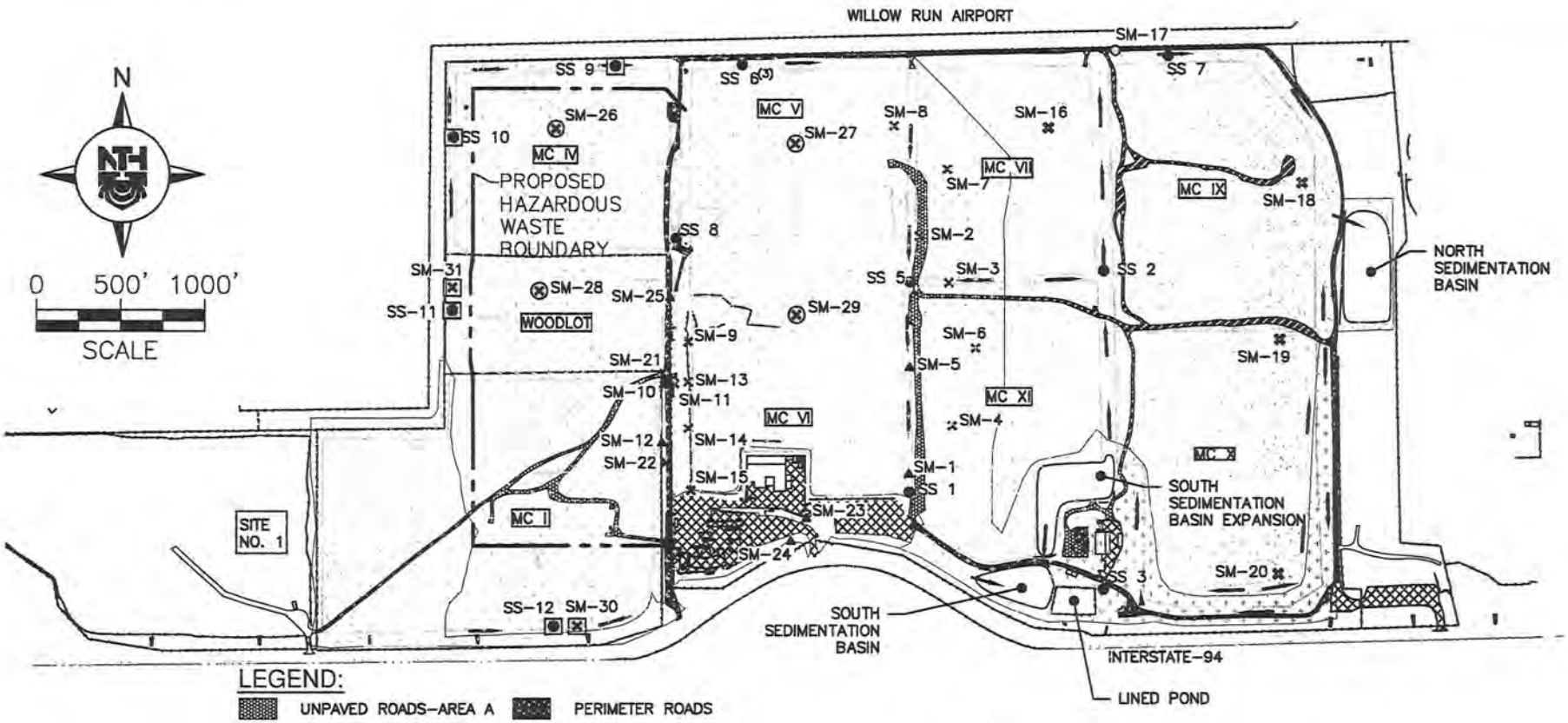
Table 1. Description of Surface Water Monitoring Locations

Sampling Location	Stormwater Run-Off Source Unique to Location	Area Designation
SS-1	east side of MC VI and west side of MC XI	A
SS-2	southeast corner of MC VII, northeast corner of MC XI part of west side of MC X and southeast cover drain of MC VII	B
SS-5	east side of MC V (and VI-E), west and part of south sides of MC VII and part of north side of MC XI	A
SS-6	north side of MC-V	A
SS-7	east side of MC VII, west side of MC IX, part of north side of MC IX, and northeast cover drain of MC VII	B
SS-8	east side of MC-IV and west side of MC-V (to be abandoned for VI F&G construction)	A
SS-9	north of MCI VI-F (to be added when VI-F ditch is constructed)	A
SS-10	west of MC VI-F (to be added when VI-F ditch is constructed)	A
SS-11	west of MC VI-G (to be added when cell VI-G is constructed)	A
SS-12	south of MC-1/VI-G (to be added when cell VI-G is constructed)	A
samples collected quarterly unless no significant precipitation events for the calendar quarter		

Table 2. Surface Water Monitoring Parameters - WDI Site #2

Parameters	MDL (mg/L)	Method	Ref
Indicator Parameters			
Alkalinity	20	2320B	1
Bicarbonate	10	2320B	2
Carbonate	10	2320B	2
Chloride	1	4500-Cl E	2
Nitrate	0.01	4500-NO3 F	2
pH	0.5-12.5	4500-H B	2
Specific Conductance	1	2510B	2
Sulfate	2	ASTM D516-90	2
Total Suspended Solids	4	2540D	2
Total Phenolics	0.01	420.2/9066	1,2
Total Cyanide	0.005	4500-CN G	1
Amenable Cyanide	0.01	4500-CN G	2
Metals			
Arsenic	0.001	6020	1
Barium	0.005	6020	1
Cadmium	0.0002	6020	1
Calcium	1	6010	1
Chromium (total)	0.001	6020	1
Chromium (hexavalent)	0.005	7196	1
Iron	0.02	6010	1
Magnesium	1	6010	1
Manganese	0.005	6020	1
Mercury	0.0002	7470	1
Selenium	0.001	6020	1
Silver	0.0002	6020	1
Sodium	1	6010	1
Zinc	0.01	6020	1

1. TEST METHODS FOR EVALUATING SOLID WASTE, USEPA SW-846
2. STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, 20th Edition
3. USEPA METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTEWATER, 3/83



LEGEND:

- UNPAVED ROADS-AREA A
- UNPAVED ROADS-AREA B
- AREA A
- AREA B
- PERIMETER ROADS
- PAVED SURFACES
- SS 1 — SURFACE WATER SAMPLING LOCATION
- SM 2 — SOIL SAMPLING LOCATION – AREA A
- SM 1 — SEDIMENT SAMPLING LOCATION – AREA A
- SM 16 — SOIL SAMPLING LOCATION – AREA B
- SM 17 — SEDIMENT SAMPLING LOCATION – AREA B
- SM 26 — SOIL SAMPLING LOCATION – POST CLOSURE
- SM 30 — SOIL SAMPLING LOCATION – POST MC VI F/G CONSTRUCTION
- SS 11 — SURFACE WATER SAMPLING LOCATION – POST MC VI F/G CONSTRUCTION
- DIRECTION OF INTERIM SURFACE WATER FLOW
- DIRECTION OF SURFACE WATER FLOW – POST MC VI F/G CONSTRUCTION

NOTES:

1. ROADWAYS ARE SHOWN FOR REFERENCE ONLY AND MAY NOT REPRESENT THE ACTUAL ROADWAY DIMENSIONS.
2. IN THE MC VI ACTIVE FILLING AREA, AS INTERIM OR FINAL COVER ARE ADDED IN ACCORDANCE WITH THE EFFECTIVE PART 111 OPERATING LICENSE, WDI WILL DIRECT NON-CONTACT STORM WATER TO AREA A. THE STORM WATER STRUCTURES ASSOCIATED WITH REDIRECTING THE STORM WATER WILL BE INSPECTED AND MAINTAINED BY WDI IN ACCORDANCE WITH THE LICENSE INSPECTION SCHEDULE APPROVED UNDER THE LICENSE.
3. ANY REVISIONS TO THIS DRAWING REQUIRE THE APPROVAL OF THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY WASTE AND HAZARDOUS MATERIALS DIVISION. APPROVED REVISIONS MUST BE ATTACHED TO THE FOLLOWING DOCUMENTS: SOIL MONITORING SAP, SURFACE WATER MONITORING SAP, TRACKOUT MANAGEMENT SOP, FUGITIVE DUST MANAGEMENT SOP.
4. THE NSB, SSB AND LINED POND THEMSELVES ARE NOT PART OF AREA A OR AREA B.
5. SS-4 WAS PREVIOUSLY REMOVED FOR CONSTRUCTION. SM-9 THROUGH SM-15, SM-21, SM-22, SM-25, AND SS-8 WILL BE REMOVED. SM-26 THROUGH SM-31 AND SS-9 AND SS-10 WILL REPLACE THE SAMPLING LOCATIONS THAT ARE REMOVED.

NTH PROJECT No.: 62080376	DESIGNED BY: KRO	CHECKED BY: DLP	DRAWING SCALE: AS SHOWN	NTH Consultants, Ltd. Infrastructure Engineering and Environmental Services	WAYNE DISPOSAL, INC. SITE NO. 2 -MC VI F & G	SURFACE WATER AND SOIL MONITORING LOCATION PLAN	FIGURE: 1
CAD FILE NAME: 080376-SLP	DRAWN BY: KRO	INCEPTION DATE: 02/16/09	PLOT DATE: 2/8/2011		VAN BUREN TWP., WAYNE COUNTY, MICHIGAN		

J:\62\62080376\Reports\Env\UC\080376-SLP.dwg

Figure 2. Sample Collection Log for Surface Water - WDI Site #2

Sample ID:	**Sample Date:**	**Sample Time:**
Sample Location:	**Sampling Method:**	**Sampler:**
Sample Description/Comments*:		
Field Measurements:	pH _____ Specific Conductance_____ Temperature_____	

Sample ID:	**Sample Date:**	**Sample Time:**
Sample Location:	**Sampling Method:**	**Sampler:**
Sample Description/Comments*:		
Field Measurements:	pH _____ Specific Conductance_____ Temperature_____	

Sample ID:	**Sample Date:**	**Sample Time:**
Sample Location:	**Sampling Method:**	**Sampler:**
Sample Description/Comments*:		
Field Measurements:	pH _____ Specific Conductance_____ Temperature_____	

Sample ID:	**Sample Date:**	**Sample Time:**
Sample Location:	**Sampling Method:**	**Sampler:**
Sample Description/Comments*:		
Field Measurements:	pH _____ Specific Conductance_____ Temperature_____	

* Note clarity of samples and any color, sheen, odor or other relevant characteristics of the sample

Attachment A
Statistical Monitoring Plan for Surface Water Monitoring

Wayne Disposal, Inc., Site #2
MID 048 090 633

Revision 1.0, December 1994
Revision 1.1, October, 1999

Statistical Monitoring Plan for Surface Water Monitoring

WDI Site #2 Hazardous Waste Landfill
MID 048 090 633

Revision 1.0, December 94
Revision 1.1, October 99

I. Introduction

The following statistical monitoring plan provides a description of the statistical procedures to be used for identifying a statistically significant increase of monitoring parameters in the surface water monitoring program for the above referenced facility. The program is intended to determine if hazardous waste constituents may be entering the storm water run-off from non-contact areas of the facility.

II. Statistical Evaluation

The statistical program provides two procedures to be used together for each set of monitoring data. The first procedure applies to the volatile organic and PCB compounds only and is not a true statistical test. For these compounds, any occurrence above the reported detection limit (which is a statistical quantity to some degree) is considered statistically significant. The second procedure is a comparison of the overall inorganic surface water quality to the average quality during a background period by using the sign test. This procedure is described in detail below.

Statistical Sign Test - The purpose of this statistical analysis of the surface water is to determine whether the overall surface water quality during a monitoring event is statistically different compared to "background" surface water quality. To determine the statistical significance of differences between monitoring and background samples, a test know as the sign test is used. This test applies to all inorganic parameters, which will generally be present in detectable concentrations. The sign test determines if enough of these parameters are higher than the background averages to conclude that there is a statistically significant difference in water quality.

The sign test will be performed at the 0.05 significance level to determine if the number of parameters that are present in the monitoring samples in higher concentrations than the background is statistically significant. To perform the sign test, the concentration of each inorganic monitoring parameter is compared to the background concentration for that sampling event. The current background concentrations utilized for the sign test are presented on Table 2. If the monitoring concentration is higher, then a "+" is assigned to that parameter; if the background concentration is higher then a "-" is assigned for that parameter; and if the concentration are equal then a "0" is assigned for that parameter. The total number of "+" parameters and the total number if "+" and "-" parameters are then used with the binomial probability table, Table 1, attached to this plan. To determine if the number of "+"parameters is statistically significant, the table is entered at n, the total number of "+" and "-" parameters and the corresponding value for y is determined for the largest number for alpha that is less than or equal to 0.05. This number y is the smallest number of "-" parameters that can be obtained without a statistically significant increase (e.g. if there are any less "-" parameters then there will be too many "+" parameters.) So the number of pluses is statistically significant if it is greater than the total number of pluses and minuses less the quantity y determined form the table. For instance, if there are eight parameters, the largest value of y corresponding to a value of alpha less than 0.05 is 1. Therefore, 8 - 1 = 7 plus values (or 8 plus values) would result in a failure of the test.

TABLE 1
BINOMIAL DISTRIBUTION
Alpha = P[X<y] for b(X;n,0.050)

n	y	Alpha	n	y	Alpha	n	y	Alpha	n	y	Alpha
1	0	0.5000	8	0	0.0039	12	0	0.0002	15	0	0.0000
1	1	1.0000	8	1	0.0352	12	1	0.0032	15	1	0.0005
			8	2	0.1445	12	2	0.0193	15	2	0.0037
2	0	0.2500	8	3	0.3633	12	3	0.0730	15	3	0.0176
2	1	0.7500	8	4	0.6367	12	4	0.1938	15	4	0.0592
2	2	1.0000	8	5	0.8555	12	5	0.3872	15	5	0.1509
			8	6	0.9648	12	6	0.6128	15	6	0.3036
3	0	0.1250	8	7	0.9961	12	7	0.0862	15	7	0.5000
3	1	0.5000	8	8	1.0000	12	8	0.9270	15	8	0.6964
3	2	0.8750				12	9	0.9807	15	9	0.8491
3	3	1.0000	9	0	0.0028	12	10	0.9968	15	10	0.9408
			9	1	0.0195	12	11	0.9998	15	11	0.9824
4	0	0.0625	9	2	0.0898	12	12	1.0000	15	12	0.9963
4	1	0.3125	9	3	0.2539				15	13	0.9995
4	2	0.6875	9	4	0.5000	13	0	0.0001	15	14	1.0000
4	3	0.9375	9	5	0.7461	13	1	0.0017	15	15	1.0000
4	4	1.0000	9	6	0.9102	13	2	0.0112			
			9	7	0.9805	13	3	0.0461			
5	0	0.0313	9	8	0.9980	13	4	0.1334			
5	1	0.1875	9	9	1.0000	13	5	0.2905			
5	2	0.5000				13	6	0.5000			
5	3	0.8125	10	0	0.0010	13	7	0.7095			
5	4	0.9687	10	1	0.0107	13	8	0.8666			
5	5	1.0000	10	2	0.0547	13	9	0.9539			
			10	3	0.1719	13	10	0.9888			
6	0	0.0156	10	4	0.3770	13	11	0.9983			
6	1	0.1094	10	5	0.6230	13	12	0.9999			
6	2	0.3437	10	6	0.8281	13	13	1.0000			
6	3	0.6562	10	7	0.9453						
6	4	0.8906	10	8	0.9893	14	0	0.0001			
6	5	0.9844	10	9	0.9990	14	1	0.0009			
6	6	1.0000	10	10	1.0000	14	2	0.0065			
						14	3	0.0287			
7	0	0.0078	11	0	0.0005	14	4	0.0898			
7	1	0.0625	11	1	0.0059	14	5	0.2120			
7	2	0.2266	11	2	0.0327	14	6	0.3953			
7	3	0.5000	11	3	0.1133	14	7	0.6047			
7	4	0.7734	11	4	0.2744	14	8	0.7880			
7	5	0.9375	11	5	0.5000	14	9	0.9102			
7	6	0.9922	11	6	0.7256	14	10	0.9713			
7	7	1.0000	11	7	0.8867	14	11	0.9935			
			11	8	0.9673	14	12	0.9991			
			11	9	0.9941	14	13	0.9999			
			11	10	0.9995	14	14	1.0000			
			11	11	1.0000						

Table 2.
Sign Test Background Data for Surface Water
Wayne Disposal, Inc. Site No. 2

Parameter	Units	Number of Values	Mean
Arsenic	mg/l	24	0.015
Barium	mg/l	24	0.64
Cadmium	mg/l	24	0.017
Calcium	mg/l	24	304
Chromium (total)	mg/l	24	0.06
Chromium (hexavalent)	mg/l	24	0.009
Iron	mg/l	24	46.4
Magnesium	mg/l	24	66
Manganese	mg/l	24	1.19
Mercury	mg/l	24	0.0007
Selemum	mg/l	24	0.0043
Silver	mg/l	24	0.01
Sodium	mg/l	24	28
Zinc	mg/l	24	0.54
Alkalinity (total)	mg/l	24	187
Alkalinity (bircarbonate)	mg/l	24	187
Alkalinity (carbonate)	mg/l	24	18
Chloride	mg/l	24	54
Fecal Coliforms	Count/100 ml	24	9637
Nitrate	mg/l	24	0.76
pH	Stnd. Units	24	7.5
Sulfate	mg/l	24	213
Tot. Susp. Solids	mg/l	21	2797

Notes: Background data were complied from eight quarters during period from May 1989 to April 1991

Detection Limits values are used for data which are reported to be below the method detection limit.

Section 33. Soil Monitoring Plan

Section 33

SOIL MONITORING
SAMPLING AND ANALYSIS PLAN

Version 1.0 December 2008
Version 1.1 February 2011
Version 1.2 September 2011

SOIL MONITORING
SAMPLING AND ANALYSIS PLAN

WAYNE DISPOSAL, INC. SITE #2
MID 048 090 633

1.0 INTRODUCTION

This Soil Monitoring Sampling and Analysis Plan (SM SAP) identifies the procedures for monitoring on-site soil and ditch sediment samples at Wayne Disposal, Inc. (WDI), Site 2 during the active life of the hazardous waste disposal facility. The soil monitoring program described in the SM SAP is designed to test on-site soil and ditch sediments for the presence of polychlorinated biphenyls ("PCBs"). PCBs detected in the soils or sediments could potentially be transported by storm water into the sedimentation basins at the site. The storm water in the sedimentation basins is treated for PCBs prior to discharge to Quirk Drain in accordance with a National Pollution Discharge Elimination System (NPDES) Permit. This monitoring program is one of the checks on the engineered controls and operational procedures employed by WDI to detect an on-site release of hazardous waste or hazardous waste constituents as early as possible and allow WDI to initiate efforts to locate and control the source and prevent the off-site release of hazardous waste or hazardous waste constituents.

This SM SAP also prompts notification and response actions that WDI must take when an apparent or confirmed threshold level exceedance of PCBs in on-site soil/sediments occurs. This

SM SAP does not apply to an off-site detection of PCBs in soil/sediments. In the event PCBs are detected and/or confirmed in off-site soil/sediments, WDI must notify the MDEQ in accordance with the General Operating Conditions of the Operating License for Reporting Noncompliance that may endanger human health or the environment

2.0 REVISIONS

WDI may revise this SM SAP and submit the revised plan to the Chief of the Waste and Hazardous Materials Division of the Michigan Department of Environmental Quality (WHMD/MDEQ) for review and approval prior to implementation.

3.0 SAMPLE LOCATIONS

Currently, there are twenty five sampling locations for the soil monitoring program. There are 20 soil sampling locations and five sediment sampling locations, identified as SM-1 through SM-25, on Figure 1, that also depicts the boundaries for Area A and Area B watersheds. Locations SM-26 through SM-34 will be added to the program post MC VI F&G construction and post-closure as indicated on Figure 1. The locations for the SM SAP samples have been surveyed and are marked in the field with a monument. With the development of Cell VI F&G and the eventual relocation of the waste transfer box, some soil sampling locations will be eliminated and/or relocated. Two additional perimeter ditch samples (SM-30 and SM-31) will be added after Cell VI-F is constructed and four additional locations (SM-26 through SM-30) will be added after final cover is installed.

One grab sample of soil will be collected from within 10 feet of the surveyed monument from each of the respective soil monitoring locations. One sediment sample will be collected from within the ditch at each of the respective drainage ditch locations within 10 feet of the surveyed monument in a linear fashion. At the time of sampling, the exact location for each of the individual samples will be marked with a flag and a written description of the location (distance from monument and compass direction) will be recorded on the sample collection log so that a confirmation sample can be collected if necessary (see Section 5 below). Upon initiation of WDI's next routine sampling event, the flag will be moved to the new sampling location following the procedures described in this section of the SM SAP

4.0 SAMPLE FREQUENCY

The SM SAP samples are to be collected semiannually in March and September of each respective year.

5.0 SAMPLE COLLECTION

Samples from each of the 25 monitoring locations shown on Figure 1 are to be collected using a disposable hand trowel or other tool capable of excavating a short distance into the soil/sediment. Each individual sampling location is to be prepared by laying out an area approximately one-half foot square on the soil/sediment surface and carefully removing vegetation, sticks, rocks or other debris to expose a clear sampling surface. At each individual sampling location, one sample is to be collected by removing the top inch of soil/sediment from the one-half foot square area, placing the soil/sediment into a separate stainless steel bowl, disposable foil pan, or ziplock bag, gently mixing the soil/sediment in the selected type of container to homogenize the sample, and

removing the homogenized soil/sediment from the container into clean glass sampling jars. A sample from each of the 25 sampling locations is to be submitted to the laboratory for PCB analysis.

Clean protective gloves must be worn during sample collection and must be replaced at each sample location. Care should be taken at all times when handling the samples. Each sample jar must be labeled with the sampling location, the time and date of the event, and the sampler's initials. If it is necessary to use non-disposable sampling equipment, the equipment will be decontaminated between sampling locations. In addition, one blind duplicate and one equipment blank for each piece of non-dedicated (if used) sampling equipment utilized in the sampling process (i.e. sample collection tools and homogenizing container) must be collected for each sampling event. The equipment blank must be collected by pouring clean de-ionized water over and/or into the decontaminated piece of equipment and collecting the rinsate in the appropriate jar for analysis. After collection, the samples must be stored in a clean cooler containing ice or ice packs. The coolers containing samples must be stored in a secure location, until being transported to the laboratory.

A sample collection log (Figure 2) must be filled out at each sampling location and any unusual conditions encountered must be noted. A chain of custody (COC) form must also be filled out for each sampling event. This COC must be filled out fully for each sample submitted for analysis and each person responsible for the handling of these samples must sign and date the form. When the samples are delivered to the laboratory and the lab has signed for their receipt, a copy of the COC must be retained on site in the Quality, Environment, Health and Safety (QEHS) Department records.

6.0 SAMPLE ANALYSIS

The samples from each of the 25 sampling locations will be analyzed for total PCBs where total PCBs equals the sum of the following PCB aroclors: PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254 and PCB-1260. The analytical method detection limit will be 0.1 mg/kg on a dry weight basis. Samples will be analyzed in accordance with USEPA SW-846 Method 8082. Samples will be analyzed within 40 days of collection to meet holding time requirements for the analytical method.

The laboratory quality control/quality assurance manual (QA/QC Manual) describing the required internal policies, guidelines and procedures of any WDI contract lab is contained in the Groundwater Sampling and Analysis Plan (GW SAP). WDI is to use this QA/QC Manual in evaluating the QA/QC standard operating procedures of any contract laboratory utilized for the purposes of this SM SAP and ensure that the laboratory employs generally acceptable practices that meet the specifications of the QA/QC Manual in the GW SAP.

7.0 DATA EVALUATION

The analytical data must be evaluated to determine whether there has been an apparent threshold level exceedance (ATLE). The applicable threshold level depends on whether the sample location is within Area A or Area B (see Figure 1). The threshold levels are defined as follows:

- Area A ATLE: Total PCBs (as defined in Section 6.0 of this SM SAP) at or above 0.75 mg/kg.

- Area B ATLE: Total PCBs (as defined in Section 6.0 of this SM SAP) at or above 0.1 mg/kg, the method detection limit for the PCB analyses.

8.0 RESPONSE ACTIONS

In the event of an ATLE, WDI must verbally notify the WHMD/MDEQ, Hazardous Waste Program Section staff immediately in accordance with the Environmental Monitoring Conditions of the Operating License and implement the procedures identified below to confirm the ATLE.

- Within 7 days of the ATLE, WDI must collect a verification sample at each soil sampling location for which an ATLE was reported. Each verification sample must be collected along the sides and bottom of the hole left by the prior sample. WDI must notify the WHMD/MDEQ prior to conducting verification sampling so that the WHMD/MDEQ can, if it chooses, split samples with WDI. .

If the ATLE is not confirmed by the additional sample analysis, WDI is to resume routine monitoring. If the ATLE is repeated upon analyzing the second sample a CTLE has occurred. In the event of a CTLE, WDI must notify the MDEQ in accordance with the Environmental Monitoring Conditions of the Operating License. Further, in the event of any CTLE, within 14 days of the CTLE, WDI is to collect the first phase of delineation samples to determine the extent of the areas exceeding the CTLE. Samples are to be collected and analyzed in accordance with the requirements in Sections 5.0 and 6.0. WDI must notify the WHMD/MDEQ prior to conducting delineation sampling so that the WHMD/MDEQ can, if it chooses, split samples with WDI.

Different approaches for locating delineation samples are required to be implemented depending on whether the CTLE has occurred:

- On top of closed landfills or other open areas.
- Along linear features such as drainage ditches or interior roads.

The approach for locating delineation samples for each of these scenarios is defined below. Before immediately and automatically implementing the defined delineation approach provided below, a visual evaluation of the area is to be completed to determine if there are features in the area that suggest a preferential pattern for the PCB exceedance (e.g. visible dust patterns, erosion gullies, vegetative cover or lack thereof, low areas, etc). If it is determined that a preferential deposition pattern is present, WDI must collect samples from those locations as appropriate. Dependent on the type and size of the feature, samples from preferential area(s) may be included as extra samples or as part of the grid sampling procedure discussed below if their locations allow. If the visual check shows no features suggesting that the PCB exceedance may be preferentially located, the following procedure is to be used to locate delineation samples.

For a CTLE on top of closed landfills or other open areas, a grid sampling strategy is to be employed as follows:

- A 100 by 100 foot grid, divided into 25 by 25 foot grid intervals, is to be centered over the CTLE location and sixteen soil samples are to be collected from the center of each 25 by 25 foot grid interval. Of the sixteen soil samples, the four step-out soil samples immediately adjacent to the CTLE location and the four corner soil samples from the 100

by 100 foot grid are to be analyzed for PCBs. The laboratory is to hold the remaining eight soil samples pending the results from the initial eight soil samples. Close communication with the laboratory will be required to insure that initial samples are analyzed quickly so that analysis of the additional samples for delineation, if necessary, can be completed without violating the holding time requirements of the PCB analytical method. WDI may voluntarily perform additional sampling within the bounds defined by the above procedure in order to refine the delineated boundary of the area exceeding the threshold limit defined in Section 7.0.

- If none of the eight initially analyzed soil samples contain PCBs above the threshold level defined in Section 7.0, the horizontal extent of the exceedance is considered to be the area inside the square drawn by connecting the four sample points immediately adjacent to the CTLE location.
- If any of the eight initially analyzed samples contain PCBs above the threshold level defined in Section 7.0, WDI is to do the following:
    - Contact the laboratory and request them to conduct PCB analysis on the soil samples that were collected and held for all locations that are contiguous to the PCB exceedance.
    - Within 14 days following WDI's determination that a PCB exceedance in a response soil sample has occurred, submit a work plan, based upon a grid or transect approach, to the WHMD/MDEQ for review and approval to identify the extent of the PCB contaminated area along with a schedule for completing the work.

For a CTLE along a linear feature, sampling is to occur as follows:

- For a CTLE in a drainage ditch, three samples are to be collected, one upstream and two downstream, at approximately 25 feet intervals, on each side of the CTLE (taking care to pick locations of sediment accumulation areas), assuming the linear feature extends the required length in each direction. If the linear feature does not extend the required length in either direction, sampling will occur at the largest possible interval before the end of the linear feature is encountered.
- For a CTLE along a roadway, two soil samples are to be collected by stepping out approximately 25 feet in both directions parallel to the roadway and two samples are to be collected from directly across the roadway if samples from the opposite side of the roadway area were not collected and analyzed as part of the original sampling.
- If none of the samples are above the threshold levels defined in Section 7.0, the extent of soil/sediments expected to exceed the remediation threshold of 1 ppm for Area A and .1 or the method detection limit for Area B, will be bounded by a 50-foot long area centered on the CTLE sampling location.
- If any of the samples are above the threshold levels defined in Section 7.0, WDI is to continue using the same approach, stepping out at 25 foot intervals (or the largest possible distance, whichever is less) in the direction of the linear feature to collect additional samples. This sample pattern is to be repeated until the first location is found that is below the applicable threshold level in Section 7.0 or until the linear feature terminates.

After the delineation phase has been completed by obtaining the delineation phase sampling results identifying the area of soil/sediments with CTLE(s), the analytical data will be evaluated

and WDI is to submit a plan to remove soils/sediments and to determine the source(s) or expected source(s) of the PCBs to the WHMD/MDEQ for review and approval. The plan is to be submitted to the WHMD/MDEQ within 14 days of completing the delineation phase. WDI shall remove at least the top six inches of soil/sediments (WDI may voluntarily remove more) of all soils at or above 1.0 mg/kg in Area A and at or above the method detection limit in Area B, perform verification sampling to confirm that the underlying soils/sediments are below the applicable threshold limit identified in Section 7, and the placement of clean soils to replace the excavated soils. The plan submitted to WHMD/MDEQ need only include a schedule to complete the excavation, fill and verification sampling described above; a drawing that shows the delineation sampling results, the limits of the soil to be removed, and the approximate locations of the verification samples; the source of the clean fill material, except if WDI will deviate from the removing 6 inches of soil in response to the CTLE, in such case WDI shall propose the corrective measure/remedy; and the steps to be taken to identify and control the source(s) of the PCBs. The verification sample locations are to be selected in accordance with the MDEQ Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.

9.0 REPORTING REQUIREMENTS

For semi-annual reports, the final data must be received from the laboratory, evaluated and transmitted to the WHMD/MDEQ within 60 days of sampling. The report is to include a narrative of the sampling event, a map showing the locations sampled, copies of the sampling logs, a tabular summary and discussion of the data, a discussion of field and laboratory QA/QC, a description of any ATLEs or CTLEs, any resampling conducted, and any additional actions taken and/or proposed as a result of the report findings.

If a CTLE occurs, the data associated with the delineation phase, collected in accordance with Section 8.0, is to be received from the laboratory, evaluated, and transmitted to the WHMD/MDEQ within 45 days of the final sampling. The report is to include a narrative of the delineation sampling, copies of the sampling logs, a summary and discussion of the data, a drawing showing the delineation boundary, a schedule to perform soil removal (or an alternate plan, with schedule, in the event WDI proposes a remedy other than soil removal) and the steps to be taken to identify and control the source(s) of the PCBs.

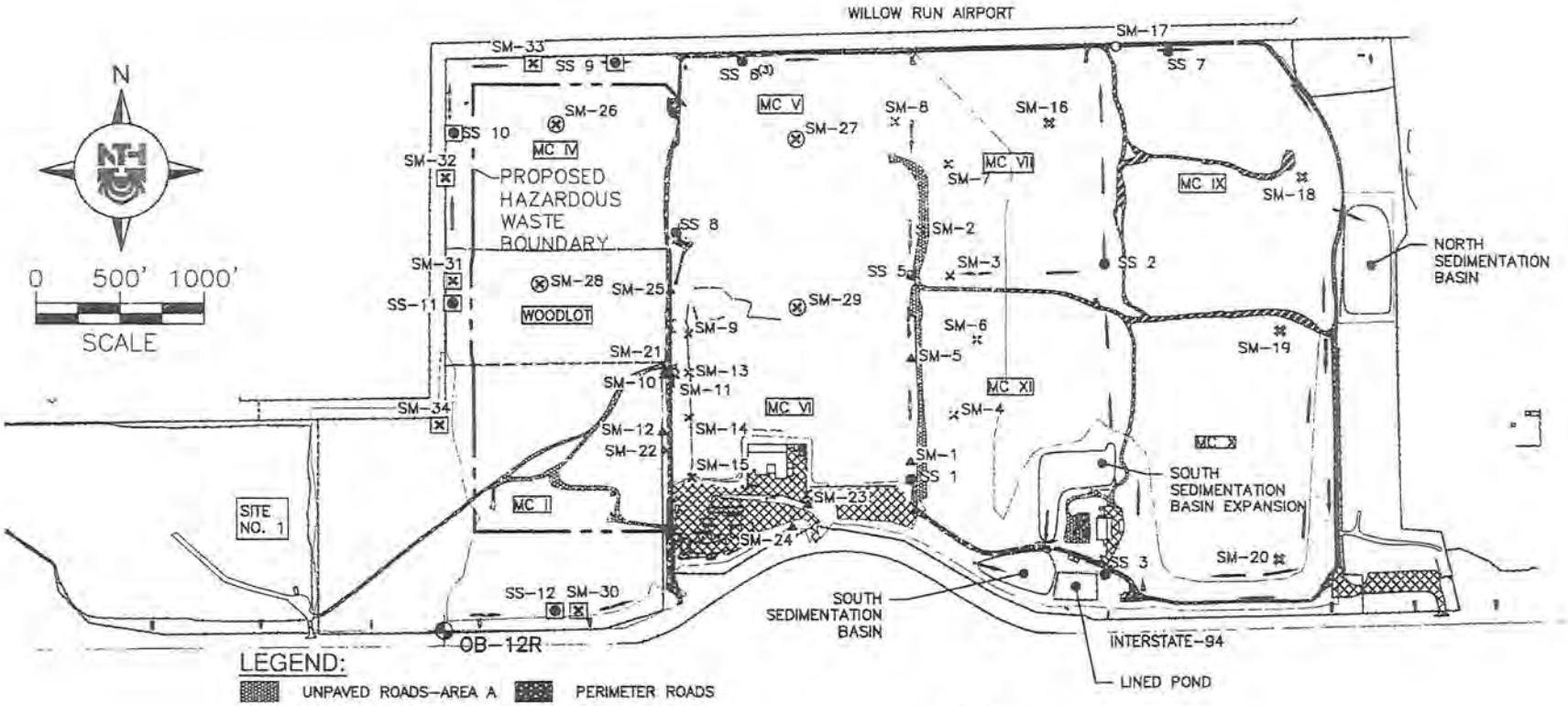
Verification sampling data, collected to confirm that all soil/sediments exceeding the applicable threshold level has been removed in accordance with Section 8.0 is to be received from the laboratory, evaluated, and transmitted to the WHMD/MDEQ within 45 days following completion of the final round of verification sampling. The report is to include a narrative of the verification sampling, locations of all verification samples, copies of the sampling logs, a summary and discussion of the data, a drawing showing the limits of the excavation and the locations of the verification samples.

An annual summary report of the monitoring results must be submitted to WHMD/MDEQ by March 1 of the following year. At a minimum, the annual report must contain a map showing all locations sampled, a tabular summary and discussion of the analytical data collected during the previous year, a description of any threshold limit exceedances (i.e. ATLE and/or CTLE), any delineation and source investigation sampling conducted as a result of a CTLE, and any response actions performed to eliminate the source. Additionally, WDI must evaluate the sampling

locations to determine whether the existing sample locations are adequate to effectively detect potential releases and prompt timely response activities.

10.0 RECORD KEEPING REQUIREMENTS

All analytical data and annual monitoring reports generated under this SM SAP must be stored on site within the QEHS filing system and be available to MDEQ staff for inspection.



LEGEND:

- UNPAVED ROADS–AREA A
- UNPAVED ROADS–AREA B
- PERIMETER ROADS
- PAVED SURFACES
- AREA A
- AREA B
- SS 1 — SURFACE WATER SAMPLING LOCATION
- SM 2 — SOIL SAMPLING LOCATION – AREA A
- SM 1 — SEDIMENT SAMPLING LOCATION – AREA A
- SM 16 — SOIL SAMPLING LOCATION – AREA B
- SM 17 — SEDIMENT SAMPLING LOCATION – AREA B
- SM 26 — SOIL SAMPLING LOCATION – POST CLOSURE
- SM 30 — SOIL SAMPLING LOCATION – POST MC VI F/G CONSTRUCTION
- SS 11 — SURFACE WATER SAMPLING LOCATION – POST MC VI F/G CONSTRUCTION
- DIRECTION OF INTERIM SURFACE WATER FLOW
- DIRECTION OF SURFACE WATER FLOW – POST MC VI F/G CONSTRUCTION

NOTES:

1. ROADWAYS ARE SHOWN FOR REFERENCE ONLY AND MAY NOT REPRESENT THE ACTUAL ROADWAY DIMENSIONS.
2. IN THE MC VI ACTIVE FILLING AREA, AS INTERIM OR FINAL COVER ARE ADDED IN ACCORDANCE WITH THE EFFECTIVE PART 111 OPERATING LICENSE, WDI WILL DIRECT NON–CONTACT STORM WATER TO AREA A. THE STORM WATER STRUCTURES ASSOCIATED WITH REDIRECTING THE STORM WATER WILL BE INSPECTED AND MAINTAINED BY WDI IN ACCORDANCE WITH THE LICENSE INSPECTION SCHEDULE APPROVED UNDER THE LICENSE.
3. ANY REVISIONS TO THIS DRAWING REQUIRE THE APPROVAL OF THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY WASTE AND HAZARDOUS MATERIALS DIVISION. APPROVED REVISIONS MUST BE ATTACHED TO THE FOLLOWING DOCUMENTS: SOIL MONITORING SAP, SURFACE WATER MONITORING SAP, TRACKOUT MANAGEMENT SOP, FUGITIVE DUST MANAGEMENT SOP.
4. THE NSB, SSB AND LINED POND THEMSELVES ARE NOT PART OF AREA A OR AREA B.
5. SS–4 WAS PREVIOUSLY REMOVED FOR CONSTRUCTION. SM–9 THROUGH SM–15, SM–21, SM–22, SM–25, AND SS–8 WILL BE REMOVED. SM–26 THROUGH SM–31 AND SS–9 AND SS–10 WILL REPLACE THE SAMPLING LOCATIONS THAT ARE REMOVED.

NTH PROJECT No.: 62080376	DESIGNED BY: KRO	CHECKED BY: DLP	DRAWING SCALE: AS SHOWN	NTH Consultants, Ltd. Infrastructure Engineering and Environmental Services	WAYNE DISPOSAL, INC. SITE NO. 2 -MC VI F & G	SURFACE WATER AND SOIL MONITORING LOCATION PLAN	FIGURE: 1
CAD FILE NAME: 080376–SLP	DRAWN BY: KRO	INCEPTION DATE: 02/16/09	PLOT DATE: 9/21/2011		VAN BUREN TWP., WAYNE COUNTY, MICHIGAN		

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Figure 2. Sample Collection Log for Soil Samples - WDI Site #2

Sample ID:	**Sample Date:**	**Sample Time:**
Sample Location:	**Sample Depth**	**Sampler:**
Soil Description/Comments*:		

Sample ID:	**Sample Date:**	**Sample Time:**
Sample Location:	**Sample Depth**	**Sampler:**
Soil Description/Comments*:		

Sample ID:	**Sample Date:**	**Sample Time:**
Sample Location:	**Sample Depth**	**Sampler:**
Soil Description/Comments*:		

Sample ID:	**Sample Date:**	**Sample Time:**
Sample Location:	**Sample Depth**	**Sampler:**
Soil Description/Comments*:		

* Note color and consistency and any sheen, odor or other relevant characteristics of the sample

Section 34. Closure Plan

CLOSURE PLAN

40 CFR 270.14b (13) & PART 111, R504(1)c

CLOSURE PLAN

40 CFR 270.14(b)(13)
Part 111 R504(1)c
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CLOSURE PLAN

40 CFR 270.14(b)(13)

I. INTRODUCTION

A. Facility Conditions

Originally Wayne Disposal, Inc. Site #2 was a 427 acre facility with approximately 360 acres available for co-disposal of both hazardous and non-hazardous waste via landfill.

Wayne Disposal Site#2 Landfill has set aside Master Cells (MC) V, VI and VII for hazardous waste disposal. The hazardous waste boundary which circumscribes MC V, VI and VII contains 120 acres of which 105.6 are actual disposal area. Since the Fall of 1982, the co-disposal of hazardous and non-hazardous waste has been discontinued, with the remaining capacity in MCs V, VI, and VII reserved for hazardous waste.

All hazardous waste cells have leachate collection and removal systems. MC V and MC VII have been closed with multilayer final cover systems. This closure plan was developed to describe closure activities for cells VI-AS through VI-E. Cells VI-F and VI-G, which have not been constructed, must be incorporated into this Plan incrementally as each phase is constructed and licensed. Updates to the closure plan must include an updated sampling plan based on the configuration of the landfill licensed at the time. The updated closure plan and closure cost estimate must be submitted to MDEQ along with the construction certification for each phase. Financial assurance must also be adjusted at this time.

The base of the existing portions of the disposal area, as licensed under Michigan Natural Resources and Environmental Protection Act, (Act 451) of 1994, consist of clay soils with an average permeability of less than 5×10^{-8} cm/sec, underlain in most areas by varying thickness of CL-ML or ML soil with permeabilities in the 10^{-6} to 10^{-7} range, followed by a water bearing sand formation.

B. Scope

This document is the Closure Plan for the cells of the Wayne Disposal, Inc. Site #2, Van Buren Township, Michigan, EPA facility ID number MID048090633. It is organized to address 40 CFR Subpart G: Closure and Post-closure, and 40 CFR 264.310: Closure and Post-closure Care for Landfills.

The plan describes activities related to construction of the cover system, decontamination of remaining facility areas and equipment, and long term monitoring, inspection and maintenance activities required during post-closure. The plan is intended to satisfy the requirements for closure of the cells in accordance with State and Federal regulations.

II. CLOSURE PERFORMANCE STANDARD (40 CFR 264.111)

The Closure Plan for the cells is designed to ensure that after closure, minimum maintenance and controls will be required. The plan is also designed to minimize or eliminate threats to human health and the environment by preventing release of hazardous waste or hazardous waste constituents into the ground, groundwater, surface water, or air.

III. CLOSURE PLAN ACTIVITIES (40 CFR 264.112 (b))

The Closure Plan for the cells requires that completed areas be finished with final cover, topsoil, and vegetative growth. The Closure Plan minimizes the need for further maintenance. This reduces the potential for contamination and allows a monitoring record to be established before

post-closure monitoring begins. The plan identifies the steps that will be necessary to close the cells at the facility.

IV. SITE PREPARATION (40 CFR 264.112 (b))

The cells to be closed will be prepared for clay capping by shaping and grading to meet the desired subgrade profile. The existing clay dike will be located before grading and shaping. The dike will serve as the baseline and starting point for constructing the clay cap. Surveyors will place corner stakes to mark the dike initially. All subsequent field stakes will be placed by Wayne Disposal, Inc. Site #2. Wayne Disposal, Inc. Site #2 will shape and grade an area capable of being capped with the FML foundation layer.

V. FINAL COVER (40 CFR 264.310 (a))

A. Purpose

The purposes for the final cover are (1) to provide long-term minimization of percolation from precipitation into the waste, (2) to function with a minimum level of maintenance, (3) to promote drainage while minimizing erosion, (4) to maintain integrity in the event of limited settlement of the waste surface, and (5) to achieve a permeability less than or equal to the bottom liner system or natural subsoils present.

B. Design Elements

The final cover system must consist of the following elements as approved by the Michigan Department of Environmental Quality (MDEQ), Waste and Hazardous Materials Division on June 4, 2004:

1. A leveling layer over the waste shall be installed per the Engineering Plans and Report on Basis of Design for Master Cell VI Cover Design Modification (11/20/02, with comment response of 4/27/04). This layer shall be installed above the surface of the waste consisting of a minimum of 12-inches of silt, clayey silt, or silty clay with a classification of ML, CL-ML, or CL as determined by ASTM Method D2487-83. This layer shall be installed in general accordance with section VI.A. of this plan;
2. A geosynthetic clay layer (GCL), placed directly over the leveling layer, consisting of a layer of sodium bentonite encapsulated between two geotextiles at least one of which shall be non-woven, and shall meet the requirements of Table 7.1 of the approved Engineering Plans and Report on Basis of Design for Master Cell VI Cover Design Modification. The lower and upper geotextiles should be either stitch bonded or needle punched together to provide stability. The manufacturers recommended overlap distance shall be marked on the GCL;
3. A 40-mil thick high density polyethylene (HDPE), very low density polyethylene (VLDPE), or linear low density polyethylene (LLDPE) flexible membrane liner (FML) installed per section VI C;
4. A double-bonded geocomposite drainage layer as specified in section VI D. of this plan;
5. A general soils layer, placed directly over the drainage blanket layer, consisting of a minimum of 30 inches of soil as described in section VI E. of this plan;
6. A layer of topsoil, placed directly over the compacted clay layer, consisting of a minimum of 6 inches of loamy sand as described in section VI F. of this plan;

7. A vegetative crop to be established per section VI G. of this plan.

C. Final Contours - Erosion Prevention (40 CFR 264.310 (b)(5))

The final contours of the constructed final cover will result in slopes between 4% and 25% and must conform to the topography for Master Cell VI as shown on Sheet 7 of the Engineering Plans for Design Modification, November 2002. Deviations from the elevations are permitted to the extent they are necessitated by complying with the thickness requirements stipulated for the clay liner, general soils and topsoil in sections VI B., VI E. and VI F. of this plan.

D. Gas Vents

At the time of closure Wayne Disposal, Inc. will develop a procedure to ensure that landfill cell(s) to be final capped will be evaluated to determine if a landfill gas collection system should be installed. Should the evaluation indicate that a landfill gas collection system is required; Wayne Disposal, Inc. will submit the evaluation and an updated landfill gas system design for MDEQ approval. However, if the evaluation indicates that the landfill gas collection system is not necessary the passive gas vents, as currently approved in the Design Modification, will be installed at the appropriate locations.

VI. CONSTRUCTION SPECIFICATIONS FOR FINAL COVER OF MASTER CELL VI

A. Construction of Intermediate Cover Layer

1. The layer upon which the geosynthetic clay liner is to be placed must consist of a minimum of 12-inches of compacted silt, clayey silt, or silty clay with an ASTM Method D2487-83 classification of ML, CL-ML or CL.

2. The CQAC or WDI will confirm the slope and correct elevations for the leveling layer surface by survey at a rate of at least once per half-acre over the entire master cell area. This survey, combined with a previous survey of top of waste elevations, will be used to confirm the thickness of the leveling layer and to determine if additional leveling osils are required. Alternatively, the required thickness of the leveling layer will be confirmed by soil borings conducted on a frequency of at least one per half-acre of final cover to be constructed. The thickness of the leveling layer shall not be less than one (1) foot.
3. The CQAC will confirm the classification of the leveling layer. A sample will be taken for every 25,000 cubic yards placed or change in borrow soil character and classified by the USCS (ASTM D2487). Additionally, the sample will be tested for gain size distribution by sieve analysis and hydrometer (ASTM D4222), and for Atterberg Limits (ASTM D4318). A test result not meeting those requirements will be reported immediately to the CQA officer.
4. The leveling layer will be smooth drum rolled in the presence of the CQAC to identify areas of excessive deflection and to prepare the surface for placmement of the GCL.

B. Installation of Geosynthetic Clay Liner (GCL)

1. The CQAC and the geosynthetics installer shall visually inspect the finished leveling layer surface and document unsuitable conditions such as soft or wet spots, large clay clods, and sharp rocks or other objects that could puncture or otherwise damage the GCL.
2. The geosynthetics installer shall supply and install the GCL in accordance with Section 7 of the approved CQA Plan.

C. Synthetic Liner

1. Introduction

The top of the geosynthetic clay liner (GCL) serves as the foundation for the synthetic liner and will be finished to the required elevations.

The synthetic liner will be a 40 mil (minimum) HDPE, VLDPE, or LLDPE.

The 40 mil (minimum) synthetic liner is placed upon the foundation materials. The individual sections of synthetic liner are welded together to form one continuous liner. During the installation of the synthetic liner, the seams will be tested with non-destructive methods.

2. Pre-Testing

Test seams shall be made on fragment pieces of geomembrane liner to verify that seaming conditions are adequate. Test seams shall also be made at the beginning of each seaming period, at the Inspector's discretion, and at least once each 4 hours, for each piece of seaming apparatus used that day.

The test seam sample shall be at least 2 feet long by 1 foot wide with the seam centered lengthwise. Two specimens 1 inch wide shall be cut from opposite ends of the test seam by the Contractor. These specimens shall be field tested by the contractor for shear and peel strength using a tensometer. If a test seam fails, the test shall be repeated in its entirety. If the additional test seam fails, the seaming apparatus or seamer shall not be accepted and shall not be used for seaming until

the deficiencies are corrected and two consecutive successful full test seams are achieved.

3. Non-Destructive Seam Testing

The Contractor shall non-destructively test all field seams over their full length using a vacuum test unit. Continuity of testing shall be done as the seaming work progresses, not at the completion of all field seaming.

a. Air Vacuum Testing Process Equipment

- A vacuum box assembly consisting of a rigid housing, a transparent viewing window, a soft neoprene gasket attached to the bottom, port hole or valve assembly, and a vacuum gauge.
- A steel vacuum tank and pump assembly equipped with a pressure controller and pipe connections.
- A rubber pressure/vacuum hose with fittings and connections.
- An air pressurized solution spraying apparatus.
- A soapy solution.

b. Air Vacuum Testing Procedure

- Energize the vacuum pump and reduce the tank pressure to approximately -5 psi (gauge pressure).
- Wet a strip of geomembrane approximately 12 inches by 96 inches with the soapy solution.
- Place the box over the wetted area and compress.
- Close the bleed valve and open the vacuum valve.

- Ensure that a leak tight seal is created between the FML and neoprene gasket.
- Examine the geomembrane through the viewing window for the presence of soap bubbles.
- If no bubble(s) appear after a leak tight seal is formed, close the vacuum valve and open the bleed valve, move the box over the next adjoining area with a minimum 3 inches overlap and repeat the process.
- All areas where soap bubbles appear shall be marked and repaired and then retested.

The following procedures shall apply to situations where seams cannot be non-destructively tested, as determined by the Inspector:

- All such seams shall be cap-stripped with the same geomembrane where possible.
- If the cap strip is accessible to testing equipment, the seam shall be non-destructively tested.
- If the cap strip seam is not accessible for testing, the seaming and cap-stripping operations shall be observed by the Inspector for uniformity and completeness.

4. Destructive Seam Testing

a. Location and Frequency

The Contractor shall conduct a minimum of one destructive test per 500 feet of seam length. The Contractor shall not be informed in advance of the locations where the seam samples will be taken.

b. Sampling Procedure

Samples shall be cut by the Contractor at times and locations designated by the Inspector as the seaming progresses in order to obtain test results prior to completion of liner installation. The Inspector must witness the procurement of all field test samples and the Contractor shall mark all samples with that location and sample number. The Contractor shall also record in written form the date, time, location, sample number, ambient temperature, number of seaming unit, name of seamer, welding apparatus temperatures and pressures, and pass or fail description, and attach a copy of each sample portion.

All holes in the geomembrane resulting from obtaining the seam samples shall be immediately repaired in accordance with repair procedures. The integrity of the new seams in the repaired area shall be tested.

c. Size and Disposition of Samples

The samples shall be 12 inches wide by 24 inches long with the seam centered lengthwise. The sample shall be cut into two equal length pieces, half to be retained by the Contractor and the other half to be given to the Owner's Representative for archive storage and/or independent testing

d. Field Testing

The Contractor shall cut five 1-inch wide replicate specimens from his sample and these shall be tested by the Contractor. The Contractor shall test the five

specimens from the seam sample for seam shear and peel, in accordance with the specified material tests and procedures. To be acceptable, four out of the five replicate test results must pass the material specification requirements. The results of these tests shall be provided to the Inspector by the conclusion of the second work day following the procurement of the field seam sample.

e. Independent Laboratory Testing

The Owner's Representative will require the Inspector to package and ship at least two seam samples received from the Installer to an independent laboratory for determination of seam shear and peel. Four of five specimens per sample must pass the material specifications requirements for the installation to be acceptable.

5. Procedures In The Event Of Destructive Test Failure

The following procedures shall apply whenever a sample fails the field destructive test. The Contractor shall have two options:

(a) The Installer can reconstruct the seam between the failed location and any passed test location.

(b) The Installer can retrace the welding path to an intermediate location (at 10 feet minimum from the location of the failed test) and take a small sample for an additional field test. If this additional sample passes the test, then the seam is reconstructed between that location and the original failed location. If this sample fails, then the process is repeated.

The Installer shall determine the length of seam failure to the satisfaction of the Inspector by additional tests or assume the seam is unacceptable between the two successful test locations, which bracket the test failure.

Over the length of seam failure, the Installer shall either cut out the old seam, reposition the panel and reseam or add a cap strip, as approved by the Inspector.

After reseaming or placement of the cap strip, one additional destructive test shall be taken within the reseamed area, and if test results are not acceptable, this process shall be repeated until the reseamed length is judged satisfactory by the Inspector.

In any case, all acceptable seams must be bounded by two passed test locations (i.e., the above procedures shall be followed in both directions from the original failed location), and one successful test must be obtained within the reconstructed area.

The Inspector shall document all actions taken in conjunction with destructive test failures.

Patches shall be round or oval in shape, made of the same geomembrane, and extend a minimum of 6 inches beyond the edge of defects.

Patches shall be applied using approved methods only. Small patches (less than 6 inches in least dimension) will require a cooling period after extruded welding half of the patch to prevent a burn through the liner before welding the second half of the patch.

6. Defects And Repairs

a. Identification

All seams and non-seam areas of the geomembrane shall be inspected by the Inspector for identification of defects, holes, blisters, undispersed raw materials and any sign of contamination by foreign matter. Because light reflected by the geomembrane helps detect defects, the surface of the geomembrane shall be clean at the time of inspection. The geomembrane surface shall be brushed, blown or washed by the Installer if the amount of dust or mud inhibits inspection.

b. Evaluation

Each suspect location in seam and non-seam areas shall be non-destructively tested. Each location which fails the non-destructive testing will be marked by the Contractor.

Where extrudate surface drifting occurs beyond 25 percent of the seam width, the affected seam length will be cap stripped as required by the Inspector. Reseaming over an existing seam will not be permitted, as it may be conducive to capillary leakage.

c. Repair Procedures

- Defective seams shall be restarted/re-seamed.
- Small holes shall be repaired by extrusion cap welding. If the hole is larger than ¼ inch, it must be patched.
- Blisters, larger holes, undispersed raw materials, and contamination by foreign matter shall be repaired by patches.

Surfaces of FML, which are to be patched, shall be abraded and cleaned no more than one hour prior to the repair.

7. Restart/Re-seaming Procedures

Restart of the extrusion welding process shall be achieved by grinding the existing seam and rewelding a new seam 2 inches from the termination of the previous seam and commencing at the start of grinding.

Re-seaming for the fusion welding process shall be achieved by cutting out the existing seam and welding in a replacement strip or if possible, cut the sheet next to the failed seam, move the panel over and seam with a single seam.

a. Verification of Repairs

Each repair shall be non-destructively tested using the methods described. Repairs which pass the non-destructive test shall be taken as an indication of an adequate repair. Failed tests shall indicate that the repair shall be redone and retested until a passing test results.

b. Record of the Results

Daily documentation of all non-destructive and destructive testing shall be provided to the Inspector by the Installer. This documentation shall identify all seams which initially failed the test and include evidence that these seams were repaired and retested successfully.

D. Construction of the FML Protection/Drainage Blanket Layer

1. The drainage layer must be a double-bonded geocomposite with a transmissivity of at least 1×10^{-5} m^2/sec when tested at a gradient of 25% under a normal load of 1,000 lbs/ft^2.
2. The perimeter drain pipe must consist of 4 inch diameter corrugated perforated pipe and 4 inch diameter non-perforated outlet pipe placed as shown in Sheet 13 of the Engineering Plans.
3. The perimeter drain pipe must be wrapped with geotextile filter material possessing an equivalent opening size of #70 standard sieve.
4. The double-bonded geocomposite comprising the layer must be placed on the FML in a manner that does not damage it or the drainage pipe system.
5. Initial double-bonded geocomposite placement must be done by placing the material at the toe of the lined slope and pushing the material up the side slope with appropriate equipment.

6. The full design thickness of the double-bonded geocomposite layer must be maintained when spreading the material and for any construction traffic on the layer.
7. Wayne Disposal, Inc. Site #2 must obtain direct layer thickness measurements at a rate of at least once per every half acre verify conformance with design requirements.

E. Construction of General Soil Layer

1. A layer of general soils a minimum of 30 inches in thickness must be placed over the granular material described in section VI D. of this plan.
2. General soils will consist primarily of inorganic soil constituents free of stumps, large roots, and other deleterious materials.
3. General soils shall not be compacted and shall be placed in such a manner as to cause minimum disturbance to the granular layer.
4. No frozen soil may be used in any lift, nor may any soil be placed on frozen base.
5. Wayne Disposal, Inc. Site #2 must obtain direct layer thickness measurements at a rate of at least once per every half-acre to verify conformance with design requirements.

F. Topsoil Specifications

- A layer of topsoil at least 6 inches thick after grading must be placed over the general soil layer described in section VI E of this plan.

- The topsoil must be a loamy sand, and confirmed by grain size analyses conducted according to ASTM Method D 422-63 at least once per 3,000 cubic yards to be placed.
- The top ½ inch of the topsoil layer must be loosely packed to provide an acceptable seed bed.
- Wayne Disposal, Inc. Site #2 must obtain direct measurements of topsoil thickness at the rate of at least once per half-acre to verify conformance with F1.

G. Vegetative Cover Specifications

1. The topsoil described in VI F. must be fertilized with 12-12-12 N-P-K at the rate which provides approximately 240 pounds per acre of total available nutrients, i.e. 80 pounds. per acre of available nitrogen, phosphoric acid, and potash, or an equivalent.
2. The following seed mix must be sown into the topsoil:

Seed	Percent by Weight
a. perennial rye	20 to 30
b. common creeping red fescue	20 to 30
c. common Kentucky bluegrass	5 to 10
d. Kentucky 31 tall fescue	100 to (a+b+c)

3. The seed mix must have a germination rate of at least 80%.
4. The seed mix must be applied at the rate of not less than 100 pounds per acre.
5. The seedbed must be rolled during or immediately after seed application unless a hydroseeding method is used to apply the seed.

6. Straw mulch/hay must be applied to the seedbed at the even rate of not less than 1.5 tons per acre in a manner that will minimize subsequent displacement by wind.

VII. FINAL COVER DESIGN BASIS (40 CFR 270.21(e))

The following is an evaluation of the proposed final cover to be used for the disposal cells in the hazardous waste management area at Wayne Disposal, Inc. Site #2. This evaluation is required under provision of 40 CFR 270.14(b)(13) and 270.21(e). Provisions relating to the cover requirements are included in 40 CFR 264.310(a). The proposed final cover is evaluated herein with respect to its ability to 1) provide long-term minimization of percolation into the landfilled waste, 2) function with a minimum of maintenance, 3) promote drainage while minimizing erosion, and 4) maintain integrity despite settlement of the landfilled waste surface. Additionally, 40 CFR 264.310 (a) requires that the cover possess a permeability less than or equal to the permeability of the leachate containment system at the base of the landfill.

A. Description of Design

The proposed cover system, exclusive of the vegetative cover, is presented in Sheet 10 (Liner and Final Cover System Details) of the Engineering Plans. The proposed cover consists of six elements. From the ground surface downward, these are 1) a minimum of 6 inches of topsoil, 2) a minimum of 30 inches of general soil, 3) a drainage layer consisting of a double-bonded geocomposite material, 4) a flexible membrane liner 40 mils in thickness, 5) a geosynthetic clay liner (GCL), and 6) a leveling layer consisting of at least 12-inches of compacted silt, clayey silt, or silty clay possessing a Unified Soil Classification of ML, CL-ML, or CL. The proposed

surface slopes will range generally from 4 to 15 percent. The proposed vegetative cover will include a mixture of rye, fescue and bluegrass.

Additionally, it is proposed that the drainage blanket layer placed above the flexible membrane liner will be drained at the master cell boundaries and at diversion berms located along the slope of the final cover. The geocomposite will daylight in the various diversion berms along the slope and that water will be conveyed to the associated spillway to the perimeter. The lowest slope section of geocomposite will daylight at the perimeter toe drain which will allow the water to be conveyed through the peastone to the perimeter surface water ditches. See Sheets 11 and 12 of the Engineering Plans.

B. <u>Function of System Components</u>

The function to be served by the topsoil is self evident. It will provide the medium for vegetative root establishment and nourishment. The vegetative cover which will be supported by the topsoil will be essential to minimize soil erosion. The general soils will provide protection for the deeper FML and will provide soil moisture storage for support of the vegetative cover. The geocomposite drainage blanket will serve to transmit water which has percolated through the general soil layer off the landfill cells into the surrounding surface drainage ditches. The FML will serve to interrupt downward percolating moisture so that the drainage blanket can transmit the moisture off the cell cover. The geosynthetic clay liner (GCL) beneath the FML will serve as a barrier layer to minimize percolation and serve as a compacted, stable bedding on which to place the FML. Lastly, the underlying fine-grained soil layer will provide a stable base for geosynthetics placement.

C. Minimization of Percolation (40 CFR 264.310(a)(1))

Percolation of precipitation into the landfill is minimized by three components of the proposed cover system. The general soil just beneath the topsoil will provide soil moisture storage for the vegetative cover. This general fill will therefore minimize the percolation of moisture into the drainage blanket beneath it. The FML which will lie beneath the drainage blanket will maximize runoff and serve to prevent the vertical migration of moisture which reaches the drainage blanket from above. Similarly, the geosynthetic clay liner will serve as an additional barrier to prevent the vertical migration of moisture. This system therefore combines the beneficial, low permeability aspects inherent in both the FML and the GCL.

Hence, the proposed cover system should provide for short and long term minimization of percolation. As will be discussed later, this conclusion is dependent upon proper installation and construction techniques, the establishment of the vegetative cover, and the diligent application of a long term inspection and maintenance program.

D. Maintenance (40 CFR 264.310 (a)(2))

The proposed system will require regular maintenance only insofar as the vegetative cover is concerned. Proposed maintenance of the vegetative cover will be performed to minimize the establishment of native, undesirable species such as deep rooted, woody plants. Other potential efforts might include occasional mowing, fertilization, or even reseeding if determined to be necessary as described below.

Maintenance efforts will generally be limited to careful, periodic inspections (condition surveys) and repair of any problems identified during these inspections. Proposed inspections will

specifically be directed toward the identification of: invasion by undesirable plant species; deterioration of the vegetative cover; areas of surface erosion; soft, or unstable areas of the cover; damage to the dikes; obstructions, erosion or deterioration of the surface drainage ditches; obstructions or damage to the discharge pipes for the drainage layer; burrowing by animals; or surface disturbance due to unwarranted vehicle traffic.

Detection of problems such as those presented above will require remedial efforts. The proposed remedial efforts will be undertaken to bring the cover back to the original designed condition insofar as possible.

E. <u>Drainage and Erosion</u> (40 CFR 264.310(a)(3))

Generally uniform slopes are planned for the proposed cover system. These slopes will range from approximately 4 percent to 25 percent. Slopes should be no less than 3 percent in order to minimize the impact of surface irregularities. The use of FML beneath the general soil and topsoil will promote runoff. Control and discharge of any runoff through ditches is described elsewhere in the permit application of which this report is a part.

Establishment and maintenance of a vegetative cover will serve to minimize erosion due to both runoff and wind. It is proposed that this vegetative cover will consist of a hardy grass mixture which will require a minimum of effort to maintain in full, thick growth on the entire cover surface. Deep rooted woody plants will not be used and their future establishment will be discouraged through a long term inspection and maintenance program. As previously discussed, placement of topsoil for the establishment of the vegetative cover is planned.

The universal soil loss equation has been applied to the proposed cover system. The analysis is presented in Appendix A of the Engineering Report on Basis of Design, MCVI Design Modification, March 2001. The analysis resulted in an estimate of soil erosion due to rainfall runoff of less than 2 tons per acre per year.

F. <u>Cover Integrity During Settlement</u> (40 CFR 264.310 (a)(4))

A large portion of the fill settlement will occur before cell closure. Nevertheless, the analysis attached herein provides an estimate that the maximum post-closure settlement of the final cover should be approximately 8 to 15 feet. This settlement will be greatest beneath the highest portions of the cover surface. Hence, some surface slopes may be reduced to approximately 3%. The cover will be inspected during the condition surveys discussed above to detect areas where the uniform surface grade may be disrupted, possibly impending surface drainage. Such a condition will be corrected by placing additional compacted clay fill (after stripping the topsoil) on the cover to restore the original grade insofar as necessary to reestablish proper drainage. Subsequent replacement of the topsoil and revegetation in the affected area will be undertaken.

The proposed cover system will have much more capability to maintain integrity during fill settlement than covers consisting of only compacted soil. This is because FML materials can withstand extensive elongation or strain (up to 700%) in comparison with soil materials. Nevertheless, it is intended that local differential settlements will be minimized by compaction during waste placement and prevention of major voids within the fill. It is anticipated that

recommendations by the FML manufacturer will be followed regarding the provisions for sufficient excess material (slack) during placement of the FML.

The proposed final cover system is expected to accommodate settling and subsidence in a manner such that cover integrity is maintained, as required by 40 CFR 264.310 (a)(4).

G. <u>Cover Permeability</u> (40 CFR 264.310 (a)(5))

The use of membrane for one component of the cover system, if constructed properly, effectively reduces the potential leakage through the cover to a negligible level. As stated previously, 40 CFR 264.310 (a) requires that the cover possess a permeability less than or equal to the permeability of the leachate containment system at the base of the landfill. Since a synthetic membrane is proposed for use in both cases, the permeability of each can be considered roughly equivalent, as suggested in 40 CFR 264 Preamble (47 FR 32314). Further, the effective "leakage" rate through any barrier is related to the hydraulic gradient. The drainage blanket above the cover membrane and the leachate collection system on the base liner should both effectively reduce hydraulic gradients through the membranes to a negligible level.

The use of a flexible, synthetic membrane as one component of the cover system, if manufactured and installed properly, should effectively reduce the potential leakage through the cover system to a negligible level. There is a scarcity of hydraulic conductivity data for synthetic membrane materials. Gas transmission rates (specifically water vapor transmission rates) through these membrane materials nevertheless suggest that such materials possess equivalent hydraulic conductivities 4 or more orders of magnitude less than that of compacted

clay soils. Therefore, polymeric membranes can be expected to be the controlling factors in liner or covers system permeability. Regardless of their hydraulic conductivities relative to each other, the polymeric membranes should effectively reduce the direct transmission of fluid through the cover and liner systems to a negligible level. Because of the low conductivity in these membranes, the prevention of membrane defects during manufacturing and installation is of relatively greater concern than direct fluid transmission through the polymeric materials. Hence, the quality control/assurance measures to be taken on this project will concentrate upon minimizing these defects.

H. <u>Freeze-Thaw Effects</u> (R299.9619(5)(a)(ii))

With regard to the potential depth of seasonal frost penetration and its effects upon the final cover, the proposed cover is expected to function as designed to provide long-term minimization of percolation with a minimum of maintenance. The expected depth of frost penetration in the region where the subject facility is located may be approximately 25 to 42 inches. The synthetic membrane and GCL layers in the cover system are both below this depth. Hence, neither will be directly subjected to seasonal frost.

The principal frost-heave effect which frost penetration may have upon a near-surface soil layer is through the formation of ice lenses. These lenses are caused by the tendency for capillarity to draw available moisture to the freezing front. Hence, ice lenses usually form parallel to this freezing front, i.e., horizontally. The direct effects of these lenses are generally horizontal zones of soil separation or increased porosity.

In order for these ice lenses to form, however, three conditions are necessary. These are a supply of moisture, freezing temperatures and a frost susceptible soil. With regard to the former, the moisture supply must generally be below the freezing front because moisture above this front will either be frozen and unavailable for capillary attraction or will be present because of thawing, i.e. freezing temperatures will not be present to create ice lenses.

The proposed cover system is designed with the purpose of eliminating the underlying supply of moisture available for ice lens formulation, thereby eliminating one of the fundamental, necessary conditions described above. As presented, the drainage blanket below the general soil layer will have more than sufficient capacity to transmit percolation off the cell in question. In addition, the geomembrane will serve as an effective barrier to upward moisture migration from the underlying soil and/or waste. Hence, the freezing front in the proposed final cover will be denied the moisture necessary for ice lens formation.

The proposed final cover which is expected to function as designed according to the requirements of 40 CFR 265.310 (a) and provide long-term minimization of percolation with a minimum of maintenance.

VIII. EQUIPMENT DECONTAMINATION (40 CFR 264.112 (a)(4))

All equipment used during the closure activity to install the leveling layer cover soils or other equipment that is in contact with hazardous waste will be thoroughly cleaned before being allowed to leave the facility. The cleaning will be conducted at the facility vehicle wash building using pressurized water. All equipment will be washed until visibly clean.

All wash water will be handled consistent with current wastewater discharge permits or transported to an appropriate hazardous waste treatment facility.

IX. DISPOSAL OR DECONTAMINATION OF EQUIPMENT, STRUCTURES, SOILS (40 CFR 264.114)

A. Access Road

This closure plan is intended to assess the impact that site operations may have had on the soils adjacent to the on-site haul/access roads. This plan is written to address the access roads currently utilized for waste operations. Should new access routes open to accommodate changes in operations, provisions in this plan must be expanded to include the new roads. These areas are not expected to be areas of significant contamination, as waste is only transported, not actively handled, on the road. Impact to soils around the access road would be limited to those caused by fugitive dust, small spills, etc. Metals and/or PCBs are the primary potential contaminants of concern. The sampling and data evaluation described in this plan will either be performed by Wayne Disposal, Inc. Site #2 staff or by a consultant retained by Wayne Disposal, Inc. Site #2. Analyses will be conducted by a qualified contract laboratory.

The first step in the closure of the access roads will be to wash the pavement to remove soil and dust. The transport road from the North I-94 Service Drive, through the reception area and to the Northwest corner of Master Cell VI will be thoroughly washed and swept with a wet vacuum sweeper. These paved roads will remain intact for post-closure activity access. The second step will be to sample soils adjacent to the paved

roads. The procedures used to sample, analyze and evaluate soil data are described below.

Sampling Locations - The sampling locations have been chosen to identify the chemical characteristics of the surface soils in the shoulders of the on-site haul/access roads. There is approximately 2000 feet of roadway from the entrance to the waste unloading area at the northeast corner of Master Cell VI. The total length of roadway will be divided in 10 segments of approximately 200 foot intervals. Out of each 200 foot segment, three soil samples will be collected from the shoulder of the roadway. At least one sample will be collected from each side of the roadway in each segment. On the side where one sample is collected, the sample will be collected in the approximate mid-point of segment. On the side where two samples are collected, the segment will be divided in half with one sample collected in each half of the segment. The proposed approximate sampling locations are shown on Figure 1.

Sampling Method - The upper 6 inches of the soil surface will be sampled using a small stainless steel trowel or shovel. Large stones (greater than 1 inch in diameter) and vegetative matter will be removed by hand at the time of sampling. The shovel will be carefully cleaned between each sampling location with a mild detergent followed by a distilled water rinse. All soil samples will be individually placed in specially prepared glass containers. These containers will be obtained from the laboratory and will remain unopened until used in the field. Each container will be marked with the sample number, date, and time immediately after receiving its sample. Each sample will be temporarily

stored in the field in an iced cooler until the sample can be placed into an on-site refrigerator. All collected samples will be stored in a secure location until transfer/transport to the laboratory. A Chain-of Custody form will be maintained for all samples obtained under the monitoring program. The form will, at a minimum, identify the sample number, sampling location, date, time, sampling individual, and amount/type of sample. A record of the sample handling and shipment, including the transfer of custody from one individual and organization to another, will also be maintained on the form. Signatures of each individual directly involved in the chain-of-custody will complete the form.

Sample Analysis - Each soil sample collected will be analyzed for the metals, Total PCB, volatile and semi-volatile organic parameters listed on Table 1. Analyses will be performed using the procedures outlined on Table 1. Target reporting limits are also listed on the table. If the laboratory is unable to meet the target detection limits, rationale must be provided to MDEQ. Results will be reported on a dry weight basis in units of mg/kg. The analyses will be conducted in accordance with standard laboratory QA/QC protocols.

Data Evaluation - The volatile, semi-volatile organics and metals data from each of the samples will be compared to the Part 201 Generic Cleanup Criteria (GCC) to determine if any standard has been exceeded. Data will be compared with residential or commercial & industrial risk-based clean-up standards or whatever standards are in use at the time of closure depending on which standards are appropriate for the future land use at the

facility. If the applicable Part 201GCC standard is exceeded for any metal, WDI can, at its discretion, demonstrate that the concentration is within the normal background concentration for soils at the site. If WDI elects to make this demonstration, a plan will be submitted to MDEQ that outlines the strategy for collecting and analyzing native background samples and for establishing a statistically valid range for background concentrations. If the concentrations are found to be within native background ranges, then no corrective action will be required. PCB analysis results will be compared to a non-detect standard and will be remediated to meet that standard at the time of landfill closure.

If the applicable standards for Volatile and semi-volatile compounds are exceeded and a site-specific background demonstration is either not successful or not possible, WDI will submit a plan to mitigate the contaminated area to MDEQ. The plan shall include a description of the apparent extent of the problem, a proposed remedy, and methods for demonstrating clean closure.

TABLE 1. SOIL MONITORING PARAMETERS

Parameter	Analytical Method	MDEQ Target Detection Limit (mg/kg)
Metals		
Arsenic	7061	0.5
Antimony	7041	N.A.
Barium	6010/6020	1.0
Cadmium	6010/6020	0.5
Cobalt	6010/6020	5.0
Chromium(total)	6010/6020	2.0
Copper	6010/6020	1.0
Iron	6010/6020	2.5
Lead	6010/6020	1.0
Mercury	7470	0.1
Molybdenum	6010/6020	5.0
Nickel	6010/6020	5.0
Selenium	7741	0.5
Silver	6010/6020	0.25
Thallium	6010/6020	N.A.
Vanadium	6010/6020	1.0
Zinc	6010/6020	1.0

Volatile Organic Parameters (analyzed by method 8260)

Parameter	TMDL	Parameter	TMDL
Acteone	0.05	1,2-Dichloropropane	0.005
Bromodichloromethane	0.005	1,3-Dichloropropane	N.A.
Bromoform	0.005	1,1,2,2-Tetrachloroethane	0.005
Carbon Tetrachloride	0.005	Tetrachloroethane	N.A.
Chlorobenzene	0.005	Tetrachloroethene	0.005
2-Chloroethylvinyl Ether	N.A.	1,1,2-Trichloroethane	0.005
Chloroform	0.005	1,1,1-Trichloroethane	0.005
Chloromethane	0.010	Trichloroethene	0.005
Dibromodifluoromethane	N.A.	Trichlorofluoromethane	0.010
1,2 Dichlorobenzene	0.005	Vinyl Chloride	0.010
1,3 Dichlorobenzene	0.005	Methylene Chloride	0.010
1,4 Dichlorobenzene	0.005	Methyl Ethyl Ketone	0.010
Dichlorodifluoromethane	0.010	Benzene	0.005
1,1-Dichloroethane	0.005	Ethylbenzene	0.005
1,2-Dichloroethane	0.005	Toluene	0.005
1,1-Dichloroethene	0.005	Xylenes	0.010
1,2-Dichloroethene	0.005		

Parameter	Analytical Method	MDEQ Target Detection Limit (mg/kg)
Total PCBs	8082	0.5

Semi-Volatile Organic Compounds (analyzed by method 8270)

Parameter	TMDL	Parameter	TMDL
Acenapthene	0.100	Hexachlorobenzene	0.100
Acenapthylene	0.100	Hexachlorobutadiene	0.200
Anthracene	0.100	Hexachlorocyclopentadiene	0.200
Benzidene	N.A.	Hexachloroethane	0.100
Benzo(a)anthracene	0.100	Indeno (1,2,3-cd) pyrene	0.500
Benzo(b)fluoranthene	0.200	Isophorone	0.100
Benzo(k)fluoranthene	0.200	2-Methylnapthalene	N.A.
Benzo(ghi)perylene	0.500	Napthalene	0.100
Benzoic Acid	N.A.	2-Nitroaniline	N.A.
Benzo(a)pyrene	0.200	3-Nitroaniline	N.A.
Benzyl alcohol	N.A.	4-Nitroaniline	N.A.
Bis (2-chloroethoxy) methane	0.200	Nitrobenzene	0.200
Bis (2-chloroethyl) ether	0.100	N-Nitrosodiphenylamine	0.500
Bis (2)chloroisopropyl) ether	0.100	N-Nitroso-di-n-propylamine	0.200
Bis (2-ethylhexyl) phthalate	0.200	Phenanathrene	0.100
4-Bromo phenyl ether	0.200	Pyrene	0.100
Butyl benzyl phthalate	0.100	1,2,4-Trichlorobenzene	0.200
4-Chloroaniline	N.A.	4-Chloro-3-methylphenol	N.A.
2-chloronapthene	0.200	2-Chlorophenol	N.A.
4-Chlorophenyl phenyl ether	0.100	2,4-Dichlorophenol	N.A.
Chrysene	0.100	2,4-Dimethylphenol	N.A.
Dibenz (a,h) anthracene	0.500	4,6-Dinitro-2-methylphenol	N.A.
Dibenzofuran	N.A.	2,4-Dinitrophenol	N.A.
Di-n-butyl phthalate	0.100	2-Methylphenol	N.A.
1,2-Dichlorobenzene	0.100	4-Methylphenol	N.A.
1,3-Dichlorobenzene	0.100	2-Nitrophenol	N.A.
1,4-Dichlorobenzene	0.100	4-Nitrophenol	N.A.
3,3'-Dichlorobenzene	N.A.	Pentachlorophenol	N.A.
Diethyl pthalate	0.100	Phenol	N.A.
Dimethyl pthalate	0.200	2,4,5-Trichlorophenol	N.A.
2,4-Dinitrotoluene	0.500	2,4,6-Trichlorophenol	N.A.
2,6-Dinitrotoluene	0.500		
Di-n-octyl phthalate	0.200		
Fluoranthene	0.100		
Fluorene	0.100		

Note: MDEQ target detection limits may not be attainable. At the time of closure; the analytical methods listed above, the detection limits, and provisions to use alternate detection limits must be negotiated with MDEQ based upon regulatory criteria in place at the time of closure. (N.A.) indicates no MDEQ target MDL for soils is available at this time.

B. <u>Vehicle Wheel Wash</u>

In the event that Michigan Disposal Waste Treatment Plant ceases operations at the same time or prior to final closure of the Wayne Disposal, Inc. Site #2, the wheel wash building will be spray washed until visibly clean. Wash water will be handled as stated in Section VIII above. Solids retained in the holding tank will be buried in the landfill. The structure and the cleaned equipment would remain on site pending a determination on its disposition.

After the wheel wash building has been spray washed until visibly clean, the building's holding tank and floor will be inspected at closure for cracks and other signs of deterioration. If there are visible impacts to the holding tank and/or floor that could potentially breach the containment of the building, then soil sampling shall be conducted. Soil sampling should be performed in accordance with current MDEQ guidance at the time of closure for VOCs, SVOCs, PCBs and metals similar to that provided in the discussion in Section IX.A of this closure plan. Field QA/QC procedures for these sample activities will be in accordance with the Soil Monitoring SAP previously approved by the MDEQ.

If Michigan Disposal Waste Treatment Plant continues hazardous waste activities after closure of the Wayne Disposal, Inc. Site #2 operation, cleaning of the wheel wash building and disposal of cleaning residues will be the responsibility of Michigan Disposal Waste Treatment Plant.

C. Lined Pond

In the event that Michigan Disposal Waste Treatment Plant ceases operations at the same time or prior to final closure of the Wayne Disposal, Inc. Site #2, the lined pond will be spray washed until visibly clean. Wash water will be handled as stated in Section VIII above. Solids retained in the lined pond will be buried in the landfill.

After the lined pond has been spray washed until visibly clean, the geosynthetic liner will be inspected for rips, tears, holes and other signs of deterioration. If there are visible impacts to the geosynthetics liner that could potentially breach the containment of the lined pond, then soil sampling shall be conducted. Soil sampling should be performed in accordance with current MDEQ guidance at the time of closure for VOCs, SVOCs, PCBs and metals similar to that provided in the discussion in Section IX.A of this closure plan

If Michigan Disposal Waste Treatment Plant continues hazardous waste activities after closure of the Wayne Disposal, Inc. Site #2 operation, cleaning of the lined pond

and disposal of cleaning residues will be the responsibility of Michigan Disposal Waste Treatment Plant.

D. Area A Soils

At the time of closure, WDI will make a final assessment of the level of metals and PCBs in the soil within Area A. Also, ten percent (10%) of the soil samples analyzed for the Area A characterization will be analyzed for the same expanded parameter list as along the roadway (metals, PCBs, VOCs, and SVOCs). Area A is a section of WDI defined in the WDI Soil and Sediment Sampling and Analysis Plan approved by the Waste and Hazardous Materials Division of the Michigan Department of Environmental Quality (WHMD/MDEQ). Area A includes, among other areas, the shoulder of the haul road leading to the WDI transfer station, and sediment in the on-site surface water ditches and storm sewers. The purpose of this final assessment is to determine if there are areas where analytical concentrations exceed applicable cleanup criteria. The cleanup criteria will be non-detect concentrations, or statutory equivalent at the time of closure.

The sample location plan will be prepared in accordance with the relevant guidance at the time of closure and in consideration of historical soil monitoring data collected in accordance with the Soil and Sediment Sampling and Analysis Plan, which may provide data from which to develop a biased sampling strategy.

On-site areas exceeding applicable cleanup criteria will be remediated by removing the top six inches of soil and disposing of the soil on site in a licensed landfill before the final cell is closed. After removal, the area will be sampled again to ensure applicable cleanup criteria are no longer exceeded. If analytical concentrations are found that exceed applicable cleanup criteria, another six inches will be removed and so on until analytical concentrations are verified below the applicable cleanup criteria. Then, clean soils will replace the soil that was removed and the clean backfill revegetated.

The following assumptions were made in preparing the cost estimate for sampling, analysis and remediation:

1. At the time of closure Area A will be 141 acres including the shoulder of the haul road leading to the WDI transfer station.
2. A biased sampling program will be developed resulting in an estimated 150 samples.
3. Assessment and Verification samples for Area A will be analyzed for PCBs and metals, with ten percent (10%) also being analyzed for VOCs and SVOCs.

   Remediation of Area A will consist of excavating one acre, six inches deep, 807 bank cubic yards – about 1,290 tons.

E. Waste Transfer Box Decommission

This closure plan is intended to assess the impact that site operations may have had on the soils adjacent to the on-site waste transfer box. This plan is written to address the waste transfer box utilized for waste operations in a position outside the limits of the hazardous waste landfill boundary. Should alternate waste transfer box positions open to accommodate

changes in operations, provisions in this plan must be expanded to include the new positions. Impact to soils around the waste transfer box positions would be limited to those caused by fugitive dust, small spills, etc. Metals, VOCs, SVOCs, and PCBs are the primary potential contaminants of concern. The sampling and data evaluation described in this plan will either be performed by Wayne Disposal, Inc. Site #2 staff or by a consultant retained by Wayne Disposal, Inc. Site #2. Analyses will be conducted by a qualified contract laboratory.

The first step in the closure of the waste transfer box will be demolition of the steel clad concrete walls and concrete floor of the receiving slab, and the demolition and removal of the tipping slab/access ramp. The soils, aggregate, and geosynthetics installed as part of the secondary containment structures for the receiving slab and access corridor between the waste transfer box and the landfill would be removed and disposed as part of the decommissioning of the waste transfer box. The secondary containment structure material will be cleaned of any visible liquids and the materials will be separated from the leachate collection system of Master Cell 6B at the anchor trench tie-in point. The remaining access pavement will be washed in a manner consistent with the wheel wash activities to remove soil and dust. The paved roads will remain intact for post-closure activity access. All demolition materials will be transported to the final active area of the hazardous waste landfill for disposal immediately prior to the landfill's final closure activities.

The second step will be to sample soils immediately adjacent to the paved surface and at a single point below the geomembrane of the secondary containment system. The procedures

used to sample, analyze and evaluate soil data are described below and are similar in nature to the above referenced process for the paved roadway surfaces.

Sampling Locations - The sampling locations have been chosen to identify the chemical characteristics of the surface soils in the immediate vicinity of the waste transfer box. There is approximately 20,000 square feet of roadway from the tipping slab ramp to the actual waste transfer and unloading area. The proposed sampling locations would be along the east side of the tipping slab ramp at a point halfway between the roadway grade break to the actual push wall of the waste transfer box and just off the pavement. A second sample would be collected from the soils beneath the receiving slab of the waste transfer box after removal of the secondary containment geomembrane. The sample location will be beneath the collection sump and any additional samples would be collected, as necessary, wherever a potential crack or other breach was identified by inspection of the containment structures (floor and walls). These samples would only require collection and analysis if contaminated liquids were detected within the receiving slab secondary monitoring sump during the useful life of the structure.

Sampling Method - The upper 6 inches of the soil surface will be sampled using a small stainless steel trowel or shovel. Large stones (greater than 1 inch in diameter) and vegetative matter will be removed by hand at the time of sampling. The shovel will be carefully cleaned between each sampling location with a mild detergent followed by a distilled water rinse. All soil samples will be individually placed in specially prepared glass containers. These containers will be obtained from the laboratory and will remain unopened until used in the

field. Each container will be marked with the sample number, date, and time immediately after receiving its sample. Each sample will be temporarily stored in the field in an iced cooler until the sample can be placed into an on-site refrigerator. All collected samples will be stored in a secure location until transfer/transport to the laboratory. A Chain-of Custody form will be maintained for all samples obtained under the monitoring program. The form will, at a minimum, identify the sample number, sampling location, date, time, sampling individual, and amount/type of sample. A record of the sample handling and shipment, including the transfer of custody from one individual and organization to another, will also be maintained on the form. Signatures of each individual directly involved in the chain-of-custody will complete the form. Field QA/QC procedures for these sample activities will be in accordance with the Soil Monitoring SAP previously approved by the MDEQ.

Sample Analysis - Each soil sample collected will be analyzed for the metals, the Total PCB, volatile and semi-volatile organic parameters listed on Table 1. Analyses will be performed using the procedures outlined on Table 1. Target reporting limits are also listed on the table. If the laboratory is unable to meet the target detection limits, rationale must be provided to MDEQ. Results will be reported on a dry weight basis in units of mg/kg. The analyses will be conducted in accordance with standard laboratory QA/QC protocols.

Data Evaluation - The volatile, semi-volatile organics and metals data from each of the samples will be compared to the Part 201 Generic Cleanup Criteria (GCC) to determine if any standard has been exceeded. Data will be compared with residential or commercial & industrial risk-based clean-up standards or whatever standards are in use at the time of

closure depending on which standards are appropriate for the future land use at the facility. If the applicable Part 201GCC standard is exceeded for any metal, WDI can, at its discretion, demonstrate that the concentration is within the normal background concentration for soils at the site. If WDI elects to make this demonstration, a plan will be submitted to MDEQ that outlines the strategy for collecting and analyzing native background samples and for establishing a statistically valid range for background concentrations. If the concentrations are found to be within native background ranges, then no corrective action will be required. PCB analysis results will be compared to a non-detect standard and will be remediated to meet that standard at the time of landfill closure.

If the applicable standards for Volatile and semi-volatile compounds are exceeded and a site-specific background demonstration is either not successful or not possible, WDI will submit a plan to mitigate the contaminated area to MDEQ. The plan shall include a description of the apparent extent of the problem, a proposed remedy, and methods for demonstrating clean closure.

X. MAXIMUM INVENTORY OF WASTES (40 CFR 264 112(b)(3))

Waste is not stockpiled at the facility for future disposal. Waste is brought to the facility only after construction of the cell in which it is to be disposed is completed. No storage or treatment occurs at the facility.

The total volume of waste that will be placed in the cells will vary according to the size of the cells. All wastes placed in the landfill are recorded in the operating log.

XI. GROUNDWATER MONITORING, RUN-OFF CONTROL (40 CFR 264.112(b)(5))

1. Groundwater monitoring, in accordance with the permit, outlined for the active facility life will be continued through partial and final closure activities.

2. Leachate collection systems will be monitored and maintained as required during the active life of the facility, including the closure period.

3. Control of run-on and run-off will be monitored and maintained as required during the active life of the facility, including the closure period.

XII. GAS VENTING SYSTEM (R299.9619(3)(c))

The gas venting system is designed to prevent the accumulation of gas generated in closed cells. Details of the gas venting system are shown on Sheet 10 of the Engineering Plans for Design Modification, November 2002. These details show that the installation does not effect the permeability of the final cover system. Gases, if generated, can be collected and discharged through this system. If required under Part 111, gas emissions will be monitored, collected and treated.

XIII. ESTIMATED DATES OF CLOSURE ACTIVITY (40 CFR 264.112 (b)(7))

H.W. Unit	Type of Closure	Anticipated Closure Date
MC V	Partial	Closed
MC VII	Partial	Closed

*Closure schedule may change depending on usage rate.

XIV. ANTICIPATED FINAL/PARTIAL CLOSURE SCHEDULE (40 CFR 264.112(b)(6))

Activity	Time Required
1. Receive of Final Volume of Hazardous Waste	N/A
2. Decontaminate Haul Road, Area A, and demolition of the Waste Transfer Box	45 Days
3. Survey Benchmarks	Concurrent with #2 above
4. Construct Intermediate Cover	30 Days
5. Install Gas Vent System	Concurrent with #4 above
6. Decontamination of Equipment	5 Days
7. Construct Leveling Layer and Install GCL	108 Days
8. Install FML	54 Days
9. Construct Drainage Layer	54 Days
10. Construct General Soils Layer	54 Days
11. Place Top Soil	54 Days
12. Apply Vegetative Cover	27 Days
13. Complete Fence-Barrier around Perimeter of Hazardous Waste Management Area	27 Days
14. Complete and Submit Closure Certification	108 Days
TOTAL TIME	**566 Days**

XV. EXTENSION FOR CLOSURE TIME (40 CFR 264.113 (b))

It is anticipated that partial/final closure activities will exceed 180 days due to the substantial size of Master Cell VI and the uncertainty of the seasonal date when the final volumes of hazardous waste are received and the impact of that date on the sequencing of

construction related closure activities. Therefore, the closure schedule assumes less than ideal conditions (see Section XIII). We therefore request an extension of the 180-day closure period. Steps necessary to prevent threats to human health and the environment from the unclosed but terminated hazardous waste management unit, including compliance with all applicable permit requirements, will be taken.

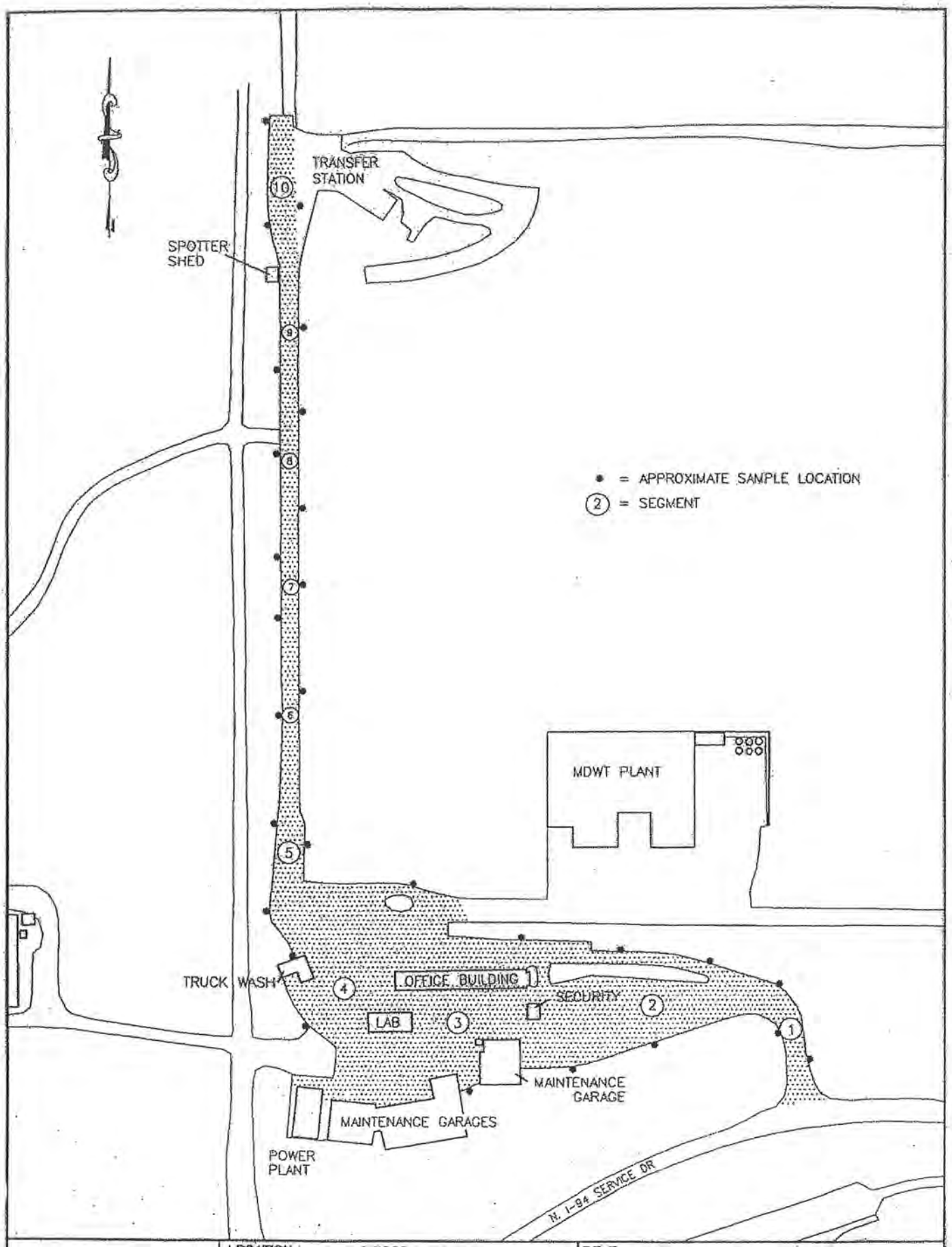
XVI. CERTIFICATION OF CLOSURE (40 CFR 264.115)

Within 60 days of the completion of final closure, certification will be submitted to the MDEQ Director by Wayne Disposal, Inc. Site #2 and an independent registered professional engineer that closure was completed in accordance with the specifications of this plan and Part 111 Rule 613 (3) and (4).

XVII. CLOSURE COST ESTIMATE (40 CFR 264.142, 264.112 (b)(2))

The closure cost estimate and associated information as presented is submitted in accordance with the requirements of 40 CFR 220.14 (b)(15), 264.142 and 264.143. These costs have been previously submitted and are updated each year using the Gross Nation Product (GNP) inflation factor and are presented in Section 39 "Financial Mechanism".

As identified in Section XIV, partial closure of Master Cell V and Master Cell VII is complete and final closure of Master Cell VI is expected in June 2015. Therefore the closure cost estimate includes the closure cost of MC VI, comprising 60.4 acres, and the final facility closure costs; i.e., haul road decontamination, Area A soil remediation, decommissioning of the Waste Transfer Box, and completion of hazardous boundary fencing, etc.



THE ENVIRONMENTAL QUALITY COMPANY	LOCATION: WAYNE DISPOSAL SITE NO. 2	TITLE: CLOSURE PLAN FIGURE 1
	SCALE: 1" = 200' DATE: 1/31/96 by J.C.D.	FILENAME: WDITSCA1

ORIGINAL

Section 35. Post-Closure Plan

POST-CLOSURE PLAN

40 CFR 264.117(a)(1), 40 CFR 270.14(b)(13)

PART 111, R504(1)c

POST-CLOSURE PLAN

40 CFR 264.117(a)(1), 40 CFR 270.14(b)(13)
PART 111, R504(1)c

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POST-CLOSURE PLAN

40 CFR 264.117, 40 CFR 270.14(b)(13), PART 111, R504(1)c

1.0 GENERAL INFORMATION

This Post-closure Plan is prepared pursuant to requirements under 40 CFR Part 264.117 and 40 CFR 270.14(b)(13). This plan addresses those activities necessary for the proper management of the facility during the 30-year post-closure period (40 CFR Part 264.117(a)(1)]. Should the post closure plan need to be revised, an amendment to the plan shall be requested according to the provisions of 40 CFR 264.118(d).

The primary areas of responsibility include monitoring, inspection, and maintenance activities and their frequencies. During post-closure, damaged or malfunctioning equipment or structures will be repaired or replaced as necessary to maintain the facility in proper condition.

Included in this Permit Application is the post-closure cost estimate, which details the expenses associated with the management and execution of the post-closure plan. In accordance with 40 CFR part 264.118(b)(3), the person to contact regarding Wayne Disposal Site #2 Landfill during the post-closure care period is:

David Lusk
Wayne Disposal, Inc.
Phone:(734) 329-8000
36255 Michigan Avenue
Wayne, MI 48184

In accordance with 40 CFR Part 264.120, no later than 60 days after the completion of the 30-year post-closure care period, Wayne Disposal Site #2 Landfill will submit to the MDEQ, by registered mail, a certification that the post-closure care activities were performed in accordance with this plan.

In accordance with 40 CFR Part 264.119(a), no later than 60 days after the certification of closure of each hazardous waste cell, WDI will submit to the MDEQ and Van Buren Township a record of the type, location, and quantity of hazardous waste disposed of within each cell.

2.0 INSPECTION ACTIVITIES AND FREQUENCIES

The post-closure inspections will be conducted using a grid system across the entire surface (final cover) of the landfill in order to discretize the area into specific regions. The approach will be conducted such that each master cell will be inspected and recorded on the Post Closure Inspection Checklist individually. The quarterly (1st & 3rd quarter) and the semi-annual (2nd quarter) inspections will be conducted on a quadrant grid system for each master cell. The annual inspection will be conducted on a 200 foot grid system (see attached Post-closure Inspection Grid Plan). Please refer to the attached Post-closure Inspection Report following this document for further information and inspection frequencies. When an identified problem is documented on the Post-Closure Inspection Report it shall be listed on the Maintenance Log Form. The purpose of this Maintenance Log Form is to track the items through completion of the repairs and to allow for a historical evaluation of any recurring items and locations.

The clay dikes and the perimeter dewatering tile system will be inspected for any surface evidence of deterioration or damage during each of the quarterly (1st and 3rd quarters), the semi-annual (2nd quarter), and the annual inspections. The two discharge points for the dewatering system will also be observed during each of these inspections to confirm that free-flowing conditions exist at the outlets. During each annual inspection, the manholes along the dewatering tile will be opened and the interiors inspected from the ground surface for evidence of deterioration, damage or tile blockage.

3.0 MAINTENANCE ACTIVITIES

In accordance with 40 CFR Part 264.118(b)(2) and 40 CFR Part 265.310(b), the following maintenance activities have been identified.

Security System

Signs will be replaced as they become illegible or if lost due to vandalism. In the event of fence or gate damage, those sections affecting site security will be repaired or replaced immediately.

Final Cover System

Periodic inspections are performed (refer to Subsection 2 of this Plan) to determine if and when additional maintenance is needed. Inspections of the final cover are specifically directed toward the identification of the following:

- Invasion of undesirable plant species
- Deterioration of vegetative cover
- Areas of surface erosion

- Soft or unstable areas of the cover
- Damage to the dikes
- Obstructions, erosion, or deterioration of the surface water drainage ditches
- Obstructions or damage to the discharge pipes for the drainage layer
- Burrowing by animals
- Surface disturbance due to unwarranted vehicle traffic

Detection of problems such as those presented above requires remedial efforts. The remedial efforts, including fertilizing and reseeding, are undertaken to bring the cover back to the original designed condition, as necessary. Documentation of these inspections is provided as shown in the Post-Closure Inspection Form following this document.

Erosion washouts will be repaired as soon as possible after detection. When cap integrity is in question, repair activities will begin immediately. Restoration of the vegetative cover will be performed during or at the end of the growing season.

In the event of localized subsidence that results in the ponding of surface water, repairs will involve building up the subsided area with soil to provide adequate surface water run-off. Based upon recommendations by the MDEQ; areas of localized subsidence must be evaluated prior to automatic application of surface soils to restore surface drainage. For relatively small areas of localized subsidence (i.e. no greater than 50 feet laterally and/or no greater than 12 inches vertically) soils may be added without notification to the MDEQ. However, larger areas must be

evaluated and/or investigated, and shall require submittal of a Work Plan for WHMD approval prior to initiation of maintenance activities.

The vegetative cover is mowed to promote vegetative growth and surface water drainage, and to help improve the site's aesthetics. Vegetative cover that is lost or destroyed due to weathering is replaced in order to control erosion.

The maintenance of the vegetative cover also includes the elimination of undesirable trees or brush growth over the capped areas when apparent. Burrowing animals will be removed or exterminated immediately after being identified. In accordance with 40 CFR Part 264.310(a)(2), the Wayne Disposal Site #2 Landfill final cover functions with a minimum of maintenance.

Clay Dikes & Perimeter Dewatering Tile System

Periodic inspections of the clay dikes and the alignment of the perimeter dewatering tile systems are specifically directed toward the identification of the following:

- Deterioration of vegetative cover over the dikes
- Invasion of the dikes by deep-rooted, woody vegetation species
- Areas of dike surface erosion
- Soft or unstable conditions on dikes or along the tile system alignment
- Disturbance or damage to dikes or tile system manholes
- Blockage of the dewatering tile system outlets
- Excess fluid levels or non-flowing conditions in the dewatering tile system manholes

Vegetative deterioration or surface erosion on the clay dikes will be restored as soon as possible after detection. Vegetation restoration will be performed during or at the end of the growing season. When dike integrity is in question, repair activities will begin immediately.

Blockage at either outlet of the dewatering tile system will be cleared immediately after detection. Damage or disturbance of the concrete manholes on the dewatering tile system will be repaired as soon as possible after detection. Fluid levels in the concrete manholes which indicate partial or full blockage of the dewatering tile system will require jetting or cleaning of the blocked portion of the system as soon as possible after detection. Any surface evidence of collapse in the dewatering tile system will require investigation by sewer camera, open excavation, or other means. If partial or complete collapse has occurred, the affected portion of the system will be repaired and/or replaced as soon as possible after detection.

Leachate Collection System

The primary anticipated maintenance concerns will be pump operations. Should damage or failure occur to this system, repair or replacement of the defective equipment will be performed promptly.

The leachate collection piping will also be maintained by jetting or cleaning out the pipes interior as necessary.

Leak Detection, Collection, and Removal System

The primary anticipated maintenance concerns will be pump operations. Should damage or failure occur to this system, repair or replacement of the defective equipment will be performed promptly. Damaged surface pipes will also be repaired.

Drainage Structures

Ditches that have been damaged due to erosion will be properly repaired. Sediment buildup will be removed where necessary to allow free gravity drainage to the sedimentation basin. Removal of sediment buildup in the sedimentation basins will also be performed as needed to maintain adequate capacity for design flow conditions. The edge drain system may require occasional maintenance via sump clean-out & power-jetting to assure flow & reduce the hydraulic head against perimeter dikes to less than 5 feet of head.

Gas Venting System

Damaged gas venting risers will be repaired or replaced promptly after notification of needed repair. Dislodged gas venting risers will be reset.

Monitoring Wells

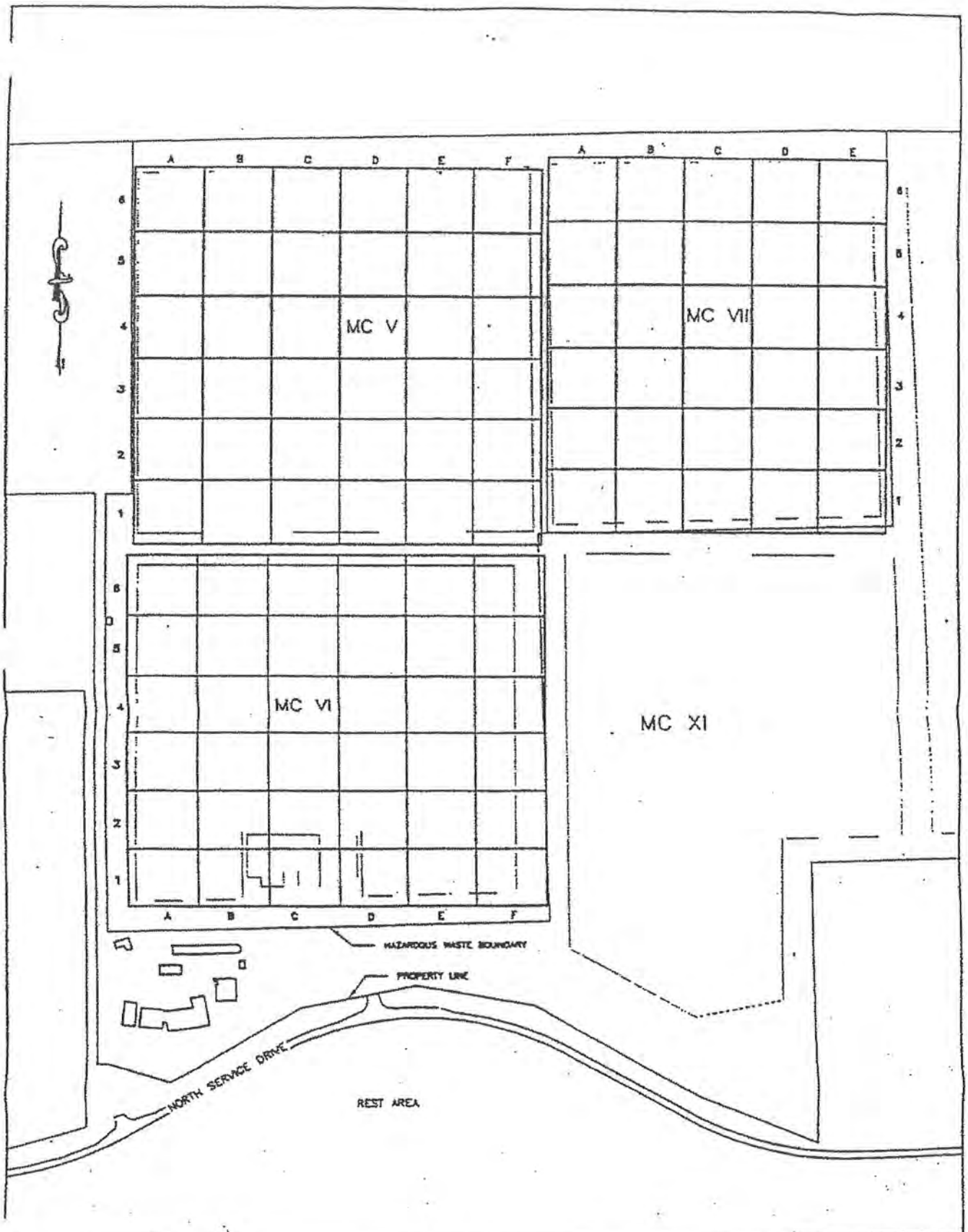
The primary anticipated maintenance concerns will be pump operation, security, and casing integrity. Should damage occur to the pumps, they will be repaired or replaced promptly. If damage is done to the locking system or the well casing, it will also be repaired.

Benchmarks

Should the benchmarks be removed or dislodged entirely, they will be reset or re-established at the original location and elevation.

4.0 MONITORING ACTIVITIES

In accordance with 40 CFR Part 264.310(b)(2). during the post-closure care period, the leachate collection and removal system will continue to be operated until leachate is no longer detected. In accordance with 40 CFR Part 264.310(b)(3), the groundwater monitoring system will be maintained and monitored throughout the post-closure period. The leak detection systems will also be maintained and monitored throughout the post-closure period. Refer to the environmental monitoring sections contained within this Permit Application for additional information regarding monitoring.



INTERSTATE – 94

MC VI SW GRID CORNER 5275N 5100E (200x225)
MC V SW GRID CORNER 7510N 5120E (215x220)
MC VII SW GRID CORNER 7550N 6460E (215x230)

WAYNE DISPOSAL SITE NO. 2
POST CLOSURE INSPECTION GRID PLAN

J*

FCLSR96

36: NOTICES FILED
FOR HW UNITS CLOSED

Section 36. Notices Filed for Closed Units

NOTICES FILED FOR HAZARDOUS WASTE UNITS CLOSED

40 CFR 270.14b

AND

NREPA 451, PART 111 R504(1)c

NOTICE IN DEED TO PROPERTY

For hazardous waste disposal units which have been closed, it is required that notices be filed under 40 CFR 264.119 - "Post-Closure Notices". Such notices must be submitted to the local zoning or land use authority and to MDEQ within 60 days after certification of closure of each hazardous waste disposal unit. At such time as the hazardous waste units at this facility are closed, this requirement will be followed.

Copies of the Site #2 Restrictive Covenant and Notice in Deed already in effect are attached. In accordance with State law, the notation on the deed to the facility property - which is normally examined during title search, will in perpetuity notify any potential purchaser of the property that the land has been used to manage hazardous wastes and its use is restricted under 40 CFR Subpart G regulations.

Op. Lic. File

NATURAL RESOURCES COMMISSION
THOMAS J. ANDERSON
MARLENE J. FLUHARTY
GORDON E. GUYER
KERRY KAMMER
ELLWOOD A. MATTSON
O. STEWART MYERS
RAYMOND POUPORE

STATE OF MICHIGAN

JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING
P.O. BOX 30028
LANSING, MI 48909

DAVID F. HALES, Director

February 13, 1990

Mr. Ernest Turpel
Wayne County Register of Deeds
400 Monroe, 6th Floor
Detroit, Michigan 48826

Dear Mr. Turpel:

SUBJECT: Restrictive Covenant for the Wayne Disposal Hazardous Waste Landfill

Pursuant to Michigan's Hazardous Waste Management Act, 1978 Public Act 64, as amended, enclosed is a restrictive covenant to be attached to the deed for the parcel of land owned by Ford Motor Company as described in Attachment A of the covenant and operated by Wayne Disposal, Inc. Also enclosed is a check for $24.00 to cover the cost of filing.

If you have any questions, please contact me.

Sincerely,

Peter Quackenbush

Peter Quackenbush, Engineer
Hazardous Waste Permits Section
Waste Management Division
517-373-7397

R1026
3/89

IMPREST CASH FUND
DEPARTMENT OF NATURAL RESOURCES
P. O. BOX 30028
LANSING, MICHIGAN 48909

TO THE TREASURER
STATE OF MICHIGAN
LANSING, MICHIGAN 48901

05706

2/7/90

PAY TO THE ORDER OF Wayne Co. Register of Deeds $ ******24.00

Twenty-Four and 00/100********** DOLLARS

Wayne Co. Register of Deeds
Earnest Turpel
400 Monroe
Detroit, MI 48226

MEMO 1

⑈005706⑈ ⑆072400706⑆ 75⑈229⑈1⑈

R1566-1

RESTRICTIVE COVENANTS RUNNING WITH THE LAND

FORD MOTOR COMPANY, ("Ford"), a Delaware corporation, is located at The American Road, Dearborn, MI 48121-1899. Ford is the record owner of land located in Van Buren Township, Wayne County, Michigan, described in Exhibit A attached ("the land").

WAYNE DISPOSAL, INC., ("Wayne"), a Michigan corporation, is located at 1349 Huron St., Ypsilanti, MI 48197. Wayne applied for and received a license under provisions of 1979 P.A. 64, MCLA 299.503 eq seq, as amended ("Act 64") to operate a hazardous waste facility ("Disposal Facility") located at the land. This license authorized disposal of hazardous waste at the Disposal Facility on the land pursuant to all of the terms of that license and Michigan law, including, but not limited to, Act 64. The land and the Disposal Facility are herein referred to as the "Property". The following restrictive covenants are executed by Ford as the sole owner of the land and by Wayne as the owner and operator of the Disposal Facility pursuant to Section 39 of Act 64 to ensure the care, maintenance, monitoring and long-term integrity of the Property for the protection of the health, safety and welfare of the people of the State of Michigan and the natural resources and the environment of the State of Michigan.

1. The Property has been used to manage hazardous wastes.

2. The Property has been used as a landfill for hazardous waste disposal.

3. Use of the Property, including use of the land and/or the Disposal Facility, shall not disturb the final cover, liners, components of any containment system, or the function of the monitoring systems on or in the Property.

4. No one, including Ford, Wayne, any purchaser of the record owner of the land or Disposal Facility, any purchaser of the land or Disposal Facility, or any of their agents, employees, heirs, successors, lessees, or assignees, shall engage in any development, including any filling, grading, excavating, building, drilling or mining on the Property following completion of the landfill closure without obtaining prior written authorization from the Director of the Department of Natural Resources.

5. The survey plat and records of the types, locations and quantities of hazardous wastes on or in the Property have been filed by Wayne with the local zoning or land use authority as required by Act 64 and its rules.

RECEIVED

JAN [illegible]

Waste Management

6. Ownership of all or a portion of the land or Disposal Facility shall not be conveyed without the owner of the land or Disposal Facility sending prior written notice to the prospective purchaser(s) of the existence of these restrictive covenants. Such notice shall state:

   (1) that there are restrictive covenants on the Property;

   (2) that development on the Property is prohibited without prior written authorization from the Director of the Department of Natural Resources;

   (3) that the prospective purchaser(s) must comply with the restrictive covenants, Act 64 and rules promulgated under Act 64; and

   (4) that the prospective purchaser(s) cannot interfere with the containment or monitoring systems on or in the Property.

Such notice shall include a copy of these restrictive covenants and shall be sent to the prospective purchaser(s) by certified mail with a copy sent to the Director of the Department of Natural Resources.

These restrictions may be enforced in law or in equity in a court of competent jurisdiction. Such action(s) may be taken against anyone, including any person, corporation, partnership, agent, successor, assignee, heir, employee or lessee, who violates or threatens to violate any of these restrictive covenants.

These restrictive covenants shall run with the land in perpetuity and shall be binding upon Ford, Wayne, any purchaser of the record owner of the land or Disposal Facility, any purchaser of the land or Disposal Facility, or any of their agents, employees, heirs, successors, lessees, or assignees.

Signed in presence of:

FORD MOTOR COMPANY

(witness name)

By: _____

J. M. Rintamaki
Assistant Secretary

Linda G. Donovan
(witness name)

Its: _____

STATE OF MICHIGAN)
) SS:
COUNTY OF WAYNE)

The foregoing instrument was acknowledged before me this _____ day of JAN 2 1990, 19 ____, by J. M. RINTAMAKI, of FORD MOTOR COMPANY, a Delaware corporation, on behalf of the corporation.

Marilyn F. Faulkner
Notary Public

_____ County, Michigan
My commission expires _____.

MARILYN F. FAULKNER
Notary Public, Wayne County, Michigan
My Commission Expires December 11, 1990

DATE: 4/20/87
REVISION # 4

270.14 (b) (14)

NOTICE IN DEED TO PROPERTY

In response to 270.14 (b) (14), attached herein is a copy of WDI's, Site #2, MID048090633, hazardous waste notice in the property deed, entitled "RESTRICTIVE COVENANT".

This document was executed and submitted to the Michigan Department of Natural Resources on August 14, 1981, in response to licensing requirements under Act 64, PA of 1979, 299.539, Section 39 and R299.6503, Rule 503 (1) (i).

ACT 64

299.539 Condition of obtaining operating license for disposal facility; condition of obtaining operating license for landfill.

Sec. 39. (1) As a condition of obtaining an operating license for a disposal facility pursuant to section 22, the applicant shall demonstrate to the director that the owner of the property has recorded on the deed to the property or some other document which is normally examined during a title search a notice that will notify in perpetuity any potential purchaser of the following:

(a) That the property has been used to manage hazardous wastes.

(b) That the use of the land should not disturb the final cover, liners, components of any containment system, or the function of the monitoring systems on or in the property.

(c) That the survey plat and records of type, location, and quantity of hazardous wastes on or in the property have been filed with the local zoning or land use authority as required by the rules promulgated under this act.

(2) As a condition of obtaining an operating license for a landfill pursuant to section 22, the applicant shall demonstrate to the director that an instrument imposing a restrictive covenant upon the land involved has been executed by all of the owners of the tract of land upon which the landfill is to be located. The instrument imposing the restrictive covenant shall be filed for record by the department in the office of the register of deeds in the county in which the disposal facility is located. The covenant shall state that the land has been or may be used as a landfill for disposal of hazardous waste and that neither the property owners, agents, or employees, nor any of their heirs, successors, lessees, or assignees shall engage in filling, grading, excavating, building, drilling, or mining on the property following completion of the landfill without authorization of the director. In giving authorization, the director shall consider, at a minimum, the original design, type of operation, hazardous waste deposited, and the state of decomposition of the fill. Before authorizing any activity that would disturb the integrity of the final cover of a landfill, the director must find either that the disturbance of the final cover is necessary to the proposed use of the property and will not increase the potential hazard to human health or the environment or that disturbance of the final cover is necessary to reduce a threat to human health or the environment.

History: New 1979, Act 64, Eff. Jan. 1, 1980.—Am. 1982, Act 456, Eff. Mar. 30, 1983.

Accordingly, as required under Section 39, the Restrictive Covenant was executed by the MDNR Director and filed with the Wayne County Register of Deeds.

DATE: 4/8/82
REVISION # 4

RESTRICTIVE COVENANT

THIS RESTRICTIVE COVENANT made as of the 13th day of August, 1981, by and among, Ford Motor Company (Ford) whose address is The American Road, Dearborn, Michigan 48121, Wayne Disposal, Inc. (Wayne) whose address is P. O. Box 5187, Dearborn, Michigan 48128, and Howard A. Tanner, (Director) Director of the Michigan Department of Natural Resources for and on behalf of the State of Michigan, whose address is DNR Executive Division, 7th Floor Mason Bldg., Lansing, Michigan, 48909.

WITNESSETH THAT:

WHEREAS, Wayne has applied or will apply for licensure under provisions of 1979 PA 64, MCLA 299.501 et seq, for the purpose of conducting, managing, maintaining or operating a disposal area upon land situated in the Township of Van Buren, County of Wayne, more particularly described on the Exhibit A attached hereto; and

WHEREAS, 1979 PA 64, supra, Section 39 requires that before operation of a landfill, an instrument which imposes a restrictive covenant upon the land involved shall be executed by all the owners of the tract of land upon which the landfill is located and the Director.

NOW THEREFORE, Ford and Wayne do for themselves, their heirs, successors, lessees, or assigns declare, covenant and agree that the land hereinbefore described has been or will hereafter be used as a landfill for disposal of hazardous waste, and that neither Ford, Wayne nor their servants, agents, employees, nor any of the heirs, successors, lessees or assignees shall engage in filling, grading, excavating, building, drilling or mining on the property following completion of the landfill without authorization of the

DATE: 4/20/87
REVISION # 4

Signed in presence of:

Virginia Garrity
* Virginia Garrity

Michael J. O'Reilly
* Michael J. O'Reilly

Signed

FORD MOTOR COMPANY - OWNER

By SIDNEY KELLY

Its ~~Assistant~~ Secretary

Signed in presence of:

Jerome S. Amber
* Jerome S. Amber

George Anderson
* George Anderson

WAYNE DISPOSAL, INC. - LICENSEE

By Michael J. Ferrantino
Michael J. Ferrantino

Its President

Signed in presence of:

*

*

STATE OF MICHIGAN

By
Howard A. Tanner

Its Director of the Department of Natural Resources for the State of Michigan

STATE OF MICHIGAN)
) ss
COUNTY OF WAYNE)

The foregoing instrument was acknowledged before me this 13th day of August, 1981 by Sidney Kelly, an ~~Assistant~~ Secretary of Ford Motor Company, a Delaware corporation, on behalf of the corporation.

Sandra G. Adams

STATE OF MICHIGAN)
) ss
COUNTY OF INGHAM)

The foregoing instrument was acknowledged before me on this ____ day of _____, 1981, by Howard A. Tanner, Director of the Department of Natural Resources, on behalf of the State of Michigan.

_____
*Notary Public

Ingham County, Michigan
My Commission Expires _____

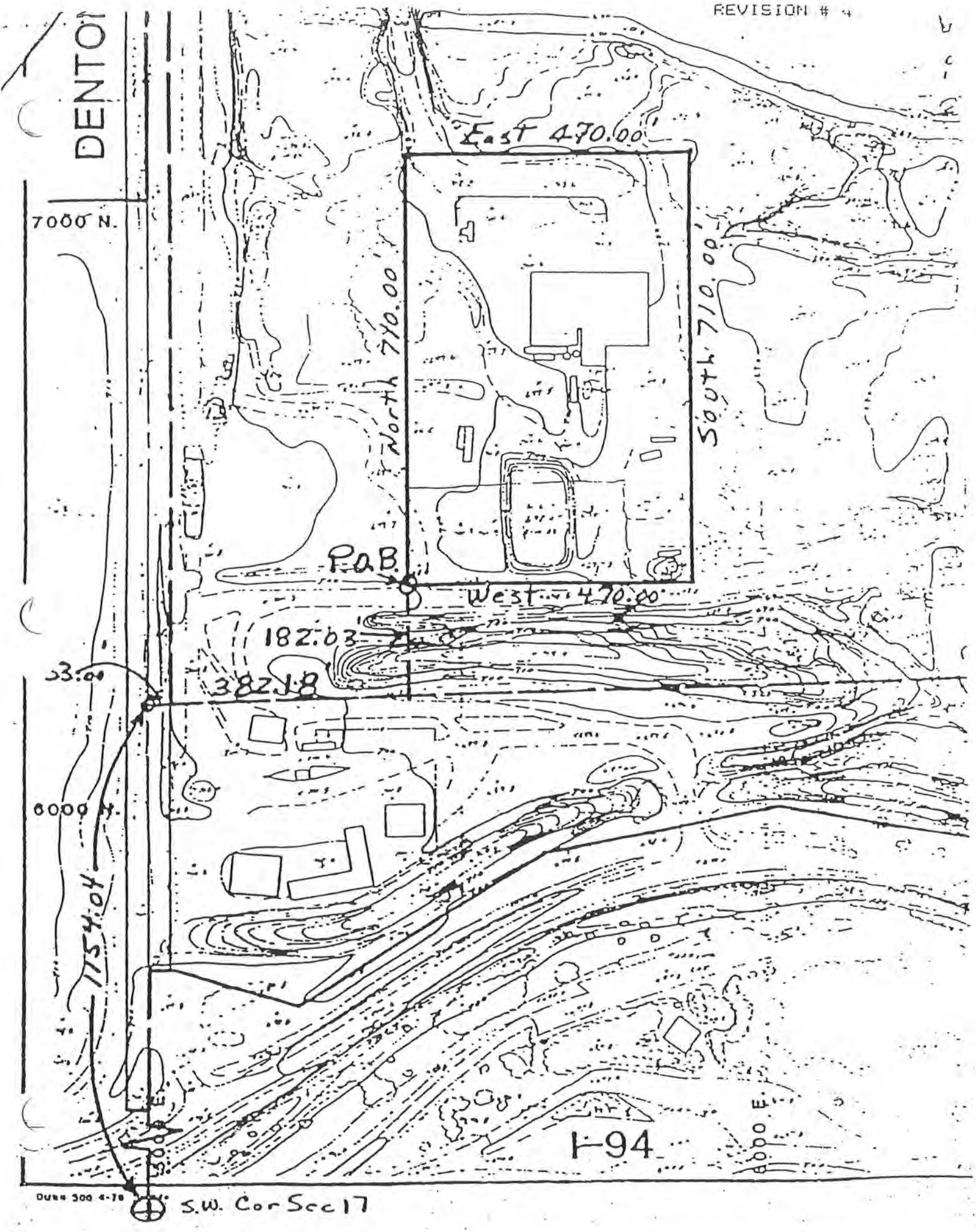
When recorded, return to:

State of Michigan
Department of Natural Resources
Solid Waste Management Division
Lansing, Michigan 48910

*Type or print name under signature

Drafted By:

ichael J. O'Reilly
The American Road
arborn, Michigan 48121


REVISION # 4
DENTON
7000 N.
East 470.00
North 710.00
South 710.00
P.O.B.
West 470.00
182.03
382.18
53.00
6000 N.
1754.04
I-94
S.W. Cor Sec 17

REVISION # 4

Michigan Disposal, Inc.

Post Office Box 5116
Dearborn, Michigan 48128
(313) 326-0204

Section 17, T3S, R8E
Van Buren Township, Wayne County
Michigan Disposal
82018
Nov. 14, 1983

DESCRIPTION OF A 7.66 ACRE PARCEL
OF LAND LOCATED IN THE S.W. 1/4 OF
SECTION 17,T3S,R8E, VAN BUREN TOWNSHIP,
WAYNE COUNTY,MICHIGAN

(HAZARDOUS WASTE
TREATMENT FACILITY)

Commencing at the S.W. corner of Section 17, T3S, R8E Van Buren Township, Wayne County, Michigan, thence N 00° 04' 28" W 1154.04 feet along the west line of said Section 17, thence N. 89° 55' 32" E 33.00 feet, thence N 88° 39' 48" E 382.18 feet; thence N 0° 00' 00" E 182.03 feet to the POINT OF BEGINNING,

thence N 00° 00' 00" E 710.00 feet;
thence N 90° 00' 00" E 470.00 feet;
thence S 00° 00' 00" E 710.00 feet;
thence S 90° 00' 00" W 470.00 feet to the POINT OF BEGINNING, being a part of the S.W. 1/4 of Section 17, T3S, R8E containing 7.66 acres of land more or less, subject to easements or restrictions of record if any.

WDI 2.1.8

LAW OFFICES
HONIGMAN MILLER SCHWARTZ AND COHN LLP
2290 FIRST NATIONAL BUILDING
660 WOODWARD AVENUE
DETROIT, MICHIGAN 48226-3583
FAX (313) 465-8000

JEFFREY L. WOOLSTRUM
TELEPHONE: (313) 465-7612
FAX: (313) 465-7613
E-MAIL: jlw@honigman.com

LANSING, MICHIGAN

November 9, 2000

VIA FACSIMILE & CERTIFIED MAIL

Mr. Jim Sygo
Chief, Waste Management Division
Michigan Department of Environmental Quality
608 W. Allegan Street
John A. Hannah Building
Lansing, Michigan 48933

Re: ***Wayne Disposal, Inc.***
Notice Regarding Statutory Obligations Applicable to Property

Dear Mr. Sygo:

Pursuant to Rule 525 of the September 11, 2000 administrative rules promulgated under Part 111 of the Natural Resources and Environmental Protection Act, enclosed please find a copy of the Notice Regarding Statutory Obligations Applicable To Property (the "Notice") relating to Wayne Disposal, Inc.'s ("WDI") hazardous waste treatment and storage facility located in Van Buren Township, Michigan. WDI has executed the Notice and filed it for recording with the Register of Deeds for Wayne County.

Please call me with any questions regarding the enclosed.

Sincerely,

Jeffrey L. Woolstrum

Enclosure

cc: Mr. Scott Maris

DET_B\250351.1

'00 NOV -9 P1:54

RESTE. YOUNGBLOOD
REGISTER OF DEEDS
WAYNE COUNTY, MI

NOTICE REGARDING
STATUTORY OBLIGATIONS APPLICABLE TO PROPERTY

This Notice Regarding Statutory Obligations Applicable to Property (the "Notice") has been executed this 8th day of November, 2000, by Wayne Disposal, Inc., a Michigan corporation ("Owner"), whose address is 49350 North I-94 Service Drive, Bellville, Michigan 48111, and is being recorded with the Register of Deeds for Wayne County, Michigan, pursuant to Rule 525 of the September 11, 2000 administrative rules promulgated under Part 111 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended ("Act 451").

The property owned by Owner and described on Exhibit A, attached hereto (the "Exhibit A Property"), has been used to manage hazardous waste and is subject to the corrective action requirements of Part 111 of Act 451 and the Resource Conservation and Recovery Act, as amended by the 1984 Hazardous and Solid Waste Amendments.

The property owned by Owner and described on Exhibit B, attached hereto (the "Exhibit B Property"), has <u>not</u> been used to manage hazardous waste, but is contiguous to the Exhibit A Property. Accordingly, the Exhibit B Property is also subject to the corrective action requirements of Part 111 of Act 451 and the Resource Conservation and Recovery Act, as amended by the 1984 Hazardous and Solid Waste Amendments.

IN WITNESS HEREOF, Owner has caused this Notice to be executed on this 8th day of November, 2000.

WITNESS:

Crezie Marshall
Name Crezie Marshall

Name Scott Maris

Wayne Disposal, Inc., a Michigan corporation

By: Thomas R. Schuck
Thomas R. Schuck

Its: CFO

STATE OF MICHIGAN
COUNTY OF Wayne

The foregoing instrument was acknowledged before me this 8th day of November, 2000 by Thomas R. Schuck, CFO of Wayne Disposal, Inc., a Michigan corporation, on behalf of the corporation.

April F. Raddatz
Notary Public, Wayne County, Michigan
*acting in
April F. Raddatz
My Commission Expires: 01-30-01

*Monroe County

Drafted by and when recorded return to:
Jeffrey L. Woolstrum, Esq.
Honigman Miller Schwartz and Cohn
2290 First National Building
Detroit, Michigan 48226
Telephone: (313) 465-7612

EXHIBIT A

LEGAL DESCRIPTION OF AREA USED TO
MANAGE HAZARDOUS WASTE
A 201.01 ACRE PARCEL OF LAND
LOCATED IN SECTION 17, T3S, R8E,
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

Commencing at the SW corner of Section 17, T3S, R8E, Van Buren Township, Wayne County, Michigan, thence N 00°04'28" W 716.02 feet along the West line of said Section 17, thence N 89°55'50" E 33.00 feet to the Easterly right-of-way line of Denton Road (66.00 feet wide) and to the POINT OF BEGINNING,

thence N 00°04'28" W 1924.68 feet along the Easterly right-of-way line of Denton Road;
thence N 89°55'42" E 80.02 feet;
thence N 00°04'29" W 1196.07 feet;
thence N 88°39'48" E 3820.25 feet;
thence S 00°37'58" E 1685.07 feet;
thence N 89°56'55" W 1247.15 feet;
thence S 02°11'22" E 850.36 feet;
thence N 88°20'11" E 76.42 feet;
thence S 00°47'42" E 952.06 feet to the Northerly right-of-way line of Interstate 94;
thence along the Northerly right-of-way line of Interstate 94, the following seven (7) courses:

S 88°35'32" W 495.86 feet;
N 66°53'38" W 413.81 feet;
N 59°27'20" W 624.43 feet;
N 80°05'38" W 387.83 feet;
S 79°16'00" W 387.84 feet;
S 58°37'42" W 482.90 feet;
N 72°31'25" W 208.85 feet to the POINT OF BEGINNING. Being a part of said Section 17, T3S, R8E, containing 240.44 acres of land, more or less.

Excepting the following described parcel of land:

Commencing at the SW corner of Section 17, T3S, R8E, Van Buren Township, Wayne County, Michigan, thence N 00°04'28" W 716.02 feet along the West line of said Section 17, thence N 89°55'50" E 33.00 feet to the Easterly right-of-way line of Denton Road (66.00 feet wide), thence N 00°04'28" W 438.02 feet along the Easterly right-of-way line of Denton Road, thence S 88°39'49" W 1426.00 feet; thence N 01°20'11" W 96.03 feet to the POINT OF BEGINNING,

thence N 01°20'11" W 1229.28 feet;
thence N 88°39'47" E 1236.65 feet;
thence S 03°05'28" E 299.39 feet;
thence S 02°11'22" E 829.31 feet;
thence S 15°32'04" W 22.66 feet;

thence S 88°20'11" W 60.64 feet;
thence S 88°31'02" W 330.79 feet;
thence S 00°43'32" E 373.05 feet;
thence N 90°00'00" W 621.58 feet;
thence N 41°15'26" W 365.84 feet to the POINT OF BEGINNING. Being a part of the S 1/2 of said Section 17, and containing 39.43 acres of land, more or less.

Total acreage of the above described parcel is 201.01 acres. Being subject to easements and restrictions of record, if any.

Parts of:

Tax Parcel No. 83-068-99-0001-001

Tax parcel No. 83-065-99-0001-000

Tax Parcel No. 83-067-99-0002-002

Tax Parcel No. 83-066-99-0002-000

Tax Parcel No. 83-067-99-0002-002

EXHIBIT B

Legal Description

SITE NO. 1

A parcel of land in the South ½ of Section 18, Town 3 South, Range 8 East, Van Buren Township, Wayne County, Michigan, more particularly described as follows: Beginning at the South ¼ corner of Section 18 and proceeding thence North 87 degrees 36 minutes East along the South line of said section, 575.22 feet; thence North 1 degree 30 minutes West, 1663.44 feet; thence South 87 degrees 35 minutes West 2698.08 feet; thence South 18 degrees 30 minutes East 270.07 feet; thence South 41 degrees East, 269.28 feet; thence South 51 degrees East, 218.46 feet; thence South 39 degrees 30 minutes East 295.68 feet; thence South 27 degrees East 126.06 feet; thence South 37 degrees East 561.66 feet; thence South 60 degrees 37 minutes East 365.33 feet; thence North 87 degrees 55 minutes East along the South line of said section 827.07 feet to the point of beginning.

Excepting therefrom the Southerly 87 feet of land conveyed by Quit Claim Deed dated July 30, 1941, by Quirk Farms to Board of County Road Commissioners of the County of Wayne; also excepting therefrom a parcel of land conveyed by instrument, dated January 17, 1952, by Ford Motor Company to State of Michigan and described as follows: All that part of the South ½ of Section 18, Town 3 South, Range 8 East, Van Buren Township, Wayne County, Michigan, described as: Beginning at a point, which is North along the North and South ¼ line of said Section 18, a distance of 87 feet from the South ¼ corner of said Section 18; thence East along a line which is the North right-of-way line of Highway M-56 and which is parallel to the South line of said Section 18, a distance of 575.22 feet; thence North 1 degree 44 minutes 15 seconds East 50 feet; thence West along a line which is 137 feet North of (measured at right angles) and parallel to the South line of said Section 18, a distance of, 430.34 feet, thence North 20 feet; thence West along a line which is 157 feet North of (measured at right angles) and parallel to the South line of said Section 18, a distance of, 500 feet; thence North 20 feet; thence West along a line which is 177 feet North of (measured at right angles) and parallel to the South line of said Section 18, a distance of 400 feet; thence South 20 feet, thence West along a line which is 157 feet North of (measured at right angles) and parallel to the South line of said Section 18, a distance of 311 feet more or less to a fence, thence South 60 degrees 37 minutes East along said fence line 134.10 feet to the North right-of-way line of Highway M-56; thence East along said North right-of-way line of Highway M-56 a distance of 969.22 feet to the point of beginning. Also excepting therefrom lands from proposed Interstate 94 right-of-way, as more fully described in Deed recorded in Liber 18385, page 706, Wayne County Records.

Tax Parcel No. 071-99-0004-001

SITE NO. 2

Commencing at the Southwest corner of fractional Section 18, Town 3 South, Range 8 East, Van Buren Township, Wayne County, Michigan; thence North 00 degrees 04 minutes 28 seconds West 716.02 feet along the East line of fractional Section 18 to the point of beginning; thence North 00 degrees 04 minutes 28 seconds West 1926.82 feet along the East line of fractional Section 18; thence South 89 degrees 16 minutes 38 seconds West 1332.32 feet along the East-West ¼ line of said Section 18; thence North 00 degrees 24 minutes 00 seconds East 1177.41 feet; thence North 88 degrees 39 minutes 48 seconds East 6571.00 feet; thence South 00 degrees 40 minutes 52 seconds East 1153.58 feet along the East line of Section 17, Town 3 South, Range 8 East and the center line of Beck Road; thence South 88 degrees 15 minutes 32 seconds West 1316.05 feet along the East-West ¼ line of said Section 17; thence South 00 degrees 37 minutes 59 seconds East 2292.53 feet; thence South 88 degrees 35 minutes 33 seconds West 1144.97 feet along the North right-of-way line of the I-94 Service Road; thence North 00 degrees 47 minutes 42 seconds West 952.06 feet; thence South 88 degrees 20 minutes 09 seconds West 163.96 feet; thence South 88 degrees 31 minutes 03 seconds West 330.79 feet; thence South 00 degrees 43 minutes 33 seconds East 950.90 feet; thence along the Northerly right-of-way line of said I-94 Service Road in the following eight (8) courses: South 88 degrees 35 minutes 33 seconds West 8.05 feet; North 66 degrees 25 minutes 22 seconds West 406.47 feet; North 59 degrees 27 minutes 20 seconds West 624.43 feet; North 80 degrees 05 minutes 40 seconds West 387.83 feet; South 79 degrees 16 minutes 00 seconds West 387.83 feet; South 58 degrees 37 minutes 40 seconds West 482.90 feet; North 72 degrees 31 minutes 18 seconds West 208.85 feet; South 89 degrees 55 minutes 32 seconds West 33.00 feet to the point of beginning.

Excepting therefrom all of the property described on Exhibit A, attached hereto.

Parts of:

Tax Parcel No. 83-068-99-0001-001

Tax parcel No. 83-065-99-0001-000

Tax Parcel No. 83-067-99-0002-002

Tax Parcel No. 83-066-99-0002-000

Tax Parcel No. 83-067-99-0002-002

WAYNE COUNTY REGISTER OF DEEDS
RECORDING TRANSACTION AND RECEIPT

DOCUMENT RECEIVED: NOV - 9 2000 #219351

TYPE OF DOCUMENT(S): NOT

NUMBER OF DOCUMENT(S): 1

RECORDING FEE: $ 28.00

TRANSFER TAX: $

COPY FEE $

TOTAL AMOUNT RECEIVED: $ 28.00 clerks initials: PB

Check ✓ Cash Money Order Other

89025197

U24079 PG 400

NOTICE IN ACCORDANCE WITH

40 C.F.R. §264.119(b)(1)

In accordance with the provisions of 40 C.F.R. §264.119(b)(1), the undersigned, Wayne Disposal, Inc., hereby states, with respect to the property described in Exhibit A attached hereto, as follows:

1. The subject land has been used to manage hazardous wastes; and

2. Its use is restricted under 40 C.F.R. Subpart G regulations; and

3. The survey plat and record of the type, location, and quantity of hazardous wastes disposed of within each cell or other hazardous waste disposal unit of the facility required by 40 C.F.R. §§264.116 and 264.119(a) have been filed with the Van Buren Township Zoning Board and with the Regional Administrator for Region V of the United States Environmental Protection Agency.

89025197

'89 FEB 20 AM 11:11

FOREST J. DUNGBLUT
REGISTER OF DEEDS
WAYNE COUNTY

Dated: February 15, 1989

Witnessed by:

Richard L. Taylor

Michael J. Miller

WAYNE DISPOSAL, INC.,
a Michigan corporation

By: Jerry A. Fore

Its: Vice President

STATE OF MICHIGAN)
) ss.
COUNTY OF)

The foregoing instrument was acknowledged before me this 15th day of February, 1989, by Jerry A. Fore who is a Vice President of Wayne Disposal, Inc., a Michigan corporation, on behalf of the corporation.

BETTY KANE
NOTARY PUBLIC-WAYNE COUNTY, MICH.
MY COMMISSION EXPIRES 9-15-92

Betty Kane
Notary Public, Wayne County, MI

My Commission Expires: 9-15-92

Drafted by and when recorded
return to:

Robert A. Hykan, Esq.
Honigman Miller Schwartz and Cohn
2290 First National Building
Detroit, Michigan 48226

C1780I

MIDWESTERN CONSULTING, INC.
CIVIL ENGINEERS · PLANNERS · SURVEYORS
2045 HOGBACK ROAD
ANN ARBOR, MICHIGAN 48104
TELEPHONE: 313 - 971-8000

LI 24079 PG 401

Section 17, T3S, R8E
Van Buren Township, Wayne County
Wayne Disposal
80057

EXHIBIT "A"

DESCRIPTION OF A 119.74 ACRE PARCEL OF LAND LOCATED IN THE W 1/2 OF SECTION 17, T3S, R8E, VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN.

(HAZARDOUS WASTE DISPOSAL AREA)

Commencing at the S. W. corner of Section 17, T3S, R8E Van Buren Township, Wayne County Michigan, thence N 00° 04' 28" W 1154.04 feet along the west line of said Section 17, thence N 89° 55' 32" E 33.00 feet to the POINT OF BEGINNING,

thence N 00° 04' 28" W 1486.72 feet;
thence N 89° 55' 32" E 80.00 feet;
thence N 00° 04' 28" W 1196.00 feet;
thence N 88° 39' 48" E 2444.52 feet;
thence S 01° 20' 12" E 1355.00 feet;
thence S 88° 39' 48" W 1157.59 feet;
thence S 01° 20' 12" E 1325.31 feet;
thence S 88° 39' 48" W 1426.00 feet to the POINT OF BEGINNING,

being a part of the W 1/2 of Section 17, T3S, R8E containing 119.74 acres of land more or less, subject to easements or restrictions of record, if any.

90032823

RESTRICTIVE COVENANTS RUNNING WITH THE LAND

L12454 7PA698

FORD MOTOR COMPANY, ("Ford"), a Delaware corporation, is located at The American Road, Dearborn, MI 48121-1899. Ford is the record owner of land located in Van Buren Township, Wayne County, Michigan, described in Exhibit A attached ("the land").

WAYNE DISPOSAL, INC., ("Wayne"), a Michigan corporation, is located at 1349 Huron St., Ypsilanti, MI 48197. Wayne applied for and received a license under provisions of 1979 P.A. 64, MCLA 299.503 eq seq, as amended ("Act 64") to operate a hazardous waste facility ("Disposal Facility") located at the land. This license authorized disposal of hazardous waste at the Disposal Facility on the land pursuant to all of the terms of that license and Michigan law, including, but not limited to, Act 64. The land and the Disposal Facility are herein referred to as the "Property". The following restrictive covenants are executed by Ford as the sole owner of the land and by Wayne as the owner and operator of the Disposal Facility pursuant to Section 39 of Act 64 to ensure the care, maintenance, monitoring and long-term integrity of the Property for the protection of the health, safety and welfare of the people of the State of Michigan and the natural resources and the environment of the State of Michigan.

90032823

1. The Property has been used to manage hazardous wastes.

2. The Property has been used as a landfill for hazardous waste disposal.

3. Use of the Property, including use of the land and/or the Disposal Facility, shall not disturb the final cover, liners, components of any containment system, or the function of the monitoring systems on or in the Property.

4. No one, including Ford, Wayne, any purchaser of the record owner of the land or Disposal Facility, any purchaser of the land or Disposal Facility, or any of their agents, employees, heirs, successors, lessees, or assignees, shall engage in any development, including any filling, grading, excavating, building, drilling or mining on the Property following completion of the landfill closure without obtaining prior written authorization from the Director of the Department of Natural Resources.

5. The survey plat and records of the types, locations and quantities of hazardous wastes on or in the Property have been filed by Wayne with the local zoning or land use authority as required by Act 64 and its rules.

90 FEB 26 PM 3:45
CRESTE YOUNGBLOOD
REGISTER OF DEEDS
WAYNE COUNTY, MI

RECEIVED
JAN 9 1990
Waste Management
Division

6. Ownership of all or a portion of the land or Disposal Facility shall not be conveyed without the owner of the land or Disposal Facility sending prior written notice to the prospective purchaser(s) of the existence of these restrictive covenants. Such notice shall state:

   (1) that there are restrictive covenants on the Property;

   (2) that development on the Property is prohibited without prior written authorization from the Director of the Department of Natural Resources;

   (3) that the prospective purchaser(s) must comply with the restrictive covenants, Act 64 and rules promulgated under Act 64; and

   (4) that the prospective purchaser(s) cannot interfere with the containment or monitoring systems on or in the Property.

Such notice shall include a copy of these restrictive covenants and shall be sent to the prospective purchaser(s) by certified mail with a copy sent to the Director of the Department of Natural Resources.

These restrictions may be enforced in law or in equity in a court of competent jurisdiction. Such action(s) may be taken against anyone, including any person, corporation, partnership, agent, successor, assignee, heir, employee or lessee, who violates or threatens to violate any of these restrictive covenants.

These restrictive covenants shall run with the land in perpetuity and shall be binding upon Ford, Wayne, any purchaser of the record owner of the land or Disposal Facility, any purchaser of the land or Disposal Facility, or any of their agents, employees, heirs, successors, lessees, or assignees.

L124547PA700

Signed in presence of:

WAYNE DISPOSAL, INC.

(witness name)

By:

(witness name)

Its: Vice President

STATE OF MICHIGAN)
) SS.
COUNTY OF Wayne)

The foregoing instrument was acknowledged before me this 27th day of December, 19 89, by Jerry A. Fore, of Wayne Disposal, Inc., a Michigan corporation, on behalf of the corporation.

Notary Public

Wayne County, Michigan
My commission expires 9/15/92.

BETTY KANE
NOTARY PUBLIC-WAYNE COUNTY, MICH.
MY COMMISSION EXPIRES 9-15-92

L124547PA701

Signed in presence of:

FORD MOTOR COMPANY

George Kuen
(Witness name)

By: J. M. Rintamaki

J. M. Rintamaki
Assistant Secretary

Linda G. Donovan
(Witness name)

Its: _____

STATE OF MICHIGAN)
) SS.
COUNTY OF WAYNE)

The foregoing instrument was acknowledged before me this _____ day of JAN 3 1990, 19 ____, by J. M. RINTAMAKI, of FORD MOTOR COMPANY, a Delaware corporation, on behalf of the corporation.

Marilyn F. Taulbee
Notary Public

_____ County, Michigan
My commission expires _____

MARILYN F. TAULBEE
Notary Public, Wayne County, Michigan
My Commission Expires December 11, 1990

L124547PA702

Signed in presence of:

Margaret T. Curry
(witness name)

Jessie W. Smith
(witness name)

STATE OF MICHIGAN

By: _____
David F. Hales

Its: Director of the Department of Natural Resources for the State of Michigan

STATE OF MICHIGAN)
) SS.
COUNTY OF INGHAM)

The foregoing instrument was acknowledged before me this 29th day of January, 19 90, by David F. Hales, of the Michigan Department of Natural Resources, on behalf of the Department.

_____
Notary Public

_____ County, Michigan
My commission expires _____.

JOAN E. SAUB
Notary Public, Clinton County, MI
My Commission Expires April 7, 1991
Acting in Ingham County, MI

MIDWESTERN CONSULTING, INC.

CIVIL ENGINEERS • PLANNERS • SURVEYORS

2045 HOGBACK ROAD
ANN ARBOR, MICHIGAN 48104
TELEPHONE: 313 - 971-6800

L124547PA703

Section 17, T3S, R8E
Van Buren Township, Wayne County
Wayne Disposal
80057

EXHIBIT "A"

DESCRIPTION OF A 119.74 ACRE PARCEL OF LAND LOCATED IN THE W 1/2 OF SECTION 17, T3S, R8E, VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN.

(HAZARDOUS WASTE DISPOSAL AREA)

Commencing at the S. W. corner of Section 17, T3S, R8E Van Buren Township, Wayne County Michigan, thence N 00° 04' 28" W 1154.04 feet along the west line of said Section 17, thence N 89° 55' 32" E 33.00 feet to the POINT OF BEGINNING,

thence N 00° 04' 28" W 1486.72 feet;
thence N 89° 55' 32" E 80.00 feet;
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thence N 88° 39' 48" E 2444.52 feet;
thence S 01° 20' 12" E 1355.00 feet;
thence S 88° 39' 48" W 1157.59 feet;
thence S 01° 20' 12" E 1325.31 feet;
thence S 88° 39' 48" W 1426.00 feet to the POINT OF BEGINNING,

being a part of the W 1/2 of Section 17, T3S, R8E containing 119.74 acres of land more or less, subject to easements or restrictions of record, if any.

37: Information for Each SWMU

Section 37. Information on Each Solid Waste Management Unit

INFORMATION FOR EACH SOLID WASTE MANAGEMENT UNIT

40 CFR 264.14d

AND

NREPA 451, Part 111 R504(1)c

INFORMATION FOR EACH SOLID WASTE MANAGEMENT UNIT

40 CFR 270.14d and NREPA 451, Part 111 R504(1)c

In accordance with the previous RCRA permit for the facility, a Phase I RCRA Facility Investigation (RFI) for Wayne Disposal Site #2 Landfill was completed and submitted to USEPA. A copy of this report, "RCRA Corrective Action Plan RFI Phase I-Environmental Monitoring Report (Volumes I and II)", dated July 17, 1990, was submitted separately. This report includes a description of the location, design, and history of the operation of all Solid Waste Management Units at the facility. In addition, environmental monitoring data collected throughout the period of interim status was summarized and evaluated for evidence of the presence or absence of a release. The report concluded that data generated over this time period did not yield evidence for the presence of a release. In addition, a work plan for a Phase II investigation Wayne Disposal Site #1 Landfill, titled "RFI Phase II Release Assessment-Task A: RFI Phase II Workplan", dated September 21, 1989 was submitted to the USEPA. USEPA responded to the submission of the Phase I Report and the Phase II Workplan in a letter dated January 3, 1991, a copy of which was included in this section. In this letter, USEPA concluded that there had been no releases of waste or waste constituents to the environment from Wayne Disposal Site #2 Landfill. In addition, the letter approved the PhaseII workplan for Wayne Disposal Site #1 Landfill.

The Phase II release assessment investigation of Wayne Disposal Site #1 Landfill has been conducted in accordance with the approved workplan. A report, titled "Draft Report-RCRA Facility Investigation Phase II Release Assessment for Wayne Disposal Site #1 Landfill (Volumes I, II, and III)" dated October 7, 1992 was submitted to USEPA. This report is reproduced electronically on compact disk for this application as Appendix B. The investigation found no clear evidence of a release to the environment, but recommended limited additional work to be conducted to resolve the origin of some anomalous groundwater monitoring results at one monitoring well. To date, there has been no response from USEPA regarding this draft report.

WDI has completed a number of site improvements activities at Site #1 since 1992. A trench drain with extraction wells was installed along the west site boundary to help prevent leachate seeps on the slope leading to Willow Run Creek. Additional leachate extraction wells (there are now 18) have been installed to lower the leachate head within the landfill. Between 2001 and 2011, more than 47 million gallons of leachate have been removed from Site #1 resulting in a significant lowering of the leachate head in most areas of the landfill. In 2000 and 2001 the cover was improved by the addition of 3 to 4 feet of clay over approximately 80% of the landfill. This reduced infiltration and increased run-off from the cover. In addition, WDI installed gas vents equipped with flares to control landfill gas emissions.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

RECEIVED - 9 1991

REPLY TO THE ATTENTION OF:
5H-12

JAN 03 1991

CERTIFIED MAIL P 175 505 917
RETURN RECEIPT REQUESTED

Mr. Jerry A. Fore
Vice President
Wayne Disposal, Inc.
1349 Huron Road
Ypsilanti, Michigan 48197

Re: Approval of RFI Phase I and II
Wayne Disposal
MID 048 090 633

Dear Mr. Fore:

The RFI Phase I Environmental Monitoring Report, dated July 17, 1990, submitted for Site I (Landfill) and Site II (Solid and Hazardous Waste Landfill) and the RFI Phase II Release Assessment Work Plan for Site I Landfill have been reviewed by the United States Environmental Protection Agency (U.S. EPA). The submittal of these documents was required by the Corrective Action provisions (Condition V.) of the Federal Hazardous and Solid Waste Amendments (HSWA) Permit issued to Wayne Disposal, Inc. by the U.S. EPA on March 30, 1990.

Based upon this information, the U.S. EPA has concluded that there have been no releases of hazardous waste or hazardous constituents to the environment from Site II. Therefore, no further action is required for Site II at this time. The Phase II Release Assessment Work Plan for the Site I Landfill is approved and is to be implemented within 30 days of receipt of this correspondence, in accordance with Condition V.A.1.

If you have any questions regarding this matter, please contact Shari Kolak of my staff, at (312) 886-6151.

Sincerely yours,

David A. Ullrich

David A. Ullrich, Director
Waste Management Division

cc: Pete Quackenbush, MDNR
Ken Burda, MDNR

XC
TU
MY
LUB
LZ
J. Rolito

Section 38. RCRA Subparts AA, BB & CC

RCRA SUBPARTS AA, BB & CC

RCRA SUBPARTS AA, BB & CC

INTRODUCTION

This section of the permit application addresses the requirements of 40 CFR 270.24, 270.25, 270.27; 40CFR 264, Subpart AA, BB, CC.

PROCESS VENTS (SUBPART AA)

WDI has no process vents subject to Subpart AA.

EQUIPMENT (SUBPART BB)

Pumps in Light Liquid Service
WDI has no pumps in light liquid service.

Open Ended Valves or Lines
WDI has no open-ended valves or lines servicing material subject to Subpart BB.

Valves in Light Liquid Service
WDI has no valves in light liquid service.

Flanges and Other Connectors
WDI has no flanges or connectors servicing material subject to Subpart BB.

Compressors
Not Applicable

Pumps And Valves In Heavy Liquid Service
Not Applicable

Pressure Relief Devices in Heavy or Light Service
Not Applicable

Delay of Repair
Not Applicable

TANKS, SURFACE IMPOUNDMENTS AND CONTAINERS (SUBPART CC)

Applicability

Not Applicable to WDI

Waste Determination

WDI does not accept waste subject to Subpart CC. Material subject to Subpart CC is treated prior to disposal at WDI.

Tanks
There are no tanks at WDI that manage Subpart CC waste.

Containers
WDI does not accept waste containers subject to Subpart CC.

Surface Impoundments
WDI does not have surface impoundments subject to Subpart CC.

Miscellaneous Units
Not Applicable

Section 39. Closure and Post-Closure Cost Estimates and Finanacial Assurance

ESTIMATED POST CLOSURE COST - WDI MASTER CELL VI

Shared Data		
Cap area (acres)	62	
Soil wet density (tons/ccy)	1.7	Per Jim Parsons, NTH, April 11, 2005 email
Soil purchase price ($/ton)	$7.50	Farmer & Underwood, clay
Seeding rate ($/acre)	$1,500	B&V Construction
CAT D6 dozer mobilization	$343	B&V Construction
CAT D6 dozer hourly rate including fuel, lubrication and operator	$170	B&V Construction
Operator hourly rate, included in the equipment hourly rates	$0.00	B&V Construction
Foreman hourly rate, includes pickup	$79.00	B&V Construction
Laborer hourly rate	$53.00	B&V Construction
Vac truck hourly rate	$107	Impact Environmental, 3553 wet/dry vac, 3,500-gal, 5,300 cfm, 25" Hg
Sewer jet hourly rate	$52	Impact Environmental, 301 sewer jet, 3,000 psi, 40 gpm
Foreman hourly rate	$40	Impact Environmental
Operator hourly rate	$32	Impact Environmental
Technician hourly rate	$28	Impact Environmental
Lead technician hourly rate	$60	NTH Tech III
Support technician hourly rate	$55	NTH Tech II
Lead electrician hourly rate	$57.00	OSC
Support electrician hourly rate	$47.00	OSC
Erosion:		
Soil loss rate (tons/acre/year)	2.6	From Universal Soil Loss Equation
Soil loss (tons/yr)	161.2	
Purchase soil	$1,209	
Gravel trains required, 50 tons each	3	
No. of workhours at 5 trains/hr	1	
Rounded up no. of workhours	8	Must manually round up to next multiple of 8-hour day
No. operators	1	
Place soil	$2,759	
Annualized Subtotal:	**$3,968**	
Revegetation:		
Fraction of cap to be revegetated in 30 years	0.5	
Annualized Subtotal:	**$1,550**	
Mowing:		
Mowing rate ($/acre)	$75.00	NERC'srate to mow Arkona Road Landfill
Number of mowing events per year	1	
Annualized Subtotal:	**$4,650**	
Collection System Cleaning		
No. of years between cleaning events	2	
Feet of pipe jetted per 8-hr day	1500	
Days to jet entire system	12.6	
Rounded up number of 8-hr days	13	Must manually round up to next multiple of 8-hour day
Hours to clean pipes	104	
Annualized Subtotal:	**$16,588**	

ESTIMATED POST CLOSURE COST - WDI MASTER CELL VI

Manhole Cleaning (After Biannual Jetting)		
No. of years between cleaning events	2	
Hours per manhole	8	
No. of manholes	5	A-North, A-South, B, C and D
CAT 416 backhoe mobilization	$343	B&V Construction
CAT 416 hourly rate including fuel, lubrication and operator	$102	B&V Construction
Power washer hourly rate to rinse pump and discharge pipe	65	Impact Environmental, 10-150 D.T., 10000 psi, 30 gpm
Annualized Subtotal:	**$12,272**	
Leachate Pump Replacement		
Annualized replacement frequency	0.2	1 of every 5 pumps and motors are replaced each year
No. of pumps and motors	9	
Leachate pump, motor and Santoprene flat-jacket motor lead cost	$1,032	Cuvo Pumping Solutions, 16S07-8 3/4 HP Grundfos and 150" motor lead
Hours per person per replacement including prep, travel, on-site work	4	
Annualized Subtotal:	**$2,686**	
Leachate Motor Controllers		
Annualized replacement frequency	0.1	Every controller to be replaced once per 10 years
Number of controllers	9	
Controller cost	$200	Coyote Manufacturing, single phase, 230-volt
Hours per person per replacement including prep, travel, on-site work	3	
Annualized Subtotal:	**$334**	
Leachate Flow Meters		
Annualized replacement frequency	0.1	Every meter to be replaced once per 10 years
Number of meters	9	
Meter cost	$519	Metrol, 2-inch MVR, brass, Hersey
Hours per person per replacement including prep, travel, on-site work	3	
Annualized Subtotal:	**$629**	
Leachate Pipeline Heat Trace		
Annualized replacement frequency	0.1	Each well's heat trace to be replaced once per 10 years
Number of wells with heat trace	9	
Heat trace spool, 240-volt, 20 ft per well	$129.50	Grainger Item No. 4E518, $647.50/100-ft role
Glass application tape, 2 ft per well, runs perpendicular to pipe	$0.41	Grainger Item No. 4E521, $13.67/66-ft role
Foil tape, 20 ft per well, runs parallel to heat trace	$2.91	Grainger Item No. 6JD45, $21.83/150-ft role
Splice/tee kit - one splice and tee kit per well	$19.96	Grainger Item No. 4DC50, $19.96/kit, one kit per well
Hours per person per replacement including prep, travel, on-site work	4	

ESTIMATED POST CLOSURE COST - WDI MASTER CELL VI

Annualized Subtotal:	**$512**	
Leachate Force Main Maintenance		
Years between cleaning events	2	
Hours to clean pipelines	40	Roughly 8,000' of pipe at 1,500'/day is 5 days
Annualized Subtotal:	**$6,380**	
Electrical System		
Feet of wire, B to AN to AS	1,275	
Feet of wire, C to D	1,125	
Feet of wire, ESW to ESE	1,500	
Feet of wire, ENW to ENE	2,600	
Wire replacement cost per foot. Includes three runs of #2 XHHW power wire (assumes 3-phase power which may be overly conservative); one run of #6 XHHW ground; removal of existing wire from conduit (if applicable); pulling new wire into conduit; connection boxes every 500 feet	$8.800	OSC proposal for 2009 is essentially the same as 2008, but cost is significantly higher than the 2007 Trouse estimate because raw material (copper) cost is up 50-70%.
No. of years between wire replacements	20	
Annualized Subtotal:	**$2,860**	
Leak Detection Pump Replacement		
Longevity of standard pump, years	2	
Longevity of piston pump, years	5	
No. of pumps and motors with standard pump	8	
No. of pumps and motors with piston pump	1	A-North only
Standard pump, motor and 200' of Santoprene flat-jacket motor lead cost	$1,725	Cuvo Pumping Solutions, Grundfos Rediflo2
Leachate pump, motor and Santoprene flat-jacket motor lead cost	$9,745	Blackhawk
Hours per person per replacement including prep, travel, on-site work	8	
Annualized Subtotal:	**$12,713**	
Leak Detection Motor Controllers		
Longevity of controller, years	10	Every controller is assumed to require replacement after 10 years of service
Number of controllers	8	A-North is excluded because it uses a piston pump. Controller cost included in pump replacement cost.
Controller cost	$2,078	Cuvo Pumping Solutions
Hours per person per replacement including prep, travel, on-site work	4	
Annualized Subtotal:	**$1,845**	
Leak Detection Flow Meters		
Longevity, years	10	Every meter to be replaced once per 10 years
Number of meters	9	
Meter cost	$519	Metrol, 2-inch MVR, brass, Hersey

ESTIMATED POST CLOSURE COST - WDI MASTER CELL VI

Hours per person per replacement including prep, travel, on-site work	4	
Annualized Subtotal:	**$468**	
Leak Detection System Heat Trace		
Longevity, years	10	Each well's heat trace to be replaced once per 10 years
Number of wells with heat trace	9	
Heat trace spool, 240-volt, 20 ft per well	$129.50	Grainger Item No. 4E518, $647.50/100-ft role
Glass application tape, 2 ft per well, runs perpendicular to pipe	$0.41	Grainger Item No. 4E521, $13.67/66-ft role
Foil tape, 20 ft per well, runs parallel to heat trace	$2.91	Grainger Item No. 6JD45, $21.83/150-ft role
Splice/tee kit - one splice and tee kit per well	$19.96	Grainger Item No. 4DC50, $19.96/kit, one kit per well
Hours per person per replacement including prep, travel, on-site work	4	
Annualized Subtotal:	**$512**	
Leak Detection Force Main Maintenance		
Years between cleaning events	2	
Hours to clean pipelines	40	Roughly 6,000' of pipe at 1,500'/day is 4 days. Rounded to 5 days.
Annualized Subtotal:	**$6,380**	
Leachate Monitoring		
Hours to collect composite sample including prep, travel and time on site	8	
No. of composite samples collected per year	12	
No. of individual well samples per year	18	9 wells sampled twice per year
Composite sample analysis, cost per sample	$468	Trimatrix
Individual well sample analysis, cost per sample	$778	Trimatrix
Data analysis and report, cost per year	$1,553	NTH Applied 2/3 of $4660 to Cells 5 & 7, 1/3 to Cell 6
Annualized Subtotal:	**$26,927**	
Leak Detection Monitoring		
Hours to turn off pumps the day before sampling including prep, travel and time on site	4	
Hours per event to collect samples and perform monthly field measurements. Includes time for quarterly sampling, prep and travel.	8	
No. of monthly sampling events	12	
Laboratory sample analysis, cost per quarter per sample	$696	
No. of samples collected per quarter	7	
No. of quarterly events	4	

ESTIMATED POST CLOSURE COST - WDI MASTER CELL VI

Reporting, cost per year for quarterly reports and monthly volume analysis	$9,320	NTH
Annualized Subtotal:	**$37,448**	
<u>TSCA Reporting</u>		
Quarterly reports	$5,440	NTH
Annual report	$2,230	NTH
Annualized Subtotal:	**$7,670**	
<u>Fence Replacement</u>		
Cost per linear foot to replace vandalized fence	$14	Roy Robinson
Feet of fence to be replaced annually due to vandalism	10	
Annualized Subtotal:	**$140**	
<u>Quarterly Inspections</u>		
Hours per quarterly inspection including prep, travel and on-site time	8	
Number of quarterly inspections per year	4	
Annualized Subtotal:	**$1,920**	
<u>Project Management</u>		
Hours per month	10	
Project Manager hourly rate	$135	NTH Senior Project Professional
Annualized Subtotal:	**$16,200**	
<u>Leachate Treatment & Disposal</u>		
Gallons per year (cells V and VII)	270452	
Cost per Gallon	$0.08	
Annualized Subtotal:	**$21,636**	
ANNUALIZED TOTAL:	**$186,287**	
30 YEAR POST-CLOSURE	**$5,588,613**	

ESTIMATE POST CLOSURE COSTS - WDI MASTER CELLS V AND VII

Shared Data		
Cap area (acres)	43	40 ac for Cell 5 and 32 ac for Cell 7. Cell 6 overlay reduced exposed Cell 5 to only 11 acres. Total is 32+11.
Soil wet density (tons/ccy)	1.7	Per Jim Parsons, NTH, April 11, 2005 email
Soil purchase price ($/ton)	$7.50	Farmer & Underwood, clay
Seeding rate ($/acre)	$1,500	B&V Construction
CAT D6 dozer mobilization	$343	
CAT D6 dozer hourly rate including fuel, lubrication and operator	$170	B&V Construction
Operator hourly rate, included in the equipment hourly rates	$0.00	B&V Construction
Foreman hourly rate, includes pickup	$79.00	B&V Construction
Laborer hourly rate	$53.00	B&V Construction
Vac truck hourly rate	$107	Impact Environmental, 3553 wet/dry vac, 3,500-gal, 5,300 cfm, 25" Hg
Sewer jet hourly rate	$52	Impact Environmental, 301 sewer jet, 3,000 psi, 40 gpm
Foreman hourly rate	$40	Impact Environmental
Operator hourly rate	$32	Impact Environmental
Technician hourly rate	$28	Impact Environmental
Lead technician hourly rate	$60	NTH Tech III
Support technician hourly rate	$55	NTH Tech II
Lead electrician hourly rate	$57.00	OSC
Support electrician hourly rate	$47.00	OSC
Erosion:		
Soil loss rate (tons/acre/year)	2.6	From Universal Soil Loss Equation
Soil loss (tons/yr)	111.8	
Purchase soil	$839	
Gravel trains required, 50 tons each	2	
No. of workhours at 5 trains/hr	0.4	
Rounded up no. of workhours	8	Must manually round up to next multiple of 8-hour day
No. operators	1	
Place soil	$2,759	
Annualized Subtotal:	**$3,598**	
Revegetation:		
Fraction of cap to be revegetated in 30 years	0.5	
Annualized Subtotal:	**$1,075**	
Mowing:		
Mowing rate ($/acre)	$75.00	NERC rate to mow Arkona Road Landfill.
Number of mowing events per year	1	
Annualized Subtotal:	**$3,225**	
Leachate Pump Replacement		
Annualized replacement frequency	0.2	1 of every 5 pumps and motors are replaced each year
No. of pumps and motors	8	
Leachate pump, motor and Santoprene flat-jacket motor lead cost	$942	Cuvo Pumping Solutions, 16S07-8 3/4 HP Grundfos w/ 75' lead

ESTIMATE POST CLOSURE COSTS - WDI MASTER CELLS V AND VII

Hours per person per replacement including prep, travel, on-site work	4	
Annualized Subtotal:	**$2,243**	

Leachate Motor Controllers

Annualized replacement frequency	0.1	Every controller to be replaced once per 10 years
Number of controllers	8	
Controller cost	$200	Coyote Manufacturing, single phase, 230-volt
Hours per person per replacement including prep, travel, on-site work	3	
Annualized Subtotal:	**$297**	

Leachate Flow Meters

Annualized replacement frequency	0.1	Every meter to be replaced once per 10 years
Number of meters	8	
Meter cost	$494	Metrol, 2-inch MVR, brass, Hersey
Hours per person per replacement including prep, travel, on-site work	3	
Annualized Subtotal:	**$539**	

Leachate Pipeline Heat Trace

Annualized replacement frequency	0.1	Each well's heat trace to be replaced once per 10 years
Number of wells with heat trace	8	
Heat trace spool, 240-volt, 20 ft per well	$129.50	Grainger Item No. 4E518, $647.50/100-ft role
Glass application tape, 2 ft per well, runs perpendicular to pipe	$0.41	Grainger Item No. 4E521, $13.67/66-ft role
Foil tape, 20 ft per well, runs parallel to heat trace	$2.91	Grainger Item No. 6JD45, $21.83/150-ft role
Splice/tee kit - one splice and tee kit per well	$19.96	Grainger Item No. 4DC50, $19.96/kit, one kit per well
Hours per person per replacement including prep, travel, on-site work	4	
Annualized Subtotal:	**$455**	

Leachate Force Main Maintenance

Years between cleaning events	2	
Hours to clean pipelines	32	Roughly 6,400' of pipe at 1,500'/day is 4 days
Annualized Subtotal:	**$5,104**	

Electrical System

Feet of wire	3,100	
Wire replacement cost per foot. Includes three runs of #2 XHHW power wire (assumes 3-phase power which may be overly conservative); one run of #6 XHHW ground; removal of existing wire from conduit (if applicable); pulling new wire into conduit; connection boxes every 500 feet	$8.800	OSC confirms 2008 proposal still valid. Cost is significantly higher than the 2007 Trouse estimate because raw material (copper) cost is up 50-70%.
No. of years between wire replacements	20	
Annualized Subtotal:	**$1,364**	

ESTIMATE POST CLOSURE COSTS - WDI MASTER CELLS V AND VII

Groundwater Monitoring		
No. of wells	22	
Hours to sample each well	2	
No. of sampling events per year	4	
Laboratory analysis, cost per sampling event	$10,052	Trimatrix
Data analysis and report, cost per year	$12,810	NTH
Pump rebuild frequency, 1 pump per 20 pumps every 2 yrs	0.025	
Cost per pump rebuild	$215	QED
Cost for replacement fittings	$15	QED
Replacement tubing, cost per foot	$1.90	QED
Average well depth, feet	90	
Annualized Subtotal:	**$63,799**	
Leachate Monitoring		
No. of sampling events per year	2	
Hours to collect samples including prep, travel and time on site	8	
No. of samples collected per event	8	
Individual well sample analysis, cost per sample	$778	
Data analysis and report, cost per year	$3,107	NTH. Applied 2/3 of $2,500 to Cells 5 & 7, 1/3 to Cell 6
Annualized Subtotal:	**$16,509**	
Lysimeter Monitoring		
No. of sampling events per year	2	
Hours on Day 1 - Initial vacuum set and vacuum reset	8	
Hours on Day 2 - Reset vacuum	4	
Hours on Day 3 - Sample collection	8	
Laboratory analysis, cost per sample	$84	Trimatrix
No. of samples collected per event	14	
Cost per year for reports	$1,360	NTH
Annualized Subtotal:	**$6,112**	
Ditch Maintenance		
CAT 330 excavator mobilization	$343	B&V Construction
CAT 35-ton truck mobilization	$343	B&V Construction
GPS grade system hourly rate	$79	B&V Construction
CAT 330 excavator hourly rate including fuel, lubrication and operator	$216	B&V Construction
CAT 35-ton truck excavator hourly rate including fuel, lubrication and operator	$189	B&V Construction
Ditch length (feet)	2,130	This is the ditch length historically attributed to these cells in past cost estimates
Ditch width (feet)	10	
Cap area (acres)	43	
Soil loss rate (tons/acre/year)	2.6	From Universal Soil Loss Equation
Soil loss (tons/yr)	111.8	

ESTIMATE POST CLOSURE COSTS - WDI MASTER CELLS V AND VII

No. of years between maintenance events	10	
Soil loss in 10 yrs (tons)	1,118	This is the amount of sediment that must be removed each cleaning event
1-truck cleaning rate (tons/hr)	160	Rate is limited by truck
2-truck cleaning rate (tons/hr)	279	Rate is limited by dozer
1-truck cleaning time (hrs)	7	
2-truck cleaning time (hrs)	4	This is the amount of time it will take to remove the sediment once per 10 years
1-truck time rounded up to next 8-hr multiple	8	
2-truck time rounded up to next 8-hr multiple	8	This is the amount of time it will take after rounding up to represent whole 8-hour days
1-truck total no. operators	3	Dozer, excavator, one truck
2-truck total no. operators	4	Dozer, excavator, two trucks
1-truck equip&labor cost, annualized	$732	
2-truck equipment&labor cost, annualized	$917	Even though it's cheaper to use one truck, it may be too tight to get the work done in one day so two trucks will be assumed.
Stockpile volume, ccy	658	
Stockpile cross section area, sq. feet	350	1 on 2 side slopes, 15 ft across top, 55 ft across base, 10 ft tall
Stockpile length, feet	51	
Outside area of stockpile, acres	0.1	
Seeding cost, annualized	$84	
Annualized Subtotal:	**$1,001**	
Fence Replacement		
Cost per linear foot to replace vandalized fence	$14	Roy Robinson
Feet of fence to be replaced annually due to vandalism	10	
Annualized Subtotal:	**$140**	
Quarterly Inspections		
Hours per quarterly inspection including prep, travel and on-site time	8	
Number of quarterly inspections per year	4	
Annualized Subtotal:	**$1,920**	
Project Management		
Hours per month	10	
Project Manager hourly rate	$135	NTH Senior Project Professional
Annualized Subtotal:	**$16,200**	
Leachate Treatment & Disposal		
Gallons per year (cells V and VII)	206409	
Cost per Gallon	$0.08	
Annualized Subtotal:	**$16,513**	
ANNUALIZED TOTAL:	**$140,093**	
30 YEAR POST-CLOSURE	**$4,202,801**	

ESTIMATED CLOSURE COST
WDI SITE 2 HAZARDOUS WASTE MANAGEMENT AREA

Item Description	Qty	Unit	Rate	Subtotal		Quote Supplier
Strip Top Half Interim Cover						
631 scrapers (3)	816	hr	$216.00	$176,256.00		B&V Rate Sheet (2-1-08)
Mobilization (3)	3	ea	$343.00	$1,029.00		B&V Rate Sheet (2-1-08)
D6 dozer	272	hr	$170.00	$46,240.00		B&V Rate Sheet (2-1-08)
Mobilization	1	ea	$343.00	$343.00		B&V Rate Sheet (2-1-08)
Foreman	272	hr	$79.00	$21,488.00		B&V Rate Sheet (2-1-08)
Laborer	272	hr	$53.00	$14,416.00		B&V Rate Sheet (2-1-08)
			SUBTOTAL:		**$259,772**	
GCL						
62 Acres	2,700,720	sf	$0.48	$1,296,345.60		GSE Quote (12-8-08)
			SUBTOTAL:		**$1,296,346**	
Membrane						
62 Acres	2,700,720	sf	$0.43	$1,161,309.60		GSE Quote (12-8-08)
			SUBTOTAL:		**$1,161,310**	
Composite						
62 Acres	2,700,720	sf	$0.53	$1,431,381.60		GSE Quote (12-8-08)
			SUBTOTAL:		**$1,431,382**	
General Soil - Bottom Foot						
631 scrapers (3)	816	hr	$216.00	$176,256.00		B&V Rate Sheet (2-1-08)
D6 dozer	272	hr	$170.00	$46,240.00		B&V Rate Sheet (2-1-08)
Foreman	272	hr	$79.00	$21,488.00		B&V Rate Sheet (2-1-08)
Laborer	272	hr	$53.00	$14,416.00		B&V Rate Sheet (2-1-08)
			SUBTOTAL:		**$258,400**	
General Soil - Top 1.5 Feet						
Load/haul	150,040	ccy	$7.10	$1,065,284.00		B&V Site 1 Clay Cap Enhancement (8-11-08)
Placement	150,040	ccy	$3.52	$528,140.80		B&V Site 1 Clay Cap Enhancement (8-11-08)
			SUBTOTAL:		**$1,593,425**	
Topsoil	**Volume**	**Units**	**Unit Rate**	**Cost ($)**		
Load/haul	85,023	Tons	$18.60	$1,581,421.60		Farmer/Underwood (12-1-08)
Place/compact	50,013	c.y.	$3.52	$176,046.93		B&V Site 1 Clay Cap Enhancement (8-11-08)
			SUBTOTAL:		**$1,757,469**	
Vegetation						
Vegetation	62	acres	$1,575.00		**$97,650**	B&V Site 1 Cap Rates (8-11-08)
Perimeter Toe Drain						
Geotextile	12	rolls	$460.00	$5,596.67		Price & Company (12-1-08)
Stone (material and delivery)	1,048	tons	$14.80	$15,505.74		Farmer/Underwood (12-1-08)
Foreman	120	hr	$79.00	$9,480.00		B&V Rate Sheet (2-1-08)
Laborers (2)	240	hr	$53.00	$12,720.00		B&V Rate Sheet (2-1-08)
Cat 426 Backhoe	120	hr	$102.00	$12,240.00		B&V Rate Sheet (2-1-08)
Equipment Mobilization	1	ea	$343.00	$343.00		B&V Rate Sheet (2-1-08)
			SUBTOTAL:		**$55,885**	
Spillway						
Geotextile	1.0	rolls	$460.00	$460.00		Price & Company (12-1-08)
Reno mattresses	75	ea	$125.00	$9,375.00		Price & Company (12-1-08)
Mattress clips	6	ea	$121.00	$726.00		Price & Company (12-1-08)
Stone (material and delivery)	174	tons	$21.24	$3,703.73		Farmer/Underwood (12-1-08)
Foreman	16	hr	$79.00	$1,264.00		B&V Rate Sheet (2-1-08)
Laborers (2)	32	hr	$53.00	$1,696.00		B&V Rate Sheet (2-1-08)
D5 Dozer	16	hr	$139.00	$2,224.00		B&V Rate Sheet (2-1-08)
Cat 426 Backhoe	16	ea	$102.00	$1,632.00		B&V Rate Sheet (2-1-08)
Equipment Mobilization	1	ea	$343.00	$343.00		B&V Rate Sheet (2-1-08)
			SUBTOTAL:		**$21,424**	
Toe of Spillway						
Stone (material and delivery)	82	tons	$21.24	$1,741.68		Farmer/Underwood (12-1-08)

Foreman	8	hr	$79.00	$632.00		B&V Rate Sheet (2-1-08)
Laborers (2)	8	hr	$53.00	$424.00		B&V Rate Sheet (2-1-08)
Cat 426 Backhoe	8	hr	$102.00	$816.00		B&V Rate Sheet (2-1-08)
			SUBTOTAL:		**$3,614**	
Gas Management						
Geotextile	18	roll	$460.00	$8,280.00		Price & Company (12-1-08)
Peastone	2,198	ton	$14.80	$32,530.40		Farmer/Underwood (12-1-08)
Pipe, HDPE, perforated, 6-inch, SDR17	6,380	lf	$4.40	$28,072.00		ISCO Quote (12-3-08 e-mail)
Pipe, HDPE, solid, 6-inch, SDR17	20	lf	$3.40	$68.00		ISCO Quote (12-3-08 e-mail)
Pipe, HDPE, tee, 6-inch, SDR 17	2	ea	$43.50	$87.00		ISCO Quote (12-3-08 e-mail)
Pipe, HDPE, 6-inch end caps	2	ea	$24.55	$49.10		ISCO Quote (12-3-08 e-mail)
Fusion machine	13	day	$100.00	$1,300.00		ISCO Quote (12-3-08 e-mail)
Backhoe loader	104	hr	$102.00	$10,608.00		B&V Rate Sheet (2-1-08)
Foreman	104	hr	$79.00	$8,216.00		B&V Rate Sheet (2-1-08)
Laborers (two at $53.00/hr each)	208	hr	$106.00	$22,048.00		B&V Rate Sheet (2-1-08)
			SUBTOTAL:		**$111,259**	
Premanent Electrical Service to LCS/LDCRS Locations						
Directional Drilling-Conduit Installation						
Sub-cells B – AN – AS	1,275	lf	$10.10	$12,877.50		Absolute Quality (12-3-08)
Sub-cells C – D	1,125	lf	$10.10	$11,362.50		Absolute Quality (12-3-08)
Sub-cells ESW – ESE	1,500	lf	$10.10	$15,150.00		Absolute Quality (12-3-08)
Sub-cells ENW – ENE	2,600	lf	$10.10	$26,260.00		Absolute Quality (12-3-08)
Electircian - Wire Installation (3-wire plus ground)						
Sub-cells B – AN – AS	5,100	lf	$1.32	$6,733.53		Trouse Technicians, Inc. (12-3-08)
Sub-cells C – D	4,500	lf	$1.32	$5,941.35		Trouse Technicians, Inc. (12-3-08)
Sub-cells ESW – ESE	6,000	lf	$1.32	$7,921.80		Trouse Technicians, Inc. (12-3-08)
Sub-cells ENW – ENE	10,400	lf	$1.32	$13,731.12		Trouse Technicians, Inc. (12-3-08)
			SUBTOTAL:		**$99,978**	
Leak Detection, Collection, and Recovery System						
Pipe, HDPE, solid, 2-inch, SDR11	8,000	lf	$0.63	$5,040.00		ISCO Quote (12-3-08 e-mail)
Fusion Tech	11	days	$650.00	$7,150.00		ISCO Quote (12-3-08 e-mail)
Fusion Machine	11	days	$55.00	$605.00		ISCO Quote (12-3-08 e-mail)
48" Diameter x 8' Tall HDPE Manhole	4	ea	$2,200.00	$8,800.00		ISCO Quote (12-3-08 e-mail)
48" Diameter x 8' Tall HDPE Manhole (Freigl	1	ea	$2,500.00	$2,500.00		ISCO Quote (12-3-08 e-mail)
Grundfos 16S Pump	4	ea	$604.00	$2,416.00		Cuvo Pumping Solutions (12-1-08 pricing)
Backhoe loader	88	hr	$102.00	$8,976.00		B&V Rate Sheet (2-1-08)
Foreman	88	hr	$79.00	$6,952.00		B&V Rate Sheet (2-1-08)
Laborer	88	hr	$53.00	$4,664.00		B&V Rate Sheet (2-1-08)
			SUBTOTAL:		**$47,103**	
SESC Permit						
SESC permit (Wayne County DOE)	62	acres	$50.00		**$3,100**	Wayne County SESC Fee Sch (10-1-03)
Silt Fence						
Silt Fence	8,500	lf	$1.50		**$12,750**	B&V Site 1 Cap Rates (8-11-08)
Soil Sampling and Analysis						
Area "A" Assessment Sampling						
NTH Technician II	108	hr	$55.00	$5,940.00		NTH 2008 Fee and Rate Schedule (1-2008)
PCBs	140	ea	$70.00	$9,800.00		TriMatrix (12-1-08 e-mail)
Area "A" Verification Sampling						
NTH Technician II	8	hr	$55.00	$440.00		NTH 2008 Fee and Rate Schedule (1-2008)
PCBs	10	ea	$70.00	$700.00		TriMatrix (12-1-08 e-mail)
Haul Road Assessment Sampling						
NTH Technician II	8	hr	$55.00	$440.00		NTH 2008 Fee and Rate Schedule (1-2008)
Metals	10	ea	$76.00	$760.00		TriMatrix (12-1-08 e-mail)
Volatiles	10	ea	$110.00	$1,100.00		TriMatrix (12-1-08 e-mail)
PCBs	10	ea	$70.00	$700.00		TriMatrix (12-1-08 e-mail)

ESTIMATED CLOSURE COST
WDI SITE 2 HAZARDOUS WASTE MANAGEMENT AREA

Semivolatiles	10	ea	$210.00	$2,100.00		TriMatrix (12-1-08 e-mail)
Haul Road Verification Sampling						
NTH Technician II	8	hr	$55.00	$440.00		NTH 2008 Fee and Rate Schedule (1-2008)
Metals	10	ea	$76.00	$760.00		TriMatrix (12-1-08 e-mail)
Volatiles	10	ea	$110.00	$1,100.00		TriMatrix (12-1-08 e-mail)
PCBs	10	ea	$70.00	$700.00		TriMatrix (12-1-08 e-mail)
Semivolatiles	10	ea	$210.00	$2,100.00		TriMatrix (12-1-08 e-mail)
			SUBTOTAL:		$27,080	
Testing Results Evaluation / Report / Project Management	1	ea	$4,534.00		$4,534	NTH e-mail (12/9/08) - "No change from 2008
Soil Remediation						
Soil Removal						
Cat 330 Excavator	9	hr	$216.00	$1,944.00		B&V Rate Sheet (2-1-08)
35-ton Articulated Truck (3)	27	hr	$189.00	$5,103.00		B&V Rate Sheet (2-1-08)
Cat 966 Loader	9	hr	$147.00	$1,323.00		B&V Rate Sheet (2-1-08)
Cat D-6 Dozer	9	hr	$170.00	$1,530.00		B&V Rate Sheet (2-1-08)
Foreman	9	hr	$79.00	$711.00		B&V Rate Sheet (2-1-08)
Laborers (2)	18	hr	$53.00	$954.00		B&V Rate Sheet (2-1-08)
Equipment Mobilization	6	ea	$343.00	$2,058.00		B&V Rate Sheet (2-1-08)
			SUBTOTAL:		$13,623	
Clean Soil Backfill						
Cat 330 Excavator	9	hr	$216.00	$1,944.00		B&V Rate Sheet (2-1-08)
35-ton Articulated Truck (2)	18	hr	$189.00	$3,402.00		B&V Rate Sheet (2-1-08)
Cat D-5 Dozer	9	hr	$139.00	$1,251.00		B&V Rate Sheet (2-1-08)
Foreman	9	hr	$79.00	$711.00		B&V Rate Sheet (2-1-08)
Laborers (2)	18	hr	$53.00	$954.00		B&V Rate Sheet (2-1-08)
Re-vegetation	2	ac	$1,575.00	$3,150.00		B&V Site 1 Cap Rates (8/11/08)
			SUBTOTAL:		$11,412	
Pavement Cleaning						
Pavement Cleaning	7	hr	$139.29		$975	Progressive Sweeping (12-3-08)
Equipment Decontamination						
Operator	24	hr	$32.00	$768.00		Impact Environmental (12-2-08 fax)
Technician	24	hr	$28.00	$672.00		Impact Environmental (12-2-08 fax)
Service/Support vehicle	24	hr	$37.57	$901.68		Impact Environmental (12-2-08 fax)
10-200 Hydroblast Unit	24	hr	$72.00	$1,728.00		Impact Environmental (12-2-08 fax)
			SUBTOTAL:		$4,070	
Construction Drawings						
Construction Drawings					$20,452	NTH Proposal (12/9/08)
Survey						
Initial control survey				$3,215.00		Midwestern Consulting, Inc. (11-26-08)
Survey of initial grades				$21,420.00		Midwestern Consulting, Inc. (11-26-08)
Survey of membrane seams				$18,200.00		Midwestern Consulting, Inc. (11-26-08)
Survey of final grades				$8,570.00		Midwestern Consulting, Inc. (11-26-08)
Drawings and Documentation				$7,500.00		Midwestern Consulting, Inc. (11-26-08)
			SUBTOTAL:		$58,905	
CQA						
Construction Quality Assurance	62	ac	$7,350.00	$455,700.00		NTH e-mail (12/9/08) - "No change from 2008
			SUBTOTAL:		$455,700	
Project Management & Certification						
Project Management & Certification	62	ac	$1,575.00	$97,650.00		NTH e-mail (12/9/08) - "No change from 2008
			SUBTOTAL:		$97,650	
Transfer Box Decommisioning			SUBTOTAL:		$70,500	
TOTAL					**$8,975,765**	

HAZARDOUS WASTE MANAGEMENT CERTIFICATE OF INSURANCE FOR CLOSURE OR POST-CLOSURE CARE

The certificate of insurance for closure or post-closure care must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted. Submit original documents to the Hazardous Waste and Radiological Protection Section, Waste and Hazardous Materials Division, Department of Environmental Quality, PO Box 30241, Lansing, Michigan 48909-7741.

Certificate of Insurance for Closure or Post-Closure Care

Name and Address of Insurer (herein called the "Insurer"):
Chartis Specialty Insurance Company
175 Water Street
New York, NY 10270

Name and Address of Insured (herein called the "Insured"):
EQ Holdings, Inc.
36255 Michigan Avenue
Wayne, MI 48184

Facilities covered:
EQ Resource Recovery, Inc.
36345 Van Born Road
Romulus, MI 48174
MID 069 975 844
Closure Amount: $495,252

Michigan Disposal Waste Treatment Plant
49350 North I-94 Service Drive
Belleville, MI 48111
MID 000 724 831
Closure Amount: $750,242

Wayne Disposal Inc.
Site #2 (Master Cells V, VI and VII)
49350 North I-94 Service Drive
Belleville, MI 48111
MID 048 090 633
Closure Amount: $7,652,775
Post Closure Amount: $ 6,479,348

Face amount: $15,337,616

Policy number: EPP 8089594

Effective date: September 30, 2010

The Insurer hereby certifies that it has issued to the Insured the policy of insurance identified above to provide financial assurance for closure and post-closure care for the facilities identified above. The Insurer further warrants that such policy conforms in all respects with the requirements of R 299.9708 of the Michigan Administrative Code as such rule was constituted on the date shown immediately below. It is agreed that any provision of the policy inconsistent with the rule is hereby amended to eliminate such inconsistency.

MAC R 299.9708
EFFECTIVE 9/22/98

The Insurer further certifies all of the following:

1. The Insurer is licensed to transact the business of insurance, or is eligible to provide insurance as an excess or surplus lines insurer, in the state of Michigan.
2. The Insurer has a minimum of $7,000,000.00 of unimpaired surplus funds.
3. The Insurer assumes financial responsibility for the accepted risk, pursuant to the terms of the policy, using its own pool of resources that is independent, separate, and unrelated to that of the Insured.

A duplicate original of the policy listed above, including all endorsements thereon, is being submitted along with this certificate to the Michigan Department of Environmental Quality.

I hereby certify that the wording of this certificate is identical to the wording specified by the Michigan Department of Environmental Quality, as such certificate was specified on the date shown immediately below.

S. Smith

Scott Smith
Vice President

Signature of witness or notary: T Maffiore
September 30, 2010

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
TIMOTHY J. MAFFIORE, Notary Public
City of Philadelphia, Phila. County
My Commission Expires May 5, 2012

Comerica Bank

SWIFT : MNBD US 33
FAX (313) 222-9324

COMERICA BANK
411 WEST LAFAYETTE, MC 3341
DETROIT, MICHIGAN 48226

Director
Department of Natural Resources and Environment
c/o Environmental Resource Management Division
Hazardous Waste Section
P.O. Box 30241
Lansing, Michigan 48909-7741

Director, Department of Natural Resources and Environment:

1. We hereby issue our irrevocable Letter of Credit #650496-04 in your favor on behalf of Wayne Disposal, Inc., hereinafter known as the Company, for a sum of $ 4,635,132.00 (Four Million, Six Hundred Thirty Five Thousand, One Hundred Thirty-two dollars and 00/100 Dollars), available by your drafts at sight drawn on our institution, Comerica Bank, marked "Drawn under Comerica Bank Letter of Credit # 650496-04 dated March 3, 2011." We are a bank or financial institution which has the authority to issue Letters of Credit. Our Letter of Credit operations are regulated and examined by the Federal Reserve Bank of Dallas, and the Texas Department of Banking.

2. This Letter of Credit is issued to provide financial assurance to the State of Michigan, Department of Natural Resources and Environment for Closure and Post-Closure care of the following hazardous waste management facility(ies): Wayne Disposal, Inc., 49350 North I-94 Service Drive, Belleville, Michigan 48111, MID048090633 in the amount of $4,635,132.00.

3. This Letter of Credit shall expire on March 3, 2012 but such expiration date shall be automatically extended for periods of one year, unless, not less than 120 days before the current expiration date, we notify both you and the Company by certified mail of our decision not to extend the current expiration date. We agree that the 120 day period shall begin on the date when both you and the Company have received the notice, as evidenced by the return receipts.

4. You may draw on this Letter of Credit in the event that you issue a notice of violation or other order in accordance with the administrative rules promulgated pursuant to Part 111 of Act 451, as amended, indicating that the Company has failed to properly execute its closure/postclosure care responsibilities. You also may draw on this Letter of Credit in the event that the Company fails to provide you with an extension of this Letter of Credit, an acceptable replacement Letter of Credit, or another type of financial assurance acceptable to you, within 90 days after receipt by both you and the Company of a notice from us that we have decided not to extend this Letter of Credit beyond its current expiration date.

5. Partial drawings are permitted. This original Letter of Credit must be submitted to us together with any drawings hereunder for our endorsement of any payments effected by us and/or for cancellation.

(Continued page 2)

Comerica Bank

SWIFT : MNBD US 33
FAX (313) 222-9324

COMERICA BANK
411 WEST LAFAYETTE, MC 3341
DETROIT, MICHIGAN 48226

6. This Letter of Credit is subject to the Uniform Customs and Practice for Documentary Credits (2007 Revision, International Chamber of Commerce Publication No. 600, with the exception of Article 38(c)), and the Michigan Uniform Commercial Code, where applicable. Where conflicts exist between the Uniform Customs and Practice for Documentary Credits and the Michigan Uniform Commercial Code, the Michigan Uniform Commercial Code shall control.

7. We shall honor drafts drawn under and in compliance with the terms of this Letter of Credit and these drafts will be duly honored upon presentation to us if presented on or after March 3, 2011, and on or before March 3, 2012, or any automatically extended date as provided in paragraph 3 above. The amount of each draft must be endorsed on the reverse of this Letter of Credit by us.

8. We certify that the wording of this Letter of Credit is identical to the wording provided by the Michigan Department of Natural Resources and Environment as of the date shown immediately below.

Comerica Bank
411 W. Lafayette, MC 3341, Detroit, Michigan 48226

M. Jane Moore

M. Jane Moore, Vice President
Date: March 3, 2011

COST ESTIMATES

Section 40 Tank Systems

TANK SYSTEM PLANS AND SPECIFICATIONS

40 CFR 270.16

FORM EQP 5111 ATTACHMENT TEMPLATE C2
TANK SYSTEMS

This document is an attachment to the Michigan Department of Natural Resources and Environment's (DNRE) *Instructions for Completing Form EQP 5111, Hazardous Waste Treatment, Storage, and Disposal Facilities Construction Permit and Operating License Application Form*. See Form EQP 5111 for details on how to use this attachment.

R 299.9615 and R 299.9627 of the administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); R 29.4101 to R 29.4505 promulgated pursuant to the provisions of the Michigan Fire Protection Act, PA 207, as amended (Act 207); and Title 40 of the Code of Federal Regulations (CFR) §§270.14(d), 270.16, 270.24, and 270.27 (Part 264, Subpart J and Part 60, Appendix A) establish requirements for tank systems. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003.

This license application template addresses requirements for tank systems at the Wayne Disposal, inc. facility in Belleville, Michigan. This template includes assessments of new and existing tank systems; installation of new tank systems; secondary containment systems and release detection; variances for secondary containment; controls and practices to prevent spills and overfills; inspections; response to leaks or spills and disposition of leaking or unfit-for-use tank systems; closure and postclosure requirements; requirements for storing or treating ignitable, reactive, or incompatible wastes

(Check as appropriate)

☐ Existing Tank System

☒ New Tank System

C2.B NEW TANK SYSTEM

Details for the construction and operation of the tank system are provided in Section 40 of the Operating License Application. The proposed tank is actually a three-sided transfer structure for waste materials delivered to the WDI hazardous waste landfill. The tank is utilized as an area where hazardous waste in transferred from the transporter to the landfill, and in some cases, is utilized to add non-biodegradable sorbent or consistency improvement materials to the waste. The tank is designed to contain incidental liquids or precipitation that may come into contact with waste.
The volume of this tank, 1,000 cubic yards,

C2.B.1 Design

The new tank was designed using engineering standards, taking into consideration the maximum quantity and weight of waste that could be placed in the tank at any time. Engineering drawings and specifications have been

submitted to MDEQ, including appropriate foundation and structural support information used in the construction of the tanks.

Cement Thickness: Cement floor 16"

Shell Thickness: Minimum 3/4" steel on sidewalls

C2.B.2 Dimensions and Capacity of Each Tank

Dimensions: 60′ W x 50′ L x 9' D

Capacity: 1,000 cubic yards (18" freeboard – wheel stop)

C2.B.3 Description of Feed Systems, Safety Cutoff, Bypass System, and Pressure Controls

C2.B.3(a) Feed – Direct unloading from transfer vehicle
C2.B.3(b) Safety Cutoff or Bypass Systems – N/A
C2.B.3(c) Tank is open to atmosphere

C2.B.4 Diagram of Piping, Instrumentation, and Process Flow – N/A

C2.B.5 Characteristics of Waste – See Waste Analysis Plan

C2.B.6 External Corrosion Protection – None

C2.B.7 Protection from Vehicular Traffic – NA

C2.D SECONDARY CONTAINMENT SYSTEMS AND RELEASE DETECTION

The secondary containment system for the tank consists of a two HDPE geomembrane layers beneath the concrete/steel vault. The first geomembrane is located beneath the structural fill that underlies the tank and provides secondary containment should any material pass through the concrete or asphalt paved areas in and around the tank. This geomembrane is sloped toward, and connected to the leachate collection system of Cell VI-B and any liquid encountering the secondary containment will flow by gravity into the leachate collection system. The second HDPE geomembrane underlies the first only in the area beneath the tank. This containment layer slopes toward the sump within the tank and is accessed by an observation well that allows measurement and/or sampling of any liquid that accumulates on top of the second geomembrane. Details are provided in the engineering drawings for the tank. This provides leak detection capability consistent with 264.193(c)(3).

C2.F CONTROLS AND PRACTICES TO PREVENT SPILLS AND OVERFILLS

The tank is continuously monitored by on-site personnel during the unloading and loading process at the transfer point to ensure that no spills occur and that adequate freeboard (18 inches) is maintained at all times.

C2.G INSPECTIONS

The inspections of the tank are be conducted on a daily, weekly and annual basis to detect any damage, leaks, cracks, corrosion or erosion of the tank construction materials that may occur. On a daily basis, for any day in which the tank is not empty, the above ground portions of the tank shall be inspected for evidence of cracks or other damage to the concrete or steel and accumulation of liquid in the sump. The tank is considered empty if there are no active operations in the tank on that day and the amount of residue in the tank does not exceed the standard listed in 261.7(b)(1). The details of the daily inspection are included on the attached inspection form. On a weekly basis, the inspection shall be expanded to include a measurement of liquids within the leak detection system and inspection of the area around the tank including the run-on prevention structures, storm water collection structures and the retaining wall. Specific details of the weekly inspection are included on the attached inspection form. The monitoring of the leak detection system for the tank is described in a Tank System Leak Detection Monitoring Plan. On an annual basis, the concrete thickness and steel thickness will be measured to determine how much wear has occurred and whether repair or replacement is required. Annual inspection requirements are also detailed on the inspection form.

C2.H RESPONSE TO LEAKS OR SPILLS AND DISPOSITION OF LEAKING OR UNFIT-FOR-USE TANK SYSTEMS

If it is determined that waste has entered the leak detection system, the tank will be emptied and surveyed to determine the source of the leak. The containment will be repaired, the repair will be tested and then certified by a registered engineer prior to the tank being placed back into service. Spills or releases in the area surrounding the tank will be handled in accordance with WDI's contingency plan.

C2.I CLOSURE AND POSTCLOSURE REQUIREMENTS

Closure of the tank is included in the post-closure plan for the facility as described in Section 34 of the Operating License application.

1.0 INTRODUCTION

The hazardous waste transfer box is tank used in the waste receiving and in certain cases waste treatment at WDI. The tank is actually a three-sided transfer structure for waste materials delivered to the WDI hazardous waste landfill. The only liquid present in the waste are "incidental" liquids related to separation or precipition during waste transport. No liquids are transferred from the tank to the landfill as this is prohibited by rule. The tank is utilized as an area where hazardous waste in transferred from the transporter to the landfill, and in some cases, is utilized to add non-biodegradable sorbent or consistency improvement materials to the waste. The tank is designed to contain incidental liquids or precipitation that may come into contact with waste.

The volume of this tank, 1,000 cubic yards, is included in the permitted capacity of the the landfill until such time it is removed from service.

2.0 REGULATORY REQUIREMENTS

This section describes the state and federal requlatory requirements for new tank sytems, the applicability of these regulations to WDI and how WDI proposes to meet these regulations. Federal tank system regulations are described in 264.190-96 and 270.16 of 40 CFR. State regulations are found in R 299.9615. Information required for permitting new tank systems is described below.

270.16 (a) The design standards used for the WDI tank includes best management and good engineering practices. The tank is constructed of mild steel armored over concrete walls with a concrete floor. Wastes incompatible with the materials of construction of the tank are not placed

in the tank. With the exception of incidental liquids, all waste are solids; and reactive, corrosive, ignitable and other prohibited wastes are not accepted for disposal by WDI (see Waste Analysis Plan). A certification that this tank system is acceptable for storing hazardous waste is included with the design drawings.

270.16 (b) Tank dimensions, capacities and shell thickness are listed below in Section 3.0.

270.16 (c) Description of feed sytems, safety cutoff, bypass systems and pressure controls do not apply to this tank as all operations are conducted above ground in an open environment.

270.16 (d) There are no piping or instrumentation associated with the operation of this tank.

270.16 (e) The metal portion of the tank is visible and the outer surface is not in contact with soil or groundwater and thus not susceptible to corrosion.

270.16 (f) New tank systems must be installed in compliance with 264.192(b), (c), (d) and (e). A description of each is provided below.

264.192(b) and (c) Proper handling and installation procedures will be followed during the construction of the tank. Backfill material and specifications are described in the design drawings for the tank.

264.192(d), (e) and (f) Based on the nature of the tank system, tightness testing and ancillary equipment support and corrosion protection do not apply to this tank.

264.192(g) All work associated with the construction of this tank will be certified by a registered professional engineer per 270.11(d).

3.0 DESCRIPTION OF TANKS AND MATERIALS OF CONSTRUCTION

The new tank was designed using engineering standards, taking into consideration the maximum quantity and weight of waste that could be placed in the tank at any time. Engineering drawings and specifications are included with this application. Also included is appropriate foundation and structural support information used in the construction of the tanks. The specifications for the tank are outlined below.

Tank Specifications

Waste Transfer Box - Steel Rectangular Three-sided Tank

Use:	Tank is used to receive and transfer waste from direct landfill waste shipments.
Dimensions:	60′ W x 50′ L x 9' D
Capacity:	1,000 cubic yards (18" freeboard – wheel stop)
Cement Thickness:	Cement floor 16"
Shell Thickness:	Minimum 3/4" steel on sidewalls
Venting:	Tank is open to natural ventilation.
Corrosion Protection:	None.
Overfilling:	All loading operations are manually inspected by WDI personnel.

Containment:	Tank is a three-sided concrete vault lined with ¾-inch plate steel. Below the concrete floor is two layers of HDPE geomembrane. The primary (upper) geomembrane is designed to direct any liquids that may penetrate the 16-inch concrete floor to the leachate collection system of Master Cell 6B. The secondary (lower) geomembrane is designed as a leak detection system with an observation well at the low-point of the system.
Liner:	None. The tank is designed as a steel tank within a concrete containment structure. The concrete containment provides secondary containment.
Vault:	Yes
Double-Walled Tank:	No

4.0 DESCRIPTION OF TANK OPERATION AND SYSTEMS

4.1 TANK PROCESS OPERATION

The waste transfer box is operated as a flow through device. Wastes are dumped from an upper level tipping slab from the waste delivery vehicles (over-the-road trucks or on-site equipment from MDWTP) to the lower receiving slab. In most cases, the waste is moved directly from the tank into the landfill. In some cases, when incidental liquids are present or the consistency of the waste is not optimum for placement in the landfill, non-biodegradable sorbent or reagents such as cement kiln dust (CKD) or lime may be added to the waste and mixed using heavy equipment. Once the waste is suitable for disposal, a wheel loader is used to scoop and load the material into an off-road articulated dump truck for transfer of the waste material into the active hazardous waste landfill. The material is hauled to the active workface where it is dumped, spread and compacted in lifts by the site's track-type tractor (dozer).

Water in the form of precipitation that falls within the tank drains to a sump where it can be pumped on demand to a contact water pond within the landfill. Precipitation that falls in the area

around the tank is contained on the asphalt by curbs and is routed via the storm water conveyance system to the lined pond.

4.2 SECONDARY CONTAINMENT

Secondary containment and release detection requirements are outlined in 264.193. The secondary containment system for the tank consists of a two HDPE geomembrane layers beneath the concrete/steel vault. The first geomembrane is located beneath the structural fill that underlies the tank and provides secondary containment should any material pass through the concrete or asphalt paved areas in and around the tank. This geomembrane is sloped toward, and connected to, the leachate collection system of Cell VI-B and any liquid encountering the secondary containment will flow by gravity into the leachate collection system. The second HDPE geomembrane underlies the first only in the area beneath the tank. This containment layer slopes toward the sump within the tank and is accessed by an observation well that allows measurement and/or sampling of any liquid that accumulates on top of the second geomembrane. Details are provided in the engineering drawings for the tank. This provides leak detection capability consistent with 264.193(c)(3).

4.3 GENERAL OPERATING REQUIREMENTS

General operating requirements are outlined in 264.194. Spill prevention and freeboard requirements apply to the tank at WDI. The tank is continuously monitored by on-site personnel during the unloading and loading process at the transfer point to ensure that no spills occur and that adequate freeboard (18 inches) is maintained at all times.

4.4 INSPECTIONS

The inspections of the tank are be conducted on a daily, weekly and annual basis to detect any damage, leaks, cracks, corrosion or erosion of the tank construction materials that may occur. On a daily basis, for any day in which the tank is not empty, the above ground portions of the tank shall be inspected for evidence of cracks or other damage to the concrete or steel and accumulation of liquid in the sump. The tank is considered empty if there are no active operations in the tank on that day and the amount of residue in the tank does not exceed the standard listed in 261.7(b)(1). The details of the daily inspection are included on the attached inspection form. On a weekly basis, the inspection shall be expanded to include a measurement of liquids within the leak detection system and inspection of the area around the tank including the run-on prevention structures, stormwater collection structures and the retaining wall. Specific details of the weekly inspection are included on the attached inspection form. The monitoring of the leak detection system for the tank is described in the attached Tank System Leak Detection Monitoring Plan. On an annual basis, the concrete thinkness and steel thickness will be measured to determine how much wear has occurred and whether repair or replacement is required. Annual inspection requirements are also detailed on the inspection form.

4.5 RESPONSE TO LEAKS OR SPILLS

If it is determined that waste has entered the leak detection system, the tank will be emptied and surveyed to determine the source of the leak. The containment will be repaired, the repair will be tested and then certified by a registered enginee prior to the tank being placed back into service. Spills or releases in the area surrounding the tank will be handled in accordance with WDI's contingency plan.

WAYNE DISPOSAL SITE #2 LANDFILL
WASTE TRANSFER TANK INSPECTION REPORT

Daily ☐
Weekly ☐
Annual ☐

Date: _____
Time: _____
Inspector: _____

INTERVAL	DESCRIPTION	ACCEPTABLE?		CORRECTIVE ACTION (Who, What)	COMPLETED (When)
		Yes	No		
Daily	Cement Floor				
	Steel Walls				
	Sump				
Weekly	Leak Detection Observation Well				
	Run-on Control				
	Retaining Wall				
	Integrity of Contact Water Piping				
Annually	Cement Thickness				
	Steel Thickness				

INSPECTION CRITERIA

Daily

Cement Floor - Check for cracks, gaps, or damage to integrity of concrete surface.
Steel Walls - Check for damage to steel, loose bolts, and displacement along seams.
Sump - Check for water in sump. If water present, pump to contact water pond.

Weekly

Leak Detection Observation Well - Check for presence of water in leak detection well with electronic sounding device.
Run-on Control - Check curbs, gutters, speed bumps, and asphalt surface for damage or obstructions.
Retaining Wall - Check for erosion of earth or displacement of seams.
Integrity of Contact Water Piping - Check for water discharge within the contact water sump at the transition of the double-contained HDPE conveyance piping to the primary pump discharge pipe.

Annual

Cement Floor Thickness - Survey floor to determine how much wear has occurred, at 4-inches of wear the surface should be repaired.
Steel Thickness - Measure thickness to determine degree of degradation. Replace if less than two-thirds of the original plate thickness.

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TANK SYSTEM LEAK DETECTION MONITORING PLAN

1.0 INTRODUCTION

WDI utilizes a three-sided tank structure for waste materials delivered to the Wayne Disposal, Inc. (WDI) hazardous to transfer waste from the waste transporter to the landfill. The waste transfer box is operated as a flow through device. Wastes are dumped from an upper level tipping slab from the waste delivery vehicles to the lower receiving slab, or floor of the tank. Within the tank the waste is loaded into dedicated dump trucks for transfer into the active hazardous waste landfill. This process eliminates the need for waste delivery vehicles to go into the active work area.

Because this tank structure is regulated as a tank per R 299.9615, it must include leak detection monitoring per R299.9615(1) and 40 CFR 264.193(a).

2.0 DESCRIPTION OF TANK AND LEAK DETECTION SYSTEM

The waste transfer tank is a three-sided concrete vault with the walls lined with ¾-inch plate steel. The concrete floor is 16 inches thick. No liquid wastes can be dumped into the waste transfer tank. However, water in the form of precipitation can contact waste within the tank. Any water that accumulates within the tank drains to a sump where it is pumped on demand to a contact water pond within the landfill. Precipitation that falls in the area around the tank is contained on the asphalt by curbs and is routed via the storm water conveyance system to the lined pond.

The secondary containment system for the tank consists of a two HDPE geomembrane layers beneath the concrete/steel vault. The first geomembrane is located beneath the structural fill that

underlies the tank and provides secondary containment should any material pass through the concrete or asphalt paved areas around the tank. This geomembrane is sloped toward, and connected to, the leachate collection system of Cell VI-B and any liquid encountering the secondary containment will flow by gravity into the leachate collection system. The second HDPE geomembrane underlies the first only in the area beneath the tank. This containment layer slopes toward the sump within the tank and is accessed by an observation well that allows measurement and/or sampling of any liquid that accumulates on top of the second geomembrane. This provides leak detection capability consistent with 264.193(c)(3).

3.0 LEAK DETECTION MONITORING

Prior to operating the tank, water levels within the observation well will be collected to determine if there is any water within the system. It is expected that there may be "construction water" in the system at this time. If enough water is present, a sample will be collected using a disposable bailer and the sample analyzed for WDI's ground water monitoring parameters as listed in the groundwater sampling & analysis plan. This will serve as a baseline evaluation. It is possible that liquids will continue to accumulate as a result of delayed gravity seepage of construction water and possibly condensation. Therefore, for the first month after a sample is collected the system will be bailed dry on a weekly basis to attempt to dry out the system.

During tank operation, leak detection monitoring is conducted weekly as part of the required weekly inspection requirements for the tank. During the weekly inspection, the water level within observation well will be checked. If the presence of liquids is indicated the level will be noted and the level will be monitored daily for one month. After one month, the level data will

be evaluated to determine if the levels are increasing and/or responding to precipitation events. If the levels do not increase or respond to precipitation events the liquid will be removed and weekly monitoring will be resumed. If the levels are increasing or responding to precipitation events, a sample will be collected and analyzed for the same constituents as the baseline analysis. These results will be evaluated with respect to baseline and a determination will be made as to whether the source of the liquid is from the tank.

If it is determined that the tank is the source of liquid to the leak detection system, the tank will be emptied and surveyed to determine the source of the leak. The containment will be repaired, the repair will be tested and then certified by a registered engineer prior to the tank being placed back into service. In the event that the source of liquid is not the tank, WDI will propose additional measures to identify the source and/or recommend changes to the monitoring plan.

WDI will report to the WHMD within 24 hours of determining that liquids are present within the leak detection system and that daily monitoring will begin. At the end of the one month of daily monitoring, WDI will submit a report of the findings to WHMD and if necessary will arrange the sampling event within 7 days. The results of the sampling and a report of the results will be submitted to the WHMD within 30 days of collecting the sample.

NTH Consultants, Ltd.
Infrastructure Engineering
and Environmental Services

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Northville, MI 48168-3459
248.553.6300
248.324.5178 Fax

Mr. Michael Takacs
Environmental Quality Company
Wayne Disposal, Inc.
49350 North I-94 Service Drive
Belleville, Michigan 48111

October 5, 2011
NTH Project No. 13-060921-03

RE: Site No. 2 Hazardous Waste Transfer Box
Tank System Assessment Report

Dear Mr. Takacs

This report has been prepared for the Wayne Disposal Inc., Site No. 2 Hazardous Waste Transfer Box as an independent assessment of the tank system to comply with 40 CFR 264.192 (a) and the requirements of the applicable administrative rules developed by the Michigan Department of Environmental Quality (MDEQ) under Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451.

A description of the tank system is included in the WDI Operating License Application – Master Cells VI-F & G (Application), Volume II-Section 40: Tank System Plans and Specifications. In general, the tank consists of a three-sided reinforced concrete retaining wall structure with a 1'-4" thick reinforced concrete floor. The tank, which is a transfer structure for waste materials delivered to the WDI hazardous waste landfill, is nominally 60'-0" wide by 50'-0" long and 9'-0" tall. The floor and retaining wall foundations of the tank sit on a bedding of compacted engineered fill/existing site soils. Two sides of the transfer box reinforced concrete retaining walls are supplemented with steel armor plates to protect the concrete during waste transfer operations. Beneath the reinforced concrete floor is a secondary containment system consisting of two geocomposites, HDPE geomembranes and geosynthetic clay liners (GCL) to provide secondary containment should any material pass through the concrete or asphalt paved areas. The design drawings entitled "Wayne Disposal, Inc. Site No. 2-Transfer Box Relocation, September 2009" prepared by NTH Consultants Ltd., were transmitted to your office and to the MDEQ on December 28, 2009. The details from this design package have been included on Sheets 26 and 27 of the Engineering Drawings in Volume III of the Application.

To satisfy the requirements of 40 CFR 264.192 (a), the proposed transfer box design and applicable sections of the Application were reviewed to attest that the tank system has sufficient structural integrity and is acceptable for storing and treating of hazardous waste. The following sections further describe the foundation, structural support, and lining system design for the transfer box.

TRANSFER BOX DESIGN CONSIDERATIONS

Tank Foundation & Structural Design

As noted above, the waste transfer box is a three sided reinforced concrete retaining wall structure which is opened to the east. The box is designed to be 60'-0" long by 50'-0" wide with a nominal working height of 9'-0". The south wall is designed for loading the box from above. The reinforced concrete wall is designed to be 2'-6" thick at the top and thicken to 5'-6" near the bottom. The west wall is designed to be 2'-6" thick reinforced concrete and is intended to be used, in addition to the south wall, by the waste transfer equipment to push the waste material against it during transfer / loading. The north wall is designed to be 1'-6" thick reinforced concrete.

The concrete waste transfer box retaining walls and floor slab were designed in accordance with ACI 350-06 Code Requirements for Environmental Engineering Concrete Structures and ACI 318-08 Building Code Requirements for Structural Concrete. Loading considerations accounted for truck loads, forces applied to the tipping walls due to front end loader equipment and accumulated waste (assumed to be 1,000 psf or 7 psi due to 9'-0" of hazardous waste). Flotation and seismic influences are not a design concern due to the nature of groundwater at the site and location of seismic faults at the project location. Refer to Volume IV of the Application for additional description of groundwater and seismic conditions. The tank is designed to withstand frost heave since the footing burial depth of 3'-6" is beneath the local grade line. Each of the walls is designed to be conventionally reinforced with No.7 and No. 5, ASTM A615, Gr. 60 reinforcement bars and to bear on conventional spread footings. The transfer box floor is designed to be 1'-4" thick concrete, reinforced with steel fibers. All of the transfer box concrete has a design minimum compressive strength of 4,500 psi at 28days, 6% (+/- 1.5%) air entrainment and a maximum water to cement ratio of 0.45.

The south (tipping) and a portion of the west wall are designed with ¾" thick ASTM A36 steel armor plates. The intent of the steel plates is to provide a wearing surface only and is not intended to provide liquid containment. The steel plates are designed such that they can be removed and replaced when they become damaged or corroded due to the scraping of the loading equipment and waste material.

Additionally, the transfer box is a concrete structure with a minimum of 0'-3" of concrete cover over the steel reinforcement bars where bearing on the soil. As such, the potential for corrosion due to soil moisture, soil pH, sulfides and resistivity have been mitigated.

Tank Secondary Containment & Other Design Components

A detailed description of the secondary containment and other design components of the transfer box are included in Volume II-Section 40 of the Application. In general, the primary containment for hazardous waste and liquids within the transfer box is the reinforced concrete retaining walls and floor. Rainwater and liquids within the transfer box drain to a sump located in the corner of the tank, away from site operations and is protected from vehicular traffic with a pipe bollard. No additional underground components of the tank system are anticipated to be affected by vehicular traffic. Access piping consists of dual-contained High-Density Polyethylene (HDPE) pipe located above-ground that runs over the transfer box retaining walls to inside the landfill limits. The liquids generated from precipitation events are pumped, on-demand, via the access piping to the contact water pond within the landfill to be treated in the future by the on-site Waste Water Treatment Plant (WWTP). Routine inspection procedures, conducted by site personnel, are specified to ensure the integrity and operation of the transfer box to store and treat hazardous waste.

Secondary containment for the transfer box consists of a double-synthetic lining system comprised of two layers of geocomposite, HDPE geomembrane, and a geosynthetic clay liner (GCL). The first geomembrane is located beneath the floor slab, sloping toward and connecting to, the lining system of Master Cell (MC) VI-B. This liner gravity drains any liquids that pass through the concrete or asphalt paved areas to the leachate collection system of MC VI-B. The second geomembrane, which underlies the first, slopes toward the sump in the tank and provides an observation well to allow for the sampling/measurement of any liquid in the secondary lining system. This observation well provides leak detection capabilities for the tank system to be monitored in accordance with the "Tank System Leak Detection Monitoring Plan" included in Volume II-Section 40 of the Application.

Volume I-Section 12: Waste Analysis Plan in the Application details the hazardous characteristics of waste to be handled within the transfer box. Additionally, Volume II-Section 40 in the Application outlines the tank process operations that will be utilized within the transfer box. Generally, inbound wastes for disposal in the Site No. 2 hazardous waste landfill will be transferred by the transporter to the transfer box. Hazardous waste is then moved by site personnel to the active disposal area of the landfill. In some cases, WDI may add and mix non-biodegradable sorbent or reagents, such as cement kiln dust or lime, to the waste within the transfer box, prior to landfilling.

During construction of the new transfer box, WDI retained the services of CTI and Associates Inc. (CTI) to observe that the construction was completed in accordance with the approved plans. CTI submitted a report entitled "Site No. 2 Transfer Box Relocation Construction Quality Assurance Documentation Report" dated July 21, 2011 to the MDEQ certifying that the construction was in accordance with the design. The MDEQ approved the certification on August 24, 2011. A copy of the certification letter is appended to this report.

CONCLUSION

Based on the information provided, it is NTH's opinion that the Site No. 2 Hazardous Waste Transfer Box tank system was sufficiently designed, has adequate structural integrity, and is acceptable for the storing and treating of hazardous waste as described in this report.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

NTH Consultants, Ltd.

Joseph F. Jackson, P. E., CWI
Principal Engineer

Ibraheem Shunnar, P. E.
Vice President

attachment

JFJ/ISS/tt

STATE OF MICHIGAN
JOSEPH F. JACKSON
ENGINEER
No. 28535
LICENSED PROFESSIONAL ENGINEER

STATE OF MICHIGAN
IBRAHEEM ALSHUNNAR
ENGINEER
No. 39106
LICENSED PROFESSIONAL ENGINEER

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

RICK SNYDER
GOVERNOR

DAN WYANT
DIRECTOR

August 24, 2011

Mr. Kerry Durnen, P.E.
Director of Operations
The Environmental Quality Company
Wayne Disposal, Inc.
49350 North I-94 Service Drive
Belleville, Michigan 48111

Dear Mr. Durnen:

SUBJECT: Approval of Site No. 2 Transfer Box Relocation Construction Quality Assurance Documentation Report (Report); Wayne Disposal, Inc. (WDI); MID 048 090 633

The Department of Environmental Quality (DEQ), Resource Management Division (RMD), has reviewed the July 2011 Report, which was submitted on your behalf by CTI and Associates, Inc., pursuant to Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Based on that review, the RMD has determined that the construction activities were done in accordance with the approved plans, and the Report is hereby approved.

Should you require further information, please contact me at 517-373-7397; quackenbushp@michigan.gov; or DEQ, P.O. Box 30241, Lansing, Michigan 48909-7741.

Sincerely,

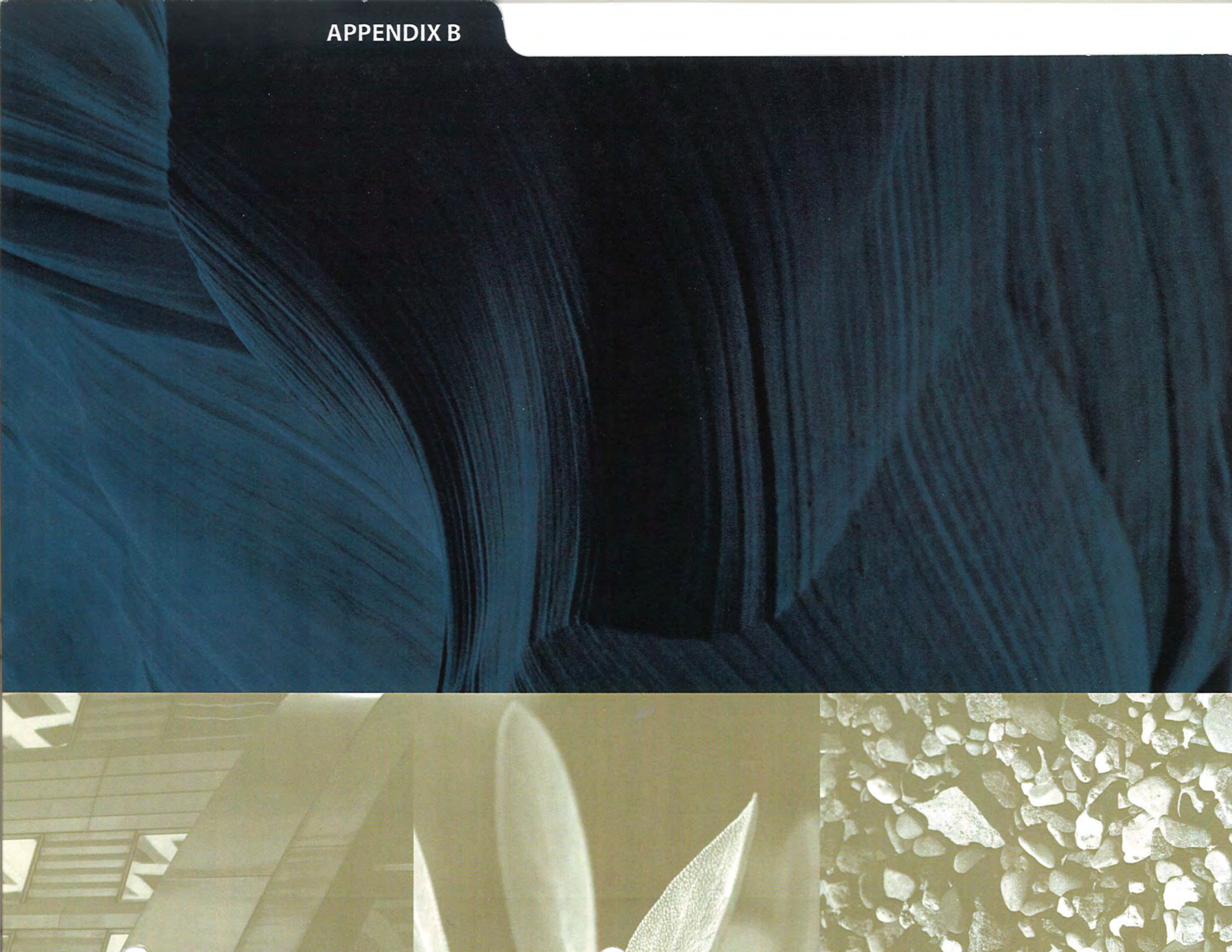
Peter Quackenbush
Senior Environmental Engineer
Hazardous Waste Section
Resource Management Division

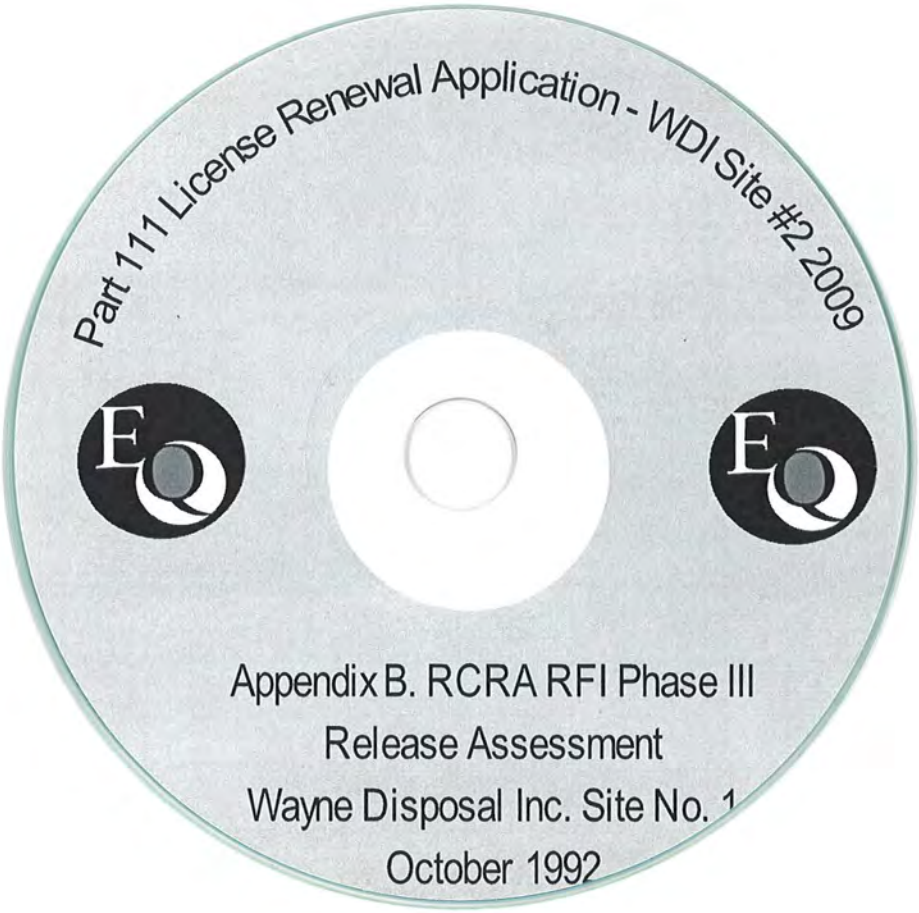
cc: Mr. Michael Porath, WDI
Mr. Kevin Foye, CTI and Associates, Inc.
Mr. Ibraheem Alshunnar, NTH Consultants, Ltd.
Mr. Mike Busse, DEQ
Mr. Leo Parks, DEQ
Dr. Dan Qian, DEQ
Operating License File

APPENDIX A

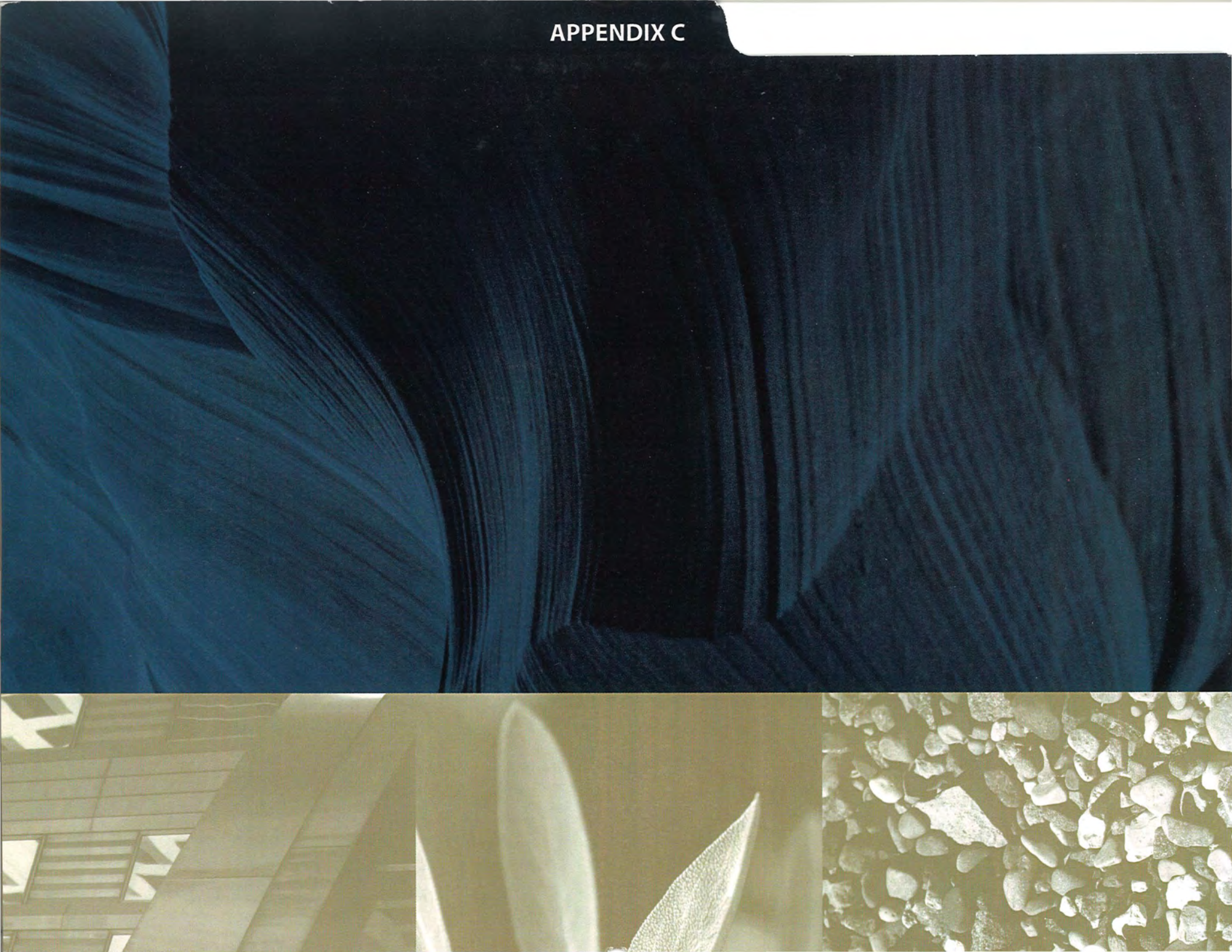
WDI - Site No. 2 - Master Cell VI - F&G
Engineering Design Drawings
February 2011
NTH Consultants, Ltd.
Infrastructure Engineering &
Environmental Services
www.nthconsultants.com

APPENDIX B




Part 111 License Renewal Application - WDI Site #2 2009
Appendix B. RCRA RFI Phase III
Release Assessment
Wayne Disposal Inc. Site No. 1
October 1992

APPENDIX C



Appendix C.
Report on Host Community Engagement in Support of Operating License Application
Wayne Disposal, Inc.

Report on Host-Community Engagement In Support of Operating License Application Wayne Disposal, Inc.

Background – Wayne Disposal, Inc. (WDI) is in the process of applying for a Part 111 Operating License to construct and operate two additional hazardous waste disposal landfill cells at the Site 2 facility in Belleville, Michigan. As WDI was preparing the application, the State of Michigan Legislature passed S.B. No. 1564 to revise portions of 1994 Public Act 451 related to the application for Part 111 Operating Licenses. Under Sec. 11123(2) paragraph (D) of S.B. 1564 and the Part 111 rules, the Applicant must conduct a pre-application public meeting that is advertised in the newspaper and radio at least 30 days before the meeting. An account of the meeting and a written summary of any public comments, including the Applicant's response to the comments, must be submitted as part of the license application.

Furthermore, under Section 11123(2) paragraph (L) of S.B. 1564, the Applicant must demonstrate "that the applicant has considered each of the following":

i. The risk and impact of accidents during transportation of waste

ii. The risk and impact of fires or explosions from improper storage and disposal

iii. The impact on the municipality in terms of health, safety, cost and consistency with local planning and existing development

iv. The nature of environmental impact including the predictable adverse effects on
   A. The natural environment and ecology
   B. Public health and safety
   C. Scenic, historic, cultural and recreational values
   D. Water and air quality and wildlife

These are issues formerly considered by the Site Review Board (SRB), which was disbanded by Executive Order and excised from PA 451 by S.B. 1564. Paragraph (M) of this statutory section then requires the applicant to prepare a summary of measures evaluated to mitigate the impacts identified and a detailed description of the measures to be implemented by the applicant. It is clear that the intent of S.B. 1564 is for the Applicant to engage the surrounding host community where the facility is located to consider and receive input regarding these SRB issues as a pre-condition for submitting a Part 111 License application.

This report documents WDI's efforts to meet the obligations for interaction with its host community (Van Buren Township) in preparation for submittal of the license application.

Strategy – As these pre-application requirements were new, there was no precedent or guidance established for the host community engagement process. Therefore, WDI proposed the following five step process to the Michigan Department of Environment and Natural Resources (MDNRE) to complete the pre-application requirements. The MDNRE agreed in principle that this strategy was adequate to meet the obligations under the law. Each step is described below:

1. Introductory Public Meeting – This meeting was advertised in a local paper, The Eagle, and was conducted on December 9, 2010. The purpose of this meeting is to introduce, to the public, WDI's plans to submit an application to construct hazardous waste landfill capacity beyond that currently permitted. The focus was on what WDI is proposing to do, why it is necessary and how it will be done. WDI also described some of the operational procedures and monitoring programs that are in place to ensure public safety and announced the plan for a second public meeting to discuss SRB issues.

2. Meeting with Van Buren Township Environmental Commission – This meeting was conducted on December 15, 2010. This meeting was an interactive presentation. WDI described the proposed project and the licensing process and then went through each of the SRB issues described above in detail. For each issue, WDI described each potential risk or impact and how WDI is controlling (or will control) each.

3. Meeting with VBT Public Safety Staff – This meeting, held on January 5, 2011, focused on the public safety issues and on the interaction between WDI and the various VBT Departments, such as the Fire Department. The VBT Fire Chief (Loyer) and the VBT Director of Public Safety (McClanahan) met with WDI personnel.

4. Presentation to VBT Board of Trustees – This meeting was conducted on January 10, 2011 at a work/study session of the VBT Board of Trustees. At this meeting, WDI presented a draft of the presentation to be made at the second public meeting and asked for comments and input from the Board.

5. Second Public Meeting – The second public meeting was conducted on January 31, 2011. The meeting was announced in the Detroit News on December 29, 2010 and on radio station WWJ on December 31, 2010 at 2:16 pm and 7:14 pm. The presentation for this meeting covered an abbreviated version of the introductory meeting plus a presentation of the SRB issues and WDI's plans to mitigate these issues.

Summary – In fact, WDI's public outreach with Van Buren Township began years ago and culminated with a Host Community Agreement (HCA) in September of 2009 (see Appendix A). In the agreement VBT agreed to be WDI's host community and support the continued operation of the facility. The benefits to VBT from the agreement include: 1) substantial improvements to the baseball diamonds northeast of the WDI facility on Beck

Road, including leasing the property to VBT for $1 per year for 99 years, 2) tree plantings in several locations within the Township, 3) reimbursement to VBT for the cost of the Township's consultant to review WDI's license application, 4) construction of a training facility at the shooting range near the ball fields, 5) a free annual household hazardous waste disposal day, 6) at least every 2 years conduct a mock emergency training exercise for the benefit of the Township's Department of Public Safety, and 7) a tipping fee of $1.65 per cubic yard disposed or in the portions of the landfill that become licensed under the license application. In addition, the HCA formalizes the Township's right to enter the site and review all records and requires timely communication regarding any on-site incidents or citizen complaints.

The HCA therefore created a solid relationship between WDI and VBT and addressed many of the SRB issues prior to WDI even starting the public outreach required by the regulations. The following descriptions of the five activities listed above do indeed reflect that the HCA accomplished many of the objectives of host community engagement.

First Public Meeting:

Date/Time: 7:00 pm, December 9, 2010 (newspaper announcement from November 4, 2010 Eagle is included in Appendix B)

Location: Holiday Inn Express, 46194 North I-94 Service Drive, Belleville, MI 48111

General Public Attendees: None

Local Government Attendees: Fire Chief Loyer

Description: There were no general public attendees at this meeting; however the presentation was made by Bob Doyle of EQ. A copy of the presentation that was made is included in Appendix B.

Comments: None

Meeting with VBT Environmental Commission:

Date/Time: 7:00 pm, December 15, 2010

Location: Van Buren Township Offices, 46425 Tyler Rd., Van Buren Township, MI 48111

General Public Attendees: None

Local Government Attendees: Van Buren Township Environmental Commission

Description: Bob Doyle of EQ made a presentation that was a draft of the presentation that was to be made at the second public meeting focusing on SRB issues. A copy of this presentation as finalized is included in Appendix C.

Comments: Several comments were made by VBT Environmental Commission members, which are summarized as follows:

Comment: It was noted that the royalties to be paid to VBT by WDI was not explicitly included in the presentation and WDI should be prepared to quote the specific benefits of the HCA.

Response: WDI added some detail to the presentation and included a copy of the HCA in the License Application

Comment: What are the geographic limits to WDI's obligation to clean-up and spills or accidents related to trucks bound for the WDI facility?

Response: The HCA requires WDI to provide and pay for clean-up of any incident that occurs in VBT and to reimburse any costs to the township up to a cap of $20K.

Comment: Is it were somehow possible to limit transport to and from the facility during bad weather/road conditions

Response: It would essentially be impossible for WDI to enforce limits on transporters based on weather conditions.

Comment: Has WDI completed its expansion of the fire suppression system that was implemented in response to the truck fire at MDI this summer.

Response: Yes, this work has been completed.

Comment: VBT stated that it would like an improved emergency notification system for the local community.

Response: WDI has agreed in the HCA to provide technical assistance and information to the Township for the development of such as system. However, VBT is developing this system and the project has not yet reached the point for WDI to provide assistance and information.

Comment: A question was raised regarding what elements are in included in the long-term post-closure care and inquired about maintenance requirements and different design elements of the landfill.

Response: The maintenance items are described in detail in the post-closure plan included in the operating license application

Comment: The question was asked why WDI was not mitigating the wetlands in Van Buren Township.

Response: WDI made a good faith effort to find mitigation properties within VBT but was unable to do so. The Superior Township location was supported, indeed recommended by the DNRE as it was located near existing wetlands and was part of a larger plan to develop wildlife corridors in the area.

Comment: The question was raised as to what happens to the wildlife within the wooded lot when the wetlands are removed.

Response: Wildlife that is able to will leave the area as development begins. This issue is further addressed in Environmental Assessment part of the License Application.

Comment: A general question was raised regarding WWTP discharge limits applicable to WDI's wastewater pre-treatment plant.

Response: WDI's discharge limitations are included in WDI's wastewater discharge permit issued by the South Huron Valley Utility Authority (SHVUA) and include non-detect limits for PCBs and mercury. WDI has done an excellent job in meeting these limits.

Comment: A question was raised as to the nature of the truck wash for vehicles leaving the facility.

Response: The truck wash is a wheel and undercarriage wash designed to minimize vehicle track out from the facility.

Meeting with VBT Fire Chief and Director of Public Safety:

Date/Time: 10:00 am, January 5, 2011

Location: Wayne Disposal, Inc. Site 2., 49350 North I-94 Service Dr., Van Buren Township, MI 48111

General Public Attendees: None

Local Government Attendees: Fire Chief Loyer and Director of Public Safety McClanahan

Description: Bob Doyle of EQ made a presentation that was a draft of the presentation that was to be made at the second public meeting focusing on SRB issues. A copy of this presentation as finalized is included in Appendix C.

Comment: Director McClanahan asked about the timing of the construction of the training facility at the shooting range.

Response: The HCA agreement requires that WDI build this facility within one year of receiving the new Operating License.

Comment: Chief Loyer inquired as to whether the nozzles for the fire protection system at the MDWTP had been extended to cover the area where the trucks are.

Response: WDI has extended the range of the fire suppression system to include this area.

Comment: Chief Loyer inquired whether WDI added a port that would allow a fire truck to connect its foam spray equipment to the MDWTP fire suppression system.

Response: There is the capability to connect VBT foam spray equipment to the MDWTP fire suppression system.

Comment: Director McClanahan recommended that WDI add the fact that 2 WDI employees are VBT volunteer fire fighters to the presentation.

Response: This fact was added to the presentation.

Meeting with VBT Board of Trustees:

Date/Time: 4:00 pm, January 10, 2011

Location: Van Buren Township Offices, 46425 Tyler Rd., Van Buren Township, MI 48111

General Public Attendees: Several

Local Government Attendees: Van Buren Township Board of Trustees

Description: Mike Takacs of EQ made a presentation that was a draft of the presentation that was to be made at the second public meeting focusing on SRB issues. A copy of this presentation as finalized is included in Appendix C.

Comments: Fire Chief Loyer made the only comment expressing his satisfaction with the level of communication and response to incidents between WDI and VBT.

Second Public Meeting:

Date/Time: 7:00 pm, January 31, 2010 (newspaper announcement from December 29, 2010 Detroit News and the WWJ Radio transcript from December 31, 2010 is included in Appendix C)

Location: Holiday Inn Express, 46194 North I-94 Service Drive, Belleville, MI 48111

General Public Attendees: None

Local Government Attendees: None

Description: There were no general public attendees at this meeting; however the presentation was made by Bob Doyle of EQ. A copy of the presentation that was made is included in Appendix C.

Comments: None

Appendix A. Host Community Agreement between WDI and Van Buren Township

HOST COMMUNITY AGREEMENT

This Host Community Agreement ("Agreement") is made and entered into this 9th day of September, 2009 by and between Wayne Disposal, Inc., a Michigan corporation ("WDI") and Van Buren Charter Township ("Township").

RECITALS

WHEREAS, WDI owns and operates a landfill site currently consisting of approximately Five Hundred Ninety (590) acres located within the Township (the "Landfill Site") a portion of which is currently permitted to lawfully receive and dispose of waste listed under Part 111 of Act 451 of the Natural Resources and Environmental Protection Act, Michigan Compiled Laws, Act 451 of 1994, as amended (together with any successor legislation, "Act 451")("Waste").

WHEREAS, WDI seeks to modify a parcel of approximately twenty (20) acres identified as Lot A on Exhibit B located within the Landfill Site (the "Modified Site") in order to allow WDI to dispose of Waste at the Modified Site in a manner consistent with WDI's current operations and Act 451.

WHEREAS, the modifications require the clearing of trees, other construction at the Modified Site and, potentially, other environmental obligations.

WHEREAS, Act 451 requires WDI to obtain certain environmental permits from the Michigan Department of Environmental Quality (the "MDEQ") and other regulatory approvals in order to proceed with the disposal of Waste at the Modified Site.

WHEREAS, based upon the Township's review of the proposed location of the Modified Site, the Township believes that the disposal of Waste at such location consistent with WDI's current operations does not present public safety or environmental concerns.

WHEREAS, WDI intends to file an administratively complete application for such modifications to its permits and to obtain any other regulatory approvals in cooperation with the Township, and the Township desires to support such application and approvals in a manner consistent with protection of public safety and the environment.

NOW THEREFORE, the parties agree as follows:

1. Definitions.

As used in this Agreement, the following terms shall have the following meanings:

(a) "Adjacent Property" shall mean that portion of the real property owned by WDI adjacent to the Landfill Site, designated as Lot B on the attached Exhibit B. Lot B on Exhibit B currently consists of existing baseball diamonds used by the Little League ("Baseball Diamonds") and a gun shooting range ("Shooting Range") used by the Township Public Safety Department and others.

(b) "Cubic Yard" shall mean one cubic yard of Waste received by WDI from Michigan Disposal, Inc., and its successors and assigns, for disposal at the Landfill Site, including the Modified Site.

(c) "Gate Ton" shall mean one ton of Waste received by WDI for disposal at the Landfill Site, including the Modified Site; excluding any Waste received from Michigan Disposal, Inc. and its successors and assigns.

(d) "Modifications" shall mean the clearance of trees and all other construction activities on the Landfill Site and the real property designated as Lot A on the attached Exhibit B necessary to dispose of Waste at the Modified Site.

(e) "Permit Date" shall mean the date on which WDI has received all Permits necessary to enable WDI to complete the Modifications and to dispose of Waste at the Modified Site.

(f) "Permits" shall mean all permits, licenses, or regulatory approvals of any kind necessary for WDI to complete the Modifications and to dispose of Waste at the Modified Site.

(g) "Resolution" shall mean a Resolution of Support executed by the Township, substantially in the form of Exhibit A.

2. Effective Date.

This Agreement shall become effective upon the (i) adoption of the Resolution and (ii) the execution of this Agreement by both parties, and shall be in force and effect until such time as WDI no longer accepts Waste at the Landfill Site, including, but not limited to, the Modified Site or this Agreement is terminated in accordance with Section 8 below.

3. Township's Consent and Obligations.

(a) The Township consents to be the host municipality for the Landfill Site for so long as the Landfill Site, including the Modified Site, remains operational and in compliance with all applicable laws and regulations. For the duration of WDI's efforts to obtain the Permits, the Township hereby agrees (i) to adopt the Resolution, (ii) to reasonably support and not to object to any WDI application for any Permits necessary to utilize the Modified Site, and (iii) to reasonably support and not object to any of WDI's efforts to fulfill any obligations that may be necessary in connection with the issuance of the Permits; provided, however, that the Township reserves the right to comment on any WDI submissions to the MDEQ to address any public safety concerns and/or take any action it determines necessary to safeguard the public health, safety and welfare of its residents in accordance with the procedures set forth in Section 3(b) below.

(b) In the event the Township has concerns with any WDI submission to the MDEQ, including but not limited to concerns which relate to safety, environmental protection, operations, or engineering ("Township Concerns"), the Township will discuss such concerns with WDI prior to any action or communications with the MDEQ. The parties will work together in good faith to resolve any such concerns. Further, the parties agree to raise and address concerns in a timely manner sufficient to enable Township comments to be submitted to the MDEQ prior to deadlines for

public comment applicable to the Permits. In the event the Township Concerns cannot be resolved to the mutual satisfaction of the parties, WDI shall advise the Township which, if any, actions or communications with the MDEQ by the Township would result in WDI terminating the Agreement pursuant to Section 8(a).

(c) It is expressly agreed that the adoption of the Resolution is made in express and direct reliance on the terms of this Agreement and would not be adopted without agreement to its terms. In the event WDI does not execute this Agreement or abandons its efforts to obtain the necessary Permits to accept Waste at the Modified Site, the Resolution shall automatically become null and void without further action by the Township.

4. Compensation.

(a) Compensation prior to the Permit Date. Prior to the Permit Date, WDI shall, at its own cost and expense:

(i) no later than December 31, 2010, regrade the parking lot and surrounding area at the baseball diamonds to improve drainage substantially in the manner set forth on the attached Exhibit C;

(ii) no later than December 31, 2010, construct restroom facilities and if necessary install or upgrade a sanitary sewer connection on the Adjacent Property substantially in the manner set forth on the attached Exhibit C;

(iii) no later than December 31, 2010, pave the parking lot adjacent to such baseball diamonds substantially in the manner set forth on the attached Exhibit C;

(iv) no later than December 31, 2010, construct a pavilion at the baseball diamonds substantially in the manner set forth on the attached Exhibit C;

(v) no later than December 31, 2010, construct a playscape on the Adjacent Property at the baseball diamonds substantially in the manner set forth on the attached Exhibit C;

(vi) no later than December 31, 2010, install a sign with a brick base at the entrance to the baseball diamonds substantially in the manner set forth on the attached Exhibit C;

(vii) no later than December 31, 2010, construct asphalt walking paths around the baseball diamonds substantially in the manner set forth on the attached Exhibit C;

(viii) no later than December 31, 2010, install benches along such walking paths at the baseball diamonds substantially in the manner

Shortfall Amount is fully utilized. Examples of such calculations are set forth on the attached Exhibit E.

In the event WDI does not accept Waste at any time after the Permit Date for a period of 365 consecutive days for any reason whatsoever, the Minimum Annual Royalty shall not apply to such time period, and shall be prorated on the basis of a 365 calendar day year for that portion of the calendar year prior to and subsequent to such interruption.

The Minimum Annual Royalty applicable to the balance of the first calendar year in which the Permit is granted and the last calendar year in which WDI accepts Waste shall be prorated on the basis of a 365 calendar day year.

If the above CPI is discontinued, a mutually agreeable replacement shall be selected.

(ii) Upon receipt of the Permit, WDI shall lease the property designated as Lot B on the attached Exhibit B to the Township at an annual rate of one dollar ($1) for a term of ninety-nine years. The Township may record a memorandum of lease. Such lease shall not permit the Township to utilize the property for any purpose other than for public recreational use or public recreational purposes, with the exception that the Shooting Range may continue its current use of training by Township public safety personnel, but if its current use is discontinued, the Shooting Range shall not be used for any purpose other than public recreational use or public recreational purposes.

(iii) Within 365 days of the Permit Date, WDI shall construct a training facility at the shooting range on the Adjacent Property substantially in the manner set forth on Exhibit D. WDI shall, subject to the cost limitation set forth below, at its own expense bring a waterline to and provide sanitary sewage facilities reasonably acceptable to the Township for the training facility. WDI warrants that the construction of the training facility shall comply with all applicable federal, state and local laws and regulations for a period of one (1) year.

(iv) Consistent with its past practice, WDI shall designate one day in each calendar year on which Van Buren Township residents, upon proof of residence, may bring household hazardous waste of a type and nature WDI has accepted from residents on prior occasions, including but not limited to, cleaners, pesticides, electronic devices and chemicals to an area designated by WDI for disposal at the Landfill Site by WDI at no charge.

set forth on the attached Exhibit C;

(ix) no later than December 31, 2010, plant trees around the baseball diamonds substantially in the manner set forth on the attached Exhibit C;

(x) no later than December 31, 2009, plant trees on the property at the Southwest corner of the intersection of Beck Road and Tyler Road, subject to approval by Willow Run Airport and other regulatory authorities as may apply, substantially in the manner set forth on the attached Exhibit C; or other suitable location as determined by the Township.

(xi) no later than December 31, 2009, plant 24 trees at Van Buren Park substantially in the manner set forth on the attached Exhibit C;

(xii) reimburse the Township for the cost of review of WDI's landfill construction permit application by the Township's consultant up to an amount not to exceed Five Thousand Dollars ($5,000).

Notwithstanding anything in this Agreement to the contrary, in no event shall the cost of the improvements set forth in subparagraphs (i)-(xi) above (the "Pre-Permit Construction") exceed $520,000. Subject to the preceding sentence, the proposed improvements are listed in order of priority and Exhibit C may be modified by mutual consent of the parties.

(b) Building Codes and Warranties. In completing the Pre-Permit Construction, WDI shall adhere to all local, state and federal laws and regulations (including but not limited to the Michigan Building Code), provide a minimum one (1) year warranty on all plant materials, and provide a one (1) year warranty on building code compliance with respect to all other improvements set forth in subparagraphs (i) – (xi) above.

(c) Permit Applications. The Township hereby agrees to reasonably cooperate with WDI in WDI's efforts to obtain permits applicable to the Pre-Permit Construction or Post-Permit Construction (as defined below).

(d) Tree Mitigation. The Township acknowledges and agrees that completion of subparagraphs (i), (ii), and (ix)-(xi) of the Pre-Permit Construction satisfies all WDI tree mitigation obligations of any kind or nature associated with the clearance of the Modified Site.

(e) Compensation Subsequent to the Permit Date. In the event that WDI receives the Permits, WDI shall perform the following obligations.

(i) Beginning on the Permit Date, which is currently estimated to be October, 2010, WDI shall pay to the Township, within thirty (30) days of the end of each calendar quarter following the Permit Date, a royalty (the "Royalty") consisting of (i) $1.65 per Gate Ton of Waste received and disposed of at the Landfill Site, including the

Modified Site in the previous quarter; and (ii) $1.65 per Cubic Yard of Waste received and disposed of at the Landfill Site, including the Modified Site in that previous quarter, provided, that Township shall allocate the revenue from at least $0.10 per Gate Ton of Waste and $0.10 per Cubic Yard of Waste to its Department of Public Safety. In addition, the Township shall allocate the revenue from at least $0.05 per Gate Ton of Waste and a $0.05 per Cubic Yard of Waste to environmental projects and programs. Late payments shall bear interest at the prime rate being charged by Bank of America.

The Royalty and the Minimum Annual Royalty (as defined below) shall increase annually commencing on the first anniversary of the Permit Date consistent with any rise in the consumer price index for CPI-U (all urban customers) for the Detroit-Ann Arbor-Flint, MI CMSA over the same time period. For purposes of this calculation, the base year shall be the price index published in the month and year in which the Permit Date takes place. In addition, the Royalties shall be reduced by the amount of all charges, if any, levied on the receipt, handling, or disposal of Waste which WDI must pay and which are received by the Township ("levied amounts"). WDI shall confirm in writing to the Township the total of all such levied amounts for each calendar quarter and shall deduct such amounts from the Royalties paid quarterly to the township under this Section 4(e). WDI guarantees the annual Royalties to the Township shall not be less than Three Hundred Twenty Five Thousand ($325,000.00) Dollars (the "Minimum Annual Royalty") regardless of the Gate Tons or Gate Yards received; provided that in the event WDI is substantially prohibited from accepting Waste at any time after the Permit Date for reasons outside its control, including but not limited to orders of governmental authority (including court orders), regulatory action, acts of war (declared or undeclared), insurrection, terrorism, rebellion or sabotage, civil disturbances, strikes of a duration of at least two consecutive weeks, actions of the elements, or unavailability of adequate insurance, the Minimum Annual Royalty shall not apply to the time period of such interruption, and the Minimum Annual Royalty shall be prorated on the basis of a 365 calendar day year for that portion of the calendar year prior to and subsequent to such interruption.

In the event that in any calendar year, the Minimum Annual Royalty exceeds the amount that would otherwise be due to the Township based on the Gate Tons and Gate Yards received in such calendar year, the amount of such excess (the "Shortfall Amount") may be set off against the amount by which the Royalties exceed the Minimum Annual Royalties in subsequent years until the

(v) On at least a bi-annual basis, WDI shall conduct a mock emergency training exercise for the benefit of the Township's Department of Public Safety. Each party shall bear its own expenses with respect to such training.

(vi) WDI shall, at its sole cost, provide a response and clean up team for any off site incident (e.g., waste spills) that occurs in the Township involving Waste shipments being transported to or from the Landfill Site. In addition, in the event the Township incurs any expenses related to any off site incident that occurs in the Township involving Waste shipments being transported to or from the Landfill Site, WDI shall reimburse the Township for reasonable equipment and personnel expenses documented and provided to WDI up to an amount not to exceed Twenty Thousand Dollars ($20,000) per incident.

Notwithstanding anything in this Agreement to the contrary, in no event shall the cost of the improvements set forth on Exhibit D exceed $150,000. Subject to the preceding sentence, Exhibit D may be modified by mutual consent of the parties.

(f) The compensation set forth in Sections 4(a) and 4(c) above is to compensate the Township for its direct and indirect costs by reason of the siting of the Modified Site within the Township. The parties hereto do expressly recognize and acknowledge that such sums and/or services as may be payable or due from WDI to the Township hereunder are a fair and reasonable measure of compensation and do not constitute any form of exaction, tax or levy.

5. Compliance with Laws.

WDI shall comply with any and all applicable county, state and or federal laws, rules or regulations related to operation of the Landfill Site. The Landfill Site, including the Modifications, shall meet or exceed all applicable existing laws, rules or regulations. WDI shall operate the Modified Site in a manner protective of human health and environment.

6. Audit Rights.

The Township may retain, at its sole expense, an independent certified auditor, who is reasonably acceptable to WDI, to verify (i) the amount of Waste disposed of at the Landfill Site in any calendar year, (ii) the levied amounts which are deducted from quarterly payments; and (iii) the calculation of the Royalty, Minimum Annual Royalty and/or Shortfall Amount in Section 4(e)(i).

After any calendar year, the auditor shall be granted access to WDI records pertaining to the matters to be verified, provided that the Township submits a written request for access to the WDI records within ninety (90) days after the end of that calendar year. The Township shall furnish a copy of any final audit report to WDI. The findings or conclusions of the auditor shall not be binding on the Township or WDI. In the event of any dispute as to the auditor's findings

or conclusions (including number of Gate Yards, Gate Tons or monies due), then either WDI or Township may elect to have such dispute resolved by a binding arbitration. In such event, then WDI or Township shall notify the other in writing within ten (10) days of WDI's receipt of the Township's audit. Within ten (10) days after such notification of an election to arbitrate, WDI and Township shall each name one (1) arbitrator who shall jointly name a third arbitrator. All arbitration matters shall be concluded within thirty (30) days of the submission. The decision of the arbitration panel shall be in writing and shall be deemed to be final and binding when agreed upon by at least two (2) of the arbitration members. Such arbitration shall be fully binding upon Township and WDI. Arbitrators shall be qualified degreed accountants.

7. Township Access to the Landfill Site.

The Township, upon reasonable request, shall be entitled to receive monitoring report results. In addition, WDI agrees to (i) communicate with applicable Township authorities on environmental matters upon reasonable request, (ii) allow Township officials access to the Landfill Site during regular business hours, and (iii) allow the Township to witness monitoring events and inspect monitoring equipment, provided that WDI shall be under no obligation to inform the Township of any such monitoring event in advance. Each of subparagraphs (ii) and (iii) above shall be subject to reasonable notice from the Township and WDI's safety rules. All Township personnel present on the Landfill Site for any reason shall be accompanied by qualified WDI personnel. Furthermore, the parties agree to promptly advise each other of any citizen complaints or as soon as reasonably possible, but no later than twenty-four (24) hours of emergency situations at the Landfill Site that threaten human health or the environment.

8. Termination.

(a) Termination by WDI. Upon an event of termination as provided below, WDI shall no longer be bound by any provision of this Agreement, shall have no further duties or obligations hereunder or be subject to any term or condition hereunder, and shall not be liable for the breach of any provision of this Agreement. WDI may terminate this Agreement upon occurrence of any of the following:

(i) WDI's abandonment of its efforts to obtain the Permits;

(ii) closure of the Landfill Site;

(iii) the Township fails to consult with WDI prior to communication with the MDEQ concerning the Permits or taking other action regarding any Township Concerns in contravention of Section 3(b) above; or

(iv) the Township materially breaches this Agreement in any other manner, provided that the Township shall have thirty (30) days to cure any such breach or actively pursue the cure of any such breach after receipt of written notice from WDI.

In addition, the parties expressly acknowledge and agree that the Township may comment following the procedure set forth in Section 3(b) above on any WDI submissions to the MDEQ to address any public safety

concerns and/or take any action it determines necessary to safeguard the public health, safety and welfare of its residents without being in breach of this Agreement. However, in the event that WDI reasonably determines that any such comment or action frustrates WDI's efforts to obtain the Permits, WDI may terminate this Agreement. Upon such termination, neither party shall have any further duties or obligations hereunder or be subject to any term or condition hereunder, and shall not be liable for the breach of any provision of this Agreement

(b) Termination by Township. Township shall not be bound by any provision of this Agreement, shall have no duties or obligations hereunder or be subject to any terms or condition hereunder, and shall not be liable for the breach of any provision of this Agreement, upon occurrence of any of the following:

(i) WDI's abandonment of its efforts to obtain the Permits;

(ii) WDI materially breaches this Agreement in any manner, provided that WDI shall have thirty (30) days to cure any such breach or actively pursue the cure of any such breach after receipt of written notice from the Township.

Prior to WDI's receipt of the Permits, WDI's or Township's right to terminate hereunder shall be the terminating party's sole remedy for any breach of this Agreement. Subsequent to WDI's recipt of the Permits, the right to terminate hereunder shall be in addition to all other legal or equitable remedies available to the non-breaching party, except that in no event shall the Township be liable to WDI for money damages of any kind or nature, either prior to or subsequent to issuance of the Permits and the Township will have no obligation to refund to WDI any monies or return any consideration to WDI received from WDI prior to the termination.

9. Notices.

All notices required or permitted under this Agreement shall be in writing and shall be delivered personally, by courier, or sent by certified registered mail (signature requested) to WDI or the Township at the addresses listed below:

If to WDI:
Wayne Disposal, Inc.
36255 Michigan Avenue
Wayne, MI 48184
Attention: President

With a copy to:
Honigman Miller Schwartz and Cohn, LLP
Attn: Patrick T. Duerr
2290 First National Building
660 Woodward Avenue
Detroit, MI 48226
Fax no. (313) 465-7363

If to Township:
Charter Township of Van Buren
46425 Tyler Road
Van Buren Township, MI 48111
Attention: Clerk

With a copy to:
Giarmarco, Mullins & Horton, P.C.
Attn: Patrick B. McCauley, Esq.
101 W. Big Beaver, 10th Floor
Troy, MI 48084
Fax no. (248) 457-7001

10. Waiver.

Waiver by either party of any term or provision of this Agreement shall not constitute a continuing waiver nor a waiver of any further or additional rights such party may hold under this Agreement.

11. Severability.

If any provision of this Agreement shall be held to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall not in any way be affected or impaired.

12. Governing Law.

This Agreement shall be construed in accordance with the laws of the State of Michigan, without regard to such state's choice of law rules.

13. Entire Agreement.

This Agreement is the complete and exclusive statement between the parties relating to the subject matter of this Agreement, and supersedes all prior understandings, communications, or representations, either oral or written, between the parties. Any and all Exhibits referred to in this Agreement are and shall be incorporated by reference herein. This Agreement shall be deemed to be mutually drafted by the parties and may not be modified or altered except by a written instrument duly executed by WDI and the Township.

14. Section Headings.

Section headings have been inserted in this Agreement for convenience of reference only and shall in no way modify or restrict any of the terms or provisions of this Agreement.

15. Assignment.

Neither party may assign this Agreement without the other party's written consent, which may not be unreasonably withheld. This Agreement shall bind and inure to the benefit of the parties to this Agreement and their respective successors and permitted assigns. This Agreement may not be relied upon by any third parties for their benefit.

16. Additional WDI Obligations.

In addition to the duties, responsibilities and obligations of WDI set forth herein, WDI shall also:

(a) Provide to the Township a copy of all applications and plans related to the Permits submitted to or received from MDEQ prior to or concurrent with submission to MDEQ;

(b) Comply with all applicable Township ordinances, rules and regulations which are not otherwise pre-empted, voided, or in conflict with any federal statutes or regulations or any rules, regulations, permits or approvals under Act 451; and

(c) In the event of any environmental accident, notify the Township as soon as reasonably possible, but no later than twenty four (24) hours of the environmental accident, to act promptly and have in place emergency procedures to assure a minimization of any environmental damage or harm to the Township's natural assets or its citizens.

(d) To the extent WDI is required by state law to mitigate wetlands in connection with the construction of the Modified Site, WDI will assess the viability of performing part of its mitigation responsibility within the Township. If such mitigation is viable and required, up to 50% of the mitigation will take place in the Township. In such event, WDI may donate to the Township the property in the Township on which such mitigation takes place, subject to mutual agreement of the parties. If such mitigation is required but not viable within the Township, the Township will support WDI's proposed mitigation plans outside the Township in accordance with Section 3 of this Agreement.

(e) WDI shall direct all vehicles carrying Waste to the Landfill Site from I-94 to utilize the Rawsonville Road Exit, proceed north to the North I-94 Service Drive, then east to the Site entrance. In addition, all vehicles will be instructed not to use Belleville Road when entering or exiting the Landfill Site. In the event that the Rawsonville Road exit is closed, alternate routes to and from the Landfill Site that avoid the Belleville Road exit off I-94 shall be provided to all Waste transporters.

(f) WDI shall provide technical assistance and information to the Township for the development of an Emergency Notification System for possible events and/or accidents that could occur in the Township.

(g) The Township or WDI may make modifications to the dugouts at the Baseball Fields. WDI shall provide financial or in-kind contributions for reasonable improvements to the dugouts at the baseball diamonds, subject to mutual agreement of the parties.

(h) The roles and responsibilities of the former Citizens Involvement Council (CIC) shall be transferred to the Township Environmental Commission

and WDI may be required by the Township to make presentations to the Commission regarding activities and any regulatory issues at the Landfill Site at least every six (6) months.

17. Recitals.

The Recitals set forth on the first page of this Agreement are incorporated into and are an integral part of this Agreement.

18. Delays.

Notwithstanding any specific dates set forth in this Agreement, if any delay in the processing or approval of the Permits occurs for any reason not attributable to a breach of this Agreement by WDI or the Township, neither party will be relieved of its obligations hereunder.

IN WITNESS WHEREOF, the parties have executed this Agreement effective as of the date first written above.

Wayne Disposal, Inc.

President

Title:

9/9/10

Date:

Title:

Charter Township of Van Buren

Paul D. White

Paul D. White

Title: Supervisor

08/25/09

Date:

Leon Wright

Leon Wright

Title: Clerk

EXHIBIT A

CHARTER TOWNSHIP OF VAN BUREN

RESOLUTION 2009-18

RESOLUTION OF SUPPORT

BE IT RESOLVED, by the Charter Township of Van Buren (the "Township"),

WHEREAS, Wayne Disposal, Inc. ("WDI") is the owner of a landfill site containing approximately 590 acres on the south side of Willow Run Airport, west of Beck Road, and north of I-94 (the "Site");

WHEREAS, WDI desires to utilize an additional parcel of approximately twenty (20) acres at the Site to construct and operate a landfill facility on the Site (the "Modified Facility"), to be regulated under Part 111 of Act 451 of the Natural Resources and Environmental Protection Act, Michigan Compiled Laws, Act 451 of 1994 as amended, and consistent with its current operations at the Site;

WHEREAS, the Modified Facility is more particularly described in the proposed construction plans and other documentation to be provided by WDI to the Township;

WHEREAS, WDI intends to apply to the Michigan Department of Environmental Quality ("MDEQ") for a modification to its existing environmental permit, and may also apply for additional regulatory approvals (the "Approvals");

WHEREAS, WDI intends to secure the support of the Township in obtaining the Approvals and in hosting the Landfill Site, and constructing the Modified Facility;

THEREFORE, BE IT RESOLVED, that the Township consents to be the host municipality for the Landfill Site (including the Modified Facility) subject to execution of the Host Community Agreement by and between WDI and the Township (the "Host Community Agreement");

BE IT FURTHER RESOLVED, that in consideration of the terms and conditions contained within the Host Community Agreement, the Township hereby supports WDI in its efforts to have the MDEQ and all other applicable regulatory agencies issue the Approvals;

BE IT FURTHER RESOLVED, that the Board of Trustees of the Township hereby authorizes the Supervisor and Clerk to execute the Host Community Agreement, to which this Resolution is attached as Exhibit "A"; and further that the Host Community Agreement shall be effective upon execution by the Supervisor and Clerk.

YEAS:

NAYS:

ABSENT:

I hereby certify that the foregoing resolution was adopted by the Board of Trustees, Charter Township of Van Buren, on August 18, 2009 by unanimous action of said Board.

Attest

Leon Wright

By: Leon Wright

Clerk, Charter Township of Van Buren

EXHIBIT B

<u>Lots A and B</u>

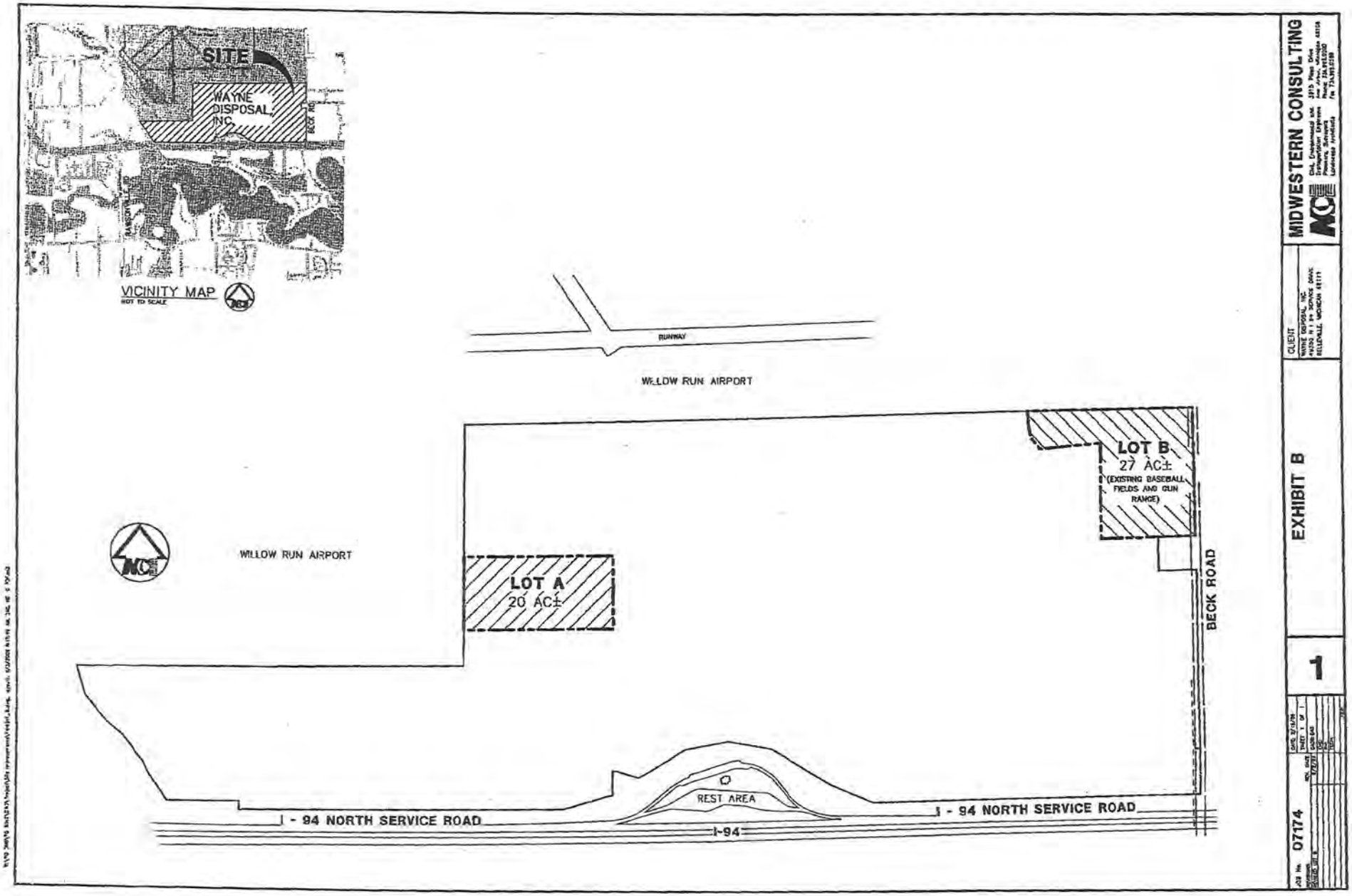

SITE
WAYNE DISPOSAL, INC.
BECK RD
VICINITY MAP
NOT TO SCALE
RUNWAY
WILLOW RUN AIRPORT
WILLOW RUN AIRPORT
LOT A
20 AC±
LOT B
27 AC±
(EXISTING BASEBALL FIELDS AND GUN RANGE)
BECK ROAD
REST AREA
I - 94 NORTH SERVICE ROAD
I - 94 NORTH SERVICE ROAD
I-94
MIDWESTERN CONSULTING
CLIENT
WAYNE DISPOSAL, INC.
BELLEVILLE, MICHIGAN 48111
EXHIBIT B
1
07174

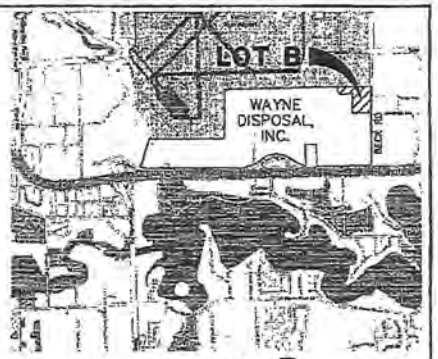
EXHIBIT C

<u>Pre-Permit Construction</u>

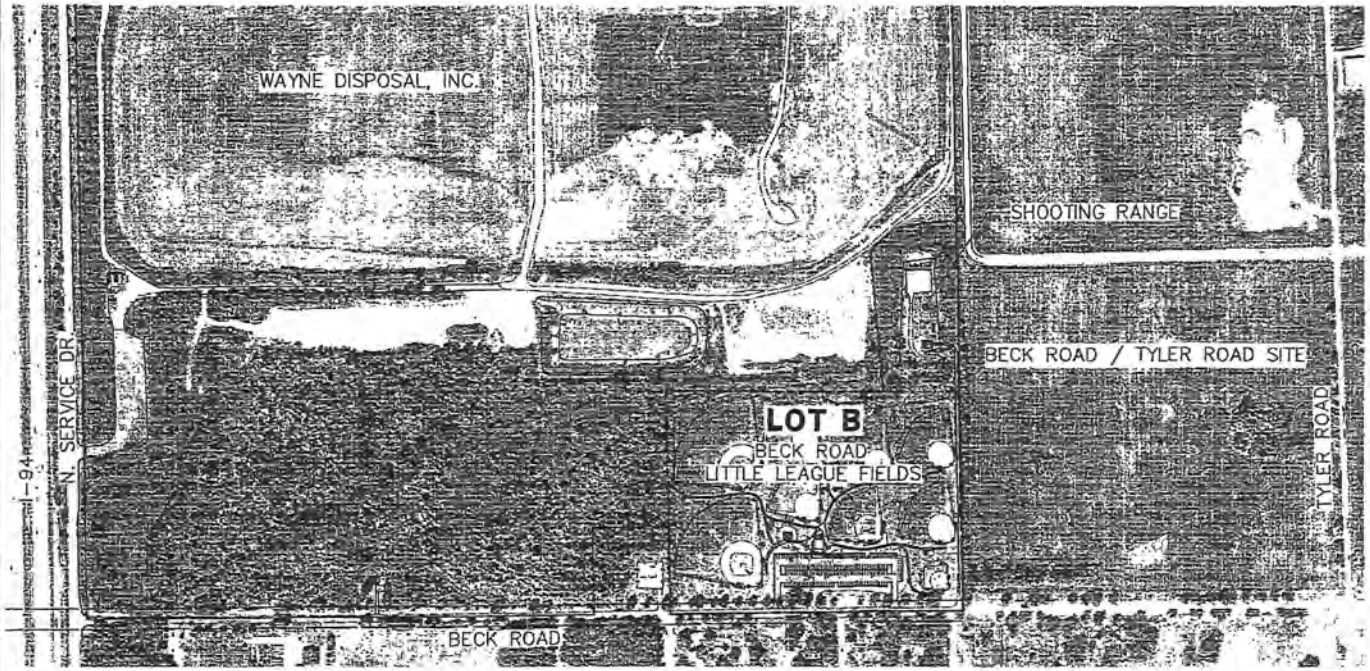
WAYNE DISPOSAL, INC.

SITE IMPROVEMENTS CONCEPT PLAN

VAN BUREN TOWNSHIP, WAYNE CO., MICHIGAN
PRIOR TO PERMIT DATE



VICINITY MAP
NOT TO SCALE



SCALE: 1" = 200'
0 200 400 600

SHEET INDEX

1. COVER SHEET
2. BECK RD./TYLER RD. SITE
3. BECK RD. LITTLE LEAGUE FIELDS
4. VAN BUREN PARK – LANDSCAPE PLAN
5. MISCELLANEOUS DETAILS

WAYNE DISPOSAL, INC.

JOB No. 07174

REVISIONS	REV. DATE
REV. PER OWNER	8-12-98
REV. PER W.	9-3-98
UPDATE MAP TO WAYNE DISPOSAL, INC.	9-3-98

DATE: 2/16/98
SHEET 1 OF 5
DWG: CMP
CHK: AE
APP:
PM:

1

MIDWESTERN CONSULTING

Civil, Environmental and Transportation Engineers, Planners, Surveyors, Landscape Architects
3815 Plaza Drive, Ann Arbor, Michigan 48108
Phone: 734.995.0200
Fax: 734.995.0599

RELEASED FOR:	DATE

PLANT MATERIAL LIST

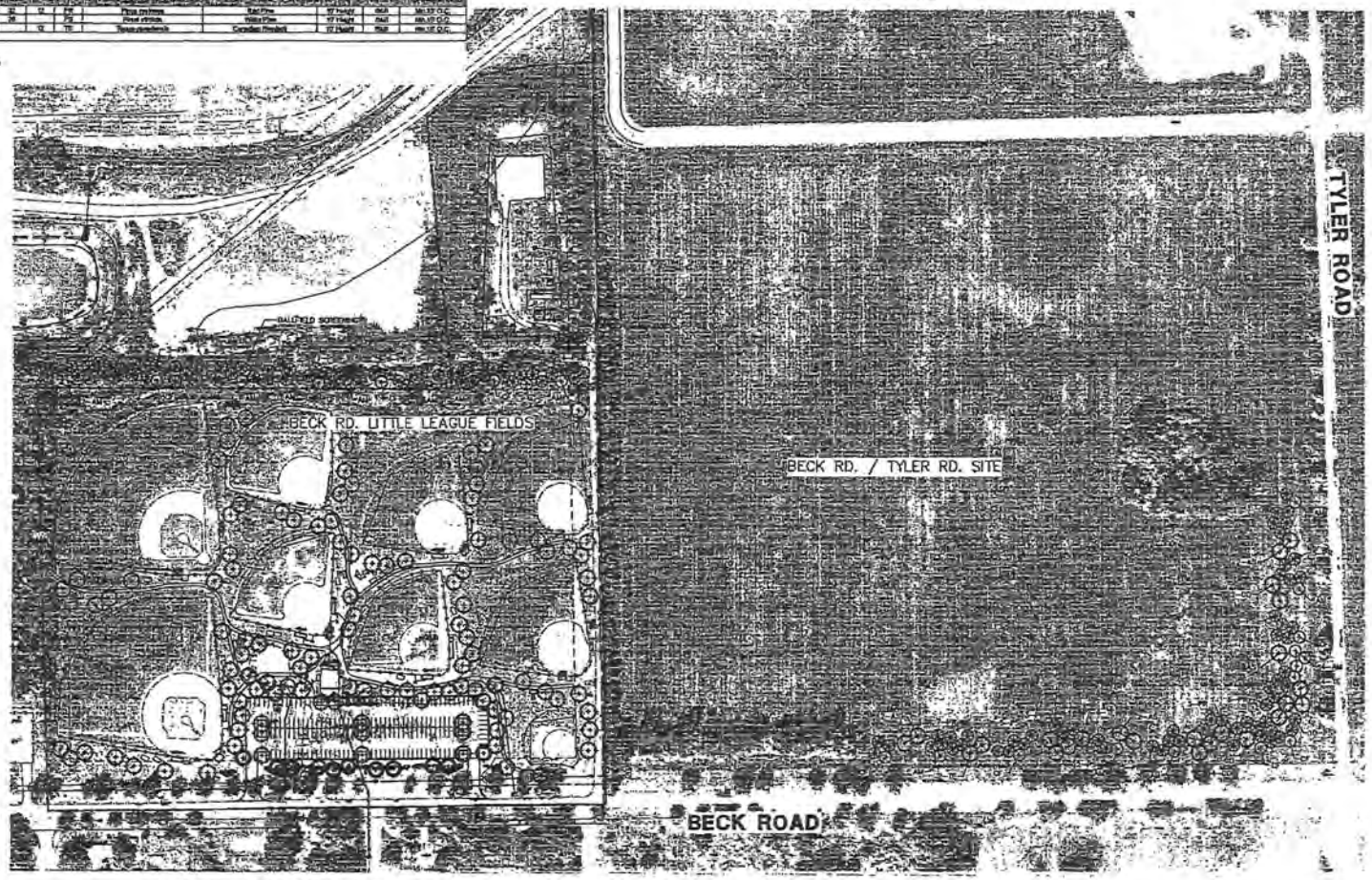
Total	Location										
15		15			AR	Red Maple	Red Maple	2" cal.	B&B	6' Branch ht.
10		10			AS	Sugar maple	Sugar Maple	2" cal.	B&B	6' Branch ht.
18		9	7		CO	Cock's spur hawthorn	Hawthorn	2" cal.	B&B	6' Branch ht.
34		34			CU	Chinese L. Starfire	Starfire Honeylocust	2" cal.	B&B	6' Branch ht.
37		26	11		TC	Tilia cordata	Crimson Linden	2" cal.	B&B	6' Branch ht.
20		20			QR	Quercus rubra	Red Oak	2" cal.	B&B	6' Branch ht.
17	9		8		AM	Amelanchier canadensis	Serviceberry	6' ht.	B&B	Tree form
35	2		3		CF	Cornus florida	Flowering Dogwood	6' ht.	B&B	Tree form
14		14			BS	Betula nigra	Heritage Birch	2" cal.	B&B	6' O.C.
20		20			VA	Viburnum x bodnantense	Compact Adaline Viburnum Bush	36" ht.	B&B	6' O.C.
11			11		JC	Juniperus ch. 'Hetzii'	Compact Hetzi Juniper	36" spread	B&B	6' O.C.
51	18		33	12	PS	Pinus strobus	White Pine	10' height	B&B	Min.10' O.C.
39	21		18	12	PR	Pinus nigra	Austrian Pine	10' height	B&B	Min.10' O.C.
12				12	TC	Tsuga canadensis	Canadian Hemlock	10' height	B&B	Min.10' O.C.

1. Total item quantity
2. Stalked Screening
3. Beck Road Little League Fields
4. Beck Road/Tyler Road Site
5. Van Dyke Park

NOTE:
TYLER & BECK ROAD SITE IS WITHIN 10ft AIRPORT PROPERTY (WEA). PROPOSED PLANTINGS ARE SUBJECT TO WEA AND FAA APPROVAL.

SCALE: 1" = 100'

0 100 200 300



SEE SHEET 3 FOR LITTLE LEAGUE FIELDS LANDSCAPING

MIDWESTERN CONSULTING
Civil, Environmental and Transportation Engineers
Land Surveyors
Landscape Architects
3815 Plaza Drive
Ann Arbor, Michigan 48108
Phone: 734-995-7200
Fax: 734-995-1599

CLIENT
WAYNE DISPOSAL, INC.
49350 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111
(734) 699-0237

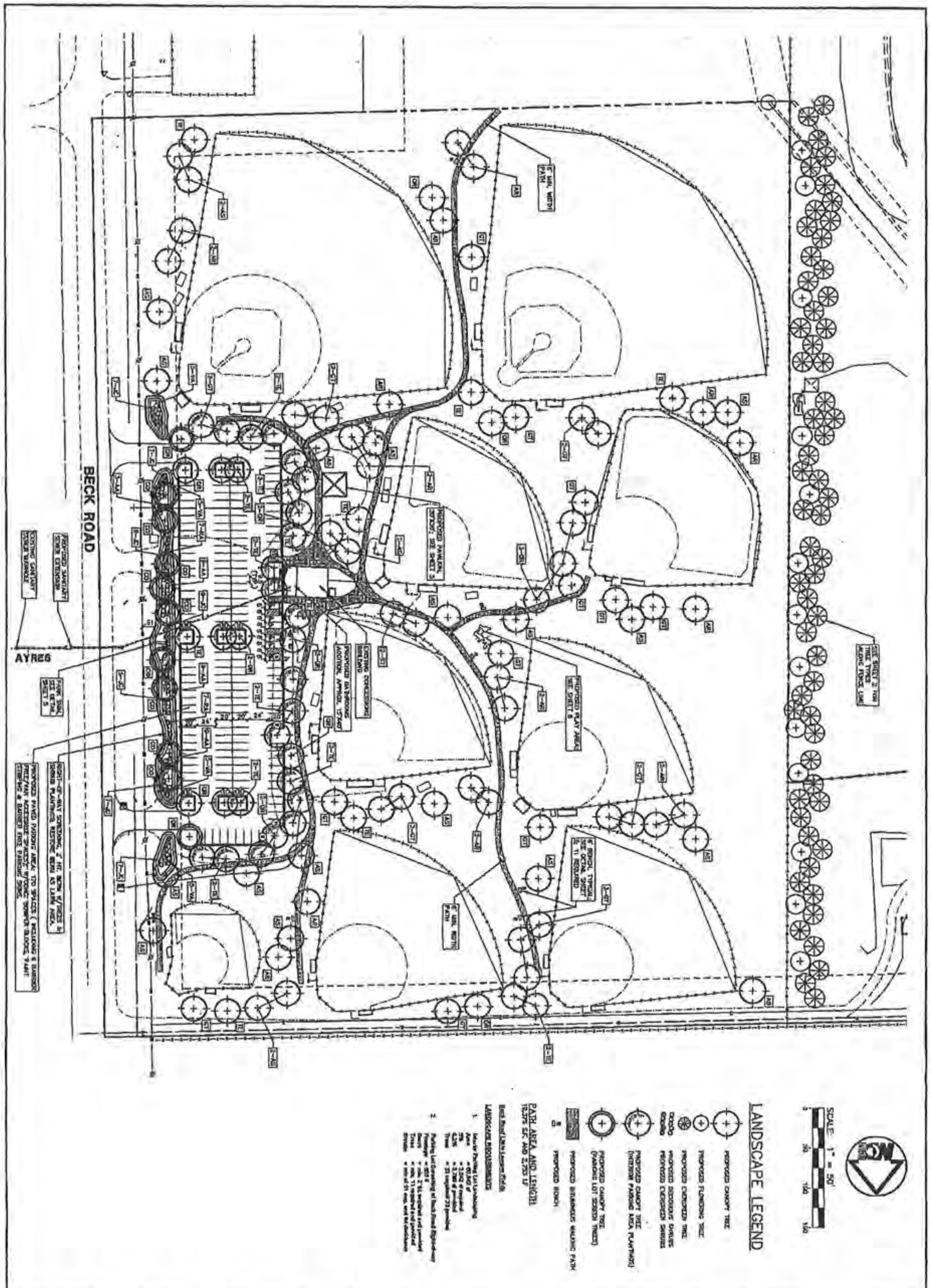
WAYNE DISPOSAL, INC.

SITE IMPROVEMENTS CONCEPT PLAN
PRIOR TO PERMIT DATE
BECK RD./TYLER RD. SITE

2

JOB No. 07174

DATE 2/16/09
SHEET 3 OF 3
DWG. NAME



JOB No. 07174		DATE: 2/14/09	
REVISIONS	REV. DATE	SHEET 3 OF 3	

3

WAYNE DISPOSAL, INC.

SITE IMPROVEMENTS CONCEPT PLAN
PRIOR TO PERMIT DATE
BECK ROAD LITTLE LEAGUE FIELDS

CLIENT
WAYNE DISPOSAL, INC.
49350 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111
(734) 699-6237

MIDWESTERN CONSULTING
Civil, Environmental and Transportation Engineers
Planners, Surveyors
Landscape Architects
3815 Plaza Drive
Ann Arbor, Michigan 48108
Phone: 734.995.0200
Fax 734.995.0599

NOTE: SEE PLANT MATERIAL LIST ON SHEET 2.

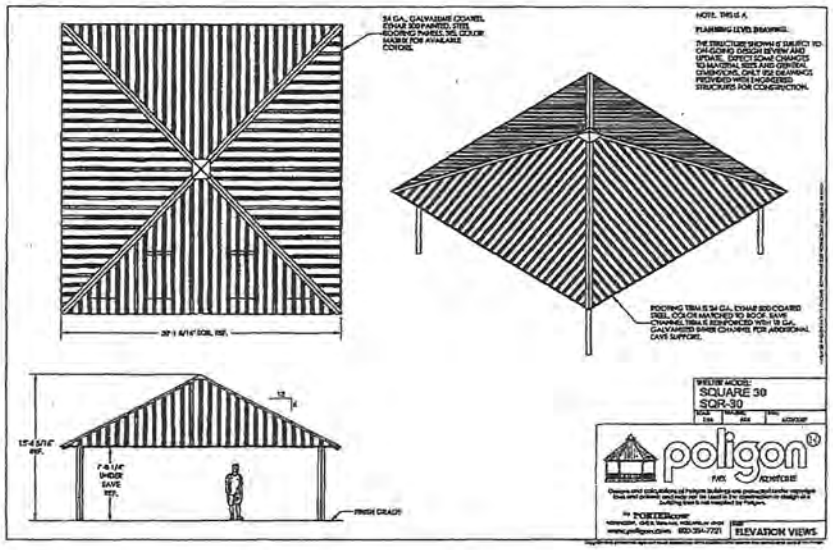
JOB No. 07174	REV. DATE	DATE 3/19/08
REVISIONS		SHEET 4 OF 8
PER MAC REVIEW	5-21-07	DRAWN BY
PER MAC REVIEW	8-3-07	CHECKED BY
		DWG. NO.
		SCALE
		REVISION
		REVISION DATE

WAYNE DISPOSAL, INC.
SITE IMPROVEMENTS CONCEPT PLAN – PRIOR TO PERMIT DATE
VAN BUREN PARK
LANDSCAPE PLAN

4

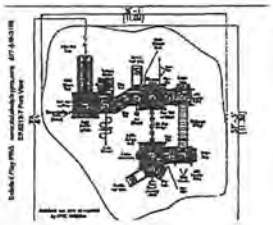
CLIENT
WAYNE DISPOSAL, INC.
49300 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111
(734) 699-8237

MIDWESTERN CONSULTING
Civil, Environmental and Transportation Engineers
Landscape Architects
3013 Fruit Ridge NW
Ada, Michigan 49301
Phone 734.676.2290
Fax 734.676.2299



RECYCLE DESIGN PARK SERIES BENCHES
NOT TO SCALE

DETAILED PLAY PRO CPS212-7 PLAY STRUCTURE



MIDWESTERN CONSULTING
Civil, Environmental and Architectural Engineers
Planners, Surveyors
Landscape Architects
2815 Plaza Drive
Jackson, Michigan 49202
Phone: 734.663.2200
Fax 734.663.2208

CLIENT
WAYNE DISPOSAL, INC.
18000 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111
(734) 699-8237

WAYNE DISPOSAL, INC.
SITE IMPROVEMENTS CONCEPT PLAN
PRIOR TO PERMIT DATE
MISCELLANEOUS DETAILS

5

JOB No. 07174
DWG. 5 OF 5
SCALE: NONE
DATE: 5/7/09
REVISIONS

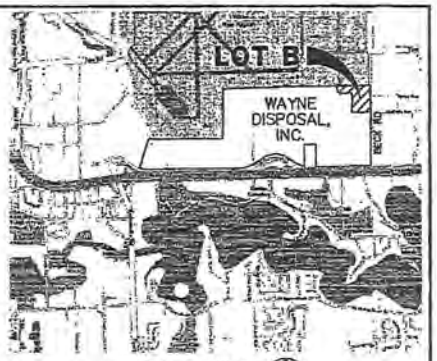
EXHIBIT D

Post-Permit Construction

WAYNE DISPOSAL, INC.

SITE IMPROVEMENTS CONCEPT PLAN

VAN BUREN TOWNSHIP, WAYNE CO., MICHIGAN
SUBSEQUENT TO PERMIT DATE



VICINITY MAP
NOT TO SCALE

SCALE: 1" = 200'
0 200 400 600

SHEET INDEX

1. COVER SHEET
2. SHOOTING RANGE & MISCELLANEOUS DETAILS

WAYNE DISPOSAL, INC.

JOB No. 07174

DATE: 2/14/00

SHEET 1 OF 2

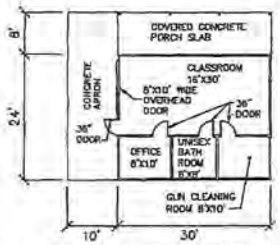
1

MIDWESTERN CONSULTING

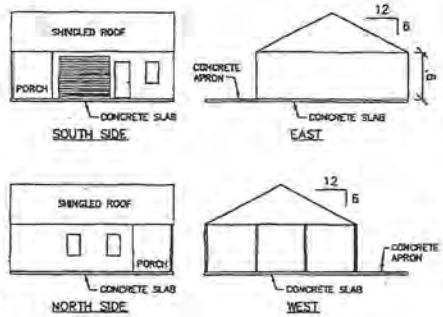
Civil, Environmental and Transportation Engineers
Planners, Surveyors
Landscape Architects

3815 Plaza Drive
Ann Arbor, Michigan 48108
Phone 734.995.0200
Fax 734.995.0599

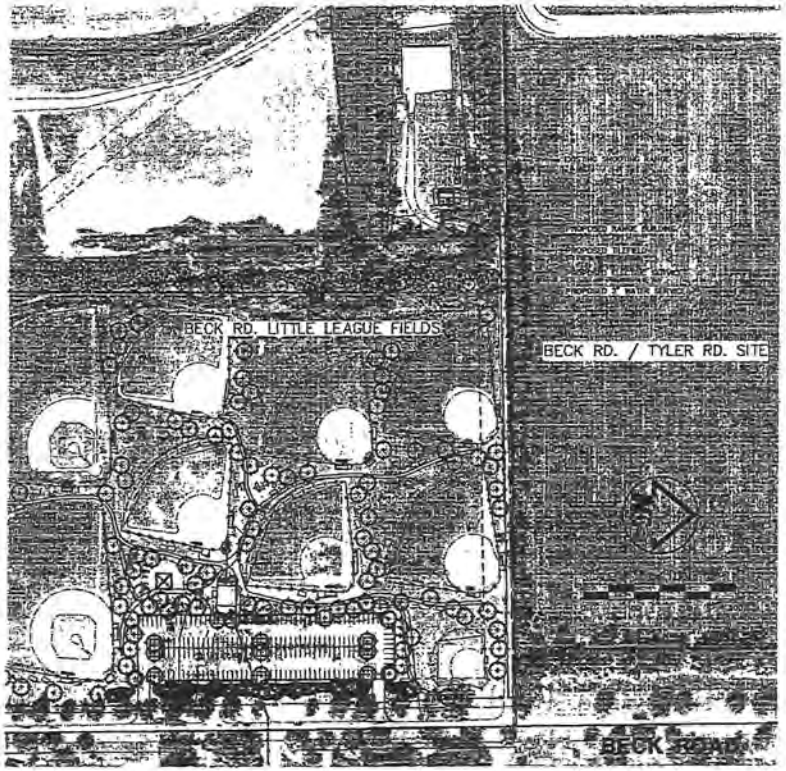
RELEASED FOR:	DATE



FLOOR PLAN



SHOOTING RANGE BUILDING



MIDWESTERN CONSULTING

Civil, Environmental and Transportation Engineers
Planners, Surveyors
Landscape Architects

3815 Plaza Drive
Ann Arbor, Michigan 48108
Phone: 734.995.0200
Fax: 734.995.0599

CLIENT
WAYNE DISPOSAL, INC.
14000 AUTO WORKS DRIVE
BELLEVILLE, MI 48111
(734) 699-6237

WAYNE DISPOSAL, INC.

SITE IMPROVEMENTS CONCEPT PLAN
SUBSEQUENT TO PERMIT DATE
SHOOTING RANGE & MISCELLANEOUS DETAILS

2

JOB No. 07174
DATE 8/21/09
SHEET 2 OF 2
REVISIONS
REV. DATE DESCRIPTION
1 12-21-09 PER PC

EXHIBIT E

Minimum Annual Royalty Calculations

The following are hypothetical examples of the Royalties due the Township under the assumptions set forth below (for simplicity, only Gate Tons are considered and the CPI increase to the Minimum Annual Royalty required by Section 4(e)(i) is not included).

Year 1: WDI disposes of 181,819 Gate Tons of Waste

Royalty = 181,819 x $1.65 = $300,000

WDI pays Township Minimum Annual Royalty of $325,000.

Shortfall Amount = $25,000

Year 2: WDI disposes of 206,061 Gate Tons of Waste

Royalty = 206,061 x $1.65 = $340,000

WDI pays Township $325,000 (because entire Shortfall Amount cannot be set off against amount by which Royalty exceeds the Minimum Annual Royalty without dipping below the Minimum Annual Royalty)

Shortfall Amount available for set off in subsequent years = $10,000 (previous Shortfall Amount reduced by amount set off in Year 2)

Year 3: WDI disposes of 212,121 Gate Tons of Waste

Royalty = 212,121 x $1.65 = $350,000

WDI pays Township $340,000

Year 4: WDI disposes of 181,819 Gate Tons of Waste

Royalty = 181,819 x $1.65 = $300,000

WDI pays Township $325,000 (Minimum Annual Royalty)

Shortfall Amount = $25,000

Year 5: WDI disposes of 212,121 Gate Tons of Waste

Royalty = 212,121 x $1.65 = $350,000

WDI pays Township $325,000

Appendix B. Presentation for First Public Meeting – December 9, 2010

October 26, 2010

Special Meeting of the City Council held Tuesday, October 26, 2010 at 8:00 p.m. at Wayne City Hall, 3355 S. Wayne Rd. All Members Present. APPROVED: bid awards for electrical work, mechanical work and exterior electrical work at City Hall. Adjourned to a Closed Session at 8:05 p.m. to discuss specific pending litigation and receive a legal opinion. Reconvened at 9:38 p.m. Adjourned at 9:39 p.m.

Mary E. Carney
City Clerk

Publish: November 4, 2010

CHARTER TOWNSHIP OF CANTON
ACCESS TO PUBLIC MEETINGS

The Charter Township of Canton will provide necessary reasonable auxiliary aids and services, such as signers for the hearing impaired and audio tapes of printed materials being considered at the meeting, to individuals with disabilities at the meeting/hearing upon two weeks notice to the Charter Township of Canton. Individuals with disabilities requiring auxiliary aids or services should contact the Charter Township of Canton by writing or calling the following:

David Medley, ADA Coordinator
Charter Township of Canton, 1150 S. Canton Center Road
Canton, MI 48188
(734) 394-5260

Published: November 4, 2010

EC110410-0300 2.5 x 1.667

CHARTER TOWNSHIP OF CANTON
NOTICE OF PUBLIC HEARING

The Board of Trustees of the Charter Township of Canton will conduct a public hearing on Tuesday, November 23, 2010, at 7:00 P.M. in the First Floor Meeting Room at the Canton Township Administration Building, 1150 S. Canton Center Road, Canton Michigan as part of its regular meeting.

The purpose of the public hearing will be to consider a request from EnovateIT L.L.C., for an Exemption of Personal Property certificate for personal property to be located at 7820 Lilley Rd., within Northeast Canton Industrial Development District, the legal description of which is as follows:

Situated in the Township of Canton, Wayne County, Michigan, described as:
02Q2A2 Q2B2B Q3B PT OF THE SE 1/4 SEC 2 T2S R8E DESC AS BEG S 00DEG 20M 10S E 258.22FT FROM N 1/4 COR SEC 2 TH N 88DEG 51M 18S E 536.63FT TH S 00DEG 33M 13S E 1016.25FT TH N 55DEG 20M 10S W 183.91FT TH N 10DEG 20M 10S W 316.04FT
TH N 60DEG 20M 10S W 101.39FT TH S 89DEG 39M 50S W 247.10FT TH N 00DEG 20M 10S W 541.25FT TO POB 8.46 AC

Parcel# 008 99 0001 710

Publish: The Eagle, November 4, 2010

Terry G. Bennett
Clerk

EC110410-0301 2.5 x 2.55

PUBLIC NOTICE
WAYNE DISPOSAL, INC.
HAZARDOUS WASTE FACILITY
CONSTRUCTION PERMIT
APPLICATION

Wayne Disposal, Inc. (WDI) hereby gives notice of a public meeting to describe their proposed construction permit application for the construction of additional waste landfill capacity at their facility.

WDI operates a hazardous waste and polychlorinated biphenyl (PCB) landfill at their facility located at 49350 North I-94 Service Drive in Belleville, Michigan.

A public meeting will be held from 7:00 pm to 8:30 pm on December 9, 2010 at the Holiday Inn Express located at 46194 North I-94 Service Drive Belleville, Michigan, 48111. The public meeting location is accessible to disabled persons. Anyone requiring special accommodations should contact Robert Doyle of WDI at least 72 hours prior to the meeting.

Any questions regarding the public meeting and the proposed construction permit application should be directed to:

Robert Doyle
Wayne Disposal, Inc.
36255 Michigan Avenue
Wayne, Michigan 48184
Phone # 734 329-8000

Publish: November, 4, 2010

bers present. Approval of ...
carried by all members present. Citizen'
the millage increase and taxes increasin
supported by Williams to approve payr
Item 1. PUBLIC HEARING – CONSI
supported by Anthony open the public he
for real property and a PA 328 Tax Abat
rled by all members present. Debbie Bi
Warehouse is over 1 million square feet
they are looking at adding 21 jobs over
Recent changes in state legislation has
abatement is only available on new pers
time WF Whelan will assume 60% of th
should take up another 20%-30% of the
two. Motion by Bennett, supported by
Facilities Exemption Certificate for rea
the WF Whelan Co. Motion carried by
application of the WF Whelan Co., for a
bers present. **CONSENT CALENDAI**
APPEALS. (MSD) Motion by Benne
ing schedule for the year 2011. Meeting
Building, 1150 Canton Center South.
THE ZONING BOARD OF APPEAI
Board of Appeals' meeting schedule fo
Township of Canton Administration B
ER RE-APPOINTMENT OF BOB I
ported by Williams to re-appoint Bob
by all members present. **Item 4. C(**
APPEALS. (MSD) Motion by Benne
expiring 12/31/2012). Motion carried
BUILDING BOARD OF APPEALS.
Board of Appeals. (Term expiring 12/
APPOINTMENT. (SUPERVISOR)
Planning Commission, term to expire
DATE FOR ENOVATEIT FOR AN
Bennett, supported by Williams to se
Personal Property Certificate for Enov
all members present. **GENERAL C/**
AUTO REPAIR. (MSD) Motion b
Establishment in a LI, Light Industri
AMENDMENT TO THE CODE O
AND INDUSTRIAL WASTE PRE
TIES AUTHORITY SYSTEM. (MS
to the Code of Ordinances, Chapter 7
Users Discharging to Ypsilanti Comn
ing will occur on November 9, 2010
ent. **STATE OF MICHIGAN, COU**
SEWER SYSTEM ORDINANCE (
OF THE CHARTER TOWNSHIP
WASTE PRETREATMENT REQ
AUTHORITY SYSTEM PROV
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REQUIRED; PERIODIC MONIT
INSURANCE, ENFORCEMENT I
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SEVERABILITY OF UNENFOR
THE CHARTER TOWNSHIP OF
WATER AND SEWER ORDINANC
MENTS OF THE EPA, DNRE AN
COMMUNITY UTILITIES AUTH
COMPREHENSIVE AND ARE A
CLERK. **SECTION 2. VIOLATIO**
legal entity who violates the provisi
($500.00) Dollars or imprisoned for
Ordinances or parts of Ordinances i
to the extent necessary to give this
phrase or portion of this Ordinance
tion shall be deemed a separate, dis
tion thereof. **SECTION 5. SAVIN**
mitted or done, or any penalty or fo
to the effective date of this Ordinan
cause this Ordinance to be publishe
force and effect upon publication.
of the Charter Township of Canton
tion in the manner required by law.
NANCE DELEGATION AGRE
Wastewater Discharge Ordinance D
the agreement on behalf of Canto
COUNTY TO PROVIDE WINT
Motion by Bennett, supported by T
miles (37.80 lane miles) of Coun
(Engineering ROW Professional &
carried. **Item 5. PENDING LITI**
dation of Township Legal Counsel
present. **OTHER:** The Tuesday, N
Election. The next Board Meeting
Room, 1150 Canton Center S., Ca
Motion carried by all members pre

Copies of the complete text of the
Rd, Canton, MI 48188, during reg
Approval. Publish: November 4,

Wayne Disposal Inc.

Construction Permit/ Operating License Application

Public Meeting

December 9, 2010

7:00 PM

THE ENVIRONMENTAL QUALITY COMPANY

Who We Are

- Wayne Disposal (WDI) has been operating in Van Buren Township for more than 50 years
- Part of EQ - The Environmental Quality Company
  - A comprehensive environmental services provider with 25 locations and 825 employees across the U.S.
- Stable employer for more than 350 people in Southeast Michigan
  - 90 jobs in Van Buren Township

THE ENVIRONMENTAL QUALITY COMPANY

Our Location

- North I-94 Service Drive between Belleville and Rawsonville Roads

Committed to the Surrounding Community

- Active member of the Van Buren Township and Belleville communities
- Sponsor local initiatives and programs
  - Household hazardous waste collection
  - Use of WDI property for baseball fields and shooting range
  - Belleville Area Chamber of Commerce
  - Strawberry Festival
  - Winterfest
  - Yankee Air Museum
  - Belleville School District programs
- Significant contributor to township tax base

THE ENVIRONMENTAL QUALITY COMPANY

Direct Commitment to Van Buren Township

- Entered into a host community agreement in 2009
- Provides funding for local improvement projects
  - Beck Road baseball fields
    - Paved parking lot, remodeled restrooms, new walking paths and benches
  - Training facility for law enforcement at shooting range
  - Planted trees at Van Buren Park and Beck Road baseball fields
- Emergency response training exercises with local authorities
- Continued funding into the community

THE ENVIRONMENTAL QUALITY COMPANY

A Responsible Solution

- Wayne Disposal is the only commercial hazardous waste landfill in Michigan; one of only 7 of its type in the U.S.
  - Designed to securely contain solid (non-liquid) waste in compliance with Land Disposal Restrictions
  - Site also hosts a waste stabilization plant, oil recycling operation, landfill gas-to-energy facility and waste water pre-treatment plant
- Even with great strides in waste reduction, a landfill option for some wastes is still a necessity
- Large proportion of waste received from contaminated soil and river sediments clean-up projects
  - Provided safe and proper disposal of waste from the Enbridge pipeline oil spill which affected the Kalamazoo River

THE ENVIRONMENTAL QUALITY COMPANY

Why We Are Here Today

- Wayne Disposal is submitting a construction permit application to the MDNRE to develop an existing parcel of land on the property into additional landfill space
- Important to inform the local community of this plan and educate them on our facility
  - Strict procedures guide landfill operations
  - Extensive safeguards and monitoring systems are in place
  - Liner system offers layers of protection

THE ENVIRONMENTAL QUALITY COMPANY

Current Site Layout

Strict Procedures Guide Landfill Operations

- All waste pre-certified to meet landfill requirements
  - Verified upon arrival
- Deliveries unloaded into "transfer box" to ensure trucks leaving the facility do not drive on waste
  - Departing trucks pass through wash facility as an additional precaution
- Dust controls
  - Wind screens strategically placed around landfill and "transfer box" to block dust
  - "Anti-dusting" agent (adhesive) applied to cover landfill each night to reduce chance of dust
  - Suspend waste unloading with high winds

THE ENVIRONMENTAL QUALITY COMPANY

Extensive Safeguards In Place to Monitor Facility

- Wayne Disposal has extensive environmental monitoring systems in place as regulated by USEPA and MDNRE
  - Includes ground water, air, leak detection systems, surface water, soil and sediment
- Stormwater generated on site is collected and treated
- Adequate funding reserved to maintain the facility indefinitely, including proper closure, maintenance and monitoring of the site

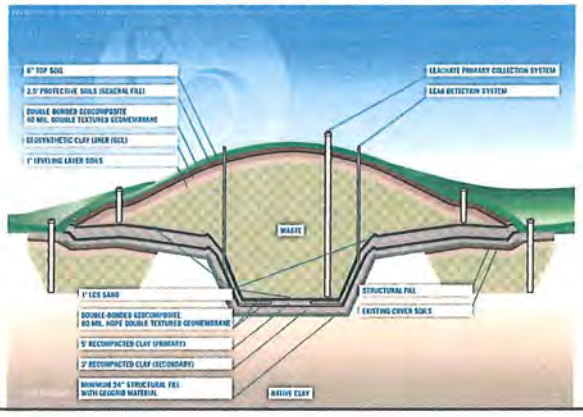
THE ENVIRONMENTAL QUALITY COMPANY

Landfill Liner Provides Layers of Protection

- See Models and Diagram

THE ENVIRONMENTAL QUALITY COMPANY

Landfill Overlay System Design



Construction Permit/Operating License Application Details

- Proposes constructing landfill space on 20 acres of undeveloped property and 53 acres of previously land-filled area via overlay construction
- Land is contained on existing property owned by Wayne Disposal
  - Surrounded by closed landfills on three sides and the Willow Run Airport on the fourth side
- Development would provide 11.7 million cubic yards of landfill space

THE ENVIRONMENTAL QUALITY COMPANY

Current Site Layout

Proposed Site Development

Summary

- WDI/EQ's continued commitment to the Van Buren Twp. community
- Host Community Agreement
- Construction permit application
- Provides a responsible solution for the management of regulated wastes

THE ENVIRONMENTAL QUALITY COMPANY

What's Next?

- Pre-application
  - Next Public Meeting scheduled to address public safety and environmental aspects of construction plan in January
- Submit application
  - MDNRE conducts Public Hearing and Comment Period on application
  - Permit application available for public review at Van Buren Township Office
- Draft license
  - MDNRE Public Hearing and Comment Period on draft license

THE ENVIRONMENTAL QUALITY COMPANY

Questions and Answers

- To have your questions on the record, please complete a card
- EQ and Wayne Disposal representatives are here to answer your questions
  - We encourage you to review the detailed plans and exhibits throughout the room
- Questions or comments may be submitted at anytime to EQ at 734-329-8000 or the MDNRE at 1-800-292-4706

THE ENVIRONMENTAL QUALITY COMPANY

Appendix C. Presentation for Second Public Meeting – January 31, 2011

PUBLIC NOTICE
WAYNE DISPOSAL, INC. HAZARDOUS WASTE FACILITY OPERATING LICENSE APPLICATION AND PRE-APPLICATION PUBLIC MEETING

Wayne Disposal, Inc. (WDI) intends to apply to the Michigan Department of Natural Resources and Environment (DNRE) for a license to construct and operate additional landfill space at WDI's existing hazardous waste and polychlorinated biphenyl landfill located at 49350 North I-94 Service Drive in Belleville, MI 48111. WDI plans to develop 20 acres of previously undeveloped land at the facility, and to overlay onto 53 acres of previously landfilled area.

Facility Location

WDI will hold a public meeting to describe its plans for the facility, and to solicit comments from the public, on January 31, 2011 from 7:00 p.m. until 8:30 p.m. at the Holiday Inn Express located at 46194 North I-94 Service Drive Belleville, Michigan, 48111.

Persons requiring special accommodations should contact WDI's contact person, Mr. Robert Doyle, at least 72 hours prior to the meeting at:

Robert Doyle
Wayne Disposal, Inc.
36255 Michigan Avenue
Wayne, Michigan 48184
Phone #: 734-329-8000
e-mail: bob.doyle@eqonline.com

A summary of WDI's plans and engineering details can be viewed before the public meeting at the Van Buren Township Offices at 46425 Tyler Road, Van Buren Township, MI 48111, and are also available on WDI's website at www.eqonline.com. After the public meeting, WDI will complete its license application and submit it to the DNRE for processing in accordance with Part 111 of the Natural Resources and Environmental Protection Act, including a public comment period and a public hearing. Copies of the complete application will be made available at the Van Buren Township Offices and will be available for downloading and printing from WDI's website.

N29024

PUBLIC RADIO ANNOUNCEMENT

Proposed Hazardous Waste Management Facility Operating License Application
For Wayne Disposal, Inc.

Wayne Disposal, Inc. intends to apply to the Michigan Department of Natural Resources and Environment for a license to construct and operate additional landfill space at its existing hazardous waste and polychlorinated biphenyl landfill located at 49350 North I-94 Service Drive in Belleville, MI. Wayne Disposal, Inc. plans to develop 20 acres of previously undeveloped land at the facility, and to overlay onto 53 acres of previously landfilled area.

Wayne Disposal, Inc. is holding a public meeting to describe its plans for the facility, and to solicit comments from the public, on January 31, 2011 from 7:00 p.m. until 8:30 p.m. at the Holiday Inn Express located at 46194 North I-94 Service Drive Belleville, Michigan. For more information and for persons requiring special accommodations, citizens may contact Mr. Robert Doyle of Wayne Disposal, Inc. at least 72 hours prior to the meeting at 734-329-8000 or bob.doyle@eqonline.com.

Wayne Disposal, Inc.

Operating License Application

Public Meeting

January 31, 2011

7:00 PM

THE ENVIRONMENTAL QUALITY COMPANY

Today's Agenda

- Present description of proposed project
- Share Wayne Disposal's (WDI) plans to ensure public safety to the residents of the surrounding community and environmental protection
- Address questions and comments

THE ENVIRONMENTAL QUALITY COMPANY

Who We Are

- WDI has been operating in Van Buren Township for more than 50 years
- Part of EQ - The Environmental Quality Company
  - A comprehensive environmental services provider with 25 locations and 825 employees across the U.S.
- Stable employer for more than 350 people in Southeast Michigan
  - 90 jobs in Van Buren Township; 100 jobs close to VBT in Ypsilanti

THE ENVIRONMENTAL QUALITY COMPANY

Our Location

- North I-94 Service Drive between Belleville and Rawsonville Roads

A Responsible Solution

- WDI is the only commercial hazardous waste landfill in Michigan; one of only 7 of its type in the U.S.
  - Designed to securely contain solid (non-liquid) waste in compliance with Land Disposal Restrictions
  - Site also hosts a waste stabilization plant, oil recycling operation, landfill gas-to-energy facility and waste water pre-treatment plant
- Even with great strides in waste reduction, a landfill option for some wastes is still a necessity
- Large proportion of waste received from contaminated soil and river sediments clean-up projects
  - Provided safe and proper disposal of waste from the Enbridge pipeline oil spill which affected the Kalamazoo River

Committed to the Surrounding Community

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- Sponsor local initiatives and programs
  - Household hazardous waste collection
  - Use of WDI property for baseball fields and shooting range
  - Belleville Area Chamber of Commerce
  - Strawberry Festival
  - Winterfest
  - Yankee Air Museum
  - VBT Public Safety
  - Belleville School District programs
- Significant contributor to township tax base

Direct Commitment to Van Buren Township

- Entered into a host community agreement in 2009
- Provides funding for local improvement projects
  - Beck Road baseball fields
    - —Paved parking lot, remodeled restrooms, new walking paths and benches
  - Training facility for law enforcement at shooting range
  - Planted trees at Van Buren Park and Beck Road baseball fields
- Emergency response training exercises with local authorities
- Continued funding into the community

Why We Are Here Today

- WDI submitting an operating license application to the Michigan Dept. of Natural Resources and Environment (MDNRE) to develop an existing parcel of land on the property into additional landfill space
- Important to inform the local community of this plan and educate them on our facility
  - Strict procedures guide landfill operations
  - Extensive safeguards and monitoring systems are in place
  - Liner system offers layers of protection

Operating License Application Details

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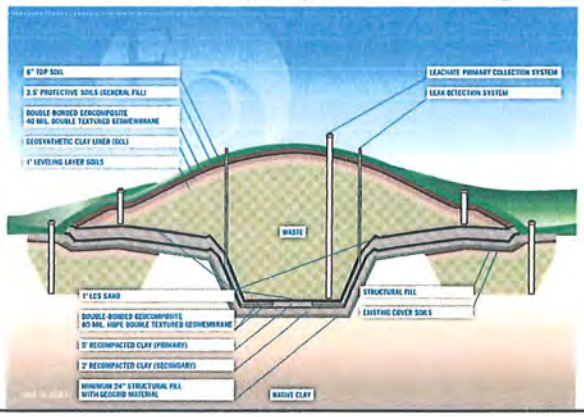
- Development would provide 11.7 million cubic yards of landfill space

THE ENVIRONMENTAL QUALITY COMPANY

Current Site Layout

Proposed Site Development

Landfill Overlay System Design



Public Communication and Participation Process

- WDI reaches out to Van Buren Township community to discuss public safety and environmental protection
- Remainder of presentation covers these topics

THE ENVIRONMENTAL QUALITY COMPANY

Discussion of Public Safety and Environmental Protection

- Transportation of waste
- Potential for fires or explosions
- Potential impact on VBT in terms of health, safety, cost and consistency with local planning and existing development
- Potential environmental impacts

THE ENVIRONMENTAL QUALITY COMPANY

Transportation of Waste
Mitigation Measures of Potential Risks and Impacts

- Truck traffic - Traffic pattern controls
  - Strict procedures communicated to transporters
  - Enforcement
  - No anticipated increase in truck traffic
- In the event of an incident
  - WDI would provide immediate response
  - Reimburse the Township for any costs
- Vehicle track out
  - Transfer box to prevent trucks from driving on waste
  - Wheel wash facility

THE ENVIRONMENTAL QUALITY COMPANY

Fires and Explosions
Mitigation Measures of potential risks and impacts

- WDI landfill presents a limited fire & explosion potential
- Both WDI and MDI carefully screen all waste streams to minimize fire potential both pre & post receipt
- MDI/WDI drills annually with the Van Buren Twp. and Belleville fire departments
  - Communicate hazards and location of chemicals at the site
  - Two EQ employees at the site are also VBT volunteer fire fighters
- Facility equipped with fire extinguishing equipment and provides training on equipment
  - MDI has sophisticated automatic fire detection & suppression systems
  - Air pollution controls minimize potential impacts from fires

THE ENVIRONMENTAL QUALITY COMPANY

The Impact on Van Buren Twp.

- Health & Safety
- Costs
  - Economic impact of Host Community Agreement
  - WDI maintains adequate funding to maintain the facility indefinitely, including proper closure, maintenance and monitoring of the site
- Consistency with local planning and existing development
  - VBT has right to pre-review all submissions
  - WDI reimburses VBT for 3rd party review of application
  - Mock emergency training exercise with VBT Dept. of Public Safety
  - Open access to site and records
  - 24 hour notification of any emergencies or incidents on site
  - WDI must comply with all VBT ordinances, rules and regulations
  - WDI meets with Environmental Commission every 6 months or upon request

Environmental Impacts

- The natural environment, ecology and wildlife
- Scenic, historic, cultural and recreational values
- Public health and safety
- Water and air quality

Environmental Impacts
The natural environment and ecology and wildlife

- 20 acres of undeveloped land that include wetlands (14.4 acres) will be used
  - WDI will construct 28.8 acres of new wetland in an area more accessible to wildlife
- Undeveloped land is surrounded by landfill and airport
- No endangered species present
- Relocation mitigates bird hazard for Willow Run Airport

Environmental Impacts
Scenic, Historic, Cultural and Recreational Values

- Environmental Impact Analysis portion of application shows no historical or cultural items
- Topography will change very little
- No recreational value as it is within site property

Environmental Impacts
Public Health and Safety

- Potential for fire or explosion
- Potential for off-site vehicle accident
- Potential exposure to public via contamination of air, surface water or ground water
  - Mitigated by engineering and process controls
  - Verified by monitoring

Environmental Impacts
Water and Air Quality Monitoring

- WDI has extensive, state-of-the-art monitoring systems required and audited by USEPA and MDNRE
- Monitoring includes:
  - Ground water – More than 50 wells on the property are monitored
  - Air – Six monitoring stations along site perimeter
  - Leak detection systems beneath primary liners of all hazardous waste cells
  - Surface water – Monitored at seven locations within the site
  - Soil and sediment – 25 soil/sediment locations and 12 samples from sedimentation basins

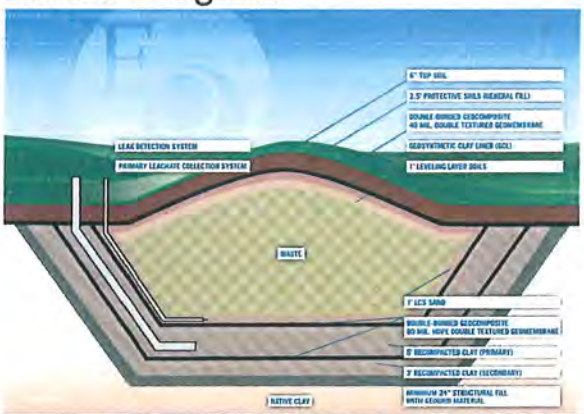
Environmental Impacts
Engineering Controls

- Storm water collection, retention and treatment
- Site divided into "Area A" (close to active operations) and "Area B" (remote to active operations). "Area B" must be maintained clean to the strictest limits
- Waste water pre-treatment
- Double composite landfill liner

Landfill Liner Provides Layers of Protection

- Liner Construction Sequence (from bottom to top)
  - 10 feet (min) of native glacial clay
  - 3 feet of recompacted clay
  - 80 mil HDPE Liner
  - Geocomposite Leak Detection System
  - 5 feet of recompacted clay
  - 80 mil HDPE Liner and Geocomposite
  - Leachate Collection System

Landfill Diagram



Environmental Impacts

Operational Controls

- All waste pre-certified to meet landfill requirements and then inspected upon arrival
- Vehicle track-out controls
- Dust controls
  - Wind screens strategically placed around landfill and "transfer box" to block dust
  - "Anti-dusting" agent (adhesive) applied to cover landfill each night to reduce chance of dust
  - Suspend waste unloading during high winds

THE ENVIRONMENTAL QUALITY COMPANY

What is Next?

- Submit application
  - MDNRE conducts Public Hearing and Comment Period on application
  - Permit application available for public review at Van Buren Township Office
- Draft license
  - MDNRE Public Hearing and Comment Period on draft license

THE ENVIRONMENTAL QUALITY COMPANY

Questions and Answers

- Additional input from the community
- To have your questions on the record, please complete a card
- EQ and Wayne Disposal representatives are here to answer your questions
  - We encourage you to review the detailed plans and exhibits throughout the room
- Questions or comments may be submitted at anytime to EQ at 734-329-8000 or the MDNRE at 1-800-292-4706

THE ENVIRONMENTAL QUALITY COMPANY