LEGEND

- APPROXIMATE PROPERTY LINE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- 710 — EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 673.4 — EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- 30+00N — SITE GRID COORDINATE
- 161T — EXISTING WATER TABLE OBSERVATION WELL LOCATION AND NUMBER
- UB5 — PIEZOMETER LOCATION AND NUMBER
- SW1 OR SG2 — STAFF GAUGE LOCATION AND NUMBER
- LS5 OR MH3 — MANHOLE/LIFT STATION LOCATION AND NUMBER
- APPROXIMATE LOCATION OF GROUNDWATER CONTAINMENT STRUCTURE
- NORTHWEST EXPANSION LIMITS OF WASTE
- OLD SITE LIMITS OF WASTE
- DESIGN MANAGEMENT ZONE
- APPROXIMATE LIMITS OF WASTE (EXISTING SITE)
- APPROXIMATE LIMITS OF WASTE CORRIDORS (EXISTING SITE)
- SS — SANITARY SEWER
- OVERHEAD ELECTRICAL
- OUTFALL 001 — SEDIMENTATION BASIN OUTFALL LOCATION AND NUMBER
- R-2 — RECOVERY WELL / MC GAS CONTROL VALVE

COVER DESIGNS

1991 TO 1993 (NON-RCRA)
- 6" TOPSOIL
- 4' COMPACTED CLAY

1990 TO 2001 (RCRA)
- 6" TOPSOIL
- 1.5' GENERAL FILL
- GEOTEXTILE FILTER
- 1' SELECT SAND
- 40 MIL VLDPE GEOMEMBRANE
- 3' COMPACTED CLAY

LOCATION OF INSTALLED RCRA FINAL COVER

1994 TO 2001 (NR 180)
- 6" TOPSOIL
- 2' GENERAL FILL
- 2' COMPACTED CLAY

2002 TO 2022 (NR 500)
- 6" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- GEOSYNTHETIC CLAY LINER (GCL)
- 2' SOIL BARRIER LAYER

LOCATION OF INSTALLED NR 500 FINAL COVER

2023 TO 2024 (NR 500 AND RCRA)

RCRA AREA
- 6" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- GEOSYNTHETIC CLAY LINER (GCL)
- 2' COMPACTED CLAY

LOCATION OF REVISED RCRA FINAL COVER UPDATED

NON-RCRA AREA (REVISED NR 500)
- 6" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- 2' COMPACTED CLAY

LOCATION OF NR 500 FINAL COVER (REVISED)

NOTES

1. SITE LOCATION PART OF THE NORTH 1/2 OF SECTION 23, TOWNSHIP 3 NORTH, RANGE 22 EAST, IN THE CITY OF RACINE, COUNTY OF RACINE, STATE OF WISCONSIN.
2. TOPOGRAPHIC BASE MAP WAS OBTAINED FROM AERO-METRIC ENGINEERING, INC. (DATE OF PHOTOGRAPHY OCTOBER 06, 1994; JUNE 1995, MARCH 28, 2005 MARCH 29, 2008), HENDERSON AERIAL SURVEYS, INC. (DATE OF PHOTOGRAPHY APRIL 9, 2012), FIRMATEK AERIAL SURVEYS CO. (DATE OF SURVEY OCTOBER 23, 2024)
3. MONITORING WELL LOCATIONS DETERMINED BY SURVEY INFORMATION PROVIDED BY KESTREL HAWK LANDFILL.
4. APPROXIMATE LIMITS OF EXISTING WASTE WERE PROVIDED BY KESTREL HAWK LANDFILL.
5. VERTICAL DATUM IS USGS MEAN SEA LEVEL. TOPOGRAPHIC CONTOUR INTERVAL IS TWO FEET.
6. HORIZONTAL DATUM IS BASED ON THE WISCONSIN STATE PLANE COORDINATE SYSTEM. THE SITE GRID IS PARALLEL AND PERPENDICULAR TO THE STATE PLANE COORDINATE SYSTEM. SITE GRID IS REFERENCED TO STATE PLANE COORDINATE GRID WITH SITE GRID COORDINATE 0+00N, 100+00E EQUAL TO STATE PLANE COORDINATE 264,196.55N, 2,573,700.72E.
7. LOCATION OF PROPERTY LINE PROVIDED BY KESTREL HAWK LANDFILL.
8. THE WESTERN BOUNDARY OF THE RCRA COVER EXTENDS TO THE WESTERN BOUNDARY OF THE GEOMEMBRANE LINER PLACED ON THE BASE OF CORRIDORS 8, 9, AND 10 PER THE AUGUST 2008 DOCUMENTATION REPORT BY EARTHTECH.

PROJECT:	KESTREL HAWK LANDFILL CLOSURE REPORT RACINE, WISCONSIN
TITLE:	CONSTRUCTED FINAL COVER LOCATIONS
DRAWN BY:	T. FIEBRANZ
CHECKED BY:	B. KAHNK
APPROVED BY:	T. MARTIN
DATE:	APRIL 2025
PROJ NO.:	557496.0000
	FIGURE 3

TRC
999 Fourier Drive
Suite 101
Madison, WI 53717
Phone: 608.826.3600

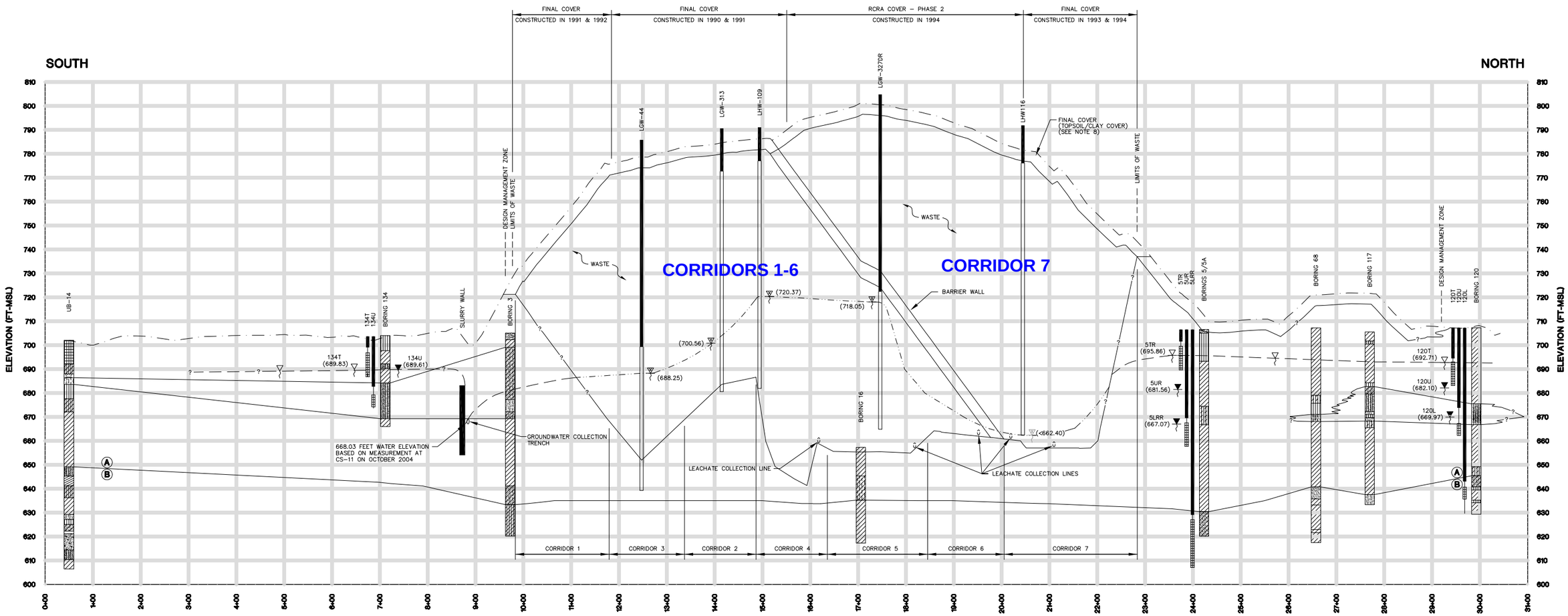
FILE NO.: 557496.0000.CFCL_APP E.dwg

SCALE IN FEET: 0, 150, 300, 450, 600

24,36 -- USER: TFiebranz -- ATTACHED XREFS: utility, CR, gas, CR, proceed, CR, bnmrt, CR, EG, 2024-10-23, pipe old-site, CR, hatching and color, CR, Hatch area Text, CR, Site Features, bnm, 2019 May -- ATTACHED IMAGES:
DRAWING NAME: J:\Republic\Kestrel Hawk\557496 - Closure Process\0000\ 557496.0000.CFCL_APP E.dwg -- PLOT DATE: April 03, 2025 - 2:19PM -- LAYOUT: CONSTRUCTED FINAL COVER LOCATIONS
Version: 2017-10-31

CALLOUTS BY: J. HOTSTREAM 4/13/2020

EXTENTION OF RCRA FINAL COVER OVER BARRIER WALL



B-B'

LEGEND

- STRATIGRAPHIC BOUNDARY (DASHED WHERE INFERRED)
- EXISTING GROUND SURFACE (3/28/05)
- LEACHATE HEAD SURFACE
- WATER TABLE SURFACE
- (679.04) GROUND WATER OR LEACHATE ELEVATION IN WELL (FT. M.S.L.)
- LEACHATE LEVEL IN LHW OR LGW WELLS (FT. M.S.L.)
- WATER TABLE ELEVATION IN MONITORING WELLS (FT. M.S.L.)
- POTENTIOMETRIC HEAD ELEVATION IN MONITORING WELLS (FT. M.S.L.)
- (A) UNIT A
- (B) UNIT B

MONITORING WELL CONSTRUCTION
- WELL SEAL
- WELL CASING
- WELL SCREEN

LEACHATE HEAD OR GAS WELL CONSTRUCTION
- GRAVEL PACK OR WELL SEAL
- WELL SCREEN

SLURRY WALL CONSTRUCTION

GEOLOGIC SYMBOLOGY

CLAYS
- LEAN CLAY/ LEAN CLAY WITH SAND/GRAVEL (CL)
- SANDY LEAN CLAY/SANDY LEAN CLAY WITH GRAVEL (CL)
- SILTY CLAY/SILTY CLAY WITH SAND/GRAVEL (CL-ML)
- SANDY SILTY CLAY/SANDY SILTY CLAY WITH GRAVEL (CL-ML)

SANDS
- WELL-GRADED/POORLY-GRADED SAND (SW OR SP)
- WELL-GRADED/POORLY-GRADED SAND, WITH GRAVEL (SW OR SP)

SILTS
- SILT/SILT WITH SAND GRAVEL (ML)
- CLAYEY SILT
- SANDY SILT/SANDY SILT WITH GRAVEL (ML)
- GRAVELLY SILT/GRAVELLY SILT WITH SAND (ML)
- ELASTIC SILT/ELASTIC SILT W/ SAND ELASTIC SILT W/ GRAVEL (MH)

GRAVELS
- WELL-GRADED/POORLY-GRADED GRAVEL (GW OR GP)

MISCELLANEOUS MATERIALS
- PEAT
- TOPSOIL
- EARTHEN FILL

NOTES

1. THE CORRELATION LINES ARE BASED ON INTERPOLATION BETWEEN BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS.
2. HORIZONTAL DISTANCES ARE MEASURED AND THE GROUNDWATER AND LEACHATE HEAD DATA ARE PLOTTED WITH RESPECT TO THE CENTER OF EACH BORING LOCATION. WELL CONSTRUCTION SCHEMATICS ARE OFFSET FOR CLARITY.
3. REFER TO FIGURE 5 FOR NOTES REGARDING THE EXISTING TOPOGRAPHY AND CROSS SECTION LOCATIONS.
4. ELEVATIONS ARE SHOWN IN REFERENCE TO USGS MEAN SEA LEVEL (M.S.L.) DATUM.
5. THE GROUNDWATER ELEVATIONS ARE BASED ON MEASUREMENTS TAKEN BY RMT ON OCTOBER 18 & 19, 2004. THE LEACHATE ELEVATIONS ARE BASED ON MEASUREMENTS TAKEN BY RMT BETWEEN OCTOBER 19 AND 21, 2004.
6. BORINGS SHOWN TO BE ABOVE OR BELOW EXISTING GROUND SURFACE (MARCH 28, 2005) PREDATE EITHER FILL OR EXCAVATION ACTIVITIES IN THOSE AREAS. WASTE IN AREAS 8, 9 AND 10 AS INDICATED IN BORINGS 144, 145 AND 168 WAS REMOVED PRIOR TO CONSTRUCTION OF SLURRY WALL IN 1991.
7. EXISTING GROUNDWATER CONTAINMENT STRUCTURE LOCATIONS AND DEPTHS WERE APPROXIMATED FROM A COPY OF THE CONSTRUCTION OBSERVATION REPORT FOR THE GROUNDWATER CONTAINMENT STRUCTURE PLAN SET RECEIVED AUGUST 1991. (FOTH & VAN DYKE).
8. FINAL COVER THICKNESS SHOWN AS 4.5-FEET THICK. ACTUAL THICKNESS MAY VARY BASED ON LOCATION WITHIN SPECIFIC FINAL COVER PHASING.
9. LANDFILL BASE ELEVATIONS AT LOCATIONS WHERE NO BORINGS OR WELLS ARE PRESENT ARE PROJECTED BASED ON INFORMATION FROM ADJACENT BORINGS OR WELLS.
10. THE TOP OF UNIT B ELEVATIONS BENEATH THE LANDFILL ARE BASED ON A PROJECTED CONTOUR MAP USING STRATIGRAPHIC DATA FROM SOIL BORINGS INSTALLED AROUND THE PERIMETER AND WITHIN THE LANDFILL.
11. THE BASEGRADES WITHIN CORRIDOR 4 WERE EXCAVATED 20' BELOW THE CORRIDOR 4 LEACHATE COLLECTION PIPE 400 FEET FROM THE EAST PIPE END. REFER TO APPENDIX A OF THIS REPORT FOR ADDITIONAL INFORMATION.

PROFILE SCALE: 20' — SCALE: 1"=20'
HORIZONTAL 0 100' — SCALE: 1"=100'
VERTICAL EXAGGERATED = 5X

NO.	BY	DATE	REVISION	APP'D.
3.				
2.				
1.				

PROJECT: **KESTREL HAWK LANDFILL OLD SITE HYDROGEOLOGIC EVALUATION PHASE I SUMMARY REPORT**

SHEET TITLE: **CROSS SECTION B-B'**

DRAWN BY: MEYERHOC	SCALE:	PROJ. NO.	4865.94
CHECKED BY: TS	AS SHOWN	FILE NO. 48659420_REV1.DWG	
APPROVED BY: JO	DATE PRINTED:		
DATE: OCTOBER 2005			

RMT
744 Heartland Trail
Madison, WI 53717-1934
P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

FIGURE 4: Reproduced from RMT, Inc. (2005)

Appendix A: WDNR Correspondence

Jodi Feld

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D Besadny
Secretary

BOX 7921
MADISON, WISCONSIN 53707

June 15, 1987

IN REPLY REFER TO: 4410-2

Mr. Glenn A. Oakes, President
Land Reclamation, Ltd.
2250 South Green Bay Road
Racine, WI 53406

SUBJECT: Facility Construction Documentation Review
Corridor 7-Land Reclamation
Ltd., License #0572, Racine County

Dear Mr. Oakes:

This letter is to inform you of the review and approval status of Corridor 7. The Residuals Management and Land Disposal Section has determined that the construction documentation reports required for approval of Corridor 7 are in substantial compliance with ch. NR 180, Wis. Adm. Code, the Plan of Operation Approval (December 19, 1984), and the subsequent conditions of other approval letters subject to the limitations contained in this letter. The Hazardous Waste Management Section has determined that the information submitted for the existing section of the hazardous waste barrier between Corridors 6 and 7 meets the requirements and intent of the Department's guidance provided for construction of the barrier. However, U.S. EPA - Region V must also approve the barrier construction. The concerns raised by Region V must be addressed to their satisfaction, and approval from Region V of the existing hazardous waste barrier must be obtained, prior to refuse placement in Corridor 7. Our staff has been in contact with Region V and has informed them of our review findings.

Refuse filling in Corridor 7 may commence after an approval letter from EPA - Region V office is issued and received by LRL. Refuse placement in Corridor 7 will be limited to the area identified below. This area should be satisfactory to handle LRL's short-term disposal needs while other details concerning the hazardous waste barrier design and construction are addressed and finalized. A comprehensive review letter by WDNR addressing the construction and documentation of Corridor 7 will follow. That letter may contain conditions of approval for the landfill. However, we do not anticipate that those conditions will affect refuse placement in the areas of Corridor 7 limited by this letter.

LIMITATIONS

1. Refuse placement in Corridor 7 shall be limited to the base area defined as follows:

   a. The temporary northern and eastern berms constructed in Corridor 7.

   b. The hazardous waste barrier as constructed between Corridor 6 and 7.

   c. The western limit of Corridor 7, shown on plan sheet 8R (RMT, June 1984 Plan of Operation Addendum) as approximately grid line 12+00E.

2. Refuse filling against the existing hazardous waste barrier shall not exceed the portions documented in Addendum #1 (Foth & Van Dyke, January 1987). The hazardous waste barrier was documented for the first 36 lifts, which extend to approximately elevation 690.

3. Further construction of the hazardous waste barrier at all locations cannot not proceed until approval of the design concepts and construction details by WDNR and U.S. EPA - Region V is obtained.

   We anticipate that Land Reclamation, Ltd. will address the remaining design concerns relating to the hazardous waste barrier and the closure plan so that construction can proceed with the barrier and additional disposal volume in Corridor 7 can be obtained.

If you have any questions concerning this letter, please contact us immediately. Please contact Edward Lynch at (608) 266-3084 or Daniel Carey at (608) 267-7572 with regard to technical or design concerns.

Sincerely,

Paul P. Didier

Paul P. Didier, P.E., Director
Bureau of Solid Waste Management

RGS:DC:pl
9741R

cc: Ken Hein - SED
Ed Lynch - HW/3
Robert Hunter - DOJ
Scott Schreiber - LRL
Mary Carington - Town of Mt. Pleasant
Chuck Slaustas - U.S. EPA Region V-SHS/13
Rick Karl - U.S. EPA Region V-SHE/12

Dennis Mack

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D. Besadny
Secretary

BOX 7921
MADISON, WISCONSIN 53707

MAR 31 1988

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO: 4430 & 4410-2

Mr. Glenn A. Oakes, President
Land Reclamation, Ltd.
2250 South Green Bay Road
Racine, WI 53406

SUBJECT: Modifications to the Hazardous Waste Closure and Long-Term Care Plan and Plan of Operation Approval
Land Reclamation, Ltd. Landfill, Racine County
EPA I.D.: WID 076171008
DNR License: 0572

Dear Mr. Oakes:

The Department of Natural Resources has completed its review of your report entitled "Closure and Long-Term Care Plan for the Land Reclamation, Ltd. (LRL) Landfill (WID 076171008)" submitted by Foth & Van Dyke and Associates, Inc. of Milwaukee, Wisconsin and received by the Department on August 10, 1987. The required review fee of $1,500.00 was received on October 1, 1987. This plan submittal also addressed items covered by the Department's December 19, 1984, ch. NR 180, Wis. Adm. Code, Plan of Operation Approval. We are hereby informing you that, as submitted, the plan does not provide sufficient detail on closure or long-term care of the LRL landfill hazardous waste management unit and also does not sufficiently address previous conditions contained in the ch. NR 180, Wis. Adm. Code, Plan of Operation Approval. You are further notified that the proposed closure and long-term care plan is modified by the conditions set forth in the attached report, and under s. NR 181.42(8)(d), Wis. Adm. Code, this modified plan becomes the approved closure plan. In addition, modifications are being made to your approved plan of operation in accordance with s. 144.44(3)(d), Stats.

Prior to initiating construction on any of the items discussed in the enclosed plan modification, all conditions associated with that construction activity must be addressed to the Department's satisfaction. We intend to ask the Department of Justice to seek an injunction halting any unapproved construction begun prior to satisfaction of a condition. All contractors at the site should be provided with a copy of this plan modification as part of their contract documents.

On March 21, 1988 you requested an extension to the closure period of 180 days. The Department will grant a time extension for filling and completion of closure construction activities until November 8, 1988, the federally mandated date by which all disposal facilities must have RCRA equivalent operating license. Once the November 8, 1988 date has past, LRL must complete closure to get back into compliance.

The Department realizes that there is limited time to complete the required construction. We believe that the sequence of construction should be:

1. Containment structure construction,

2. Barrier wall construction,

3. Leachate and gas extraction system construction,

4. Slope stabilization, and

5. RCRA cap construction.

In addition all the Environmental Monitoring and Long-Term Care requirements must also be met.

The plan modification contains numerous items which were not addressed in your submittal. In addition, several items require further submittals prior to implementing closure. We understand that you are anxious to proceed with these closure activities, and therefore, we suggest that you work expeditiously to satisfy our conditions.

Further assistance is available from my staff to meet with you and your consultants during the development of responses to conditions as well as during implementation of the plan modification. Please carefully review the conditions contained in the plan modification and contact Ed Lynch at (608) 266-3084, Dennis Mack at (608) 267-9386, or Ken Hein at (414) 562-9645 should you have questions or desire a meeting.

Sincerely,

Paul P. Didier

Paul P. Didier, P.E., Director
Bureau of Solid & Hazardous Waste

PPD:ED:hf/5215C
Attachments - Plan Modification
cc: Southeast District
Hazardous Waste Management Section - SW/3
Solid Waste Management Section - SW/3
Bureau of Legal Counsel - LC/5
Ron Kazmierczak - SED
Robert Hunter - Wisconsin Department of Justice
Chuck Slaustas - RCRA Permitting - EPA Region V 5HS/13
Glenn Stenard - RCRA Enforcement - EPA Region V 5HE/12
CERCLA Enforcement - EPA Region V 5HE/11
Scott Schreiber - LRL
Joe Muratore - LRL; Attorney
Tim Weyenberg - Foth & Van Dyke
Representative Cloyd Porter - CAPITOL
Representative Jeffery Neubauer - CAPITOL
Senator Joseph Strohl - CAPITOL
Tom Ryan - Foth and Van Dyke - Milwaukee
Program Services Section - SW/3
Mary Carrington - Town of Mount Pleasant
Fred Larson - City of Racine

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Land Reclamation, Ltd. Landfill

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Plan of Operation Approval Modification

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BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

MODIFIED
CLOSURE AND LONG-TERM CARE PLAN AND
PLAN OF OPERATION APPROVAL MODIFICATION
LAND RECLAMATION LIMITED LANDFILL (0572)
WID 076171008

GENERAL INFORMATION

Authorized Contact: Mr. Scott Schreiber, Vice President-Operations
Land Reclamation Limited (LRL)
2250 South Green Bay Road
Racine, Wisconsin 53406
Telephone: 414/554-0560

Property Owner: Land Reclamation Ltd.
Mr. Glenn A. Oakes, President

Site Operator: Land Reclamation Ltd.

Person Responsible for Daily Site Operations: Mr. Scott Schreiber

Location of Site: The Land Reclamation Limited Landfill is located in the S 1/2 of the NE 1/4 of Section 23, T4N, R22E, Town of Mount Pleasant, Racine County, Wisconsin. This property was recently annexed by the City of Racine. In general terms, the site is located approximately 3/4 of a mile south of Highway 20 and 1/4 of a mile west of Highway 31 (Green Bay Road).

Report Prepared by:

Mr. Tim Weyenberg
Project Manager
Foth & Van Dyke and
Associates, Inc.
8528 West Lisbon Ave
Milwaukee, WI 53222
(414) 463-9160

Mr. Tom Ryan, P.E.
Project Coordinator
Foth & Van Dyke and
Associates, Inc.
8528 West Lisbon Ave
Milwaukee, WI 53222
(414) 463-9160

Mr. Rodney Bloese
Senior Hydrogeologist
Foth & Van Dyke
and Associates, Inc.
2737 South Ridge Road
Green Bay, WI 54307
(414) 497-2500

Site Description: LRL was first licensed as a solid waste disposal facility in 1970 and began operation at that time. The current licensed acreage is 81 acres and includes corridors 1 through 13. The hazardous waste management unit (HWU) consists of corridors 1 through 6 and is roughly 36 acres in size. This modified plan covers the closure and long-term care of the hazardous waste unit as required by the Department's interim license denial of December 10, 1982 as well as ch. NR 181, Wis. Adm. Code, the federal Resource Conservation and Recovery Act (RCRA) requirements and certain conditions included in the Department's December 19, 1984 ch. NR 180, Wis. Adm. Code, Conditional Plan of Operation Approval.

Hazardous wastes were disposed of at the site from sometime prior to June 23, 1973 until the Department denied LRL's interim license application for continued disposal of hazardous waste on December 10, 1982. Since denial of the interim license, LRL has continued operation of the site for solid waste disposal and has constructed and filled corridors 5 and 6. Corridor 7 has been partially constructed and filled. Because hazardous waste was disposed of at the site and since LRL did not close in accordance with the interim license denial, it is an active hazardous waste landfill. Due to s. NR 181.12(1)(b)2., Wis. Adm. Code, known as the "mixture rule", all wastes disposed of within the first 6 corridors are hazardous wastes. The total volume of waste disposed of in the hazardous waste unit is approximately 6 million cubic yards. In addition to hazardous waste, material disposed of included residential waste, demolition wastes, nonhazardous commercial and industrial wastes, foundry wastes, asbestos, and tires.

Description of Upper Hydrogeological Units: The unconsolidated materials, consisting of layers of alternating tills and outwash or lacustrine deposits, were deposited as the glaciers made successive advances and retreats over the site area. Though somewhat variable in composition, extent, and thickness, the following scheme is used to delineate the stratigraphy of the upper glacial units at the site. All units dip slightly to the west.

Unit 1: Unit 1, the uppermost unit, consists of clayey till (CL) with an average clay content of 25% and P200 content of 78%. The mean values for liquid limit and plastic index are 22.8 and 7.6, respectively. Horizontal conductivity probably ranges from 1×10^{-7} cm/sec to as high as 1×10^{-5} cm/sec where fracturing occurs. Vertical conductivity has a potential range of 2×10^{-8} cm/sec to 2×10^{-7} cm/sec. Fractures may increase the vertical conductivity 10 to 100 times this range. Unit 1 varies from 0 to 40 feet in thickness and pinches out toward the west.

Unit 2: Unit 2 consists of outwash or lacustrine sediments ranging from silt loam (ML), silty clay loam (CL-ML), sandy loams (SM), and gravelly and silty sands (SP-SM) according to the USCS. This layer is overlain by up to 27 feet of Unit 1 in the eastern portion of the site and outcrops to the west. It varies in thickness from 6 to 27 feet. The range of measured horizontal hydraulic conductivity for the unit is 3.6×10^{-4}cm/sec to 1.8×10^{-6} cm/sec. The horizontal conductivity of this unit is significantly higher than both the till units below (Unit 3) and above (Unit 1). Due to its relatively high conductivity and interconnection with the hazardous waste unit, the highest level of contaminants tend to be present in this unit

Unit 3: Unit 3 consists of fine grained (CL) lacustrine sediments (Unit 3A) and sediment flow deposits or till (CL) (Unit 3B). Unit 3A is made up of 6-8 inch beds of clay having a mean P200 content of 94%, a clay content of 50%, a liquid limit of 35.1% and plastic index of 17.3%. Unit 3B consists of lean clay (CL) with some silty clay (CL-ML) in the upper portion of the unit. Vertical hydraulic conductivity for Unit 3 is in the range of 2×10^{-8} cm/sec to 1×10^{-7} cm/sec. Horizontal conductivity is in the range of 6×10^{-7} cm/sec to 1×10^{-6} cm/sec. The thickness of Unit 3 generally ranges from between 15 to 38 ft., with one boring indicating a thickness of 5 feet.

Unit 4: Unit 4 consists of alternating layers of clay (CL), silt (ML), silty clay (CL-ML) and silty sand (SM). The layers appear to be thin and discontinuous. This unit is more permeable than Units 1 or 3 with one sample giving a horizontal conductivity of 1×10^{-5} cm/sec. The unit ranges from about 12 to 35 feet under the hazardous waste unit but thins northward to less than 4 feet.

Site Construction: Construction activities included as part of this plan modification include:

1. The construction of a separation barrier wall between corridor 6 and corridor 7 to be keyed into the liner of corridor 7 and a separation barrier wall, slurry cutoff wall and drainage trench along the west end of corridors 1 through 6. The purpose of these systems is to separate the hazardous waste unit from adjacent approved nonhazardous waste disposal capacity.

2. The construction of a containment structure along the southern boundary of the site and along the west end of the City of Racine landfill. This containment structure includes excavation of a construction bench and installation of a drainage trench and combination slurry cutoff wall/clay-lined trench. The purpose of this containment structure is to intercept and collect contaminated groundwater prior to its leaving the site.

3. The construction of a RCRA composite cap over the hazardous waste unit and over the southern portion of corridor 7 above the barrier wall. This cap is required to fulfill EPA requirements for closure of the hazardous waste unit.

4. The stabilization of sideslopes along the southern perimeter of corridor 1. This work will include cutting back the slope along corridor 1 to a maximum slope of 3 horizontal to 1 vertical (3:1). An alternative to this is extending the toe of the slope outward in order to achieve a 3:1 slope. Documentation of adequate closure of the hazardous waste unit's east slope is also required.

5. The installation of a more extensive leachate and gas extraction system.

Other Actions Covered by this Plan Modification:

1. Environmental Monitoring: An environmental monitoring program which includes applicable portions of Chs. NR 500 through 520 and NR 181, Wis. Adm. Code, monitoring networks, and sampling activities to assess groundwater quality around the hazardous waste unit. This environmental monitoring program has been expanded to include leachate monitoring and surface water monitoring.

2. Financial Responsibility: Obtaining liability insurance coverage for nonsudden occurrences.

Long-term Care Period: Thirty years commencing after Department approval of all construction documentation required for closure of the site and proof is established to the Department's satisfaction that leachate heads have been eliminated and can be prevented from recurring.

Definitions: The terms used in this plan modification are defined below:

1. Barrier Wall. The term "barrier wall", refers to the structure that will separate the existing hazardous waste unit from future contiguous nonhazardous areas used for solid waste disposal. This structure consists of a minimum 7 foot thick clay separation barrier which is keyed into the existing recompacted clay liner of corridor 6 and into the native soils along the perimeter of the hazardous waste unit. It also includes granular drainage layers and leachate collection piping on both sides of the clay barrier. The barrier wall along the western end of the hazardous waste unit also includes a slurry cut off-wall and drainage trench below the compacted clay separation barrier.

2. Containment Structure. The term "containment structure", refers to the structure proposed to be constructed along the southern boundary of the hazardous waste unit and the southern and western sides of the City of Racine site. This structure consists of a trench excavation into unit 1 soils, installation of a two-foot thick bentonite slurry cutoff wall extending from the base of the excavation to a minimum of 3 feet into geologic unit 3 and a drainage trench located at the base of unit 2. The excavation into unit 1 is to be lined with a two-foot thick recompacted clay liner.

3. RCRA Cap. The term "RCRA cap," refers to a composite final cover required by U.S. EPA for the hazardous waste unit. This multi-component cap consists of a recompacted clay layer, a synthetic flexible membrane liner, a drainage layer, a needle punched geotextile, a soil rooting zone and a layer of topsoil. The final cover is to be seeded, fertilized and mulched. The RCRA cap must cover the entire hazardous waste management unit as well as the portions of corridors which lie vertically above the barrier wall. The RCRA cap will cover approximately 27 acres over corridors 1 through 7 and 8.

4. Slope Stabilization. The term "slope stabilization" refers to the requirements necessary to properly close the exterior slopes of the facility in such a manner as to minimize maintenance. As required by chs. NR 180 and NR 181, Wis. Adm. Code, and in past correspondence, this is reflected as a maximum slope of 3 horizontal to 1 vertical (3:1).

5. Drainage Trench. The term "drainage trench" refers to the trench excavation in which a perforated PVC pipe is laid and backfilled with gravel. The drainage trenches are to intercept, collect, and transport contaminated groundwater and leachate.

6. Slurry Cutoff Wall. The term "slurry cutoff wall" refers to the excavation through subsurface permeable soil which is backfilled with a bentonite/soil slurry mixture. The cutoff wall is keyed into underlying clay soils.

MAJOR DEPARTMENT CONCERNS REGARDING PROPOSED PLAN

1. The proposed plan contains faulty design concepts and insufficient detail concerning the placement and construction of the barrier wall, the drainage trench, and the slurry cutoff wall for the western end of the hazardous waste unit. As proposed, the clay barrier for the western end of the hazardous waste unit would terminate in refuse. Such a design is not acceptable because in order to ensure the separation of solid and hazardous waste, the barrier must

be located exterior to the hazardous waste unit and be keyed into native soil. The wastes located to the west of the proposed barrier location in the undefined fill area are by definition hazardous and must be contained in the hazardous waste unit. As a result of these concerns, the Department has imposed in the conditions contained in Section B of this modification.

2. Sufficient information was not provided to allow for proper placement of the drainage trench portion of the containment structure along the south and west sides of the site. The proposed plan shows the drainage trench at various levels within unit 2. In order to achieve acceptable results, the drainage trench must be placed at or very near the base of unit 2 at all locations. These concerns are addressed in the conditions in Section C.

3. Except as otherwise noted in this modification the RCRA cap must be installed over all portions of the hazardous waste unit. This cap, which will cover approximately 27 acres over corridors 1 through 7 and 8, is an integral part of the closure of the hazardous waste unit. Sufficient information was not provided concerning placement or construction of the cap. The Department believes that the cap must consist of a minimum 3-foot thick recompacted clay layer, a flexible membrane liner consisting of 40-mil high density polyethylene (HDPE), a minimum one-foot thick granular drainage layer, a geotextile filter fabric, a minimum 1.5-foot thick root zone layer and a minimum 0.5-foot thick layer of topsoil. The final cover must be seeded, fertilized and mulched. Detailed engineering plans are needed showing the cap configuration itself, how the cap will be penetrated by vents and monitoring devices, how the geosynthetics will be anchored, the method of membrane placement testing, how the drainage layer will be drained, and the aerial extent of the entire RCRA cap.

   The Department is requiring a minimum 3-foot thick recompacted clay component of the cap primarily because the clay material LRL is proposing to use for cap construction does not meet the clay specification dictated in the Department's December 19, 1984 conditional plan of operation approval and because of documented problems associated with proper construction and performance of thin clay layers.

   In addition, the Department is requiring that the flexible membrane liner (FML) consist of high density polyethylene (HDPE) material rather than polyvinyl chloride (PVC). We believe that HDPE is a superior to PVC for several reasons:

   a. PVC compounds contain large amounts of plasticizer additives to make the liner flexible. Over time, the plasticizers are lost possibly resulting in liner deterioration. HDPE contains no plasticizer additives, and therefore, has no loss of flexible properties over time.

   b. A number of penetrations of the landfill cap will be necessary for installation of leachate and gas extraction wells. HDPE can be ordered in smaller sections which can then be custom installed on the site and equipped with various boots and other devices necessary to maintain the integrity of the system.

   c. Rodents (a source of liner deterioration) have been shown to avoid HDPE membranes while being attracted to PVC membranes.

   d. HDPE has superior chemical resistance, strength characteristics and temperature performance than PVC.

e. PVC is sensitive to ultraviolet light while HDPE has a carbon black additive to prevent deterioration from sunlight.

4. Although the issue is not addressed in the proposed closure plan, the landfill's southern sideslope must be stabilized before the site can be considered closed. This belief is based upon observed, persistent problems such as sloughing of the slope, gas and leachate seeps and vegetative stress along the slope. Conditions included in Section E require LRL to develop detailed plans and specifications for this area which either cut back the slope (with all excavated material to be disposed of within the hazardous waste unit) or extend it to the south to obtain a three horizontal to one vertical (3:1) grade.

5. Information contained in the proposed plan regarding environmental monitoring and long-term care is insufficient and confusing. Plan sheet C-21 is not of sufficient scale to be able to clearly read or delineate all of the environmental monitoring points. Groundwater monitoring wells, leachate head wells and landfill gas extraction wells cannot be clearly read and some are mislabelled. For instance, 3 wells are labeled as "LH32". In addition, the design management zone delineation obscures many of the labels for monitoring points. A new plan sheet or plan sheets drawn to a scale of 1" = 100' clearly showing and correctly labeling all monitoring and extraction points is necessary. Conditions found in Section G address these concerns.

6. As a result of changes to RCRA, LRL is responsible for complying with the groundwater monitoring requirements set forth in s. NR 181.49(6), Wis. Adm. Code for new facilities. During interim status monitoring, LRL has reported statistically significant increases over background for indicator parameters at several wells at the site. Therefore, LRL must sample the groundwater monitoring wells for all constituents identified in Table VI of s. NR 181.16(4), Wis. Adm. Code, and establish a compliance monitoring program as required by s. NR 181.49(6)(j), Wis. Adm. Code. This sampling must be done in an accelerated fashion of taking samples for 4 consecutive months rather than quarterly samples. These numbers will be used to establish background values and concentration limits. Additional analysis of indicator, health and welfare parameters is also required to allow for their statistical evaluation at this hydrogeologically complex site. Conditions found in Section G address these concerns.

7. As indicated on plan sheet C-21 and Appendix I, very significant leachate head levels exist within the hazardous waste unit. In some portions of the site, heads are in excess of 750' MSL. This is roughly 50 feet above the adjacent topography and 70 feet above the underlying landfill base. The elevated leachate levels in the hazardous waste unit are in part responsible for groundwater contamination in geologic unit 2.

   Section NR 181.42(8) and (9), Wis. Adm. Code, cover closure and long-term care of hazardous waste facilities which in turn require compliance with ss. NR 181.44(12) and (14), Wis. Adm. Code, specifically describing closure and long-term care of hazardous waste landfills. Other requirements are incorporated by reference. Requirements specified in these sections include:

   a. Control, minimization or elimination to the extent necessary to protect human health and the environment, post-closure escape of wastes, hazardous waste leachate or waste decomposition products to groundwater (NR 181.42(8)(a)2.).

b. Installation of a leachate monitoring system to provide accurate measurements of leachate levels and a means of obtaining representative samples. Leachate level elevations must be measured at least monthly and each time a sample is taken (NR 181.49(4)(b) and (e)).

c. A long-term care plan complying with the monitoring and reporting requirements found in subchapter V, Ch. NR 181, Wis. Adm. Code (NR 181.42(9)(b)1.) and quarterly reports on the amount of leachate extracted (hazardous waste) are required (NR 181.42(6)(a)).

d. Maintenance and monitoring of the waste containment systems and drainage control features. Also required are measures needed to correct contamination caused by leachate and gases generated within the landfill and any other maintenance features necessary to protect the environment and prevent hazards to human health (NR 181.42(9)(b)4.).

The leachate collection and extraction program discussed in the closure plan does not comply with these code requirements. Conditions included in Section F address these concerns.

8. The existing landfill gas extraction system was installed without Department approval, and its construction has never been properly documented. The partial documentation which has been submitted clearly shows the implementation of unacceptable design concepts. Furthermore, the existing system covers only a portion of the approved landfill area. As indicated in point number 7 above, landfill gas concerns are an integral portion of the closure and long-term care of the hazardous waste unit and the solid waste unit as well. Conditions contained in Section F also address these concerns.

9. As a hazardous waste landfill which has not closed, LRL must provide proof of financial responsibility to ensure compliance with closure and long-term care requirements. In addition, LRL is responsible for obtaining liability coverage for nonsudden accidental occurrences in the amount of $3 million per occurrence with an annual aggregate of at least $6 million, exclusive of legal defense costs. These requirements can be found in ss. NR 181.42(10) and (11), Wis. Adm. Code.

The closure and long-term care costs presented in the closure plan are underestimated. LRL did not identify all the activities necessary for closure. Revised cost estimates are necessary and must be based upon the cost of closing the landfill in accordance with the conditions of this modified hazardous waste closure and long-term care plan and solid waste plan modification. All actions called for in the closure plan are necessary for the facility to properly close. The Department's position on closure costs was supported by a circuit court decision issued on October 6, 1987. The long-term care portion of the landfill cost estimate must also be covered by the proof mechanism.

LRL's argument that the company will be in existence indefinitely is not sufficient to waive administrative code requirements. In addition, LRL has frequently commented in discussions with the Department that, if the Department does not allow certain actions, the site will have to close.

Not having liability insurance is a significant violation of state and federal requirements making LRL a high priority violator. As such, this violation must be corrected. Conditions included in the Section H address these concerns.

10. Conditions from previous actions that have not been complied with are listed in the Findings of Facts and involve the December 10, 1982 hazardous waste interim license denial and the December 19, 1984 ch. NR 180 Wis. Adm. Code conditional plan of operation approval. These actions cover:

    a. Stabilization of sideslopes,

    b. Reduction of leachate heads,

    c. Submittal of detailed plans for a slurry cutoff wall, and

    d. Submittal of annual reports.

Each of these concerns have been addressed by the Department in this plan modification.

REGULATORY STATUS AS A SOLID AND HAZARDOUS WASTE FACILITY

1. Land Reclamation, Ltd. (LRL) owns and operates a solid and hazardous waste disposal facility in the Town of Mount Pleasant, Racine County, Wisconsin which was initially licensed by the Department of Natural Resources on April 20, 1970.

2. LRL initially reported that toxic and hazardous waste was being disposed of at the facility in their landfill license renewal application dated June 23, 1973.

3. On May 16, 1975 the Department conditionally reissued LRL's 1974-75 operations license to allow acceptance of toxic and hazardous waste.

4. LRL submitted a Federal Resource Conservation and Recovery Act (RCRA) Notification Form to U.S. EPA on August 18, 1980, and a RCRA Part A Application on November 19, 1980 to U.S. EPA for the purpose of obtaining "Interim Status" from U.S. EPA to continue to dispose of hazardous waste at their landfill. U.S. EPA subsequently granted interim status, and LRL continued to accept hazardous waste.

5. On January 8, 1982 the Department issued a ch. NR 180, Wis. Adm. Code determination of feasibility for LRL which, in part, required development and implementation of additional engineering to reverse outward gradients along the southern border of corridor #1 and the southwest corner of the site.

6. The Department reviewed LRL's RCRA Part A Application and other related material and determined that the landfill was not eligible for an interim license under ch. NR 181, Wis. Adm. Code. The interim license was denied on December 10, 1982 based on the absence of sufficient information and detail in LRL's request. This denial required, among other things, that closure be implemented for corridors 1 through 4, and that closure was to include:

    a. Filling the existing hazardous waste disposal trench to approved grades, and covering and contouring the waste in order to minimize surface water run-on and runoff by January 1, 1983,

    b. Cutting back the outside slopes of corridors 1 through 4 by May 1, 1983, if the slopes were not adequately vegetated and stabilized by that date.

    c. Filling Corridors 1 through 4 to approved final grades and abandoning them with final clay cover, topsoil and seed by June 1, 1983.

7. U.S. EPA "called in" LRL's RCRA Part B permit application on February 7, 1983. LRL responded to U.S. EPA in a letter dated August 5, 1983, by stating that LRL had "decided not to pursue, at this time, a federal permit or state license to operate a hazardous waste landfill", and that the Part B permit application would not be filed. This letter also stated that nonhazardous waste was still being placed in corridors 1 through 4 and that these corridors would be closed when final grades, according to the ch. NR 180 Wis. Adm. Code, Plan of Operation, were reached.

8. A Conditional Plan of Operation Approval for the facility was issued by the Department under ch. NR 180, Wis. Adm. Code, on December 19, 1984. This conditional plan approval allowed LRL to continue to operate a solid waste landfill. The plan of operation conditions required, among other things, that LRL;

   a. Document slope stabilization,
   b. Reduce leachate heads,
   c. Design and construct a slurry cutoff wall,
   d. Submit annual reports on landfill operation, and
   e. Establish financial responsibility.

9. On January 28, 1987, the Department received a report from LRL entitled "Closure and Long-Term Care Plan for the Land Reclamation, Ltd., Landfill" prepared by Foth and Van Dyke and Associates of Milwaukee, Wisconsin. On July 8, 1987, the Department denied LRL's Closure and Long-Term Care Plan and required that a modified plan be submitted in accordance with s. NR 181.41(8)(d), Wis. Adm. Code.

FINDINGS OF FACT

The Department finds that:

1. On August 10, 1987, LRL submitted a modified ch. NR 181, Wis. Adm. Code, Closure and Long-Term Care Plan for the hazardous waste unit at the LRL landfill. This plan was submitted in response to the Department's July 8, 1987 denial of their January 28, 1987 ch. NR 181, Wis. Adm. Code, proposed Closure and Long-Term Care Plan.

2. The LRL landfill has not been constructed in accordance with the December 19, 1984 ch. NR 180, Wis. Adm. Code, Conditional Plan of Operation Approval. Conditions included in that approval have not been complied with.

3. LRL has not provided a plan for addressing the stability of the southern sideslopes as required by Condition 21 of the December 19, 1984 conditional ch. NR 180, Wis. Adm. Code, Plan of Operation Approval. Stabilization of sideslopes is necessary for proper closure.

4. LRL has not conducted the leachate head reduction activities or prepared the reports called for in Conditions 23 and 35 of the December 19, 1984 conditional ch. NR 180, Wis. Adm. Code, Plan of Operation Approval. LRL has not established an effective leachate reduction program. Reduction of the leachate head is necessary to minimize the leachate and contaminated groundwater from moving off site.

5. LRL has not provided detailed plans and specifications for a slurry cut off wall as required in Condition 32 of the December 19, 1984 conditional ch. NR 180, Wis. Adm. Code, Plan of Operation Approval. The plans for the containment structure included in the Closure and Long-Term Care Plan do not satisfy this condition. Sufficient information was not provided to allow for proper placement of the drainage trench portion of the containment structures. Construction of the slurry cutoff wall is necessary to prevent the existing groundwater contamination from moving further off-site and to prevent future contamination from moving off-site.

6. LRL has not provided the annual reports on waste handling, leachate head reduction and remedial action effectiveness as required by Condition 36 of the December 19, 1984 ch. NR 180, Wis. Adm. Code, Plan of Operation Approval.

7. LRL has not demonstrated financial responsibility for bodily injury and property damage to third parties caused by nonsudden accidental occurrences arising from operation of their landfill as required by s. NR 181.42(11), Wis. Adm. Code.

8. On April 17, 1987, the Department provided LRL with detailed comments on their gas collection system and outlined areas where further work was needed. The closure plan submittal does not address these concerns.

9. The Department public noticed the January 28, 1987 closure plan submittal in the Racine Journal Times on Monday February 16, 1987 in accordance with s. NR 181.42(8), Wis. Adm. Code. No comments were received.

10. The Closure and Long-Term Care Plan as submitted on August 10, 1987 is inadequate in the following respects:

    a. Conditions called for in the ch. NR 180, Wis. Adm. Code, Conditional Plan of Operation Approval necessary to ensure proper closure are not included in the closure plan submittal.

    b. Faulty design concepts and insufficient detail exist concerning placement and construction of the barrier wall, drainage trench and slurry cutoff wall along the western end of the hazardous waste unit.

    c. Sufficient information was not provided concerning the design, placement and construction of the RCRA cap.

    d. Sufficient information was not provided on leachate monitoring, gas monitoring and long-term care.

    e. Requirements in ss. NR 181.42, .44 and .49, Wis. Adm. Code, have not been complied with.

11. The containment structure, as proposed in the closure plan submittal, constitutes an expansion of a solid waste disposal facility under applicable sections of chs. NR 500 through 520 Wis. Adm. Code. The Department has sent numerous letters and held meetings with LRL on this issue. Filling must take place within approved licensed acreage.

12. LRL has not complied with groundwater monitoring requirements found in applicable sections of chs. NR 500 through 520 and 181, Wis. Adm. Code for solid and hazardous waste facilities. Section NR 181.49, Wis. Adm. Code, requires groundwater monitoring for all hazardous waste disposal facilities. Section NR 181.49(6)(j), Wis. Adm. Code, includes compliance monitoring requirements for all facilities which have reported statistically significant increases in parameters being monitored. LRL has had statistically significant increases in groundwater monitoring parameters. The Code of Federal Regulations, Title 40, Part 264, Subpart F requires facilities which accepted hazardous waste after July 26, 1982 to be in compliance monitoring when statistically significant increases are detected. LRL accepted hazardous waste until December, 1982.

13. Gas migration from the landfill is occurring along the south sideslope. Levels of methane above its lower explosive limit have been detected in monitoring devices located outside the limits of fill.

14. On July 8, 1987, the Department denied LRL's January 28, 1987 closure plan submittal and required a modified plan be submitted within 30 days in accordance with s. NR 181.42(8)(d), Wis. Adm. Code. The basis for denial included:

    a. The plan constituted an expansion of a hazardous waste landfill,

    b. The containment structure did not satisfy conditions 32 and 33 of the December 19, 1984 Plan of Operation Approval, and

    c. The plan did not meet groundwater monitoring requirements found in s. NR 181.49, Wis. Adm. Code.

15. Submittals reviewed as part of this plan review include:

    a. An August 28, 1987 LRL letter verifying design changes to engineering details contained in LRL's August 21, 1987 cover letter.

    b. The Closure and Long-Term Care Plan cover letter from Land Reclamation, Ltd. dated August 21, 1987 and received by the Department on August 25, 1987.

    c. A two-volume report and 35 associated plan sheets dated August, 1987 entitled "Revised Closure and Long-Term Care plan for the: Land Reclamation, Ltd. Landfill", which were prepared by Foth and Van Dyke, and received by the Department on August 10, 1987.

    d. A two-volume report and 21 associated plan sheets dated January, 1987 entitled "Closure and Long-Term Care plan for the Land Reclamation, Ltd. Landfill", prepared by Foth and Van Dyke, and received by the Department on January 28, 1987.

    e. A cover letter and report dated February 5, 1988, prepared by Foth and Van Dyke & Associates of Milwaukee providing comments on the Department's Draft Modification to the Closure and Long-Term Care Plan and Plan of Operation Approval dated December 16, 1987.

16. Department and related correspondence/documents considered in review of the Closure and Long-Term Care Plan include:

    a. The Department's December 10, 1982 Interim License Denial.

    b. The Department's December 19, 1984 Conditional Plan of Operation Approval.

    c. The Department's February 12, 1986 letter discussing "Option 3".

    d. The Department's November 26, 1986 letter informing LRL of hazardous waste closure requirements.

    e. The Department's October 30, 1986 Containment Structure Denial.

    f. The Department's July 8, 1987 Closure and Long-Term Care Plan Denial.

    g. Other Department correspondence to LRL dated January 15, 1988, April 17, 1987, October 30, 1986, October 13, 1986, August 13, 1986, and related file material.

    h. U.S. EPA letters and memoranda dated February 7, 1983, April 18, 1986, September 19, 1986, October 23, 1986, November 13, 1986 and November 14, 1986.

    i. The applicable requirements of chs. NR 500 through 520, NR 180, NR 140, and NR 181, Wis. Adm. Code.

    j. U.S. EPA-RCRA Groundwater Monitoring Technical Enforcement Guidance Document (September, 1986).

17. The Modifications to the Closure and Long-Term Care Plan and Plan of Operation Approval are hereby defined to consist of Foth & Van Dyke, Inc.'s August, 1987 two-volume report and 35 associated plan sheets entitled "Revised Closure and Long-Term Care Plan for the Land Reclamation, Ltd. Landfill WID 076171008" and all conditions contained in this document. Unless the conditions set forth below are complied with, the facility poses a substantial hazard to public health and welfare.

CONCLUSIONS OF LAW

1. Land Reclamation, Ltd. (LRL) is an existing solid waste disposal facility as defined in ss. 144.43(5), Stats. and an existing hazardous waste facility as defined in s. 144.61(5m), Stats., and a hazardous waste landfill as defined in s. NR 181.04(55), Wis. Adm. Code.

2. Based upon the foregoing Findings of Fact, the Department has the authority pursuant to s. 144.44(3), Stats., to modify the Plan of Operation Approval for the LRL landfill.

3. The Department has the authority to determine closure, long-term care and termination standards for hazardous waste facilities pursuant to ss. 144.441(1m) and 144.62(8)(e), Stats. These requirements are listed in ss. NR 181.42(8) and (9) and 181.44(12) and (14) and 181.49, and 181.52, Wis. Adm. Code.

4. Characteristic hazardous wastes as defined in s. NR 181.15, Wis. Adm. Code and listed hazardous wastes as defined in s. NR 181.16, Wis. Adm. Code have been disposed of at LRL's facility. Hazardous waste means any solid waste identified by the Department as hazardous under s. 144.62(2), Stats., and is defined in s. NR 181.12, Wis. Adm. Code. Included in this definition is s. NR 181.12(1)(b)2., Wis. Adm. Code, which identifies mixtures of solid wastes and hazardous wastes listed is s. NR 181.17, Wis. Adm. Code, as hazardous waste. Both solid waste and listed hazardous waste have been disposed of at LRL.

5. The Department has the authority to issue an interim license pursuant to s. 144.64(2)(c), Stats., to a person who operates a hazardous waste facility in existence on November 19, 1980, if the person applies for a license and complies with conditions and restrictions prescribed by rule or special order by the Department pending the decision on the issuance of a final operating license. LRL's interim license application was denied by the Department on December 10, 1982. That denial required LRL to close the hazardous waste area in existence at that time. LRL has not closed the hazardous waste area.

6. LRL does not have an approved plan of operation to operate a hazardous waste disposal facility pursuant to s. 144.44(3), Stats. and s. NR 181.44(7), Wis. Adm. Code, and consequently is a nonapproved hazardous waste disposal facility.

7. The Department has the authority to approve or modify a closure plan pursuant to s. NR 181.42(8)(d), Wis. Adm. Code once it has been initially denied and revised.

8. The conditions contained in the Modification to the Closure and Long-Term Care Plan and Plan of Operation Approval are needed to ensure compliance with the applicable portions of chs. NR 500 through 520 and ch. NR 181, Wis. Adm. Code.

9. The Department has the authority pursuant to ch. NR 140, the applicable portions of chs. NR 500 through 520 and ch. NR 181, Wis. Adm. Code, to require sampling of groundwater, evaluate impacts to the groundwater and to require remedial measures where groundwater standards are attained or exceeded.

MODIFICATION TO THE CLOSURE AND LONG TERM CARE PLAN AND PLAN OF OPERATION APPROVAL

Based on the foregoing Findings of Fact and Conclusions of Law, the Department hereby modifies the Closure and Long-Term Care Plan for the Land Reclamation, Limited Landfill as set forth in the following conditions. As modified, the Closure and Long-Term Care Plan is hereby approved, and the Plan of Operation for the Land Reclamation, Limited Landfill is hereby modified by the following conditions:

CONDITIONS

A. General

1. All site construction, documentation, closure and post closure activities of the Land Reclamation, Ltd. Landfill - Hazardous Waste Unit (HWU) shall be in accordance with Foth and Van Dykes' August 10, 1987 "Revised Closure and Long-term Care Plan", the applicable portions of chs. NR 500 through 520 and ch. NR 181, Wisconsin Administrative Code, the conditions of this plan modification, and all conditions contained in past approvals. In the

event of any discrepancies, the Department's conditions shall take precedence. Any proposed changes to the plan modification shall be presented to the Department in writing for our review and approval. If the Department believes that these changes are compatible with the proper closure and long-term care of the site, an addendum to this approval will be issued indicating acceptance of those changes. Written Department approval shall be obtained prior to implementation of any changes.

2. A complete copy of the plan modification as defined in the previous condition, shall be retained at the landfill office at all times and shall be used by the individuals responsible for proper operation, closure and long-term care of the hazardous waste unit. Individuals responsible for construction, closure and long-term care shall be informed of all Department conditions. A copy of the plan modification shall be included with all contract or construction documents.

3. All reports and investigations called for in this plan modification shall be prepared by a Professional Engineer registered in the state of Wisconsin in accordance with the applicable portions of chs. NR 500 through 520 and ch. NR 181, Wis. Adm. Code. In order to avoid continued violations of previous approvals, LRL shall submit all reports and investigations called for in this plan modification no later than the dates stated herein. LRL shall not initiate construction until appropriate plans have been approved in writing by the Department. LRL shall complete construction of all aspects of this plan modification within a schedule approved by the Department.

4. LRL shall submit all overdue construction documentation including:

   a. The final cover system for the eastern sideslope.

   b. The leachate drainage system around the City of Racine site and west side of corridors 1 through 5 installed in 1986.

   c. Corridor 5 east leachate cleanout.

   d. Construction of the eastern sidewalls for corridors 5 & 6.

   e. The interim sanitary sewer connection as approved on November 4, 1985.

   f. All other outstanding documentation including well information forms.

5. All construction shall be performed under the observation of a competent on-site inspector under the direction and immediate supervision of an independent professional engineer registered in the state of Wisconsin. A specific inspector shall be provided and assigned to each major construction item. The inspectors shall not be an employee of LRL, any of its sister corporations, or of the contractor. Within 30 days of the beginning of each major construction item, the inspector's identity and employment history shall be provided to the Department. Each inspector shall be familiar with all technical aspects of the job being overseen and have related work experience in the specific area they are inspecting. Inspectors shall prepare daily reports for each day that construction is

attempted or accomplished at the site. The reports shall describe construction practices employed and work accomplished. Drawings shall be prepared daily to outline and record construction progress. A copy of all daily construction reports prepared by the inspector shall be submitted with each construction documentation report.

6. All plan submittals made as a result of the conditions included in this plan modification shall include, at a minimum, the following:

   a. A cover letter detailing the desired Department action along with the appropriate review fee.

   b. Five copies of all reports, plans and specifications.

   c. The seal of professional engineer registered in the State of Wisconsin. Reports where interpretation of geology or hydrogeology is necessary shall be signed by a hydrogeologist.

   d. A table of contents listing all sections of the submittal.

   e. Maps, figures, tables, plan sheets, drawings, cross sections and aerial photographs meeting the applicable requirements of chs. NR 500 through 520 and ch. NR 181, Wis. Adm. Code.

B. Barrier Wall

1. LRL shall submit by June 30, 1988, for the Department's review and approval a revised barrier wall design. The submittal shall consist of a bound report and associated engineering drawings which, in addition to an in-depth presentation of the revised design and supporting rationale, shall also include:

   a. An identification and thorough discussion of all construction tasks associated with establishment of the barrier wall and their phasing, as well as a proposed time schedule for completion of each task.

   b. A proposed comprehensive construction documentation program for the barrier wall.

   c. An identification of all elements of a proposed construction documentation report for the barrier wall to be submitted for our review and approval.

2. The proposed revised barrier wall design shall incorporate the following concepts:

   a. Design of the portion of the barrier wall separating corridors 6 and 7 as per figure 3-1 of Volume 1 of Foth and Van Dyke's August, 1987 "Revised Closure and Long-Term Care Plan".

   b. Design of the slurry cutoff wall and drainage trench components of the western segment of the barrier wall as per the requirements contained in Section C of this plan modification.

c. Location of the base of the western segment of the barrier wall either to the west of the existing hazardous waste unit, or where existing waste thicknesses outside of the hazardous waste unit are determined to be at a minimum. In either case, the base of the barrier wall shall be keyed into native soils.

d. Removal of any hazardous waste remaining between the city site and the chosen western barrier wall location and placement of this waste within the hazardous waste unit.

e. Alignment of the western segment of the barrier wall as well as its cutoff wall and drainage trench components in a general north-south direction with a minimum number of changes in direction.

f. Design of the barrier wall system such that it minimizes penetrations of the barrier wall and the slurry cutoff wall by any type of piping or other appurtenances. Any penetrations shall be specially designed and detailed.

g. A barrier wall slope no milder than 5 horizontal to 1 vertical (5:1). The thickness of the barrier must consider settlement.

3. The lower portion of the western barrier wall, which would extend through existing waste, may be proposed to be constructed vertically provided that:

a. A minimum width of 8 feet is maintained,

b. Maximum lift thicknesses do not exceed 8-inches prior to compaction (compaction equipment must be specified),

c. The clay barrier wall is keyed a minimum of 3-feet into unit 3,

d. The vertical barrier wall segment is keyed into the barrier wall extending up the western sideslope of the hazardous waste unit,

e. The western barrier wall extends the entire distance from the containment structure to the northern barrier wall and recompacted clay base liner.

f. Sufficient design details are provided at the barrier wall interface with the containment structure, the northern barrier wall, unit 3, the barrier wall on the western slope and the drainage structure,

g. Safety concerns necessary to protect the equipment operators are fully considered in the design, and

h. Contingency mechanisms to reduce odor problems caused by the excavations are proposed.

4. The following specific information shall be included as part of the design submittal for the barrier wall:

a. The results of a more-extensive boring program conducted to clearly establish either the western extent of waste or the areas where waste thicknesses are at a minimum. The borings shall be performed on a 75-foot grid pattern (minimum 3 borings per east-west cross section) within the area defined by site coordinates: 1+30N/7+50E, 5+00N/7+50E, 9+50N/7+00E, 10+00N/11+00E, 9+00N/11+00E, 8+00N/9+00E and 1+30N/9+00E. Each boring shall extend a minimum of 5 feet into unit 3 or 5 feet below the waste, whichever is deeper. Detailed logs of each boring shall be included along with cross sections drawn every 300 feet perpendicular to the western perimeter of the waste. At least two cross sections shall be drawn every 75 feet parallel to the western perimeter of the waste.

b. Quantification of the volume of waste which must be removed from the western perimeter of the hazardous waste unit and placed within the hazardous waste unit, as well as proposed procedures for excavating and transporting the waste. The proposed areas of the hazardous waste unit which would receive this waste shall also be identified.

c. A through discussion of how all components of the barrier wall would be constructed with particular emphasis given to the sealing of any penetrations of the barrier wall.

d. Engineering drawings of the following type:

   i. Cross sectional drawings both along the barrier wall and perpendicular to it which show the location and elevation of the clay barrier, the drainage piping, the slurry cutoff wall and all lift stations and clean out manholes. The drawings running perpendicular to the barrier wall shall be prepared on no greater than 300-foot intervals. Boring log locations and interpretation of hydrogeology shall be included on the cross sections.

   ii. Plan view drawing(s) showing the items detailed immediately above.

e. Tables on each engineering drawing detailing:

   i. The amounts and types of materials which must be excavated in order to accomplish the construction shown on the plan sheet.

   ii. The amounts and types of materials necessary for the construction shown on the plan sheet.

f. Detail drawings of:

   i. Each manhole and lift station.

   ii. Each location where the barrier wall is penetrated.

   iii. Each location where the slurry wall intersects the barrier wall on any other recompacted clay layers.

iv. The connection of the barrier wall to the RCRA cap.

v. The connection of the barrier wall to native clay soils and to the clay liner of corridor 7.

vi. Other details as necessary.

C. Containment Structure

1. LRL shall submit by June 30, 1988, for the Department's review and approval a revised containment structure design. This submittal may be combined with that for the barrier wall. Nevertheless, it shall consist of a bound report and associated engineering drawings which, in addition to an in-depth presentation of the revised design and supporting rationale, shall also include:

   a. An identification and thorough discussion of all construction tasks associated with establishment of the containment structure, as well as a proposed time schedule for completion of each task.

   b. A proposed comprehensive construction documentation program for the containment structure.

   c. An identification of all elements of a proposed construction documentation report for the containment structure to be submitted for our review and approval.

2. The revised containment structure design shall incorporate the following concepts:

   a. Choice of the containment structure location and elevations based upon the supplemental boring program specified in condition 4 below.

   b. Location of the base of the drainage trench at the bottom of geologic unit 2. If necessary, the trench may be extended a maximum of 3 feet into unit 3. The drainage pipe shall not be positioned greater than 2 feet above unit 3.

   c. Gravity flow within the drainage trench piping and placement of lift stations wherever needed to maintain the specified drainage pipe grade. Discharge from each lift station shall be through nonperforated piping for the entire distance to the sanitary sewer.

   d. Design of the slurry cutoff wall component of the containment structure as a homogeneous barrier containing no discontinuities. Special consideration shall be given to the design and construction of the area where the slurry cutoff wall of the containment structure meets the north-south slurry wall associated with the barrier wall. No piping or other appurtenances shall penetrate the containment structure's slurry cutoff wall.

e. Perforated drainage trench piping of sufficient size to handle the maximum possible flows within geologic unit 2 as well as the strength to withstand the substantial earth load it will be under. The piping shall be bedded in gravel throughout, and the gravel shall be extended to the top of unit 2.

f. Placement of manholes with internal cleanout risers at each significant change in direction or elevation of the drainage trench piping. Cleanout risers shall be placed at least every 700 feet. Manholes shall be constructed containing all cleanout risers if select material is placed in the trench. Specific details on all types of cleanouts shall be provided.

g. Keying of the slurry wall a minimum of 3 feet into geologic unit 3 or 3 feet below the base of the drainage trench, whichever is lower.

h. Construction of a recompacted clay liner on the south side of excavation trench and keying of the base of this liner into the top of the slurry wall.

i. Backfilling of the excavation trench with properly compacted clean soil to be placed in maximum 1-foot lift heights, unless all provisions of condition 3 below are met.

j. Testing of all soils removed in the establishment of the construction bench for volatile organic compounds and determination of the fate of these soils based upon the results of the testing.

3. Alternative material to clean soil may be used in backfilling the containment structure trench, provided that the following requirements are met:

a. The material used shall consist only of broken concrete, brick, asphalt or building stones all of which is entirely free of organic material (i.e. wood, brush, etc) and contains no particles larger than 3 inches.

b. This material shall not be filled against the hazardous waste unit.

c. This material shall be placed only on licensed acreage,

d. A plan sheet showing the licensed acreage and property lines as they existed in the December 19, 1984 Plan of Operation Approval and the limits of fill shall be provided,

e. This material shall be placed in loose lift heights not to exceed 12 inches and the compacted between each lift,

f. Any area filled by this material shall be covered by a cap meeting the requirements of the December 19, 1984 Plan of Operation Approval,

g. A protective layer of at least 6 inches of sand shall be placed over the clay base of the fill area.

h. A filter layer shall be provided between the final fill and the clay cap material. This filter may be a geotextile or 6-inches of appropriately sized sand to establish a graded filter.

i. Use of this material shall not delay final closure of the landfill. If necessary, backfilling shall be completed with clean soil as detailed in condition C.2.i shall be done.

4. The following specific information shall be included as part of the design submittal for the containment structure:

a. The results of a supplemental boring program performed to better define the extent of geologic unit 2. Additional borings shall be performed between the following boring locations: 76 and 77, 77 and 78, 85, and B30, B30 and 86, and 90 and 91. Each boring shall extend a minimum of 5 feet into unit 3. Detailed logs of each boring shall be included along with cross-sectional drawings. The boring location and hydrogeological interpretation of the soils shall be included on the cross sections.

b. A detailed proposal for lowering the hydraulic heads in unit 2 prior to and during establishment of the construction bench in order to prevent uplift conditions from developing.

c. A proposed soil sampling program to determine the level of contamination, if any, existing in the soils to be excavated in order to establish the construction bench. The program shall specify the proposed method of testing, the type of equipment to be used, and the testing frequency.

Unless otherwise demonstrated to the Department's satisfaction, soils with total volatile organic compound (VOC) concentrations greater than or equal to 10.0 ppm shall be disposed of within the hazardous waste unit. Soils with total VOC concentrations between 1.0 ppm and 10.0 ppm may be disposed of within corridor 7. Soils containing an organic compound at a concentration that attains or exceeds its ch. NR 140, Wis. Adm. Code, Preventive Action Limit or containing total VOC concentrations in excess of 1.0 ppm shall not be used for liner construction.

Note: No filling may occur in the hazardous waste unit after November 8, 1988.

d. All information regarding slurry wall design and construction required in conditions 32 and 33 of the Department's December 19, 1984 conditional plan of operation approval.

e. Engineering drawings of the following type:

i. Cross sectional drawings both along the containment structure and perpendicular to it which show the location and elevations of the construction bench, clay liner, extent of unit 2, slurry cutoff wall, drainage trench, and all lift stations and cleanout manholes. The drawings running perpendicular to the containment structure shall be prepared on no greater than 300-foot intervals and shall also include final grades.

ii. Plan view drawing(s) showing the items detailed immediately above as well as all property lines, permanent roads and utilities. The drawing(s) shall also identify monitoring wells which may need to be abandoned, and shall propose locations for replacement wells.

f. Tables on each engineering drawing detailing the amounts of each material which must be excavated and the amounts and types of each material necessary for construction.

g. Detail drawings of each manhole and lift station.

h. A proposed method of field determining the interface of Unit 1 and Unit 2 and the interface of Unit 2 and Unit 3 during construction shall be provided. Protocols for documenting and reporting this data shall be provided.

D. Final Cover System - RCRA Cap

1. LRL shall submit by July 29, 1988, for the Department's review and approval a detailed design of the final cover system for the hazardous waste unit. The submittal shall consist of a bound report and associated engineering drawings which, in addition to an in-depth presentation of the revised design and supporting rationale shall also include:

   a. An identification and detailed discussion of all construction tasks associated with the the final cover system and their phasing, as well as a proposed time schedule for completion of each task.

   b. A proposed comprehensive construction documentation program for the final cover system.

   c. An identification of all elements of a proposed construction documentation report for the final cover system to be submitted for our review and approval.

2. The revised final cover system design shall incorporate the following concepts and d tails:

   a. A recompacted clay component with a minimum thickness of 3 feet which meets all specifications found in Section J.

   b. A 40-mil or thicker high density polyethylene (HDPE) liner. Any penetrations of the HDPE liner shall be specifically designed and detailed.

   c. A minimum 1-foot thick drainage layer.

   d. Rooting zone and topsoil layers having minimum thicknesses of 18 inches and 6 inches, respectively.

   e. A nonwoven, needle-punched geosynthetic material placed between the FML and the drainage layer and between the drainage layer and the rooting zone.

f. Efficient removal of water from the drainage layer. Methods to prevent erosion from points of discharge shall be included.

g. Design of the cover system such that a failure rate of the FML is recognized.

h. The final cover system design extending over corridor 7 and the western end of the hazardous waste unit to the extent necessary to cover the barrier wall.

i. Final waste grades consistent with those approved in the Department's December 19, 1984 conditional plan of operation approval. Where waste elevations exceed approved grades, the waste shall be cut back to approved grades. Where waste elevations are less than the approved grades, waste/fill material shall be used to attain the approved grades prior to placement of the final cover system.

3. The following specific information shall be included as part of the design submittal:

a. Complete soil quality and density testing results in accordance with s. NR 516.05(1), Wis. Adm. Code (or condition 54 of the Department's December 19, 1984 plan of operation approval, if previously performed), should any portions of the existing clay cap be proposed for use as part of the revised final cover system. Unless otherwise demonstrated to the Department's satisfaction, the upper 2 feet of existing clay shall be proposed to be removed due to concerns regarding freeze/thaw and dessication.

b. Quantification of the volume of in-place clay which must be removed as well as of the volume of clay which must be placed. Clay which can no longer be utilized as cap material because it does not meet the required specifications shall also be quantified. Procedures for excavating and placing clay material shall be addressed. The source of new clay material and the deposition site of unacceptable clay material shall be identified.

c. A thorough discussion on how all components of the cover system would be constructed with particular emphasis given to the sealing of any penetration of the final cover.

d. Engineering drawings of the following type:

i. Cross sectional drawings at no greater than 500-foot intervals in both the north-south and east-west directions of the final cover system. These drawings shall show the location and elevation of the extent of waste filling, the elevation of the top of the clay component and final elevation of the cover system. Estimated quantities of material needed and waste capacity remaining shall be noted.

ii. Plan view drawing(s) showing the items detailed above as well as:

1) The entire extent of the final cover, including corridor 7 and the western end of the hazardous waste unit with construction schedules for specific phases identified.

2) All drainage structures and piping.

3) Each location where the final cover is penetrated.

e. Detailed specifications for all material necessary for construction including soils, earthwork, geosynthetics and piping.

f. Tables on each engineering drawing detailing:

i. The amount and types of material which must be excavated in order to prepare the hazardous waste unit for construction shown on the plan sheet.

ii. The amount and types of materials necessary for the construction shown on the plan sheet.

g. Calculations justifying the size of the piping system necessary to dewater the drainage layer.

h. Detail drawings of:

i. The layered final cover system itself.

ii. Each penetration of the final cover system.

iii. The FML and geotextile anchoring system.

iv. The drainage layer dewatering system including the discharge system to the storm water basins.

v. The connection of the final cover to:

1) The barrier wall.

2) The existing and proposed sideslopes.

3) Future areas where this final cover system is not required.

4. LRL shall contract with an HDPE manufacturer to prepare detailed plans and specifications regarding the FML component of the cap. These plans shall specifically address FML installation, anchoring, seaming, penetration, venting and quality assurance. These plans and specifications shall be included with the design submittal specified in the previous condition.

E. Slope Stabilization

1. LRL shall submit by June 30, 1988 for the Department's review and approval a plan for stabilization of the sideslope located along the southern boundary of the hazardous waste unit. This plan shall call for either cutting back or extending the sideslope. The submittal shall consist of a bound report and associated engineering drawings which, in addition to an in-depth presentation of the selected design and supporting rationale, shall also include:

   a. An identification and detailed discussion of all construction tasks and their phasing, as well as a proposed time schedule for completion of each task.

   b. A proposed comprehensive construction documentation program for the slope stabilization project.

   c. An identification of all elements of a proposed construction documentation report to be submitted for our review and approval.

2. The proposed design for the slope stabilization project shall incorporate the following concepts:

   a. Final grades for the south slope shall be a maximum of three horizontal to one vertical (3:1).

   b. If the sideslopes are cut back, all excess material shall be disposed of within the hazardous waste unit, and a RCRA cap shall be placed over the cutback area.

   c. If the sideslopes are extended, the material necessary to bring the slope to final grades shall be clean earthern materials. A cap, as approved in the December 19, 1984 conditional plan of operation approval, shall be constructed over this material.

   d. The south slope cover shall be designed such that it is an integral part of the RCRA cap and containment structure. Special design consideration shall be given to transition areas.

   e. In order to minimize erosion, at least one surface water diversion berm (and associated downslope flumes) shall be proposed along the slope.

3. The following specific information shall be included as part of the design submittal for the slope stabilization project:

   a. If the sideslopes are cut back, quantification of the volume of waste which must be removed from the existing sideslopes of the landfill and placed within the hazardous waste unit, as well as proposed procedures for excavating and transporting the waste. Particular emphasis shall be given to the handling of previously accepted asbestos wastes and how safety concerns would be addressed. The proposed areas of the hazardous waste unit which will receive this waste shall also be identified.

b. If the sideslopes are extended, quantification of the volume of earthern material which must be placed above the existing sideslo as well as the proposed procedures for placing and transporting th material. The borrow source of the material shall be identified.

c. Engineering drawings of the following type:

i. North-south cross sectional drawings which show the location and elevation of the existing sideslope, the proposed sideslope, the appropriate cap, and all surface water diversion berms. The cross sections shall be prepared on no greater than 300 foot intervals.

ii. Plan view drawing(s) showing the items detailed above.

d. Tables on each engineering drawing detailing the amounts and types of material which must be excavated or placed necessary for the construction shown on each plan sheet.

e. Detail drawings of:

i. The connection of the sideslope cap to the RCRA cap (extension option only).

ii. The connection of the sideslope cap to the containment structure.

iii. Each location where the sideslope final cover system is penetrated.

F. Landfill Gas and Leachate Extraction Systems

1. LRL shall submit by July 29, 1988 for the Department's review and approval a proposed design for a combination gas and leachate extraction system for corridors 1 through 4. The design shall also provide for active gas extraction in all other approved corridors. The submittal shall consist of a bound report and associated engineering drawings which, in addition to an in-depth presentation of the chosen design and supporting rationale, shall also include:

a. An identification and thorough discussion of all construction tasks and their phasing, as well as a proposed time schedule for completion of each task.

b. A proposed comprehensive construction documentation program for the gas and leachate extraction system.

c. An identification of all elements of a proposed construction documentation report to be submitted for our review and approval.

d. A detailed proposal for operation, monitoring and regular maintenance of all aspects of the gas and leachate extraction system. This shall include a method of documenting the observed areas of influence for each gas and leachate point.

2. The proposed design for the landfill gas and leachate extraction system shall incorporate the following concepts:

   a. Extension of all extraction wells to the base of the refuse. If, at any locations, the base of the refuse is not clearly documented, the wells shall be proposed to be extended to elevation 650 feet MSL in corridors 1, 2 or 3 and to 640 feet in MSL in corridor 4. Unless otherwise demonstrated to our satisfaction, the well borings shall be a minimum of 36 inches in diameter and the well casing shall be 12-inch diameter Schedule 80 or 120 PVC slotted over the lower two-thirds of its length. Geophysical logging of each boring shall be proposed in order to differentiate between refuse and clay cover and to determine the saturated thickness of refuse.

   b. Overlapping radiuses of influences for all extraction wells and coverage of the entire approved landfill area. Unless otherwise demonstrated to our satisfaction, the combination gas and leachate extraction wells for corridors 1 through 4 shall be located based upon a maximum assumed horizontal radius of influence of 75 feet for each well and the gas extraction wells for all remaining approved corridors shall be located based upon a maximum assumed radius of influence of 150 feet for each well. Horizontal extraction wells may only be proposed for areas immediately beneath the barrier wall. The submersible pumps to be placed in each extraction well in corridors 1 through 4 shall be proposed to activate whenever a leachate head of no greater than 3 feet accumulates within the well.

   c. Location of all header piping for gas and leachate above the synthetic membrane element of the final cover system wherever possible. No portion of the header systems shall be located greater than 7 feet below the final landfill surface. All header piping shall be appropriately sized high-density polyethylene (HDPE). Repair of the FML shall be specifically discussed in the long-term care plan.

   d. Convenient performance of the following procedures from the final landfill surface:

      i. Measurement of vacuum levels and gas concentrations at each extraction well and in header line sections immediately adjacent to each extraction well.

      ii. Gas flow rate adjustment at each extraction well.

      iii. Accurate measurement of gas flow rates and concentrations in at least every major branch of the extraction system.

      iv. Measurement of leachate head levels and leachate extraction rates from each extraction well in corridors 1 through 4.

   e. Collection of all condensate produced by the gas extraction system and treatment of the condensate as a hazardous waste. The current drip leg/pumping riser design is unacceptable. In addition, routing of condensate to perforated leachate collection piping shall not be proposed.

f. Provisions for secondary containment and leak detection in any condensate or leachate storage tanks which prove to be necessary. Each tank shall also be sized to provide a minimum of 4-days storage at worst-case condensate or leachate extraction rates.

g. Continued operation of both the gas and leachate extraction systems until the end of the required long-term care period.

h. Incineration of all landfill gas extracted in an environmentally acceptable fashion. Venting of any quantities of landfill gas is not an acceptable management strategy. In order to provide backup incineration capacity for periods when industrial gas usage is reduced or nonexistent, an on-site flare station, or stations, shall be proposed which shall be capable of incinerating all landfill gas which could possibly be produced by the entire approved facility. The design of the flare station(s) shall also fully address aesthetic impacts and shall attempt to limit them to the greatest extent possible. (If necessary, the Department will allow the details of the flare station(s) design to be delayed until December 1, 1988. However, the location(s) must be identified in the submittal required in this section.)

i. Protection of all aspects of the gas and leachate extraction system from vandalism.

3. The following specific information shall be included as part of the design submittal for the landfill gas and leachate extraction system:

a. A plan view drawing and cross sections every 300 feet (both north-south and east-west) showing the base grades of all previously filled corridors. These drawings shall be prepared using all available information (including the borings required in this plan modification) and shall be as detailed as possible. All references used in preparation of the map shall be clearly identified. If estimates of base grade elevations are necessary at any locations, the rationale behind the estimates shall be given.

b. A safety plan identifying all precautions and procedures to be followed when the gas system is out of operation or not functioning as designed. The plan shall also identify all design features incorporated to minimize the system's down time.

c. Accurate as-built information on the existing gas extraction system as per the Department's April 17, 1987 letter and a through assessment of whether any portions of this system are suitable for incorporation into the larger system.

d. Calculations justifying the size and strength of all extraction well and header piping.

e. Calculations justifying the size and type of the chosen gas blower and flare station(s).

f. Calculations justifying the sizes and types of submersible pumps chosen for the extraction wells and the sizes of any leachate or condensate storage tanks.

g. Location and design of each leachate and gas extraction well and of each leachate and gas monitoring well, including all leachate head monitoring wells.

6. Environmental Monitoring and Long-term Care

1. LRL shall submit by May 2, 1988, a revised plan sheet C-21 clearly delineating all environmental monitoring points. Groundwater monitoring wells, leachate head wells and landfill gas wells shall be clearly marked and legible. The new plan sheet or plan sheets shall be drawn to a scale of 1" = 200' clearly showing and correctly labeling all monitoring and extraction points and submitted within 30 days of the date of this letter. This map or an attachment shall give coordinates to all ch. NR 181, Wis. Adm. Code, monitoring wells. The wells in this compliance monitoring plan shall be as listed in the condition G.4. The wells shall be labelled and differentiated into NR 181, special NR 508, or NR 508 categories as described below.

2. LRL shall submit a plan for monitoring the performance of the containment structure with the containment structure submittal required in Section C of this plan modification. This submittal shall meet the following requirements.

a. Pairs of piezometers competed in the bottom of Unit 2 shall be placed such that one piezometer is on each side of the containment structure and both are within 50 feet of the structure.

b. The piezometer pairs shall be spaced no farther than 500 feet between pairs along the length of all containment or dewatering structures to be constructed at the site, with exception of the structures to be constructed between the hazardous waste unit and the former City of Racine site. In this last area, 3 piezometer nest locations shall be established within 100 feet of a line segment with end points of 2+70N, 8+30E and 7+30N, 8+30E. No piezometer nest location shall be within 100 feet of another. Two piezometers, one screened in the bottom of Unit 2 and one screened in Unit 4, shall be constructed at the three locations. All piezometer locations shall be west of the barrier wall. LRL shall submit piezometer design specifications and procedures to the Department for approval by May 2, 1988, which will ensure cross-contamination of Unit 4 from Units 2 and 3 will not occur during the construction of the Unit 4 piezometer. This approval is required prior to the construction of these piezometers. The piezometer locations shall be designated 143, 144, and 145 with a U or L letter added to designate the Unit 2 or Unit 4 position respectively.

c. All boring logs and well completion data shall be reported to the Department.

d. Piezometer groundwater measurements shall be conducted as specified in condition G.4. utilizing the sampling protocol for the NR 508 well group unless specified elsewhere in this modification.

3. Abandonment of borings and monitoring devices shall be conducted in accordance with condition 8 of the December 19, 1984, conditional Plan of Operation Approval with the Department's well construction guidelines. Efforts shall be made to maintain the existing groundwater monitoring network around the site. LRL shall submit a report that identifies all existing wells which will need to be abandoned as part of the closure. The report shall also identify additional wells to be located south and west of the containment structure in order to monitor its performance. A replacement well shall be constructed for each well abandoned. A plan sheet specifying which wells will be abandoned as well as the location of the replacement well shall be provided with the containment structure submittal requested in section C of this plan modification. Department approval must be received prior to abandoning any wells.

Groundwater Monitoring

4. LRL shall establish and maintain a comprehensive groundwater monitoring program as required by s. NR 181.49 and ch. NR 508, Wis. Adm. Code. Groundwater monitoring wells shall be monitored for water quality both upgradient and downgradient of the site. The water table unit (unit 1) and the underlying sandy/silty units (units 2 and 4) shall be included. The groundwater shall be monitored according to the protocols specified for each of the following well groupings:

NR 181 Wells

Steiner Well (026)[1]
110T
17T (042)
109T (092)
18+30E, 0+40N [134T][2]
4+15E, 0+20N [135T]
23+40E, 1+00N [141T]
9+25, 0+80N [140T]
1+50W, 6+50N [22T]

23+40E, 1+00N [141U]
9+25E, 0+80N [140U]
5U (061)
109U (093)
135U
22U (085)
40U (086)
1110U (084)
13AU
6U (082)
146U[4]

Special NR 508 Wells

60T
120T
5T (054)

120U
14U (034)
108U
2+30W, 4+10N [142U]
5U (061)
29U (069)
17U (043)

14L
5L (062)
6L (090)
22L (060)
108L (083)
18L (047)
109L (094)
40L (087)
29L (070)
30L (072)
110L
17L (044)

NR 508 Wells

14T (033)	3U (053)	22M (059)	4L (089)
18T (045)	44 (088)	30M (071)	10L (063)
30T (067)	10U (022)		143L[5]
3T (068)	11U (023)		144L[5]
29T (066)	9U (021)		145L[5]
7T	39U (073)		14L (035)
108T	18U (046)		
6T (007)	19U (049)[3]		RS1[6]
8T (017)	143U[5]		RS2[6]
19T (048)[4]	144U[5]		
	145U[5]		

Notes

[1] (000) denotes DNR well ID.

[2] [000] denotes existing piezometer nest location.

[3] Water elevation only.

[4] Well 146U to be completed in bottom of Unit 2 between borings 73 and 74 (2+80E, 0+50N) outside of containment structures.

[5] Wells to be installed per condition G.2.b. Analysis shall include quantification of detected base/neutral and acid extractable organic compounds. These wells are to be sampled such that a minimum of 8 quality assured rounds over a minimum one year period are obtained. Sampling shall then continue quarterly until abandonment is required.

[6] RS1 and RS2 are leachate head wells at the former City of Racine Landfill site which shall be located at 3+40E, 5+90N, and 4+70E, 3+50N, respectively. The reported well construction must document that the wells are screened at the base of the site. Analysis shall include quantification of detected base/neutral and acid extractable organic compounds.

The following sampling protocols shall be used for each group of wells:

NR 181 Wells

The NR 181 well group shall be sampled for the constituents of Table VI of s. NR 181.16(4), Wis. Adm. Code as is required by s. NR 181.49(6)(i)8.b., Wis. Adm. Code. This sampling shall be done in an accelerated fashion by sampling monthly for 4 consecutive months instead of 4 quarterly measurements. These numbers will be used to establish background values and concentration limits. Parameters of Table VI which are detected in the first sampling round shall be measured in all wells in the three remaining sampling rounds. The sampling results shall be reported to the Department by September 15, 1988.

The following indicator parameters shall also be measured in the NR 181 wells during eight consecutive months and quarterly thereafter:

field conductivity	chloride
field pH	sodium
field temperature	potassium
water elevation	dissolved iron
COD	sulfate
alkalinity total	VOC
hardness	
phenol	

The physical appearance of the water sample, including color, odor and turbidity, shall be recorded at the time of sampling of each monitoring point.

The following health and public welfare parameters shall also be measured in the NR 181 wells during the eight consecutive months of sampling and annually thereafter:

copper (dissolved)	chromium (dissolved)
manganese (dissolved)	lead (dissolved)
total dissolved solids	mercury (dissolved)
zinc (dissolved)	selenium (dissolved)
arsenic (dissolved)	silver (dissolved)
barium (dissolved)	Endrin, Lindane, Methoxychlor,
fluoride	Toxaphene
nitrate and nitrite (as N)	2,4-D,
	2,4,5-TP (Silvex)

LRL may obtain an exemption from dioxin analysis if representative leachate samples from eight leachate head wells show no dioxin upon analysis. Six of the samples must be from Corridors 1, 2, 3, and 4, and two must be from the required Racine site head wells.

If all of the first four monthly health and public welfare analyses for a specific well and parameter are found to be less than the NR 140 preventative action limit then further analysis of that parameter at that well may be discontinued.

Special NR 508 Wells

The special NR 508 wells shall be sampled according to the same NR 181 protocol above as is required for the indicator and health and public welfare parameters. Additionally, only those Table VI constituents detected in the NR 181 sampling groundwater analysis will be required to be analyzed for the Special NR 508 wells. These added analyses shall be made on a quarterly basis.

NR 508 Wells

The NR 508 wells shall be sampled in the same manner as the Special NR 508 wells above except analysis of Table VI constituents is not required.

Boring logs, well completion reports, and well information forms (WIFs) for wells required for construction in condition G.4. shall be submitted by May 31, 1988.

Documentation for wells 143U, 144U, 145U, 143L, 144L and 145L shall be submitted by June 30, 1988.

5. LRL shall submit annual monitoring reports as required by s. NR 181.49(6)(j)6, Wis. Adm. Code.

6. LRL shall monitor all ch. NR 181, Wis. Adm. Code, monitoring wells listed in Condition G.4. for all Table VI constituents detected on a quarterly basis and compare them to background values determined by the Department. If a groundwater protection standard or concentration limit (NR 181.49(6)(d)) is exceeded, then LRL must notify the Department and propose a corrective action program. Groundwater monitoring results shall also be compared to all ch. NR 140, Wis. Adm. Code, groundwater standards and exceedances reported to the Department.

7. A revised combined chs. NR 181 and NR 508, Wis. Adm. Code, groundwater monitoring plan reflecting these conditions, the conditions listed below, and the requirements of ss. NR 181.49(6) and NR 508, Wis. Adm. Code, must be submitted by May 31, 1988.

8. Samples collected for dissolved metals analyses shall be filtered and preserved in the field immediately after withdrawing the sample.

9. The diagrams included for typical well construction (Figures 5-1 and 5-2) are inconsistent with previous well construction information received from LRL and are inconsistent with the well logs found in the appendix of the closure plan. Water table wells should not be sealed above the screen and piezometers should be. These well construction diagrams shall be checked and corrections made where appropriate.

10. Water levels shall be measured to the nearest 0.01 foot.

11. Field blanks shall be taken every 20 samples or at a minimum one per sampling event.

12. Sample bottles shall not be rinsed with sample water. Bottles shall be properly prepared in the lab prior to sampling.

13. For any monitoring points not specified above, LRL shall continue to conduct ch. NR 508, Wis. Adm. Code, groundwater monitoring in accordance with the December 19, 1984 Plan of Operation Approval. The sampling protocol of any such wells shall be that of the NR 508 well group described above.

14. All groundwater monitoring wells required by this approval shall have in-field hydraulic conductivity tests performed and the results reported with the well boring and construction documentation. Any existing groundwater monitoring wells without in-field conductivity measurements shall also be tested and the results shall accompany the monitoring plan required in G.7.

Leachate and Containment System Drainage Monitoring

15. LRL shall submit a leachate monitoring plan by August 1, 1988. The plan shall contain the following minimum components:

a. Description and plan location of each monitoring point.

b. Utilize all leachate extraction wells required in this approval located in Corridors 1, 2, 3, or 4 as points for monitoring leachate head elevation and quality. Extraction well pumps shall be turned off for 24 hours prior to the elevation measurements at the head wells to be measured.

c. Propose locations for monitoring leachate head elevations and quality for Corridors 5, 6, and 7.

d. Include existing leachate head well monitoring points for Corridors 1, 2, 3, and 4 for both leachate elevation and equality until new leachate extraction wells are operational, and continue monitoring the existing head wells for elevation after the new wells are installed.

e. Monitor leachate head monitoring well levels monthly and whenever a sample is taken. Monitor leachate extraction well head levels quarterly.

f. Include all leachate and containment system drainage manholes and lift stations as leachate quality monitoring points.

g. All leachate and drainage system water quality monitoring points shall be sampled according to the following protocol.

i) Semiannually for:

field conductivity	phenol
field pH	Chloride
Field temperature	Sodium
COD	Potassium
Alkalinity (total)	Iron (total)
Hardness	VOC's*

ii) Annually for:

Copper (total)	Nitrate
Manganese (total)	Lead (total)
Zinc (total)	Mercury (total)
Arsenic (total)	Selenium (total)
Barium (total)	Silver (total)
Fluoride	

Endrin, Lindane, Methoxychlor, Toxaphene, 2,4-D, 2,4,5-TP (Silvex), quantification of base/neutral and acid extractible organic compounds**

*The VOC analysis shall be done using a gas chromatograph/mass spectrometer in accordance with SW846 method 8240 or EPA wastewater method 624. As an alternative, the VOC analysis may be performed using a gas chromatograph/photoionization detector/hall detector in accordance with SW948 methods 8010/8020 or EPA wastewater methods 601/602.

**EPA wastewater analytical protocol 625. Compounds must be identified and quantified where possible.

Surface Water Monitoring

16. LRL shall submit a surface water monitoring plan to update the present sampling program by August 1, 1988. The plan shall contain the following minimum components:

    A description of the routing and magnitude of water flow.

    a. Description and plan location of each monitoring point.

    b. A sampling of parameter list which includes as a minimum: field conductivity, field pH, field temperature, total suspended solids, BOD_5, nitrate-nitrogen, chloride, sodium, sulfate, and potassium.

    c. Water elevations measured by permanent staff gauges.

17. LRL shall evaluate its monitoring data collection system and determine if the monitoring data normally transmitted through the turn around documents (TAD) can instead be reformatted and transmitted using a computer disk or tape. An information package is enclosed which should allow this type of transmittal. A printout of the data shall be enclosed with the tape or disk and the TAD shall also be filled out and reported for the first two quarters of data to ensure the Department can read the disk or tape. The procedures of the above condition shall be incorporated in the monitoring plan required in G.7.

Long Term Care Plan

18. The long-term care plan does not provide sufficient detail on what actions LRL will take once a problem is discovered. A revised long-term care plan shall be submitted by August 15, 1988, which includes a specific inspection checklist and identifies specific actions that LRL will take once a problem is found.

H. Financial Responsibility

LRL shall provide proof of financial responsibility to ensure compliance with hazardous waste closure requirements. In addition, LRL shall obtain liability coverage for nonsudden accidental occurrences in the amount of $3 million per occurrence with an annual aggregate of at least $6 million, exclusion of legal defense costs (ss. NR 181.42(10) and (11), Wis. Adm. Code).

1. No later than August 15, 1988 LRL shall submit revised and detailed closure costs for the hazardous waste unit which are in addition to those items covered in the Department's December 19, 1984 conditional plan of operation approval. The major closure item areas which shall be included are the entire barrier wall including the cutoff wall and drainage system on the west end of the hazardous waste unit; additions to the containment structure; the flexible membrane liner, geotextile and drain layer of the RCRA cap; and leachate/gas extraction system. Cost estimates for each major area listed above shall include materials, equipment and labor, engineering services and construction certification for field work and reporting.

   Unit costs upheld by the Racine County Circuit Court decision dated October 6, 1987 shall be used after being inflated to 1988 dollars. Standard cost estimate based on the Dodge Guide to Public Works and Heavy Construction Costs published by McGraw-Hill, Incorporated, and/or Building Construction Cost Data published by Robert Snow Means Company Incorporated or other independent third party cost estimates shall be used when items are not included in the court decision.

2. No later than August 15, 1988 LRL shall submit revised and detailed long-term care costs for the hazardous waste unit which are in addition to the long-term care items covered in the 1984 conditional plan of operation approval. The major long-term care areas include leachate head pumping and maintenance, gas withdrawal and maintenance; additional leachate and gas condensate treatment; increased groundwater and gas monitoring; leachate line cleaning; and other long-term care items required as a result of this plan modification.

   Unit cost for long-term care items shall be consistent with the previous condition, where applicable, including presenting the costs in 1988 dollars. A 30-year long-term care period shall be used and this long-term care period shall begin once all construction documentation required for closure of the entire site is approved and proof is established to the Department's satisfaction that leachate heads have been eliminated and can be prevented from recurring.

3. LRL shall immediately obtain liability insurance coverage for nonsudden accidental occurrences in the amount of $3 million per occurrence with an annual aggregate of at least $6 million, exclusive of legal defense costs. A listing of companies which have sold liability insurance is attached. Documentation of coverage shall be provided by June 1, 1988.

I. Construction Documentation

Construction documentation reports shall be completed and submitted for the Department's review and approval following construction of each major phase of closure. These include the barrier wall, the contaminant structure, the cap, leachate gas extraction systems. These reports shall comply with the minimum standards for solid waste facilities in effect of the time of the submittal.

J. Soil Specifications and Testing Requirements

1. Clay. All clay used for lining and capping purposes shall meet the following specifications:

Classification:	CL or CH under the Unified Soil Classification System
Thickness:	Minimum of 3 feet for the cap Minimum of 7 feet for the barrier wall
Permeability:	Less than or equal to 1×10^{-7} cm/sec.
Liquid Limit:	27% or greater
Plasticity Index:	12% or greater
Compaction:	95% standard Proctor
Grain Size:	P200 Content of 50% by weight or greater Clay Content of 25% by weight or greater

Lifts may not exceed 8 inches in height prior to compaction unless otherwise approved by the Department.

2. Drainage Material. A representative sample of the material being used for the sand drainage blanket shall be tested once very 1000 yd^3 or 1000 linear feet of trench for grain size down to the #200 sieve. The P200 content of this material shall not exceed 5% by weight. In addition, five permeability tests per corridor or five permeability tests per 1000 linear feet of trench shall be performed to document that the permeability is 5×10^{-3} cm/sec. or greater at 90% standard Proctor density.

3. Topsoil and Seed Mixture. Documentation testing of topsoil, seed, fertilizer and mulch placement shall consist of the following:

   a. One grab sample of topsoil per acre shall be analyzed for soil pH and classified under the USDA soil classification system.

   b. Verification of thickness on a 100-foot grid pattern.

   c. The amount and type of fertilizer, seed and mulch used per acre.

   d. A short narrative which explains how the seed bed was prepared and a summary of how placement of the seed, fertilizer and mulch were accomplished.

   e. A series of 35 mm slides or color prints which document the work.

4. Documentation testing shall be included with each construction documentation report.

NOTIFICATION OF APPEALS RIGHTS

If you believe you have a right to challenge this decision, you should know that Wisconsin Statutes and Administrative rules provide time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to Sections 227.52 and Sections 227.53, Wisconsin Statutes, you have 30 days after the decision is mailed or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for a judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to Section 227.48(2), Statutes.

Dated: MAR 31 1988.

Department of Natural Resources
For the Secretary.

Paul P. Didier

Paul P. Didier, P.E., Director
Bureau of Solid and Hazardous Waste

Edward K. Lynch

Edward K. Lynch, P.E.
Hazardous Waste Management Section

Dennis Mack

Dennis Mack, P.E.
Solid Waste Management Section

Ken Wade

Ken Wade, Hydrogeologist, C.P. G.S.
Solid Waste Management Section

Attachments: Insurance Companies
Groundwater Monitoring Reporting

5215C
3/31/88

Attachment I

Pollution Liability Insurance Companies

American Home Assurance Company
70 Pine Street
7th Floor
New York, New York 10270
Todd Cunningham
(212) 770-7000
Member, American International Group

American Mutual Liability Insurance Company
Quannapowitt Parkway
Wakefield, Massachusetts 01880
Mr. Svehla, Vice President - Underwriting
(617) 245-6000
Member, PLIA

Amerisure Insurance Company
28 West Adams Avenue
Detroit, Michigan 48226
Ed Foley
(313) 965-8600
Member, PLIA

Employers Mutual Casualty Co.
717 Mulberry Street
P.O. Box 712
Des Moines, Iowa 50303-0712
Home Office Underwriting
(515) 280-2511
Member, PLIA

International Insurance Company
c/o Crum & Forster Corporation
305 Madison Avenue
Morris Township, New Jersey 07960
Jim Hill, Vice President
(201) 953-3153
Member, Crum & Forster Insurance Companies

Liberty Mutual Insurance Companies
175 Berkley Street
Boston, Massachusetts 02117
John W. Purkis, Vice President
(617) 357-9500
Member, PLIA

National Union Fire Insurance Company
70 Pine Street
New York, New York 10270
Mark Vuono, Manger
Pollution Legal Liability Dept.
(212) 770-7000
Member, American International Group

St. Paul Surplus Lines Insurance Company
445 Minnesota Street
Suite 900
St. Paul, Minnesota 55101
Kay Scott
(612) 228-8979
Member, Swett & Crawford

Travels Insurance Company
One Tower Square - 10MN
Hartford, Connecticut 06183-4030
Thomas A. Jackson, Secretary
(203) 277-2867

U.S. Fire Insurance Company
211 Mounty Airy Road
P.O. Box 0558
Basking Ridge, New Jersey 07920
Bill Spataro
(201) 953-3153
Member, Crum & Forster Insurance Companies

Wausau Insurance Companies
2000 Westwood Drive
Wausau, Wisconsin 54401
Dick Rice
(715) 845-5211
Member, PLIA

PLIA - Pollution Liability Insurance Association

Other sources of insurance may also be available. Premiums for these policies may be expensive. Expense is not a basis for not having insurance.

ATTACHMENT II

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D Besadny
Secretary

BOX 7921
MADISON, WISCONSIN 53707

File Ref:

Thank you for your interest in providing groundwater monitoring data on electronic media. This packet of materials will provide the information you need to prepare your data in a format we can use. If you have questions about reporting your data, please contact Pat Jesse at (608) 267-7550. If you have questions about your monitoring requirements, sampling techniques or other technical issues related to groundwater monitoring, please contact your DNR district or area office.

The following documents are attached:

Attachment 1 - Record Layout

Whether you submit a tape or diskette, the data must be in ASCII format and in the layout indicated in Attachment 1. You must use the well identification number DNR has assigned to your wells and DNR's parameter codes. The well names can be found on your Turnaround Document (TAD).
A list of parameter codes is in Attachment 3.

Attachment 2 - Sample Record Layout

Attachment 3 - Parameter Codes List

You must use our parameter codes. We are in the process of converting our parameter codes to STORET (the parameter coding system used by EPA and many labs.) Some of our codes are currently STORET, the others soon will be. We encourage you, your contractor and lab to use STORET codes.

Note that information sometimes written on the TAD as comments (e.g., well frozen, well broken, color, odor, turbidity, etc.) may be coded using a parameter code. This is important because the record layout does not provide a place for comments. Please use the parameter codes to transmit this comment type information to us.

Note: Other comments you may wish to make and the name of the person taking the sample should be put in a cover letter.

Attachment 4 - Certification Statement

This signed, dated statement must accompany each data submittal. As you will note, you must also provide with each submittal a hardcopy printout of the data on the electronic media.

It is important we continue to receive your groundwater monitoring data in a timely and accurate fashion. Therefore, please continue to submit TAD's for the next two reporting periods along with the data on tape or diskette. When we are certain we are able to read the data from your electronic media, TAD submittal will no longer be required.

ATTACHMENT 1

FORMAT FOR GROUNDWATER MONITORING RECORDS

COL 1	6	
COL 2-4	LEAVE BLANK	
COL 5-9	LICENSE NO.	
COL 10-12	DNR'S WELL ID NO.	
COL 13-17	DNR'S PARAMETER NO.	
COL 18-23	SAMPLE DATE (YYMMDD)	
COL 24-25	SERIES (01)	
COL 26	BACKGROUND	1=TRUE 2=NOT TRUE
COL 27	AGENCY	1=FACILITY 2=DNR
COL 28	TYPE	1=REGULAR 2=SPLIT
COL 29	< OR > OR BLANK	
COL 30-40	VALUE	FORMAT: 9(6)v9(5) There are 6 digits to the left and 5 digits to the right of assumed decimal point. DO NOT enter decimal point. This field must be all numeric or completely blank, no partial filling.
COL 41-126	BLANK	
COL 127-137	0010592GM01	
COL 138-159	BLANK IN ALL BUT THE LAST RECORD. IN THE LAST RECORD, THIS FIELD CONTAINS THE LAB IDENTIFICATION NUMBER (SEE ATTACHED EXAMPLE).	

Data must be in ASCII format.

ATTACHMENT 2

PANEL NAME = ISREDDE MESSAGE NAME = ISRE108

```
EDIT ---- DHR.E508.SWTAD ---------- COLUMNS 001 072 ---------- COLUMNS 088 159
COMMAND ===>                        SCROLL ===> CSR            SCROLL ===> CSR
000905 B  0296803500032861202012l1 24302900000                 0010
000906 B  0296603500134861202012l1 00006700000                 0010
000907 B  0296603500307861202012l1 00086800000                 0010
000908 B  0296603500310861202012l1 00705000000                 0010
000909 B  0296603800340861202012l1 00374000000                 0010
000910 B  0296803500400861202012l1 00000720000                 0010
000911 B  0296603800410861202012l1 00328000000                 0010
000912 B  0296803500872861202012l1 00615000000                 0010
000913 B  0296603600900861202012l1 00600000000                 0010
000914 B  0296803501046861202012l1 00011000000                 0010
000915 B  0296603800005861202012l1 00000000000                 0010
000916 B  0296603700005861202012l1 00000000000                 0010
000917 B  0296603800005861202012l1 00000000000                 0010
000918 B  0296603900307861202012l1 00000500000                 0010
000919 B  0296603900340861202012l1 00000230000                 0010
000920 B  0296603900400861202012l1 00000770000                 0010
000921 B  0296603900410861202012l1 00016800000                 0010
000922 B  0296603800872861202012l1 00044000000                 0010
000923 B  0296603900900861202012l1 00020800000                 0010
000924 B  0298803901046861202012l1 00000002000                 0010
000925 B  0296603900842861202012l1 00112865000                 0010
000926 B                                                       0010                    750040280
```

RECORD DESCRIPTION FOR PRMTBL.DAT DISK

cols 016-020	DNR PARAMETER NUMBER
cols 027-076	PARAMETER LONG NAME
cols 077-088	PARAMETER ABBR 1
cols 089-096	PARAMETER ABBR 2
col 101	DECIMAL PRECISION
cols 102-117	TURNAROUND DOCUMENT APPEARANCE
col 118	NON DETECT POSSIBLE INDICATOR
	-- if 'Y' then it is possible to get NOT DETECTED as a sample result (VOC parameters)

RECORD DESCRIPTION FOR PRMTBL.DAT DISK

cols 016-020	DNR PARAMETER NUMBER
cols 027-076	PARAMETER LONG NAME
cols 077-088	PARAMETER ABBR 1
cols 089-096	PARAMETER ABBR 2
col 101	DECIMAL PRECISION
cols 102-117	TURNAROUND DOCUMENT APPEARANCE
col 118	NON DETECT POSSIBLE INDICATOR
	-- if 'Y' then it is possible to get NOT DETECTED as a sample result (VOC parameters)

The parameter Table can be sent to you on a disk for uploading to your system.

We also provide well name and ID number on a disk file.

ATTACHMENT 3

N59203A GWM PARAMETER CODES - 02/19/88 - ALPHABETICAL ORDERING PAGE: 1

CODE	PRINTOUT ABREV.	REPORTING PRECISION	DESCRIPTION	TURNAROUND DOC APPEARANCE	POSSIBLE NON-DETECT
34205	ACENAPTH WHL SAMP UG/L	XXXXX.XX	ACENAPTHENE IN WHL WTR SAMPLE (UG/L)	ACENAPTHENE	Y
34200	ACENAPTH WHL SAMP UG/L	XXXXX.XX	ACENAPTHYLENE IN WHL WTR SAMPLE (UG/L)	ACENAPTHYLENE	Y
81552	ACETONE WHL SAMP UG/L	XXXXX.XX	ACETONE IN WHL WTR SAMPLE (UG/L)	ACETONE	Y
76997	ACETONIT WHL SAMP UG/L	XXXXX.XX	ACETONITRILE IN WHL WTR SAMPLE (UG/L)	ACETONITRILE	Y
81553	ACETOPHE WHL SAMP UG/L	XXXXX.XX	ACETOPHENONE IN WHL WTR SAMPLE (UG/L)	ACETOPHENONE	Y
00019	ACETIC ACID MG/L	XXXXXX.X	ACID, ACETIC (MG/L)	ACETIC ACID	
00021	ISOBUTYC ACID MG/L	XX.XXXXX	ACID, ISOBUTYRIC (MG/L)	ISOBUTYRIC ACID	
00022	ISOVALER ACID MG/L	XX.XXXXX	ACID, ISOVALERIC (MG/L)	ISOVALERIC ACID	
00020	PROPIONC ACID MG/L	XX.XXXXX	ACID, PROPIONIC (MG/L)	PROPIONIC ACID	
34210	ACROLEIL WHL SAMP UG/L	XXXXX.XX	ACROLEIN IN WHL WTR SAMPLE (UG/L)	ACROLEIN	Y
34215	ACRYLONI WHL SAMP UG/L	XXXXX.XX	ACRYLONITRILE IN WHL WTR SAMPLE (UG/L)	ACRYLONITRILE	Y
39053	ALDICARB WHL SAMP UG/L	XXXXX.XX	ALDICARB IN WHOLE WATER (UG/L)	ALDICARB	Y
39330	ALDRIN WHL SAMP UG/L	XXXXX.XX	ALDRIN IN WHL WTR SAMPLE (UG/L)	ALDRIN	Y
00071	HCO3 ALK CACO3 MG/L	XXXXXXXX	ALKALINITY, BICARBONATE (MG/L AS CACO3)	ALKALINITY, HCO3	
00067	CO3 ALK CACO3 MG/L	XXXXXXXX	ALKALINITY, CARBONATE (MG/L AS CACO3)	ALKALINITY, CO3	
39036	ALKLNITY CACO3FIL MG/L	XXXXXXXX	ALKALINITY, FILTERED SAMPLE (MG/L AS CACO3)	ALKALINITY, FILT	
00410	TOT ALK CACO3 MG/L	XXXXXXXX	ALKALINITY, TOTAL (MG/L AS CACO3)	ALKALINITY, TOT	

CODE	PRINTOUT ABREV.	REPORTING PRECISION	DESCRIPTION	TURNAROUND DOC APPEARANCE	POSSIBLE NON-DETECT
73505	ALLYL AL WHL SAMP UG/L	XXXXX.XX	ALLYL ALCOHOL IN WHL WTR SAMPLE (UG/L)	ALLYL ALCOHOL	Y
73564	AADMPEA WHL SAMP UG/L	XXXXX.XX	ALPHA,ALPHA-DIMETHYLPHENETHYLAMINE W W S (UG/L)	A,A-DMPEA	Y
00250	ALUMINUM AL,DISS UG/L	XXXX.XXX	ALUMINUM, DISSOLVED (UG/L AS AL)	ALUMINUM, DISS	
00266	ALUMINUM AL,TOTAL UG/L	XXXX.XXX	ALUMINUM, TOTAL (UG/L AS AL)	ALUMINUM, TOT	
00619	UNIONZD NH3-NH3 MG/L	XXXX.XXX	AMMONIA, UNIONIZED PERCENT OF TOT. T-PH CAL (MG/L)	NH3-NH3,UNIONZD%	
77089	ANILINE WHL SAMP UG/L	XXXXX.XX	ANILINE IN WHL WTR SAMPLE (UG/L)	ANILINE	Y
00029	ANTHO-CYANIN MG/L	XXXX.XXX	ANTHOCYANIN (MG/L)	ANTHOCYANIN	
34220	ANTHRACE WHL SAMP UG/L	XXXXX.XX	ANTHRACENE IN WHL WTR SAMPLE (UG/L)	ANTHRACENE	Y
01095	ANTIMONY SB,DISS UG/L	XXXXXXXX	ANTIMONY, DISSOLVED (UG/L AS SB)	ANTIMONY, DISS	
01097	ANTIMONY SB,TOTAL UG/L	XXXXXXXX	ANTIMONY, TOTAL (UG/L AS SB)	ANTIMONY, TOT	
73510	ARAMITE WHL SAMP UG/L	XXXXX.XX	ARAMITE IN WHL WTR SAMPLE (UG/L)	ARAMITE	Y
00070	AROMATIC HYDROXYL MG/L	XX.XXXX	AROMATICS, HYDROXYLATED (MG/L)	AROMTIC HYDROXYL	
01000	ARSENIC AS,DISS UG/L	XXXX.XXX	ARSENIC, DISSOLVED (UG/L AS AS)	ARSENIC, DISS	
01002	ARSENIC AS,TOTAL UG/L	XXXX.XXX	ARSENIC, TOTAL (UG/L AS AS)	ARSENIC, TOT	
00030	ASH TOTAL MG/L	XXXX.XXX	ASH, TOTAL (MG/L)	ASH, TOT	
01005	BARIUM BA,DISS UG/L	XXXX.XXX	BARIUM, DISSOLVED (UG/L AS BA)	BARIUM, DISS	
01007	BARIUM BA,TOTAL UG/L	XXXX.XXX	BARIUM, TOTAL (UG/L AS BA)	BARIUM, TOT	

CODE	PRINTOUT ABREV.	REPORTING PRECISION	DESCRIPTION	TURNAROUND DOC APPEARANCE	POSSIBLE NON-DETECT
00025	BAROM PRESSURE MM OF HG	XXXXX.XX	BAROMETRIC PRESSURE (MM OF HG)	BAROMETRIC PRESS	
34526	BZ(A)ANT WHL SAMP UG/L	XXXXX.XX	BENZ(A)ANTHRACENE IN WHL WTR SAMPLE (UG/L)	BENZANTHRACENE	Y
34030	BENZENE GC-MS MG/L	XXXXX.XX	BENZENE BY GC-MS (MG/L)	BENZENE (GC-MS)	Y
81283	BHC WHL SMPL UG/L	XXXXXX.X	BENZENE HEXACHLORIDE, 6H6CL6, WHL WAT SMPL (UG/L)	BNZ HEXACHLORIDE	
73518	BZTHIOL WHL SAMP UG/L	XXXXX.XX	BENZENETHIOL IN WHL WTR SAMPLE (UG/L)	BENZENETHIOL	Y
39120	BZIDINE WHL SAMP UG/L	XXXXX.XX	BENZIDINE IN WHL WTR SAMPLE (UG/L)	BENZIDINE	Y
34247	BZ(A)PYR WHL SAMP UG/L	XXXXX.XX	BENZO(A)PYRENE IN WHL WTR SAMPLE (UG/L)	BENZO(A)PYRENE	Y
34230	BZ(B)FAN WHL SAMP UG/L	XXXXX.XX	BENZO(B)FLUORANTHENE IN WHL WTR SAMPLE (UG/L)	BENZOFLUORDANTHR	Y
34521	BZ(GHI)P WHL SAMP UG/L	XXXXX.XX	BENZO(GHI)PERYLENE IN WHL WTR SAMPLE (UG/L)	BENZO(GHI)PERYLE	Y
34242	BZ(K)FAN WHL SAMP UG/L	XXXXX.XX	BENZO(K)FLUORANTHENE IN WHL WTR SAMPLE (UG/L)	BENZO(K)FLUORANT	Y
77247	BENZOIC WHL SAMP UG/L	XXXXX.XX	BENZOIC ACID IN WHL WTR SAMPLE (UG/L)	BENZOIC ACID	Y
77147	BENZYL A WHL SAMP UG/L	XXXXX.XX	BENZYL ALCOHOL IN WHL WTR SAMPLE (UG/L)	BENZYL ALCOHOL	Y
01010	BERYLIUM BE, DISS UG/L	XXXXX.XX	BERYLLIUM, DISSOLVED (UG/L AS BE)	BERYLLIUM, DISS	
01012	BERYLIUM BE,TOTAL UG/L	XXXXX.XX	BERYLLIUM, TOTAL (UG/L AS BE)	BERYLLIUM, TOT	
00028	BOD 6 DAY MG/L	XXXXXX.X	BIOCHEMICAL OXYGEN DEMAND (MG/L, 6 DAY - 20DEC C)	BOD, 6 DAY	
00310	BOD 5 DAY MG/L	XXXXXX.X	BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C)	BOD, 5 DAY	
00311	DISS BOD 5 DAY MG/L	XXXXXX.X	BIOCHEMICAL OXYGEN DEMAND, DISSOLVED 5 DAY (MG/L)	DISS BOD, 5 DAY	

CODE	PRINTOUT ABREV.	REPORTING PRECISION	DESCRIPTION	TURNAROUND DOC APPEARANCE	POSSIBLE NON-DETECT
34268	B(CM)ET UG/L	XXXX.XXX	BIS(CHLOROMETHYL) ETHER (UG/L)	BIS(CMTHYL)ETHER	Y
34278	B(2CEO)M WHL SAMP UG/L	XXXXX.XX	BIS(2-CHLOROETHOXY)METHANE IN WHL WTR SAMP (UG/L)	BIS(2CE)METHANE	Y
34273	B(2CE)ET WHL SAMP UG/L	XXXXX.XX	BIS(2-CHLOROETHYL) ETHER IN WHL WTR SAMPLE (UG/L)	BIS(2CE)ETHER	Y
73522	B(2CI)ET WHL SAMP UG/L	XXXXX.XX	BIS(2-CHLOROISOPROPYL) ETHER IN WHL WTR SMP (UG/L)	BIS(2CI)ETHER	Y
39100	B-2-EHPT WHL SMPL UG/L	XXXXX.XX	BIS-2-ETHYLHEXYLPHTHALATE IN WHL WTR SMPL (UG/L)	BIS-2-ETHHEXPHTH	
01020	BORON B,DISS MG/L	XXXX.XXX	BORON, DISSOLVED (MG/L AS B)	BORON, DISS	
01022	BORON B,TOTAL MG/L	XXXX.XXX	BORON, TOTAL (MG/L AS B)	BORON, TOT	
81555	BROMOBEN WHL SAMP UG/L	XXXXX.XX	BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	BROMOBENZENE	Y
32101	BDCM WHL SMPL UG/L	XXXXX.XX	BROMODICHLOROMETHANE IN WHL WATER SAMPLE (UG/L)	BRODICHLMETHANE	Y
34413	BROMOMET WHL SAMP UG/L	XXXXX.XX	BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	BROMOMETHANE	Y
77566	BUBEZPHT WHL SMPL UG/L	XXXXX.XX	BUTYLBENZYLPHTHALATE IN WHOLE WATER SAMPLE (UG/L)	BUTYLBENZPHALATE	
00312	CADMIUM CD,DISS. UG/L	XXXX.XXX	CADMIUM, DISSOLVED (UG/L AS CD)	CADMIUM, DISS	
00120	CADMIUM CD,TOTAL UG/L	XXXX.XXX	CADMIUM, TOTAL (UG/L AS CD)	CADMIUM, TOT	
00915	CALCIUM CA,DISS MG/L	XXXXXX.X	CALCIUM, DISSOLVED (MG/L AS CA)	CALCIUM, DISS	
00916	CALCIUM CA,TOTAL MG/L	XXXXXX.X	CALCIUM, TOTAL (MG/L AS CA)	CALCIUM, TOT	
81405	CRBOFURN WHL SAMP UG/L	XXXX.XXX	CARBOFUREN (FURANDAN) WHOLE WATER SAMPLE (UG/L)	CARBOFUREN	Y
85544	CARBON DIOXIDE %	XXXXXX.X	CARBON DIOXIDE GAS, VOL PERCENT OF DISS. GASES (%)	CO2	

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77041	CDS WHL SMPL UG/L	XXXXX.XX	CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	CARBON DISULFIDE	Y
32102	CTC WHL SMPL UG/L	XXXXX.XX	CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	CARBON TET CHLD	Y
00680	T ORG C C MG/L	XXXXXX.X	CARBON, TOTAL ORGANIC (MG/L AS C)	CARBON, TOT ORG	
00445	CO3 ION CO3 MG/L	XXXXXXXX	CARBONATE ION (MG/L AS CO3)	CARBONATE ION	
00340	COD HI LEVEL MG/L	XXXXXX.X	CHEMICAL OXYGEN DEMAND, .25N K2CR2O7 (MG/L)	COD, HI LEVEL	
00341	DISS COD MG/L	XXXXXXXX	CHEMICAL OXYGEN DEMAND, .25N K2CR2O7 (MG/L)	DISS COD	
00307	CHLORIDE CL MG/L	XXXXXXXX	CHLORIDE (MG/L AS CL)	CHLORIDE	
82295	CHLORIDE CL,DISS MG/L	XXXXXXXX	CHLORIDE, DISSOLVED (MG/L AS CL)	CHLORIDE, DISS	
50064	CHLORINE FREE AVL MG/L	XXXXX.XX	CHLORINE, FREE AVAILABLE (MG/L)	CHLORINE,FREE AV	
34301	CHLOROBE WHL SAMP UG/L	XXXXX.XX	CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	CHLOROBENZENE	Y
39460	CBZILATE WHL SAMP UG/L	XXXXX.XX	CHLOROBENZILATE IN WHL WTR SAMPLE (UG/L)	CHLOROBENZILATE	Y
39350	CHLORODA WHL SAMP UG/L	XXXXX.XX	CHLORODANE IN WHL WTR SAMPLE (UG/L)	CHLORODANE	Y
34306	CDMETHA WHL SAMP UG/L	XXXXX.XX	CHLORODIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	CHLORODIBROMOMET	Y
34311	CHLOROET WHL SAMP UG/L	XXXXX.XX	CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	CHLOROETHANE	Y
32106	CHLORFRM WHL SMPL UG/L	XXXXX.XX	CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	CHLOROFORM	Y
34418	CMETHANE WHL SAMP UG/L	XXXXX.XX	CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	CHLOROMETHANE	Y
00273	CHROMIUM CR,DISS UG/L	XXXX.XXX	CHROMIUM, DISSOLVED (UG/L AS CR)	CHROMIUM, DISS	

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00121	CHROMIUM HEX-VAL UG/L	XXXX.XXX	CHROMIUM, HEXAVALENT (UG/L AS CR)	CHROMIUM,HEX-VAL	
01220	DISS CR HEX-VAL UG/L	XXXXX.XX	CHROMIUM, HEXAVALENT, DISSOLVED (UG/L AS CR)	CR,HEX-VAL, DISS	
00274	CHROMIUM HEX-VAL UG/L	XXXX.XXX	CHROMIUM, HEXAVALENT, TOTAL (UG/L AS CR)	CHROMIUM,HEX-VAL	
00122	CHROMIUM CR,TOTAL UG/L	XXXX.XXX	CHROMIUM, TOTAL (UG/L AS CR)	CHROMIUM, TOT	
00257	CHROMIUM TRI-VAL UG/L	XXXX.XXX	CHROMIUM, TRIVALENT, TOTAL (UG/L AS CR)	CHROMIUM,TRI-VAL	
34320	CHRYSENE WHL SAMP UG/L	XXXXX.XX	CHRYSENE IN WHL WTR SAMPLE (UG/L)	CHRYSENE	Y
34704	C13DCPRO WHL SAMP UG/L	XXXXX.XX	CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	C13DICHLOROPROPE	Y
00322	COBALT CO,TOTAL MG/L	XXXX.XXX	COBALT, TOTAL (MG/L AS CO)	COBALT, TOT	
00080	COLOR PT-CO-U	XXXXXXXX	COLOR (PLATINUM-COBALT UNITS)	COLOR	
00077	COLOR APHA SU	XXXXXXXX	COLOR, APHA	COLOR, ALPHA	
00007	CMT, OTHER	N.A.	COMMENT, OTHER	CMT, OTHER	
00002	CMT,SMPL COLOR	N.A.	COMMENT, SAMPLE COLOR	CMT, SMPL COLOR	
00001	CMT,SMPL ODOR	N.A.	COMMENT, SAMPLE ODOR	CMT, SMPL ODOR	
00003	CMT,SMPL TURBID	N.A.	COMMENT, SAMPLE TURBIDITY	CMT, SMPL TURBID	
00004	CMT,WELL BROKEN	N.A.	COMMENT, WELL BROKEN	CMT, WELL BROKEN	
00006	CMT,WELL DRY	N.A.	COMMENT, WELL DRY	CMT, WELL DRY	
00005	CMT,WELL FROZEN	N.A.	COMMENT, WELL FROZEN	CMT, WELL FROZEN	

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00277	COPPER CU,DISS UG/L	XXXX.XXX	COPPER, DISSOLVED (UG/L AS CU)	COPPER, DISS	
00123	COPPER CU,TOTAL UG/L	XXXX.XXX	COPPER, TOTAL (UG/L AS CU)	COPPER, TOT	
45058	CRESOL WHL SMPL UG/L	XXXXX.XX	CRESOL IN WHOLE WATER SAMPLE (UG/L)	CRESOL (WHL SMP)	
00723	CYANIDE CN,DISS MG/L	XXXX.XXX	CYANIDE, DISSOLVED (MG/L AS CN)	CYANIDE, DISS	
00720	CYANIDE CN,TOTAL MG/L	XXXX.XXX	CYANIDE, TOTAL (MG/L AS CN)	CYANIDE, TOT	
77101	CYCHEXAM WHL SMPL MG/L	XX.XXXXX	CYCLOHEXYLAMINE, WHOLE WATER SAMPLE (MG/L)	CYCLOHEXYLAMINE	
39361	DDD FLT FRAC UG/L	XXXX.XXX	DDD IN FILT. FRAC. OF WATER SAMPLE (UG/L)	DDD, FLT FRAC	
39360	DDD WHL SAMP UG/L	XXXXX.XX	DDD IN WHL WTR SAMPLE (UG/L)	DDD	Y
39366	DDE FLT FRAC UG/L	XXXX.XXX	DDE IN FILT. FRAC. OF WATER SAMPLE (UG/L)	DDE, FLT FRAC	
39365	DDE WHL SAMP UG/L	XXXXX.XX	DDE IN WHL WTR SAMPLE (UG/L)	DDE	Y
39371	DDT FLT FRAC UG/L	XXXX.XXX	DDT IN FILT. FRAC. OF WATER SAMPLE (UG/L)	DDT, FLT FRAC	
39370	DDT WHL SAMP UG/L	XXXXX.XX	DDT IN WHL WTR SAMPLE (UG/L)	DDT	Y
72002	DEPTH TO GRD WTR FEET	XXXXX.XX	DEPTH TO GROUNDWATER (FEET BELOW WELL TOP)	DEPTH TO GRD WTR	
39110	DNBPHTHA WHL SAMP UG/L	XXXXX.XX	DI-N-BUTYL PHTHALATE IN WHL WTR SAMPLE (UG/L)	DIBUTYLPHTHALATE	Y
34596	DNOPHTHA WHL SAMP UG/L	XXXXX.XX	DI-N-OCTYL PHTHALATE IN WHL WTR SAMPLE (UG/L)	DIOCTYLPHTHALATE	Y
34428	DNPNAMIN WHL SAMP UG/L	XXXXX.XX	DI-N-PROPYLNITROSAMINE IN WHL WTR SAMPLE (UG/L)	DIPROPYLNITROSA	Y
34556	DBZ(AH)A WHL SAMP UG/L	XXXXX.XX	DIBENZ(A,H)ANTHRACENE IN WHL WTR SAMPLE (UG/L)	DIBENZ(AH)ANTHRA	Y

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73544	DBZ(AE)P WHL SAMP UG/L	XXXXX.XX	DIBENZO(A,E)PYRENE IN WHL WTR SAMPLE (UG/L)	DIBENZO(AE)PYREN	Y
73545	DBZ(AH)P WHL SAMP UG/L	XXXXX.XX	DIBENZO(A,H)PYRENE IN WHL WTR SAMPLE (UG/L)	DIBENZO(AH)PYREN	Y
73546	DBZ(AI)P WHL SAMP UG/L	XXXXX.XX	DIBENZO(A,I)PYRENE IN WHL WTR SAMPLE (UG/L)	DIBENZO(AI)PYREN	Y
81302	DBZFURAN WHL SAMP UG/L	XXXXX.XX	DIBENZOFURAN IN WHL WTR SAMPLE (UG/L)	DIBENZOFURAN	Y
32105	DBCM WHL SMPL UG/L	XXXXX.XX	DIBROMOCHLOROMETHANE IN WHL WATER SAMPLE (UG/L)	DIBROCHLMETHANE	Y
77596	DBMETHAN WHL SAMP UG/L	XXXXX.XX	DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	DIBROMOMETHANE	Y
34716	DCB WHL SMPL UG/L	XXXXX.XX	DICHLOROBENZENE IN WHL WATER SAMPLE (UG/L)	DICHLOROBENZENE	
34668	DCDFMETH WHL SAMP UG/L	XXXXX.XX	DICHLORODIFLUOROMETHANE IN WHL WTR SAMPLE (UG/L)	DICHLORODIFLUORO	Y
81575	DCIM WHL SMPL UG/L	XXXXX.XX	DICHLOROIODOMETHANE IN WHL WATER SAMPLE (UG/L)	DICHLOROIODOMETH	
34423	DCMETHAN WHL SAMP UG/L	XXXXX.XX	DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	DICHLOROMETHANE	Y
39381	DIELDRIN FLT FRAC UG/L	XXXX.XXX	DIELDRIN IN FILT. FRAC. OF WATER SAMPLE (UG/L)	DIELDRIN FLT FRC	
34336	DEPHTHAL WHL SAMP UG/L	XXXXX.XX	DIETHYL PHTHALATE IN WHL WTR SAMPLE (UG/L)	DIETHYL PHTHALAT	Y
34531	DMPHTHAL WHL SAMP UG/L	XXXXX.XX	DIMETHYL PHTHALATE IN WHL WTR SAMPLE (UG/L)	DIMETHYLPHTHALAT	Y
77579	DIPHEN WHL SAMP UG/L	XXXXX.XX	DIPHENYLAMINE IN WHL WTR SAMPLE (UG/L)	DIPHENYLAMINE	Y
00185	DO FINAL MG/L	XXXXXX.X	DISSOLVED OXYGEN, FINAL (MG/L)	DISS OXY, FINAL	
00360	DISS SOL TOTAL MG/L	XXXXX.XX	DISSOLVED SOLIDS, TOTAL (MG/L)	DISS SOLIDS, TOT	
81888	DSULFOTO WHL SAMP UG/L	XXXXX.XX	DISULFOTON IN WHL WTR SAMPLE (UG/L)	DISULFOTON	Y

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00842	GRD WTR ELEV FEET,MSL	XXXXX.XX	ELEVATION, GROUNDWATER (FEET ABOVE MSL)	GRD WATER ELEV	
00843	GRD WTR ELEV FT, SITE	XXXXX.XX	ELEVATION, GROUNDWATER (FEET, SITE DATUM)	GRD WATER ELEV	
00023	LEACHATE HEAD ELV FEET MSL	XXXXX.XX	ELEVATION, LEACHATE HEAD IN FEET ABOVE MSL	LEACHATE HD ELEV	
34361	ESULF I WHL SAMP UG/L	XXXXX.XX	ENDOSULFAN I IN WHL WTR SAMPLE (UG/L)	ENDOSULFAN I	Y
34356	ESULF II WHL SAMP UG/L	XXXXX.XX	ENDOSULFAN II IN WHL WTR SAMPLE (UG/L)	ENDOSULFAN II	Y
34366	ENDRIN A WHL SAMP UG/L	XXXXX.XX	ENDRIN ALDEHYDE IN WHL WTR SAMPLE (UG/L)	ENDRIN ALDEHYDE	Y
39391	ENDRIN FLT FRAC UG/L	XXXX.XXX	ENDRIN IN FILT. FRAC. OF WATER SAMPLE (UG/L)	ENDRIN, FLT FRAC	
39390	ENDRIN WHL SAMP UG/L	XXXXX.XX	ENDRIN IN WHL WTR SAMPLE (UG/L)	ENDRIN	Y
77007	ECYANIDE WHL SAMP UG/L	XXXXX.XX	ETHYL CYANIDE IN WHL WTR SAMPLE (UG/L)	ETHYL CYANIDE	Y
73570	EMACRYLA WHL SAMP UG/L	XXXXX.XX	ETHYL METHACRYLATE IN WHL WTR SAMPLE (UG/L)	ETHYL METHACRYLA	Y
78113	ETHYLBEN WHL SMPL UG/L	XXXXX.XX	ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ETHYLBENZENE	Y
76999	EOXIDE WHL SAMP UG/L	XXXXX.XX	ETHYLENE OXIDE IN WHL WTR SAMPLE (UG/L)	ETHYLENE OXIDE	Y
38462	FAMPHUR WHL SAMP UG/L	XXXXX.XX	FAMPHUR IN WHL WTR SAMPLE (UG/L)	FAMPHUR	Y
74055	FEC COLI GENERAL #/100ML	XXXXX.XX	FECAL COLIFORM,GENERAL (#/100ML)	FEC COLI, GEN	
74054	FECSTREP GENERAL #/100ML	XXXXX.XX	FECAL STREPTOCOCCI,GENERAL (#/100ML)	FECAL STREP, GEN	
00056	FLOW RATE GPD	XXXXXXXX	FLOW RATE (GALLONS PER DAY)	FLOW RATE	
50051	FLO RATE INST MGD	XXXX.XXX	FLOW RATE INSTANTANEOUS (MGD)	FLOW RATE INST	

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34376	FLUORANT WHL SAMP UG/L	XXXXX.XX	FLUORANTHENE IN WHL WTR SAMPLE (UG/L)	FLUORANTHENE	Y
34381	FLUORENE WHL SAMP UG/L	XXXXX.XX	FLUORENE IN WHL WTR SAMPLE (UG/L)	FLUORENE	Y
00950	FLUORIDE F,DISS MG/L	XXXXX.XX	FLUORIDE, DISSOLVED (MG/L AS F)	FLUORIDE, DISS	
00305	FLUORIDE F,TOTAL MG/L	XXXX.XXX	FLUORIDE, TOTAL (MG/L AS F)	FLUORIDE, TOT	
34488	FREON WHL SAMP UG/L	XXXXX.XX	FLUOROTRICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	FREON	Y
71880	FORMALDE HYDE MG/L	XXXXXX.X	FORMALDEHYDE (MG/L)	FORMALDEHYDE	
39340	G-BHC WHL SAMP UG/L	XXXXX.XX	GAMMA-BHC IN WHL WTR SAMPLE (UG/L)	GAMMA-BHC	Y
01501	G-ALPHA TOTAL PC/L	XXXXXXXX	GROSS ALPHA (PC/L)	GROSS ALPHA	
03501	G-BETA TOTAL PC/L	XXXXXXXX	GROSS BETA (PC/L)	GROSS BETA	
50052	GRDWTR VOL PUMP 1000GALS	XXXX.XXX	GROUNDWATER VOLUME PUMPED (1000 GALS)	GRDWTR VOL PMP	
78115	TOX HALOGEN UG/L	XXXXX.XX	HALOGEN, TOTAL ORGANIC, WHOLE WATER SAMPLE (UG/L)	HALOGEN, TOT ORG	
00066	CA HARD CACO3 MG/L	XXXXXXXX	HARDNESS, CALCIUM (MG/L AS CACO3)	CA HARD, CACO3	
00065	MG HARD CACO3 MG/L	XXXXXXXX	HARDNESS, MAGNESIUM (MG/L AS CACO3)	MG HARD, CACO3	
00900	TOT HARD CACO3 MG/L	XXXXXXXX	HARDNESS, TOTAL (MG/L AS CACO3)	TOT HARD, CACO3	
39420	HPCHLREP WHL SMPL UG/L	XXXX.XXX	HEPTACHLOR EPOXIDE IN WHOLE WATER SAMPLE (UG/L)	HPCHLR EPOXIDE	
39410	HEPTACHL WHL SAMP UG/L	XXXXX.XX	HEPTACHLOR IN WHL WTR SAMPLE (UG/L)	HEPTACHLOR	Y
39700	HCB WHL SMPL UG/L	XXXX.XXX	HEXACHLOROBENZENE IN WHOLE WATER SAMPLE (UG/L)	HCB, WHL WTR SMP	

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34391	HCBUTADI WHL SAMP UG/L	XXXXX.XX	HEXACHLOROBUTADIENE IN WHL WTR SAMPLE (UG/L)	HEXACHLOROBUTADI	Y
78022	HCCPENTA WHL SAMP UG/L	XXXXX.XX	HEXACHLOROCYCLOPENTADIENE IN WHL WTR SAMPLE (UG/L)	HCCPENTADIENE	Y
34396	HCETHANE WHL SAMP UG/L	XXXXX.XX	HEXACHLORDETHANE IN WHL WTR SAMPLE (UG/MPLE (UG/L)	HEXACHLORDETHANE	Y
73575	HCPHENE WHL SAMP UG/L	XXXXX.XX	HEXACHLOROPHENE IN WHL WTR SAMPLE (UG/L)	HEXACHLOROPHENE	Y
73576	HCPROPEN WHL SAMP UG/L	XXXXX.XX	HEXACHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	HEXACHLOROPROPEN	Y
00083	HYDRDCAR BONS-IR MG/L	XXXX.XXX	HYDROCARBONS, IN WATER,IR,CC114 EXT.CHROMAT. MG/L	HYDROCARBONS-IR	
34403	I123CDPY WHL SAMP UG/L	XXXXX.XX	INDENO(1,2,3-CD)PYRENE IN WHL WTR SAMPLE (UG/L)	INDENO(123CD)PYR	Y
77424	IMETHANE WHL SAMP UG/L	XXXXX.XX	IODOMETHANE IN WHL WTR SAMPLE (UG/L)	IODOMETHANE	Y
00249	IRON FE,DISS MG/L	XXXX.XXX	IRON, DISSOLVED (MG/L AS FE)	IRON, DISS	
01046	IRON FE,DISS MG/L	XXXX.XXX	IRON, DISSOLVED (MG/L AS FE)	IRON, DISS	
74010	IRON FE,TOTAL MG/L	XXXX.XXX	IRON, TOTAL (MG/L AS FE)	IRON, TOT	
77033	ISOBUTYL WHL SAMP UG/L	XXXXX.XX	ISOBUTYL ALCOHOL IN WHL WTR SAMPLE (UG/L)	ISOBUTYL ALCOHOL	Y
39430	ISODRIN WHL SAMP UG/L	XXXXX.XX	ISODRIN IN WHL WTR SAMPLE (UG/L)	ISODRIN	Y
34408	IPHORON WHL SAMP UG/L	XXXXX.XX	ISOPHORONE IN WHL WTR SAMPLE (UG/L)	ISOPHORONE	Y
77015	ISOPROPA MG/L	XXXXX.XX	ISOPROPANOL (MG/L)	ISOPROPANOL	Y
77223	IPPB WHL SMPL UG/L	XXXXX.XX	ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ISOPROPYLBENZENE	Y
73582	ISAFROLE WHL SAMP UG/L	XXXXX.XX	ISOSAFROLE IN WHL WTR SAMPLE (UG/L)	ISOSAFROLE	Y

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81281	KEPONE WHL SAMP UG/L	XXXXX.XX	KEPONE IN WHL WTR SAMPLE (UG/L)	KEPONE	Y
00031	LEACHATE DEPTH FEET	XXXXX.XX	LEACHATE, DEPTH IN FEET	LEACHATE DEPTH	
00032	LEACHATE VOL PUMP 1000GALS	XXXXXXXX	LEACHATE, VOLUME PUMPED (1000 GALLONS)	LEACHATE VOL PMP	
00240	LEAD PB,DISS UG/L	XXXX.XXX	LEAD, DISSOLVED (UG/L AS PB)	LEAD, DISS	
00125	LEAD PB,TOTAL UG/L	XXXX.XXX	LEAD, TOTAL (UG/L AS PB)	LEAD, TOT	
00074	LIGNIN MG/L	XXXX.XXX	LIGNIN (MG/L)	LIGNIN	
39782	LINDANE WHL SMPL UG/L	XXXX.XXX	LINDANE IN WHOLE WATER SAMPLE (UG/L)	LINDANE, WHL SMP	
01130	LITHIUM LI, DISS UG/L	XXXXXXXX	LITHIUM, DISSOLVED (UG/L AS LI)	LITHIUM, DISS	
01132	LITHIUM LI, TOT UG/L	XXXXXXXX	LITHIUM, TOTAL (UG/L AS LI)	LITHIUM, TOT	
34566	M-DCBENZ WHL SAMP UG/L	XXXXX.XX	M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	M-DICHLOROBENZEN	Y
81710	M-XYLENE TOTAL UG/L	XXXX.XXX	M-XYLENE (UG/L)	M-XYLENE	Y
00925	MAGNSIUM MG,DISS MG/L	XXXXXX.X	MAGNESIUM, DISSOLVED (MG/L AS MG)	MAGNESIUM, DISS	
00348	MAGNSIUM MG,TOTAL MG/L	XXXXX.XX	MAGNESIUM, TOTAL (MG/L AS MG)	MAGNESIUM, TOT	
73587	MALONONE WHL SAMP UG/L	XXXXX.XX	MALONONITRILE IN WHL WTR SAMPLE (UG/L)	MALONITRILE	Y
00316	MANGNESE MN,DISS UG/L	XXXX.XXX	MANGANESE, DISSOLVED (UG/L AS MN)	MANGANESE, DISS	
00253	MANGNESE MN,TOTAL UG/L	XXXX.XXX	MANGANESE, TOTAL (UG/L AS MN)	MANGANESE, TOT	
71890	MERCURY HG,DISS UG/L	XXXX.XXX	MERCURY, DISSOLVED (UG/L AS HG)	MERCURY, DISS	

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00126	MERCURY HG,TOTAL UG/L	XXXX.XXX	MERCURY, TOTAL (UG/L AS HG)	MERCURY, TOT	
81593	MANITRIL WHL SAMP UG/L	XXXXX.XX	METHACRYLONITRILE IN WHL WTR SAMPLE (UG/L)	METHACRYLONITRIL	Y
85547	METHANE GAS %	XXXXXX.X	METHANE GAS, VOLUME PERCENT OF DISSOLVED GASES (%)	METHANE	
00073	METHANOL MG/L	XXXX.XXX	METHANOL (MG/L)	METHANOL	
39480	MOCHLOR WHL SAMP UG/L	XXXXX.XX	METHOXYCHLOR IN WHL WTR SAMPLE (UG/L)	METHOXYCHLOR	Y
81597	MMACRYLA WHL SAMP UG/L	XXXXX.XX	METHYL METHACRYLATE IN WHL WTR SAMPLE (UG/L)	METHYL METHACRYL	Y
73595	MMSULFON WHL SAMP UG/L	XXXXX.XX	METHYL METHANESULFONATE IN WHL WTR SAMPLE (UG/L)	M M SULFONATE	Y
39600	MPARATHI WHL SAMP UG/L	XXXXX.XX	METHYL PARATHION IN WHL WTR SAMPLE (UG/L)	METHYL PARATHION	Y
38260	MBAS MG/L	XXXXX.XX	METHYLENE BLUE ACTIVE SUBST. (DETERGENTS, ETC.)	METH BLU ACT SUB	
81595	METHETHK WHL SMPL UG/L	XXXXX.XX	METHYLETHYLKETONE IN WHOLE WATER SAMPLE (UG/L)	METHYLETHYLKETON	Y
00127	MOLY MO,TOTAL MG/L	XXXX.XXX	MOLYBDENUM, TOTAL (MG/L AS MO)	MOLYBDENUM, TOT	
77189	N-BUTYLA WHL SAMP UG/L	XXXXX.XX	N-BUTYLACETATE IN WHL WTR SAMPLE (UG/L)	N-BUTYLACETATE	Y
78207	NNDNBAMI WHL SAMP UG/L	XXXXX.XX	N-NITROSODI-N-BUTYLAMINE IN WHL WTR SAMPLE (UG/L)	NNITROSODI-N-BUT	Y
78200	NNDEAMIN WHL SAMP UG/L	XXXXX.XX	N-NITROSODIETHYLAMINE IN WHL WTR SAMPLE (UG/L)	NNITROSODIETHYLA	Y
34438	NNDMAMIN WHL SAMP UG/L	XXXXX.XX	N-NITROSODIMETHYLAMINE IN WHL WTR SAMPLE (UG/L)	NNITROSODIMETHYL	Y
34433	NNDPAMIN WHL SAMP UG/L	XXXXX.XX	N-NITROSODIPHENYLAMINE IN WHL WTR SAMPLE (UG/L)	NNITROSODIPHENYL	Y
73613	NNMEAMIN WHL SAMP UG/L	XXXXX.XX	N-NITROSOMETHYLETHYLAMINE IN WHL WTR SAMPLE (UG/L)	NNITROSOMETHYLET	Y

CODE	PRINTOUT ABREV.	REPORTING PRECISION	D E S C R I P T I O N	TURNAROUND DOC APPEARANCE	POSSIBLE NON-DETECT
73617	NNMORPHO WHL SAMP UG/L	XXXXX.XX	N-NITROSOMORPHOLINE IN WHL WTR SAMPLE (UG/L)	NNITROSOMORPHOLI	Y
73619	NNPIPERI WHL SAMP UG/L	XXXXX.XX	N-NITROSOPIPERIDINE IN WHL WTR SAMPLE (UG/L)	NNITROSOPIPERIDI	Y
78206	NNPYRROL WHL SAMP UG/L	XXXXX.XX	N-NITROSOPYRROLIDINE IN WHL WTR SAMPLE (UG/L)	NNITROSOPYRROLID	Y
34696	NAPTHALE WHL SAMP UG/L	XXXXX.XX	NAPTHALENE IN WHL WTR SAMPLE (UG/L)	NAPTHALENE	Y
00276	NICKEL NI,DISS UG/L	XXXX.XXX	NICKEL, DISSOLVED (UG/L AS NI)	NICKEL, DISS	
00128	NICKEL NI,TOTAL UG/L	XXXX.XXX	NICKEL, TOTAL (UG/L AS NI)	NICKEL, TOT	
00618	NO3-N DISS MG/L	XXXXX.XX	NITRATE NITROGEN, DISSOLVED (MG/L AS N)	NO3-N, DISS	
00620	NO3-N TOTAL MG/L	XXXXX.XX	NITRATE NITROGEN, TOTAL (MG/L AS N)	NO3-N, TOT	
00613	NO2-N DISS MG/L	XXXX.XXX	NITRITE NITROGEN, DISSOLVED (MG/L AS N)	NO2-N, DISS	
00615	NO2-N TOTAL MG/L	XXXX.XXX	NITRITE NITROGEN, TOTAL (MG/L AS N)	NO2-N, TOT	
00631	NO2&NO3 N-DISS MG/L	XXXXXX.X	NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	NO2 & NO3,N-DISS	
00630	NO2&NO3 N-TOTAL MG/L	XXXX.XXX	NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	NO2 & NO3, N-TOT	
34447	NBENZENE WHL SAMP UG/L	XXXXX.XX	NITROBENZENE IN WHL WTR SAMPLE (UG/L)	NITROBENZENE	Y
00608	NH3-N DISS MG/L	XXXX.XXX	NITROGEN, AMMONIA, DISSOLVED (MG/L AS N)	NH3-N, DISS	
00610	NH3-N TOTAL MG/L	XXXX.XXX	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	NH3-N, TOT	
00640	INORG N N,TOTAL MG/L	XXXXX.XX	NITROGEN, INORGANIC, TOTAL (MG/L AS N)	INORG N, TOT	
00623	KJELDL N DISS MG/L	XXXX.XXX	NITROGEN, KJELDAHL, DISSOLVED (MG/L AS N)	DISS KJELDAHL N	

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00625	TOT KJEL NITROGEN MG/L	XXXXX.XX	NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	TOT KJELDAHL N	
00607	ORG N N,DISS MG/L	XXXXX.XX	NITROGEN, ORGANIC, DISSOLVED (MG/L AS N)	ORG NITROGEN,DIS	
00605	ORG N N,TOTAL MG/L	XXXXX.XX	NITROGEN, ORGANIC, TOTAL (MG/L AS N)	ORG NITROGEN,TOT	
78121	O&P XYLENE UG/L	XXXX.XXX	O&P-XYLENE (UG/L)	O&P-XYLENE	Y
77275	O-CLTOLU TOTAL UG/L	XXXXX.XX	O-CHLOROTOLUENE (UG/L)	O-CHLOROTOLUENE	Y
34536	O-DCBENZ WHL SAMP UG/L	XXXXX.XX	O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	O-DICHLOROBENZEN	Y
77135	O-XYLENE TOTAL UG/L	XXXX.XXX	O-XYLENE (UG/L)	O-XYLENE	Y
73553	OODIO2PP WHL SAMP UG/L	XXXXX.XX	O,O-DIETHYL O-2-PYRAZINYL PHOSPHOROTHIOATE WWS UG/	OODEO2PPTHIOLATE	Y
00556	OIL&GRSE FREON-GR MG/L	XXXXX.XX	OIL & GREASE (FREON EXTR-GRAV METH) TOT REC (MG/L)	OIL & GREASE	
01241	OSMIUM TOTAL UG/L	XXXXX.XX	OSMIUM, TOTAL (UG/L)	OSMIUM, TOT	
00013	OXY DEM TOTAL MG/L	XXXXXX.X	OXYGEN DEMAND, TOTAL (MG/L)	OXY DEM, TOT	
85550	OXYGEN GAS %	XXXXXX.X	OXYGEN GAS, VOLUME PERCENT OF DISSOLVED GASES (%)	OXYGEN	
73519	PBZQUINO WHL SAMP UG/L	XXXXX.XX	P-BENZOQUINONE IN WHL WTR SAMPLE (UG/L)	P-BENZOQUINONE	Y
34452	PCMC WHL SAMP UG/L	XXXXX.XX	P-CHLORO-M-CRESOL IN WHL WTR SAMPLE (UG/L)	PCMC	Y
73529	PCANILIN WHL SAMP UG/L	XXXXX.XX	P-CHLOROANILINE IN WHL WTR SAMPLE (UG/L)	P-CHLOROANILINE	Y
77277	P-CLTOLU TOTAL UG/L	XXXXX.XX	P-CHLOROTOLUENE (UG/L)	P-CHLOROTOLUENE	Y
77146	P-CRESOL WHL SAMP UG/L	XXXXX.XX	P-CRESOL IN WHL WTR SAMPLE (UG/L)	P-CRESOL	Y

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34571	P-DCBENZ WHL SAMP UG/L	XXXXX.XX	P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	P-DICHLOROBENZEN	Y
73558	PDMAABZ WHL SAMP UG/L	XXXXX.XX	P-DIMETHYLAMINOAZOBENZENE IN WHL WTR SAMPLE (UG/L)	P-DMAAB	Y
73605	PNANILIN WHL SAMP UG/L	XXXXX.XX	P-NITROANILINE IN WHL WTR SAMPLE (UG/L)	P-NITROANILINE	Y
78132	P-XYLENE TOTAL UG/L	XXXX.XXX	P-XYLENE (UG/L)	P-XYLENE	Y
39540	PARATHIO WHL SAMP UG/L	XXXXX.XX	PARATHION IN WHL WTR SAMPLE (UG/L)	PARATHION	Y
34671	PCB-1016 WHL SAMP UG/L	XXXXX.XX	PCB(AROCLOR)1016	PCB-1016	Y
39488	PCB-1221 WHL SAMP UG/L	XXXXX.XX	PCB(AROCLOR)1221	PCB-1221	Y
39492	PCB-1232 WHL SAMP UG/L	XXXXX.XX	PCB(AROCLOR)1232	PCB-1232	Y
39496	PCB-1242 WHL SAMP UG/L	XXXXX.XX	PCB(AROCLOR)1242	PCB-1242	Y
39500	PCB-1248 WHL SAMP UG/L	XXXXX.XX	PCB(AROCLOR)1248	PCB-1248	Y
39504	PCB-1254 WHL SAMP UG/L	XXXXX.XX	PCB(AROCLOR)1254	PCB-1254	Y
39508	PCB-1260 WHL SAMP UG/L	XXXXX.XX	PCB(AROCLOR)1260	PCB-1260	Y
39516	PCBS WHL SMPL MG/L	XXXX.XXX	PCBS IN WHOLE WATER SAMPLE (MG/L)	PCBS IN WHL SMPL	
77793	PCBZ WHL SAMP UG/L	XXXXX.XX	PENTACHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	PENTACHLOROBENZE	Y
81501	PCE WHL SAMP UG/L	XXXXX.XX	PENTACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	PENTACHLOROETHAN	Y
81316	PCNBZ WHL SAMP UG/L	XXXXX.XX	PENTACHLORONITROBENZENE IN WHL WTR SAMPLE (UG/L)	PENTACHLORONITRO	Y
39032	PCP WHL SMPL UG/L	XXXXX.XX	PENTACHLOROPHENOL IN WHOLE WATER SAMPLE (UG/L)	PENTACHLORPHENOL	

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00400	PH PH,FIELD SU	XXXXX.XX	PH-FIELD (STANDARD UNITS)	PH (FIELD)	
00403	PH LAB SU	XXXXX.XX	PH, LAB (STANDARD UNITS)	PH (LAB)	
73626	PHENACET WHL SAMP UG/L	XXXXX.XX	PHENACETIN IN WHL WTR SAMPLE (UG/L)	PHENACETIN	Y
34461	PHENANTH WHL SAMP UG/L	XXXXX.XX	PHENANTHRENE IN WHL WTR SAMPLE (UG/L)	PHENANTHRENE	Y
34694	PHENOL WHL SAMP UG/L	XXXXX.XX	PHENOL IN WHL WTR SAMPLE (UG/L)	PHENOL	Y
32723	PHENOLS DISS UG/L	XXXXX.XX	PHENOLICS, DISSOLVED	PHENOLICS, DISS	
00129	PHENOLS TOTAL UG/L	XXXX.XXX	PHENOLICS, TOTAL, RECOVERABLE	PHENOLICS, TOT	
00660	ORTHOPO4 PO4 MG/L	XXXXX.XX	PHOSPHATE, ORTHO (MG/L AS PO4)	PHOSPHATE, ORTHO	
00118	PHSPHATE PO4,TOT MG/L	XXXXX.XX	PHOSPHATE, TOTAL (MG/L AS PO4)	PHOSPHATE, TOT	
00133	PHOS P,TOTAL MG/L	XXXX.XXX	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, TOT	
71888	SOL PHOS T AS PO4 MG/L	XXXXX.XX	PHOSPHORUS, TOTAL SOLUBLE AS PO4 (MG/L)	P,TOT SOL AS PO4	
00935	PTSSIUM K,DISS MG/L	XXXXX.XX	POTASSIUM, DISSOLVED (MG/L AS K)	POTASSIUM, DISS	
00076	PTSSIUM K,TOTAL MG/L	XXXX.XXX	POTASSIUM, TOTAL (MG/L AS K)	POTASSIUM, TOT	
39080	PRONAMID WHL SAMP UG/L	XXXXX.XX	PRONAMIDE IN WHL WTR SAMPLE (UG/L)	PRONAMIDE	Y
77045	PYRIDINE WHL SAMP UG/L	XXXXX.XX	PYRIDINE IN WHL WTR SAMPLE (UG/L)	PYRIDINE	Y
11503	RADIUM TOTAL PC/L	XXXXXX.X	RADIUM, TOTAL (PC/L)	RADIUM, TOTAL	
00072	RESISTIV MEGAOHMS	XX.XXXXX	RESISTIVITY (STANDARD UNITS - MEGA OHMS)	RESISTIVITY	

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77164	RESOUCI WHL SAMP UG/L	XXXXX.XX	RESOUCINOL IN WHL WTR SAMPLE (UG/L)	RESOUCINOL	Y
77545	SAFROLE WHL SAMP UG/L	XXXXX.XX	SAFROLE IN WHL WTR SAMPLE (UG/L)	SAFROLE	Y
00026	SALINITY PPTH	XXXXX.XX	SALINITY (PARTS PER THOUSAND)	SALINITY	
01145	SELENIUM SE,DISS UG/L	XXXX.XXX	SELENIUM, DISSOLVED (UG/L AS SE)	SELENIUM, DISS	
00270	SELENIUM SE,TOTAL UG/L	XXXX.XXX	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, TOT	
00955	SILICA DISOLVED MG/L	XXXXXX.X	SILICA, DISSOLVED (MG/L AS SIO2)	SILICA, DISS	
00078	SILICA TOTAL MG/L	XXXXXX.X	SILICA, TOTAL (MG/L AS SIO2)	SILICA, TOT	
01140	SILICON SI,DISS UG/L	XXXXXXXX	SILICON, DISSOLVED (UG/L AS SI)	SILICON, DISS	
01075	SILVER AG,DISS UG/L	XXXXXX.X	SILVER, DISSOLVED (UG/L AS AG)	SILVER, DISS	
01077	SILVER AG,TOTAL UG/L	XXXXXX.X	SILVER, TOTAL (UG/L AS AG)	SILVER, TOT	
39760	SILVEX WHL SAMP UG/L	XXXXX.XX	SILVEX IN WHL WTR SAMPLE (UG/L)	SILVEX	Y
39055	SIMAZINE WHL SAMP UG/L	XXXXX.XX	SIMAZINE IN WHOLE WATER SAMPLE (UG/L)	SIMAZINE	Y
32017	NA CL MG/L	XXXXXX.X	SODIUM CHLORIDE (MG/L)	NACL	
00930	SODIUM NA,DISS MG/L	XXXXX.XX	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM, DISS	
00929	SODIUM NA,TOTAL MG/L	XXXXXX.X	SODIUM, TOTAL (MG/L AS NA)	SODIUM, TOT	
00247	SOLIDS TOTAL MG/L	XXXXXX.X	SOLIDS, TOTAL (MG/L)	SOLIDS, TOT	
00163	SOLIDS VOLATILE MG/L	XXXXXX.X	SOLIDS, VOLATILE (MG/L)	SOLIDS, VOLATILE	

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00402	CNDUCTVY UNCOR TE MICROMHO	XXXXXXXX	SPEC CONDUCTANCE, NON-TEMPERATURE CORR. (UMHOS/CM)	COND, UNCOR TEMP	
00872	CNDUCTVY AT 25C MICROMHO	XXXXXXXX	SPECIFIC CONDUCTANCE-FIELD (UMHOS/CM @ 25C)	COND(FIELD) @25C	
00095	CNDUCTVY @25C LAB MICROMHO	XXXXXXXX	SPECIFIC CONDUCTANCE, LAB (UMHOS/CM @ 25C)	COND (LAB) @ 25C	
00069	SPECIFIC GRAVITY SU	XXX.XXXX	SPECIFIC GRAVITY (STANDARD UNITS)	SPECIFIC GRAVITY	
00075	STRONTUM SR,TOTAL MG/L	XX.XXXXX	STRONTIUM, TOTAL (MG/L AS SR)	STRONTIUM, TOT	
77128	STYRENE WHL SAMP UG/L	XXXXX.XX	STYRENE IN WHOLE WATER SAMPLE (UG/L)	STYRENE WHL SMP	Y
00946	SULFATE SO4,DISS MG/L	XXXXX.XX	SULFATE, DISSOLVED (MG/L AS SO4)	SULFATE, DISS	
00945	SULFATE SO4,TOT MG/L	XXXXX.XX	SULFATE, TOTAL (MG/L AS SO4)	SULFATE, TOT	
00746	SULFIDE DISOLVED MG/L	XXXXX.XX	SULFIDE, DISSOLVED (MG/L AS S)	SULFIDE, DISS	
00745	SULFIDE S,TOTAL MG/L	XXXXX.XX	SULFIDE, TOTAL (MG/L AS S)	SULFIDE, TOT	
00740	SULFITE SO3 MG/L	XXXXXX.X	SULFITE (MG/L AS SO3)	SULFITE	
00134	SUSP SOL TOTAL MG/L	XXXXXX.X	SUSPENDED SOLIDS, TOTAL (MG/L)	SUSP SOLIDS, TOT	
32241	TANNIN MG/L	XXXXX.XX	TANNIN (MG/L)	TANNIN	
00068	TANNIN LIGNIN MG/L	XXXXXX.X	TANNIN AND LIGNIN, COMBINED (MG/L)	TANNIN & LIGNIN	
00010	WATER TEMP CENT	XXXXXX.X	TEMPERATURE, WATER (DEGREES CENTIGRADE)	WATER TEMP	
34475	TCTHY WHL SAMP UG/L	XXXXX.XX	TETRACHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	TETRACHLOROETHYE	Y
77871	TEDTPP WHL SAMP UG/L	XXXXX.XX	TETRAETHYLDITHIDPYROPHOSPHATE WHL WTR SAMP (UG/L)	TEDTPP	Y

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81607	THF WHL SMPL UG/L	XXXXX.XX	TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	TETRAHYDROFURAN	Y
01057	THALLIUM TL,DISS UG/L	XXXXXXXX	THALLIUM, DISSOLVED (UG/L AS TL)	THALLIUM, DISS	
00841	THALLIUM TL,TOTAL UG/L	XXXX.XXX	THALLIUM, TOTAL (UG/L AS TL)	THALLIUM, TOT	
00314	TIN SN,DISS MG/L	XXXX.XXX	TIN, DISSOLVED (MG/L AS SN)	TIN, DISS	
00180	TITANIUM TI,TOTAL MG/L	XXXXX.XX	TITANIUM, TOTAL (MG/L AS TI)	TITANIUM, TOT	
34010	TOLUENE GC-MS MG/L	XXXXX.XX	TOLUENE BY GC-MS (MG/L)	TOLUENE (GC-MS)	Y
78131	TOLUENE WHL SAMP UG/L	XXXXX.XX	TOLUENE IN WHL WTR SAMPLE (UG/L)	TOLUENE	Y
74056	TOT COLI GENERAL #/100ML	XXXXX.XX	TOTAL COLIFORM,GENERAL (#/100ML)	TOT COLI, GEN	
39400	TOXAPHEN WHL SAMP UG/L	XXXXX.XX	TOXAPHENE IN WHL WTR SAMPLE (UG/L)	TOXAPHENE	Y
34699	T13DCPRO WHL SAMP UG/L	XXXXX.XX	TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	T13DICHLOROPROPE	Y
73547	T14DCZBU WHL SAMP UG/L	XXXXX.XX	TRANS-1,4-DICHLORO-2-BUTENE IN WHL WTR SAMP (UG/L)	TRANS14DICHLORO2	Y
32104	TBM WHL SAMP UG/L	XXXXX.XX	TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	TRIBROMOMETHANE	Y
39180	TRI-TCE WHL SMPL UG/L	XXXXX.XX	TRICHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	TRICHLETHYLENE	Y
73561	TCMETHIO WHL SAMP UG/L	XXXXX.XX	TRICHLOROMETHANETHIOL IN WHL WTR SAMPLE (UG/L)	TRICMETHANETHIOL	Y
81611	TCTFE WHL SMPL UG/L	XXXXX.XX	TRICHLOROTRIFLUOROETHANE IN WHL WTR SAMPLE (UG/L)	TRICHLTRIFLUETH	Y
73655	T23DBPP WHL SAMP UG/L	XXXXX.XX	TRIS(2,3-DIBROMOPROPYL)PHOSPHATE WHL WTR SMP(UG/L)	TRIS(23DBP)PHOSP	Y
22706	URANIUM AS U3O8 TOT UG/L	XXXXX.XX	URANIUM, TOTAL (UG/L AS U3O8)	URANIUM, TOTAL	

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01087	VANADIUM V, TOT UG/L	XXXXXXXX	VANADIUM, TOTAL (UG/L AS V)	VANADIUM, TOTAL	
77057	V ACETAT WHL SAMP UG/L	XXXXX.XX	VINYL ACETATE IN WHL WTR SAMPLE (UG/L)	VINYL ACETATE	Y
39175	VIN CLD WHL SMPL UG/L	XXXXX.XX	VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	VINYL CHLORIDE	
84085	VOC SCAN	XXXXXXXX	VOLATILE ORGANIC COMPOUND SCAN	VOC SCAN	
81551	XYLENE WHL SMPL UG/L	XXXXX.XX	XYLENE IN WHOLE WATER SAMPLE (UG/L)	XYLENE (WHL SMP)	Y
00275	ZINC ZN,DISS UG/L	XXXX.XXX	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, DISS	
00131	ZINC ZN,TOTAL UG/L	XXXX.XXX	ZINC, TOTAL (UG/L AS ZN)	ZINC, TOT	
73600	1NAMINE WHL SAMP UG/L	XXXXX.XX	1-NAPTHYLAMINE IN WHL WTR SAMPLE (UG/L)	1-NAPTHYLAMINE	Y
34496	11DCETHA WHL SAMP UG/L	XXXXX.XX	1,1-DICHLOROETHANE IN WHL WTR SAMPLE (UG/L)	11DICHLOROETHANE	Y
34501	11DCETHY WHL SAMP UG/L	XXXXX.XX	1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	11DICHLOROETHYLE	Y
34506	111TCE WHL SAMP UG/L	XXXXX.XX	1,1,1-TRICHLOROETHANE IN WHL WTR SAMPLE (UG/L)	111TRICHLOROETHA	Y
77562	1112TCE WHL SAMP UG/L	XXXXX.XX	1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	1112TETRACHLOROE	Y
34511	112TCE WHL SAMP UG/L	XXXXX.XX	1,1,2-TRICHLOROETHANE IN WHL WTR SAMPLE (UG/L)	112TRICHLOROETHA	Y
34516	1122TCE WHL SAMP UG/L	XXXXX.XX	1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	1122TETRACHLOROE	Y
38437	12DB3CP WHL SAMP UG/L	XXXXX.XX	1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	DIBROMOCHLOROPRO	Y
77651	1,2-DBRE TOTAL UG/L	XXXX.XXX	1,2-DIBROMOETHANE (UG/L)	1,2-DIBROMOETHAN	Y
32103	1,2-DICH WHL SMPL UG/L	XXXXX.XX	1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	1,2-DICHLOETHANE	Y

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34546	1,2DCETH WHL SAMP UG/L	XXXXX.XX	1,2-DICHLOROETHENE IN WHL WTR SAMPLE (UG/L)	1,2DICHLORDE	Y
34541	12DCPROP WHL SAMP UG/L	XXXXX.XX	1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	12DICHLOROPROPAN	Y
34346	12DPH WHL SAMP UG/L	XXXXX.XX	1,2-DIPHENYLHYDRAZINE IN WHL WTR SAMPLE (UG/L)	12DIPHENYLHYDRA	Y
77443	123TCPRD WHL SAMP UG/L	XXXXX.XX	1,2,3-TRICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	123TRICHLOROPROP	Y
34551	124TCB WHL SAMP UG/L	XXXXX.XX	1,2,4-TRICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	124TRICHLOROBENZ	Y
77734	1245TCBZ WHL SAMP UG/L	XXXXX.XX	1,2,4,5-TETRACHLOROBENZENE IN WHL WTR SMP (UG/L)	1245TETRACHLORBE	Y
82388	14DIOXAN WHL SAMP UG/L	XXXXX.XX	1,4-DIOXANE IN WHL WTR SAMPLE (UG/L)	1,4-DIOXANE	Y
73599	14NQUINO WHL SAMP UG/L	XXXXX.XX	1,4-NAPTHOQUINONE IN WHL WTR SAMPLE (UG/L)	14NAPTHOQUINONE	Y
73501	2AAFLUOR WHL SAMP UG/L	XXXXX.XX	2-ACETYLAMINOFLUORENE IN WHL WTR SAMPLE (UG/L)	2ACETYLAMINOFLUO	Y
34576	CEV ETHE WHL SAMP UG/L	XXXXX.XX	2-CHLOROETHYLVINYL ETHER IN WHL WTR SAMPLE (UG/L)	2-CVE ETHER	Y
34581	2CNAPTHA WHL SAMP UG/L	XXXXX.XX	2-CHLORONAPTHALENE IN WHL WTR SAMPLE (UG/L)	2CHLORONAPTHALEN	Y
34586	2CPHENOL WHL SAMP UG/L	XXXXX.XX	2-CHLOROPHENOL IN WHL WTR SAMPLE (UG/L)	2-CHLOROPHENOL	Y
77103	2HANONE WHL SAMP UG/L	XXXXX.XX	2-HEXANONE IN WHL WTR SAMPLE (UG/L)	2-HEXANONE	Y
77416	2MNAPTHA WHL SAMP UG/L	XXXXX.XX	2-METHYLNAPTHALENE IN WHL WTR SAMPLE (UG/L)	2METHYLNAPTHALEN	Y
73601	2NAMINE WHL SAMP UG/L	XXXXX.XX	2-NAPTHYLAMINE IN WHL WTR SAMPLE (UG/L)	2-NAPTHYLAMINE	Y
34591	2NPHENOL WHL SAMP UG/L	XXXXX.XX	2-NITROPHENOL IN WHL WTR SAMPLE (UG/L)	2-NITROPHENOL	Y
77088	2PICOLIN WHL SAMP UG/L	XXXXX.XX	2-PICOLINE IN WHL WTR SAMPLE (UG/L)	2-PICOLINE	Y

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73638	2P1OL WHL SAMP UG/L	XXXXX.XX	2-PROPYN-1-OL IN WHL WTR SAMPLE (UG/L)	2-PROPYL-1-OL	Y
81287	DBNP WHL SAMP UG/L	XXXXX.XX	2-SEC-BUTYL-4,6-DINITROPHENOL WHL WTR SMPL (UG/L)	DBNP	Y
77770	2346TCP WHL SAMP UG/L	XXXXX.XX	2,3,4,6-TETRACHLOROPHENOL IN WHL WTR SMP (UG/L)	2346TETRACHLORPH	Y
34675	2378TCDD WHL SAMP UG/L	XXXXX.XX	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN W W S (UG/L)	2378 TCDD	Y
34601	24DCPHEN WHL SAMP UG/L	XXXXX.XX	2,4-DICHLOROPHENOL IN WHL WTR SAMPLE (UG/L)	24DICHLOROPHENOL	Y
39730	2,4-D WHL SAMP UG/L	XXXXX.XX	2,4-DICHLOROPHENOXYACETIC ACID WHL WTR SMP (UG/L)	2,4-D	Y
34606	24DMPHEN WHL SAMP UG/L	XXXXX.XX	2,4-DIMETHYLPHENOL IN WHL WTR SAMPLE (UG/L)	2,4-DIMETHYLPHEN	Y
34616	24DNPHEN WHL SAMP UG/L	XXXXX.XX	2,4-DINITROPHENOL IN WHL WTR SAMPLE (UG/L)	24DINITROPHENOL	Y
34611	24DNTOLU WHL SAMP UG/L	XXXXX.XX	2,4-DINITROTOLUENE IN WHL WTR SAMPLE (UG/L)	24DINITROTOLUENE	Y
39740	245T WHL SAMP UG/L	XXXXX.XX	2,4,5-T IN WHL WTR SAMPLE (UG/L)	2,4,5-T	Y
77687	245TCPHE WHL SAMP UG/L	XXXXX.XX	2,4,5-TRICHLOROPHENOL IN WHL WTR SAMPLE (UG/L)	245TRICHLOROPHEN	Y
34621	246TCPHE WHL SAMP UG/L	XXXXX.XX	2,4,6-TRICHLOROPHENOL IN WHL WTR SAMPLE (UG/L)	246TRICHLOROPHEN	Y
77541	26DCPHEN WHL SAMP UG/L	XXXXX.XX	2,6-DICHLOROPHENOL IN WHL WTR SAMPLE (UG/L)	26DICHLOROPHENOL	Y
34626	26DNTOLU WHL SAMP UG/L	XXXXX.XX	2,6-DINITROTOLUENE IN WHL WTR SAMPLE (UG/L)	26DINITROTOLUENE	Y
73532	3CPNITRI WHL SAMP UG/L	XXXXX.XX	3-CHLOROPROPIONITRILE IN WHL WTR SAMPLE (UG/L)	3CHLOROPROPIONIT	Y
73591	3MCANTHR WHL SAMP UG/L	XXXXX.XX	3-METHYLCHOLANTHRENE IN WHL WTR SAMPLE (UG/L)	3METHYLCHOLANTHR	Y
34631	33DCBZID WHL SAMP UG/L	XXXXX.XX	3,3'-DICHLOROBENZIDINE IN WHL WTR SAMPLE (UG/L)	33DICHLOROBENZID	Y

CODE	PRINTOUT ABREV.	REPORTING PRECISION	DESCRIPTION	TURNAROUND DOC APPEARANCE	POSSIBLE NON-DETECT
73567	33DMOBZI WHL SAMP UG/L	XXXXX.XX	3,3'-DIMETHOXYBENZIDINE IN WHL WTR SAMPLE (UG/L)	33DIMETHOXYBENZI	Y
73560	33DMBZID WHL SAMP UG/L	XXXXX.XX	3,3'-DIMETHYLBENZIDINE IN WHL WTR SAMPLE (UG/L)	3,3-DMB	Y
77581	4ABIPHEN WHL SAMP UG/L	XXXXX.XX	4-AMINOBIPHENYL IN WHL WTR SAMPLE (UG/L)	4AMINOBIPHENYL	Y
34636	4BPPETHE WHL SAMP UG/L	XXXXX.XX	4-BROMOPHENYL PHENYL ETHER IN WHL WTR SMPL (UG/L)	4BROMOPHENYL PHE	Y
34641	4CPETHER WHL SAMP UG/L	XXXXX.XX	4-CHLOROPHENYL ETHER IN WHL WTR SAMPLE (UG/L)	4-CHLOROPHENYL E	Y
78133	4M2PENON WHL SAMP UG/L	XXXXX.XX	4-METHYL-2-PENTANONE IN WHL WTR SAMPLE (UG/L)	4METHYL2PENTANON	Y
34646	4NPHENOL WHL SAMP UG/L	XXXXX.XX	4-NITROPHENOL IN WHL WTR SAMPLE (UG/L)	4-NITROPHENOL	Y
78123	44MB2CAN WHL SAMP UG/L	XXXXX.XX	4,4'-METHYLENEBIS(2-CHLOROANILINE) WHL WTR S UG/L	44METHYLENEBIS(2	Y
34657	46DNOCRE WHL SAMP UG/L	XXXXX.XX	4,6-DINITRO-O-CRESOL IN WHL WTR SAMPLE UG/L)	46DINITROOCRESOL	Y
73622	5NOTOLUI WHL SAMP UG/L	XXXXX.XX	5-NITRO-O-TOLUIDINE IN WHL WTR SAMPLE (UG/L)	5NITRO-O-TOLUIDI	Y
73559	712DMBZA WHL SAMP UG/L	XXXXX.XX	7,12-DIMETHYLBENZ(A)ANTHRACENE WHL WTR SAMP (UG/L)	7,12-DMB(A)A	Y

ATTACHMENT 4

GROUNDWATER MONITORING DATA CERTIFICATION

I hereby certify the data on the enclosed tape or diskette is accurately represented in the accompanying printout. To the best of my knowledge, the information reported and the statements made on this printout and tape or diskette are true and correct.

_____ _____

Signature Date

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D. Besadny
Secretary

BOX 7921
MADISON, WISCONSIN 53707

SEP 2 0 1988

IN REPLY REFER TO: 4430

Mr. Kip R. Whitehead, President
Oakes et-al, Management Company
2000 Oakes Road
Racine, WI 53406

SUBJECT: Plan Modification - Barrier Wall
Land Reclamation Ltd. Landfill, License #0572
Racine County, WID 076171008

Dear Mr. Whitehead:

The Bureau of Solid & Hazardous Waste Management has completed its review of a Foth and Van Dyke and Associates, Inc. (FVD) submittal entitled "Barrier Wall Design for the Hazardous Waste Unit" for the Land Reclamation Ltd. (LRL) Landfill. This submittal, which was supplemented by several addenda, was required under Section B of the conditions contained in the Department's March 31, 1988 plan modification letter.

Based upon our review, we believe that this submittal will allow for adequate separation of the solid and hazardous waste areas of the landfill provided that the conditions contained in the enclosed approval are strictly followed. This approval should be attached to the Department's December 19, 1984 plan of operation approval as well as all subsequent approvals, and the conditions of approval incorporated therein.

The Department also takes this opportunity to recount and discuss the development of what we believe is an important issue. In technical discussions during the preparation of the barrier wall submittal, the Department first expressed concern over the proposed use of the B600 trenching machine to install the drainage trench on the hazardous waste side of the barrier. We stated that our primary concerns involved the mandatory use of polyethylene piping versus stiffer PVC pipe and the severe lack of sidefill support provided a nominal 6-inch diameter pipe (6.7-inch outside diameter) in the 10-inch trench established by the machine.

The Department informed LRL and FVD that we had similar concerns at the Waste Management of Wisconsin, inc. - Metro Landfill, and that substantial work had been done both by Waste Management's consultant and the Department to investigate the problem. These materials, consisting of a December, 1987 bound report by Warzyn Engineering and a three-page February 11, 1988 Department memo commenting on the report, were provided to FVD.

In response to our concerns, FVD submitted pipe strength calculations which indicated that excessive deflection of the polyethylene piping would not occur. FVD's calculations used one of the alternative equations (Molin 1981, 1985) promoted by Warzyn Engineering instead of the Iowa Equation. Although FVD followed several recommendations contained in our February 11, 1988 memo regarding proper application of this particular equation, no discussion was provided regarding our basic concerns over the alternative equations or why the Iowa Equation was not used. Simple calculations performed by the Department using the Iowa Equation show excessive deflections even when assuming proper bedding conditions for the pipe. For these reasons, the Department recommended that LRL reconsider use of conventional trenching methods, or at least pursuing some method of creating a significantly wider trench with the machine.

In a July 22, 1988 addendum, FVD's only recommended change was reducing the particle size of the polyethylene pipe bedding from 1½ inches to a gradation having a maximum size of ½ inch. In our view, this change would only marginally improve the bedding conditions and sidefill support of the piping while at the same time, the smaller gravel can be expected to have the negative effect of reducing the permeability of the drainage trench. It is our understanding that conventional trenching methods were used in conditions at least as adverse at the Waste Management-Omega Hills landfill.

Therefore, please be advised that should the trenching machine be used for placement of the west barrier wall drainage trench, the Department may subsequently move to substantially reduce waste fill heights over this piping in order to ensure its continued performance. You should also be aware that failure of this pipe for whatever reason would then violate EPA's criteria for separation of solid and hazardous waste areas and could result in severe limitations on continued filling.

Should you have any questions regarding the contents of this letter ~~of~~ the attached approval, please contact Dennis Mack at (608) 267-9386, Ed Lynch at (608) 266-3084 or Ken Hein at (414) 562-9645.

Sincerely,

Barbara J. Zellmer, Chief
Hazardous Waste Management Section
Bureau of Solid & Hazardous Waste Management

Paul M. Huebner /for L.S.

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

BZ:LS:DM:so32
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cc: Glen Oakes - LRL
Joe Muratore - LRL
Bill Schultz/Bill Reed - LRL
Mary Carrington - Town of Mount Pleasant
Fred Larson - City of Racine
Tom Ryan/Tom Sweet - Foth and Van Dyke, Milwaukee
Al Debus/Chuck Slaustas - U.S. EPA, Region V, 5HR/13
Joe Baker/Glen Sternard - U.S. EPA, Region V, 5HR/12
Ken Hein - SED
Robert Hunter - DOJ
Bureau of Legal Council - LC/5
PSS - SW/3

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
CONDITIONAL PLAN OF OPERATION APPROVAL MODIFICATION
BARRIER WALL
LAND RECLAMATION LTD., LANDFILL (#0572)
WID 076171008

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Ltd. (LRL) owns and operates a hazardous and solid waste disposal facility located in the City of Racine, Racine County, Wisconsin.

2. The Department issued a conditional plan of operation approval for the facility on December 19, 1984 for disposal of nonhazardous solid waste.

3. On August 10, 1987, LRL submitted a Closure and Long-Term Care Plan to the Department addressing closure of the portion of the facility which had accepted hazardous waste. This plan also addressed items covered in the Department's December 19, 1984 conditional plan of operation approval.

4. In response to this submittal, the Department issued a plan modification on March 31, 1988, regarding the closure and long-term care plan and the December 19, 1984 conditional plan of operation approval. This plan modification was entitled "Modifications to the Hazardous Waste Closure and Long-Term Care Plan and Plan of Operation Approval" and included the requirement that LRL submit detailed design plans for a barrier wall separating the hazardous waste unit from future contiguous areas of nonhazardous waste disposal.

5. The information submitted in connection with the modification request, all of which was prepared by Foth and Van Dyke and Associates, Inc. includes the following:

   a. A May 31, 1988 report entitled "Barrier Wall Design for the Hazardous Waste Unit" and 27 associated plan sheets received on June 8, 1988,

   b. Additional information concerning refuse excavation dated July 21, 1988 and received on June 22, 1988, and

   c. Additional information concerning the construction of the barrier wall and drainage structure dated July 22, 1988 and August 22, 1988 and received on July 27 and August 23, 1988, respectively.

6. Additional documents considered in connection with this plan modification included the Department's March 31, 1988, approval as well as the correspondence/documents considered in its review, and subsequent plan submittals including the "Containment Structure Design for the Hazardous Waste Unit." The Department also considered recent submittals by Waste Management of Wisconsin, Inc. regarding the strength of plastic piping and numerous technical references used in review of those submittals. A number of technical references were also consulted in review of the proposed slurry wall.

CONCLUSIONS OF LAW

1. Land Reclamation, Ltd. (LRL) is an existing solid waste disposal facility as defined in ss. 144.43(5), Stats. and an existing hazardous waste facility as defined in s. 144.61(5m), Stats., and a hazardous waste landfill as defined in s. NR 181.04(55), Wis. Adm. Code.

2. Based upon the foregoing Findings of Fact, the Department has the authority pursuant to s. 144.44(3), Stats., to modify the Plan of Operation Approval for the LRL landfill.

3. The Department has the authority to determine closure, long-term care and termination standards for hazardous waste facilities pursuant to ss. 144.441 (1m) and 144.62(8)(e), Stats. These requirements are listed in ss. NR 181.4 2(8) and (9) and 181.44(12) and (14) and 181.49, and 181.52, Wis. Adm. Code.

4. The Department has the authority to issue an interim license pursuant to s. 144.64(2)(c), Stats., to a person who operates a hazardous waste facility in existence on November 19, 1980, if the person applies for a license and complies with conditions and restrictions prescribed by rule or special order by the Department pending the decision on the issuance of a final operating license. LRL's interim license application was denied by the Department on December 10, 1982. That denial required LRL to close the hazardous waste area in existence at that time. LRL has not closed the hazardous waste area.

5. LRL does not have an approved plan of operation to operate a hazardous waste disposal facility pursuant to s. 144.44(3), Stats. and s. NR 181.44(7) , Wis. Adm. Code, and consequently is a nonapproved hazardous waste disposal facility.

6. The conditions contained in the Modification to the Closure and Long-Term Care Plan and Plan of Operation Approval are needed to ensure compliance with the applicable portions of chs. NR 500 through 520 and ch. NR 181, Wis. Adm. Codes.

7. In accordance with the foregoing, the Department has authority under s. 144 .44 Stats., to issue the following conditional plan modification.

CONDITIONAL PLAN MODIFICATION

The Department hereby approves the proposed barrier wall design and authorizes LRL to begin construction of the barrier wall subject to the following conditions:

1. All construction and documentation for the west barrier wall shall be in accordance with Foth & Van Dyke's submittals detailed in Finding of Fact 5, the conditions of this plan modification and all applicable conditions contained in past approvals.

2. Should the Department determine at any time prior to the end of the site's long-term care period that problems have developed with any aspect of the construction associated with the west barrier wall project, LRL shall remediate the problems to the Department's satisfaction.

3. Within 60 days of the date of this letter, LRL shall submit a report to the Department which provides an accurate monthly summary of leachate extraction volumes and leachate quality since extraction began in corridor number 4. This report shall include, but not be limited to, the following:

   a. Identification of when each corridor began operation and explanations of any apparent anomalies in leachate quantity or quality.

   b. Identification and description of all leachate extraction points which have been used over time and for what periods they were used.

   c. Explanations of how leachate volume estimates have been obtained over time, both before and after the sewer hookup. The type and accuracy of any flow meters utilized shall be detailed. Both the manufacturers' recommended calibration procedures as well as those followed shall be fully described. In addition, the accuracy of flow estimates obtained from pump electricity usage shall be addressed, if applicable.

4. Due to odor concerns, the leachate collection pipe and gravel trench conveying leachate eastward along the northern perimeter of the old City of Racine site shall be temporarily plugged at 6+50E, as opposed to allowing it to drain into a sump. Within 30 days of the date of this letter, a proposed design for permanently connecting this line to a new manhole 1 shall be submitted for Department's review and approval. The

submittal shall clearly explain how this design relates to the revised liner and leachate collection system for corridors 11 and 12.

5. All north-south trending segments of the lower leachate line located in the saddle area as well as the existing transfer line between manholes 1 and 2 shall be removed and the removal documented in the west barrier wall construction documentation.

6. All piping entering either the recompacted clay surround of the permanent lift station or any portions of the west barrier wall shall be nonperforated. Alternative materials are not acceptable for construction of the clay surrounds of lift stations or manholes.

7. An additional manhole to be constructed and tested in the same manner as manholes 1 and 2, shall be placed at grid location 9+25N/8+00E to allow improved cleanout access to the west barrier wall leachate collection system. Each of the two cleanout risers shall be secured to the sides of the manhole and extended to its top.

8. The portion of the west barrier wall leachate collection system located east of grid line 8+00E shall be constructed with Schedule 80 or 120 PVC piping as opposed to polyethylene material.

9. Manholes 1 and 2 as well as the additional manhole required at grid location 9+25N/8+00E shall be constructed with a minimum 5-foot recompacted clay surround up to the surface of the adjacent clay liners. From that point upward, the manholes shall be surrounded with a minimum of twenty feet of soil compacted to at least 90% of standard Proctor density. A minimum of 2 density tests shall be performed on each lift of the manholes' soil surround. The results of the initial density testing shall be included in the construction documentation for the west barrier wall. As filling progresses and the 20-foot soil surround is extended vertically, the density testing results shall be included in each annual report.

10. In order to improve cleanout capabilities from new manholes 1 and 2, sweep bends shall be used to extend corridor 7 leachate piping to the manholes. The bends shall be 6-inch Schedule 80 or 120 PVC. All piping located within 50 feet of manholes 1 and 2 shall be Schedule 120 PVC.

Sch 120 for All of transfer line between MH 1 & 2

11. Within 30 days of completing construction of manhole 2, cleanout of the two corridor 7 leachate collection lines shall be attempted from manhole 2. If, in either line, the cleaning device used cannot be advanced eastward to at least grid line

19+00E, LRL shall submit a proposal for the Department's review and approval to install an additional manhole or manholes to the north of manhole 2 and nonperforated piping extended westward from grid locations 13+00N/12+90E and/or 12+20N/12+30E to the manhole(s). The Department shall be notified at least one week in advance of when this cleanout attempt will take place. Documentation of the cleanout attempt and proposal for additional manholes, if appropriate, shall be included in the construction documentation for the west barrier wall.

12. A minimum of 30 feet of recompacted clay liner shall be extended westward from manholes 1 and 2 and northward from grid location 9+25N/8+00E to manhole 1 in order to provide sufficient room to key into the liners for adjacent corridors. The location of the edge of this liner and the results of all required soil testing shall be provided in the west barrier wall construction documentation.

13. The "pump on" elevation for the submersible pump to be placed in manhole 2 shall be located below the inlet of the transfer pipe leading from manhole 1.

14. All collection and transfer piping associated with the west barrier wall and all manholes shall be bedded in gravel with a maximum particle size of one inch. The gravel bedding for all nonperforated PVC pipes shall be completely enclosed in an appropriately sized nonwoven geotextile and a minimum of five feet of recompacted clay extended vertically in all directions from the gravel bedding. This includes the leachate transfer piping between manholes 1 and 2. Within five feet of where these nonperforated lines begin and proceeding through the recompacted clay barrier wall, PVC or HDPE sheeting shall be secured around the pipe in the same manner as are anti-seep collars. The sheeting shall extend through the gravel bedding and a minimum of two feet into the recompacted clay in all directions.

15. If the B600 trenching machine is used to place the collection pipe along the western perimeter of the hazardous waste unit, the gravel bedding shall meet the specifications contained in Exhibit No. 6 of the Foth & Van Dyke's July 22, 1988 Addendum No. 1 to their May 31, 188 submittal entitled "Barrier Wall Design for the Hazardous Waste Unit." As stated in the attached cover letter, the Department strongly recommends that conventional construction techniques be used rather than a trenching machine.

16. Leachate extraction shall continue as normal during the reconstruction of manholes 1 and 2.

17. Construction of the slurry wall and entire collection system associated with the west barrier wall proposal shall be completed by October 31, 1988. Construction documentation for this work shall be submitted no later than January 1, 1989. Construction of the barrier wall along the western perimeter of the hazardous waste unit shall occur incrementally as filling against the HWU progresses. Unless otherwise approved by the Department, the barrier wall shall be completed in three increments with construction documentation being submitted within 60 days of completing each increment.

18. Rather than using the program outlined in Appendix M of Foth & Van Dyke's May 31, 1988 report "Barrier Wall Design for the Hazardous Waste Unit," all clay placed during construction of the west barrier wall shall be tested in accordance with ch. NR 516.05(1)(a) through (c), Wis. Adm. Code. In addition, a minimum of 5 density tests shall be performed at various levels within the recompacted clay surround of each leachate transfer pipe, for every 100 linear feet of the transfer line running between manholes 1 and 2.

19. In addition to the periodic performance of sand cone density tests, each nuclear density meter used for the project shall be calibrated daily as per the manufacturer's recommended procedures. The results of each calibration shall be included in the required construction documentation.

20. During construction of the slurry wall, unit 3 soil samples shall be obtained every 100 linear feet and analyzed for grain size to the #200 sieve and Atterberg limits. The results of this testing shall be included in the west barrier wall construction documentation.

21. Clarifying item 2 under section J of our March 31, 1988 approval (see page 36), the Department requires the following:

    a. Grain size analyses to the #200 sieve shall be performed at a rate of once every 1,000 cubic yards on the sand drainage blanket to be placed on both sides of the barrier wall and once every 400 linear feet on the bedding material utilized for all leachate collection and transfer piping associated with the west barrier wall and the containment structure.

    b. Remolded laboratory hydraulic conductivity tests shall be performed at a rate of one for every 2,500 cubic yards of sand drainage blanket.

22. All leachate collection and transfer piping constructed as part of the west barrier wall, including manholes 1 and 2, shall be ~~cleaned out~~ CLEANED OUT (jetted) immediately after installation and annually thereafter along with all other previously installed

lines. Documentation of the initial cleanout, consisting of a narrative describing the procedure and any problems encountered, as well as plan sheets and photographs, shall be submitted as part of the west barrier wall construction documentation. Also included shall be a listing of each time the collection system has been cleaned, which lines were cleaned each time, the distance the cleaning equipment penetrated from each cleanout point, and the dates of documentation submitted to the Department.

23. Within 30 days of the date of this letter, LRL shall submit for the Department's review and approval proposed pressure testing methods and procedures for each of three segments of leachate transfer piping. These segments are:

    a. The new gravity line to be located between manholes 1 and 2.

    b. The 4-inch force main extending from manhole 2 to manhole 7 as identified in the set of seven plan sheets submitted by Nielsen, Madsen and Barber entitled "Proposed Sanitary Sewer for Land Reclamation, Ltd." which were revised several times, and were ultimately received by the Department on July 25, 1988.

    c. The 8-inch gravity sewer extending from manhole 7 to Oakes Road also as identified in the NMB plans received on July 25, 1988.

    The methods proposed shall be in accordance with accepted practices for sanitary sewers and force mains, and all references utilized in developing the methods shall be identified. In particular, the pressure drop or level of leakage which would constitute failure shall be clearly specified and justification given for this standard. Unless otherwise determined by the Department, the results from the pressure testing shall be submitted with the construction documentation for the west barrier wall.

24. All bentonite/water slurry utilized shall be made from the City of Racine public water supply and Slurry Ben 90 or Fed-Jel bentonite. The prepared weight of the bentonite/water supply shall be 64 pounds per cubic foot or greater. The Marsh funnel viscosity shall be 40 seconds or greater, and the filtrate loss as measured in an API filter press cell shall be no more than 30 cc in 30 minutes at 100 psi. When placed in the trench, the bentonite/water slurry shall have a unit weight at least 15 pounds per cubic foot less than that of the soil/bentonite slurry wall backfill mix.

25. The fluid level in the slurry wall trench shall be maintained a minimum of two feet above the surrounding groundwater level at all times.

26. As previously required in condition C.2.g. of the Department's March 31, 1988 approval, the base of the slurry wall shall extend a minimum of three feet into unit 3 soils or three feet below the base of the adjacent drainage trench, whichever is lower. The upper surface of the soil/bentonite slurry wall shall be keyed into the recompacted clay barrier wall as shown in detail 3/26 on sheet B-26 of the "Barrier Wall Design" plan sheets dated May 31, 1988. The minimum trench width shall be 30 inches.

27. Due to technical concerns regarding the geologic variability of unit 2 and its undocumented level of contamination, as well as regulatory concerns regarding separation of solid and hazardous waste areas, unit 2 soils shall not be used in construction of the soil/bentonite slurry wall. Unless tested and handled in accordance with the Department's August 18, 1988 letter, all unit 2 soils excavated shall be placed in the hazardous waste unit.

28. All soils used in construction of the soil/bentonite slurry wall shall be obtained from uncontaminated portions of units 1 or 3, shall have a minimum P200 content of 50% by weight and shall be classified as a CL or CH under the unified soil classification system.

29. All portions of the soil/bentonite backfill mixture shall have a minimum unit weight of 100 pounds per cubic foot, a slump ranging from 2 to 6 inches, and a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec.

30. As required by condition A.5. of the Department's March 31, 1988 approval, Foth & Van Dyke shall provide a full-time inspector to observe Geo•Con's work, perform on-site quality control testing and collect samples for subsequent laboratory testing. This person shall have technical expertise and work experience in slurry wall construction.

31. At a minimum, Geo•Con shall perform the materials quality control program outlined in Figure No. 4-2 of Appendix H of Foth & Van Dyke's May 1988 reported entitled "Barrier Wall Design for the Hazardous Waste Unit," and turn this data over to the on-site inspector each day.

32. The following slurry wall control program shall be performed by Foth & Van Dyke for the west barrier wall project:

a. Water used for slurry production shall be sampled twice per month or a minimum of four times during the project for pH, conductivity and total hardness.

b. Bentonite samples shall be analyzed for grain size and Atterberg limits at least twice per month, or a minimum of four times during the project.

c. Backfill soils shall be visually inspected on a continuous basis and samples obtained and tested for grain size and Atterberg limits once for every 100 feet of trench.

d. Bentonite/water slurry samples as prepared for placement in the trench shall be tested twice daily (once in the morning and once in the afternoon) for unit weight using a mud balance and viscocity using the Marsh funnel test. Filtrate loss shall be determined daily using an API filter press cell.

f. Soil/bentonite mixture samples shall be obtained from the trench:

   i. During each of the first three days of backfilling and at least once every 100 feet of trench thereafter, and tested for hydraulic conductivity using a flexible wall permeameter and grain size to 5 microns.

   ii. At least twice daily and tested for slump and unit weight.

33. At maximum 20-foot intervals, Foth & Van Dyke's inspector shall determine both the elevation of the top of unit 3 and the bottom of the key penetration using a rigid probe calibrated in foot increments. Each depth measurement shall be referenced to pre-established stations along the wall alignment.

34. As backfilling is occurring, Foth & Van Dyke's inspector shall also regularly use the previously mentioned rigid probe to ensure that the key is free of sediment. Any sediment encountered shall be removed prior to backfilling. The inspector shall also probe the excavated trench at the beginning an end of each day of operation to determine if any sidewall sloughing has occurred. Any soils which have sloughed shall be removed and the trench bottom redocumented.

35. Both Geo•Con and Foth & Van Dyke shall certify in the west barrier wall construction and documentation that construction of the slurry wall was completed in compliance with the proposed plans and all Department conditions, with all exceptions noted. Foth & Van Dyke shall also provide similar certification for all other construction associated with the west barrier wall project.

36. The Department's solid waste investigator shall be contacted a minimum of one week prior to beginning each of the construction event listed below for the purpose of allowing the Department to inspect the work. A fee shall be paid to the Department for each required inspection in accordance with s. NR 520.04(5), Wis. Adm. Code. The inspection fees for construction shall be paid at the time the construction documentation is submitted.

    Construction Events:

    a. Construction of manholes 1, 2 and the additional manhole required at 9+25N/8+00E.

    b. Lift station construction.

    c. Leachate lines associated with slurry wall construction.

    d. Slurry wall construction.

    e. Keying of the clay barrier wall into the slurry wall and adjacent liner segments.

The Department retains the right to require the submittal of additional information or to modify this conditional plan modification at any time if, in the Department's opinion, further modifications are necessary. The conditions of this approval modification do not supercede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Barbara J. Zellmer, Chief
Hazardous Waste Management Section
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

Paul M. Huebner /for L.S.
Lakshmi Sridharan, Ph.D, P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

BJZ:LS:so32
8809\SW9Barr.EKL

Dennis M.

State of Wisconsin \ **DEPARTMENT OF NATURAL RESOURCES**

Carroll D. Besadny
Secretary

Box 7921
Madison, Wisconsin 53707

December 14, 1988 IN REPLY REFER TO: 4430

Mr. Kip R. Whitehead, President
Oakes et-al. Management Company
2000 Oakes Road
Racine, WI 53406

SUBJECT: Plan Modification - Containment Structure
Land Reclamation, Ltd. Landfill, License #0572
Racine County, WID 076171008

Dear Mr. Whitehead:

The Bureau of Solid and Hazardous Waste Management has completed its review of a Foth and Van Dyke and Associates, Inc. (FVD) submittal entitled "Containment Structure Design for the Hazardous Waste Unit." This submittal, which was supplemented by several addenda, was required under Section C of the conditions contained in the Department's March 31, 1988 plan modification letter.

Provided that the conditions contained in the enclosed approval are strictly followed, we believe that implementation of thia proposal will significantly reduce leachate and gas migration within unit 2 along the south and west perimeters of the landfill. This approval should be attached to the Department's December 19, 1984 plan of operation approval as well as all subsequent approvals, and the conditions of approval incorporated therein.

Should you have any questions regarding the contents of this letter, please contact Dennis Mack at (608) 267-9386 or Ken Hein at (414) 562-9645.

Sincerely,

Barbara J. Zeltmer, Chief
Hazardous Waste Management Section
Bureau of Solid & Hazardous Waste Management

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

LS:BJZ:mf
31\8812\sw9whd.dpm
cc: Glenn Oakes- LRL
Ed Perrey - LRL
Joe Muratore - LRL
Fred Larson - City of Racine
Tom Ryan/Tom Sweet - FVD - Milwaukee
Mary Carrington - Town of Mount Pleasant
Joe Baker/Glenn Sternard- US EPA, Region V, 5HR/12
Al Debus/Chuck Slaustas - US EPA. Region V. 5HR/13
Ken Hein - SED
Robert Hunter - DOJ
Bureau of Legal Council - LC/5
PSS - SW/3
Ed Lynch - SW/3

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
CONDITIONAL PLAN OF OPERATION APPROVAL MODIFICATION
CONTAINMENT STRUCTURE
LAND RECLAMATION LTD., LANDFILL (#0572)
WID 076171008

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Ltd. (LRL) owns and operates a hazardous and solid waste disposal facility located in the City of Racine, Racine County, Wisconsin.

2. The Department issued a conditional plan of operation approval for the facility on December 19, 1984 for disposal of nonhazardous solid waste.

3. On August 10, 1987, LRL submitted a Closure and Long-Term Care PLan to the Department addressing closure of the portion of the facility which had accepted hazardous waste. This plan also addressed items covered in the Department's December 19, 1984 condition plan of operation approval.

4. In response to LRL's August 10, 1987 submittal, the Department issued a plan modification on March 31, 1988, regarding the closure and long-term care plan and the December 19, 1984 conditional plan of operation approval. This plan modification, which was entitled "Modifications to the Hazardous Waste Closure and Long-Term Care Plan and Plan of Operation Approval", included a condition that LRL submit detailed plans for the containment structure originally required in our December 19, 1984 plan of operation approval.

5. The Foth and Van Dyke and Associates, Inc. (FVD) submittals comprising the modification request include the following:

   a. A June 28, 1988 report titled "Containment Structure Design for the Hazardous Waste Unit" and a set of 12 associated plan sheets dated June 30, 1988 and titled "Croundwater Containment Structure." The report was received by the Department on July 1, 1988 and the plan sheets on June 30, 1988.

   b. A July 21, 1988 letter received on July 22, 1988 requesting approval to excavate soils in the area of the Containment Structure and then place the two-foot thick recompacted clay working surface.

   c. An August 12, 1988 letter and revised plan sheets A-3 and A-4 relating to the plan sheets described in a. above.

6. Additional documents considered in connection with this plan modification include the Department's March 31, 1988 approval as well as both the correspondence and documents considered in its review and subsequent submittals required as a result of it.

7. The correct plan review fee of $1,500 has been applied against the $4,500 refund requested by LRL after withdrawing their proposed feasibility study.

CONCLUSIONS OF LAW

1. Land Reclamation, Ltd. (LRL) is an existing solid waste disposal facility as defined in ss. 144.43(5), Stats. and an existing hazardous waste facility as defined in s. 144.61(5m), Stats., and a hazardous waste landfill as defined in s. NR 181.04(55), Wis. Adm. Code.

2. Based upon the foregoing Findings of Fact, the Department has the authority pursuant to s. 144.44, Stats., to modify the Plan of Operation Approval for the LRL landfill.

3. The Department has the authority to determine closure, long-term care and termination standards for hazardous waste facilities pursuant to ss. 144.441 (1m) and 144.62(8)(e), Stats. These requirements are listed in ss. NR 181.4 2(8) and (9) and 181.44(12) and (14) and 181.49, and 181.52, Wis. Adm. Code.

4. The Department has the authority to issue an interim license pursuant to s. 144.64(2)(c), Stats., to a person who operates a hazardous waste facility in existence on November 19, 1980, if the person applies for a license and complies with conditions and restrictions prescribed by rule or special order by the Department pending the decision on the issuance of a final operating license. LRL's interim license application was denied by the Department on December 10, 1982. That denial required LRL to close the hazardous waste area in existence at that time. LRL has not closed the hazardous waste area.

5. LRL does not have an approved plan of operation to operate a hazardous waste disposal facility pursuant to s. 144.44(3), Stats. and s. NR 181.44(7) , Wis. Adm. Code, and consequently is a nonapproved hazardous waste disposal facility.

6. The conditions contained in the Modification to the Closure and Long-Term Care Plan and Plan of Operation Approval are needed to ensure compliance with the applicable portions of chs. NR 500 through 520 and ch. NR 181, Wis. Adm. Codes.

7. In accordance with the foregoing, the Department has authority under s. 144.44 Stats., to issue the following conditional plan modification.

Conditional Plan Modification

The Department hereby approves the proposed containment structure subject to the following conditions:

1. All construction and documentation for the containment structure shall be in accordance with Foth and Van Dyke's submittals detailed in Finding of Fact 5, the conditions of this plan modification and all applicable conditions contained in past approvals.

2. Should the Department determine at any time prior to the end of the site's long-term care period that problems have developed with any aspect of the containment structure, LRL shall remediate the problems to the Department's satisfaction.

3. Within 30 days of the date of this approval, LRL shall submit plans showing the proposed connection of each lift station associated with the containment structure to the sewer just south of the landfill. These connections shall not be constructed until Department approval has been obtained.

4/13/89

4. Within 120 days of the date of this approval, LRL shall submit a report assessing the integrity of the sewer segments currently utilized or proposed to be utilized by the landfill from each point of leachate entry to the wastewater treatment facility. This assessment shall include:

   a. A description of the location, type, size and condition of each segment of sewer;

   b. A summary of sewage flow rates in the various sewer segments and any available infiltration/inflow data; and

   c. A conclusion based upon the information required above, and any other information believed to be relevant, regarding the possibility and likelihood of leachate leakage from any portion of the sewer system causing groundwater impacts. We strongly recommend that the report provide documentation that the City of Racine's Public Works Director concurs with or at least has noted the conclusion drawn.

   Should the Department determine that continued sewering of leachate poses an unacceptable risk to groundwater quality, LRL shall provide alternate means of leachate handling acceptable to the Department.

5. As opposed to the design contained in the submitted plans, the western segment of the containment structure, from grid line 2+80N southward, shall be lowered such that the invert elevation of the leachate collection pipe at manhole 5 is 645 feet (MSL). The elevations of the manhole sump, slurry wall and recompacted clay manhole surround shall also be lowered accordingly so that the design guidance given in Section C of the Department's March 31, 1988 approval is satisfied.

6. As required in our September 20, 1988 approval of the barrier wall, all piping entering the recompacted clay surround of the permanent lift station (designated as manhole 6) shall be nonperforated. Alternative materials are not acceptable for construction of the clay surround of the lift station.

I phoned Tom Ryan of F+VD on 3/6/89 + told him that NO clay encapsulation needed for manholes 7 + 9, but the remainder had to have it.

7. A minimum of five feet of clay compacted to at least 90% modified Proctor density shall be placed below and around each of the six manholes associated with the containment structure. The clay shall be extended vertically to at least five feet above the highest pipe entrance. A minimum of two density tests shall be performed on each lift of the manholes' soil surround.

8. The pump activation controls for the submersible pumps in each of the three lift stations shall be located below the level of the pipes entering them.

9. Within 30 days of the date of this letter, LRL shall submit a report to the Department for our review and approval evaluating the potential for the granular backfill of the proposed containment structure leachate collection system to become clogged by the inflow of finer grained adjacent soils. The potential benefits of using a much smaller sized backfill gradation shall also be addressed.

   In addition, the report shall indicate whether or not the polyethylene pipe to be used will include a geotextile fabric "sock" and shall provide justification for the choice made. Finally, the report shall include detaila of any proposed changes to the collection system design resulting from this investigation. Construction of the collection system shall not begin until written Department approval of this report is obtained.

10. Appropriately sized geotextile shall be placed over the top of all portions of the leachate collection trench associated with both the containment structure and the west barrier wall.

11. All clay placed during construction of the containment structure shall be tested in accordance with ch. NR 516.05(1)(a) through (c) Wis. Adm. Code. Lift heights shall not exceed six inches after compaction, and density testing shall be performed every 100 linear feet on each lift.

12. The clean soil backfill required in the construction excavation shall be placed in maximum six-inch lift heights to a density of at least 90% modified proctor. Density testing shall be performed every 100 linear feet on each lift, and modified Proctor curves developed for each 5,000 cubic yards of soil placed.

13. In addition to the periodic performance of sand cone density tests, each nuclear density meter used for the project shall be calibrated daily as per the manufacturer's recommended procedures. The results of each calibration shall be included in the required construction documentation.

14. During construction of the slurry wall, unit 3 soil samples shall be obtained every 100 linear feet and analyzed for grain size to the #200 sieve and Atterberg limits. The results of this testing shall be included in the containment structure construction documentation.

15. Grain size analyses to the #200 sieve shall be performed at least once every 400 linear feet on the gravel bedding utilized for all leachate collection and transfer piping associated with the containment structure.

16. All leachate collection and transfer piping constructed as part of the containment structure shall be cleaned immediately after installation and annually thereafter along with all previously installed lines. All cleaning shall be done with a hydraulic jet type device. Documentation of the initial cleanout, consisting of a narrative describing the procedure and any problems encountered, as well as plan sheets and photographs, shall be submitted as part of the containment structure construction documentation.

17. All bentonite/water slurry utilized shall be made from the City of Racine public water supply and Slurry Ben 90 or Fed-Jel bentonite. The prepared weight of the bentonite/water supply shall be 64 pounds per cubic foot or greater. The Marsh funnel viscosity shall be 40 seconds or greater, and the filtrate loss as measured in an API filter press cell shall be no more than 30 cc in 30 minutes at 100 psi. When placed in the trench, the bentonite/water slurry shall have a unit weight at least 15 pounds per cubic foot less than that of the soil/bentonite slurry wall backfill mix.

18. The fluid level in the slurry wall trench ahall be maintained a minimum of two feet above the surrounding groundwater level at all times.

19. As previously required in condition C.2.g. of the Department's March 31, 1988 approval, the base of the slurry wall shall extend a minimum of three feet into unit 3 soils or three feet below the base of the adjacent drainage trench, whichever is lower. The minimum trench width shall be 30 inches.

20. Due to technical concerns regarding the geologic variability of unit 2 and its undocumented level of contamination, as well as regulatory concerns regarding separation of solid and hazardous waste areas, unit 2 soils shall not be used in construction of the soil/bentonite slurry wall. Unless tested and handled in accordance with the Department's August 18, 1988 letter, all unit 2 soils excavated shall be placed in the hazardous waste unit. Any waste encountered along the south or west perimeter of the old City of Racine landfill shall be removed and placed in Corridor 7.

21. All soils used in construction of the soil/bentonite slurry wall shall be obtained from uncontaminated portions of units 1 or 3, shall have a minimum P200 content of 50% by weight and shall be classified as a CL or CH under the Unified Soil Classification System.

22. All portions of the soil/bentonite backfill mixture shall have a minimum unit weight of 100 pounds per cubic foot, a slump ranging from 2 to 6 inches, and a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec.

23. As required by condition A.5. of the Department's March 31, 1988 approval, Foth & Van Dyke shall provide a full-time inspector to observe Geo•Con's

work, perform on-site quality control testing and collect samples for subsequent laboratory testing. This person shall have technical expertise and work experience in slurry wall construction.

24. At a minimum, Geo•Con shall perform the materials quality control program outlined in Figure No. 4-2 of Appendix H of Foth & Van Dyke's May 1988 reported entitled "Containment Structure Design for the Hazardous Waste Unit," and turn this data over to the on-site inspector each day.

25. The following slurry wall control program shall be performed by Foth & Van Dyke for the containment structure project:

    a. Water used for slurry production shall be sampled twice per month or a minimum of four times during the project for pH, conductivity and total hardness.

    b. Bentonite samples shall be analyzed for grain size and Atterberg limits at least twice per month, or a minimum of four times during the project.

    c. Backfill soils shall be visually inspected on a continuous basis and samples obtained and tested for grain size and Atterberg limits once for every 100 feet of trench.

    d. Bentonite/water slurry samples as prepared for placement in the trench shall be tested twice daily (once in the morning and once in the afternoon) for unit weight using a mud balance and viscosity using the Marsh funnel test. Filtrate loss shall be determined daily using an API filter press cell.

    f. Soil bentonite mixture samples shall be obtained from the trench:

        i. During each of the first three days of backfilling and at least once every 100 feet of trench thereafter, and tested for hydraulic conductivity using a flexible wall permeameter and grain size to 5 microns.

        ii. At least twice daily and tested for slump and unit weight.

26. Both Geo•Con and Foth & Van Dyke shall certify in the containment structure construction documentation that construction of the slurry wall was completed in compliance with the proposed plans and all Department conditions, with any exceptions noted. Foth & Van Dyke shall also provide similar certification for all other construction associated with the containment structure project.

27. The Department's Southeast District solid waste investigator and Central Office engineer shall be contacted a minimum of one week prior to beginning each of the construction events listed below for the purpose of allowing the Department to inspect the work. A fee shall be paid to the Department for each required inspection in accordance with s. NR 520.04(5), Wis. Adm.

Code. The inspection fees for construction shall be paid at the time the construction documentation is submitted.

Construction Events:

a. Construction of manhole 6.

b. Installation of the leachate collection trench associated with the containment structure.

c. Slurry wall installation.

The Department retains the right to require the submittal of additional information or to modify this conditional plan modification at any time if, in the Department's opinion, further modifications are necessary. The conditions of this approval modification do not supercede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Barbara J. Zellmer, Chief
Hazardous Waste Management Section
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

Lakshmi Sridharan, Ph.D, P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

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State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES
Carroll D. Besadny
Secretary

Box 7921
Madison, Wisconsin 53707

NOV 17 1989

IN REPLY REFER TO 4410-2

Mr. Phillip Cali
Land Reclamation Company
2000 Oakes Road
Racine, WI 53406

SUBJECT: Construction Documentation Approval for the Hazardous Waste Unit North Barrier Wall and the East and North Sidewalls of Corridor No. 7 - Land Reclamation, Ltd., License No. 0572, Racine County, WI.

Dear Mr. Cali:

I am pleased to inform you that the construction documentation submitted for the hazardous waste north barrier wall and the east and north sidewalls of Corridor 7 at your disposal facility has been formally approved. Although a verbal approval has been given and waste filling has taken place, this letter serves to formally approve the submittal. This approval should be attached directly to the plan of operation approval issued on December 19, 1984.

The required sand blanket was not placed on the hazardous waste side of the hazardous waste north barrier wall. To compensate this, seven gas and leachate wells were installed in the bench of phase I of the hazardous waste unit north barrier wall. These wells will compensate for the sand blanket by venting the gas and creating a permeable conduit for the leachate to reach the leachate collection lines.

The clay for the north and east sidewalls was placed and compacted in 12 inch lifts instead of the required 6 inch lifts. Also, about seven percent of the samples tested failed to meet the specified liquid limit of 30% and ten percent of the samples did not meet the required plasticity index of 15%. However, the compaction and permeability test results were more than adequate, and therefore we are approving the clay and clay placement.

Please call Ken Hein at (414)562-9645 or Cindy Cook at (608)267-3542 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid and Hazardous Waste Management

cc: Ken Hein - SED
Mary Carrington - Town of Mt. Pleasant
Fred Larson - City of Racine
Chuck Slaustas/Al Debus - U.S. EPA, Region V, 5Hs/12
Laura Ladisio - U.S. EPA, Region V, 5HE/12
Solid Waste Management Section - SW/3
Hazardous Waste Management Section - SW/3
Glenn Oakes - LRC
Joe Muratore - LRC, Attorney
Tom Ryan/Tom Sweet - Foth & Van Dyke
Ted Juszczyk - Creative Resource Ventures
Tom Just
PSS - SW/3

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL CONSTRUCTION DOCUMENTATION

APPROVAL FOR THE
LAND RECLAMATION, LTD. LANDFILL, # 0572

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the facility was known as Land Reclamation, Ltd. (LRL).

2. A conditional plan of operation approval was issued by the Department for the facility on December 19, 1984.

3. Foth & Van Dyke and Associates, Inc. (FVD), on behalf of LRL, submitted construction documentation required by condition 60 of the plan of operation approval.

4. The information submitted as construction documentation includes the following:

   a. A report submitted to the Department by FVD, on behalf of LRL, entitled, "Construction Observation Report for the Land Reclamation, Ltd. Landfill, Corridor No. 7." The report was received by the Department on December 16, 1986. Appropriate plan review fees have been submitted.

   b. A report submitted to the Department by FVD, on behalf of LRL, entitled, "Construction Observation Report for the Land Reclamation, Ltd. Landfill, Corridor No. 7, Addendum No. 1." The report was received by the Department on February 5, 1987.

   c. A report submitted to the Department by FVD, on behalf of LRL, entitled, "Construction Observation Report for Phase II Construction of the North Barrier Wall at the Land Reclamation, Ltd. Landfill." The report was received by the Department on December 10, 1987.

   d. A report submitted to the Department by FVD, on behalf of LRL, entitled, "Construction Observation Report for Phase III of the North Barrier Wall - Land Reclamation, Ltd." The report was received by the Department on August 4, 1988.

   e. A report submitted to the Department by FVD, on behalf of LRL, entitled, "Construction Observation Report - Phase II Construction of the Corridor No. 7 - East and North Sidewall at

the Land Reclamation, Ltd. Landfill." The submittal was dated March 7, 1988.

5. Additional documents considered in connection with the review of the construction documentation include the following:

   a. The EPA's letter to the Department dated November 13, 1986, which outlines the requirements for a hydraulic barrier.

   b. The Department's February 13, 1987 letter to deny the construction documentation for Corridor 7.

   c. The Department's June 15, 1987 approval to initiate filling in Corridor 7.

   d. A letter dated September 13, 1989, sent to the Department by Creative Resource Ventures, Ltd. proposing a new design for the north sidewall.

   e. Other Departmental correspondence.

6. The conditions set forth below are needed to assure that the environment is adequately protected.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(4)(b), Stats. and NR 516, Wis. Adm. Code to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

2. If the conditions of approval set forth below are complied with the applicant will have demonstrated that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

CONDITIONAL CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the proposed construction documentation for the Land Reclamation Company Landfill, subject to the following condition:

1. Within 90 days of the date of this letter, a written explanation shall be submitted to the Department as to the condition of the two extended leachate head wells in Corridor 7.

2. The two Corridor 7 cleanouts and the Corridor 6 cleanout surface anchors shall be reconstructed so they comply with the Department's December 19, 1984 plan of operation approval. A report shall be submitted to the Department within 90 days of the date of this letter documenting the reconstruction of the cleanouts.

3. The clay liner shall meet the required clay specifications and be properly documented prior to splicing the existing clay liner with the clay liner sidewall. This keying of the liner and sidewall shall be specifically addressed in all subsequent construction documentation.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: NOV 17 1989

DEPARTMENT OF NATURAL RESDURCES
For the Secretary

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

Cindy M. Cook

Cindy M. Cook, Environmental Engineer
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

Ken Wade

Ken Wade, Hydrogeologist
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

WISCONSIN
DEPT. OF NATURAL RESOURCES

Carroll D. Besadny
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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File Ref: FID #252076990
Racine Co.
SW
Approvals

JUL 2 9 1991

Mr. Rick Jernigan, Operations Manager
Land Reclamation Company
2000 Oakes Road
Racine, WI 53406

SUBJECT: Facility Post-Construction Documentation Approval, East Slope Final Clay Cover, Land Reclamation Landfill, #0572, Racine County, WI.

Dear Mr. Jernigan:

I am pleased to inform you that your Facility Post-Construction Documentation has been approved for the clay final cover of the east slope of your disposal facility. You should attach this approval directly to the plan of operation approval issued by the Department on December 19, 1984.

Construction of the final clay cap for the Land Reclamation Company Landfill (LRC) had been completed in July, 1985, but was not properly documented at that time. Post-construction documentation was performed during the last half of 1990, and the results submitted to the Department in a report from Warzyn, Inc. dated April, 1991.

This letter approves the construction of the clay portion of the final cover system of the east slope of your facility between Grid Line 26+00E and 26+80E with the northerly and southerly limits as shown in the submitted drawings, which is approximately between Grid Line 5+00N and 10+00N. Portions of the four foot clay cover material west of Grid Line 26+00E and east of line 26+80E will be reconstructed during the 1991 construction activities to correct deficiencies found in these areas.

Mr. Jernigan

Please call Ken Hein at (414)562-9645 or Cindy Cook at (608)267-3542 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

cc: Ken Hein - SED
Mary Carrington - Town of Mount Pleasant
Fred Larson - City of Racine
Chuck Slaustas/Al Debus - U.S. EPA, Region V, 5HE/12
Ed Lynch - HW/3
Meshkat Assian - Warzyn Engineering, Inc. (Chicago office)
Todd Watermolen - Creative Resource Ventures
PSS -SW/3

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION
APPROVAL FOR THE
LAND RECLAMATION COMPANY LANDFILL, # 0572

FINOINGS OF FACT

The Oepartment finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the facility was known as Land Reclamation, Ltd. (LRL).

2. A conditional plan of operation approval was issued by the Department for the facility on December 19, 1984.

3. Warzyn Engineering, Inc., on behalf of LRC, submitted construction documentation required by condition 54 of the plan of operation approval.

4. The information submitted as construction documentation includes a report submitted by Warzyn Engineering, Inc., on behalf of LRC, entitled, "Post-Construction Documentation Report, East Slope Final Clay Cover, Land Reclamation Landfill," and dated April, 1991. The $1000 construction documentation fee was received on May 2, 1991.

5. Additional documents considered in connection with the review of the construction documentation include the following:
   a. The Oecember 19, 1984 plan of operation approval.
   b. The March 31, 1988 modification to the hazardous waste closure and long-term care plan.
   c. A September 5, 1990 letter from Warzyn, Inc. to the Department proposing an alternative approach for determining the percent compaction of the in-place clay cover material.
   d. A September 26, 1990 letter from the Department to Warzyn, Inc. approving the approach for determining compaction for the in-place clay cover materials.
   e. A December 4, 1990 letter from Warzyn, Inc. to the Department presenting schematic drawings.
   f. Other Departmental correspondence pertaining to the LRC landfill.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(4)(b), Stats. and NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in

substantial compliance with the conditional plan of operation approval.

CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the proposed construction documentation for the Land Reclamation Landfill.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the condition of this approval does not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision has been mailed, or otherwise served by the Department, to file your decision with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: JUL 2 9 1991

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Lakshmi Sridharan

Lakshmi Sridharan, PhD., P.E., Chief
Solid Waste Management Section

Ken Wade

Ken Wade, Hydrogeologist
Solid Waste Management Section

Cindy Cook, Environmental Engineer
Solid Waste Management Section

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

WISCONSIN
DEPT. OF NATURAL RESOURCES

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September 16, 1991

FILE REF: FID #252076990
Racine Co.
SW
Approvals
HW Lic

Mr. Rick Jernigan, Operations Manager
Land Reclamation Company
2000 Oakes Road
Racine, WI 53406

SUBJECT: Modification to the Plan of Operation Approval for RCRA Final Cover, Land Reclamation Company Landfill, License # 0572, WID 076171008, Racine, WI

Dear Mr. Jernigan:

I am pleased to inform you that your requested modifications to your plan of operation approval have been reviewed and approved. The Department believes that the proposed modifications will not have an adverse effect on the performance of your landfill provided the conditions in the enclosed conditional plan of operation approval modification are fulfilled. You should attach this conditional plan of operation approval modification directly to the plan of operation approval issued on December 19, 1984.

The plan modification proposal was received by the Department on May 13, 1991. The report and associated plan sheets were submitted by GeoSyntec Consultants on behalf of Land Reclamation Company (LRC) (EPA ID #WID076171008).

This letter approves a modification to the RCRA final cover, to be placed over the hazardous waste unit, originally approved by the Department for the LRC landfill on August 2, 1989. This plan of operation approval letter supersedes the Department's August 2, 1989 approval letter in its entirety. Any pertinent conditions have been repeated in this letter.

The modifications include the following:

1. A change from HDPE to VLDPE for the geomembrane material.

2. Revised construction phases for the RCRA final cover.

3. Revised final grades to reflect the March 6, 1991 final grade plan modification approval.

4. Expanded limits of the RCRA final cover system to the north, which lies over corridor 7.

5. A revised and more extensive QA/QC construction observation manual.

6. New maintenance road location and corresponding details.

7. New perimeter drainage layer and geotextile design requirements.

8. New construction phasing diagrams, pipe penetrations and anchoring details.

LRC requested elimination of condition 14 of the Department's August 2, 1989 approval which required that the installer have previously installed a minimum of 25 million square feet of geomembrane liner. The Department will not eliminate this condition. However, the installer may count general polyethylene experience rather than VLDPE installation specifically.

Please be aware that condition 9 of the attached approval document modifies your proposal for the monitoring of long-term settlement. After a number of years have passed, if LRC finds that substantial settlement is no longer taking place, LRC may petition the Department in writing to reduce the surveying requirements. At that time the Department will review the data and reduce the requirement if appropriate.

Please call Cindy Cook at (608)267-3542 or Ken Hein at (414)263-8647 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

LS:cmc

cc: Ken Hein - SED
Ed Lynch - HW/3
Martin Herrick/Jill Fermanich - HW/3
Mary Carrington - Town of Mt. Pleasant
Laura Ladisio - U.S. EPA, Region V, 5HR/13
Mardi Klevs/Al Debus - U.S. EPA, Region V, 5HR/13
Todd Watermolen - Creative Resource Ventures
PSS - SW/3

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL PLAN OF OPERATION
APPROVAL MODIFICATION FOR THE
LAND RECLAMATION COMPANY LANDFILL (# 0572)

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the owner was known as Land Reclamation, Ltd. (LRL).

2. The Department issued a conditional plan of operation approval for the facility on December 19, 1984. A subsequent plan of operation approval modification dated August 2, 1989 approved the design of a RCRA cap over the hazardous waste unit.

3. On May 13, 1991, the Department received a report and associated plan sheets submitted by Geosyntec Consultants (Geosyntec) entitled, "Land Reclamation Company Landfill, Hazardous Waste Unit, RCRA Final Cover Modifications Report". The report was dated May 10, 1991.

4. Additional information submitted in connection with the modification request includes the following:

   a. A May 21, 1991 letter from Creative Resource Ventures (CRV) to the Department requesting an elimination of a condition in the Department's August 2, 1989 RCRA final cover design plan modification approval. The condition required that the geomembrane installer have 25 million cubic yards experience installing HDPE membrane.

   b. A July 10, 1991 letter from CRV to the Department addressing issues raised at the pre-construction meeting.

   c. A packet of documents dated July 29, 1991 submitted to the Department by Geosyntec which included requested quality control documents and a geomembrane panel layout.

5. The $1500 plan review fee was received by the Department on September 10, 1991.

6. Additional facts and documents considered in connection with the modification request include the following:

   a. The August 2, 1989 plan of operation modification approval for the RCRA final cover.

b. LRC began construction of the RCRA final cover prior to receiving this conditional plan modification approval. Their stated rationale for doing so was to complete the cap system this construction season as they had committed to the Department.

7. The special conditions set forth below are needed to assure compliance with chapters NR 500-520 and NR 600-685, Wis. Adm. Code. If the special conditions are complied with, the proposed modifications will not inhibit compliance with the standards set forth in chapters NR 500-520 and NR 600-685, Wis. Adm. Code.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(3), Stats., to modify a plan of operation approval if the modification would not inhibit compliance with chapters NR 500-520 and NR 600-685, Wis. Adm. Code.

2. The Department has authority to approve a plan of operation with special conditions if the conditions are needed to ensure compliance with chapters NR 500-520 and NR 600-685, Wis. Adm. Code.

3. Conditions of approval set forth below are needed to ensure compliance with NR 500-520 and NR 600-685, Wis. Adm. Code.

4. In accordance with the foregoing, the Department has the authority under s. NR 144.44 Stats. to issue the following conditional plan of operation approval modification.

CONDITIONAL PLAN OF OPERATION APPROVAL MODIFICATION

The Department hereby approves the plan of operation modification for the RCRA cover at the Land Reclamation Company landfill, subject to the following conditions:

1. A preconstruction report shall be submitted to the Department for review and approval prior to the construction of each of Phases 1, 2a, 2b, and 3 of the final cover. The report shall be submitted to the Department a minimum of 30 days prior to the preconstruction meeting. The report shall include contractor and product identification, revised details, and changes incorporated to address Department requirements. The preconstruction report shall also include the following:

a. Any proposed changes to details of the design or construction required by this approval.

b. A phase-specific panel layout pattern and any revised details and cross-sections of the anchor trenches and undercut for the collection trenches.

2. A preconstruction meeting shall be scheduled prior to the initiation of the preparation of each of Phases 1, 2b, and 3. The meeting shall be used to clarify or confirm design changes, construction concepts or practices, and requirements of this approval. LRC shall include the engineering consultant and the Department staff in the meeting.

3. Geomembrane installation shall not proceed at ambient temperatures less than 32° F or greater than 104° F. The membrane shall also not be placed during precipitation, in an area of ponded water, or during excessive winds.

4. Three feet of clay shall be placed below the downslope discharge pipes of the RCRA cover drainage system at all times.

5. The temporary limit of placed membrane between the different phases shall be staked with flags to mark the location for future splicing.

6. The final cover shall be constructed in accordance with the following:

a. Grass seed shall be applied at a minimum rate of 2.0 pounds per 1000 square feet, and shall be watered if necessary to ensure that vegetative cover is obtained.

b. The topsoil/compost mixture shall be analyzed as to its nutritional needs and appropriate fertilizer applied accordingly. A letter shall be submitted to the Department, prior to placing the topsoil, including the ratio of topsoil to compost to be used, the screening method proposed for the compost, and the proposed procedure to be followed when placing the mixture.

c. Erosion control matting placed on drainage diversion berms shall be firmly staked until vegetative cover is obtained. Velocity breaks, such as bails of hay, shall be placed in the drainage diversion berms at regular intervals to reduce the impacts of erosion prior to the vegetative cover being established.

7. The cover vegetation shall be mowed twice a year to prevent any trees from growing on the cover and puncturing the membrane.

8. Construction inspections shall be performed at this site during the placement of the geomembrane for each of phases 1, 2a, 2b, and 3. The Southeast District and the central office staff shall be notified a minimum of one week prior to beginning the above listed construction event for the purpose of allowing the Department to inspect the work. A fee shall be paid to the Department for each required inspection in accordance with c. NR 520.04(5), Wis. Adm. Code. The inspection fees shall be paid at the time the construction documentation is submitted to the Department for review.

9. Documentation of the settlement of the final cover shall take place according to CRV's July 10, 1991 letter except that the long-term

settling shall be documented as follows; those portions of the landfill that have reached final grades shall be surveyed on a 200-foot grid twice a year for the first year after final cover placement, then annually for the remaining long-term care period. The same grid points shall be used for each survey.

10. Construction documentation shall be submitted to the Department for review and approval within 90 days of completion of construction of each phase of the final cover. In addition to the information proposed in the RCRA final cover report, the construction documentation shall contain the following:

a. Plan sheets which indicate the location of all soil and geomembrane test locations, geomembrane panel placement, geomembrane patches and seam repairs, geomembrane destructive sample locations, and pipe penetrations. The plan sheets shall also include the location of gas extraction wells and header pipes, leachate head wells, and the surface and subsurface drainage systems.

b. Detail drawings and photographs that record the construction of the following:

   i. Construction of subsurface drains in the final cover, and the sequence of placement of the construction materials.

   ii. Collection pipe assembly for the subsurface drain system, including pipe and joining details, welded and mechanical attachments to soil and geomembrane, pipe stubs and seals for future construction, and pipe anchoring and penetration.

   iii. Construction and compaction methods used in the placement of the final cover system.

   iv. Geomembrane panel layout as constructed.

   v. Anchor trenches as constructed.

c. The narrative describing the construction of the facility in chronological fashion. The following shall be included:

   i. Any deviations from the approved plans shall be described and the rationale for utilizing the deviations included.

   ii. Construction of the connections to the splice of the previous phase and protective measures taken to preserve the splice to the succeeding phase shall be described.

   iii. All actions taken to eliminate coarse material in the top lift of the clay component of the lysimeter and capping layer shall be described.

   iv. Controls and machinery used to place the clay liner and the

drainage blanket of the final cover in terms of machine weights, limits on machine maneuvers, lift thickness, and haulway and dumping controls shall be described.

v. The construction sequence of the geomembrane component of the capping layer, including the construction of collection pipe and trenches and the integration of collection trench construction with other geomembrane and drainage blanket placement.

d. Narrative and tabulated data for all geomembrane installation and tests. The narrative shall include identification of the geomembrane supplier and installer, material specifications of the installed geomembrane, attachment and welding methods used on the project, and samples of the geomembrane material and seams that are representative of the installed geomembrane liner.

e. Narrative describing the measures taken to place topsoil and to revegetate the achieved final grades. In addition, plan sheets and narrative shall be included which describe the construction of access roads and erosion control features, including alignment, grades, surfacing, location of culverts and drain pipes, road and ditch invert elevations, revegetation measures, and any use of riprap and erosion control matting.

f. Documentation of any monitoring point removed, damaged, replaced, or repaired during construction.

g. Certification that the extrudate used is comprised of the same resin as the geomembrane to be used shall be included in the documentation.

The Department retains the jurisdiction either to require the submittal of additional information or to modify the approval at any time if, in the Department's opinion, further modifications are necessary. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: SEP 16 1991

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Barbara J. Zellmer, Chief
Hazardous Waste Management
Section

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management
Section

Bureau of Solid & Hazardous Waste Management

Cindy M. Cook, Environmental Engineer
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

Martin Herrick, Environmental Engineer
Hazardous Waste Management Section
Bureau of Solid & Hazardous Waste Management

Ken Wade, Hydrogeologist
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

Cindy Cook File Author

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

WISCONSIN DEPT. OF NATURAL RESOURCES

Carroll D. Besadny
Secretary

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SOLID WASTE MGMT 608-266-2111
SOLID WASTE TELEFAX 608-267-2768

MAY 1 1 1992

Mr. Rick Jernigan, Operations Manager
1989 Oakes Road
P.O. Box 081220
Racine, WI 53408-1220

FILE REF: FID # 252076990
Racine
SW
Approvals

SUBJECT: Interior Manhole Construction Documentation Approval, Land Reclamation Company Landfill, Racine County

Dear Mr. Jernigan:

I am pleased to inform you that your construction documentation has been approved for the interior manhole and piping system for your disposal facility. You should attach this approval directly to the plan of operation approval issued by the Department on December 19, 1984.

This letter approves the construction of the two interior manholes and their related piping system at the Land Reclamation Company Landfill. Work included the construction of two manholes interior to the landfill, [illegible] existing manholes [illegible] piping. Continuing construction includes the placement of the foundry sand cone around each of the manholes, which will be documented in annual reports.

The abandonment report for the dewatering well does not give any information regarding the removal of the 3/8 inch peagravel screen packing. This material should have been removed by overdrilling prior to grouting. Also, the use of neat cement grout to seal abandoned boreholes from Temporary Piezometers A and B, and the use of concrete grout to abandon the dewatering well is inappropriate for this clay environment. A high density bentonite grout would be more appropriate. Although it will be approved in this instance, this approval letter requires that a high-density bentonite grout be used for the abandonment of all future borings.

A verbal approval was given to LRC in January for this construction documentation. LRC was informed at that time that they would need to leave a portion of the completed liner open during the winter months, since they could not meet the Department's deadline of December 31 to have placed four feet of waste over the liner. This portion of the liner is required to have density and permeability testing performed on it as per the Department's March 7, 1991 memo (attached).

5/1/92

Printed on Recycled Paper

Please call Ken Hein at (414)562-9645 or Cindy Cook at (608)267-3542 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

Enclosure

cc: Ken Hein - SED
Mary Carrington - Town of Mount Pleasant
Fred Larson - City of Racine
Chuck Slaustas/Al Debus - U.S. EPA, Region V, 5HE/12
Marty Herrick/Ed Lynch - HW/3
Richard Weber - Warzyn, Inc.
Todd Watermolen - Creative Resource Ventures

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION
APPROVAL FOR THE
LAND RECLAMATION COMPANY LANDFILL, # 0572

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the facility was known as Land Reclamation, Ltd. (LRL).

2. A conditional plan of operation approval was issued by the Department for the facility on December 19, 1984.

3. The information submitted as construction documentation includes a report submitted by Warzyn Engineering, Inc. on behalf of LRC entitled, "Construction Observation Report [illegible] and [illegible] Phase Land Reclamation Landfill" and associated plan sheets, dated December, 1991.

4. The $1000 construction documentation fee and the $500 for each of 3 construction inspections ($1500) was received by the Department on May 2, 1991.

5. Additional documents considered in connection with the review of the construction documentation include the following:

   a. The September 24, 1990 plan of operation modification which approved the construction of the interior manholes.

   b. A March 7, 1991 memo from Lakshmi Sridharan to Department staff, which was subsequently sent to LRC, outlining the procedure to be followed for any sites wanting an exemption to the portion of the code requiring that all newly constructed clay liners be covered with 4 feet of waste by December 31 of the year of construction.

   c. A September 4, 1991 letter from LRC to the Department regarding clay liner material laboratory index testing.

   d. A September 19, 1991 memo from the Department to LRC regarding the placement of Claymax below the manholes and the elimination of the settlement plates outside the manholes.

   e. A December 26, 1991 letter from LRC to the Department addressing a field modification of final grades to allow foundry sand placement around interior manholes 1 and 2.

f. Other Departmental correspondence pertaining to the LRC landfill.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(4)(b), Stats. and NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

2. If the conditions of approval set forth below are complied with, the applicant will have demonstrated that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

CONDITIONAL CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the proposed construction documentation for the Land Reclamation Landfill subject to the following conditions:

1. LRC shall leave at least a 20' x 100' strip of completed liner (or equivalent area) with one foot of drainage blanket open during the winter months. This portion of the liner shall have density and permeability tests performed on it, according to the March [illegible] Department memo (attached).

2. [illegible] will be placed [illegible] sand placed around the manholes to prevent [illegible] from escaping from the waste through the sand. The geomembrane may be removed before the next lift of sand is placed and reused. Care shall be taken that the geomembrane remains in good condition, and shall be replaced as necessary.

3. Within 30 days of the date of this approval, LRC shall submit written procedures to the Department which will be followed as manhole sections are placed to address the following:

   a. The delineation of the sand cone placement.

   b. The density testing procedures for the sand placement.

4. The following information shall be submitted to the Department in each year's annual report:

   a. The number of sections added to each manhole in that year.

   b. The survey performed on each manhole to measure the settlement that had occurred during that year.

c. Survey data performed on the foundry sand limits during that year to document that the sand has indeed been placed in a cone-shape.

d. Density testing results for the placement of the sand.

e. A list of the foundries whose waste was used to construct the sand cone, along with the data required in condition 5(a) and (b) of this approval.

5. The foundry sand used in the cone-surround for the interior manholes shall comply with the following specifications:

a. P200 $\leq$ 12%.

b. Dry density $\geq$ 90% Modified Proctor density.

c. No debris or organic material shall be included.

d. No material greater than 6-inches in diameter shall be included.

6. Any borings or wells to be abandoned in future waste fill areas shall be grouted using high-density bentonite grout (>30% solids) with documentation showing minimum field grout densities of 11 lbs/gal or greater.

The Department reserves the right to require the submittal of additional information and to modify or amend this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the condition of this approval does not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision has been mailed, or otherwise served by the Department, to file your decision with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: MAY 11 1992

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Lakshmi Sridharan

Lakshmi Sridharan, PhD., P.E., Chief
Solid Waste Management Section

Cindy M. Cook

Cindy Cook, Environmental Engineer
Solid Waste Management Section

Ken Wade

Ken Wade, Hydrogeologist
Solid Waste Management Section

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: March 7, 1991 FILE REF: 4400

TO: Solid Waste Management Section Staff

FROM: Lakshmi Sridharan

SUBJECT: Exemption from s. NR 506.07(2)(b), Wis. Adm. Code

Section NR 506.07(2)(b) requires that a newly constructed liner area be covered with 4' of waste or other frost protection material by December 31 of the year of construction. Preliminary information, available from recent research and our program data base indicate that clay liners are <u>not likely</u> to be severely deteriorated due to freeze-thaw cycles in one winter. However, we need additional data for more soil types and site locations before we feel comfortable to delete this provision from the code.. We have decided to grant exemption from s. NR 506.07(2)(b), Wis. Adm. Code to all landfills constructed in the '90-'91 and '91-'92 construction seasons and as conditions of this exemption for landfills with clay liner we will require the following testing:

1. The landfill shall leave at least a 20'x 100' strip of completed liner (or equivalent area) with one foot of drainage blanket open for performing density and permeability tests.

2. Description of a visual inspection of top surface of a [illegible] liner area at each testing location after removing the sand [illegible] prior to performing any testing must be reported. If surface cracks are observed, then depth of such cracks shall be measured and reported.

3. Density of the clay shall be tested at five locations at depths of 6" and 12" from the top (total of 10 density tests).

4. Permeability tests shall be performed on undisturbed clay samples collected from two different locations which are within 2' of a density test location. Two samples shall be collected at depths of 12" and 24" from top at each of the two locations (total of 4 permeability tests). Licensees should be encouraged to perform insitu permeability tests.

5. The field tests and sample collection shall be completed by May 15.

6. A report summarizing the test data shall be submitted by July 15.

For landfills with composite liner, the following additional tests shall be required on the PE liner before and after exposure to the elements:

1. Five PE liner samples from the open area shall be tested for stress and strain at both yield and break, thickness, density, carbon black content, dimensional stability, tear resistance and brittleness temperature.

2. Two seam samples, at least 2' long, shall be buried in the test area. The seam samples shall be tested for shear and peel adhesion. These samples shall be tested for seam continuity using vacuum box or other suitable test.

We will not require any corrective actions on the liner at these landfills regardless of the test results.

If you need additional information on the testing procedures please contact Amalendu Bagchi at (608) 267-7576.

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cc: Paul Didier - SW/3
District SW Program Supervisors
District SW Unit Leaders
District SW Investigators
Guidance Notebook

WISCONSIN
DEPT. OF NATURAL RESOURCES
George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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April 13, 1993

Mr. Henry Koch
1989 Oakes Road
P.O. Box 081220
Racine, WI 53408-1220

FILE REF: FID# 252076990
Racine Co.
SW
Correspondence

SUBJECT: RCRA Cover - Phase I, Construction Documentation Approval, Land Reclamation Company Landfill, Racine County

Dear Mr. Koch:

I am pleased to inform you that your construction documentation has been approved for Phase 1 of the RCRA cover system at your disposal facility. You should attach this approval directly to the plan of operation approval issued by the Department on December 19, 1984.

This letter approves the construction of Phase 1 of the RCRA cover system over the hazardous waste unit as required by the Department's March 31, 1988 approval letter, and the subsequent September 16, 1991 plan of operation modification. Construction included the placement of (from the bottom up) three feet of clay, a geomembrane liner, a one foot thick drainage layer, a geotextile, a one and a half foot thick rooting layer, and a six inch thick topsoil layer. Phase I encompasses approximately 10 acres on the southern end of the hazardous waste unit (HWU).

The September 16, 1991 approval letter required that the temporary limit of the placed geomembrane be staked with flags to mark the location for future splicing. This was not yet accomplished, and should be completed as soon as possible.

The attached approval requires that fine grading, fertilizing, seeding and mulching must be accomplished this construction season, in accordance with condition 6 of the September 16, 1991 approval letter.

We would like to remind you that LRC is required, by condition 9 of the September 16, 1991 approval, to document the settlement of the final cover twice a year for the first year after placement of the final cover, and then annually thereafter.

Printed on Recycled Paper

Please call Ken Hein at (414)562-9645 or Cindy Cook at (608)267-3542 if you have any questions regarding this approval.

Sincerely,

Jack P. Connelly for

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

Enclosure

cc: Ken Hein - SED
Mary Carrington - Town of Mount Pleasant
Fred Larson - City of Racine
Laura Lodisio/Alan Wojas - U.S. EPA, Region V, HRE-8J
Marty Herrick/Ed Lynch - HW/3
Jan Kucher/Joel Schittone - Warzyn, Inc.

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION
APPROVAL FOR THE
LAND RECLAMATION COMPANY LANDFILL, # 0572

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the facility was known as Land Reclamation, Ltd. (LRL).

2. A conditional plan of operation approval was issued by the Department for the facility on December 19, 1984.

3. The information submitted as construction documentation includes a two volume report and associated plan sheets dated March 1992 and received by the Department on March 27, 1992. Volume one is entitled, "RCRA Phase 1 Cover Construction, Hazardous Waste Unit, Land Reclamation Company, Racine, Wisconsin", and was prepared by Warzyn, Inc. Volume two is entitled, "Final Report on Construction Quality Assurance Monitoring Services for Construction of Phase I of the RCRA Final Cover System at the Land Reclamation Company Landfill, Racine, Wisconsin", and was prepared by Geosyntec Consultants.

4. The $1000 construction documentation fee and the $500 fee for the construction inspection was received by the Department on May 26, 1992.

5. Additional documents considered in connection with the review of the construction documentation include the following:

   a. A March 31, 1988 plan of operation approval modification to the Hazardous Waste Closure and Long-term Care Plan.

   b. A September 4, 1991 letter from LRC to the Department discussing soil testing results.

   c. A September 16, 1991 plan of operation approval modification for the RCRA Final Cover.

   d. Other Departmental correspondence pertaining to the LRC landfill.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(4)(b), Stats. and NR 516, Wis. Adm. Code, to require that the owner of a solid and hazardous waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

2. If the conditions of approval set forth below are complied with, the applicant will have demonstrated that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

CONDITIONAL CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the proposed construction documentation for Phase I of the RCRA Final Cover over the hazardous waste unit, subject to the following conditions:

1. The temporary limit of placed membrane between the different phases shall be staked with flags to mark the location for future splicing.

2. Fine grading, fertilizing, seeding and mulching shall be accomplished within 90 days of this approval over the area of Phase I of the RCRA cover.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the condition of this approval does not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within whic" requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision has been mailed, or otherwise served by the Department, to file your decision with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: APR 1 6 1993

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Jack P. Connelly for
Lakshmi Sridharan, PhD., P.E., Chief
Solid Waste Management Section

Edward K. Lynch for
Barbara J. Zellmer, Chief
Hazardous Waste Management Section

Cindy M. Cook
Cindy Cook, Environmental Engineer
Solid Waste Management Section

Martin Herrick, Environmental Engineer
Hazardous Waste Management Section

Ken Wade
Ken Wade, Hydrogeologist
Solid Waste Management Section

WISCONSIN
DEPT. OF NATURAL RESOURCES
George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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SOLID WASTE TELEFAX 608-267-2768

September 13, 1993

Mr. Hank Koch
1989 Oakes Road
P.O. Box 081220
Racine, WI 53408-1220

FILE REF: FID # 252076990
Racine Co.
SW
Approvals

SUBJECT: Groundwater Containment Structure Construction Documentation Approval, Land Reclamation Company Landfill, Racine County

Dear Mr. Koch:

I am pleased to inform you that your construction documentation has been reviewed and partially approved for the groundwater containment structure at your disposal facility. You should attach this approval directly to the plan of operation approval issued by the Department on December 19, 1984.

Project Summary

The groundwater containment structure consists of a bentonite slurry wall which extends along the entire southern portion of the hazardous waste unit (HWU) and the City of Racine site, along the western portion of the City of Racine site, and underneath the Corridor Nos. 8, 9 & 10 area. Interior to the slurry wall is a gravel-filled, groundwater collection trench. Perforated corrugated piping lies at the bottom of the trench to collect groundwater. A perforated pipe lies at the top of the trench in the portion of the structure that is just south of the HWU to collect methane. The purpose of the containment structure is to prevent any migration of leachate from the unlined portion of the HWU and from the City of Racine site. The structure is also designed to help prevent the migration of methane from the hazardous waste unit. The groundwater containment structure was required to be constructed in the Department's March 31, 1988 Closure Plan Modification letter.

Construction began on the groundwater containment structure in the summer of 1988 and continued through the end of 1989. The construction observation report was submitted by Foth & Van Dyke, Inc. (F&VD), on behalf of LRC, and was received by the Department on August 9, 1991. After reviewing this documentation, the Department determined that the slurry wall and gas collection line appeared to be adequately constructed, however several problems were associated with the construction of the groundwater collection structure. These problems were outlined in a letter to LRC dated March 10, 1992. This letter also identified the additional information that the Department would need before the groundwater collection system could be approved. LRC's response to this letter was a report prepared by F&VD and dated March 30, 1993. This report included a review of the quality assurance procedures of the trenching operations and a comparison of the horizontal and vertical alignment of the trench to that of record conditions. The report also contained information regarding the performance of the structure. The

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submittal of this information has allowed the Department to feel much more comfortable in the construction and long-term performance of the groundwater containment structure. Therefore, this letter conditionally approves the entire groundwater containment structure.

I would like to take this opportunity to address a separate issue. LRC has recently brought to the Department's attention the fact that the City of Racine site is not yet to final grades. We agree with the request to use foundry sand, contaminated soils and/or excess earth associated with the regrading of the City of Racine site to fill in this location.

LRC also asked the Department during a July 22, 1993 meeting whether a connection between the sand drainage blanket below the barrier wall of the hazardous waste unit and the groundwater collection trench would be acceptable. This concept would be acceptable to the Department provided LRC include detail drawings of this connection in the Corridor Nos. 8, 9 and 10 plan of operation modification request. LRC must address whether soil, waste or both will be excavated and where this material would be disposed. LRC must also be willing to make a determination as to whether the material excavated is hazardous. Any material which is determined to be hazardous will be managed accordingly.

On one additional matter, in a letter dated April 2, 1993, LRC requested two exemptions to the construction quality control for all future earthwork projects. Condition 19 of the Department's September 20, 1988 plan of operation modification approval required that periodic sand cone density tests be performed and that the results of the nuclear density meter calibration be submitted to the Department with the corresponding construction documentation. We agree that the accuracy and precision of the nuclear density meter is at least that of the sand cone method, and will agree that sand cone tests no longer need to be performed. Also, the results of the nuclear density meter calibration no longer need to be submitted to the Department with the understanding that the calibrations will still be performed and the records will be kept by LRC or their consultants for review by the Department if requested.

Please call Ken Hein at (414)562-9645 or Cindy Cook at (608)267-3542 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

Barbara J. Zellmer

Barbara J. Zellmer, Chief
Hazardous Waste Management Section
Bureau of Solid & Hazardous Waste Management

Enclosure

cc: Ken Hein - SED

Joann Kovac - Town of Mount Pleasant
Rick Jones - City of Racine
Laura Lodisio/Alan Wojtas - U.S. EPA, Region V, HRE/8J
Marty Herrick/Ed Lynch - HW/3
Jerry Sevick - Foth & Van Dyke
Jean Gromnicki U.S. EPA, REGION V HRM/7J

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION
APPROVAL FOR THE
LAND RECLAMATION COMPANY LANDFILL, # 0572

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the facility was known as Land Reclamation, Ltd. (LRL).

2. A conditional plan of operation approval was issued by the Department for the facility on Oecember 19, 1984.

3. The information submitted as construction documentation includes a three volume report and associated plan sheets submitted to the Department by Foth & Van Dyke, on behalf of LRC. The report was entitled, "Construction Observation Report, Groundwater Containment Structure, Land Reclamation Company." It was dated August 6, 1991 and was received by the Department on August 9, 1991.

4. The $1000 construction documentation fee was received by the Department on September 4, 1991. The $500 for each of 3 construction inspections ($1500) was received by the Department on December 4, 1991.

5. Additional documents considered in connection with the review of the construction documentation include the following:

   a. The Plan of Operation Approval for LRC dated December 19, 1984.

   b. The November 15, 1985 plan modification approval for the recalculation of closure and long-term care cost estimates. This letter also included an estimate on the volume of groundwater which would be collected by the groundwater collection system.

   c. The March 31, 1988 approval letter for the closure of the Hazardous Waste Unit (HWU).

   d. The December 14, 1988 approval letter for the design of the containment structure.

   e. A report dated May 11, 1989 from Foth & Van Dyke, on behalf of LRC, evaluating the granular backfill for the groundwater collection trench.

f. A letter from the Department to LRC, dated July 6, 1989, approving modifications to the containment structure.

g. The August 18, 1988 plan modification letter from the Department to LRC regarding the containment structure excavation.

h. A letter from the Department to LRC dated August 31, 1989 which documents a construction inspection made on lift station no. 6.

i. A memo from the Department to the LRC file, dated December 4, 1989, which documents a construction inspection made on the containment structure.

j. A June 30, 1989 letter from Foth & Van Dyke, on behalf of LRC, requesting modifications to the approved construction documentation program for the containment structure.

k. A letter from the Department to LRC requesting additional information regarding the containment structure construction documentation. The letter was dated March 10, 1992.

l. A report submitted by Warzyn, Inc., on behalf of LRC, which was entitled, "Pipe Cleaning Observation Report, Leachate and Groundwater Pipe Cleaning, Land Reclamation Company." The report was dated September 30, 1992.

m. A report submitted by Warzyn, Inc., on behalf of LRC, which was entitled, "Pipe Cleaning Summary Report, Land Reclamation Company." The report was dated on March 26, 1993.

n. A report submitted by Foth & Van Dyke, on behalf of LRC, which contained the additional information requested by the Department in the March 10, 1992 letter. The report was dated March 30, 1993 and was received by the Department on April 1, 1993.

o. Other Departmental correspondence pertaining to the LRC landfill.

6. The special conditions set forth below are needed to assure that the facility is constructed and operated in an environmentally sound fashion.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(4)(b), Stats. and NR 516 and 680, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

2. If the conditions of approval set forth below are complied with, the applicant will have demonstrated that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

CONDITIONAL CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the construction documentation for the groundwater containment structure for the Land Reclamation Landfill subject to the following conditions:

1. The cleanout riser for the collection pipe between Lift Station No. 5 and Lift Station No. 6 shall be repaired and replaced to its original vertical position.

2. The surface water which is currently being discharged into Lift Station No. 6 shall be temporarily connected to the force main providing for direct discharge to Manhole No. 13 of the sanitary sewer system until construction of Corridor Nos. 8,9 and 10.

3. The guide rails in Lift Station No. 8 shall be realigned so that the pump can be repaired or be replaced if necessary. Floats shall be positioned such that the low float is approximately one foot above the pump and the high float is approximately one foot below the lowest invert (the line from Manhole No. 9).

4. The required repairs listed in conditions 1 through 3 of this approval shall be completed within 90 days of the date of this approval. Documentation of the repairs shall be submitted to the Department within 30 days after its completion.

5. The groundwater collection lines shall be jetted on an annual basis, with the documentation being submitted to the Department as part of the annual report. The documentation shall include drawings depicting which portions of the lines were cleaned and the locations of any blockages in the line, photos documenting the cleaning and a narrative explaining how the cleaning proceeded and whether any blockages were encountered.

6. Prior to jet cleaning the collection lines, LRC shall sound the bottom of the manhole and record the distance to the top of the manhole. Several hours after jetting, LRC shall then resound the bottom and record the new measurement. Using this difference in elevations, the volume of silt shall be calculated and reported to the Department as part of the pipe cleaning documentation. If the volume of silt is determined to be present in sufficient quantity, the silt shall be removed by jetting and vacuuming. If large volumes of silt occur on a regular basis, or if regular blockages occur, the Department may require more frequent jet cleaning of the groundwater collection lines.

7. Should the Department determine at any time that problems have developed with any aspect of the containment structure, LRC shall remediate the problems to the Department's satisfaction.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the condition of this approval does not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision has been mailed, or otherwise served by the Department, to file your decision with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: SEP 1 7 1995

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Lakshmi Sridharan

Lakshmi Sridharan, PhD., P.E., Chief
Solid Waste Management Section

Barbara J. Zellmer, Chief
Hazardous Waste Management Section

Cindy M. Cook

Cindy M. Cook, P.E.
Solid Waste Management Section

Martin Herrick

Martin Herrick, Environmental Engineer
Hazardous Waste Management Section

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DEPT. OF NATURAL RESOURCES

George E. Meyer
Secretary

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SOLID WASTE TELEFAX 608-267-2768

November 4, 1993

Mr. Hank Koch
1989 Oakes Road
P.O. Box 081220
Racine, WI 53408-1220

FILE REF: FID # 252076990
Racine
SW
Approvals

SUBJECT: Construction Documentation Approval for Phase II of West Barrier Wall and Horizontal Gas Well Construction and Plan of Operation Modification, Land Reclamation Company Landfill, Racine County

Dear Mr. Koch:

I am pleased to inform you that your construction documentation has been reviewed and approved for the completion of Phase II of the West Barrier Wall at your disposal facility. You should attach this approval directly to the plan of operation approval issued by the Department on December 19, 1984.

This letter approves the construction of Phase II of the West Barrier Wall which consists of two horizontal gas wells, a seven foot thick clay barrier wall, and interior and exterior drainage layers. The construction of the barrier wall was required in the March 31, 1988 approval letter addressing "Modifications to the Hazardous Waste Closure and Long-Term Care Plan, and Plan of Operation Approval".

The construction documentation report did not address the missing exterior drainage layer at the northeast tie-in to the barrier wall to the Department's satisfaction. Therefore the Department is requiring as part of this approval that LRC more thoroughly address this situation.

On another matter, the Department has reviewed the letter dated May 24, 1993 from Warzyn, Inc., on behalf of LRC, to the Department. The letter contained an analysis of the settlement of the RCRA Phase I Cover, which had been required by the Department in an approval letter dated December 30, 1991. The settlement analysis performed was not strictly in accordance with the conditions required in the approval letter, however, the Department believes that the proposed monitoring would be adequate. Therefore an alternative monitoring procedure has been required as part of this approval, at your request. The settlement monitoring results should still be submitted to the Department as part of your annual report, as required by the Department's December 30, 1991 approval.

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Please call Ken Hein at (414)562-9645 or Cindy Cook at (608)267-3542 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

LS:cmc
encl.

cc: Ken Hein - SED
Joann Kovac - Town of Mount Pleasant
Rick Jones - City of Racine
John Belken - Warzyn, Inc.
Rich Weber - Warzyn, Inc., Milwaukee Office

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL
FOR THE CONSTRUCTION OF THE WEST BARRIER WALL
OF THE HAZARDOUS WASTE UNIT OF THE
LAND RECLAMATION COMPANY LANDFILL, # 0572

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the facility was known as Land Reclamation, Ltd. (LRL).

2. A conditional plan of operation approval was issued by the Department for the facility on December 19, 1984.

3. The information submitted as construction documentation includes a report submitted by Warzyn, Inc. (Warzyn), on behalf of LRC, entitled "Construction Observation Report, Phase II of West Barrier Wall and Horizontal Gas Well Construction, Hazardous Waste Unit, Land Reclamation Company Landfill". The report was dated August 23, 1993 and was received by the Department on the same day.

4. The $1000 construction documentation fee was received by the Department on September 15, 1993.

5. Additional documents considered in connection with the review of the construction documentation include the following:

   a. The Department's Modification to the Hazardous Waste Closure and Long-Term Care Plan, dated March 31, 1988.

   b. The Department's September 20, 1988 Barrier Wall Plan Modification Approval.

   c. A letter from LRC to the Department requesting a modification in the hydraulic conductivity of the drainage blanket. The letter was dated October 26, 1990.

   d. The Department's May 11, 1992 letter approving the construction documentation of the interior manholes and Phase I of the West Barrier wall.

   e. The Department's December 30, 1991 approval letter requiring that a settlement analysis be performed on an annual basis.

f. A letter from Warzyn, Inc., on behalf of LRC, to the Department dated May 24, 1993. The letter contained the settlement analysis for the final cover, and a request that the analysis be performed differently than that required by a previous approval.

g. Other Departmental correspondence pertaining to the LRC landfill.

6. The special conditions set forth below are needed to assure that the facility is constructed and operated in an environmentally sound fashion.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(4)(b), Stats. and NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

2. If the conditions of approval set forth below are complied with, the applicant will have demonstrated that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

CONDITIONAL CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the construction documentation for Phase II of the West Barrier Wall of the Land Reclamation Landfill subject to the following conditions:

1. Settlement condition #12 of the Department's December 30, 1991 approval letter shall be superseded by the following:

   a. An aerial topographic survey shall be performed at the site on an annual basis with the preparation of drawings with a 2-foot contour interval at a scale of 1-inch equal to 100-feet.

   b. Settlement monitoring shall be performed at the locations indicated on Tables 1, 2 and 3, which are attached.

   c. Vertical settlement shall be estimated to within a 1-foot tolerance. Pipe invert elevations shall be estimated assuming that settlement will be equal to cover settlement.

   d. A report shall be submitted with each annual report which includes annual and cumulative settlement, as well as pipe invert elevations and the slope between the wells.

2. Within 14 days of the date of this approval, LRC shall submit to the Department a written narrative more thoroughly explaining the lack of exterior drainage blanket at the tie-in for the northeast corner of the Phase II West Barrier Wall. The excavation performed to search for the blanket shall be discussed. LRC shall also address whether they believe that the layer had ever been placed, or if the sand drainage layer had been eroded prior to the placement of waste. Does LRC have any idea to what extent the drainage layer is missing? LRC shall identify any other discrepancies that have been observed between the construction documentation and the actual construction of the barrier wall or any other construction events.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the condition of this approval does not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision has been mailed, or otherwise served by the Department, to file your decision with the appropriate circuit

court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: NOV 5 1993

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Lakshmi Sridharan

Lakshmi Sridharan, PhD., P.E., Chief
Solid Waste Management Section

Cindy M. Cook

Cindy M. Cook, P.E.
Solid Waste Management Section

Jim Bauer, Hydrogeologist
Solid Waste Management Section

WISCONSIN
DEPT. OF NATURAL RESOURCES

George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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March 14, 1994

Mr. Hank Koch
1989 Oakes Road
P.O. Box 081220
Racine, WI 53408-1220

FILE REF: FID # 252076990
Racine
SW
Approvals

SUBJECT: Construction Documentation Approval for Phase IV & V of the North Barrier Wall, Land Reclamation Company Landfill, Racine County

Dear Mr. Koch:

This letter serves to inform you that your construction documentation has been reviewed and approved for Phases IV and V of the North Barrier Wall at your disposal facility. You should attach this approval directly to the plan of operation approval issued by the Department on December 19, 1984.

This letter approves the construction of Phases IV and V of the West Barrier Wall which consists of a seven foot thick clay barrier wall and interior and exterior drainage layers. The construction of the barrier wall was required in the March 31, 1988 approval letter addressing "Modifications to the Hazardous Waste Closure and Long-Term Care Plan, and Plan of Operation Approval".

The construction documentation, which was prepared by Warzyn, Inc. and Foth & Van Dyke, was entitled, "Construction Observation Report, North Barrier Wall - Phase IV & V Construction, Hazardous Waste Unit, Land Reclamation Company." The report was received by the Department on February 20, 1992. The report had several deficiencies and was poorly organized, with the main narrative documenting the construction of Phase V and the Phase IV documentation being included in the Appendix. However, a May 25, 1993 submittal cleared up any questions regarding the construction. I would suggest that, if two different consulting firms collaborate on construction documentation reports in the future, more thought is given to how the report would be organized, and how to present the information more clearly.

Please call Ken Hein at (414)562-9645 or Cindy Cook at (608)267-3542 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

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LS:cmc

cc: Ken Hein - SED
Joann Kovac - Town of Mount Pleasant
Rick Jones - City of Racine
Rich Weber - Warzyn, Inc., Milwaukee Office
Gerald Sevick - Foth & Van Dyke

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL
FOR THE CONSTRUCTION OF PHASES IV & V
OF THE NORTH BARRIER WALL
OF THE HAZARDOUS WASTE UNIT OF THE
LANO RECLAMATION COMPANY LANDFILL, # 0572

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the facility was known as Land Reclamation, Ltd. (LRL).

2. A conditional plan of operation approval was issued by the Department for the facility on December 19, 1984.

3. The information submitted as construction documentation includes a report submitted by Warzyn, Inc. (Warzyn), on behalf of LRC, entitled "Construction Observation Report, North Barrier Wall - Phase IV & V Construction, Hazardous Waste Unit, Land Reclamation Company Landfill". The report was dated February 18, 1992 and was received by the Department on February 20, 1992.

4. The $1000 construction documentation fee was received by the Department on March 26, 1992.

5. Additional documents considered in connection with the review of the construction documentation include the following:

   a. The Department's Modification to the Hazardous Waste Closure and Long-Term Care Plan, dated March 31, 1988.

   b. The Department's September 20, 1988 Barrier Wall Plan Modification Approval.

   c. A letter from LRC to the Department requesting a modification in the hydraulic conductivity of the drainage blanket. The letter was dated October 26, 1990.

   d. A letter from the Department to LRC requesting additional information regarding the construction documentation for the North Barrier Wall, dated April 1, 1993.

e. A letter dated May 10, 1993 from Foth & Van Dyke to Warzyn which contained some of the additional information requested by the Department's April 1, 1993 letter.

f. A letter dated May 25, 1993 from Warzyn to the Department which contained the additional information requested in the Department's April 1, 1993 letter.

g. Other Departmental correspondence pertaining to the LRC landfill.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(4)(b), Stats. and NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

CONDITIONAL CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the construction documentation for Phases IV & V of the North Barrier Wall of the Land Reclamation Landfill.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the condition of this approval does not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision has been mailed, or otherwise served by the Department, to file your decision with the appropriate circuit

court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: MAR 15 1994

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Lakshmi Sridharan
Lakshmi Sridharan, PhD., P.E., Chief
Solid Waste Management Section

Cindy M. Cook
Cindy M. Cook, P.E.
Solid Waste Management Section

Jim Bauer, Hydrogeologist
Solid Waste Management Section

WISCONSIN
DEPT. OF NATURAL RESOURCES
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File Ref: FID #252076990
Racine Co.
SW
Approvals

APR 1 9 1994

Hank Koch
Land Reclamation Company
2000 Oakes Road
Racine, WI 53406

SUBJECT: Construction Documentation Approval, East Slope Final Clay Cover, Land Reclamation Landfill, #0572, Racine County, WI.

Dear Mr. Koch:

I am pleased to inform you that your Construction Documentation has been approved for the clay final cover of the east slope of your disposal facility. You should attach this approval directly to the plan of operation approval issued by the Department on December 19, 1984.

Construction of the final cover for the East Slope of the hazardous waste unit was performed in July 1985, but was not documented at the time. Post-construction documentation performed in 1990 showed that the cover met Department requirements only in the middle portion of the slope. Therefore, the final cover was reconstructed to the east and west of this middle band of cover. This letter approves the construction of the four-foot clay and six-inch topsoil cover approximately west of the 25+80E grid line and east of the 26+55E grid line.

This letter also approves the construction of the final cover of the east slope of Corridor 7. The construction of this portion of the east slope began in April 1993, and consisted of the following activities:

* Construction of clay tie-ins of the new Corridor 7 east slope cover with the RCRA Phase I cover, HWU east slope cover, and the north barrier wall;

* Additional construction of the east and north liner sidewalls of Corridor 7;

* Repair of damaged cleanouts in Corridors 5, 6 and 7;

* Backfilling of pipe repair excavations and filling to establish final refuse grades on the Corridor 7 east slope;

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* Construction of final cover on the east slope of Corridor 7; and

* Placement of topsoil and compost followed by seeding, fertilizing and mulching the southern portion of the east slope. The seeding of the remaining portion of the east slope will be performed in early May of 1994.

As the excavation was being performed for the repair of the damaged cleanouts in Corridors 5, 6 and 7, an additional cleanout was found which could not initially be identified. After some investigation, it was found that the cleanout was attached to a previously undocumented horizontal gas extraction trench. This cleanout has been given the nomenclature of the 7X cleanout. This pipe will be cleaned out biannually along with the gas trenches GT-1 and GT-2.

Please call Ken Hein at (414)562-9645 or Cindy Cook at (608)267-3542 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

cc: Ken Hein - SED
Mary Carrington - Town of Mount Pleasant
Fred Larson - City of Racine
Rich Weber - Warzyn

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION
APPROVAL FOR THE
LAND RECLAMATION COMPANY LANDFILL, # 0572

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the facility was known as Land Reclamation, Ltd. (LRL).

2. A conditional plan of operation approval was issued by the Department for the facility on December 19, 1984.

3. Warzyn Engineering, Inc., on behalf of LRC, submitted construction documentation required by condition 54 of the plan of operation approval.

4. The information submitted as construction documentation includes the following:

   a. A report submitted by Warzyn Engineering, Inc., on behalf of LRC, entitled, "Construction Observation Report, East Slope Construction, Hazardous Waste Unit, Land Reclamation Landfill," and dated February, 1992.

   b. A report submitted by Warzyn Engineering, Inc., on behalf of LRC, entitled, "Construction Observation Report, Corridor 7 East Slope Final Cover", and was dated February, 1994.

5. The $1000 construction documentation fee for the east slope construction was received on March 26, 1992. The $1000 review fee for the Corridor 7 east slope final cover construction documentation was received by the Department on March 21, 1994.

6. Additional documents considered in connection with the review of the construction documentation include the following:

   a. The December 19, 1984 plan of operation approval.

   b. The March 31, 1988 modification to the hazardous waste closure and long-term care plan.

   c. A letter from the Department to LRC approving the East Slop Post-Construction Documentation, dated July 29, 1991.

   d. A letter from LRC to the Department regarding Atterberg testing requirements, dated September 4, 1991.

e. The July 28, 1993 construction documentation approval letter for the completion of Corridor 11.

f. Other Departmental correspondence pertaining to the LRC landfill.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(4)(b), Stats. and NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the proposed construction documentation for the east slope final cover of the Land Reclamation Landfill.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the condition of this approval does not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision has been mailed, or otherwise served by the Department, to file your decision with the appropriate circuit court and serve the petition on the Oepartment. Such a petition for

judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: APR 19 1994

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Lakshmi Sridharan

Lakshmi Sridharan, PhD., P.E., Chief
Solid Waste Management Section

Cindy M. Cook

Cindy Cook, P.E.
Solid Waste Management Section

WISCONSIN
DEPT. OF NATURAL RESOURCES

George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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DNR TDD 608-267-6897
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File Ref: FID #252076990
Racine Co.
SW
Approvals

JUL 13 1994

Hank Koch
Land Reclamation Company
2000 Oakes Road
Racine, WI 53406

SUBJECT: Construction Documentation Approval, East Slope and Corridor 7 Gas & Leachate Extraction System, Land Reclamation Company Landfill, #0572, Racine County, WI.

Dear Mr. Koch:

I am pleased to inform you that your Construction Documentation has been approved for the gas and leachate extraction system on the east side slope and on Corridor 7 of your disposal facility. You should attach this approval directly to the plan of operation approval issued by the Department on December 19, 1984.

The modifications to the gas and leachate extraction system were made as a result of methane detects in the gas monitoring probes on the east side of the site. Gas extraction wells located along the east side of the site (GW14, GW15, and GW16) had been determined to be ineffective in controlling the migration of gas. To address these issues, the following construction activities took place:

* Gas extraction wells GW14, GW15, and GW16 were abandoned.

* Gas and leachate extraction wells LGW321, LGW322, LGW323, LGW324, LGW325, and the associated header lines were installed.

* A compacted clay barrier wall was constructed at the toe of the east slope, followed by the installation of a perforated gas migration control pipe between the wall and the HWU.

* Gas monitoring probes were installed within the waste, west of the compacted clay barrier wall, and gas tee monitoring probes were installed east of the barrier wall to detect migration and monitor system performance.

The construction documented in this report also includes a portion of the Corridor 7 gas and leachate extraction system. The construction included the following:

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* Installation of gas and leachate extraction well LGW326S (shallow - above the north barrier wall) and LGW326D (deep - below the north barrier wall). The two wells were constructed in a single borehole and were connected to a combination gas and leachate header pipe.

* The gas header pipe along the toe of the east side of the site was extended north and around the northeast corner of the site.

* Gas monitoring probe GP4 was installed through the final cover of the Corridor 7 east slope.

The rest of the Corridor 7 gas extraction system is planned to be completed in the 1994 construction season.

The construction documented in this report has been performed adequately, however I do have a few comments. First, the Department's July 27, 1993 Plan Modification approval letter recommended in the cover letter that GMW20 and GMW21 not be abandoned for a year or two. They had methane detects in the past and would therefore be useful in determining the performance of the newly constructed gas-migration control system. However, due to an oversight, these wells were abandoned. Other wells exist to monitor system performance. Second, jetting of the horizontal gas extraction pipes was required by condition 3 of the Department's July 27, 1993 Plan Modification approval letter. This jetting was performed, but neither the cleaning of GT-1 nor GT-2 was successful. This demonstrates the questionable usefulness of these horizontal extraction pipes.

This approval letter requires LRC to complete Groundwater Monitoring Well Information Forms and Parameter Sampling Required Forms for all monitoring points and parameters added or deleted by this approval. Samples of these forms are included.

Please call Ken Hein at (414)562-9645 or Cindy Cook at (608)267-3542 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

encl.

cc: Ken Hein - SED
Thomas Melzer - Town of Mount Pleasant
Fred Larson - City of Racine
Rich Weber - Warzyn

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION
APPROVAL FOR THE
LAND RECLAMATION COMPANY LANDFILL, # 0572

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the facility was known as Land Reclamation, Ltd. (LRL).

2. A conditional plan of operation approval was issued by the Department for the facility on December 19, 1984.

3. Warzyn Engineering, Inc., on behalf of LRC, submitted construction documentation required by condition 54 of the plan of operation approval.

4. The information submitted as construction documentation includes a report submitted by Warzyn Engineering, Inc., on behalf of LRC, entitled, "Construction Observation Report, East Slope and Corridor 7, Gas and Leachate Extraction System, Land Reclamation Landfill," and dated December 22, 1993.

5. The $2000 construction documentation fee ($1000 for the review of the document and $500 each for two construction inspections) was received on January 31, 1994.

6. Additional documents considered in connection with the review of the construction documentation include the following:

   a. The December 19, 1984 plan of operation approval.

   b. The March 31, 1988 modification to the hazardous waste closure and long-term care plan.

   c. The July 27, 1993 plan of operation modification approval for the gas extraction system for Corridor 7 and the remedial gas system for the east slope.

   d. A letter from Warzyn, on behalf of LRC, dated July 13, 1993 outlining the waste disposal plan for the excavation spoils.

   e. Other Departmental correspondence pertaining to the LRC landfill.

7. The special conditions set forth below are needed to assure that the facility is constructed and operated in an environmentally sound fashion.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(4)(b), Stats. and NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

2. If the conditions of approval set forth below are complied with, the applicant will have demonstrated that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the proposed construction documentation for construction of the east slope and Corridor 7 gas and leachate extraction system of the Land Reclamation Landfill subject to the following conditions:

1. LRC shall complete Groundwater Monitoring Well Information Forms and Parameter Sampling Required Forms for all environmental monitoring points and parameters added or deleted by this approval.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the condition of this approval does not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision has been mailed, or otherwise served by the Department, to file your decision with the appropriate circuit

court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: JUL 1 3 1994

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Lakshmi Sridharan

Lakshmi Sridharan, PhD., P.E., Chief
Solid Waste Management Section

Cindy M. Cook

Cindy Cook, P.E.
Solid Waste Management Section

WISCONSIN
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State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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FILE REF: FID #252076990
Racine Co.
SW
Approvals
HW Lic

MAR 3 1 1995

Mr. Hank Koch, Operations Manager
Land Reclamation Company
2000 Oakes Road
Racine, WI 53406

SUBJECT: Modification to the Plan of Operation Approval for Corridors 8, 9 and 10, Land Reclamation Company Landfill, License # 0572, WID 076171008, Racine, WI

Dear Mr. Koch:

I am pleased to inform you that your requested modifications to your plan of operation approval have been reviewed and approved. The Department believes that the proposed modifications will not have an adverse effect on the performance of your landfill provided the conditions in the enclosed conditional plan of operation approval modification are fulfilled. You should attach this conditional plan of operation approval modification directly to the plan of operation approval issued on December 19, 1984.

The plan of operation modification approved in this letter include design changes to Corridors 8, 9 and 10. The modification consists of adding a composite liner at the base of the Corridor, and a design to handle the leachate and gas generated within Corridor. The base liner will consist of a composite clay/geosynthetic liner system made up of a 5-foot thick compacted clay liner overlain by a 60-mil thick HOPE geomembrane. A geotextile blanket will cushion the geomembrane from the one-foot stone drainage blanket which overlays the geomembrane.

The east sidewall of Corridor 8, 9 and 10 will consist of a 7-foot thick compacted clay West Barrier Wall of the Hazardous Waste Unit with granular drainage layers above and below the compacted clay. The west sidewall will consist of a 5-foot thick compacted clay liner over the City of Racine site, overlain with a granular drainage layer.

A single, Schedule 120 PVC pipe will be placed at a 1% slope down the center of the phase, and will transmit the leachate by gravity to a sump located at the south end of the phase. Leachate will be pumped up a sideslope riser through a metering manhole to MH13, and discharge in the City of Racine sewer.

The final cover for Corridors 8, 9 and 10 is a combination of the extended

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RCRA final cover over the hazardous waste unit (HWU) and a 4-foot thick compacted clay cover. The extended RCRA final cover extends from the HWU to above the west edge of the base composite liner. The 4-foot thick compacted clay cover will tie-in with the extended RCRA cap and cover the rest of the phase to the west.

Four vertical active gas extraction wells will be installed in Corridors 8, 9 and 10. The wells will be drilled to within 10 feet of the base of the landfill and will consist of perforated 6-inch diameter Schedule 120 PVC pipe within a 36-inch borehole. The annular space around the perforated pipe will be filled with a clear stone pack. The gas header pipe will be connected to the header system for the rest of the landfill. Gas that is extracted from Corridors 8, 9 and 10 will combine with that from the rest of the landfill and, after being processed, will be conveyed to the Johnson Wax Corporation for utilization.

Please call Cindy Cook at (608)267-3542 or Ken Hein at (414)263-8647 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

LS:cmc

cc: Ken Hein - SED
Ed Lynch - HW/3
Thomas Melzer - Town of Mt. Pleasant
Rich Weber - Montgomery Watson, Milwaukee
Deb Nelson - Montgomery Watson, Madison

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL PLAN OF OPERATION
APPROVAL MODIFICATION FOR THE
LAND RECLAMATION COMPANY LANDFILL (# 0572)

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the owner was known as Land Reclamation, Ltd. (LRL).

2. The Department issued a conditional plan of operation approval for the facility on December 19, 1984.

3. On January 18, 1994, the Department received a plan modification request from Warzyn, Inc., on behalf of LRC, entitled, "Plan Modification, Corridors 8, 9 and 10, Land Reclamation Company Landfill". The submittal consisted of the report and associated plan sheets and was dated January 14, 1994.

4. Additional information submitted in connection with the modification request includes the following:

   a. A letter dated June 17, 1994 from Warzyn, Inc. to the Department. The letter outlines proposed design changes to the Corridors 8,9 and 10 plan modification request.

   b. A facsimile received by the Department on March 20, 1995 containing comments on the draft plan modification approval.

5. The $1500 plan review fee was received by the Department on February 8, 1994.

6. The special conditions set forth below are needed to assure compliance with chapters NR 500-520, Wis. Adm. Code. If the special conditions are complied with, the proposed modifications will not inhibit compliance with the standards set forth in chapters NR 500-520, Wis. Adm. Code.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(3), Stats., to modify a plan of operation approval if the modification would not inhibit compliance with chapters NR 500-520, Wis. Adm. Code.

2. The Department has authority to approve a plan of operation with special conditions if the conditions are needed to ensure compliance with chapters NR 500-520, Wis. Adm. Code.

3. Conditions of approval set forth below are needed to ensure compliance with chs. NR 500-520, Wis. Adm. Code.

4. In accordance with the foregoing, the Department has the authority under s. NR 144.44 Stats. to issue the following conditional plan of operation approval modification.

CONDITIONAL PLAN OF OPERATION APPROVAL MODIFICATION

The Department hereby approves the plan of operation modification for Corridors 8, 9 and 10 at the Land Reclamation Company landfill, subject to the following conditions:

Design and Construction

1. All clay layers in the liner shall be constructed in lift heights no greater than 6 inches after compaction using footed compaction equipment having feet at least as long as the loose lift height. Clay shall be processed prior to compaction to allow for moisture content readjustment as needed. Clod size shall be no greater that 4 inches. All compaction equipment utilized shall have a minimum static weight of 30,000 pounds.

2. A sufficient number of passes of the compaction equipment shall be made over each lift of clay to ensure complete remolding of the clay.

3. All clay shall be compacted to 90% modified or 95% standard Proctor density at a moisture content at least 2% wet of optimum based on the characteristics of the appropriate Proctor curve for the clay being placed or at a moisture content within a window of acceptable water contents with the left-most bound being the line of optimums, the right-most bound being the zero-air voids line, and the lower bound being the minimum dry unit weight needed to ensure adequate shear strength. A method to determine the line of optimums shall be proposed and submitted to the Department for approval.

4. The thickness of clay at the tie-in between the 4-foot clay final cover and the RCRA cover shall be increased such that 3 feet of clay remain below the anchor trench of the geomembrane component in all cases.

5. The north edge of the geomembrane shall be covered and protected with plywood or some other suitable material to prevent vehicular or environmental damage to the geomembrane before the first lift of refuse is placed.

6. Construction of the geomembrane component of the liner and final cover

shall comply with the following:

a. Polyethylene geomembranes composed of resins specifically formulated for waste containment purposes shall be utilized in the construction of the geomembrane components of the composite liner and the composite capping layer. Use of alternate geomembrane materials shall be proposed to the Department for review and approval prior to utilization.

b. The geomembrane installation quality assurance consultant shall be an independent party not affiliated with the owner, manufacturer, or installer.

c. Quality assurance personnel shall be on site and performing their assigned duties at all times that the geomembrane is being deployed, seamed, or tested.

d. The geomembrane panels shall be installed parallel to all slopes in excess of 10%, providing alignment of the seams in a direction along and not across the slope.

e. Geomembrane panels made of polyethylene resins shall be welded by double-tracked, fusion welding machines for all linear seams. Corners, butt seams and long repairs shall be fusion welded where possible. Extrusion or fusion welding shall be used for all other repairs, detail work and patches. Department approval shall be obtained prior to use of any other welding method for either panel seaming, repairs, or construction of details.

f. Department approval shall be obtained prior to geomembrane installation for ambient temperatures below 32° F.

g. Wrinkles in the geomembrane component which are higher than they are wide, shall be smoothed or cut out and repaired prior to covering with soil. Guidance to machine operators placing soil on the geomembrane component shall be provided by the use of an observer with an unobstructed view of the advancing lift of soil.

h. To prevent movement and folding of wrinkles, placement of soil over the membrane shall be performed during cooler temperature periods to the extent possible using methods of placement which minimize wrinkling.

i. Repairs for cuts to correct wrinkles and fishmouths longer than one foot shall include terminating the cut in circular holes at each end of the cut prior to patching and welding.

j. Installed geomembrane shall be covered with earthen material within 30 days of completing quality control and quality assurance testing of the installation.

k. All areas of composite liner and leachate collection blanket

shall be covered by an initial lift of solid waste or other acceptable material as soon as possible following Department approval to begin waste placement. After December 31 of the year following construction of the composite liner, any areas of liner and leachate collection blanket not yet covered by the initial lift of waste shall be investigated for damage after freezing conditions have ceased. The owner shall propose an investigative program to the Department for review and approval prior to implementing the investigation.

1. All areas of completed composite capping layer of the final cover shall be covered with the drain layer material and rooting zone material after completion of documentation of geomembrane construction quality assurance. Any topsoil and seeding not completed during the construction season in which the geomembrane was installed shall be completed no later than June 30 following geomembrane installation.

7. Construction of the final cover system shall comply with the following additional elements:

   a. The topsoil on the final cover system shall be seeded with a cover crop within 30 days of placement of the topsoil.

   b. The drain layer shall be terminated for a 10 foot radius around penetrations of the final cover structure, including gas extraction well risers, leachate headwell risers, and leachate collection pipe access risers. The soil placed over the geomembrane around the penetrations shall be rooting zone soil.

   c. Penetrations of the geomembrane component of the composite capping layer shall be fitted with polyethylene pipe boots welded to membrane at the same angles which the penetrations make with the final cover slope.

8. A narrative shall be submitted to the Department at least two weeks prior to the start of construction which describes the method planned to be used in monitoring the leachate headwell. If electronic water level indicators are proposed to be used, please indicate how condensate on the side of the riser will be differentiated from the actual head level.

9. Field shear and peel tests of geomembrane seams and membranes shall be performed using standardized specimen sizes in tensile testing machines with mechanically or electrically controlled rates of jaw separation. The tensile testing machine shall be equipped with electrically controlled and smoothly moving jaw separation apparatus, capable of adjustments and defined settings for jaw separation rate, and displaying jaw separation rates and tensile loadings exerted on the geomembrane samples. Tensile testing machines shall be accompanied by documentation for calibration conducted within one month of the start of geomembrane installation. Geomembrane samples shall be prepared for

field analyses by use of templates and cutting tools that prepare uniformly sized samples.

10. A preconstruction report shall be submitted to the Department no later than seven days prior to the preconstruction meetings for the construction of the geomembrane component of the composite liner and the composite capping layer. At a minimum, one copy shall be provided to the central office in Madison and one copy shall be provided to the Southeast District office. The report(s) shall include contractor and product identification, revised details, and changes incorporated to address Department requirements. The preconstruction report shall include, at a minimum, the following:

    a. Any revisions and detail diagrams incorporating all changes, agreements, and instructions between the owner, the installer, and the quality assurance contractor. The report shall include any proposed changes to details of the design or construction required by this approval. The report shall include a summary of any proposed changes to the quality assurance manual. The report shall indicate the proposed limits of installation and schedule for construction of the composite liner or the composite capping layer.

    b. Identification of the manufacturer of the geomembrane and other geosynthetics used in construction, manufacturer qualifications, technical specifications of the resin and polymer selected, and results of the manufacturer's quality control tests on the geomembranes supplied to the project.

    c. Identification of the installation contractor, contractor qualifications and onsite supervisory staff, and proposed seaming methods and equipment. The report shall include a quality control plan that the installation contractor will follow in the installation of the geomembrane liners. The report shall describe contractor-specific welding equipment and methods, panel overlaps, patching and seam repair procedures, seamer qualifications, use of trial seams, use of nondestructive and destructive tests, and acceptable limits on subgrade and weather conditions.

    d. Identification of the quality assurance consultant indicating on-site staff and a summary of their qualifications and experience. The report shall indicate the proposed equipment and test methods to be used for construction quality assurance and the laboratory to be used to testing geosynthetic samples. The report shall include a copy of the construction quality assurance manual to be used during documentation of construction.

    e. Frequency of testing geomembrane materials and the proposed test methods to be used, including the identification of destructive and nondestructive testing methods.

f. A proposed method of removing coarse gravel and cobbles on the surface of the compacted clay component, a construction method to assure a smooth surface prior to geomembrane placement, and a documentation method to record the elimination of unacceptable material on the surface of the compacted clay.

g. Panel layout pattern for geomembrane placement.

h. Source and construction of specialty connections between the geomembrane component and any penetrations, and any proposed revisions to details of connecting pipe penetrations to the geomembrane. The report shall identify methods to test the integrity of seams and connections to penetrations of the geomembrane.

i. Identification of the fabricator of geotextiles and other geosynthetics used in site construction, technical specifications of the products and materials to be used, methods used to bond the materials together and to connect panels together, installation contractor, contractor qualifications, and onsite supervisory staff.

11. Daily inspector's records shall be prepared for each day that significant geomembrane installation is either attempted or accomplished. The records shall describe changes or adaptations to the approved construction practices, progress achieved, and nonconforming conditions of subgrade, geomembrane, pipe, connections, and any specialty sections. The records shall be included in the construction documentation required by this approval. The records shall also contain the following:

a. Identification and location of geomembrane panels placed, with modifications of the fabrication plan noted.

b. Location of field seams and ends of panels, and results of all destructive and nondestructive field tests of test seams and installed seams.

c. Methods and procedural steps taken prior to field seaming of geomembrane panels.

d. Location of wrinkles that were large enough to double over and were cut out and repaired.

e. Location of repairs and destructive samples and the results of the nondestructive testing of those repairs.

f. Amount and location of geotextile and other geosynthetics used in construction of the composite liner, leachate collection system, and final cover system.

g. Weather conditions and constraints.

12. Construction inspections shall be performed at this facility as indicated below. The Southeast District office and central office shall be notified a minimum of one week prior to beginning each of the construction events listed below for the purpose of allowing the Department to inspect the work. A fee shall be paid to the Department for each required inspection in accordance with c. NR 520.04(5), Wis. Adm. Code. The inspection fees shall be paid at the time the construction documentation is submitted to the Department for review.

    a. Inspections for liner construction shall include:

        i. Construction of the geomembrane component of the liner.

        ii. Construction of the sideslope riser.

    b. Inspections for final cover construction shall include:

        i. Construction of the geomembrane component of the capping layer.

        ii. Construction of the gas extraction wells.

Documentation and Reporting Requirements

13. Conformance sampling and testing shall be conducted on geomembrane materials delivered on site and used in construction of the liner or final cover. Sampling shall be conducted by quality assurance staff. Testing shall be conducted by the quality assurance staff or by a quality assurance laboratory. Frequencies shall be no less than those listed in the following schedules. Conformance testing data shall be included in the construction documentation.

    a. Geomembrane thickness shall be tested upon receipt at the facility at the rate a minimum of 5 areas measured per roll.

    b. Geomembrane tensile properties (strength and elongation in yield and break) shall be tested at a minimum of one test per 40,000 ft^2 of geomembrane installed and a minimum of one test on rolls from each batch of resin used to manufacture rolls delivered on site.

    c. Geomembrane density and melt index of the polymer shall be tested at a rate of one test per 40,000 ft^2 of geomembrane installed and a minimum of one test on rolls from each batch of resin used to manufacture rolls delivered on site.

    d. Geomembrane environmental stress cracking resistance shall be tested at a rate of one test per 200,000 ft^2 of geomembrane installed unless documentation is provided that the manufacturer performed a minimum of one test for each batch of resin used to manufacture rolls delivered on site.

14. Prequalification tests for geomembrane welding machines shall be conducted by a minimum of two prequalification seams run per welding machine each day by each seaming technician performing geomembrane welding, with additional test runs following work interruptions or weather changes. Extrusion welding machine performance shall be verified by a minimum of one test seam per day per machine. A portion of each prequalification specimen shall be tested in the field for acceptable tensile strength. Test results shall be collated for documentation along with notes on date, ambient temperature, technician and seaming machine used to make the seam, and results of both field and laboratory tests.

15. Documentation of seams and connections shall be conducted on geomembrane materials used in construction of the liner or final cover. Field sampling and testing shall be observed by quality assurance staff. Laboratory testing shall conducted by the quality assurance staff or by a quality assurance laboratory. Sampling and testing shall be conducted at frequencies no less than those listed in the following schedules. Documentation of seams and connections shall be included in the construction documentation.

    a. Nondestructive field seam testing shall be performed on all seams of geomembrane attached by welding or mechanical attachments to other geomembrane sheet, plastic plate, and pipe penetrations wherever possible.

    b. Destructive field and laboratory seam test samples shall be taken at a rate of one sample per 500 feet of fusion seam accomplished, unless another frequency or spacing is approved by the Department. Destructive seam test samples shall be tested under the same protocol as the welding machine test seams.

    c. A destructive sample shall be taken from at least one end of each fusion weld and tested using a calibrated field tensile testing machine. Sampling may be waived for butt seams or seams subjected to extrusion welds of tee joints or repairs, where such welds are subjected to integrity tests specific to extrusion welds.

16. Site construction documentation shall be submitted to the to the Department for review and approval within 90 days of completion of construction of the liner, and within 90 days of completion of the final cover for the final cover segment. Three copies shall be submitted to the central office in Madison and one copy shall be submitted to the Southeast District office. Construction documentation shall comply with the format and technical requirements of chs. NR 500 and 516, Wis. Adm. Code, and the following:

    a. Plan sheets shall indicate the location of all soil and geomembrane test locations, geomembrane panel placement, geomembrane patches and seam repairs, geomembrane destructive sample locations, and pipe penetrations. All seams and panels

shall be identified on plan sheets with appropriate identification codes and markings indicating sequence of construction.

b. Plan sheets for liner construction documentation shall include location of manholes and header lines for the leachate drainage system, leachate headwells, and alignment of discharge pipelines. Plan sheets for final cover construction shall include the location of gas extraction wells, gas system lateral and header pipes, and the alignment of the final cover drainage systems.

c. Detail drawings shall be made and photographs shall be taken that record the construction of the following:

   i. Leachate line penetrations, leachate headwells, gas extraction wells and header and lateral pipes in the final cover, sequence of placement of construction materials, bedding and assembly of the lateral and header pipes, pipe joining details, and welded and mechanical attachments to penetrations and geomembrane.

   ii. Compaction methods used in placement of the clay component of the liner and final cover, including equipment specifications and number of passes.

   iii. Anchorage details for geosynthetics used in construction of the geomembrane of the final cover.

   iv. All manufactured components installed as part of construction, including leachate collection sump, sideslope riser, leachate conveyance piping and manholes, controls for the leachate pump, and gas extraction wells.

d. Narrative shall describe construction in chronological fashion. The description shall be based upon the daily inspector's reports required by this approval. The following shall be included:

   i. Any deviations from the approved plans and the rationale for such deviations.

   ii. Description of all actions taken to prepare or condition the compacted clay component and to eliminate coarse material in the surface of the compacted clay.

   iii. Description of controls and machinery used to place the leachate collection blanket on the composite liner or the drain layer and rooting zone soils on the composite capping layer in terms of machine weights, limits on machine maneuvers, lift thickness, and haulway and dumping controls.

   iv. A chronological record of the start and completion of

placing each component of the liner, or final cover.

v. Identification of contractors and subcontractors involved in the construction of soil layers, geosynthetics, piping systems, and other landfill appurtenances.

vi. Identification of the sources and product information for manufactured items used in site construction, including all geosynthetics, pipes, pumps, and collection tanks.

e. The report shall include narrative, observations, and tabulated data for all tests conducted on subgrade investigations, compacted clay and other soil materials used in construction of the liner, final cover, the leachate collection system, or the gas extraction system.

f. The report shall include narrative and tabulated data for all geomembrane installation and tests, including tests performed by the resin supplier, manufacturer, installer, and quality assurance consultant. Narrative and tabulated data shall be included for all tests of prequalification seams for all fusion and extrusion welders and welding technicians employed in geomembrane construction. Documentation shall include calibration of the tensile testing machine, conformance tests, and destructive and nondestructive tests. The narrative shall include identification of the geomembrane supplier and installer, material specifications of the installed geomembrane, and attachment and welding methods used on the project. An analysis of all geomembrane tests shall be presented. All raw data from geomembrane testing shall be appended to the report.

g. The report shall include documentation that the sideslope riser pumps and conveyance systems for leachate have been tested and are operating as designed. Documentation shall include results of pressure tests of the leachate conveyance piping, explanation of failed tests, and repairs and retests.

h. The report shall include identification of the sources and models of pumps and pump controls for the leachate collection system, piping used for the sideslope risers and discharge lines, and methods used to connect pipe segments of the sideslope risers and discharge lines for the leachate system.

i. Narrative shall be included which describes the geotextile used to cover the geomembrane in the liner and the final cover. The seaming method for geotextile or geocomposite panels shall be included.

j. The report shall identify seeding mixes and seeding rates used for revegetation of the topsoil, including use of any cover species, mulch, fertilizer, and other soil amendments.

k. Well logs depicting as-constructed features for each gas extraction well including: surface elevation and depth of borehole, elevation and length of perforated pipe, and elevation of gravel backfill, general soil backfill, and seals. The logs shall include a summary of the appearance of the wastes extracted as part of the drilling operation, liquids encountered, and presence of sludges or other wastes that might reduce the effectiveness of the wells or probes.

l. Documentation shall be included for any monitoring point removed, damaged, replaced, or repaired during construction.

m. The report shall include a signed statement by the persons listed below that the construction was completed in accordance with approved plans with any deviations noted:

   i. The installer's quality control person, including signed acceptance forms for subbase and completion of geomembrane.

   ii. Quality assurance staff.

   iii. Supervisor of earthwork construction.

The Department retains the jurisdiction either to require the submittal of additional information or to modify the approval at any time if, in the Department's opinion, further modifications are necessary. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial

review shall name the Department as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: MAR 31 1995

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

Cindy M. Cook

Cindy M. Cook, P.E.
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

Tim Kessenich

Tim Kessenich, Hydrogeologist
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

WISCONSIN
DEPT. OF NATURAL RESOURCES

George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESC

101 South Webster Street
Box 7921
Madison, Wisconsin 53707
DNR TELEPHONE 608-266-2621
DNR TELEFAX 608-267-3579
DNR TDD 608-267-6897
SOLID WASTE MGMT 608-266-2111
SOLID WASTE TELEFAX 608-267-2768

June 29, 1995

FILE REF: FID # 252076990
Racine Co.
SW
Approvals

Mr. Hank Koch, P.E.
Land Reclamation Company
1989 Oakes Road
P.O. Box 081220
Racine, WI 53408-1220

SUBJECT: Plan of Operation Approval Modification for a Special Waste Acceptance Program at the Land Reclamation Company Landfill (LRC), License # 0572, Racine, WI, WID: 076171008

Dear Mr. Koch:

I am pleased to inform you that your requested modifications to your plan of operation approval have been reviewed and approved. The Department believes that the proposed modifications will not have an adverse effect on the performance of your landfill provided the conditions in the enclosed conditional plan of operation approval modification are fulfilled. You should attach this conditional plan of operation approval modification directly to the plan of operation approval issued on December 19, 1984.

The proposed modification involves implementing a program at the landfill for the review and disposal of special waste. Currently, Department approval is required of all industrial process wastes prior to disposal at the site. This modification approval will allow LRC to accept categorized wastes and dispose of them in a specified manner without first seeking Department approval. This approval also requires that a summary of the special waste program be submitted to the Department on an annual basis.

This letter approves materials suitable for landfilling. Please be reminded that petroleum contaminated soils are also subject to NR 700, Wis. Adm. Code

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regulations and pending NR 419, Wis. Adm. Code regulations.

Please call Cindy Cook at (608)267-3542 or Ken Hein at (414)229-0843 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

LS:cmc

cc: Ken Hein - SED
Tim Kessenich - SW/3
Thomas Melzer - Town of Mt. Pleasant
Rick Jones - City of Racine

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL PLAN OF OPERATION
APPROVAL MODIFICATION FOR THE
LAND RECLAMATION COMPANY LANDFILL (# 0572)
WID 076171008

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the owner was known as Land Reclamation, Ltd. (LRL).

2. The Department issued a conditional plan of operation approval for the facility on December 19, 1984.

3. The Department received a report on January 31, 1994 submitted by LRC which included a plan modification request for a special waste program approval. The report was dated January 27, 1994. The Department received an update to the plan modification request on March 27, 1995.

4. The $1,500 plan review fee was received by the Department on March 21, 1994.

5. Additional facts relevant to the review of the plan modification include the following:

   a. The special waste plan for this facility will be a more efficient process than the current procedure for approving special wastes.

   b. The special wastes proposed for disposal at this facility are not expected to significantly alter leachate generation rates or characteristics.

6. The special conditions set forth below are needed to assure compliance with chapters NR 500-520 and NR 660-685, Wis. Adm. Code. If the special conditions are complied with, the proposed modifications will not inhibit compliance with the standards set forth in chapters NR 500-520 and NR 660-685, Wis. Adm. Code.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(3), Stats., to modify a plan of operation approval if the modification would not inhibit compliance with chapters NR 500-520 and NR 660-685, Wis. Adm. Code.

2. The Department has authority to approve a plan of operation with special conditions if the conditions are needed to ensure compliance with chapters NR 500-520 and NR 660-685, Wis. Adm. Code.

3. Conditions of approval set forth below are needed to ensure compliance with NR 500-520 and NR 660-685, Wis. Adm. Code.

4. In accordance with the foregoing, the Department has the authority under s. NR 144.44 Stats. to issue the following conditional plan of operation approval modification.

CONDITIONAL PLAN OF OPERATION
APPROVAL MODIFICATION

The Department hereby approves the plan of operation approval modification for a special waste acceptance program at the Land Reclamation Company landfill (LRC), subject to the following conditions:

1. The disposal of special wastes at this facility shall comply with the analytical protocols, concentration limits, and disposal operations listed in the tables contained in the "Land Reclamation Company Landfill: Special Waste Management Plan" dated January 27, 1994 and updated on March 23, 1995.

2. When changes in the production process of an industrial generator occur which may produce a change in the physical or chemical characteristics of an approved waste, the waste shall be retested according to the approved protocol to determine if the waste is acceptable for disposal at the landfill.

3. The annual report required for this facility shall include a summary of the special waste program over the previous calendar year including the following:

   a. Total volume and tonnage of special wastes and tabulation by waste category for each of the waste types in the Special Waste Management Plan.

   b. Computation of the total volume of all wastes disposed at this facility and the proportion of special wastes compared to the total volume of waste landfilled.

   c. A list of the wastes which did not meet the LRC imposed concentration limits and were still accepted for disposal, and the reason for acceptance.

   d. A list of the wastes which were denied disposal at the landfill and the reason for denial.

   e. Any proposed changes to the waste categories, analytical

protocols or disposal operations.

f. Any problems encountered with the special waste program and their resolution.

The Department retains the jurisdiction either to require the submittal of additional information or to modify the approval at any time if, in the Department's opinion, further modifications are necessary. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: JUN 2 9 1995

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

FOR LS

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

Cindy M. Cook

Cindy M. Cook, P.E.
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

WISCONSIN
DEPT. OF NATURAL RESOURCES

George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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SOLID WASTE TELEFAX 608-267-2768

File Ref: FID #252076990
Racine Co.
SW
Approvals

NOV 2 1995

RECEIVED

NOV 0 3 1995

D.N.R. SED Hqtrs.
Milwaukee, WI

Hank Koch
Land Reclamation Company
2000 Oakes Road
Racine, WI 53406

SUBJECT: Construction Documentation Approval, Corridor 7, North Slope Final Cover and Completion of Corridor 7, East Slope Final Cover, Land Reclamation Landfill, #0572, Racine County, WI.

Dear Mr. Koch:

I am pleased to inform you that your Construction Documentation has been approved for the clay final cover of the north slope of Corridor 7 of your disposal facility. You should attach this approval directly to the plan of operation approval issued by the Department on December 19, 1984.

This letter approves the construction of the Corridor 7 north slope final cover, which was documented in a report submitted to the Department by Montgomery Watson, on behalf of LRC, entitled, "Construction Observation Report, Corridor 7, North Slope Final Cover, Land Reclamation Company Landfill." The report was dated February 28, 1995 and was received by the Department on March 3, 1995. Construction began in October 1993 and continued until October 1994. Construction activities included the following: exposure of the top of the north sidewall liner in Corridor 7 to facilitate tie-ins; additional liner and drainage blanket construction; exposure and tie-in of the west edge of the east slope final cover and the north edge of the RCRA Phase II final cover; construction of a NR 500, Wis. Adm. Code, final cover on the north slope of Corridor 7; construction of surface water drainage features; and the placement of compost followed by seeding, fertilization and mulching.

This letter also approves the construction documented in the September 14, 1994 report submitted to the Department by Warzyn, Inc., on behalf of LRC, entitled, "Addendum to the Construction Observation Report, Corridor 7 East Slope Final Cover, Land Reclamation Company Landfill". This report addresses the activities performed for the completion of the construction of the final cover of the east slope of Corridor 7. The majority of Corridor 7 had been constructed earlier and its documentation approved in an April 19, 1994 letter from the Department. The addendum submitted to the Department contains documentation of Area II of the east slope of Corridor 7 including:

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redocumentation of existing clay cap thickness; construction of a sideslope surface water diversion berm; and placement of topsoil and compost followed by seeding, fertilizing, and mulching.

Please call Ken Hein at (414)562-9645 or Cindy Cook at (608)267-3542 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

cc: Ken Hein - SED
Mary Carrington - Town of Mount Pleasant
Fred Larson - City of Racine
Rich Weber - Warzyn

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION
APPROVAL FOR THE
LAND RECLAMATION COMPANY LANDFILL, # 0572

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the facility was known as Land Reclamation, Ltd. (LRL).

2. A conditional plan of operation approval was issued by the Department for the facility on December 19, 1984.

3. Montgomery Watson Americas, Inc. (formerly Warzyn Engineering, Inc.), on behalf of LRC, submitted construction documentation required by condition 54 of the plan of operation approval.

4. The information submitted as construction documentation includes the following:

   a. A report submitted by Warzyn Engineering, Inc., on behalf of LRC, entitled, "Addendum to the Construction Observation Report, Corridor 7 East Slope Final Cover, Land Reclamation Landfill," and dated September 14, 1994.

   b. A report submitted by Montgomery Watson Americas, Inc, on behalf of LRC, entitled, "Construction Observation Report, Corridor 7 North Slope Final Cover", and was dated February 28, 1995.

5. The $1000 construction documentation fee for the north slope construction was received on June 26, 1995.

6. Additional documents considered in connection with the review of the construction documentation include the following:

   a. The December 19, 1984 plan of operation approval.

   b. The March 31, 1988 modification to the hazardous waste closure and long-term care plan.

   c. Other Departmental correspondence pertaining to the LRC landfill.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(4)(b), Stats. and NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal

facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the proposed construction documentation for the Corridor 7 north slope final cover and the completion of the Corridor 7 east slope final cover of the Land Reclamation Landfill.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the condition of this approval does not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision has been mailed, or otherwise served by the Department, to file your decision with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: NOV 2 1995

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Lakshmi Sridharan, PhD., P.E., Chief
Solid Waste Management Section

Cindy M. Cook

Cindy Cook, P.E.
Solid Waste Management Section

Conditions/Closure Modification SEE HW/CA

State of Wis ...MENT OF NATURAL RESOURCES

Tommy G. Thompson
George E. Meyer, Se...

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101 South Webster Street
Madison, Wisconsin 53707-7921
DNR TELEPHONE 608-266-2621
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DNR TDD 608-267-6897
SOLID WASTE MGMT 608-266-2111
SOLID WASTE FAX 608-267-2768

RECEIVED
MAY 23 1996
D.N.R. SED Hqtrs.
Milwaukee, WI

MAY 22 1996

Mr. Hank Koch
1989 Oakes Road
P.O. Box 081220
Racine, WI 53408-1220

FILE REF: FID # 252076990
Racine
SW
Approvals

SUBJECT: Construction Documentation Approval for the South Slope of the Hazardous Waste Unit, Land Reclamation Company Landfill, Racine County

Dear Mr. Koch:

This letter serves to inform you that your construction documentation has been reviewed and approved for the construction of the South Slope of the Hazardous Waste Unit at your disposal facility. You should attach this approval directly to the plan of operation approval issued by the Department on December 19, 1984.

This letter approves the South Slope construction of the Hazardous Waste Unit. The South Slope construction was required by the Department's March 31, 1988 approval letter which addressed "Modifications to the Hazardous Waste Closure and Long-Term Care Plan". The March 1988 approval required that the south slope of the hazardous waste unit be stabilized such that the resulting slope be at a maximum 3:1, and that surface water be managed to minimize erosion.

The construction documentation, which was prepared by Montgomery Watson, was entitled, "Construction Observation Report, South Slope Construction, Hazardous Waste Unit, Land Reclamation Company Landfill." The report was received by the Department on January 15, 1992. The report discussed the undercutting of unsuitable soils on the south slope, the placement of general fill to bring the slope to 3:1, and placement of a 4-foot thick recompacted clay cover. Subsequently, Addendums No. 1 and 2 were also submitted to the Department on March 16, 1993 and January 28, 1994, respectively.

Addendum No. 1 discussed the construction of a diversion berm on the south slope, placement of the topsoil layer, vegetation of the slope, and the repair and construction of drainage features for the RCRA cap on the Hazardous Waste Unit. The construction documented in Addendum No. 1 took place from November 1991 to May 1992. Addendum No. 1 also outlined additional cap repair, landscaping and surface water management device repair which would need to be accomplished.

Addendum No. 2 to the Construction Observation Report for the South Slope Construction documented construction activities which took place from April through October of 1993. The construction activities included the evaluation and repair of the clay cap, erosion rills and topsoil thickness as well as

Mr. Koch

revegetating the south slope. Other construction activities documented by this report included south slope and RCRA Phase I drainage improvements as well as the desilting of gas and leachate extraction wells and the over seeding of areas of the RCRA Phase I cap.

Please call Ken Hein at (414)562-9645 or Cindy Cook at (608)267-3542 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

LS:cmc

cc: Ken Hein - SED
Rich Weber - Warzyn, Inc., Milwaukee Office

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL
FOR THE CONSTRUCTION OF SOUTH SLOPE CONSTRUCTION
OF THE
LAND RECLAMATION COMPANY LANDFILL, # 0572

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the facility was known as Land Reclamation, Ltd. (LRL).

2. A conditional plan of operation approval was issued by the Department for the facility on December 19, 1984.

3. The information submitted as construction documentation includes the following:

   a. A report submitted by Warzyn, Inc. (Warzyn), on behalf of LRC, entitled, "Construction Observation Report, South Slope Construction, Hazardous Waste Unit, Land Reclamation Company". The report was dated January 14, 1992 and was received by the Department on January 15, 1992.

   b. A report submitted by Warzyn, on behalf of LRC, entitled, "Addendum to the Construction Observation Report, South Slope Construction Hazardous Waste Unit, Land Reclamation Company" The report was dated March 15, 1993 and was received by the Department on March 16, 1993.

   c. A report submitted by Warzyn, on behalf of LRC, entitled, "Addendum No. 2 to the Construction Observation Report South Slope Construction, Hazardous Waste Unit, Land Reclamation Company Landfill". The report was dated January 24, 1994 and was received by the Department on January 28, 1994.

4. The $1000 construction documentation review fee was received by the Department on February 19, 1992.

5. Additional documents considered in connection with the review of the construction documentation include the following:

Mr. Koch

a. A Solid Waste Facility Inspection Form dated February 4, 1993 regarding an inspection made by Ken Hein of the Department regarding the LRC landfill.

b. A memo to the file dated February 24, 1993 and written by Hank Koch of LRC regarding the WDNR inspection of the south slope erosion.

c. Other Departmental correspondence pertaining to the LRC landfill.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(4)(b), Stats. and NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the construction documentation for South Slope Construction of the Hazardous Waste Unit of the Land Reclamation Landfill.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the condition of this approval does not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision has been mailed, or otherwise served by the Department, to file your decision with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial

review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: MAY 2 < 1996

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Lakshmi Sridharan

Lakshmi Sridharan, PhD., P.E., Chief
Solid Waste Management Section

Cindy M. Cook

Cindy M. Cook, P.E.
Solid Waste Management Section

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Tommy G. Thompson, Governor
George E. Meyer, Secretary

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SOLID WASTE MGMT 608-266-2111
SOLID WASTE FAX 608-267-2768

AUG 1 1996

Mr. Hank Koch
1989 Oakes Road
P.O. Box 081220
Racine, WI 53408-1220

FILE REF: FID # 252076990
Racine
SW
Approvals

SUBJECT: Construction Documentation Approval for the Barrier Wall of the Hazardous Waste Unit, Land Reclamation Company Landfill, Racine County

Dear Mr. Koch:

This letter serves to inform you that your construction documentation has been reviewed and approved for the construction of the Barrier Wall of the Hazardous Waste Unit at your disposal facility. You should attach this approval directly to the plan of operation approval issued by the Department on December 19, 1984.

This letter approves a portion of the Barrier Wall construction of the Hazardous Waste Unit. The Barrier Wall construction was required by the Department's March 31, 1988 approval letter which addressed "Modifications to the Hazardous Waste Closure and Long-Term Care Plan". The March 1988 approval required that a barrier wall be constructed between the hazardous waste unit and the municipal solid waste portions of the landfill. The Barrier Wall consists of a seven foot thickness of compacted clay with a one foot granular drainage blanket on either side of the clay layer. The design also includes two horizontal gas extraction lines which are placed beneath the interior granular layer.

The construction documentation, which was submitted by RMT, Inc., was entitled, "Construction Documentation Report for Barrier Wall Construction, Prepared for Land Reclamation Company." The report was received by the Department on July 18, 1996. The report contains documentation for barrier wall construction which took place in the 1994, 1995 and 1996 construction seasons. Documentation of the 1994 and 1995 barrier wall construction had been previously submitted to the Department in the form of a letter report by Warzyn and Montgomery Watson, respectively.

The portion of the barrier wall which was constructed in 1996 remains to be tied-in with the RCRA cap. This will allow LRC to dispose of any hazardous waste which would be excavated as a result of any work performed on the hazardous waste unit. The area left open is approximately 10 to 30 feet wide.

Please call Ken Hein at (414)562-9645 or Cindy Cook at (608)267-3542 if you have any questions regarding this approval.

Sincerely,

Lakshmi Sridharan

Lakshmi Sridharan, Ph.D., P.E., Chief
Bureau of Waste Management

LS:cmc

cc: Ken Hein - SED
Katherine Martin - RMT
Rich Weber - Montgomery Watson, Milwaukee Office

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL
FOR THE CONSTRUCTION OF BARRIER WALL
OF THE
LAND RECLAMATION COMPANY LANDFILL, # 0572

FINDINGS OF FACT

The Department finds that:

1. Land Reclamation Company (LRC) owns and operates a hazardous and solid waste disposal facility located in the N 1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin. Prior to May 1, 1989, the facility was known as Land Reclamation, Ltd. (LRL).

2. A conditional plan of operation approval was issued by the Department for the facility on December 19, 1984.

3. The information submitted as construction documentation includes the following:

   a. A report submitted by RMT, Inc., on behalf of LRC, entitled, "Construction Documentation Report for Barrier Wall Construction, Prepared for Land Reclamation Company". The report was dated July 18, 1996 and was received by the Department on July 18, 1996.

   b. A letter report submitted by Montgomery Watson, on behalf of LRC, entitled, "Construction Observation Letter Report, 1995 West Barrier Wall Phase III Construction, Land Reclamation Company Landfill" The report was dated January 4, 1996.

   c. A letter report submitted by Warzyn, on behalf of LRC, entitled, "Construction Observation Report, 1994 West Barrier Wall Construction, Land Reclamation Company Landfill". The report was dated September 21, 1994.

4. The $1500 construction documentation review fee was received by the Department on July 29, 1996.

CONCLUSIONS OF LAW

1. The Department has authority under s. 144.44(4)(b), Stats. and NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

CONSTRUCTION DOCUMENTATION
APPROVAL

The Department hereby approves the construction documentation for Barrier Wall Construction of the Land Reclamation Landfill.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the condition of this approval does not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision has been mailed, or otherwise served by the Department, to file your decision with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: AUG 1 1996

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Lakshmi Sridharan

Lakshmi Sridharan, PhD., P.E., Chief
Bureau of Waste Management

Cindy M. Cook

Cindy M. Cook, P.E.
Bureau of Waste Management

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary
Gloria L. McCutcheon, Regional Director

Sturtevant Service Center
9531 Rayne Road, Suite IV
Sturtevant, Wisconsin 53177
Telephone 262-884-2300
FAX 262-884-2307
TTY 262-884-2304

July 2, 2004

FID # 252076990
SW/Approvals

Mr. Daniel Otzelberger, P.E.
Republic Services
Kestrel Hawk Recycling and Disposal Facility (RDF)
1989 Oakes Road
Racine, WI 53406

FIST SUB# 55378 55987
DEC # 11531
DEC # 12615

Subject: Remaining Old Site Final Cover: Use of LLDPE Geomembrane, Closure Schedule for the Remaining RCRA and non-RCRA Final Cover for the "Old Site", Extension of RCRA Cap to West Edge of Corridors 8, 9 & 10 Baseliner (RCRA Phase 3 Final Cover) and Northwest expansion Final Cover Closure Cost to include remaining RCRA and non-RCRA Final cover of the "Old Site" - Plan Modification Approval for the Kestrel Hawk Landfill, Lic# 00572

Dear Mr. Otzelberger:

We have completed our review of your request for a RCRA Closure Plan Modification for the Kestrel Hawk Landfill, dated July 31, 2003 with subsequent addenda and your request for use of LLPDE geomembrane in the RCRA Area of the Kestrel Hawk Landfill, dated April 7, 2003.

Based on our review we have determined that we are able to conditionally approve your above requests. Please keep the attached plan approval modification with the plan of operation approval for this facility.

Condition 1 of this approval does not allow the continued disposal of waste in the unclosed portions of landfill discussed in the July 31, 2003 plan modification request, with addenda. This includes drill cuttings. The reason for this condition is because these areas of landfill, along with the old City of Racine Landfill and the Hazardous Waste Landfill, were originally approved to be closed several years ago, but were not. In addition, the remaining unclosed RCRA portion is above the barrier containment wall. No waste may be placed outside this wall.

Currently the only portion of the Kestrel Hawk Landfill that the Department considers to be "active" for waste disposal is the Northwest Expansion. Republic Services may propose a disposal method for future drill cuttings in a plan modification request which may include disposal in certain areas for certain classified drill cuttings in the Hazardous Waste Unit within the barrier containment structure.

The Department is unable to approve your request for an exemption from the March 31, 1995 Plan of Operation Modification Approval by the Department for design changes to corridors 8, 9, and 10 which requires a composite RCRA final cover over the area labeled Area 1 on the September 4, 2003 addendum figure 1A. Condition 2a requires Republic to submit a schedule to the Department within 60 days for when Republic plans to place RCRA final cover in this area. The Department believes RCRA final cover should be placed by the end of the 2005 construction season.

Condition 2b requires Republic to submit the updated financial assurance for closure of the remaining uncapped areas and condition 3 requires Republic to submit the required $600 plan review fee for the

review of the plan modification request to use LLDPE geomembrane, dated April 7, 2003. An invoice is enclosed.

If you have any questions regarding this approval please contact Joe Lourigan, Hydrogeologist, at (262) 884-2347 or Pat Brady, Waste Management Engineer, at (414) 263-8594.

Sincerely,

for FMK

Frances M. Koonce, Supervisor
Waste Management Program
Southeast Region, WDNR

c:
Joe Lourigan – Sturtevant

BEFORE THE
STATE OF WISCONSI N
DEPARTMENT OF NATURAL RESOURCES

"OLD SITE" RCRA AND NON-RCRA FINAL COVER:
USE OF LLDPE GEOMEMBRANE,

CLOSURE SCHEDULE FOR REMAINING RCRA AND NON-RCRA FINAL COVER FOR THE "OLD SITE",

EXTENSION OF RCRA CAP TO WEST EDGE OF CORRIDORS 8, 9 & 10 BASELINER (RCRA PHASE 3 FINAL COVER), AND

NORTHWEST EXPANSION FINAL COVER CLOSURE COST TO INCLUDE REMAINING RCRA AND NON-RCRA FINAL COVER OF THE "OLD SITE"

PLAN MODIFICATION APPROVAL
FOR THE KESTREL HAWK PARK LANDFILL
LICENSE # 00572

FINDINGS OF FACT

The Department finds that:

1. Republic Services, Inc. owns and operates the Kestrel Hawk Park Landfill (formerly owned by USA Waste Services and known as the Land Reclamation Company Landfill), a solid and hazardous waste disposal facility located in the N1/2 of S23, T3N, R22E, City of Racine, Racine County, Wisconsin.

2. The Department issued a conditional Plan of Operation Approval for the facility on December 19, 1984 with subsequent modifications.

3. The Department issued a conditional plan of operation for the expanded facility on August 30, 1996, referred to as the Kestrel Hawk Northwest Expansion Landfill with subsequent modifications.

4. On April 8, 2003 the Department received a plan modification request from Republic Services, Inc., dated April 7, 2003 to use 40 mil LLDPE geomembrane instead of the approved 40 mil VLDPE geomembrane with the RCRA final cover design at the Kestrel Hawk Landfill, Lic#0572.

5. On August 6, 2003 the Department received a plan modification request from Republic Services, Inc., dated July 31, 2003 to amend the timing for final cover construction for the remaining RCRA Phase 3 final cover construction for the Kestrel Hawk Landfill, Racine, Wisconsin, WDNR License #0572. This plan modification request also included the following:

   a. an adjustment to closure costs for the Kestrel Hawk Northwest Expansion for the purposes of financial assurance, and;

   b. a request for an exemption from the requirement for a composite final cover over the composite baseliner area of corridors 8, 9 and 10 for a strip labeled on September 4, 2003 addendum figure 1A as Area 1 as required in the March 31, 1995 Plan of Operation Modification Approval by the

Department for design changes to corridors 8, 9, and 10 at the Land Reclamation Company Landfill (Kestrel Hawk Landfill).

6. On August 27, 2003 the Department received an addendum from Republic Services, Inc., dated August 26, 2003 to the plan modification request referenced in finding of fact number 5 above to include an additional area referenced in the addendum as area B.

7. On September 9, 2003 the Department received another addendum from Republic Services, Inc., dated September 4, 2003 to the plan modification request referenced in finding of fact number 5 above. This addendum included a revised plansheet figure 1, which is referenced as figure 1A to illustrate the many areas of both RCRA and non-RCRA final cover that require future action by Republic Services, Inc..

8. The information reviewed by the Department specifically for this approval includes the documents referenced in finding of facts 4 through 7 above.

9. Other information considered are documents contained in the Department's file for Kestrel Hawk RDF under facility identification number (FID#) 252076990, including the following documents:

   a. an expedited plan modification request submitted by Republic Services, dated May 17, 2001 and received by the Department on May 5, 2001. This expedited plan modification requested the use of 40 mil HDPE and 40 mil LLDPE for use in final cover construction.

   b. a plan modification request submitted by Warzyn, Inc. on behalf of Land Reclamation Company Landfill, dated June 17, 1994 proposing design changes to corridors 8, 9 and 10 at the Land Reclamation Landfill (Kestrel Hawk Landfill), and;

   c. the March 31, 1995 Plan of Operation Modification Approval by the Department for design changes to corridors 8, 9, and 10 at the Land Reclamation Company Landfill (Kestrel Hawk Landfill.

   d. a report dated May 10, 1991 and received by the Department on May 13, 1991, entitled " Land Reclamation Company Landfill, RCRA Final Cover, Modifications Report ", prepared by GeoSyntec Consultants of behalf of Land Reclamation Company;

   e. the September 16, 1991 Plan of Operation Modification Approval by the Department for RCRA Final Cover, and;

   f. an e-mail dated August 4, 2003 from Robert Grefe, WDNR Waste Management Program Engineer in the Technical Support Section, to Mark Stohl, WDNR Waste Management Engineer.

10. In the report dated May 10, 1991 and received by the Department on May 13, 1991, entitled " Land Reclamation Company Landfill, RCRA Final Cover, Modifications Report ", prepared by GeoSyntec Consultants of behalf of Land Reclamation Company it states on page 2 that the estimated phase 3 final cover construction will take place in the summer of 1995 or 1996. This has not been done and was listed in the Department's February 25, 2003 Notice of Violation alleged violation # 24.

11. On December 22, 2003 the Department received payment of the required plan review fee of $1,500 under ch. NR 520, Wis. Adm. Code and $600 under s. 680.45, Wis. Adm. Code for the plan modification request dated July 31, 2003.

12. The Department has not received payment for the required $600 plan review fee under s. 680.45, Wis. Adm. Code for the plan modification request dated April 7, 2003, submitted by Republic Services requesting use of 40 mil LLDPE geomembrane instead of the approved 40 mil VLDPE.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.30, Stats., to modify a plan of operation approval if the modification would not inhibit compliance with chapters NR 500-538 and the NR 600 series, Wis. Adm.. Code.

2. The Department has authority to approve a plan of operation with special conditions if the conditions are needed to ensure compliance with chapters NR 500-538 and the NR 600 series, Wis. Adm. Code.

3. In accordance with the foregoing, the Department has the authority under s. 289, Stats., to issue the following plan of operation approval modification.

4. Conditions of approval set forth below are needed to ensure compliance with chs. NR 500-538 and the chs. NR 600 series, Wis. Adm. Code

DETERMINATION OF EXEMPTIONS

Republic Services, Inc. has not demonstrated justification for granting an exemption from the requirement in the March 31, 1995 Plan of Operation Modification Approval by the Department for design changes to corridors 8, 9, and 10 at the Land Reclamation Company Landfill (Kestrel Hawk Landfill) and the requirement contained in s. NR 504.07 (1) (c), Wis. Adm. Code for a composite final cover. The requested exemption from the required composite final RCRA cover over the area labeled Area 1 in the September 4, 2003 addendum figure 1A is not approved.

CONDITIONAL PLAN OF OPERATION
APPROVAL MODIFICATION

"OLD SITE" RCRA AND NON-RCRA FINAL COVER:
USE OF LLDPE GEOMEMBRANE,

CLOSURE SCHEDULE FOR REMAINING RCRA AND NON-RCRA FINAL COVER FOR THE "OLD SITE",

EXTENSION OF RCRA CAP TO WEST EDGE OF CORRIDORS 8, 9 & 10 BASELINER (RCRA PHASE 3 FINAL COVER), AND

NORTHWEST EXPANSION FINAL COVER CLOSURE COST TO INCLUDE REMAINING RCRA AND NON-RCRA FINAL COVER OF THE "OLD SITE"

FOR THE KESTREL HAWK PARK LANDFILL
LICENSE # 00572

The Department hereby approves the plan of operation modification for the RCRA Final Cover: Use of LLDPE Geomembrane, Closure Schedule for the remaining RCRA and non-RCRA final cover over the "Old Site", and the Northwest Landfill Expansion Financial Assurance adjustment to include the remaining RCRA and non-RCRA Final Cover Closure Cost for the Kestrel Hawk Landfill proposed in the documents referenced in the findings of facts 4 through 7 above, subject to chs. NR 500 and NR 600, Wis. Adm. Code and the following conditions:

1. No additional solid or hazardous waste, including drill cuttings, may be disposed of in the remaining uncapped areas colored in gray identified as "Total Remaining RCRA Cap Area", and the areas labeled areas A and B identified in the September 4, 2003 addendum plansheet Figure 1A.

2. Republic shall submit to the Department within 60 days of this approval the following:

   a. a schedule for placement of the RCRA final cover in the area labeled Area 1 in the September 4, 2003 addendum figure 1A. RCRA final cover shall be placed in this area by the end of the 2005 construction season.

   b. updated proof of financial assurance for the Northwest expansion to cover the additional cost to close the remaining 6.5 acres identified in the August 26, 2003 addendum. The 6.5 acres shall be added to the total acreage of approximately 36.40 acres to close phase 5 of the Northwest Expansion and adjusted to the Department's 2004 inflationary factor.

3. Republic Services shall submit payment of the required $600 plan review fee for the plan modification request dated April 7, 2003, submitted by Republic Services, Inc. requesting use of 40 mil LLDPE geomembrane instead of the approved 40 mil VLDPE within 30 days from the date of this approval.

The Department retains the jurisdiction to require the submittal of additional information or to modify this approval at any time, if in the Department's opinion, conditions warrant further modifications. Unless

specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be Filed.

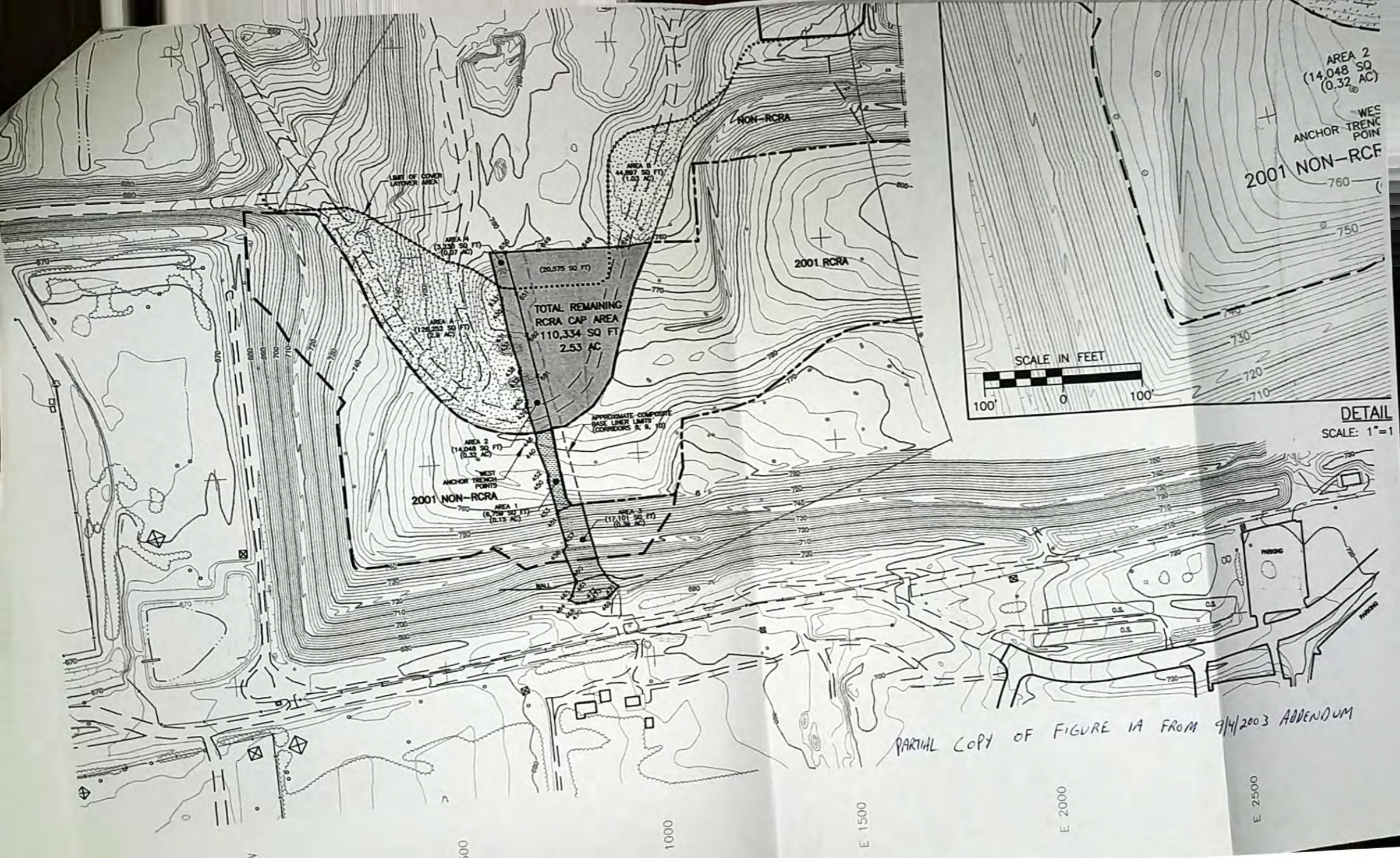
For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent. This notice is provided pursuant to section 227.48(2), Stats.

Dated July 2, 2004

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Frances M. Koonce, Supervisor
Waste Management Program
Southeast Region

Joe Lourigan, Hydrogeologist
Waste Management Program, SER-Sturtevant



PARTIAL COPY OF FIGURE 1A FROM 9/4/2003 ADDENDUM

→ SER Lasfile

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary
Gloria L. McCutcheon, Regional Director

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September 8, 2004

FID# 252076990
SW/APPR

Mr. Michael Ettner, General Manager
Republic Services, Inc., Kestrel Hawk Landfill
1989 Oakes Road
Racine, WI 53406

FIST SUB # 56676
DEC # 12153

RE: Construction Documentation Determination for 2001 Old Site Final Cover Closure
Kestrel Hawk Recycling and Disposal Facility (RDF), License # 0572

Dear Mr. Ettner:

The Department has completed our review of the Republic Services, Inc. (Republic) January 28, 2002, construction documentation report for the 2001 Old Site final closure for the Kestrel Hawk Recycling and Disposal Facility (RDF). The Department has found that the 2001 final cover closure of the Old Site has been constructed in substantial compliance with your plan of operation approvals dated December 19, 1984, and August 30, 1996, and ch. NR 516, Wis. Adm. Code, with the exception of the RCRA final cover extension for the west edge of corridors 8, 9 and 10.

The Kestrel Hawk landfill 2001 Old Site final cover construction was divided into two separate areas, Phase III of the Resource Conservation and Recovery Act (RCRA) area and the non-RCRA area. The final cover of the Phase III/RCRA area was constructed in the following sequence: intermediate cover regrading, compacted clay cover construction, 40-mil geomembrane installation, sand drainage layer and drainage pipe placement, geotextile separation layer installation, rooting zone placement, topsoil placement and site restoration. The final cover of the non-RCRA area was constructed in the following sequence: intermediate cover regrading, compacted clay cover construction, rooting zone and topsoil placement, and site restoration. Final cover was constructed on approximately 11 acres of the RCRA area and 10-acres of the non-RCRA area. Approximately 6.5 acres of final cover for the Old Site remains to be constructed. During the construction surface water drainage features were also built.

The report entitled, "Construction Documentation Report, Old Site 2001 Final Cover, Kestrel Hawk Landfill, Racine, Wisconsin" was prepared by STS Consultants, Ltd. (STS), on behalf of Republic, and received by the Department on February 4, 2002. In response to a June 30, 2004 incompleteness letter, Republic submitted an incompleteness response dated and received by the Department on August 8, 2004.

In a July 2, 2004, plan modification approval, the Department addressed the western edge of corridors 8, 9 and 10, where final cover has yet to be installed, which is approximately 0.15 acres. Condition 2.a. of the July 2, 2004, plan modification approval, requires Republic to submit a schedule for placement of final cover in this area and place final cover in this area before the end of the 2005 construction season. The Department has received Republic's August 31, 2004, response to the July 2, 2004 plan modification, but has not completed review of the document.

With this letter and the attached approval, the Department approves the construction of the 2001 Old Site final cover construction documentation report, with the exception of the RCRA final cover extension for the west edge of corridors 8, 9 and 10.

If you have any questions about this approval, please call Mike Ellenbecker at (262) 884-2342, Joe Lourigan at (262) 884- 2347, or Pat Brady at (414) 263-8594.

Sincerely,

Frances M. Koonce

Frances M. Koonce
Waste Management Team Leader
Southeast Region, WDNR

Cc: SER Casefile

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL
FOR THE 2001 OLD SITE FINAL COVER CONSTRUCTION DOCUMENTATION REPORT
AT THE KESTREL HAWK RDF, LICENSE # 0572

FINDINGS OF FACT

The Department finds that:

1. Republic Services, Inc. owns and operates a municipal solid waste and hazardous waste disposal facility in the North ½ of Section 23, T3N, R22E, City of Racine, Racine County, Wisconsin known as the Kestrel Hawk RDF (formerly known as Land Reclamation Landfill).

2. The Department issued a plan of operation approval for Land Reclamation, LTD on December 19, 1984, with subsequent modifications.

3. The Department issued a plan of operation approval for Land Reclamation Company on August 30, 1996, with subsequent modifications.

4. Mark Stohl inspected the Old Site final cover construction on May 29, September 28, October 1, October 2, and October 9, 2001.

5. On February 4, 2002, Republic hand delivered a report, prepared for them by STS Consultants, Ltd., entitled, "Construction Documentation Report, 2001 Old Site Final Cover", and dated January 28, 2002. The report included 16 plan sheet drawings.

6. On February 19, 2002, an acknowledgement letter and invoice were sent to Republic. The invoice was for $2,000.00, which includes a $1,000.00 construction documentation report review fee and at 2 construction documentation inspections at $500.00 each. On April 1, 2002, the Department received a $2,000.00 payment from Republic.

7. During a July 28, 2004, meeting at Kestrel Hawk, representatives of Republic and Department personnel met to discuss the construction documentation review of the Old Site final cover closure. An e-mail was sent out by the Department on July 29, 2004, regarding the issues discussed at this meeting.

8. Additional information considered in this review are:

   a. RCRA Phase II construction documentation reports and approvals.
   b. Republic's July 31, 2004, response to a July 1, 2004, incompleteness letter from the Department, which was received by the Department on August 8, 2004. The response included a plan sheet drawing.
   c. The plan modification report for corridors 8, 9 and 10, and the approval dated March 3, 1995.
   d. The December 3, 2002, approval for the Kestrel Hawk RDF entitled, "Construction Documentation Approval Phase 3, and Clay Borrow Source Plan Modification Approval".

e. A December 20, 2001, report entitled, "Gas Collection and Control System Improvements" submitted to the Department by EMCON/OWT Solid Waste Services on behalf of Republic.
f. A July 1, 2004, final cover design approval for the Old Site, and also addressing 1994 final grades and corridor 11 overfill.
g. A July 2, 2004, approval for he use of 40-mil LLDPE geomembrane in place of VFPE, and also addressing a closure schedule for the extension of the cap to the western edge of corridors 8, 9 and 10, and revisions to the closure cost.
h. A July 11, 2001, field change regarding the placement and function of the 4-inch diameter perforated pipe that drains the RCRA cover sand layer.

9. CORR 8, 9 and 10 RCRA cover extension was not constructed according to the approved plans dated March 31, 1995.

10. A July 2, 2004, plan modification approval requires Republic to place final cover in corridors 8, 9 and 10.

11. The conditions set forth below are needed to assure that the handling and disposal of solid waste at the Kestrel Hawk RDF is conducted in compliance with chapters NR 500 to 538, Wis. Adm. Code.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.31(3), Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the construction documentation for the 2001 Old Site final cover closure for the Kestrel Hawk RDF, with the exception of CORR 8, 9 and 10 RCRA extension, subject to compliance with the provisions of chapters NR 500-538, Wis. Adm. Code.

The Department retains the jurisdiction to either require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications.

NOTIFICATION OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin Statutes and Administrative Rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to ss. 227.52 and 227.53, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

Dated: September 8, 2004

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Frances Koonce

Frances M. Koonce
Waste Management Team Leader
Southeast Region, WDNR

Mark C. Stohl

Mark Stohl
Air Management Engineer
Southeast Region, WDNR

Patrick J. Brady

Patrick J. Brady
Waste Management Engineer
Southeast Region, WDNR

WDNR CORRESPONDENCE

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary
Gloria L. McCutcheon, Regional Director

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May 25, 2010

FID# 52076990
SW/APPR

Mr. Khalid Umer, P.E., Area Environmental Manager
Republic Services, Inc., Kestrel Hawk Landfill
1989 Oakes Road
Racine, WI 53406

JUN 2 2010

RE: Construction Documentation Determination for the Phase 1 and 2 Partial Closure
Kestrel Hawk Recycling and Disposal Facility (RDF), License # 0572

Dear Mr. Umer:

The Department has reviewed and approved the construction documentation report and drawings for the Phase 1 & 2 partial closure at the Republic Services, Inc. (Republic) Kestrel Hawk Recycling and Disposal Facility (RDF) landfill. The Department finds that this work has been constructed in substantial compliance with the Kestrel Hawk plan of operation approval issued on August 30, 1996, and ch. NR 516, Wis. Adm. Code. With this letter and the attached approval, the Department approves the construction of the Phase 1 & 2 partial closure construction documentation report. Please include the attached approval in the written operating record for the landfill as specified in s. NR 506.17, Wis. Adm. Code.

The report entitled, "Construction Documentation Report for the Phase 1 and 2 Partial Closure, Kestrel Hawk Landfill, Racine, Wisconsin" was prepared by CQM, Inc., on behalf of Republic, and received by the Department on October 13, 2005.

The report documents the construction of partial closure of Phases 1 and 2 on the north and south side of the landfill, which began in July of 2004 and continued through September of 2004. The area of the Phase 1 and 2 partial closure is approximately 4.8 acres. Construction of the Phase 1 and 2 partial closure included the following activities:

- Preparation of the grading layer;
- Construction of 2-foot thick soil barrier layer;
- Connection to previous placed closure area;
- Placement of geosynthetic clay liner GCL, which is Cetco Bentomat ST;
- Installation of geomembrane, which is GSE textured 40-mil linear low density polyethylene LLDPE;
- Preparation around gas extraction wells and other penetrations;
- Placement of geocomposite drainage layer, which is a FabriNet geonet heat bonded between two 6-oz./sy. polypropylene layers of geotextile;
- Placement of rooting zone soil;
- Construction of surface water diversion berm, ditches, downslope flume and energy dissipater;
- Installation of toe and cove slope drainage piping system; and
- Placement of topsoil, seed, fertilizer and mulch.

History

The area of the Phase 1 & 2 partial closure consists of two separate noncontiguous areas on the north and south slopes. The area on the south slope is adjacent to corridor 7 and 11 of the Old Site at Kestrel Hawk. Refuse was discovered to having been placed in this common berm area between the Northeast Expansion and the Old Site. Because of concerns about how the waste in the berm area may impact the Northeast landfill, particularly in regard to how and where the liner and the cover are connected, the Department denied approval of Phase 1 & 2 partial closure construction documentation report on March 10, 2006.

The Kestrel Hawk feasibility report and the plan of operation did show that waste is not to be placed in the area between Phase I of the Northwest Expansion landfill and Corridor 7 of the Old Site landfill. However, these reports did not contain discussion, details or drawings for how the area located between Phase I and Corridor 7 was to be constructed. The Department requested Republic to either propose a plan to remove the waste located in the area between Phase I and Corridor 7, or submit a feasibility report plan modification request to leave the waste in place.

Republic submitted a proposed a plan to remove waste found to be buried in the area located between Phase I of the Northwest Expansion landfill and Corridor 7 of the Old Site landfill, and perform final cover construction. Because of the originally approved geometry, including the approved base grades and final grades in the plan of operation drawings, final cover to liner tie-in and connection is not possible in this location. As a result, clean soil was proposed to be used as fill material in the area to achieve the proper final grades. On February 22, 2007, the Department issued a plan approval for waste removal and revised cover construction in the area between Phase 1 and Corridor 7.

On December 30, 2010, the Department issued a construction documentation approval for waste removal and cover construction between Phase 1 of the Northwest Expansion and Corridor 7 of the Old Site landfill.

If you have any questions about this approval, please call Mike Ellenbecker at (262) 884-2342, Joe Lourigan at (262) 884- 2347, or Pat Brady at (414) 263-8594.

Sincerely,

Franklin C. Schultz
Waste and Materials Supervisor
Southeast Region, WDNR

c: SER Casefile

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL OF THE
PHASE 1 AND 2 PARTIAL CLOSURE
REPUBLIC SERVICES, INC. KESTREL HAWK RDF
LICENSE No. 0572

FINDINGS OF FACT

The Department finds that:

1. Republic Services, Inc. (Republic) owns and operates a municipal solid waste and hazardous waste disposal facility in the North ½ of Section 23, T3N, R22E, City of Racine, Racine County, Wisconsin known as the Kestrel Hawk RDF (formerly known as Land Reclamation Landfill).

2. The Department issued a plan of operation approval for Land Reclamation, Ltd. on December 19, 1984, with subsequent modifications.

3. The Department issued a plan of operation approval for Land Reclamation Company on August 30, 1996, with subsequent modifications.

4. The Department issued a plan of operation modification approval for Republic on May 1, 2002, regarding final cover.

5. On October 13, 2005, CQM, Inc., on behalf of Republic, submitted a construction documentation report for Phase 1 and 2 partial closure as required by ch. NR 516, Wis. Adm. Code. On December 9, 2005, the Department received the construction documentation report review fee of $1,100 and a construction inspection fee of $1,100 ($550 x 2) for a total of $2,200.

6. On March 10, 2006, the Department informed Republic that approval of the October 13, 2005, construction documentation report was denied.

7. On December 30, 2008, the Department approved the construction documentation determination of the waste removal and cover construction between Phase 1 of the Northwest Expansion landfill and Corridor 7 of the Old Site landfill. With this approval, the Department was now able to begin again review of the construction documentation report for Phase 1 and 2 partial closure.

8. The information submitted as part of the construction documentation includes the following:

   a. A construction documentation report for the Phase 1 & 2 partial closure prepared by CQM, Inc., on behalf of Republic, dated October 5, 2005, accompanied by 11 plan sheet drawings, and received by the Department on October 13, 2005; and
   b. A construction documentation report for the Phase 1 and Corridor 7 waste removal and cover construction, dated January 16, 2008, including additional information submitted on August 27, 2008.

9. Additional information considered in this review are:

   a. The Department's December 19, 1984, and August 30, 1996, plan of operation approvals;
   b. The May 1996, plan of operation for the Northwest Expansion at Land Reclamation Co.;
   c. The Department's May 1, 2002, plan of operation modification approval regarding final cover;
   d. A July 6, 2004, preconstruction documentation report for the Phase 1 & 2 partial closure;
   e. A July 3, 2006, waste removal and cover construction plan for the area located between Phase 1 and Corridor 7, including additional information dated January 25, 2007; and
   f. Department files for the Kestrel Hawk landfill license #0572.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.30, Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

2. In accordance with the foregoing, the Department has the authority to issue the following construction documentation approval.

CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the construction documentation report for the Phase 1 and 2 partial closure for the Kestrel Hawk RDF, subject to compliance with the provisions of chapters NR 500-538, Wis. Adm. Code.

The Department retains the jurisdiction to either require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications.

NOTIFICATION OF APPEAL RIGHTS

If you believe you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes, administrative codes and case law establish time periods and requirements for reviewing Department decisions.

To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats., establish criteria for filing a petition for judicial review. Such a petition shall be filed with the appropriate circuit court and shall be served on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: May 26, 2010

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Franklin C. Schultz
Waste and Materials Supervisor
Southeast Region, WDNR

Patrick J. Brady
Waste Management Engineer
Southeast Region, WDNR

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary
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JUN 2 2010

May 26, 2010

FID# 252076990
SW/APPR

Mr. Khalid Umer, P.E., Area Environmental Manager
Republic Services, Inc., Kestrel Hawk Landfill
1989 Oakes Road
Racine, WI 53406

RE: Construction Documentation Determination for 2009 Composite Cover
Kestrel Hawk Recycling and Disposal Facility, License # 0572

Dear Mr. Umer:

The Department has reviewed and approved the construction documentation report including drawings for the 2009 composite cover at the Republic Services, Inc. (Republic) Kestrel Hawk Recycling and Disposal Facility (RDF) landfill, dated January 22, 2010. The Department finds that the 2009 composite cover construction has been constructed in substantial compliance with the Kestrel Hawk plan of operation approval issued on August 30, 1996, subsequent plan modifications, and ch. NR 516, Wis. Adm. Code. With this letter and the attached approval, the Department approves the construction of the 2009 composite cover construction documentation report Please include the attached approval in the written operating record for the landfill as specified in s. NR 506.17, Wis. Adm. Code.

The report documents the 2009 cover construction over the top of the landfill in Phases 1 and 2, which began in August of 2009 and continued through November of 2009. The area of the 2009 cover construction is approximately 4.5 acres. The 2008 cover construction included the following activities:

- Preparation of the grading layer, and construction of 2-foot thick soil barrier layer;
- Connection to previous placed closure area;
- Placement of geosynthetic clay liner GCL, which is Cetco Bentomat;
- Installation of geomembrane, which is textured 40-mil linear low density polyethylene LLDPE;
- Preparation around gas extraction wells and other penetrations;
- Placement of geocomposite drainage layer, which is SKAPS Industries Transnet 220-2-6, a geonet heat bonded between two 6-oz./sy. polypropylene layers of geotextile;
- Construction of surface water diversion berm, ditches, downslope flume and energy dissipater; and
- Placement of rooting zone soil, topsoil, seed, fertilizer and mulch.

If you have any questions about this approval, please call, Joe Lourigan at (262) 884-2347, Mike Ellenbecker at (262)884-2342 or Pat Brady at (414) 263-8594.

Sincerely,

Franklin C. Schultz
Waste and Materials Management Supervisor
Southeast Region, WDNR

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL FOR THE 2009 COMPOSITE COVER CONSTRUCTION AT THE KESTREL HAWK RDF, LICENSE No. 0572

FINDINGS OF FACT

The Department finds that:

1. Republic Services, Inc. owns and operates a municipal solid waste and hazardous waste disposal facility in the North ½ of Section 23, T3N, R22E, City of Racine, Racine County, Wisconsin, known as the Kestrel Hawk RDF (formerly known as Land Reclamation Landfill).

2. The Department issued a plan of operation approval for Land Reclamation, Ltd. on December 19, 1984, with subsequent modifications.

3. The Department issued a plan of operation approval for Land Reclamation Company on August 30, 1996, with subsequent modifications.

4. On February 8, 2010, the Department received from Republic a construction documentation report, dated January 22, 2010, for 2009 composite cover construction. The report was prepared by CQM, Inc.

5. An acknowledgement letter and invoice were sent out to the facility on January 27, 2010. The construction documentation report review fee of $1,100.00, plus the fee for one construction inspection of $550.00, for a total of $1,650.00, was received by the Department on January 27, 2010.

6. The information submitted as part of the construction documentation includes the following:

   a. The January 22, 2010, construction documentation report for the 2009 composite cover construction at Kestrel Hawk.

7. Additional information considered in this review are:

   a. The Department's December 19, 1984, and August 30, 1996, plan of operation approvals,
   b. The May 1996, plan of operation for the Northwest Expansion at Land Reclamation Co.;
   c. The Department's May 1, 2002, plan of operation modification approval regarding final cover;
   d. The Department's December 28, 2005, plan modification approval; and
   e. The Department files for the Kestrel Hawk Landfill #572.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.30, Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

2. In accordance with the foregoing, the Department has the authority to issue the following construction documentation approval.

CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the construction documentation report for the 2009 composite cover construction at the Kestrel Hawk RDF, license #0572, subject to compliance with the provisions of chapters NR 500-538, Wis. Adm. Code.

The Department retains the right to either require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications.

NOTIFICATION OF APPEAL RIGHTS

If you believe you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes, administrative codes and case law establish time periods and requirements for reviewing Department decisions.

To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats., establish criteria for filing a petition for judicial review. Such a petition shall be filed with the appropriate circuit court and shall be served on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: May 26, 2010

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Franklin C. Schultz, Supervisor
Waste and Materials Management Program
Southeast Region

Patrick J. Brady
Waste Management Engineer
Southeast Region

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary
Gloria L. McCutcheon, Regional Director

Sturtevant Service Center
9531 Rayne Road Suite IV
Sturtevant, Wisconsin 53177
Telephone 262-884-2300
FAX 262-884-2307
TTY 262-884-2304

May 24, 2010

FID# 52076990
SW/APPR

Mr. Khalid Umer, P.E., Area Environmental Manager
Republic Services, Inc., Kestrel Hawk Landfill
1989 Oakes Road
Racine, WI 53406

MAY 27 2010

RE: Construction Documentation Determination for the
Phase 2 and 3 Partial Closure and RCRA Cover Extension
Kestrel Hawk Recycling and Disposal Facility (RDF), License # 0572

Dear Mr. Otzelberger:

The Department has reviewed and approved the construction documentation report and drawings for the Phase 2 & 3 partial closure and RCRA cover extension at the Republic Services, Inc. (Republic) Kestrel Hawk Recycling and Disposal Facility (RDF) landfill. The Department finds that this work has been constructed in substantial compliance with the Kestrel Hawk plan of operation approval issued on August 30, 1996, and ch. NR 516, Wis. Adm. Code. With this letter and the attached approval, the Department approves the construction of the Phase 2 & 3 partial closure and RCRA cover extension construction documentation report. Please include the attached approval in the written operating record for the landfill as specified in s. NR 506.17, Wis. Adm. Code.

The report documents the construction of partial closure of Phases 2 and 3 on the north side of the landfill, which began in early July of 2005 and continued through August of 2005. The area of the Phase 2 and 3 partial closure is approximately 3.2 acres. Construction of the Phase 2 and 3 partial closure included the following activities:

- Preparation of the grading layer
- Construction of 2-foot thick soil barrier layer;
- Connection to previous placed closure area;
- Placement of geosynthetic clay liner GCL, which is Bentofix Thermal Lock NSL GCL;
- Installation of geomembrane, which is textured 40-mil liner low density polyethylene LLDPE;
- Preparation around gas extraction wells and other penetrations;
- Placement of geocomposite drainage layer, which is a 200 mil thick HDPE geonet heat bonded between two 6-oz./sy. layers of geotextile;
- Placement of rooting zone soil;
- Construction of surface water diversion berm and ditches
- Installation of toe and cover slope drainage piping system; and
- Placement of topsoil, seed, fertilizer and mulch.

The RCRA cover extension is 45 feet by 200 feet area located in Corridors 8, 9 and 10 of the south final cover of the facility. The extension covers components of the of the site's approved RCRA cover that had not received a RCRA final cover. The RCRA cover extension required: the addition of 1 foot of select clay fill, for a total of 3 feet of select clay fill; installation of a LLDPE geomembrane; and the installation of a perimeter conveyance system to drain collected infiltration from the final cover.

The report entitled, "Construction Documentation Report for the Phase 2 and 3 Partial Closure and RCRA Cover Extension, Kestrel Hawk Landfill, Racine, Wisconsin" was prepared by Earth Tech, on behalf of Republic, and received by the Department on September 2, 2008.

If you have any questions about this approval, please call Mike Ellenbecker at (262) 884-2342, Joe Lourigan at (262) 884- 2347, or Pat Brady at (414) 263-8594.

Sincerely,

Franklin C. Schultz
Waste and Materials Supervisor
Southeast Region, WDNR

c: SER Casefile

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL OF THE
PHASE 2 AND 3 PARTIAL CLOSURE AND RCRA COVER EXTENSION
REPUBLIC SERVICES, INC. KESTREL HAWK RDF
LICENSE No. 0572

FINDINGS OF FACT

The Department finds that:

1. Republic Services, Inc. (Republic) owns and operates a municipal solid waste and hazardous waste disposal facility in the North ½ of Section 23, T3N, R22E, City of Racine, Racine County, Wisconsin known as the Kestrel Hawk RDF (formerly known as Land Reclamation Landfill).

2. The Department issued a plan of operation approval for Land Reclamation, Ltd. on December 19, 1984, with subsequent modifications.

3. The Department issued a plan of operation approval for Land Reclamation Company on August 30, 1996, with subsequent modifications.

4. The Department issued a plan of operation modification approval for Republic on May 1, 2002, regarding final cover.

5. On September 2, 2008, the Department received a construction documentation report for Phase 2 and 3 partial closure RCRA cover extension as required by ch. NR 516, Wis. Adm. Code. The report was prepared by Earth Tech for Republic and dated August 27, 2008.

6. On January 14, 2009, the Department received the construction documentation report review fee of $1,100 and a construction inspection fee of $1,100 ($550 x 2) for a total of $2,200.

7. The information submitted as part of the construction documentation includes the following:

   a. A construction documentation report for the Phase 2 & 3 partial closure and RCRA cover extension was prepared by Earth Tech, on behalf of Republic, dated August 27, 2008, accompanied by 11 plan sheet drawings, and received by the Department on September 2, 2008.

8. Additional information considered in this review are:

   a. The Department's December 19, 1984, and August 30, 1996, plan of operation approvals;
   b. The May 1996, plan of operation for the Northwest Expansion at Land Reclamation Co.;
   c. The Department's May 1, 2002, plan of operation modification approval regarding final cover;
   d. The Department's June 30, 2005, plan modification regarding use of soil as soil barrier layer; and
   e. Department files for the Kestrel Hawk landfill license #0572.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.30, Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

2. In accordance with the foregoing, the Department has the authority to issue the following construction documentation approval.

CONSTRUCTION DOCUMENTATION APPROVAL

The Department hereby approves the construction documentation report for the Phase 2 and 3 partial closure and RCRA cover extension for the Kestrel Hawk RDF, subject to compliance with the provisions of chapters NR 500-538, Wis. Adm. Code.

The Department retains the jurisdiction to either require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications.

NOTIFICATION OF APPEAL RIGHTS

If you believe you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes, administrative codes and case law establish time periods and requirements for reviewing Department decisions.

To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats., establish criteria for filing a petition for judicial review. Such a petition shall be filed with the appropriate circuit court and shall be served on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: May 24, 2010

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Franklin C. Schultz
Waste and Materials Supervisor
Southeast Region, WDNR

Patrick J. Brady
Waste Management Engineer
Southeast Region, WDNR

WDNR CORRESPONDENCE

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Southeast Region Headquarters
2300 N. Dr. Martin Luther King, Jr. Drive
Milwaukee WI 53212-3128

Scott Walker, Governor
Cathy Stepp, Secretary
John Hammen, Acting Regional Director
Telephone 414-263-8500
FAX 414-263-8606
TTY Access via relay - 711

August 17, 2011

FID# 52076990
SW/APPR

Mr. Khalid Umer, P.E., Area Environmental Manager
Republic Services, Inc., Kestrel Hawk Landfill
1989 Oakes Road
Racine, WI 53406

RECEIVED 8-22-11

Subject: Plan of Operation Approval Modification, Kestrel Hawk Landfill (#572)

Dear Mr. Umer:

The requested modification to your plan of operation to modify the final cover system at the Kestrel Hawk Landfill has been reviewed and approved. Please include the attached approval in the written operating record for the landfill as specified in s. NR 506.17, Wis. Adm. Code.

The plan modification includes a request to modify the final cover systems over the Old Site Area (portions of Corridors 1 to 6), Corridors 8 to 11, and former City of Racine site. Currently, there are three different approved final cover designs that come together at the intersection of these parts of the landfill. The City of Racine site has a NR 180 cap which consists of a 2-foot clay layer and a 6-inch topsoil layer. The Old Site Area has a RCRA cover design with consists of 6-inch grading layer, 3-foot clay layer, a 40-mil geomembrane, a 1-foot thick granular drainage layer, a geotextile separation layer, a 1.5-foot thick rooting zone layer, and a 6-inch topsoil layer. Corridors 8 to 11 have a NR 500 cap which consists of 6-inch grading layer, 2-foot clay layer, a 40-mil geomembrane, a geonet, 2.5-foot rooting zone layer and a 6-inch topsoil layer. The plan modification standardizes the cover system thickness and cover components over the remaining uncovered RCRA (2.07 acres) and non-RCRA (4.43 acres) areas of the older portions of the site.

The proposed RCRA cover would consist of 6-inch grading layer, 2-foot thick compacted clay layer, a geosynthetic clay liner (GCL), a 40-mil LLDPE geomembrane, a geocomposite drainage layer, a 2.5-foot thick rooting zone layer, and a 6-inch thick topsoil layer. The proposed non-RCRA cover would consist of 6-inch grading layer, 2-foot thick compacted clay layer (the clay layer may be replaced with 2-foot barrier layer and a GCL), a 40-mil LLDPE geomembrane, a geocomposite drainage layer, a 2.5-foot thick rooting zone layer, and a 6-inch thick topsoil layer.

The plan modification also includes the installation of a new 12-inch, SDR 17 landfill gas header pipe along the access road on the west side of the former City of Racine Landfill and Corridor 11. The additional header will improve vacuum distribution throughout the landfill by providing a more direct connection from the 16-inch "biogas line" to the northern expansion. It will also improve the ability to balance the well field as landfill gas generation decreases in the southern half of the site and increases in the northern half.

If you have any questions regarding this letter, please contact Ann Bekta at (608)743-4845.

Sincerely,

Franklin C. Schultz
Waste and Materials Management Program Supervisor
Southeast Region

cc: Ann Bekta – JSC
Joe Lourigan - Sturtevant

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

PLAN OF OPERATION APPROVAL MODIFICATION
REPUBLIC SERVICES, INC. KESTREL HAWK RDF
LICENSE No. 0572

FINDINGS OF FACT

The Department finds that:

1. Republic Services, Inc. (Republic) owns and operates a municipal solid waste and hazardous waste disposal facility in the North ½ of Section 23, T3N, R22E, City of Racine, Racine County, Wisconsin known as the Kestrel Hawk RDF (formerly known as Land Reclamation Landfill).

2. The Department issued a plan of operation approval for Land Reclamation, Ltd. on December 19, 1984, with subsequent modifications.

3. The Department issued a plan of operation approval for Land Reclamation Company on August 30, 1996, with subsequent modifications.

4. On June 13, 2011, CQM, Inc., on behalf of Republic, submitted a plan of operation approval modification request to modify the final cover system over the Old Site Area (portions of Corridors 1 to 6), Corridors 8 to 11, and former City of Racine site. On June 20, 2011, the Department received the correct review fee of $1,650.

5. The information submitted as part of the modification request includes:

    a. A report entitled "Plan of Operation Modification, Kestrel Hawk, RDF, Racine, Wisconsin" and associated drawings dated June 10, 2011 which were received by the Department on June 13, 2011.

    b. Additional information and clarification requested was emailed to the Department on July 12, 2011. The plan sheets were received on July 15, 2011.

    c. A July 12, 2011 Cornerstone letter and plan sheets regarding landfill gas header improvements.

    d. Additional information and clarification requested was emailed to the Department on August 12, 2011.

    e. Additional clarification was emailed to the Department on August 16, 2011.

6. Additional documents considered in connection with the review of the modification include the following:

    a. The Department's July 2, 2004 remaining old site final cover plan modification approval.

b. The Department's May 1, 2002 final cover plan modification approval to use a GCL.

c. The Department's August 30, 1996 plan of operation approval.

d. The Department's September 16, 1991 RCRA final cover plan modification approval.

e. The Department files for the Kestrel Hawk RDF (#572).

7. The special conditions set forth below are needed to assure that the facility is operated in an environmentally sound fashion. If the special conditions are complied with, the proposed modification will not inhibit compliance with the standards set forth in the applicable portions of chs. NR 500-538, Wis. Adm. Code.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.30(6), Stats., to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500-538, Wis. Adm. Code.

2. The Department has authority to approve a plan of operation approval modification with special conditions if the conditions are needed to ensure compliance with chs. NR 500-538, Wis. Adm. Code.

3. The conditions of this approval are needed to ensure compliance with chs. NR 500-538, Wis. Adm. Code.

4. In accordance with the foregoing, the Department has the authority under s. 289.30, Stats., to issue the following conditional plan of operation approval modification.

PLAN OF OPERATION APPROVAL MODIFICATION

The Department hereby approves the proposed changes to the final cover system for the Kestrel Hawk RDF, subject to compliance with the provisions of chapters NR 500-538, Wis. Adm. Code and the following conditions:

1. The geosynthetic clay liner (GCL) and the soil barrier layer shall designed and constructed in accordance with NR 504.07(4)(a), Wis. Adm. Code, and tested and documented in accordance with ch. NR 516, Wis. Adm. Code.

   This condition supersedes conditions 8, 9, 10, 11, 12 and 14 of the Department's May 1, 2002 approval.

2. The gas header construction shall be documented in accordance with NR 516.06, Wis. Adm. Code and shall include the field verified location and depth of the existing slurry wall where the gas header crosses it.

The Department retains the jurisdiction to either require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications.

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Southeast Region Headquarters
2300 N. Dr. Martin Luther King Jr. Drive
Milwaukee, WI 53212-3128

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

February 3, 2020

Mr. Khalid Umer, P.E.
Republic Services, Inc.
1989 Oakes Road
Racine, WI 53406

FILE REF: FID# 252076990
Racine County
SW/APP

SUBJECT: Construction Documentation Approval for the 2018-2019 Composite Cover and Landfill Gas System, Kestrel Hawk Landfill, License No. 0572

Dear Mr. Umer:

The Department of Natural Resources (department) has reviewed and approves the construction documentation submitted for the 2018-2019 Final Cover and Gas System Improvements. Please include the attached approval in the written operating record for the landfill as specified in s. NR 506.17, Wis. Adm. Code.

The 2018-2019 final cover report documents construction of approximately 8.3 acres of final cover, construction of surface water drainage features and construction of an access road over the final cover. The final cover consists of (from bottom to top) a two-foot soil barrier layer, a geosynthetic clay liner, a 40-mil LLDPE textured geomembrane, a geocomposite drainage layer, a 30-inch rooting zone layer and a six-inch topsoil layer. The landfill gas system improvements include: installation of two replacement gas wells and abandonment of the existing gas wells; the installation of new and replacement gas header and lateral piping and gas valves; installation of replacement air piping; the installation of a horizontal collector below the new final cover area; installation of remote well heads for several existing wells; and other minor improvements to the gas system. The two replacement gas wells are designated GW-408R (DNR Pt. ID #963) and GW-413R (DNR Pt. ID #964).

If you have any questions regarding this letter, please contact Susan Fisher at 262-574-2148 or susan.fisher@wisconsin.gov.

Sincerely,

James C. Delwiche
Waste and Materials Management Program Supervisor
Southeast Region

cc: Mike Williams – mwilliams2@republicservicses.com
Pete Rammer – rammer@cqminc.com
Gerald DeMers – DNR SER

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL FOR THE 2018-2019 FINAL COVER & LANDFILL GAS SYSTEM AT THE KESTREL HAWK LANDFILL, LICENSE # 0572

FINDINGS OF FACT

The Department of Natural Resources (department) finds that:

1. Republic Services of Wisconsin, LP (Republic) owns and operates a municipal solid waste disposal facility and a hazardous waste facility, known as the Kestrel Hawk Landfill, located in the N 1/2 of Section 23, T3N, R22E, City of Racine, Racine County, Wisconsin.

2. The department issued a plan of operation approval for Land Reclamation, Ltd. on December 19, 1984, with subsequent modifications.

3. The department issued a conditional plan of operation for the expanded Kestrel Hawk Landfill, referred to as the Kestrel Hawk Northwest Expansion Landfill on August 30, 1996, with subsequent modifications.

4. On October 22, 2019, CQM, Inc. (CQM), on behalf of Republic, submitted construction documentation required by NR 516, Wis. Adm. Code. The correct review fee of $1,100 and construction inspection fee of $2,750 were received by the department on November 4, 2019.

5. The information submitted as construction documentation includes the following:

    a. A report entitled "Construction Documentation Report for the 2018-2019 Composite Cover and LFG Systems" and accompanying 18 plan sheets dated October 22, 2019 and received by the department on October 25, 2019.

    b. A letter addendum, attachments and one revised plan sheet #6, submitted by Tetra Tech (formerly CQM) and dated January 29, 2020. The submittal was in response to a department email request dated January 13, 2020 for additional information regarding the documentation report.

6. Additional documents considered in connection with the review of the construction documentation include the following:

    a. An RMT Inc. report entitled “Land Reclamation Company Northwest Expansion Plan of Operation” and accompanying plan sheets. The report was submitted by RMT Inc., on May 31, 1996.

    b. The preconstruction report for the final cover submitted by CQM and dated September 25, 2018.

    c. The department’s August 17, 2011 plan modification approval for final cover.

d. The department's January 26, 2007 plan modification approval that included the conditional reuse of treated soils as soil barrier layer in the final cover and the department's September 1, 1995 processing plan approval that included conditional reuse of treated soil for the rooting zone soil layer in the final cover.

e. The department's June 29, 2004 plan modification approval for revisions to the gas extraction system.

f. The department's May 1, 2002 plan modification approval for use of a geosynthetic clay liner and a geocomposite drainage layer in the final cover.

g. The department's inspection reports for inspections of 2018-2019 cap conducted on: September 28, 2018, October 30, 2018, December 6, 2018, June 6, 2019, and July 9, 2019.

CONCLUSIONS OF LAW

1. The department has authority under s. 289.31(3), Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

2. In accordance with the foregoing, the department has the authority to issue the following construction documentation approval.

CONSTRUCTION DOCUMENTATION APPROVAL

The department hereby approves the proposed construction documentation for 2018-2019 final cover and the landfill gas system at the Kestrel Hawk landfill, subject to compliance with chs. NR 500-538, Wis. Adm. Code.

This approval is based on the information available to the department as of the date of approval. If additional information, project changes or other circumstances indicate a possible need to modify this approval, the department may ask you to provide further information relating to this activity. Likewise, the department accepts proposals to modify approvals, as provided for in state statutes and administrative codes.

NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision made by the department, you should know that Wisconsin statutes and administrative codes establish time periods and requirements for reviewing department decisions.

To seek judicial review of the department's decision, sections 227.52 and 227.53, Stats., establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the department to file your petition with the appropriate circuit court and serve the petition on the department.

The petition shall name the Department of Natural Resources as the respondent.

Dated: February 3, 2020

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

James C. Delwiche
Waste and Materials Management Program Supervisor
Southeast Region

Susan M. Fisher, P.E.
Waste & Materials Management Program Engineer
Southeast Region

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
141 NW Barstow St. Room 180
Waukesha, WI 53188

Tony Evers, Governor

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WISCONSIN
DEPT. OF NATURAL RESOURCES

February 16, 2024

FID #252076990
Racine County
SW/Approval

Mr. Khalid Umer, P.E.
Environmental Manager
Republic Services, Inc., Kestrel Hawk Landfill
1969 Oakes Road Racine, WI 53406

Subject: Construction Documentation Approval for Final Cover Construction at the Kestrel Hawk Landfill, License #0572

Dear Mr. Umer:

The Department of Natural Resources (department) is approving the construction documentation report for the 2022-2023 composite cover construction at the Kestrel Hawk Landfill. The report documents the construction of approximately 15 acres of final cover in Phase 4 and Phase 5. The final cover consists of the following elements from top bottom to top.

- 6-inch grading layer
- 24-inch soil barrier layer
- Geocomposite clay liner layer
- 40-mil LLDPE geomembrane layer
- Geocomposite drainage layer
- 30-inch rooting zone layer
- 6-inch topsoil layer
- Erosion matting, seed, and fertilizer

Please keep in mind that this approval does not relieve you of obligations to meet all other applicable federal, state and local permits or regulatory requirements. If you have questions regarding this approval, please contact Tony Peterson at (715) 491-8546 or anthony.peterson@wisconsin.gov.

Sincerely,

James C. Delwiche

James C. Delwiche
Waste and Materials Management Program Supervisor
Southeast Region

cc: Craig Brochrup – Weaver Consultants Group (cbrochtrup@wcgrp.com)
Tony Peterson – DNR/WA (anthony.peterson@wisconsin.gov)
David Buser – DNR/WA (david.buser@wisconsin.gov)

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL FOR
2022-2023 COMPOSITE COVER FOR THE
REPUBLIC SERVICES, INC. KESTREL HAWK LANDFILL, LICENSE #0572

FINDINGS OF FACT

The Department of Natural Resources (department) finds that:

1. Republic Services, Inc. (Republic Services) owns and operates a municipal solid waste and hazardous waste disposal facility in the North ½ of Section 23, T3N, R22E, City of Racine, Racine County, Wisconsin known as the Kestrel Hawk Landfill (formerly known as Land Reclamation Landfill, LRL).

2. The department initially licensed the LRL on April 20, 1970.

3. The department issued conditional plan of operation approvals for the Kestrel Hawk Landfill on December 19, 1984, and August 30, 1996, for the Kestrel Hawk Park Northwest Expansion Landfill.

4. On December 12, 2023, Weaver Consultants Group, on behalf of Republic Services, submitted construction documentation required by NR 516, Wis. Adm. Code, for composite cover construction. The department received the review fee of $1,100 and inspection fee of $2,200 on December 29, 2023.

5. The information submitted with the construction documentation includes the following:

    a. A report titled "Construction Documentation Report 2022-2023 Composite Cover Kestrel Hawk Landfill", and associated drawings dated and received by the department on December 12, 2023.

6. Additional documents considered in connection with the construction documentation include the following:

    a. The report titled “Preconstruction Report 2022 Composite Cover Kestrel Hawk Landfill” and dated July 15, 2022.

    b. The department’s reports for the construction observation inspections conducted on May 16, 2022, August 15, 2022, September 2, 2022, and October 5, 2022.

    c. The department’s August 30, 1996, plan of operation approval for the Northwest Expansion of the Kestrel Hawk Landfill.

    d. The department’s files pertaining to the Kestrel Hawk Landfill (License #0572).

CONCLUSIONS OF LAW

1. The department has authority under s. 289.31(3), Wis. Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

2. In accordance with the foregoing, the department has the authority to issue the following construction documentation approval.

CONSTRUCTION DOCUMENTATION APPROVAL

The department hereby approves the construction documentation for 2022-2023 composite cover at the Kestrel Hawk Landfill, subject to compliance with chs. NR 500-538, Wis. Adm. Code.

This approval is based on the information available to the department as of the date of approval. If additional information, project changes or other circumstances indicate a possible need to modify this approval, the department may ask you to provide further information relating to this activity. Likewise, the department accepts proposals to modify approvals, as provided for in state statutes and administrative codes.

NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision made by the department, you should know that Wisconsin statutes and administrative codes establish time periods and requirements for reviewing department decisions.

To seek judicial review of the department's decision, sections 227.52 and 227.53, Wis. Stats., establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the department to file your petition with the appropriate circuit court and serve the petition on the department. The petition shall name the Department of Natural Resources as the respondent.

Dated: February 16, 2024

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

James C. Delwiche
Waste & Materials Management Program Supervisor
Southeast Region

Tony Peterson
Waste Management Engineer
Southeast Region

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
141 NW Barstow St. Room 180
Waukesha, WI 53188

Tony Evers, Governor

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WISCONSIN DEPT. OF NATURAL RESOURCES

November 8, 2024

FID #252076990
Racine County
SW/Approval

Mr. Khalid Umer, P.E.
Environmental Manager
Republic Services, Inc., Kestrel Hawk Landfill
1969 Oakes Road Racine, WI 53406

Subject: Construction Documentation Approval for 2023-2024 Composite Cover Construction at the Kestrel Hawk Landfill, License #0572

Dear Mr. Umer:

The Department of Natural Resources (department) is approving the construction documentation report for the 2023-2024 composite cover construction at the Kestrel Hawk Landfill. The report documents the final closure of the Kestrel Hawk Landfill by construction of approximately 24.8 acres of final cover in Phase 4 and Phase 5.

The final cover project area consists of the following elements from bottom to top.

- 6-inch grading layer
- 24-inch compacted clay layer
- 40-mil LLDPE geomembrane layer
- Geocomposite drainage layer
- 30-inch rooting zone layer
- 6-inch topsoil layer
- Erosion matting, seed, and fertilizer

The southeastern corner of the 2024-2024 composite cover constriction area, which is subject to requirements of the Resources Conservation and Recovery Act (RCRA), also includes a geosynthetic clay liner (GCL) layer between the 24-inch compacted clay layer and the 40-mil LLDPE geomembrane layer.

One deviation was noted in the construction documentation report pertaining to the storm water management components of the final cover. The toe drain system has outlet pipes at varying distances along the toe of the slope. The outlet pipes are oriented down slope to convey water to existing stormwater features. In areas where water did not flow to existing stormwater features, a sump was installed to pump water to the existing stormwater features.

Please keep in mind that this approval does not relieve you of obligations to meet all other applicable federal, state and local permits or regulatory requirements. If you have questions regarding this approval, please contact Tony Peterson at (715) 491-8546 or anthony.peterson@wisconsin.gov.

Sincerely,

Natasha Gwidt, P.E.

Natasha Gwidt, P.E.
Field Operations Director and Interim Southeast Region Supervisor
Waste and Materials Management Program

cc: Craig Brochrup – Weaver Consultants Group (cbrochtrup@wcgrp.com)
Tony Peterson – DNR/WA (anthony.peterson@wisconsin.gov)
David Buser – DNR/WA (david.buser@wisconsin.gov)
Doug Coenen – DNR/WA (douglas.coenen@wisconsin.gov)
Kendra Fisher – DNR/WA (Kendra.fisher@wisconsin.gov)
Dustin Sholly – DNR/WA (dustin.sholly@wisconsin.gov)

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL FOR
2023-2024 COMPOSITE COVER FOR THE
REPUBLIC SERVICES, INC. KESTREL HAWK LANDFILL, LICENSE #0572

FINDINGS OF FACT

The Department of Natural Resources (department) finds that:

1. Republic Services, Inc. (Republic Services) owns and operates a municipal solid waste and hazardous waste disposal facility in the North ½ of Section 23, T3N, R22E, City of Racine, Racine County, Wisconsin known as the Kestrel Hawk Landfill (formerly known as Land Reclamation Landfill, LRL).

2. The department initially licensed the LRL on April 20, 1970.

3. The department issued conditional plan of operation approvals for the Kestrel Hawk Landfill on December 19, 1984, and August 30, 1996, for the Kestrel Hawk Park Northwest Expansion Landfill.

4. On July 24, 2024, Weaver Consultants Group, on behalf of Republic Services, submitted construction documentation required by NR 516, Wis. Adm. Code, for composite cover construction. The department received the review fee of $1,100 and inspection fee of $3,300 on August 20, 2024.

5. The information submitted with the construction documentation includes the following:

    a. A report titled "Construction Documentation Report 2023-2024 Composite Cover Kestrel Hawk Landfill", and associated drawings dated and received by the department on July 24, 2024.

    b. A report titled “Response to October 7, 2024, Comments, Kestrel Hawk Landfill”, and associated drawings dated and received by the department on October 11, 2024.

1. Additional documents considered in connection with the construction documentation include the following:

    a. The department’s email dated October 7, 2024, deeming the construction documentation report incomplete and requesting additional information.

    b. The report titled “Preconstruction Report 2023 Composite Cover Kestrel Hawk Landfill” and dated June 2023.

    c. The department’s reports for the construction observation inspections conducted on May 16, 2023, July 11, 2023, July 25, 2023, August 31, 2023, November 14, 2023, and June 13, 2024.

    d. The department’s August 30, 1996, plan of operation approval for the Northwest Expansion of the Kestrel Hawk Landfill.

    e. The department’s files pertaining to the Kestrel Hawk Landfill (License #0572).

CONCLUSIONS OF LAW

1. The department has authority under s. 289.31(3), Wis. Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the conditional plan of operation approval.

2. In accordance with the foregoing, the department has the authority to issue the following construction documentation approval.

CONSTRUCTION DOCUMENTATION APPROVAL

The department hereby approves the construction documentation for 2023-2024 composite cover at the Kestrel Hawk Landfill, subject to compliance with chs. NR 500-538, Wis. Adm. Code.

This approval is based on the information available to the department as of the date of approval. If additional information, project changes or other circumstances indicate a possible need to modify this approval, the department may ask you to provide further information relating to this activity. Likewise, the department accepts proposals to modify approvals, as provided for in state statutes and administrative codes.

NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision made by the department, you should know that Wisconsin statutes and administrative codes establish time periods and requirements for reviewing department decisions.

To seek judicial review of the department's decision, sections 227.52 and 227.53, Wis. Stats., establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the department to file your petition with the appropriate circuit court and serve the petition on the department. The petition shall name the Department of Natural Resources as the respondent.

Dated: November 8, 2024

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Natasha Gwidt, P.E.
Field Operations Director and Interim Southeast Region Supervisor
Waste and Materials Management Program

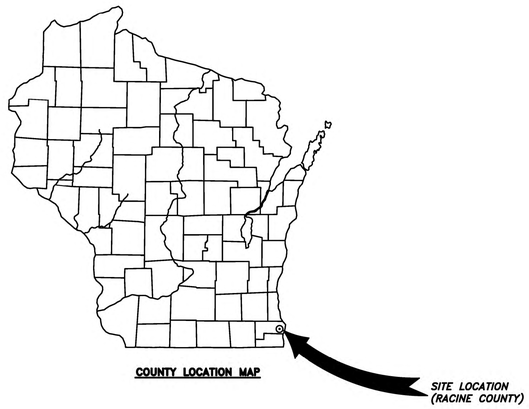
Tony Peterson
Waste Management Engineer
Southeast Region

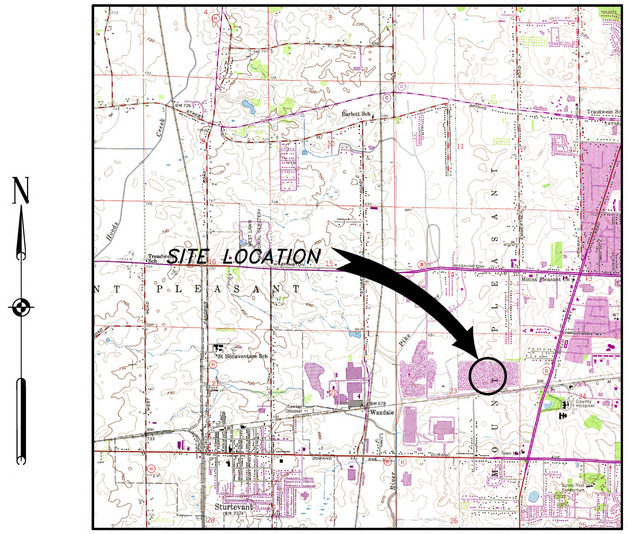
Appendix B: RCRA Cover Plans

REPUBLIC SERVICES OF WISCONSIN, L.P.

OLD SITE AREA FINAL COVER
Plan Modification
KESTREL HAWK RDF
RACINE, WISCONSIN

JUNE 2011





SITE LOCATION MAP – RACINE COUNTY
APPROX. SCALE = N.T.S.

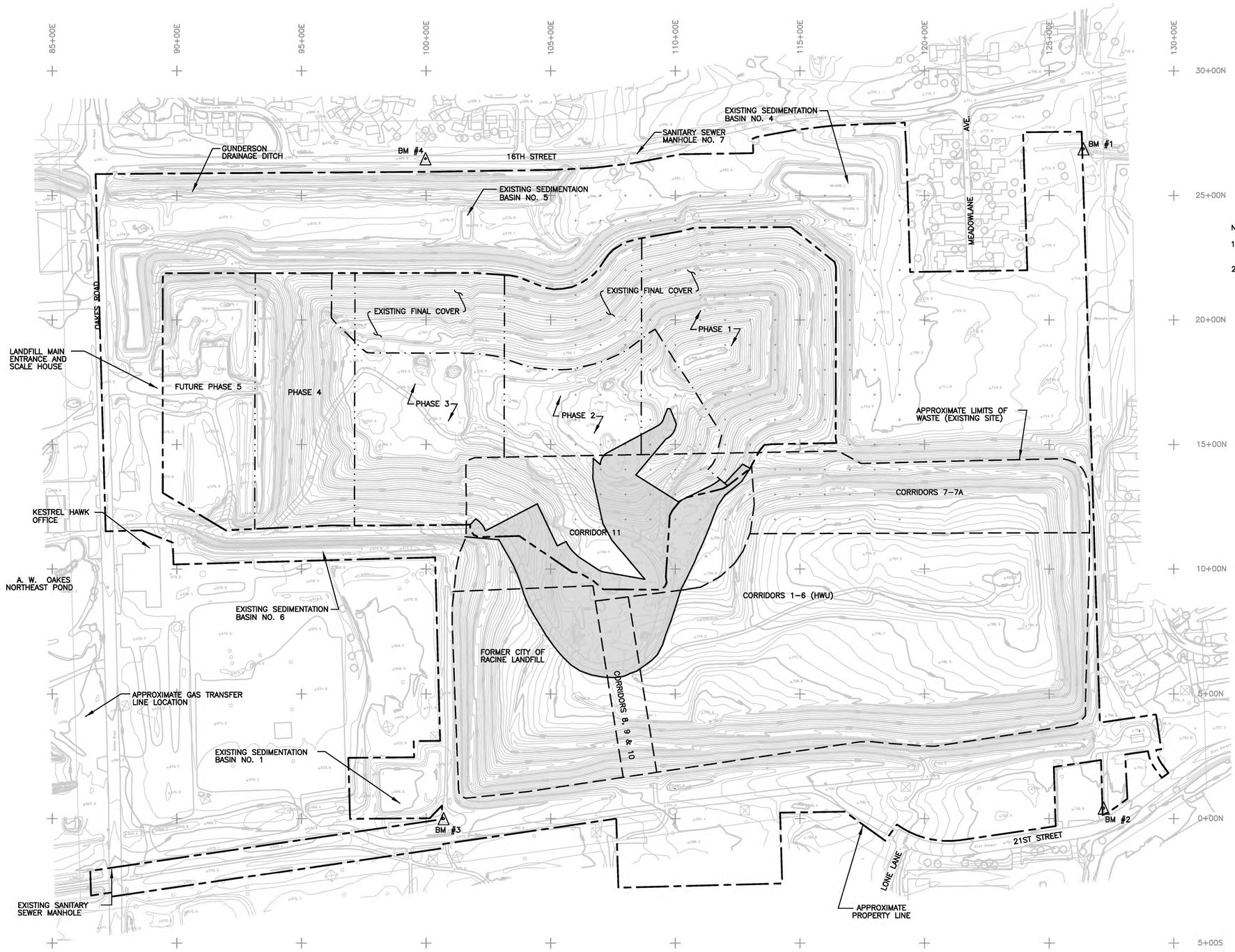
INDEX	
DRAWING NO	**DESCRIPTION**
1	TITLE SHEET
2	EXISTING CONDITIONS
3	FINAL COVER GRADES (PERMIT VS PLAN MODIFICATIONS)
4	DETAILS
5	DETAILS
6	CROSS SECTIONS
7	CROSS SECTIONS

Drawings Prepared By:

CQM, INC.

Engineering–Surveying–Material Testing

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LEGEND

- APPOXIMATE LIMITS OF WASTE NORTHWEST EXPANSION
- 670 — EXISTING CONTOUR
- LIMITS OF WASTE (OLD SITE)
- APPROXIMATE PROPERTY LINE
- APPROXIMATE PHASING BOUNDARIES
- EXISTING CLOSURE BOUNDARIES
- AREA OF PLAN MODIFICATION
- BM #1 — SURVEY BENCHMARK LOCATION

NOTES:

1. BASE MAP IS FROM AIR PHOTO MAPPING BY THE SIDEWELL COMPANY, SAINT CHARLES, ILLINOIS. DATE OF PHOTO: APRIL 12, 2010.
2. SITE GRID IS WISCONSIN STATE PLANE COORDINATE SYSTEM

   0+00 SITE GRID NORTH = 264,196.55 STATE PLANE GRID
   0+00 SITE GRID EAST = 2,563,700.72 STATE PLANE GRID

ELEVATIONS REFERENCED TO MEAN SEA LEVEL

N

SITE BENCHMARK LOCATION COORDINATES

BENCHMARK DESCRIPTION	CONSTRUCTION GRID NORTH	CONSTRUCTION GRID EAST	ELEVATION (MSL)
BM #1	26+87.50 N	126+37.78 E	N/A
BM #2	0+42.34 N	127+19.15 E	716.82
BM #3	0+00.11 S	100+70.38 E	674.88
BM #4	26+47.93 N	99+97.68 E	683.11

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Project Review

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REPUBLIC SERVICES

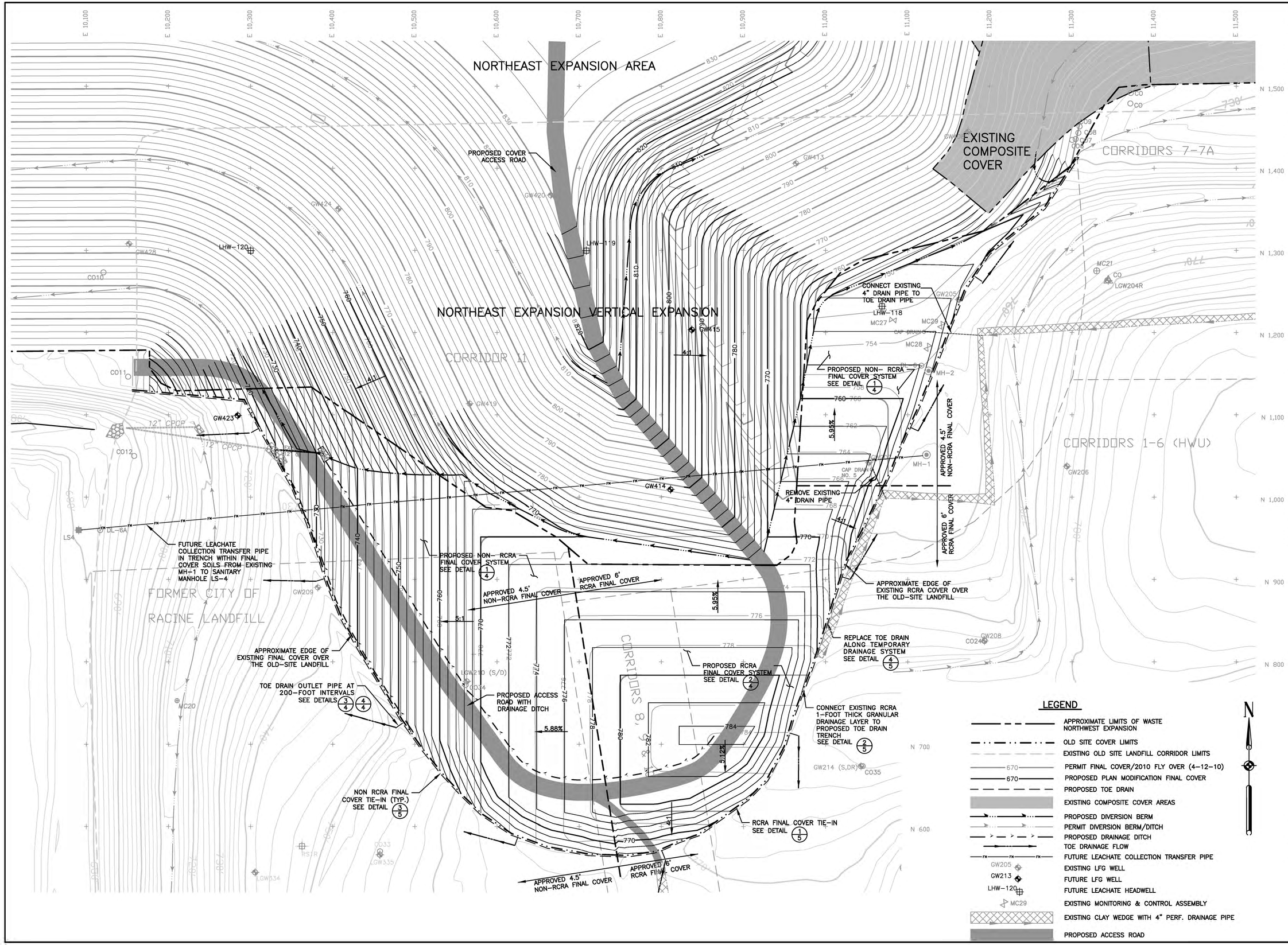
CQM, INC.
Engineering–Surveying–Material Testing
2679 Continental Drive
Green Bay, WI 54311

Existing Conditions

Old Site Area Final Cover
Plan Modification
Kestrel Hawk RDF
Racine, Wisconsin

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DATE: June 2011
SCALE: 1" = 200'
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Green Bay, WI 54311

Final Cover Grades (Permit Vs Plan Modifications)

Old Site Area Final Cover
Plan Modification
Kestrel Hawk RDF
Racine, Wisconsin

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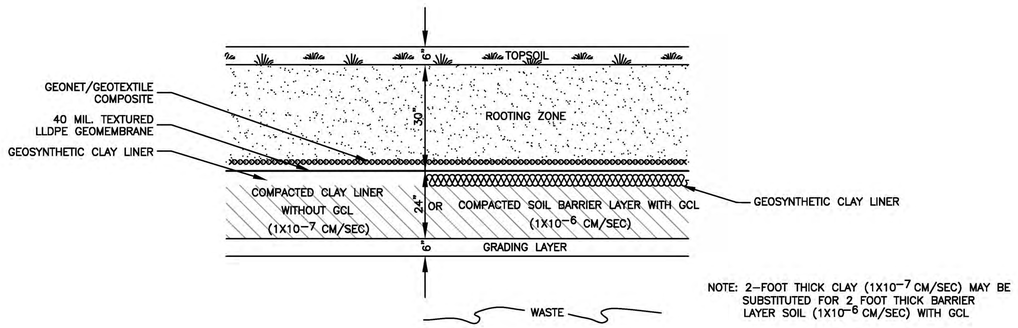
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SCALE: 1" = 50'

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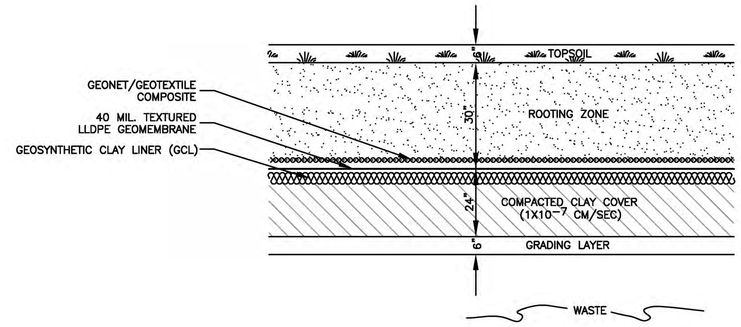
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NOTE: 2–FOOT THICK CLAY (1X10^{-7} CM/SEC) MAY BE SUBSTITUTED FOR 2 FOOT THICK BARRIER LAYER SOIL (1X10^{-6} CM/SEC) WITH GCL

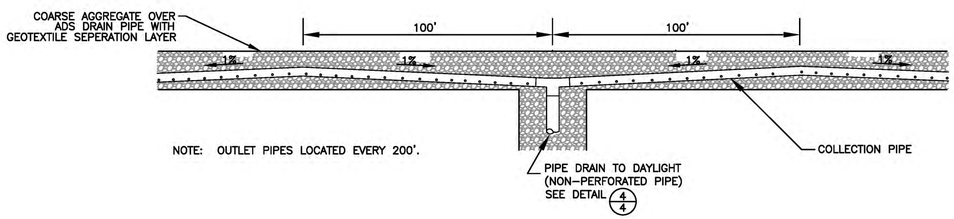
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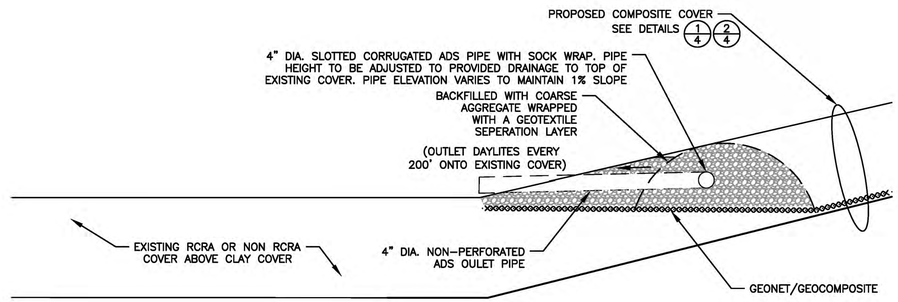
2/4 PROPOSED RCRA FINAL COVER SYSTEM

NOT TO SCALE



3/4 COVER DRAIN PIPE LAYOUT DETAIL

NOT TO SCALE



4/4 COVER DRAIN

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REPUBLIC SERVICES

CQM, INC.
Engineering–Surveying–Material Testing
2679 Continental Drive
Green Bay, WI 54311

Details

Old Site Area Final Cover
Plan Modification
Kestrel Hawk RDF
Racine, Wisconsin

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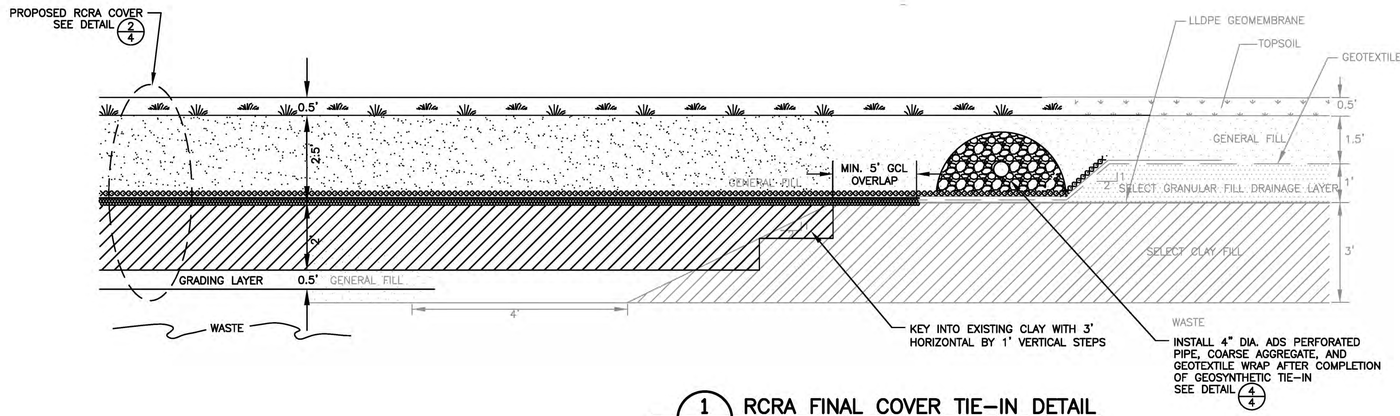
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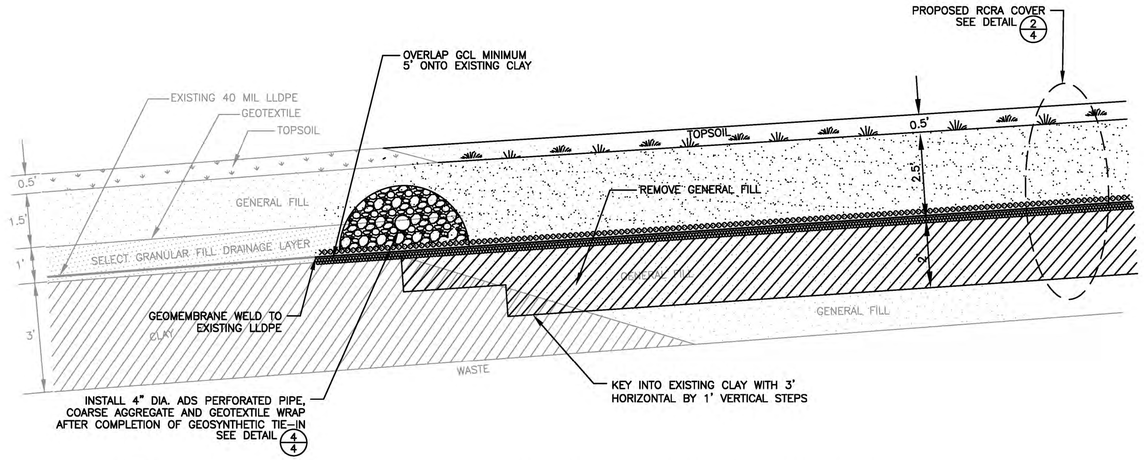
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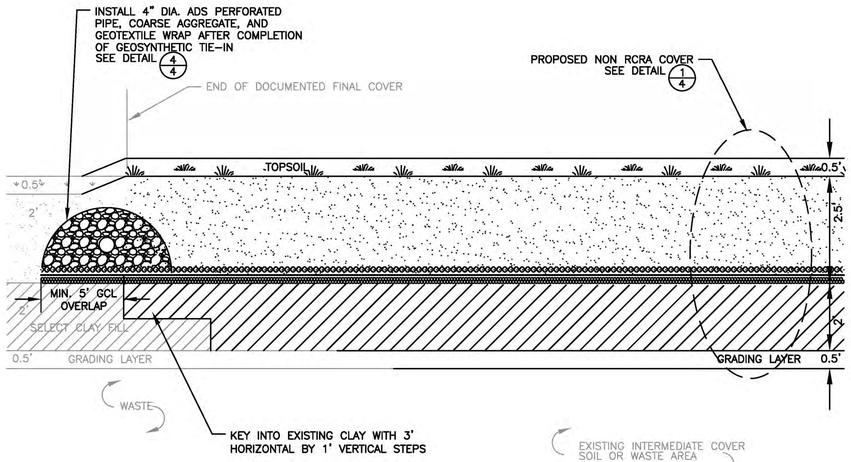
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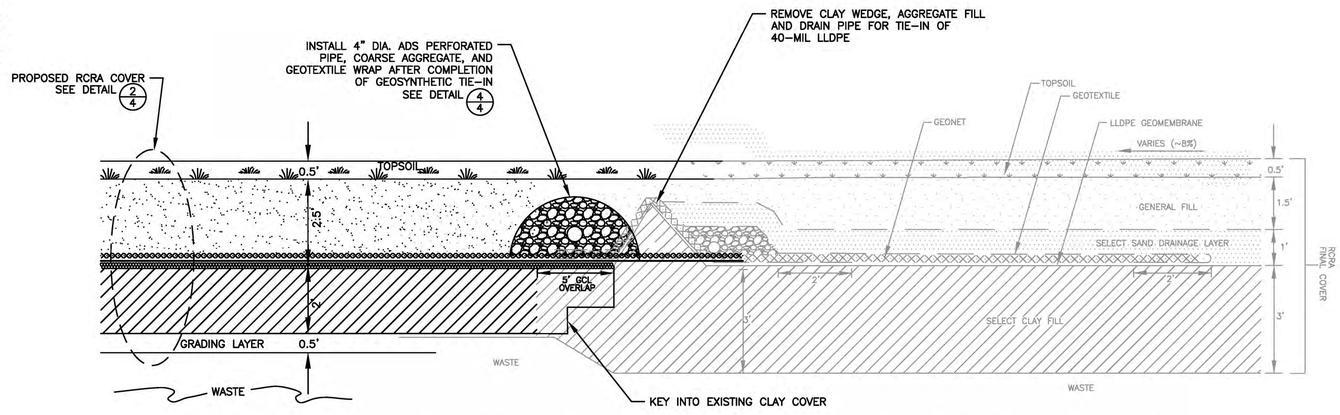
1/5 RCRA FINAL COVER TIE-IN DETAIL
NOT TO SCALE



2/5 RCRA FINAL COVER TIE-IN @ TEMPORARY DRAINAGE SYSTEM DETAIL
NOT TO SCALE



3/5 NON-RCRA FINAL COVER TIE-IN DETAIL
NOT TO SCALE



4/5 RCRA COVER TIE-IN TO EXISTING RCRA COVER WITH PERIMETER DRAINAGE SYSTEM
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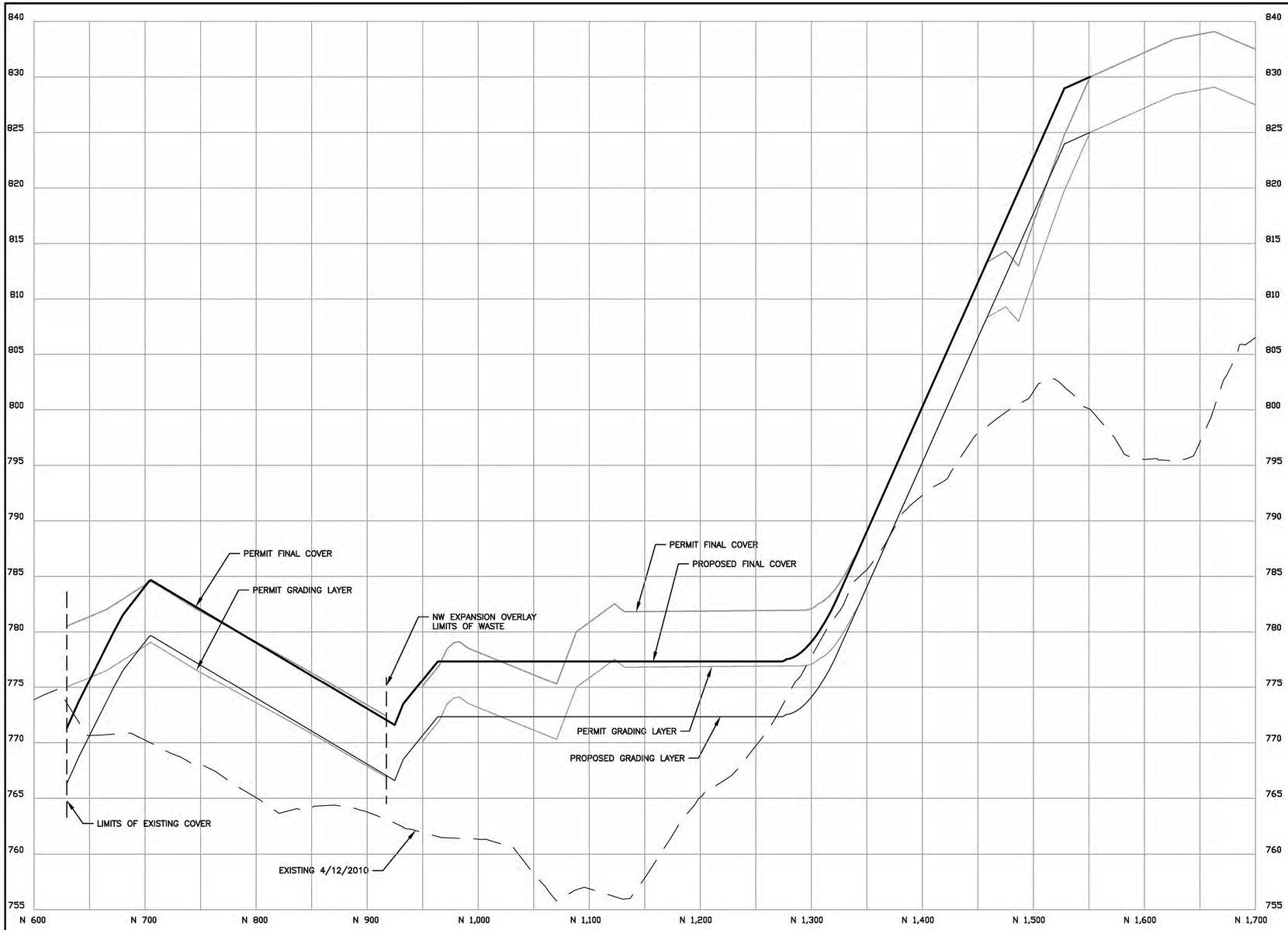
CQM, INC.
Engineering-Surveying-Material Testing
2679 Continental Drive
Green Bay, WI 54311

Details

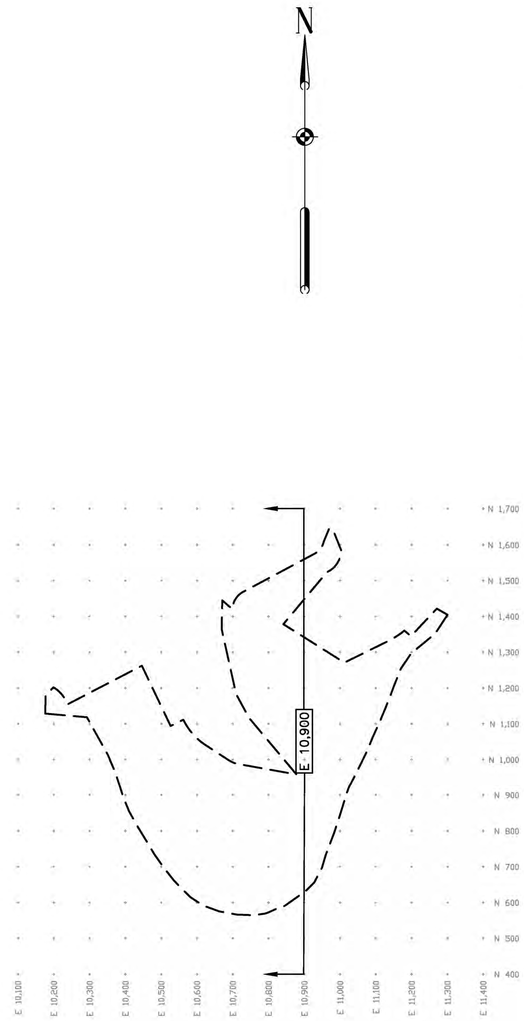
Old Site Area Final Cover
Plan Modification
Kestrel Hawk RDF
Racine, Wisconsin

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ENGINEERING CROSS SECTION E 10,900



SITE LOCATION MAP

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REVISIONS

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Engineering–Surveying–Material Testing
2679 Continental Drive
Green Bay, WI 54311

Cross Sections

Old Site Area Final Cover
Plan Modification
Kestrel Hawk RDF
Racine, Wisconsin

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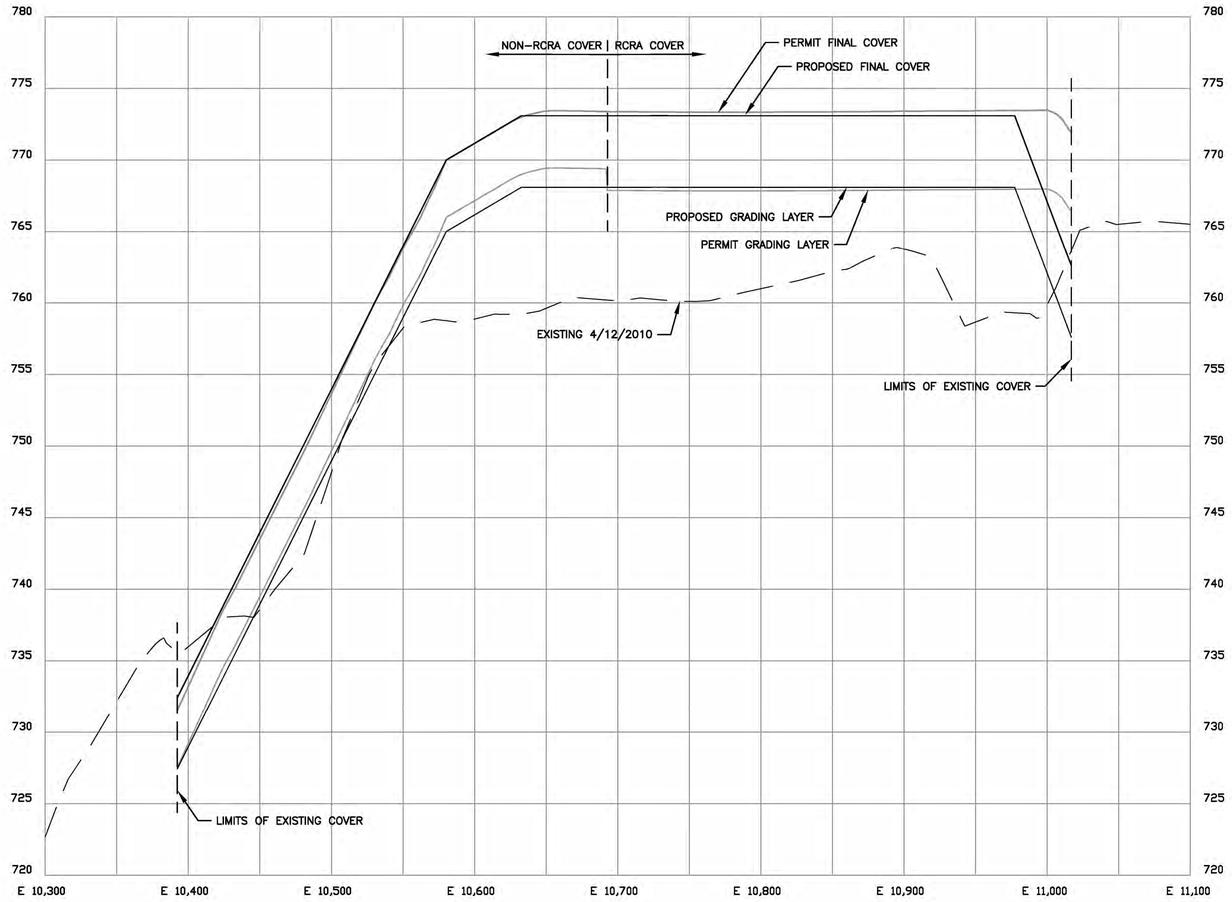
DATE: June 2011

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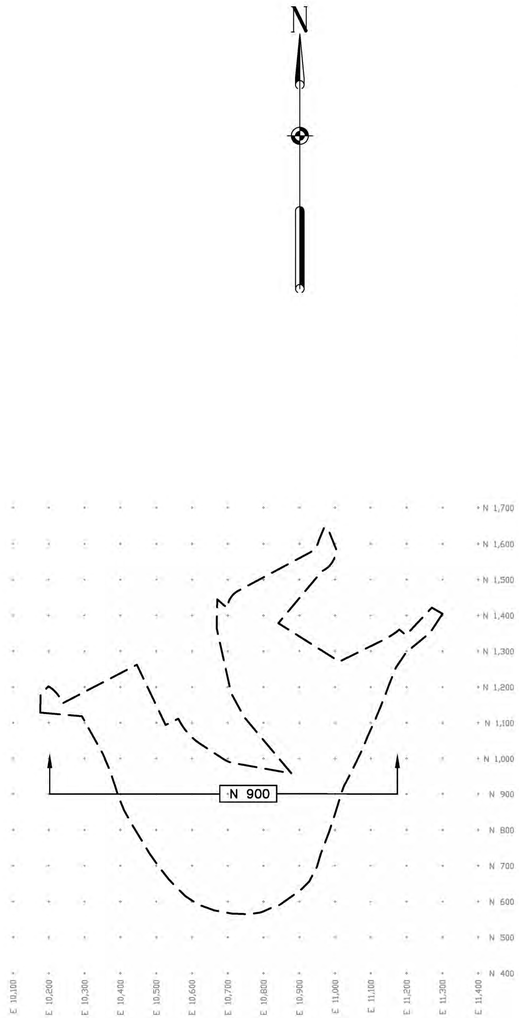
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ENGINEERING CROSS SECTION N 900



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REVISIONS

REPUBLIC SERVICES

CQM, INC.
Engineering-Surveying-Material Testing
2879 Continental Drive
Green Bay, WI 54311

Cross Sections

Old Site Area Final Cover
Plan Modification
Kestrel Hawk RDF
Racine, Wisconsin

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DATE: June 2011

SCALE: As Shown

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Appendix C: Closure Cost Estimate

Engineering Opinion of Probable Cost - 2024
Site Closure (Final Grades)
Kestrel Hawk - Northwest Expansion & Old Site Landfill (License #252076990)
Racine County, Wisconsin

Cost Item	2024 Unit Price[1]		Quantity	Cost
Final Cover System:				
Mobilization (earthwork, geosynthetics, and gas system contractors)	$16,100.00	EA	1	$16,100
Grading layer (6 inch thick)	$4.44	CY	31,218	$138,700
Soil barrier layer/clay (24 inch thick)	$9.53	CY	124,872	$1,190,100
Geosynthetic clay liner (GCL)	$0.72	SF	1,685,775	$1,213,800
40-mil LLDPE geomembrane	$0.60	SF	1,685,775	$1,011,500
Geocomposite drainage layer	$0.54	SF	1,685,775	$910,400
Root zone soils (30 inch thick)	$9.53	CY	156,090	$1,487,600
Diversion berms	$13.50	LF	6,445	$87,100
Topsoil (6 inch thick)	$10.32	CY	31,944	$329,700
Seed, fertilizer, and mulch	$2,381.00	ACRE	40.0	$95,300
Downslope flumes/Energy dissipator	$20,634.00	LS	1	$20,700
4 inch HDPE perimeter toe drain pipe	$22.22	LF	3,560	$79,200
Gas extraction wells and appurtenances[2]	$81.79	VF	308	$25,200
6" Gas collection pipe	$17.58	LF	4,840	$85,100
8" Gas collection pipe	$23.58	LF	1,325	$31,300
12" Gas collection pipe	$35.58	LF	3,335	$118,700
Engineering Fees:				
Engineering Drawings and Specifications	$29,815.00	EA	1	$29,800
Construction Observation	$11,904.00	ACRE	38.7	$460,700
Surveying	$2,698.00	ACRE	38.7	$104,400
			Subtotal[3]:	$7,435,400
			Contingency (10%)[3]:	$743,500
			Total Cost[3]:	$8,178,900

Notes:

1. Unit prices are based on 2021 closure estimate submitted with the 2021 Hazardous Waste Report. The unit prices were inflated by a factor of 1.1926 approved 2006 closure estimate increased by the published inflation .
2. Assumed replacement of 4 gas extraction wells at an average depth of 77 feet per well.
3. Costs are rounded to the nearest hundred.

Created By: S. Edwards, 8.24.2021, B. Kahnk 2/9/2024
Checked By: J. Hotstream, 8.24.2021

Appendix E: Hazardous Waste Summary

© Republic Services of Wisconsin, Limited Partnership 2026

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
17801	01/16/01	Phillips Plating Corp	Hazardous waste sludge N.O.S.	ORM-E	NA9188	EW	24210	
						GW	57090	
						F006	32800	
17802	02/10/01	Phillips Plating Corp	Hazardous waste sludge N.O.S.	ORM-E	NA9188	EW	24420	
						GW	57690	
						F006	33270	
01497	01/09/00	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008		
01493	12/29/00	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189			
39321	02/12/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
29635	10/07/01	Ladish Company	Hazardous Waste Solid NOS	ORM-E	NA9189	D008	6400	
49801	02/19/01	Ladish Company	Waste oil, forge Lubricant scale mixture	ORM-E	NA9189	D008	1500	1
39320	02/10/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39319	02/09/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39318	02/09/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39317	02/06/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39316	02/15/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39314	02/05/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
93915	02/04/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39313	02/04/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39312	02/02/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
39311	01/29/81	Ladish Company	Waste Oil, Forge Lubricants Scale Mixture	ORM-E	NA9189	D000	1500	
39310	01/27/81	Ladish Company	Waste Oil, Forge Lubricants Scale Mixture	ORM-E	NA9189	D000	1500	
39309	01/27/81	Ladish Company	Waste Oil, Forge Lubricants Scale Mixture	ORM-E	NA9189	D000	1500	
39308	01/22/81	Ladish Company	Waste Oil, Forge Lubricants Scale Mixture	ORM-E	NA9189	D000	1500	
39307	01/20/81	Ladish Company	Waste Oil, Forge Lubricants Scale Mixture	ORM-E	NA9189	D000	1500	
39306	01/16/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000		
39305	01/16/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000		
39304	01/15/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
39303	01/14/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
39302	01/13/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
39301	01/12/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000		
01498	01/12/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000		
01496	01/07/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189			
01495	01/06/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189			
01494	01/05/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189			
39323	02/13/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
39324	02/16/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
39325	02/10/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
39322	01/12/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
50012	03/27/81	Ladish Company	Hazardous Waste, Liquid or Solid NOS	NON-E	NA9189	D000	4000	

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
49803	04/02/01	Ladish Company	Hazardous Waste, Liquid or Solid NOS	ORM-E	NA9189	D008	2500	
49804	04/29/01	Ladish Company	Hazardous Waste, Liquid or Solid NOS	ORM-E	NA9189	K063	22000	
20959	09/09/01	Ladish Co/Tri-Clover	Waste Flammable Liquid NOS	Flammable Liq	UN1993	D001,F001 F002,F005	3200	
20956		Ladish Co/Tri-Clover	Waste Flammable Liquid NOS	Flammable Liq	UN1993	D001,F001 F002,F005	12455	
20957	04/21/01	Ladish Co/Tri-Clover	Waste Flammable Liquid NOS	Flammable Liq	UN1993	D001,F001 F002,F005	5397	
01402	12/08/00	Ladish Company	Waste Oil, Forge Lubricant, Scale Mixture	ORM-E	NA9189		2500	
01407	12/16/00	Ladish Company	Waste Oil, Forge Lubricant Scale MIxture	ORM-E	NA9189			
01406	12/15/00	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189			
01404	12/11/00	Ladish Company	WAste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189			
01499	12/09/00	Ladish Company	Waste Oil, Forge Lubricant, Scale MIxture	ORM-E	NA9189			
01500	11/25/00	Ladish Company	Waste Oil, Forge Lubricant, Scale Mixture	ORM-E	NA9189		11000	
01403	12/9/00	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189		2500	
01405	12/15/00	Ladish Company	Waste Oil, Forge Lubricant Scale MIxture	ORM-E	NA9189			
49306	10/09/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-000		
49305	10/09/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-000		
04846	10/09/01	Getzen Company	WAstewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-000		
04844	10/09/01	Genzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-000		
04845	10/09/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9190	F-006,D-000		
04840	10/09/01	Gentzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-000		
04934	10/08/01	Gentzen Company	WAstewater treatment sludge from electroplating operations	ORM-E	NA9189			

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
04043	10/01/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04039	10/08/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04036	10-08/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04030	10/08/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04035	10/08/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04032	10/08/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189			
04028	05/10/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006	6300	
04031	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006		
23035	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
23033	10-08-01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
23034	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008	55540	
23031	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
23030	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04033	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189			
49308	10/09/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189			
49307	10/91/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
23032	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04041	10/09/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04042	10/09/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189			
04047	10/09/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
49315	12/20/02	Getzen Company, Inc.	WAstewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006		
04049	04/14/02	Getzen Company, Inc.	Wastewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006		
04040	01/15/02	Getzen Company, Inc.	WAstewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006		
49314	09/21/02	Getzen Company, Inc.	Wastewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006	4020	
20932	02/03/01	Eaton Corporation	Hazardous Waste	ORM-E	NA9189	F017	1670	
20940	09/24/02	Eaton Corporation	Hazardous Waste	ORM-E	NA9189	F017	5120	
127303	12/14/02	Eaton Corporation	Hazardous Waste	ORM-E	NA9189	F017	466	
20943	06/22/02	Eaton Corporation	Hazardous Waste	ORM-E	NA9189	F017	640	
20939	03/24/02	Eaton Corporation	Hazardous WAste	ORM-E	NA9189	F017	1665	
20946	06/29/02	Eaton Corporation	Hazardous Waste-S	ORM-E	NA9189	D008	237	
			Hazardous Waste-L	ORM-E	NA9189	F002	1540	
			Hazardous Waste-L	ORM-E	NA9189	D001	53	
20945	06/29/02	EAton Corporation	Hazardous Waste-S	ORM-E	NA9189	D007	200	
			Hazardous Waste-L	ORM-E	NA9189	D007	2068	
127301	12/12/02	Eaton Corporation	Hazardous Waste-L	ORM-E	NA9189	D007	370	
			Hazardous Waste-L	ORM-E	NA9189	F002	735	
			Non-Hazardous Special	N/A	N/A	N/A	1831	
36002	06/29/02	Frank Holton & Co	Wastewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006	10000	
36003	07/08/02	FRank Holton & Co	Wastewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006	10000	
36004	09/30/02	Frank Holton & Co	Wastewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006	10000	

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
36005	10/15/02	Frank Holton & Co	Wastewater treatment sludge from electroplating operation	ORM-E	NA9189	F-006	10000	
36006	11/24/02	Frank Holton & Co	Wastewater treatment sludge from electroplating operation	ORM-E	NA9189	F-006	10000	
13955	02/26/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	29370	
13961	07/31/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	20210	
13962	09/15/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	27000	
13969	07/27/02	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	36780	
13965	12/17/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	34040	
13957	04/15/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	20000	
13953	02/03/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9188	F-006	30480	
13952	01/14/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	28430	
13954	02/05/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	31690	
101005	11/08/02	Square D Company	Hazardous waste NOS	ORM-C	NA9189	NONE	1680	
			Scrap Magnet waste-NOS	ORM-E	NONE	U013	715	
101001	08/09/02	Square D Company	Hazardous waste-NOS	ORM-C	NA9189	NONE	1870	
			Scrap Magnet waste-NOS	ORM-E	NONE	U013	1170	
20597	04/28/02	Square D Company	Hazardous waste-NOS	ORM-C	NA9189	NONE	3020	
			Scrap Magnet Waste-NOS	ORM-E	NONE	U013	1860	
20593	02/03/02	Square D Company	Hazardous waste-NOS	ORM-C	NA9189	NONE	940	
			Scrap magnet waste-NOS	ORM-E	NONE	U013	2705	
20576	05/05/01	Square D Company	Hazardous Waste-S-NOS	ORM-E	NA9189	D000	5460	

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
20576(CONT)	05/05/01	Square D Company	Not Listed	Not Listed	N/L	N/L	13932	
			Combustible Liquid-NOS	Combustible	NA9189 liquid	N/A	910	
20583	07/29/01	Square D Company	Hazardous Waste-S NOS	ORM-E	NA9189	D000	370	
			Not Listed	Not Listed	N/L	N/L	5460	
			Scrap Magnet Waste	ORM-C	N/A	0011	830	
20580	05/20/01	Square D Company	Scrap Magnet Waste	ORM-C	N/A	U011	6000	
20592	10/20/01	Square D Company	Scrap Magnet Waste	ORM-C	N/A	U011	2025	
			Hazardous Waste-S NOS	ORM-E	NA9189	N/A	1010	
101000	12/29/02	Square D Company	Scrap Magnet Waste NOS	ORM-E	NONE	U011	600	
			Hazardous Waste NOS	ORM-C	NA9189	NONE	315	
22397	10/01/01	Professional Plating	Sludge from Chloride zinc Bath with Chromate	ORM-E	UN2331	F006,F000	6250	
			Profile No. K066-K008 Drum Control 2173	NONE	NONE	NONE	7916	
23604	01/02/01	Racine Steel Casting	Waste Furnace Dust	ORM-E	NA9189	D006,D000	20000	
23606	01/20/01	Racine Steel Casting	Waste Furnace Dust	ORM-E	NA9189	D006,D000	20000	
23600	12/01/01	Racine Steel Casting	Pep setI-1600 & Pep	set II-2600 ORM-E	NA9189	D001	2000	
136715	06/17/02	Huffy Corporation	Hazardous waste NOS	ORM-E	NA9189	D000		
21019	06/22/02	Huffy Corporation	Hazardous waste NOS	ORM-E	NA9189	0000	2000	
37725	08/19/01	Plastics Engineering	Waste phenol contaminated dirt	ORM-E	NA9189	U188	46300	
22444	08/06/01	Jacobsen-TEXTRON	Hazardous Waste NOS	ORM-E	NA9189	D000		
22443	07/23/01	Jacobsen-TEXTRON	Hazardous Waste NOS	ORM-E	NA9189	D000		

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
22442	07/14/01	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
22438	07/09/01	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
22439	07/07/01	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
22436	06/09/01	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
22437	06/09/01	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
22435	06/09/01	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
52001	04/12/02	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
52002	10/05/02	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
52012	10/20/02	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
52000	09/03/02	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
52004	05/13/02	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
36620	03/31/02	Quality Carriers, Inc	, Haz waste NOS	ORM-E	NA9189	D001	15660	
36621	04/01/02	Quality Carriers, Inc	, Haz waste NOS	ORM-E	NA9189	D001	15000	
36623	05/01/02	Quality Carriers, Inc	, Haz waste NOS	ORM-E	NA9189	D001	10020	
11664	07/30/02	Quality Carriers, Inc	, Haz waste NOS	ORM-E	NA9189	D001	6540	
40201	04/16/02	Shurpac Inc.	Paint Sludge	11274	11274	F017	7126	
22401	09/20/02	Shurpac Inc.	Paint Sludge	11274	11274	F017	2545	
22402	12/27/02	Shurpac Inc.	Paint Sludge	11274	11274	F017	1527	
40200	06/30/02	Shurpac Inc.	Paint Sludge	11274	11274	F017	2545	

Appendix F: Corrective Action Information

- F.1 – Excerpt from Foth Groundwater Remediation System Construction Observation Report – Sheet 1
- F.2 – Excerpt from 2024 Annual Report – Figure D-1: Vinyl Chloride Plume
- F.3 – Excerpt from 2024 Annual Report – Vinyl Chloride Trends
- F.4 – Excerpt from 2024 Annual Report – Figure D-2: 141U Area Instrumentation Diagram
- F.5 – Excerpt from Corrective Measures Study – List of Documents about 141U Area
- F.6 – Excerpt from Corrective Measures Study – Vinyl Chloride Historic Data

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Appendix F.1
Excerpt from Foth Groundwater Remediation System Construction Observation Report – Sheet 1

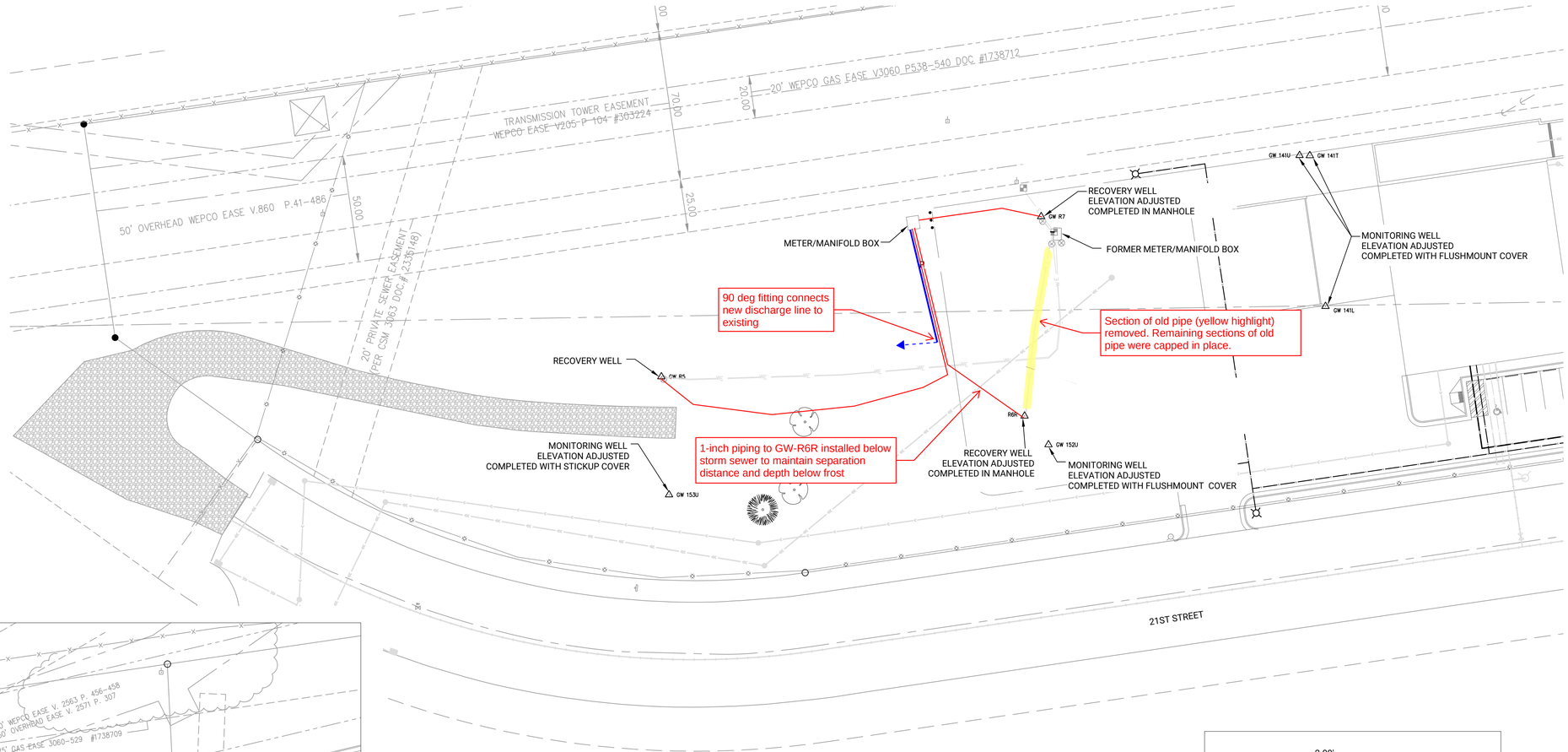
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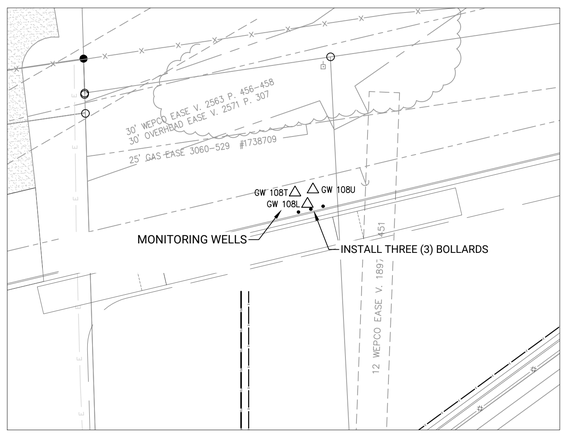
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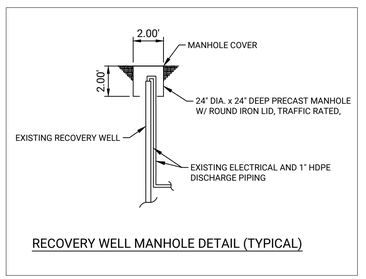
APPROX. NEW 1-IN. HDPE PIPE AND ELECTRICAL CONDUIT

DISCHARGE LINE

NOTE PIPE LOCATIONS ARE APPROXIMATE.
MONITORING AND RECOVERY WELLS WERE SURVEYED ON 6/27/2024







RECOVERY WELL MANHOLE DETAIL (TYPICAL)

0 30 60
scale feet

Foth

Foth Infrastructure & Environment, LLC
7044 S. 13th Street, Suite 200
Franklin, WI 53132
Phone: 414-336-7900 Fax: 414-336-7901

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CITY OF RACINE TRANSFER STATION

6110 - 6300 21ST STREET
RACINE, WI

WISCONSIN

RACINE COUNTY

DATE: MAY 2024
BY: ASL
CHKD: SMB2

WISCONSIN
ANDREA R. LORENZ
35736-006
DRAFTER-ISO
PROFESSIONAL ENGINEER

REMEDIAL SYSTEMS DOCUMENTATION

PROJECT ID 22R021.00

SHEET 1

Aug 18, 2023 - 3:51pm nol C:\pw_workdir\pw_ie\fvd_ncr\d0628297\C3.00.dwg

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Appendix F.2
Excerpt from 2024 Annual Report – Figure D-1: Vinyl Chloride Plume

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GROUNDWATER CONTAINMENT STRUCTURE

CS10 (687.81) (ND)
CS12 (693.41) (ND)
CS14 (696.65) (6.5)
108U (699.35) (NA)
134U (691.43) (ND)
141U (695.72) (3.8)
153U (693.56) (7.7)
152U (695.12) (9.0)
156U (NM) (NA)
155U (NA) (NM)
151UR (NA) (NM)
110U (NM)
(NA) (NA) (NA) (NA)
ND
5

LEGEND

	APPROXIMATE PROPERTY LINE
(5.2)	VINYL CHLORIDE CONCENTRATION (ug/L)
(NA)	NOT ANALYZED
(ND)	NOT DETECTED
(NM)	NOT MEASURED
	SLURRY WALL/BENTONITE WALL
10	CONTOUR FOR VINYL CHLORIDE CONCENTRATION BASED ON OCTOBER 2024 DATA (DASHED WHERE INFERRED)
141T	WATER TABLE OBSERVATION WELL LOCATION AND NUMBER
134U	PIEZOMETER IN THE UNIT A SAND
R-1	RECOVERY WELL
R-4	RECOVERY WELL ABANDONED
(690.12)	GROUNDWATER ELEVATION (FEET M.S.L.) (OCTOBER 9, 2024)
689	GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
	GROUNDWATER FLOW DIRECTION

NOTES

1. WATER LEVELS WERE MEASURED DURING OCTOBER 2024.
2. GROUNDWATER SAMPLES WERE COLLECTED DURING THE OCTOBER 2024 MONITORING PROGRAM.
3. RECOVERY WELLS R-5, R-6R, & R-7 AVERAGE PUMPING RATE DURING 2024 WAS 1.5 GPM AS CALCULATED FROM THE MONTHLY DATA PROVIDED BY KESTREL HAWK LANDFILL.

0 100 200
SCALE IN FEET

PROJECT:
KESTREL HAWK LANDFILL
2024 ANNUAL REPORT
RACINE, WISCONSIN

TITLE **POTENTIOMETRIC SURFACE CONTOURS AND VINYL CHLORIDE ISOCONCENTRATION MAP - UNIT A SAND 141U AREA**

DRAWN BY:	T. FIEBRANZ	PROJ NO.:	635454.0000
CHECKED BY:	J. EMERSON		
APPROVED BY:	T. MARTIN		**FIGURE D-1**
DATE:	JUNE 2025		

TRC
999 Fourier Drive
Suite 101
Madison, WI 53717
Phone: 608.826.3600

FILE NO.: 635454.0000.D1.dwg

11x17 - ATTACHED IMAGES; borrow, xrefs, image(s) - ATTACHED IMAGES
DRAWING NAME: J:\Republic\Kestrel Hawk\635454 - 2024 Annual Report\0000\635454.0000.D1.dwg — PLOT DATE: June 10, 2025 - 12:24PM — LAYOUT: FIGURE D-1
Version: 2017-03-03

Appendix F.3
Excerpt from 2024 Annual Report – Vinyl Chloride Trends

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Figure D-3
Kestrel Hawk Landfill
Vinyl Chloride Concentration: Well 141U

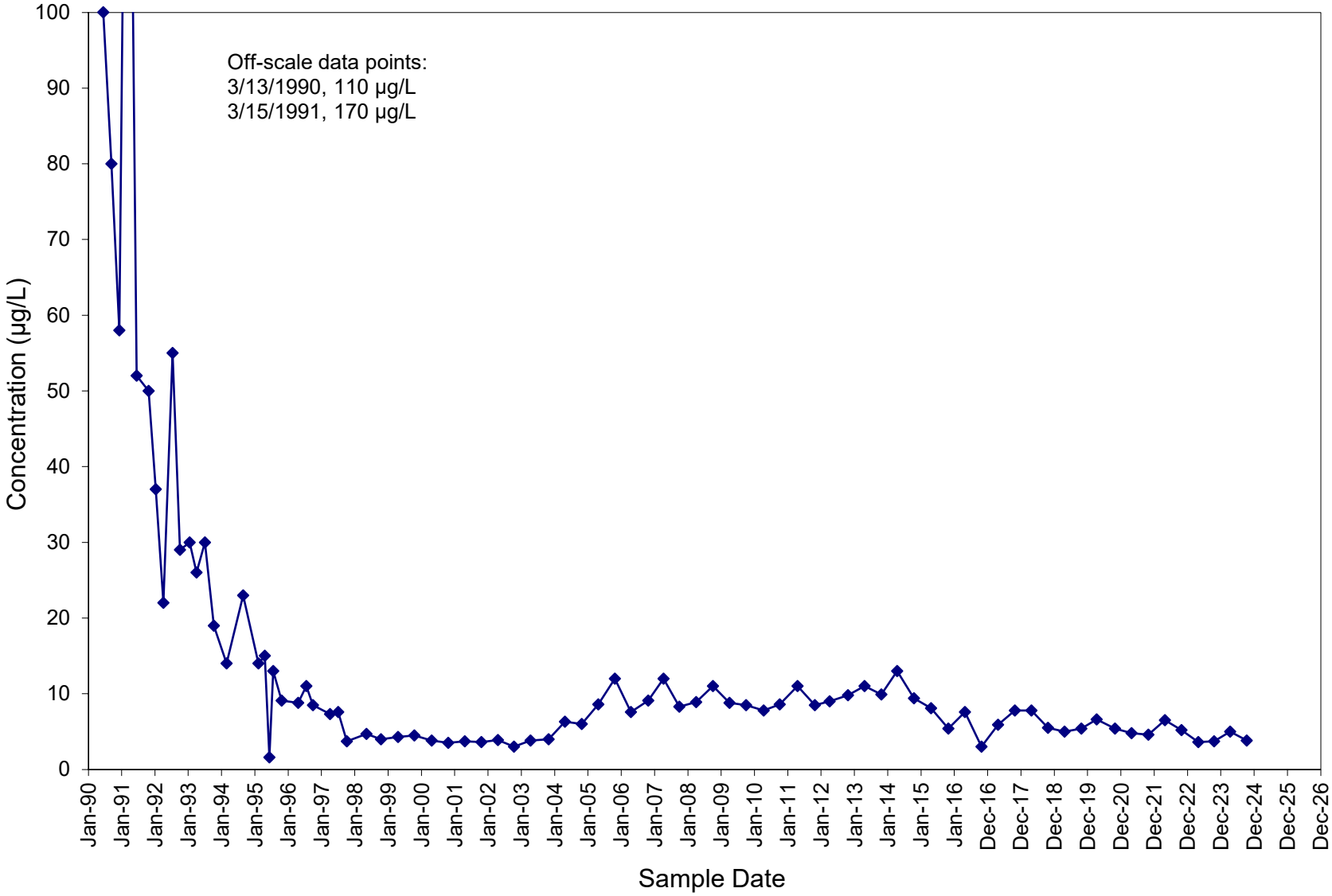
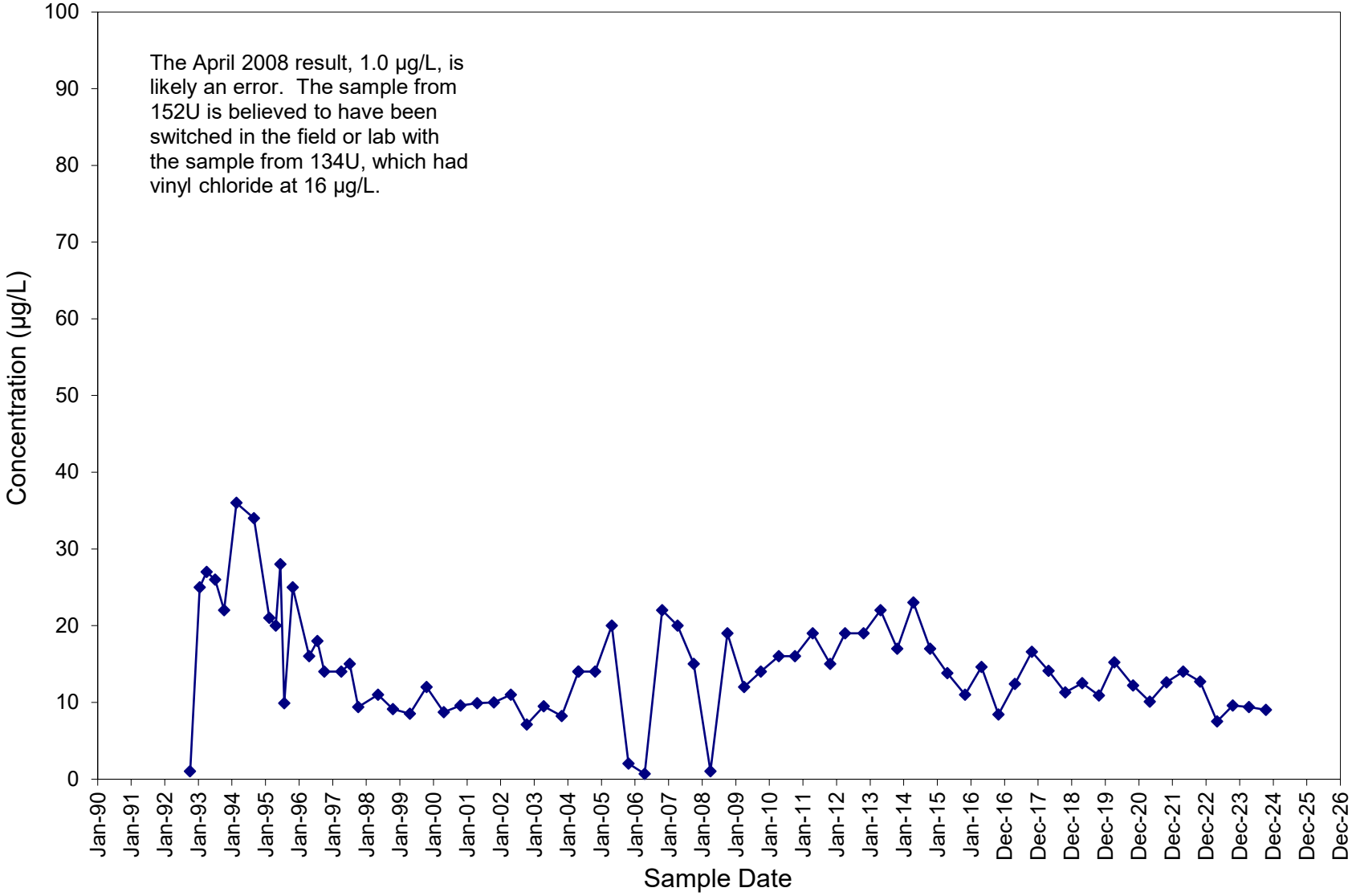
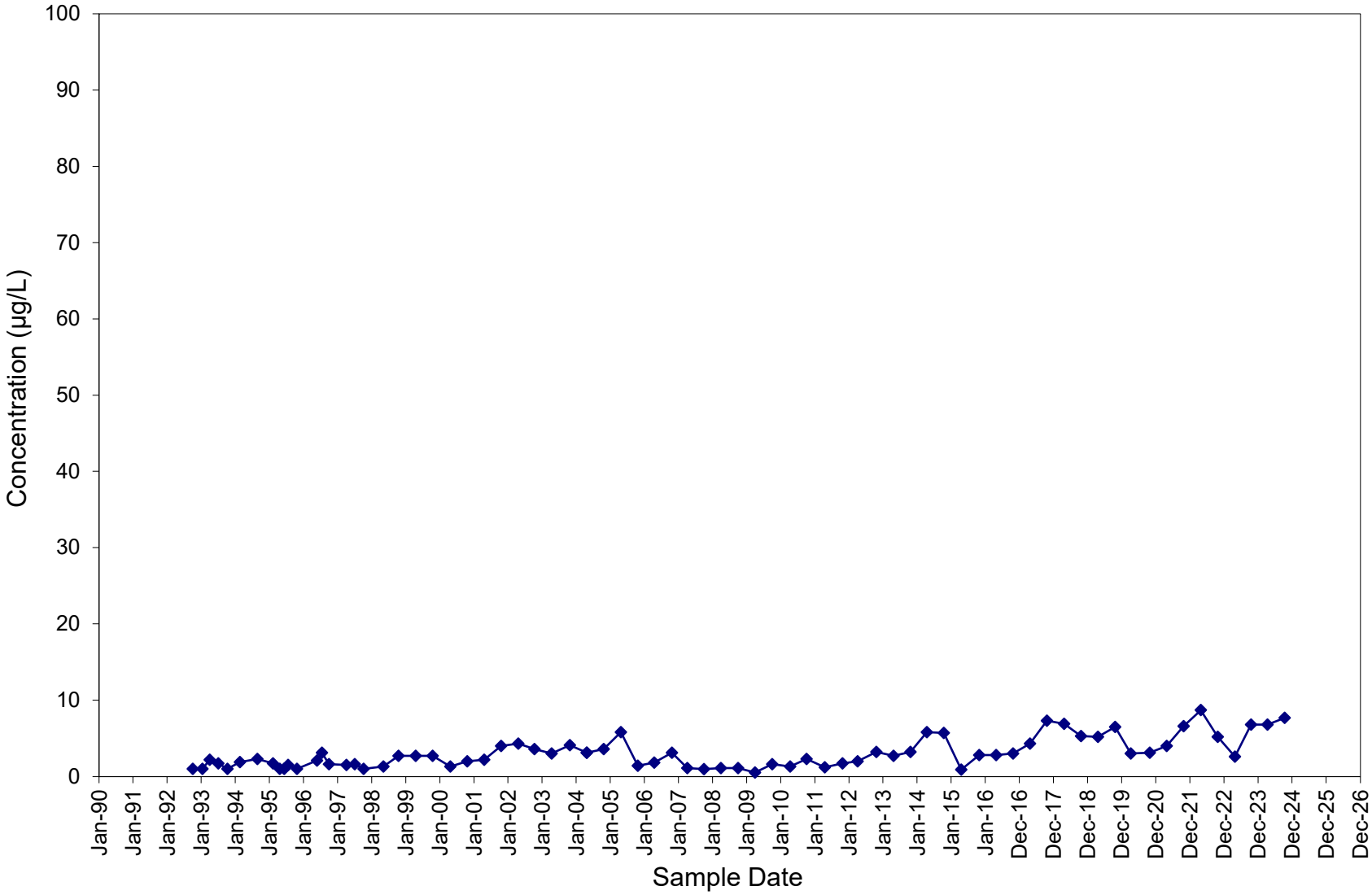


Figure D-4
Kestrel Hawk Landfill
Vinyl Chloride Concentration: Well 152U



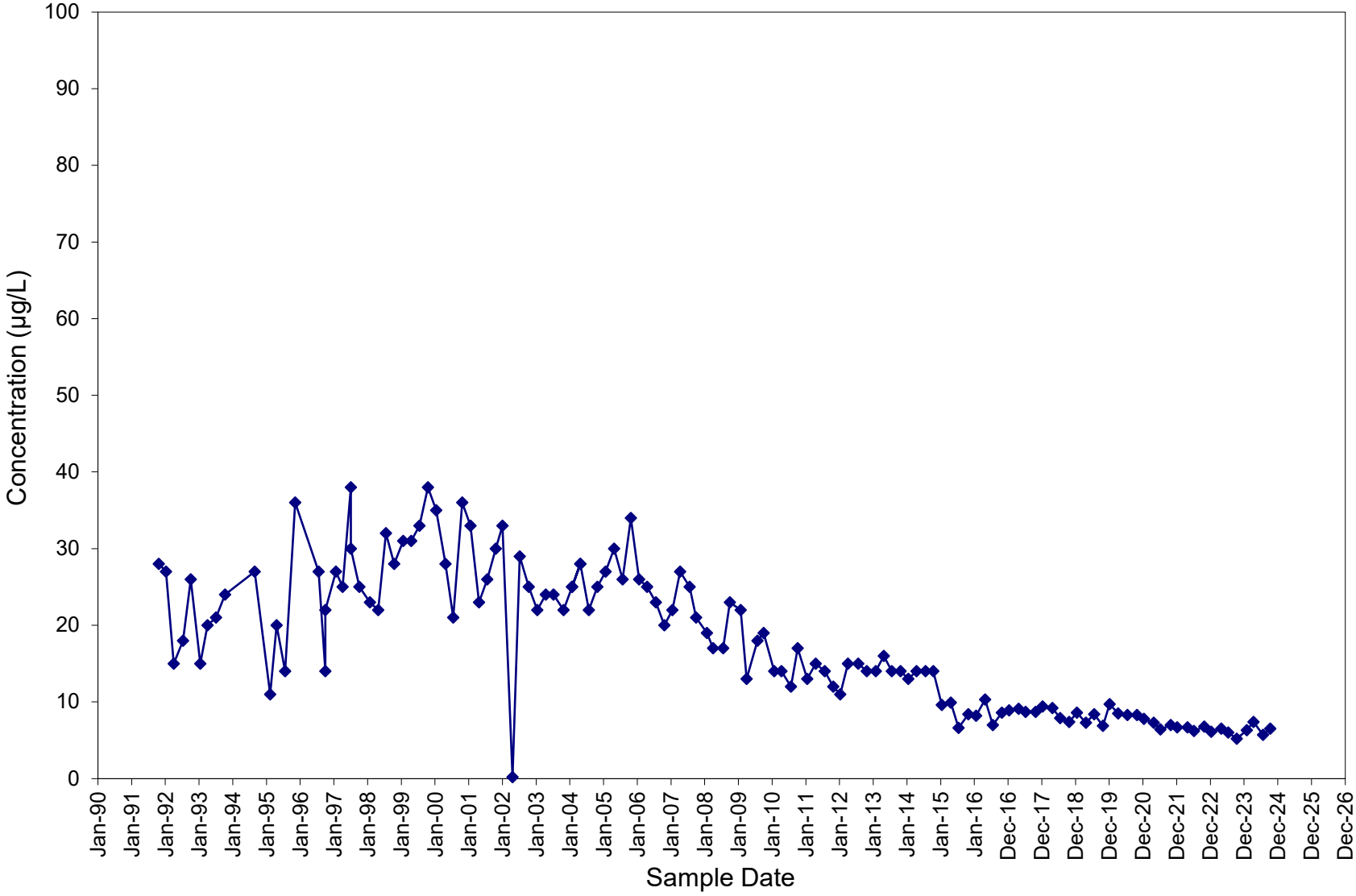
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Figure D-5
Kestrel Hawk Landfill
Vinyl Chloride Concentration: Well 153U



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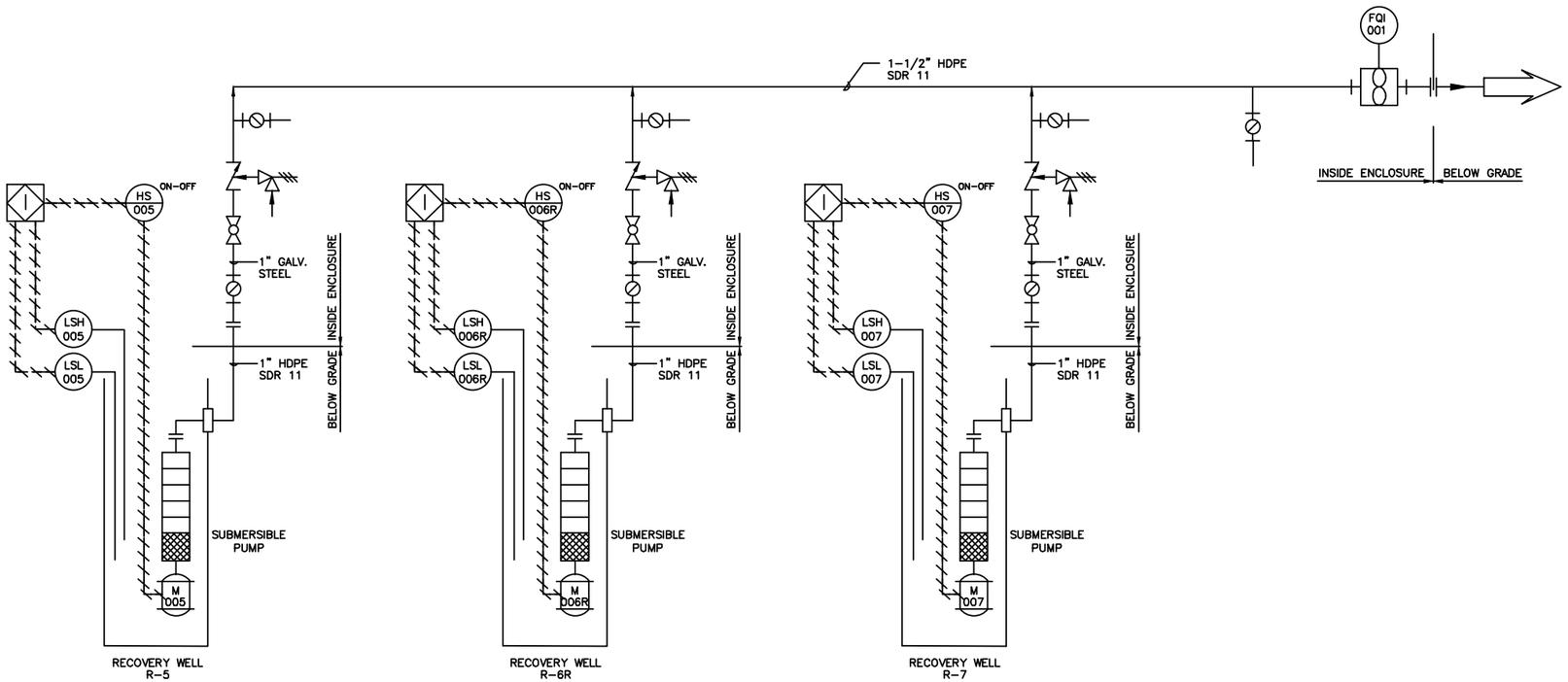
Figure D-6
Kestrel Hawk Landfill
Vinyl Chloride Concentration: Well CS-14



\\madison-vfp\Records\-\WPMSN\PJT2\635454\0000\000002\Files for R-001\Appendix D\2_24AR Appendix D Fig D3-D6 VC Plots.xlsx

Appendix F.4
Excerpt from 2024 Annual Report – Figure D-2: 141U Area Instrumentation Diagram

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LEGEND

- FLOW INDICATOR w/ TOTALIZER
- BALL VALVE
- SAMPLE TAP
- GLOBE VALVE
- CHECK VALVE WITH VACUUM RELIEF VALVE
- INTERLOCK
- LSH 001 — LEVEL SWITCH (HIGH)
- LSL 001 — LEVEL SWITCH (LOW)
- HS 001 ON-OFF — HAND SWITCH (ON/OFF)
- FQI 001 — FLOW INDICATOR w/ TOTALIZER

NOTE

1. REPLACEMENT WELL R-6R WAS INSTALLED IN JUNE-SEPTEMBER 2008. R-6 WAS ABANDONED IN JUNE 2008.

PROJECT:
KESTREL HAWK LANDFILL
2024 ANNUAL REPORT
RACINE, WISCONSIN

TITLE:
141-U AREA
CONSTRUCTION RECORD DRAWING & INSTRUMENTATION DIAGRAM

DRAWN BY:	T. FIEBRANZ	PROJ NO.:	635454.0000
CHECKED BY:	J. EMERSON		**FIGURE D-2**
APPROVED BY:	T. MARTIN		
DATE:	JUNE 2025		

TRC
999 Fourier Drive
Suite 101
Madison, WI 53717
Phone: 608.826.3600

FILE NO.: 635454.0000.D2.dwg

1:47 --- ATTACHED XREFS: --- ATTACHED IMAGE:
DRAWING NAME: J:\Republic\Kestrel Hawk\635454 - 2024 Annual Report\0000\ 635454.0000.D2.dwg --- PLOT DATE: June 10, 2025 - 12:24PM --- LAYOUT: FIGURE D-2

Appendix F.5
Excerpt from Corrective Measures Study – List of Documents about 141U Area

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LIST OF DOCUMENTS PREPARED FOR THE WELL 141U AREA
LAND RECLAMATION COMPANY LANDFILL
RACINE, WISCONSIN

Gibbons, Robert D. 1996. Statistical Comparison of Upgradient versus Downgradient Ground-Water Quality for the Land Reclamation Company RFI. January 1996.

Law Engineering and Environmental Services, Inc. 1992. Description of current conditions report (DCCR). April 23, 1992.

Law Engineering and Environmental Services, Inc. 1994. Revised RCRA Facility Investigation Workplan for Land Reclamation Company, April 29, 1994.

Law Engineering and Environmental Services, Inc. 1994. Interim Measures Assessment Report, Land Reclamation Company, Racine, Wisconsin, Facility. Prepared for Land Reclamation Company, May 1994.

Law Engineering and Environmental Services, Inc. 1996. Draft RCRA Facility Investigation Report. Prepared for Land Reclamation Company, February 2, 1996. Supplement: LRC/Sanifill Response to Comments (April 3, 1996), dated September 26, 1996.

RMT, Inc. 1994. Evaluation of Field Sampling Methods for Groundwater Metals Analysis. Prepared for Land Reclamation Company, December 1994.

RMT, Inc. 1995. Workplan for Pilot Test of the Interim Corrective Measure of Unit A Sand. Prepared for Land Reclamation Company, June 1995.

RMT, Inc. 1995. Report of the Pilot Pumping Test for the Interim Corrective Action in the Unit A Sand. Prepared for Land Reclamation Company: A Sanifill of Wisconsin Company, November 1995.

The Section of the Environmental Epidemiology and Prevention of the Bureau of Public Health, Wisconsin Division of Health. 1995. Investigation of Health Concerns Among Residents Near Land Reclamation Company Landfill. April 10, 1995.

Appendix F.6
Excerpt from Corrective Measures Study – Vinyl Chloride Historic Data

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TABLE 1

LAND RECLAMATION COMPANY, WELL 141U AREA WELLS
VINYL CHLORIDE CONCENTRATIONS (µg\L)

	Well I.D.															
Sample Dates	108U	110U	134U	141U	151U(R)	152U	153U	155U	CS12	CS14	UB7	UB8	R-1	R-2	R-3	R-4
3/8-9/90		ND	ND													
3/13/90	ND			110												
6/19-21/90	ND	ND	ND	100												
9/19/90	ND	ND	ND	80												
12/7/90		ND														
12/11-12/90	ND		ND	58												
3/14-15/91		ND		170												
3/18-20/91	ND		ND		ND											
6/18-20/91	ND	ND	ND	52	ND											
10/22-25/91	ND	ND	ND						ND		ND	ND				
10/28-29/91				50	ND					28						
1/14-16/92	ND	ND	ND	37	ND				ND	27	ND	ND				
4/7-9/92	ND	ND	ND	22	ND				ND	15	ND	ND				
7/14-17/92	ND	ND	ND		ND				ND	18	ND	ND				
7/20/92				55												
10/6-8/92	ND	ND	ND	29	ND	ND	ND		ND	26	ND	ND				
1/19-21/93	ND	ND	ND	30	ND	25	ND		ND	15	ND	ND				
4/6-7/93	ND	ND	ND	26	ND	27	2.2		ND	20	ND	ND				
7/7-9/93	ND	ND	ND	30		26	1.7			21	ND	ND				
7/13/93					ND				ND							
10/12-14/93	ND	ND	ND	19	ND	22	ND		ND	24	ND	ND				
2/25/94			ND			36	1.9									
3/3/94				14												
8/29-31/94	ND			23			2.3			27	ND	ND				
9/1-2/94			ND			34		ND	ND							
2/13-15/95			ND	14		21	1.7	ND	ND	11	ND	ND				
2/22/95				49		160										
4/26-27/95			ND	15		20	ND	ND	ND	20	ND	ND				
6/15-16/95													ND		15-17	
7/10/95														22	17	17
7/26-27/95			ND	13		9.9	1.5	ND	ND	14	ND	ND				
9/12/95													ND	16	16	17
10/27/95				9.1		25	ND									
11/13/95	ND		ND						ND	36	ND	ND				
Apr-May '96			ND	8.8		16	2.1									
7/23/96			ND	11		18	3.1		ND	27			ND	21		27

NOTES:
The Preventive Action Limit (PAL) for vinyl chloride is 0.02 µg/L. The Enforcement Standard (ES) is 0.2 µg/L.
All detections to date exceed both the PAL and the ES for vinyl chloride.
Blank space indicates that no sample was collected.
ND indicates vinyl chloride not detected above the estimated quantitation limit.

Prepared By: JMR 10-20-96
Checked By: SSM 11-7-96

LAND RECLAMATION LANDFILL
VINYL CHLORIDE RESULTS
WELL 141U AREA

SAMPLE IDENTIFIER	SAMPLE DATE	RESULT	DATA FLAGS	UNITS
108U	13-MAR-90	< 0.5		UG/L
108U	21-JUN-90	< 0.5		UG/L
108U	19-SEP-90	< 1		UG/L
108U	11-DEC-90	< 1		UG/L
108U	19-MAR-91	< 1		UG/L
108U	19-JUN-91	< 1		UG/L
108U	22-OCT-91	< 1		UG/L
108U	14-JAN-92	< 1.0		UG/L
108U	08-APR-92	< 1.0		UG/L
108U	16-JUL-92	< 1.0		UG/L
108U	06-OCT-92	< 1.0		UG/L
108U	19-JAN-93	< 1.0		UG/L
108U	06-APR-93	< 1.0		UG/L
108U	09-JUL-93	< 1.0		UG/L
108U	12-OCT-93	< 1.0		UG/L
108U	29-AUG-94	< 1.0		UG/L
108U	13-NOV-95	< 1.0		UG/L
110U	08-MAR-90	< 0.5		UG/L
110U	19-JUN-90	< 0.5		UG/L
110U	19-SEP-90	< 1		UG/L
110U	07-DEC-90	< 1		UG/L
110U	14-MAR-91	< 1		UG/L
110U	18-JUN-91	< 1		UG/L
110U	23-OCT-91	< 1		UG/L
110U	14-JAN-92	< 1.0		UG/L
110U	09-APR-92	< 1.0		UG/L
110U	16-JUL-92	< 1.0	W	UG/L
110U	07-OCT-92	< 1.0		UG/L
110U	20-JAN-93	< 1.0		UG/L
110U	07-APR-93	< 1.0		UG/L
110U	08-JUL-93	< 1.0		UG/L
110U	13-OCT-93	< 1.0		UG/L
134U	09-MAR-90	< 0.5		UG/L
134U	20-JUN-90	< 0.5		UG/L
134U	19-SEP-90	< 1		UG/L
134U	11-DEC-90	< 1		UG/L
134U	18-MAR-91	< 1		UG/L
134U	20-JUN-91	< 1		UG/L
134U	25-OCT-91	< 1		UG/L
134U	14-JAN-92	< 1.0		UG/L
134U	08-APR-92	< 1.0		UG/L
134U	17-JUL-92	< 1.0	W	UG/L
134U	07-OCT-92	< 1.0		UG/L
134U	20-JAN-93	< 1.0		UG/L
134U	07-APR-93	< 1.0		UG/L
134U	08-JUL-93	< 1.0		UG/L
134U	14-OCT-93	< 1.0		UG/L

LAND RECLAMATION LANDFILL
VINYL CHLORIDE RESULTS
WELL 141U AREA

SAMPLE IDENTIFIER	SAMPLE DATE	RESULT	DATA FLAGS	UNITS
134U	25-FEB-94	< 1.0		UG/L
134U	01-SEP-94	< 0.5		UG/L
134U	15-FEB-95	< 1.0		UG/L
134U	26-APR-95	< 1.0		UG/L
134U	26-JUL-95	< 1.0		UG/L
134U	13-NOV-95	< 1.0		UG/L
134U	25-APR-96	< 1.0		UG/L
134U	23-JUL-96	< 1.0		UG/L
141U	13-MAR-90	110		UG/L
141U	19-JUN-90	100		UG/L
141U	19-SEP-90	80		UG/L
141U	12-DEC-90	58		UG/L
141U	15-MAR-91	170		UG/L
141U	20-JUN-91	52		UG/L
141U	29-OCT-91	50		UG/L
141U	16-JAN-92	37		UG/L
141U	08-APR-92	22		UG/L
141U	20-JUL-92	55		UG/L
141U	08-OCT-92	29		UG/L
141U	21-JAN-93	30		UG/L
141U	07-APR-93	26		UG/L
141U	08-JUL-93	30		UG/L
141U	13-OCT-93	19		UG/L
141U	03-MAR-94	14		UG/L
141U	31-AUG-94	23		UG/L
141U	14-FEB-95	14		UG/L
141U	22-FEB-95	49		PPBV
141U	26-APR-95	15		UG/L
141U	27-JUL-95	13		UG/L
141U	27-OCT-95	9.1		UG/L
141U	25-APR-96	8.8		UG/L
141U	23-JUL-96	11		UG/L
151UR	13-JUL-93	< 1.0		UG/L
151UR	12-OCT-93	< 1.0		UG/L
152U	08-OCT-92	< 1.0		UG/L
152U	20-JAN-93	25		UG/L
152U	07-APR-93	27		UG/L
152U	08-JUL-93	26		UG/L
152U	13-OCT-93	22		UG/L
152U	25-FEB-94	36		UG/L
152U	02-SEP-94	34	D	UG/L
152U	15-FEB-95	21		UG/L
152U	22-FEB-95	160		PPBV
152U	26-APR-95	20		UG/L
152U	27-JUL-95	9.9		UG/L
152U	27-OCT-95	25		UG/L
152U	25-APR-96	16		UG/L

LAND RECLAMATION LANDFILL
VINYL CHLORIDE RESULTS
WELL 141U AREA

SAMPLE IDENTIFIER	SAMPLE DATE	RESULT	DATA FLAGS	UNITS
152U	23-JUL-96	18		UG/L
153U	08-OCT-92	< 1.0	W	UG/L
153U	20-JAN-93	< 1.0		UG/L
153U	07-APR-93	2.2		UG/L
153U	09-JUL-93	1.7		UG/L
153U	13-OCT-93	< 1.0		UG/L
153U	25-FEB-94	1.9		UG/L
153U	31-AUG-94	2.3		UG/L
153U	15-FEB-95	1.7		UG/L
153U	26-APR-95	< 1.0		UG/L
153U	26-JUL-95	1.5		UG/L
153U	27-OCT-95	< 1.0		UG/L
153U	31-MAY-96	2.1		UG/L
153U	23-JUL-96	3.1		UG/L
155U	01-SEP-94	< 0.5		UG/L
155U	15-FEB-95	< 1.0		UG/L
155U	27-APR-95	< 1.0		UG/L
155U	27-JUL-95	< 1.0		UG/L
CS-10	23-OCT-91	< 1		UG/L
CS-10	15-JAN-92	< 1.0		UG/L
CS-10	07-APR-92	< 1.0		UG/L
CS-10	15-JUL-92	< 1.0		UG/L
CS-10	07-OCT-92	< 1.0		UG/L
CS-10	19-JAN-93	< 1.0		UG/L
CS-10	07-APR-93	< 1.0		UG/L
CS-10	08-JUL-93	< 1.0		UG/L
CS-10	12-OCT-93	< 1.0		UG/L
CS-10	31-AUG-94	< 0.5		UG/L
CS-10	14-FEB-95	< 1.0		UG/L
CS-10	25-APR-95	< 1.0		UG/L
CS-10	26-JUL-95	< 1.0		UG/L
CS-10	26-OCT-95	< 1.0		UG/L
CS-12	24-OCT-91	< 1		UG/L
CS-12	15-JAN-92	< 1.0		UG/L
CS-12	08-APR-92	< 1.0		UG/L
CS-12	16-JUL-92	< 1.0		UG/L
CS-12	07-OCT-92	< 1.0		UG/L
CS-12	20-JAN-93	< 1.0		UG/L
CS-12	07-APR-93	< 1.0		UG/L
CS-12	13-JUL-93	< 1.0		UG/L
CS-12	14-OCT-93	< 1.0		UG/L
CS-12	01-SEP-94	< 0.5		UG/L
CS-12	15-FEB-95	< 1.0		UG/L
CS-12	26-APR-95	< 1.0		UG/L
CS-12	26-JUL-95	< 1.0		UG/L
CS-12	13-NOV-95	< 1.0		UG/L
CS-12	23-JUL-96	< 1.0		UG/L

LAND RECLAMATION LANDFILL
VINYL CHLORIDE RESULTS
WELL 141U AREA

SAMPLE IDENTIFIER	SAMPLE DATE	RESULT	DATA FLAGS	UNITS
CS-14	29-OCT-91	28		UG/L
CS-14	15-JAN-92	27		UG/L
CS-14	08-APR-92	15		UG/L
CS-14	15-JUL-92	18		UG/L
CS-14	07-OCT-92	26		UG/L
CS-14	19-JAN-93	15		UG/L
CS-14	07-APR-93	20		UG/L
CS-14	08-JUL-93	21		UG/L
CS-14	13-OCT-93	24		UG/L
CS-14	31-AUG-94	27		UG/L
CS-14	14-FEB-95	11		UG/L
CS-14	26-APR-95	20		UG/L
CS-14	26-JUL-95	14		UG/L
CS-14	13-NOV-95	36		UG/L
CS-14	23-JUL-96	27		UG/L
R-01	23-JUL-96	< 1.0		UG/L
R-02	23-JUL-96	21		UG/L
R-04	23-JUL-96	27		UG/L
R-05	10-JUL-96	< 1.0		UG/L
R-06	10-JUL-96	< 1.0		UG/L
R-07	10-JUL-96	< 1.0		UG/L
UB-07	24-OCT-91	< 1		UG/L
UB-07	16-JAN-92	< 1.0		UG/L
UB-07	07-APR-92	< 1.0		UG/L
UB-07	14-JUL-92	< 1.0		UG/L
UB-07	07-OCT-92	< 1.0		UG/L
UB-07	19-JAN-93	< 1.0		UG/L
UB-07	06-APR-93	< 1.0		UG/L
UB-07	07-JUL-93	< 1.0		UG/L
UB-07	12-OCT-93	< 1.0		UG/L
UB-07	31-AUG-94	< 0.5		UG/L
UB-07	14-FEB-95	< 1.0		UG/L
UB-07	26-APR-95	< 1.0		UG/L
UB-07	26-JUL-95	< 1.0		UG/L
UB-07	13-NOV-95	< 0.50		UG/L
UB-08	25-OCT-91	< 1		UG/L
UB-08	16-JAN-92	< 1.0		UG/L
UB-08	07-APR-92	< 1.0		UG/L
UB-08	15-JUL-92	< 1.0		UG/L
UB-08	07-OCT-92	< 1.0		UG/L
UB-08	19-JAN-93	< 1.0		UG/L
UB-08	06-APR-93	< 1.0		UG/L
UB-08	07-JUL-93	< 1.0		UG/L
UB-08	12-OCT-93	< 1.0		UG/L
UB-08	29-AUG-94	< 0.5		UG/L
UB-08	13-FEB-95	< 1.0		UG/L
UB-08	26-APR-95	< 1.0		UG/L

LAND RECLAMATION LANDFILL
VINYL CHLORIDE RESULTS
WELL 141U AREA

SAMPLE IDENTIFIER	SAMPLE DATE	RESULT	DATA FLAGS	UNITS
UB-08	26-JUL-95	< 1.0		UG/L
UB-08	13-NOV-95	< 0.50		UG/L

Appendix G: Photographic Log

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Photographic Log

Client Name:	Site Location:	Project No.:
Republic Services of Wisconsin, Limited Partnership	Kestrel Hawk Landfill Racine, WI	557469

Photo No.	Date
1	11/12/2024

Description
Hazardous waste unit looking east.



Photo No.	Date
2	11/12/2024

Description
View of the Northwest Expansion (non-hazardous waste unit)



Photographic Log

Client Name:	Site Location:	Project No.:
Republic Services of Wisconsin, Limited Partnership	Kestrel Hawk Landfill Racine, WI	557469

Photo No.	Date
3	11/12/2024

Description
Typical view of the Former City of Racine Landfill.



Photo No.	Date
4	11/12/2024

Description
Typical view of the Kestrel Hawk Landfill.



Photographic Log

Client Name:	Site Location:	Project No.:
Republic Services of Wisconsin, Limited Partnership	Kestrel Hawk Landfill Racine, WI	557469

Photo No.	Date
5	11/12/2024

Description
Typical view of lift stations used to convey leachate, condensate, and impacted groundwater to the City of Racine waste water treatment plant.



Photo No.	Date
6	11/12/2024

Description
Drainage swale located north of the Kestrel Hawk Landfill.



Photographic Log

Client Name:	Site Location:	Project No.:
Republic Services of Wisconsin, Limited Partnership	Kestrel Hawk Landfill Racine, WI	557469

Photo No.	Date
7	11/12/2024

Description
View of Kestrel Hawk facilities.



Photo No.	Date
8	11/12/2024

Description
Typical view of lift stations used to convey leachate, condensate, and impacted groundwater to the City of Racine waste water treatment plant.



Photographic Log

Client Name:	Site Location:	Project No.:
Republic Services of Wisconsin, Limited Partnership	Kestrel Hawk Landfill Racine, WI	557469

Photo No.	Date
9	11/12/2024

Description
Connection location for Kestrel Hawk Landfill's discharge to the City of Racine waste water treatment plant.

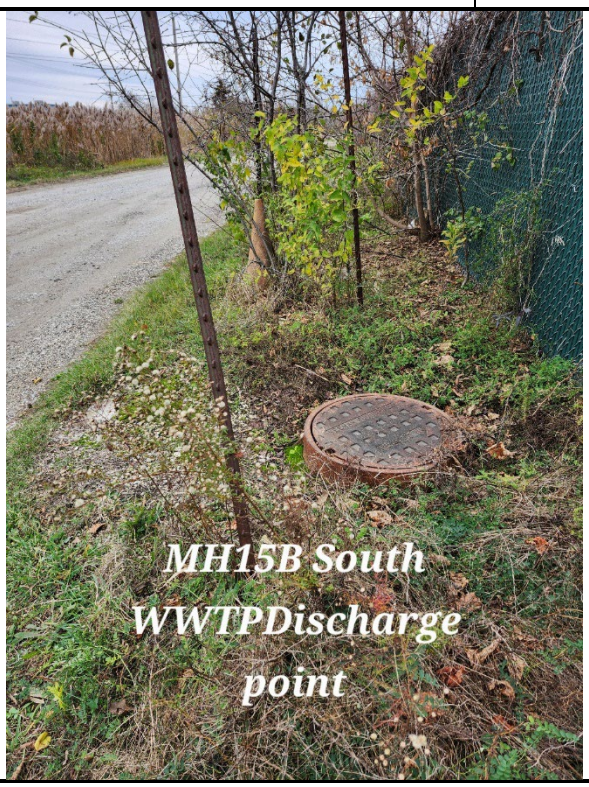


Photo No.	Date
10	11/12/2024

Description
View of Kestrel Hawk Landfill's environmental monitoring building.

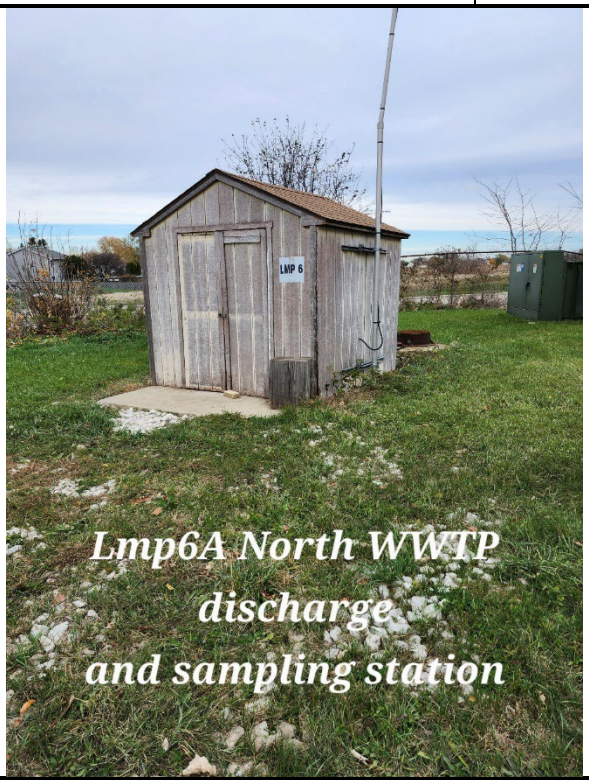


Photographic Log

Client Name:	Site Location:	Project No.:
Republic Services of Wisconsin, Limited Partnership	Kestrel Hawk Landfill Racine, WI	557469

Photo No.	Date
11	11/12/2024

Description
LMP6 sampling location.



Appendix H: Groundwater, Surface Water, and Leachate Sampling Guidelines

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GROUNDWATER, SURFACE WATER, AND LEACHATE SAMPLING GUIDELINES

Sanifill, Inc.
Groundwater, Surface Water, and Leachate Sampling Standard

1.0 STANDARD REVIEW REQUIREMENT

This Standard should be reviewed and signed by the sampling team leader prior to initiation of routine or special groundwater sampling events at all Sanifill sites. All well construction information and documentation of completed sampling events should be filed at the site and at the Region Sanifill office.

Site conditions or local regulatory requirements may necessitate a deviation from the Standard as described herein. Should such a deviation be necessary changes to this Standard must be documented by the sampling team leader and coordinated with the appropriate Sanifill Corporate Hydrogeologist and Regional Engineering Manager (REM) or the Region Compliance Manager prior to the sampling event.

2.0 OVERVIEW OF STANDARD

This Standard represents the minimum requirements for groundwater, surface water, and leachate sample collection at Sanifill sites. This standard is consistent with guidelines set forth in the following ASTM Environmental Standards:

ASTM Standard D1129-90, (1990) ***"Terminology Related to Water"*****,**
ASTM Standard D4448 85a, (1992) ***"Guide for Sampling Groundwater Monitor Wells"*****,**
ASTM Standard D3370-82, (1989) ***"Standard Practices for Sampling Water"*****,**
ASTM Standard D4840-88, (1993) ***"Practice for Sampling Chain of Custody Procedures"*****,**
ASTM Standard D3694-93, ***(1993) "Practices for Preparation of Sample Containers and for Preservation of Organic Constituents"*****,**
ASTM Standard D5088-90 (1993), ***"Practice for Decontamination of Field Equipment Used at Non-Radioactive Waste Sites".***

This Standard is a guideline that may be supplemented based on site-specific conditions and/or state specific requirements which preclude strict adherence to the Standard as described herein. Possible reasons for variation to this Standard include, but are not limited to, unusual site hydrogeologic conditions (e.g., low permeability formations requiring long recharge

times), deep monitor wells that may require unusual purge volumes, and state-specific sampling requirements that significantly differ from this Standard.

The site sampling technician and/or consultant (hereinafter referred to as sampling team) is responsible for the proper collection of samples at Sanifill's groundwater sample points, piezometers, surface water locations and leachate wells. As such, the sampling team must be familiar with the contents of this Standard prior to the initiation of a sampling event. The sampling team is also responsible for ensuring that all sampling requirements described in the site's operating permit, approved monitoring plan, local regulations, and any other associated documents are complied with in full. In cases where any of the aforementioned documents are not available for review, it is the responsibility of the sample team leader to confer with the site engineer and/or the appropriate Corporate Hydrogeologist prior to initiation of sampling. The designated Sanifill Project Manager/engineer should provide oversight to ensure that the final sample results satisfy both Sanifill's minimum standards and the requirements of the appropriate State regulatory authority.

3.0 SAMPLING EQUIPMENT, PRESAMPLING PROCEDURES AND DOCUMENTATION

Before any sampling is performed at a facility, a number of preliminary tasks must be completed. These tasks include reviewing the site permit and approved site specific groundwater monitoring plan, identifying well characteristics, verifying the sampling schedule, identifying the parameters to be analyzed, and identifying sampling point order (i.e., clean wells first).

Presampling procedures include calibrating field meters and equipment, inspecting coolers and bottles sets, initiating Chain-of-Custody records, obtaining the proper Field Information Forms, and coordinating timely sample set delivery from the laboratory. It is suggested that preparation begin at least one week prior to the event to provide the sample team enough time to complete all of the steps addressed in this standard and to address any problems that may occur. For unplanned or emergency events, contact the laboratory and/or Sanifill for help on abbreviating procedures.

3.1 Equipment and Materials

All non-dedicated equipment should be cleaned and/or decontaminated, checked to ensure proper functioning and calibrated before going into the field.

3.1.1 Pumps

The specific pump used depends on site conditions and type of analyses being performed. Dedicated displacement bladder pumps constructed of Teflon and stainless steel or PVC (e.g., QED Well Wizards or MicroPurge ® System) are preferred for most sampling programs and are the Sanifill default sampling system. Notify the appropriate Sanifill Corporate Hydrogeologist of any well network not utilizing dedicated bladder pumps. When non-dedicated pumps or sampling devices are used, stringent cleaning procedures must be followed between sampling locations (see Section 3.2). Under no circumstances should pumps without check valves be used during purging. It is the sampling team's responsibility to ensure that proper decontamination procedures are followed and that associated documentation is maintained in field notes and/or Field Information Forms (see Section 3.4).

3.1.2 Bailers

Bailers should be made of suitable inert materials, when monitoring for organic compounds, (such as stainless steel or PVC or in some cases Teflon) and should be dedicated or disposable. Dedicated stainless steel or disposable teflon bailers should be used for such applications as "oily" matrices where ease of cleaning and durability may be a factor. PVC bailers with non-glued joints may also be used. Non-dedicated/reusable equipment should only be used as an exception or in emergencies. When used, non-dedicated bailers must be thoroughly decontaminated (see Section 3.2) and triple-rinsed with deionized water (or laboratory reagent water) before and after sampling at each location. Equipment blanks must also be obtained in accordance with Section 4.2.5 of this Standard. Dedicated bailers require no decontamination. Disposable bailers may be used at each well if necessary and if pre-approved by the Sanifill Project Manager.

3.1.3 Sample Coolers and Sample Bottles

The sampling team is responsible for checking all sample containers and sample coolers for broken bottles and proper preservatives when received and for obtaining ice packs prior to the sampling event. Filtering requirements, as indicated on sample labels and bottle schematic should be corroborated with the site permit and approved Groundwater Monitoring plan. The sampling team must communicate with site personnel to ensure access to the facility before the sampling event so that the event may proceed on schedule, and equipment, sample coolers, and supplies may be checked. (Note: It is important that sample coolers be stored in buildings that do not contain solvents, cleaners, gasoline, diesel fuels, or other potential contaminants.)

Upon receipt, an inventory of the coolers and bottles and their condition should be noted in field notes and documented on the Field Information Form. Each sample bottle is provided with its own bottle I.D., which refers to the laboratory group, filtering requirements, necessary

preservatives, sample point/location, analytical method, and bottle size. This information must be checked, verified, and included on Field Information Forms and Chain-of-Custody records. Should an error occur within the bottle set, the laboratory must be notified immediately.

The proper number of sample containers will be provided in each sample cooler. The type of bottle will vary depending on the analysis required. ~~With the exception of bottles for VOAs and TOX, samples requiring preservation in the field will have an associated preservative supplied in separate containers. VOA's and TOX containers will be preserved at the laboratory. Each sample bottle is labeled with a sticker to identify the preservative required. It is the sample team's responsibility to ensure that the appropriate preservatives are added in the field (see Section 7.1). Preservatives must not be added to bottles that do not require them.~~

Each Sample cooler that includes bottles for volatile organic analyses, must include a Trip Blank (see Section 4.2.6 of this standard). When volatile organic analyses have been requested, the sample cooler will contain a Trip Blank regardless of whether a request has been placed for analysis of the Trip Blank. An effort to pack all VOAs in one cooler should be made to reduce trip blank costs. Prior to shipment, the Laboratory checks each Trip Blank vial to ensure that it has no air bubbles. Note the condition of the Trip Blanks as well as any relevant information about the sample cooler on the Chain-of-Custody Record (see Section 7.5). Trip Blanks may contain air bubbles due to atmospheric conditions and cooling of samples. If large (i.e., pea sized) bubbles are present, then immediately contact the laboratory for replacement trip blanks. Empty bottles will be included within the sample cooler for Field Blank (and equipment blanks if necessary) analyses. One Field Blank should be collected for each day of sampling conducted at the site (see section 4.2.5). The sampling team should coordinate with the laboratory to identify the number of days required for sampling.

The sample cooler will not contain ice packs upon receipt from the laboratory. Sanifill requires the use of wet ice to maintain sample temperature at the levels required by EPA methods during shipment of samples back to the laboratory. It is the sampler's responsibility to ensure that ice packs are available to cool samples upon collection. Furthermore, the sampling team is responsible to ensure that provisions have been made in advance for those facilities which do not have accommodations to maintain ice packs. In such cases, it is recommended to bring pre-chilled coolers and extra ice packs to the site.

3.2 Decontamination Procedures for Non-Dedicated and Down-Hole Equipment

All non-dedicated sample-contacting and down-hole equipment must be thoroughly decontaminated prior to its use in sample collection activities. This includes non-dedicated pumps, non-dedicated bailers, groundwater level measurement devices, field parameter measurement devices and non-dedicated filtering apparatuses.

Decontamination procedures must, at a minimum, consist of prewashing and scrubbing (both inside and outside of non-dedicated bailers) with a non-phosphatic detergent solution followed by a series of rinses (i.e., 2 to 3) with control water (i.e., water of a known chemistry) and one

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rinse with deionized water. Decontamination of pumps must, at a minimum, consist of circulation of three pump volumes of clean water through the pump system and all associated discharge tubing at separate stations. A series of three precleaned fluid storage containers will aid in this respect. The first container should contain a non-phosphatic solution. The remaining two should consist of water of a known chemistry.

Equipment Blanks must be collected from equipment following decontamination based on a schedule of one sample for each day of sample collection (see Section 4.2.5). Equipment Blanks will be analyzed for VOCs (USEPA Method 8260 or equivalent). Equipment blanks for pump systems should be collected from the discharge tubing subsequent to decontamination

3.3 Calibration and Use of Meters

The proper measurement and documentation of field analyses are integral to the monitoring program. Before going to the field, all equipment must be cleaned and checked for any malfunctions. The sampling team must calibrate all meters each morning before using them in the field following manufacturers' calibration procedures. In all cases, it is the sampling team's responsibility to ensure proper documentation of all calibration procedures for each sampling event.

It is the sampling team's responsibility to maintain log books for all field meters. These log books must contain the same information as those for permanent laboratory instruments (e.g., serial number, name and model of meter, year purchased, etc.). These books also must contain quality control (QC) results, maintenance performed by the factory, and calibration notes for each day the equipment is used. If such log books do not already exist, contact the appropriate Corporate Hydrogeologist prior to proceeding. Sanifill requires that calibration for temperature, pH, and electrical conductivity be collected at a minimum for each day of sampling. However, some permits may require additional data and therefore additional calibration data (i.e., turbidity, dissolved oxygen, redox potential, etc.) will need to be documented.

3.4 Field Record Keeping

Proper chain-of-custody documentation is a crucial part of the monitoring program's quality assurance and quality control (QA/QC). Comprehensive, consistent, and accurate documentation of field tests, measurements, decontamination procedures, meter calibration, and field observations is extremely important.

Two forms must be filled out by the sampling team during each sampling event: a Field Chain-of-Custody Record and a Field Information Form. A copy of each form must be sent with the samples to the laboratory. **Under no circumstances will samples be analyzed without these forms.** The forms are returned to Sanifill with the analytical report. These forms must be completed with ball point ink only. Pencils and felt-tip pens should not be used. Copies of all forms are also to be maintained at the site and/or Region Office for easy reference.

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3.5 Field Information Forms

The Field Information Form contains information regarding site and well conditions, sampling and purging procedures, field measurements, and bottle set information. The Field Information Form must be filled out by the sampling team for each sample point and a copy placed along with the Chain-of-Custody Record in the cooler(s) shipped to the laboratory. An example of the Sanifill Field Information Form is provided as Attachment 1. At a minimum, the following information must be documented.

3.5.1 Purging Information

This section should be completed if the sample points are groundwater wells, piezometers, or water supply wells. All wells/piezometers must be purged prior to sampling. The date and time the well was purged, the elapsed time for purging, the volume of water purged, the color of purged water, how the water level reacted to purging, the total volume of water in the casing and filter pack(gallons) or discharge lines (with MicroPurge ®), and if the well was purged dry must be documented. The Field Information Form must indicate whether the well was dry and un-sampleable. Further information on purging practices is presented in Section 4.1.

3.5.2 Purging and Sampling Equipment

Document the types of equipment used for purging/sample collection and the materials of which they are constructed. If QED MicroPurge ® systems or pumps are used, the pump and tubing material must be documented.

3.5.3 Field Measurements

For groundwater, leachate, and surface water sampling events, the fluid surface elevation (depth to groundwater or leachate adjusted to MSL), temperature, pH, and specific conductance (at 25 degrees Celsius) are required to be determined prior to, during, and subsequent to purging (see Section 4.2.2). Additional field measurements such as dissolved oxygen, turbidity, and redox potential (Eh), may also be required (space is provided for additional measurements, as required, on the Field Information Form). Note on the Field Information Forms the units and values of these measurements.

3.5.4 Field Comments

The section on field comments should include field observations such as:

* Condition of the well and dedicated equipment, and any abnormalities (e.g., cracked cement pad, surface seal, malfunctioned or missing lock, broken protective casing, ponded water, cracked or bent pump/tubing, etc.)

* Weather condition such as wind direction and speed, upwind activities, temperature, barometric pressure (where needed for regulatory requirements). Any difference in weather conditions between purging and sampling should also be noted,
* Any landfill gas odor emanating from or evident at the sample point,
* Sample Appearance including odor, color, and turbidity,
  Odor: e.g., rotten eggs, earthy, strong, moderate, slight, metallic.
  Color: true "color" is the color after the turbidity has been removed. True color may be caused by metallic ions, humus, peat, or industrial chemicals. Hold the sample up to the light and describe the color in as much detail as possible.
* Turbidity:
  None: (sample is clear.).
  Trace: (sediment only slightly clouds or colors the sample; sediment does not accumulate at the bottom of the bottle.);
  Moderate: (definite cloudiness, sediment accumulates at the bottom of sample bottle.),
  High: (muddy/dark brown appearance),
  If a turbidity measuring device is used, measurements must be provided in nephelometric units.
* Reference point for well measurements (i.e., is it clearly marked on top of casing),
* Well I.D. where the Field Blank or duplicate sample is collected,
* All calculations for purge volumes and temperature conversions. Note when wells are purged dry, or explain when less than three casing volumes are removed (not applicable for MicroPurge Sampling),
* Duplicate field measurement results,
* Other conditions, such as sample splits with regulatory agencies, potential safety or health hazards (e.g., fire ants, presence of landfill gas in well). Note whether sampling occurred downwind from the on-site disposal activity.

NOTE: When samples are split with regulatory agencies, document appropriately on the Field Information Form including the condition of the bottles or preservatives, sample collection methods if different from the Sanifill standard, and the laboratory used by the agency.

3.5.5 Sampling Certification

On the bottom of the Field Information Form, the sample team leader must sign the form certifying that the sampling procedures were in accordance with applicable federal and state regulations, and corporate policy as outlined in this standard and the approved monitoring plan. The person(s) providing the sampling certification assumes full responsibility that the sample process satisfied the above criteria.

3.5.6 Maintenance Conditions at Well

The condition of the well and its surrounding area must be observed and problems and changes recorded on the Field Information Form upon arrival at the well location. The following information, at a minimum, should be noted:

* Presence and condition of the well's identification sign,
* Whether the well was recently painted,
* Whether the well's protective casing is locked and whether the key works,
* Well integrity:
  - physical surroundings (e.g., high weeds, standing water, cleanliness, nearby activities),
  - condition of the QED MicroPurge ® system, bladder pump, or dedicated bailer,
  - any obstructions or kinks in the well casing,
  - any presence of water in the annular space,
  - any grease or other un-natural substances around top of the well or on the threaded caps,
  - whether the cap fits securely to prevent the introduction of contaminants,
  - evidence of natural contamination (e.g., animal or insect parts in the well),
  - well guard post and concrete pad condition.

3.5.7 Static Water Level Measurements

The depth to water and elevation of the water level (MSL) should be recorded to the nearest hundredth of a foot (i.e., 0.01 ft). Water levels should be collected prior to and subsequent to purging to assess drawdown effects at each well, and to produce a representative static groundwater contour map. To alleviate potential errors, previous water level data should be used for comparison purposes during field activities.

3.5.8 Depth of Well Measurements

The total depth of well is required to be measured at least once every other year, or when tampering is noted. Total well depths should be measured every year for wells without dedicate pump systems. The depth of the well, when not physically measured, should be obtained and recorded on the Field Information Form from site records or the approved groundwater monitoring plan.

3.5.9 Additional Field Measurements

Protective casing stickup length (ft.), well casing size, and material of construction must be recorded on the Field Information Form as required once per year. The condition of flush-mounted well head covers and locks must also be recorded once per year.

4.0 GROUNDWATER SAMPLING PROCEDURES

4.1 Purging Procedures

After the necessary initial field measurements/observations are made and the depth to water has been determined from every well, the purging process can begin. Purged water should be discarded to the ground far enough away from the well footing to prevent the possibility of

affecting shallow soils or groundwater water near the well. Permit conditions or results from previous sampling events may prevent disposal of purge water to the ground. The appropriate Sanifill Corporate Hydrogeologist will define the proper method for the disposal of purge water. If purge water is deemed contaminated by previous testing, it may be necessary to collect all purge water in drums to dispose of them in the site leachate collection system or other approved manner as defined by the Sanifill Project Manager or State/Local regulation.

4.1.1 Procedure using MicroPurge ®

Many Sanifill sites have been approved for utilization of the MicroPurge ® technique using the QED MicroPurge® sampling system. In such cases, purging procedures should consist of evacuating the total volume of groundwater present in the sampling system at low flow rates to clear the system lines of any stagnant water left from prior sampling events. The maximum flow rate is determined by pumping a rate which causes no net drawdown of the water level surface within the well. Low flow rate pumping (i.e., less than 1.0 liter/minute) is continued throughout the sample collection process. Field measurements, as described in Section 4.2.2, should be initiated at the start of purging and continued at evenly spaced intervals until stabilization. Once stabilization has been achieved, sampling can be conducted at the same rate. Some states have maximum allowable flow rates for certain analyses. It is the sampling team's responsibility to ensure that all state requirements are adhered to.

4.1.2 Traditional Purging Methods

When MicroPurge ® techniques are not utilized, monitoring wells should be pumped or bailed prior to sample withdrawal to prevent collection of non-representative stagnant water in a sample. As a general rule, pump or bail a minimum of three times the volume of water standing in the borehole (for moderate-to high-yield formations) and at least one borehole (including the filter pack) volume for low-yield formations (those with slow recharge), if possible. Well purging should be sufficient to increase the likelihood that the water collected is representative of the groundwater within the formation around the well. Purging should continue, when possible, until field parameters (including pH, temperature, and electrical conductivity) have stabilized (see Section 4.2.2).

If a monitor well is a very low-yield well, bail or pump the volume of water standing in the well and allow the well to recharge for up to 24 hours or as stipulated by local or state regulation. If there is not sufficient water for sampling any parameter, then the well is considered dry for the purpose of sampling. If water is available to partially complete sampling requirements, samples should be obtained such that volatile organic compounds are collected first, followed by remaining state analysis requirements. Contact the laboratory for minimum testing volumes for each analyte. If a sample cannot be obtained from a given well, notify the Sanifill Project Manager immediately.

When it is necessary to use bailers, nylon, stainless steel rope, or polypropylene, preferably braided, is to be used. This rope must be new, clean, and in good condition. The end of the rope

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should be fastened to the well cap or to a large spool to prevent losing the rope and bailer in the well. The rope should be securely tied onto the bailer and checked with each bail during the purging process. Care should be taken not to excessively disturb the column of water in the well casing. Gently lower the bailer into the well with each cycle. The samplers knowledge of the depth to water will help in this regard. Attempt to lower the bailer into the water only to the extent necessary to fill or nearly fill the chamber. Avoid submerging the top of the bailer.

Non-dedicated pumps are most often used for purging when large volumes of water must be removed from the well before sampling. The best (and most commonly used) pumps are submersible, centrifugal pumps. These pumps are generally used in 2-inch diameter or larger wells. Pumps without check valves should not be used for purging monitor wells. Disposable PVC or latex powderless gloves must be worn when handling unsealed samples or sample equipment. New gloves should be used at each well, or more frequently (e.g., if they become dirty or torn).

All of the down-hole equipment must be thoroughly decontaminated (see Section 3.2) and rinsed with deionized or laboratory reagent quality water and air dried before use. In addition, an Equipment Blank must be collected following the procedures discussed in Section 4.2.5 of this standard.

4.2 Sampling the Well

The following section describes standard procedures for collecting samples from wells subsequent to purging activities at Sanifill sites. Methodologies for the collection of field measurements, field filtered samples, and Field/Equipment and Trip Blanks are also presented.

4.2.1 When Not to Sample

During a sampling event, all scheduled wells must be sampled, except in the following cases:

* If the well has been destroyed or otherwise rendered unsampleable (e.g., casing broken off or severely bent so as to preclude sampling),
* If the well is dry, or
* If the well is new and has not been properly developed (pH, temperature, and specific conductance must be stabilized and drilling effects eliminated from the well).

4.2.2 Field Measurements

At a minimum, field measurements for pH, electrical conductivity, and temperature must be collected at each sample point prior to and during purging and sampling. Purging must be continued until the final three consecutive measurements for each parameter agree to within 10% of each other prior to sample collection. Measurements should be taken at appropriate intervals (based on total volume to be purged) during the purging process to determine stabilization. All results must be recorded on the Field Information Form noting all units to one significant figures.

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All pH meters must provide a reading to the nearest hundredth [e.g., 7.14]. When field measurement errors occur, a line should be drawn through any error or correction, and the entry initialed and dated.

If the values obtained are not within the normal ranges, as indicated on previous Field Information Forms, notify the Sanifill Project Manager immediately. Such readings may result from inadequate purging, instrument malfunction, or a change in the character of the groundwater. The instrument should be recalibrated and additional samples may be requested by the Sanifill Project Manager to ascertain the cause of the abnormal readings. All calibration information must be documented in field log books.

Groundwater samples should be collected in the shortest possible time subsequent to purging the well. The method to be used for sampling is usually the same as that used for purging, unless otherwise specified by site conditions or regulation.

4.2.3 Filtration

Field filtering is to be conducted at all Sanifill sites unless otherwise prohibited by local and/or state regulation, or the approved groundwater monitoring plan for the facility. All samples (except those listed below) must be filtered through a 0.45 micron membrane pressure filter, unless regulatory requirements specify otherwise.

Samples Never Requiring Filtration

Alkalinity
Turbidity
Total Dissolved Solids (lab filtration)
Total Suspended Solids (TSS)
Total Solids
Semi Volatile Organics
Volatile Organics (VOA)
Total Metals
pH
Specific conductivity
Oil and grease
Surfactants
Pesticides
Herbicides
Color
Total Residual Chlorine
Biological and Bacteriological Parameters
Total Petroleum Hydrocarbons

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Regulatory and permit requirements will generally specify whether to analyze, for example, for "total" metals as opposed to "dissolved" metals. Sanifill policy is to filter all heavy metals samples unless otherwise specifically requested. The requirements must be noted on the field Chain-of-Custody Records in the column labeled "Remarks" (see Section 7.5). Specific filtering instruction are included on the Laboratory Contract Addendum, the approved Groundwater Monitoring Plan, and in some cases the site's operating permit. Furthermore, samples which will require filtering will be noted on individual bottle labels and bottle schematics.

It is recommended that all filtration be performed using an in-line filtration system. A minimum of three pump cycles of water must be allowed to pass through the filter before obtaining a sample. The filter should be changed between sample points unless clogging promotes a greater frequency. If samples are collected utilizing disposable bailers, then vacuum filters are an acceptable method of filtering. Where in-line filtration is not possible, pre-filtration bottles may be used to collect the samples. Pre-filtration bottles must be obtained from the laboratory with the sample coolers and identified at the time of initiating the bottle request.

Additional Notes:

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* Filtering should be performed during sample collection while in the field.
* Filters must be ~~0.045~~ microns and dedicated for groundwater only. Do not use any filtering apparatus that is used for other procedures such as TCLP.
* Surface water and leachate samples are never filtered unless specifically required by permit.
* Pre-filtration bottles, as in the case of Vacuum or pump filtering, should not be used between wells. If re-use is absolutely necessary, prefiltrations bottles must be thoroughly decontaminated between wells in accordance with Section 3.1.4 of this Standard. The use of Pre-filtration bottles must be noted on the Field Chain-of-Custody Record in the "Remarks" column.

4.2.4 Filling Sample Bottles

Sample bottles should be filled directly from the bailer, dedicated bladder pump, or filter apparatus with minimal air contact. Volatile and semi-volatile organic analyses (VOA) and Total Organic Halides (TOX), and alkalinity bottles should be headspace-free (i.e., no air bubbles in the sample bottle).

When filling the sample bottles, the following procedures and precautions should be adhered to:

1. Bottle caps should be removed carefully so that the inside of the cap is not touched. Caps should never be put on the ground. Caps for VOA vials should contain a Teflon lined septum. The Teflon side of the septum must be facing the sample to prevent contamination of the sample through the septum.
2. The sampling team should wear appropriate surgical, PVC, or vinyl gloves. Gloves should be changed between wells or on a more frequent basis.

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3. Tubing or hoses from the sampling systems must not touch or be placed in the sample bottles.
4. After filtering, ~~sufficient space should be available in the sample bottles for the addition of required preservatives (see Section 7.1 of this Standard)~~. The bottle caps should then be replaced tightly.
5. TOX and VOA vials must be filled so that they are headspace-free. These sample bottles, therefore, need to be slightly overfilled (water tension will maintain a convex water surface in the bottle). The caps for these bottles should be replaced gently, to eliminate any air bubbles in the sample. These bottles must then be checked by inverting them and tapping them sharply with a finger. If any air bubbles appear, open the bottle, add more water, and repeat this process until all air bubbles are gone. Do not empty the bottle and refill it. VOA and TOX bottles already contain preservatives (see Section 7.1). Do not add additional preservatives to VOAs prior to sample collection.
6. Sample bottles, caps, or septums that fall on the ground before filling should be thoroughly rinsed with sample water before being used. All circumstances regarding dropped caps or bottles, and their subsequent rinsing and use, must be noted on the Field Information Form.
7. The sampling team must collect a sufficient volume of liquid to allow for analysis of all required parameters. In the event that an insufficient volume of water exists for collection of the requisite suite of samples, VOA and semi-VOA samples should be collected first, followed by leachate indicator parameters, metals, etc.
8. The sequence of filling vessels should ensure that samples are representative of natural groundwater conditions. This is accomplished by evenly distributing bailer contents amongst containers by analyte type (i.e., leachate indicator parameters, metals, major cations/anions, etc). For example, all sample vessels designated for analysis of major cations and anions should be filled prior to proceeding to sample vessels for another analyte type.
9. Under no circumstances should bottles (sample or Pre-filtration) or caps not supplied by the laboratory be used for any sampling!
10. Sample coolers should be present at all sample locations and should be equipped with pre-chilled, double bagged ice packs for immediate placement of sample bottles subsequent to collection.

4.2.5 Trip, Field, and Equipment Blanks

Trip Blanks, Field Blanks and Equipment Blanks are used to detect contamination that may be introduced in the field (either from the atmosphere or from sampling equipment), in transit to or from the sampling site, or in bottle preparation. Upon return to the laboratory, Trip Blanks, Field Blanks, and Equipment Blanks will be analyzed using the same laboratory procedures and methods that are used for the collected field samples.

4.2.5.1 Trip Blanks

Trip Blanks are samples of volatile organic-free, laboratory quality water (e.g., Type II reagent grade) which are prepared at the laboratory. They remain with the sample bottles while in transit to the site, during sampling, and during the return trip to the laboratory. Trip Blank sample bottles are not opened at any time during this process. Trip Blanks are to be reported in the laboratory results as separate samples, using the designations TB-(well#) as their sample point designation. If Trip Blank sample bottles are accidentally opened, note this fact on the Field Chain-of-Custody Record.

One Trip Blank per cooler is recommended for Sanifill sites (or as stated in the approved site groundwater monitoring plan). Each sample cooler that includes bottles for volatile organic analyses, must include a Trip Blank. When volatile organic analyses have been requested, the sample cooler will contain a Trip Blank regardless of whether a request has been placed for analysis of the Trip Blank.

4.2.5.2 Field Blanks

Field Blanks are prepared in the field (at the sampling site), using laboratory supplied bottles and the deionized or laboratory reagent quality water. Each Field Blank should be prepared by pouring the deionized water into the sample bottles at the location of one of the wells in the sampling program. The well at which the Field Blank is prepared must be identified on the Field Information Form along with any information/observations that may explain any anomalous results (e.g., prevailing winds, upwind potential sources of contamination, etc.). Once a Field Blank is collected, it is handled and shipped in the same manner as the rest of the samples. If filtration is conducted, but not in-line, the de-ionized or laboratory quality water is exposed to air, poured into pre-filtration bottles, filtered as required, and placed in the Field Blank bottles, with the proper preservative subsequently being added.

Field Blank results will be reported in the laboratory results as separate samples, using the designations FB-(well#) as their sample designation point. A minimum of one Field Blank for each day that monitor wells are sampled is recommended.

4.2.5.3 Equipment Blanks

Equipment Blanks are required for all sampling events utilizing non-dedicated equipment. Decontamination procedures for non-dedicated equipment are outlined in Section 3.2 of this document. Equipment Blanks for non-dedicated equipment are collected by pouring the deionized or laboratory reagent quality water into or over the sampling device (e.g., the bailer) after it has been properly decontaminated, then pouring the sample into the Equipment Blank bottles. Equipment blanks should be filtered if appropriate for the analytical method. At a minimum, nondedicated sampling equipment blanks should be analyzed for VOC's. Whether or not the sample is filtered, this water should be placed into the Equipment Blank bottles, and the

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proper preservative added (as required). As in the case of Field Blanks, VOA sample bottles will be pre-equipped with preservatives.

Equipment Blank results will be reported in the laboratory results as separate samples, using the designations EB-(well#) as their sample designation point. A minimum of one Equipment Blank for each day that monitor wells are sampled is recommended.

5.0 SURFACE WATER SAMPLE COLLECTION

This section of the standard is applicable to sampling water from sources such as rivers, streams, and lakes. Prior to commencing with surface water sampling activities, Field Information Forms for each sample location should be completed. The sampler should note any areas of dead or distressed vegetation, odors, discolored water, oily sheens, weather conditions, wind direction, nearby activities, etc. At a minimum, field measurements for pH, electrical conductivity, and temperature must be collected at each sample point prior to sampling. All results must be recorded on the Field Information Form.

The location of the sample point should be selected with care to ensure that a representative sample of water is obtained for testing. The sample point should be selected so as to minimize intrusion of particulate matter within the sample container. Samples collected from shallow depths can readily be obtained by merely submerging the sample container below the water surface. The containers mouth or opening should be positioned such that the mouth faces in a downstream direction if flowing water is encountered. The sample container should be lowered into the water while still capped, uncapped under water to allow the sample bottle to fill, and re-capped before removal from the water. The sampler should stand in a downstream position so as to prevent any sources of cross contamination and to prevent sediment disturbance.

When sampling consecutive points in streams of flowing water, sampling should begin in the furthest downstream location and proceed in an upstream direction. In separate channels or water bodies, the locations expected to exhibit the greatest impacts should be sampled last. To ensure that the surface water samples are representative, samples should be collected from the center of the stream or body of water when possible, and at mid depth.

Should samples be collected from a boat, the sampler must take care to avoid collection points where the turbulence caused by the propeller or by the oars has disturbed the characteristics of the water. Such samples should be collected from the lower half of the water column of the surface water body.

Surface water samples are not to be field filtered unless specified under local and/or state regulations or as otherwise stated in the sites operating permit or approved Groundwater Monitoring Plan. Sample filling techniques and preservation should follow those described in Section 4.2.4 and 7.1 of this Standard, respectively.

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6.0 LEACHATE SAMPLE COLLECTION

This section of the standard is applicable to sampling fluids from leachate wells, leachate manholes, and/or leachate retention basins. Prior to commencing with leachate sampling activities, Field Information Forms for each sample point should be completed. Upon arrival at the sample location, the general condition of the sample location and its surroundings should be recorded on the Field Information Form. The sampler should note any obvious odors in the vicinity of the sample point, foaming, discolored surface fluids, weather conditions, wind direction, nearby activities, leachate color, etc.

All leachate sampling equipment must be dedicated to each sample point or must be disposable. Fluid level measuring equipment used at leachate monitoring points should never be used at groundwater monitor points. Leachate fluid levels should be measured prior to sample collection. At a minimum, field measurements for pH, electrical conductivity, and temperature must be collected at each sample point prior to sampling. All results must be recorded on the Field Information Form, noting units to three significant figures. Leachate risers and manholes do not require purging prior to sample collection. Samples should be collected by gently lowering a dedicated or disposable bailer into the sampling port and transferring the collected liquid into the sample bottles. Sample filling techniques are described in Section 4.2.4 of this standard. Leachate samples are not to be field filtered unless specified under local and/or state regulations or as otherwise stated in the sites Operating Permit or Groundwater Monitoring Plan.

Special care should be taken when preserving leachate samples with acid since a violent reaction may occur. Acid should be added slowly and carefully to the leachate samples to avoid a violent reaction. Sample filling techniques and preservation should follow those described in Section 4.2.4 and 7.1 of this Standard, respectively. Leachate samples should not be placed in the same coolers used for shipping residential, water supply well samples, or other typically uncontaminated samples.

7.0 SAMPLE PRESERVATION, STORAGE, AND SHIPMENT

7.1 Sample Preservation

Samples are to be preserved ~~immediately after filtering or immediately after sample collection~~ (if samples are not filtered). ~~TOX and VOA's, which are allowed no headspace~~ (no air bubbles trapped in the sample), will have preservatives included in the sample bottle.

~~Under normal circumstances, preservatives will be provided in small labeled vials and will be packed in a separate ziplock baggie and labeled as such. The preservatives should be added to the sample bottle after it has been filled with the sample.~~ The sample bottle should be filled to within 1/2 inch of the top of the sample container. ~~Subsequent to filling, the sample container should be topped off with the appropriate sample preservative.~~ Once the preservative has been added and the sample container capped, the sample container should be inverted to ensure

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complete mixing with the sample. The sample container is not to be shaken.

7.2 Temperature Control

The sample container and samples should be cooled to 4 degrees Celsius from the time the sample is collected through the time of analysis. Samples should be maintained in temperature regulated refrigerators, in coolers, or in sample coolers containing double bagged or commercial frozen wet ice packs. It is the sampler's responsibility to ensure that provisions have been made in advance for those facilities which do not have accommodations to freeze the ice packs. In such cases, it is recommended to bring pre-chilled coolers and extra ice packs to the site. The ice packs should be frozen solid prior to use. It is the sample team leader's responsibility to ensure that the samples are properly cooled during shipment to the laboratory.

7.3 Sample Packing and Storage

7.3.1 Checking Sample Designations and Numbers

Prior to packing the sample bottles into the shipment coolers, the sampling team must record the sample designations in the appropriate spaces on the Field Chain-of-Custody Records and Field Information Form. It is important that the proper designations be recorded in the proper space on the form and that they be double-checked before sealing the sample cooler.

All bottles filled from the same sample point at the same time must have identical sample designations (except Field Duplicates). Samples that are split with regulatory agencies should also be checked for consistent sample point designation numbers and for other methods of identification used by the agency.

7.3.2 Sample Packing

After the sample is collected and the preservatives are added (when applicable), the bottles should be capped and placed in the sample cooler. The frozen ice packs should be placed into the sample cooler such that they are not in direct contact with sample bottles. Glass containers should not be packed in contact with each other. Bottle holders/cushions and/or bubble wrap should be used for glass bottles to protect them from potential breakage.

All bottles should be wiped clean with paper towels before placement in the sample cooler. The sample cooler must be kept as clean as possible to minimize the potential for cross contamination. All bottle caps should be checked to ensure they are tight and will not become loose when inserted in the Sample cooler. Bottle caps should not be taped. Labels should be taped only if they are loose, and this should be noted on the Field Information Form or Chain-of-Custody Record.

The Field Chain-of-Custody Records (see Section 7.5) and Field Information Forms must then be reviewed to ensure that they have been completed properly. All paperwork should be placed in a

plastic bag, sealed, and placed inside the sample cooler. The sampling team should maintain a copy of all Chain-of-Custody documents and Field Information Forms for verification purposes.

7.3.3 Sample Storage

Samples should be stored at 4 degrees Celsius, in an enclosed cooler or darkened refrigerator where possible, before shipment to the laboratory for analysis. Samples should be shipped daily to the laboratory to ensure proper temperature control and holding time requirements are met.

7.4 Sample Shipment

Samples must be shipped to the laboratory or the subcontract laboratory as soon as possible such that there is no exceedance of holding times. Due to the extremely short hold and extraction times involved with many of these methods, it is recommended that the shipment occurs on the same day that the samples are collected. It is the sample teams sole responsibility to ensure expedient delivery of samples to the laboratory, such that the samples arrive at the laboratory at the proper temperature and well within the range of specified holding times.

A member of the sampling team must be appointed to arrange sample pickup and/or transportation to the laboratory. Friday shipment of samples to the laboratory should be avoided to ensure that holding times are not exceeded over a weekend. Delivery requested on Saturday must be noted specifically on the shipping/packing air bill for the courier. The laboratory must be notified within 48 hours preceding the anticipated delivery.

Sample coolers should be returned via the courier specified by the Sanifill Project Manager. When contacting the courier for transport of a sample, specify the sample cooler's contents. Alert the courier to the potential problems of the samples freezing in the winter or ice packs melting in the summer, and note these potential problems on the shipping/packing label. Sample coolers should be received at the laboratory within 24 to 48 hours of when the frozen ice packs were placed in the sample cooler. This is necessary for temperature preservation and to meet required holding times for some analyses. Any necessary delay in shipment of the coolers to the laboratory must be documented on the Field Chain-of-Custody Record.

7.5 Sample Chain-of-Custody Record

To help maintain the integrity of the samples, strict chain-of-custody procedures are necessary. These procedures help to ensure that tampering with the samples does not occur. From the time the sample bottles leave the laboratory until the issuance of the analytical laboratory results, the samples and/or sample containers must be in the custody of assigned Sanifill personnel or an assigned consultant or contractor or the laboratory. In order to maintain the chain-of-custody, the samples must be in sight of the assigned custodian or locked in a tamper-proof location. A written record of sample bottle possession and any transfers of samples must be maintained and documented on the Field Chain-of-Custody Record.

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The Sample Chain-of-Custody must contain, at a minimum, the following information:

Site Name
Station Numbers (Line No. on COC, ascending order)
Date Samples are collected (by sample)
Time Sample Collected (by Sample)
Type of Sample (Composite, Grab, Groundwater, leachate, surface water)
Number of containers per sample point
Filtering Requirements (Remarks Column)
Preservatives (Remarks Column)
Analysis Required
Special Remarks (at base of Form)

The Field Chain-of-Custody Record must further be signed with the date and time for the following activities:

* Receipt of the sample cooler (s)
* Each time the sample cooler is transferred to the custody of another person.
* Immediately before sealing the sample cooler for transport to the laboratory. (The form must be signed and enclosed within the cooler in a water tight bag.)

Samples from the same sample point that are placed in more than one sample cooler require a Field Chain-of-Custody Record in each sample cooler. Any problems with the sample cooler's contents must also be noted on the form. Upon receipt of the sample cooler by the lab, the condition of the samples, temperature, date, and time are recorded on the Field Chain-of-Custody Record by the log-in personnel receiving the sample coolers. The Field Chain-of-Custody Record indicates by bottle and analysis group whether samples are to be preserved. If actual preservation and filtration procedures vary from the instructions provided in these spaces, the chain-of-custody instructions must be modified by a member of the sampling team and initialed in the appropriate locations provided on the Field Chain-of-Custody Record or on the Filed Information Form. Failure to complete the Field Chain-of-Custody Record will render the resulting data useless. An example of the Sanifill Field Chain of Custody Form is provided as Attachment 2.

ATTACHMENT I

WELL SAMPLING FIELD INFORMATION FORM

SANIFILL, INC.

Well Sampling Field Information Form

Site Name: _____

Sample Point: _____

Date: _____

Well/Equipment Information

DTW (pre/post) _____ (ft)/ _____ (ft)
Cons. Well Depth _____ (ft)
Reference Elev: _____ (msl)
Water Level Elev: _____ (msl)

Actual Well Depth: _____ (ft)
Casing Vol: _____ (gallons)
Well/Borehole Vol: _____ (gallons)
Pump Sys. Vol: _____ (gallons)

Dedicated Equipment: Yes No
QED Sampling Systems: Yes No
MicroPurge Yes No
Purging Device: _____
Sampling Device: _____
Filtering (device): _____

Purge Start Date: _____ End Purge Date: _____ Sample Date: _____
Purge Start Time: _____ : _____ End Purge Time: _____ : _____ Sample Time: _____ : _____

Field Measurements:

		Initial	1st	2nd	3rd	4th	Sample
pH							
E.C.	(uS)						
Temp.	(F)						
Volume	(gal)	na					
Other: _____							
Time :		:	:	:	:	:	:

Sample Attributes: Color: _____ Odor: _____ Turbidity: _____
Eh _____ D.O. _____ Alkalinity _____

Sample Vessels:
Intact: Yes / No
Explain Below

Bot. Type	Time	Analysis	Analysis	Number	Volume	Preserv.	Filter (Y/N)

Field Comments:

Notes: (weather conds., temp., wind direction, near-by activities) _____

Well Head/Surrounding Conditions (distressed veg, surface completion conditions): _____

I certify that all sampling procedures were conducted in accordance with the Sanifill Groundwater, Surface Water, and Leachate Sampling Standard and State/Federal Regulations.

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Date: _____ Signature/Title _____ Company _____

ATTACHMENT II

SAMPLE CHAIN OF CUSTODY FORM

EN CHEM INC.

1241 Bellevue St., Suite 9
Green Bay, WI 54302
414-469-2436 • 1-800-736-2436
FAX 414-469-8827

802 Deming Way
Madison, WI 53717
608-827-5501 • 1-888-530-2436
Fax: 608-827-5503

2231 Catl... ...ve., Suite 420
Superior, WI 54880
715-392-5844 • 1-800-657-8238
FAX 715-392-5843

CHAIN OF CUSTODY

1100

Company Name: _____

Branch or Location: _____

Project Contact: _____

Telephone: _____

Project Number: _____

Project Name: _____

Project Location: _____

Sampled By (Print): _____

Regulatory Program *(circle)*: UST RCRA CLP SDWA
NPDES/WPDES CAA NR_____
Other _____

NR720 Confirmation Analysis Required? *(circle)*: Y N
(En Chem will confirm unless otherwise instructed.)

Page _____ of _____

P.O. # _____ Quote # _____

Mail Report To: _____

Company: _____

Address: _____

_____

Invoice To: _____

Company: _____

Address: _____

_____

Mail Invoice To: _____

FILTERED? (YES/NO)
PRESERVATION (CODE)*
ANALYSES REQUESTED

FIELD ID	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	FIELD SCREEN	MATRIX	SHADED AREA FOR LABORATORY USE ONLY: GOOD COND.	TOTAL BOTTLES	COMMENTS	LABORATORY NUMBER

EXAMPLE

*Preservation Code
A=None B=HCL C=H2SO4
D=HN03 E=EnCore F=Methanol**
G=NaOH O=Other (Indicate)

**If not using En Chem's methanol, indicate volume of methanol added and mark the appropriate samples.

Relinquished By:	Date/Time:	Received By:	Date/Time:	En Chem Project No.
Relinquished By:	Date/Time:	Received By:	Date/Time:	Sample Receipt Temp.
Relinquished By:	Date/Time:	Received By (En Chem):	Date/Time:	Sample Receipt pH (Wet/Metals)

Appendix I: Inspection Manual

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Inspection Manual

Kestrel Hawk Landfill
Racine, Wisconsin

Revised April 2025
Revised September 2026

WDNR License No. 0572

Prepared For:

Republic Services of Wisconsin, Limited Partnership
City of Racine, Racine County, Wisconsin

Prepared By:

TRC
999 Fourier Dr., Suite 101
Madison, Wisconsin 53717

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Attachment B: Inspection Forms
Attachment C: Corrective Action Report

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1.0 Introduction

1.1 Purpose

The purpose of this Inspection Manual (Manual) is to address the general inspection requirements for the hazardous waste unit (HWU), comprised of Corridors 1 through 6, at the Kestrel Hawk Landfill. This Manual was prepared in accordance with s. NR 664.0015, Wis. Adm. Code, and identifies systems of the HWU that require inspection at regular intervals. A general description of the HWU systems and their major components is included within this Manual.

This Manual is prepared for the Inspector(s) at Kestrel Hawk Landfill and provides direction and guidance for conducting inspections. In addition, it provides procedures, schedules, and inspection forms to identify problems, such that the problems can be corrected before potential harm to human health or the environment occurs.

Though this Manual was developed specifically for the HWU, general inspection requirements for the remaining portions of Kestrel Hawk Landfill (non-hazardous waste) are provided in **Section 3.0**. Details provided in the remainder of **Section 1.0** and **Section 2.0** relate only to the HWU.

1.2 Background

The HWU as part of the Kestrel Hawk Landfill is located south of Wisconsin State Highway 20 and west of Wisconsin State Highway 31 in the northern one-half of Section 23, Township 3 North, Range 22 East, in the City of Racine, Racine County, Wisconsin. Kestrel Hawk Landfill is bordered to the west by Oakes Road, the north by 16th Street, the east by a residential area, and the south by 21st Street. Entrance to the site is from Oakes Road.

The Old Site (approved by the Wisconsin Department of Natural Resources [WDNR]) included 13 sequential phases identified as corridors, and the former City of Racine landfill area. The corridors have since been renumbered to include Corridors 1 through 11, as shown on **Figure 1**. Corridors 1 through 6 have been designated by the WDNR as the HWU. The HWU is in the southeastern corner of the Old Site and consists of approximately 38 acres.

Hazardous waste was co-disposed with nonhazardous municipal solid waste in the HWU until 1982 when Kestrel Hawk Landfill discontinued acceptance of hazardous waste. It is estimated that hazardous waste consisted of approximately 3% by volume of the total waste placed in the HWU. Following the cessation of hazardous waste disposal, non-hazardous waste disposal areas continued to be developed at Kestrel Hawk Landfill. Non-hazardous waste disposal areas included the remainder of the Old Site and the Northwest Expansion that vertically and horizontally expanded the Kestrel Hawk Landfill footprint. The Plan of Operation for the Northwest Expansion at Kestrel Hawk Landfill was approved by the WDNR on August 30, 1996.

Kestrel Hawk Landfill ceased accepting waste on December 30, 2022, and by July 2024 final cover had been placed on the entirety of the Kestrel Hawk Landfill. Upon completion of the final cover construction, the monitoring trailer and scale house previously located at the site were removed. The site complex includes the following structures which reside outside the HWU: landfill office, maintenance building, and the biogas compressor buildings. The landfill office contains files and records of the site's operation.

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The design for Corridors 1 through 6 was modified to provide physical and hydraulic separation of the HWU from the remaining corridors of the Old Site and the former City of Racine Landfill. This separation is provided by the north barrier wall (NBW) and west barrier wall (WBW). Several design modifications for the HWU were submitted to the WDNR for review and approval in a series of design reports prepared by Foth & Van Dyke (Foth) through 1988. WDNR requirements for the pre-1988 design reports are defined in a March 31, 1988 approval letter addressing Modifications to the Hazardous Waste Closure and Long-Term Care Plan and Plan of Operation Approval. The March 31, 1988 letter specified the requirements for closure of the HWU and included containment structure construction (slurry wall and groundwater collection trench), barrier wall construction, leachate and gas extraction system construction, south slope stabilization, and RCRA cover construction. Subsequent WDNR approvals on July 1, 2004, July 2, 2004, and September 8, 2004 have modified materials, sequencing, and timing for the final cover (both RCRA and non-RCRA cover systems) construction.

The following reports have been completed to document construction related to the HWU:

Containment Structure

- Construction Observation Report for the Groundwater Containment Structure, Foth, August 1991.

South Slope Cover

- Construction Observation Report, South Slope Construction Hazardous Waste Unit, Warzyn, January 1992.
- Addendum to the Construction Observation Report, South Slope Construction Hazardous Waste Unit, Warzyn, March 1993.
- Addendum No. 2 to the Construction Observation Report, South Slope Construction Hazardous Waste Unit, Warzyn, January 1994.

West Barrier Wall

- Construction Observation Report, Interior Manhole and Piping System, Warzyn, December 1991.
- Construction Observation Report, Phase II of West Barrier Wall and Horizontal Gas Well Construction Hazardous Waste Unit, Warzyn, August 1993.
- Construction Documentation Report for Barrier Wall Construction, RMT, July 1996.

North Barrier Wall

- Construction Observation Report, Corridor No. 7, Addendum No. 1, Foth, January 1987.
- Construction Observation Report for Phase II Construction of the North Barrier Wall, Foth, December 1987.
- Construction Observation Report for Phase III Construction of the North Barrier Wall, Foth, July 1988.

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- Construction Observation Report, North Barrier Wall - Phase IV & V Construction, Warzyn, February 1992.

East Slope Cover

- Post-Construction Documentation Report, East Slope Final Clay Cover, Warzyn, April 1991.
- Construction Observation Report, East Slope Construction Hazardous Waste Unit, Warzyn, February 1992.
- Construction Observation Report, Corridor 7 East Slope Final Cover, Warzyn, February 1994.

RCRA Cover

- RCRA Phase I Cover Construction, Hazardous Waste Unit, GeoSyntec Consultants, March 1992.
- Construction Observation Report, RCRA Phase II Final Cover, Montgomery Watson, December 1994.
- Old Site 2001 Final Cover Construction Documentation, STS Consultants, January 2002.
- Construction Documentation Report, 2023-2024 Composite Cover, Weaver Consultants Group, July 2024.

Gas and Leachate Extraction System

- Construction Observation Report, 1990 & 1991 Temporary/Permanent Construction, Gas and Leachate Extraction System, Warzyn, November 1991.
- Construction Observation Report - Addendum, Permanent Gas and Leachate Piping Construction, Hazardous Waste Unit, Warzyn, April 1992.
- Construction Observation Report, East Slope and Corridor 7, Gas and Leachate Extraction System, Warzyn, December 1993.
- Construction Observation Report, Corridor 7 Gas and Leachate Extraction System, Montgomery Watson, August 1995.
- Gas Collection and Control System Improvements Construction Quality Assurance, EMCON/OWT Solids Waste Services, December 2001.
- Construction Documentation Report Gas Management System improvements/Expansion 2003, Earth Tech, Inc. August 2001.

Groundwater Remediation System

- Corrective measures study and corrective measures implementation, RMT, November 1996.
- Groundwater Remediation System Alteration Construction Observation, City of Racine Transfer Station Project, Foth, August 2024.

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1.3 Use of Inspection Manual

The Manual is to be read and understood by Kestrel Hawk RDF staff involved in inspections. The Manual is intended to provide direction and guidance to identify problems that may cause, or lead to, a potential discharge of hazardous waste or solid waste.

In accordance with s. NR 664.0015(1), Wis. Adm. Code, inspections must be performed to identify malfunctions and deterioration, operator errors, and discharges which may be causing, or may lead to, a discharge of hazardous waste (or their constituents), so as to minimize risk to human health or to the environment. The purpose of this Manual is to provide guidance to landfill personnel such that a proactive maintenance program can be undertaken to reduce the possibility of a hazardous waste discharge. The inspection program is intended to identify potential problems in a timely manner so they may be corrected before they harm human health or the environment. The Manual will be kept on file in the landfill office and the maintenance building.

This Manual includes a description of the facility layout and the Inspection Plan. **Figures 1** through **6** are provided as references for the systems that are part of the HWU. The Inspection Plan includes details pertaining to inspection procedures, inspection forms, and corrective actions. Kestrel Hawk Landfill employees, who have responsibilities in the inspected areas and have duties outlined in this Manual, will receive training to carry out actions discussed in this Manual. They will also receive training when changes are incorporated into the Manual.

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2.0 Facility Layout

2.1 General

This section of the Manual presents a description of the systems in operation as part of the HWU at the Kestrel Hawk Landfill. Components relating to the non-hazardous waste portions of Kestrel Hawk Landfill are not included. A discussion of the existing and proposed major components of each system is provided. The systems include:

- Final Cover System
- Surface Water Management System
- Gas Control System
- Leachate Control System
- Groundwater Containment System
- Groundwater Remediation System
- Site Security System

The Environmental Monitoring Program for the landfill, including those of the HWU, are included in the report titled "Proposed Amendment to Existing Environmental Monitoring Program," July 1993, Warzyn, and the Plan of Operation Approval for the Northwest Expansion dated August 30, 1996. The Closure and Long-Term Care Plan License Application for the Kestrel Hawk Landfill includes the most recent Environmental Monitoring Program for the landfill.

2.2 Final Cover System

The cover system for the HWU consists of five components: Resource Conservation and Recovery Act (RCRA) cap, South Slope cap, West Barrier Wall (WBW), North Barrier Wall (NBW), and the East Slope cap. Construction documentation reports for these various segments are listed in **Section 1.2** and are detailed in the Revised Corridors 1-6 Closure Status Report. Refer to **Figure 1** for final cover area locations.

The RCRA cover system for Phases I, II, and III consists of, from top down:

- 6 inches of topsoil
- 1.5 feet rooting zone
- geotextile fabric
- 1 foot drainage layer
- geomembrane
- 3 feet of compacted clay

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In July 2024, the last portion of RCRA cover system was completed and consists of, from top to bottom:

- 6 inches of topsoil
- 2.5 feet rooting zone
- Geocomposite drainage layer
- 40 mil LLDPE geomembrane
- Geosynthetic clay liner (GCL)
- 2 feet of compacted clay

The South Slope and East Slope caps consist of 4 feet of compacted clay overlain by 6 inches of topsoil. The NBW and WBW consist of 7 feet of compacted clay with 1 foot of drainage layer both above and below.

The major closure phases for the facility are detailed in the WDNR's December 19, 1984 Conditional Plan of Operation Approval and WDNR March 31, 1988 Modified Closure and Long-Term Care Plan Approval and WDNR July 2, 2004 Final Cover Approval.

The purpose of the HWU cover is to limit infiltration of precipitation and surface water into the waste. The NBW and WBW also provide physical and hydraulic separation from the non-hazardous portions of the landfill. The RCRA cover provides the added protection of a membrane and drainage layer to further reduce infiltration and the production of leachate. Water that percolates to the drainage layer will be intercepted and routed into the surface water management system.

Details of the surface water management system are described in the report titled, "Plan of Operation Modification, Surface Water Management," RMT, April 1993. In addition, the RCRA, South Slope, and East Slope cover systems reduce gas migration through the cover and limits air intrusion into the landfill and gas extraction system.

The RCRA, South Slope, and East Slope cover systems are to be maintained so they can function properly. The cover systems are to be maintained with a good, vegetated cover with minimal erosion which will allow the cover to perform as designed.

2.3 Surface Water Management System

The surface water management system for the HWU consists of diversion berms, ditches, culverts, flumes, sedimentation basins, and other erosional control measures. The primary purpose of this system is to efficiently collect and convey stormwater off the landfill to perimeter ditches, so that erosional damage to the final cover or exposure to hazardous waste is minimized.

Surface water collected on the landfill is generally conveyed to one of 5 sedimentation basins (No. 1, 4, 5, 6, or 7). Surface water collected off the HWU final cover is directed primarily to Sedimentation Basin No. 1 located within the southwestern corner of the Old Site. Sedimentation Basins No. 4 and No. 7 may also receive surface water from the HWU due to the drainage patterns at the landfill. Discharge from Sedimentation Basin No. 1 occurs through the site's southern drainage ditch. Discharge from Sedimentation Basin No. 4 flows to the Gunderson Drainage

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Ditch. Discharge from Sedimentation Basin No. 7 flows from an outlet structure on the northern perimeter of the basin. Refer to **Figure 2** and **Figure 3** for locations of the surface water management system.

The ditches created by the surface water diversion berms collect surface water from the HWU. Downslope flumes collect the flow from the diversion berm ditches and direct it to the perimeter ditches. The perimeter ditches carry the surface water to the sedimentation basins.

There are two inlets to Sedimentation Basin No. 1. A single culvert intersects the northeast side of the basin. A double culvert enters the basin at the southeast. The basin outlet consists of a riser pipe with perforations which allow the water in the basin to discharge to an 18-inch diameter outlet pipe. An 18-inch gate valve is located on the outlet pipe to contain surface water in the basin if necessary. An emergency spillway, located at the western end of the basin, provides an outlet during peak storm events.

Sedimentation Basin No. 4 has a single inlet on the south side. The basin outlet contains a 30-inch diameter riser pipe and 24-inch diameter outlet pipe. The emergency spillway for Sedimentation Basin No. 4 is located at the northwest corner above the outlet pipe.

Sedimentation Basin No. 7 has a single outlet on the northern side of the basin. The basin outlet contains a 30-inch diameter riser pipe. The emergency spillway for Sedimentation Basin No. 7 is located along the northern perimeter above the outlet pipe.

Maintaining surface water management system components both within the HWU and in the non-hazardous disposal areas will provide for proper handling of surface water. The ditches, flumes, and culvert inlets and outlets are to be kept clear of obstructions to surface water flow. Erosion control measures are to be maintained, as needed. The sedimentation basins should be maintained and cleaned, as needed.

2.4 Gas Control System

The gas control system installed in the HWU operates in conjunction with the gas control system for the entire site, for the purpose of:

- emission control,
- migration control, and
- energy recovery.

The gas control system on the HWU consists of gas extraction wells, horizontal gas extraction trenches, gas monitoring and control stations, gas header pipe, and gas monitoring probes. Gas collected from the HWU combines with that from other landfill areas. The compressor located at the Biogas West Facility (aka gas plant) withdraws gas from the extraction wells. Then, the gas is directed to either the S.C. Johnson Inc. facility for energy recovery and/or to a utility flare. The utility flare is located at the Biogas West Facility. Refer to **Figure 3** for the biogas building and flare locations.

There are four horizontal gas extraction trenches associated with the HWU. Two trenches, GT-1 and GT-2, are located beneath the NBW in Corridor 6 of the HWU. The other two trenches, GT-3

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and GT-4, are located beneath the WBW. Monitoring no longer occurs at the trenches near the WBW.

Following is a list of the gas extraction wells installed within the HWU.

Gas Only	Combined Gas and Leachate			
GW11	LGW36DR	LGW300	LGW309	LGW318R
GW12	LGW38DR	LGW301	LGW310	LGW319
GW(LHW)104	LGW39S/D	LGW302	LGW311	LGW320R
GW213S/D	LGW40S/D	LGW303	LGW312R	LGW321
GW214S/DR	LGW44S/D	LGW304	LGW313	LGW322
GW330	LGW45DR	LGW305	LGW314R	LGW323
GW331	LGW46DR	LGW306	GW315R	LGW324
GW21	LGW47S/D	LGW307	LGW315RR	LGW325
GW206R	LGW308	LGW317	LGW316	
GW208	LGW326S/DRR			
GW211	LGW327S/DR			
	LGW328S/DR			
	LGW329S/DR			

At gas extraction wells with S/D labels, two gas wells are installed in the same borehole. The shallow well pipe (S) extends through waste and ends above the NBW or WBW. The deep well pipe (D) extends through the NBW or WBW and is part of the HWU. Gas extraction wells and horizontal gas extraction trenches GT-1 and GT-2 include wellheads which connect the wells to the landfill gas header pipe system. The wellheads provide the equipment needed to adjust gas flow and to collect monitoring data. Refer to **Figure 4** for a detail of a typical leachate/gas extraction wellhead.

To monitor for migration, a migration control trench was installed on the eastern perimeter of the HWU. The trench includes three risers: GTR1, GTR2, and GTR3. Each riser includes a wellhead connection to the gas header pipe system. In the event gas is detected in the trench, a vacuum may be applied to the trench.

Existing gas probes installed around the landfill for additional migration monitoring are as follows:

Gas Probes			
GMW-1RA	GMW-26A/B	GP-15	TP6
GMW-1RB	GMW-27 A	GP-16	TP7
GMW-2R	GP-10	TP1	TP8
GMW-8	GP-11	TP2	TP9
GMW-9	GP-12	TP3	GMP-6A/B
GMW-23 A/B	GP-13	TP4	141U
GMW-24 A/B	GP-14	TP5	

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Probes TP1 through TP9 are installed east of the migration control trench for additional migration detection points. The gas extraction system and gas probe monitoring locations and schedules are presented in the Environmental Monitoring Program (Figure 5 of the Long-term Care Application).

Condensate produced in the gas header pipes of the HWU flows by gravity to driplegs DL1, DL1A, DL2, and DL3. The condensate produced in the gas line to the West Biogas Facility is removed at dripleg DL4R and discharged to the leachate management system at manhole LS-5. From driplegs DL2 and DL3, the condensate combines with extracted leachate and flows by gravity to a vault, LMP8A, near lift station LS8. From driplegs DL1 and DL1A, the condensate flows by gravity directly to lift station LS8 and is metered at U-trap LMP1. From lift station LS8, the condensate flows to manhole MH10. Refer to **Figure 5** for locations of the condensate system.

Refer to the Environmental Monitoring Program (Figure 5 of the Long-Term Care Application) for the locations of gas extraction infrastructure and monitoring points for the areas outside the HWU.

2.5 Leachate Control System

The leachate extraction system in the HWU consists of vertical leachate extraction wells, and horizontal leachate collection pipes installed as part of the base liner collection system. The extraction wells use pneumatic pumps to discharge leachate to the leachate conveyance system (below grade header pipes). The leachate combines with the condensate at driplegs DL1, DL1A, DL2, and DL3. From these locations, the combined liquid flows through metering points LMP1 and/or LMP8A before entering the City of Racine sanitary sewer at manhole MH10.

There are three base liner leachate collection pipes installed in the HWU. Corridors 4, 5, and 6 each contain one collection pipe. The leachate collected in Corridors 4 and 5 flows by gravity directly to interior manhole MH1. The leachate collected in interior manhole MH2 from the Corridor 6 collection pipe also flows to interior manhole MH1. The combined leachate from interior manhole MH1 is pumped to lift station LS4. From lift station LS4, the leachate is pumped to lift station LS5 and to the City of Racine sewer system at a point just east of manhole MH15B. Refer to **Figure 5** for the leachate collection system locations.

All existing leachate extraction wells include a wellhead with controls and fittings for use with the pneumatic pumps. Refer to **Figure 4** for typical wellhead details.

Leachate headwells have been installed to monitor leachate head levels within the HWU. The leachate extraction system and leachate head monitoring program are presented in the Environmental Monitoring Program (Figure 5 of the Long-Term Care Application).

The leachate head monitoring wells installed within the HWU are as follows:

Leachate Head Monitoring Wells			
LHW100	LHW105	LHW110	LHW121
LHW101R	LHW106	LHW111	LHW122
LHW102	LHW107	LHW112RR	LHW123
LHW103	LHW108	LHW113	LHW124
LHW104	LHW109	LHW114R	LHW401-A/B/C
			LHW402-A/B/C

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2.6 Groundwater Containment System

The groundwater containment system of the HWU includes a groundwater collection pipe installed within trenches around portions of the HWU. The groundwater collection pipe starts at manhole MH9, located at the southeastern corner of the landfill, and extends along the southern edge of the HWU to lift stations LS8 and LS6. From lift station LS6, the collection pipe continues to the west to lift station LS5 and also to the north. The collection pipe north of lift station LS6 borders the HWU on the west and extends to interior manhole MH1.

The groundwater collection pipe is designed to collect any liquids which may migrate from the HWU. The groundwater which is collected in the collection pipe from the HWU flows by gravity to lift stations LS6 and/or LS8. Lift stations LS6 and LS8 pump to the City of Racine sewer system at manholes MH13 and MH10, respectively. Refer to **Figure 5** for locations of the groundwater containment system for the HWU.

The ch. NR 635, Wis. Adm. Code, groundwater monitoring wells associated with the HWU are as follows:

Groundwater Monitoring Wells		
49LR	CS7	CS11
UB6	CS8	CS12
UB8	CS9	CS13
UB9	CS10	CS14

Refer to the Environmental Monitoring Program (Figure 5 of the Long-Term Care Application) for the monitoring well locations and respective sampling schedules.

2.7 Groundwater Remediation System

A groundwater extraction and treatment system is located near the southeastern corner of the HWU. The system was installed to address vinyl chloride contamination in the groundwater. The existence of vinyl chloride is attributed to contaminant release from the HWU. Three recovery wells (R5, R6R, and R7) extract groundwater for treatment. Extracted groundwater is discharged to the City of Racine sanitary sewer at manhole MH11. The layout of the groundwater remediation system is shown on **Figure 6**.

2.8 Site Security

The site security system at the Kestrel Hawk Landfill consists of a perimeter fence, lockable gates, and the site access roads. The fence, gates, and roads are indicated on **Figure 3**. The gates are designated as follows:

- Landfill entrance and gate
- North gate
- South slope access entrance and gate

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- 21st Street gate
- East entrance and gate

As part of the site security system, the Contingency Plan (provided separately) indicates evacuation routes for the HWU along with the location of the following items:

- First-aid kit and location
- Two-way radio location
- Fire extinguisher location
- Telephone location

Radio communications are available to personnel who may be required to work in the HWU area. Construction within the HWU area is limited to maintenance activities. Contractors are required to have a Health and Safety Plan and be familiar with the Contingency Plan for the HWU.

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3.0 Inspections

3.1 General

In accordance with s. NR 664.0015, Wis. Adm. Code, a description of the Inspection Plan for the HWU is provided in this section. The purpose of this plan is to provide landfill inspection personnel with the information necessary to perform routine inspections of the HWU systems and facilities, and to identify problems or potential problems which may exist and could cause a release of a hazardous waste. These inspections are critical to minimizing the risks to human health and the environment.

Activities in the HWU areas consist primarily of inspection and maintenance of the HWU systems by landfill personnel. Outside contractors may be working on the repairs/maintenance of the HWU final cover, infrastructure, or other large or specialized projects.

This Inspection Plan includes:

- Procedures to be used when performing inspections to identify problems, such as equipment malfunction for the HWU.
- An inspection schedule.
- Inspection forms.
- Description of tasks necessary for proper record-keeping of performed inspections.

In the event that inspections result in recommendations for corrective actions, a tracking mechanism will be implemented to promote timely and efficient problem remediation as detailed below.

3.2 Contingency Plan Training and Emergency Response

Inspectors are to be trained in emergency response as noted in the Contingency Plan for Kestrel Hawk Landfill. An inspector training sign-off sheet is included in **Attachment A** of this Manual. An emergency response by landfill personnel is limited to the items detailed in the Contingency Plan.

If at any time during an inspection the potential for Immediate Danger to Life or Health (IDLH) conditions exist, or if there is potential for a release of a hazardous waste or hazardous waste constituents to the environment, the Emergency Coordinator or Alternate (as defined in the Contingency Plan) must be contacted immediately and the procedures outlined in the Contingency Plan are to be followed.

3.3 Inspection Schedule

HWU infrastructure is to be inspected based on the frequencies detailed in **Sections 3.5** (weekly inspections), **3.6** (monthly inspections), and **3.7** (quarterly inspections). The inspection schedules for the HWU have been organized as follows:

- Weekly inspections will be performed on a regular working day during the week.

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- Monthly tasks will be performed around the last working day of each month.
- Quarterly inspections are anticipated to take place during the months of March, June, September, and December.

In addition to the HWU systems, systems associated with the non-hazardous waste portions of Kestrel Hawk Landfill are anticipated to be inspected annually as detailed in **Section 3.8**.

3.4 Inspection Procedures

The HWU systems consist of: the final cover system, surface water management system, gas control system, leachate control system, groundwater containment system, groundwater remediation system, and site security systems. **Sections 3.5**, **3.6**, and **3.7** detail the inspection requirements for the weekly, monthly, and quarterly inspections, respectively. Similar to the HWU system, the non-hazardous waste system consists of: the final cover system, surface water management system, gas control system, and leachate control system. **Section 3.8** details the inspection requirements for annual inspections of Non-HWU system components. Inspections shall be performed by trained personnel who will complete the provided inspection forms in **Attachment B**.

The Inspector is to note maintenance activities which may be taking place during the inspection. If activities appear to be inappropriate or an unsafe condition exists, appropriate action shall be taken, and the Landfill Supervisor shall be contacted immediately.

Conditions which indicate a potential release to the environment will be reported immediately to the Emergency Coordinator or Alternate (as defined in the Contingency Plan).

3.5 Weekly Inspections

The HWU site shall be inspected weekly for general site conditions. This inspection is intended to be performed primarily as a drive-by type inspection to identify conditions which require action. Activities being performed on the HWU shall be noted.

Conditions which may require action for the HWU systems include:

3.5.1 Final Cover System

- Leachate seeps
- Noticeable gas odors venting through cover soils
- Significant erosion (>4-in. depth)

3.5.2 Surface Water Management System

Sedimentation Basins

- Little to no available storage capacity (levels approaching spillway elevation)
- Significant erosion (>4-in. depth)

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3.5.3 Gas and Leachate Extraction and Groundwater Containment Systems

3.5.3.1 Wells/Wellheads

- Visibly damaged or cracked equipment
- Disconnected pipes or hoses

3.5.3.2 Lift Stations/Manholes

- Lack of power (red power indicator light is off)
- High liquid level alarms
- Meter readings (hours and total flow)

3.5.4 Groundwater Remediation System

- Visibly damaged or leaking equipment
- Lack of power

3.5.5 Site Security System

- Damaged fences and gates
- Inaccessible site access roads

Conditions which require action shall be reported on the Weekly Inspection Form.

3.6 Monthly Inspections

Monthly inspections within the HWU are designed to be performed thoroughly by the Inspector in a walk-through manner. The Inspector shall identify conditions which require action.

3.6.1 Final Cover System

Inspection shall be performed to observe the condition of the final cover. At a minimum, the following conditions which require action shall be noted:

- Landfill gas release through the cover soils based on noticeable odors, hissing sounds, bubbling through surface water
- Leachate seeps
- Exposed refuse
- Erosion of topsoil, vegetation or clay cover (>4-in. depth)
- Stressed or lack of vegetation

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- Cracks or holes in cover soils due to weathering or burrowing animals
- Ponded water on landfill cover
- Clogged or eroded drain pipes associated with the RCRA caps

3.6.2 Surface Water Management System

Inspection shall be performed to observe the sediment build-up in the basins and ditches, storage capacity remaining in the basins, outlet shutoff valve position, condition of ditches for potential erosion, and condition of inlets and outlets for scouring or erosion.

The following items should be observed for the sedimentation basins:

- Available storage capacity (distance from water level to the spillway outlet elevation)
- Condition of containment berm (signs of erosion or leakage)
- Outlet shutoff valve position (open to allow discharge or closed to contain surface water)
- Sediment build-up

3.6.2.1 Sedimentation Basins

Conditions which require action for the sedimentation basins are as follows:

- Erosion that threatens interior and exterior condition of the basins
- Outlet valve in closed position (valve open for normal operation)
- Significant erosion of waterways
- Insufficient vegetation to prevent erosion
- Insufficient riprap at overflow structure

3.6.2.2 Swales, Downslope Flumes, Culverts, and RCRA Cap Drains/Drain Pipes

Conditions which require action are as follows:

- Presence of debris or sediment which may obstruct flow
- Erosion of swale sidewalls or waterways (>4-in. depth)
- Insufficient vegetation to control erosion
- Erosion around drainage structures
- Ponding of surface water
- Insufficient erosion control measures at culvert inlets and outlets (e.g. rip-rap, erosion mat)

If a condition threatens the stability of the basin or any drainage feature, it will be immediately reported to the Landfill Supervisor.

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3.6.3 Gas and Leachate Extraction Systems

The Inspector shall observe the condition of each extraction wellhead, inspecting for deterioration of the riser pipes, flexible hoses, valves, and surface seals around the pipes. Inspection of the system components shall be performed during monitoring events, when possible.

Wellheads and Monitoring and Control Stations

- Noticeable gas odors or hissing sounds associated with leaks in pipes or hoses
- Leachate or condensate leaks on wellhead pipes or hoses (visible liquids, stained conditions)
- Inoperable valves or sample ports
- Damaged or leaking of gas through ground surface seals
- Ponding of surface water

3.6.4 Leachate Control and Groundwater Containment Systems

The Inspector shall observe the condition of the liquids handling system components including holding tanks, lift stations, and manholes. The following items should be observed at the manholes and lift stations:

- Condition of manholes and manhole covers
- Meter readings (hour and total flow)
- Manhole and lift station operation systems (i.e., power, pump operation)

The lift station pumps shall be tested by starting the pumps in the manual mode to verify operation.

Conditions which require action at a minimum are as follows:

- Damaged or inaccessible manholes, pipes, or seals
- Inoperable lift station pumps or metering devices
- Full condensate tank at positive pressure dripleg
- Leachate or condensate leaking at pipe connections
- High liquid or sediment levels (inoperable pumps)
- Unusually high or low pump run times (based on previous monitoring data)
- Open manholes or missing locks
- Manual override pump operation fails

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3.6.5 Groundwater Remediation System

The Inspector shall observe the condition of each recovery well and discharge hoses or piping. Conditions which require action at a minimum include:

- Leaking contaminated groundwater from discharge hoses or piping
- Inoperable pumps or meters

3.6.6 Site Security System

Fence and gates shall be inspected for identification of any unauthorized openings and damage to fence, posts, or gates. Site access roads shall be inspected to determine if roads are in good condition.

Conditions which require action at a minimum are as follows:

- Damage to fence or gates
- Missing warning signs
- Missing and/or inoperable locks
- Damaged, inaccessible, or eroded site access roads

Conditions requiring action shall be reported on the Monthly Inspection Form. Conditions associated with system failure will be reported immediately to the Landfill Supervisor.

3.7 Quarterly Inspections

In addition to the monthly inspection requirements detailed in **Section 3.6**, the following features are to be inspected on a quarterly basis within the HWU.

3.7.1 Environmental Monitoring

Groundwater monitoring wells, probes for gas migration, and leachate headwells shall be inspected for condition of protective casing pipes, surface seals, padlocks and caps, and well riser pipes and fittings. Wells associated with the non-hazardous waste landfill can be inspected on a semiannual basis.

Conditions which require action at a minimum include:

- Missing or damaged padlocks
- Damaged ground protective casings
- Damaged ground surface seals
- Inoperable caps or lids

Conditions which require action shall be reported on the Quarterly inspection Form. Space has been provided on the inspection form for the Inspector to comment about conditions noted during inspections that do not appear as one of the items listed.

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3.8 Annual Inspections

Inspections within the non-HWUs portions of Kestrel Hawk Landfill are designed to be performed thoroughly by the Inspector in a walk-through manner. Annual inspections of the non-HWUs portions can be completed concurrently with a quarterly inspection of the HWU. The inspection should be recorded on the Quarterly Inspection form provided in **Attachment B**. Conditions requiring action shall be reported on the Quarterly Inspection Form. Conditions associated with system failure will be reported immediately to the Landfill Supervisor.

The Inspector shall identify conditions which require action.

3.8.1 Final Cover System

Inspection shall be performed to observe the condition of the final cover. At a minimum, the following conditions which require action shall be noted:

- Landfill gas release through the cover soils based on noticeable odors, hissing sounds, bubbling through surface water
- Leachate seeps
- Exposed refuse
- Erosion of topsoil, vegetation or clay cover (>4-in. depth)
- Stressed or lack of vegetation
- Cracks or holes in cover soils due to weathering or burrowing animals
- Ponded water on landfill cover
- Clogged or eroded drain pipes

3.8.2 Surface Water Management System

Inspection shall be performed to observe the sediment build-up in the basins and ditches, storage capacity remaining in the basins, outlet shutoff valve position, condition of ditches for potential erosion, and condition of inlets and outlets for scouring or erosion.

The following items should be observed for the sedimentation basins:

- Available storage capacity (distance from water level to the spillway outlet elevation)
- Condition of containment berm (signs of erosion or leakage)
- Outlet shutoff valve position (open to allow discharge or closed to contain surface water)
- Sediment build-up

3.8.2.1 Sedimentation Basins

Conditions which require action for the sedimentation basins are as follows:

- Erosion that threatens interior and exterior condition of the basins

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- Outlet valve in closed position (valve open for normal operation)
- Significant erosion of waterways
- Insufficient vegetation to prevent erosion
- Insufficient riprap at overflow structure

3.8.2.2 Swales, Downslope Flumes, Culverts, and Drain Pipes

Conditions which require action are as follows:

- Presence of debris or sediment which may obstruct flow
- Erosion of swale sidewalls or waterways (>4-in. depth)
- Insufficient vegetation to control erosion
- Erosion around drainage structures
- Ponding of surface water
- Insufficient erosion control measures at culvert inlets and outlets (e.g. rip-rap, erosion mat)

If a condition threatens the stability of the basin or any drainage feature, it will be immediately reported to the Landfill Supervisor.

3.8.3 Gas Extraction System

The Inspector shall observe the condition of each landfill gas extraction wellhead, inspecting for deterioration of the riser pipes, flexible hoses, valves, and surface seals around the pipes. Inspection of the system components shall be performed during monitoring events, when possible. At a minimum, the following conditions require action if noted:

- Noticeable gas odors or hissing sounds associated with leaks in pipes or hoses
- Leachate or condensate leaks on wellhead pipes or hoses (visible liquids, stained conditions)
- Inoperable valves or sample ports
- Damaged or leaking of gas through ground surface seals
- Ponding of surface water at extraction well location

3.8.4 Leachate Extraction and Conveyance System

The Inspector shall observe the condition of the liquids handling system components including lift stations/manholes. The following items should be observed:

- Condition of manholes and manhole covers
- Condition of leachate head well and cleanout access points
- Meter readings (hour and total flow)
- Manhole, lift station, and extraction well operation systems (i.e., power, pump operation)

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Pumps shall be tested by starting the pumps in the manual mode to verify operation. Conditions which require action at a minimum are as follows:

- Damaged or inaccessible manholes, pipes, or seals
- Inoperable lift station/extraction well pumps or metering devices
- Full condensate tank at positive pressure dripleg
- Leachate or condensate leaking at pipe connections
- High liquid or sediment levels (inoperable pumps)
- Unusually high or low pump run times (based on previous monitoring data)
- Open manholes or missing locks
- Manual override pump operation fails

3.8.5 Site Security System

Portions of the site security system not previously inspected as part of the HWU inspections should be completed annually. Fence and gates shall be inspected for identification of any unauthorized openings and damage to fence, posts, or gates. Site access roads shall be inspected to determine if roads are in good condition.

Conditions which require action at a minimum are as follows:

- Damage to fence or gates
- Missing warning signs
- Missing and/or inoperable locks
- Damaged, inaccessible, or eroded site access roads

3.8.6 Environmental Monitoring

Groundwater monitoring wells, probes for gas migration, gradient control, and leachate headwells shall be inspected for condition of protective casing pipes, surface seals, padlocks and caps, and well riser pipes and fittings.

Conditions which require action at a minimum include:

- Missing or damaged padlocks
- Damaged ground protective casings
- Damaged ground surface seals
- Inoperable caps or lids

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3.9 Inspection Forms

Inspection forms have been provided in **Attachment B**, which shall be used for all inspections. A form is provided for each type of inspection (weekly, monthly, and quarterly). Inspection forms are to be completed with the Inspector names, date, and time of inspection, inspection results, and comments. Inspection forms will be signed by the Inspector indicating the inspection has been completed, and presented to the Landfill Supervisor for signature, indicating that the Landfill Supervisor is aware of potential problems.

If corrective action is required, it will be noted on the inspection form, and the Corrective Action Form presented in **Attachment C** will be utilized. Inspection forms will be kept for at least three years in accordance with s. NR 664.0015(4), Wis. Adm. Code.

3.10 Corrective Actions

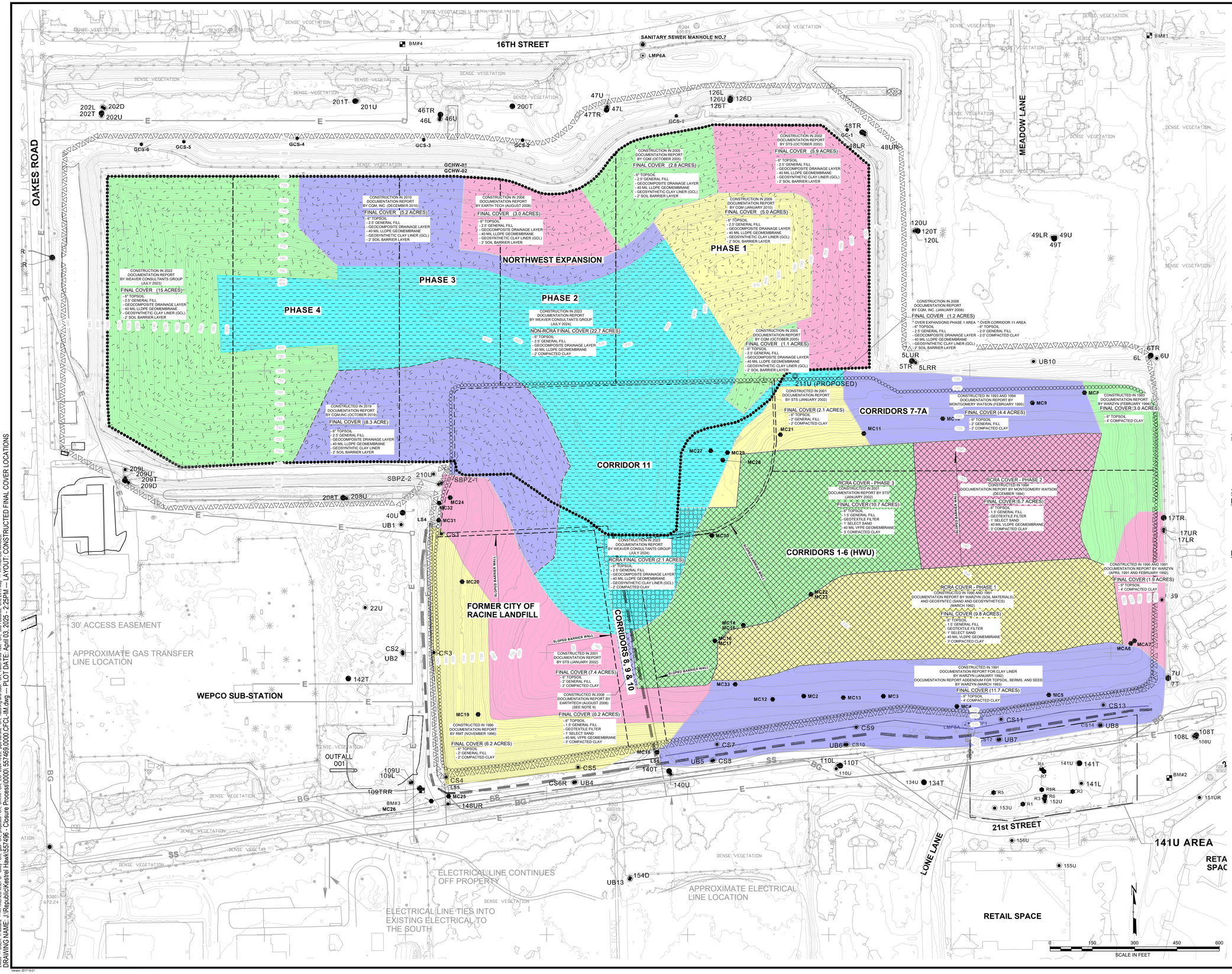
The routine inspections may result in recommendations for corrective actions. A specific tracking mechanism shall be used to make sure that all noted deficiencies are corrected, forms completed, and proper filing maintained.

When a corrective action is required, the inspection form will initiate the process. The "work required" portion of a Corrective Action Report (**Attachment C**) shall be filled out by the Inspector and given to the person responsible for the correction or repair.

After the deficiency is corrected, the completed Corrective Action Report will be provided to the Inspector to be signed by the Inspector and Landfill Supervisor. The Corrective Action Report will be attached to the inspection form in the file which first noted the deficiency.

During the next scheduled inspection, the Inspector will verify that the deficiency was corrected. By using this system, the Inspector will track the deficiencies from identification to correction. A file system will be maintained such that completed inspection forms are filed by date and are accessible.

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LEGEND

- APPROXIMATE PROPERTY LINE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- 710 — EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 673.4 — EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- 30+00N — SITE GRID COORDINATE
- 161T — EXISTING WATER TABLE OBSERVATION WELL LOCATION AND NUMBER
- UB5 — PIEZOMETER LOCATION AND NUMBER
- SW1 OR SG2 — STAFF GAUGE LOCATION AND NUMBER
- LS5 OR MH3 — MANHOLE/LIFT STATION LOCATION AND NUMBER
- APPROXIMATE LOCATION OF GROUNDWATER CONTAINMENT STRUCTURE
- NORTHWEST EXPANSION LIMITS OF WASTE
- OLD SITE LIMITS OF WASTE
- DESIGN MANAGEMENT ZONE
- APPROXIMATE LIMITS OF WASTE (EXISTING SITE)
- APPROXIMATE LIMITS OF WASTE CORRIDORS (EXISTING SITE)
- SS — SANITARY SEWER
- E — OVERHEAD ELECTRICAL
- OUTFALL 000 — SEDIMENTATION BASIN OUTFALL LOCATION AND NUMBER
- R-2 — RECOVERY WELL / MC GAS CONTROL VALVE

COVER DESIGNS

1991 TO 1993 (NON-RCRA)
- 6" TOPSOIL
- 4' COMPACTED CLAY

1990 TO 2001 (RCRA)
- 6" TOPSOIL
- 1.5' GENERAL FILL
- GEOTEXTILE FILTER
- 1' SELECT SAND
- 40 MIL VLDPE GEOMEMBRANE
- 3' COMPACTED CLAY

LOCATION OF INSTALLED RCRA FINAL COVER

1994 TO 2001 (NR 180)
- 6" TOPSOIL
- 2' GENERAL FILL
- 2' COMPACTED CLAY

2002 TO 2022 (NR 500)
- 6" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- GEOSYNTHETIC CLAY LINER (GCL)
- 2' SOIL BARRIER LAYER

LOCATION OF INSTALLED NR 500 FINAL COVER

2023 TO 2024 (NR 500 AND RCRA)

RCRA AREA
- 6" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- GEOSYNTHETIC CLAY LINER (GCL)
- 2' COMPACTED CLAY

LOCATION OF REVISED RCRA FINAL COVER UPDATED

NON-RCRA AREA (REVISED NR 500)
- 6" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- 2' COMPACTED CLAY

LOCATION OF NR 500 FINAL COVER (REVISED)

NOTES

1. SITE LOCATION PART OF THE NORTH 1/2 OF SECTION 23, TOWNSHIP 3 NORTH, RANGE 22 EAST, IN THE CITY OF RACINE, COUNTY OF RACINE, STATE OF WISCONSIN.
2. TOPOGRAPHIC BASE MAP WAS OBTAINED FROM AERO-METRIC ENGINEERING, INC. (DATE OF PHOTOGRAPHY OCTOBER 06, 1994; JUNE 1995, MARCH 28, 2005 MARCH 29, 2008); HENDERSON AERIAL SURVEYS, INC. (DATE OF PHOTOGRAPHY APRIL 9, 2012); FIRMATEK AERIAL SURVEYS CO. (DATE OF SURVEY OCTOBER 23, 2024)
3. MONITORING WELL LOCATIONS DETERMINED BY SURVEY INFORMATION PROVIDED BY KESTREL HAWK LANDFILL.
4. APPROXIMATE LIMITS OF EXISTING WASTE WERE PROVIDED BY KESTREL HAWK LANDFILL.
5. VERTICAL DATUM IS USGS MEAN SEA LEVEL. TOPOGRAPHIC CONTOUR INTERVAL IS TWO FEET.
6. HORIZONTAL DATUM IS BASED ON THE WISCONSIN STATE PLANE COORDINATE SYSTEM. THE SITE GRID IS PARALLEL AND PERPENDICULAR TO THE STATE PLANE COORDINATE SYSTEM. SITE GRID IS REFERENCED TO STATE PLANE COORDINATE GRID WITH SITE GRID COORDINATE 0+00N, 100+00E EQUAL TO STATE PLANE COORDINATE 264,196.55N, 2,573,700.72E.
7. LOCATION OF PROPERTY LINE PROVIDED BY KESTREL HAWK LANDFILL.
8. THE WESTERN BOUNDARY OF THE RCRA COVER EXTENDS TO THE WESTERN BOUNDARY OF THE GEOMEMBRANE LINER PLACED ON THE BASE OF CORRIDORS 8, 9, AND 10 PER THE AUGUST 2008 DOCUMENTATION REPORT BY EARTHTECH.

PROJECT: **KESTREL HAWK LANDFILL INSPECTION MANUAL RACINE, WISCONSIN**

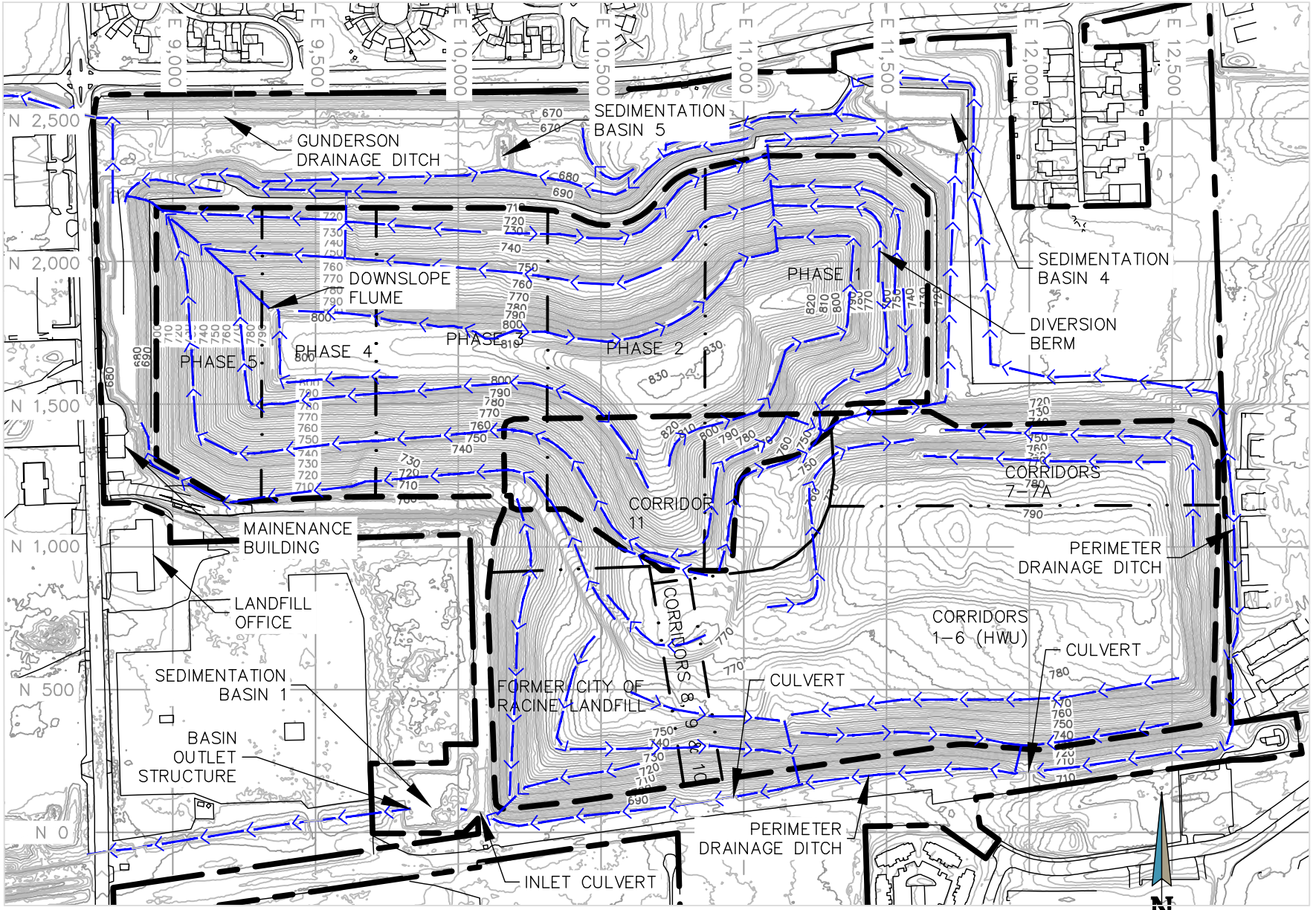
TITLE: **CONSTRUCTED FINAL COVER LOCATIONS**

DRAWN BY:	T. FIEBRANZ	PROJ NO.:	557469.0000
CHECKED BY:	B. KAHNK		FIGURE 1
APPROVED BY:	T. MARTIN		
DATE:	APRIL 2025		

TRC
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Suite 101
Madison, WI 53717
Phone: 608.826.3600

FILE NO.: 557469.0000.CFCL-IM.dwg

24x36 --- USER: Tfiebranz --- ATTACHED XREFS: utility - CR, gas - CR, proposed - CR, bmmt - CR, EG - 2024-10-23, pipe old-site - CR, hatching and color - CR, Hatch area Text - CR, Site Features, bmc 2019 May --- ATTACHED IMAGES:
DRAWING NAME: J:\Republic\Kestrel Hawk\557496 - Closure Process\0000\557469.0000.CFCL-IM.dwg --- PLOT DATE: April 03, 2025 - 2:25PM --- LAYOUT: CONSTRUCTED FINAL COVER LOCATIONS
Version: 2017-10-21



NOTES:

1. TOPOGRAPHY SHOWN WAS OBTAINED FROM AERIAL SURVEY CONDUCTED BY FIRMATEK ON OCTOBER 23, 2024.

FIGURE 2

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F:\PROJECTS\0120\184 - Kestral Hawk\dwg\KH000542.dwg;WCGv19b5;bsimek;March 25, 2025

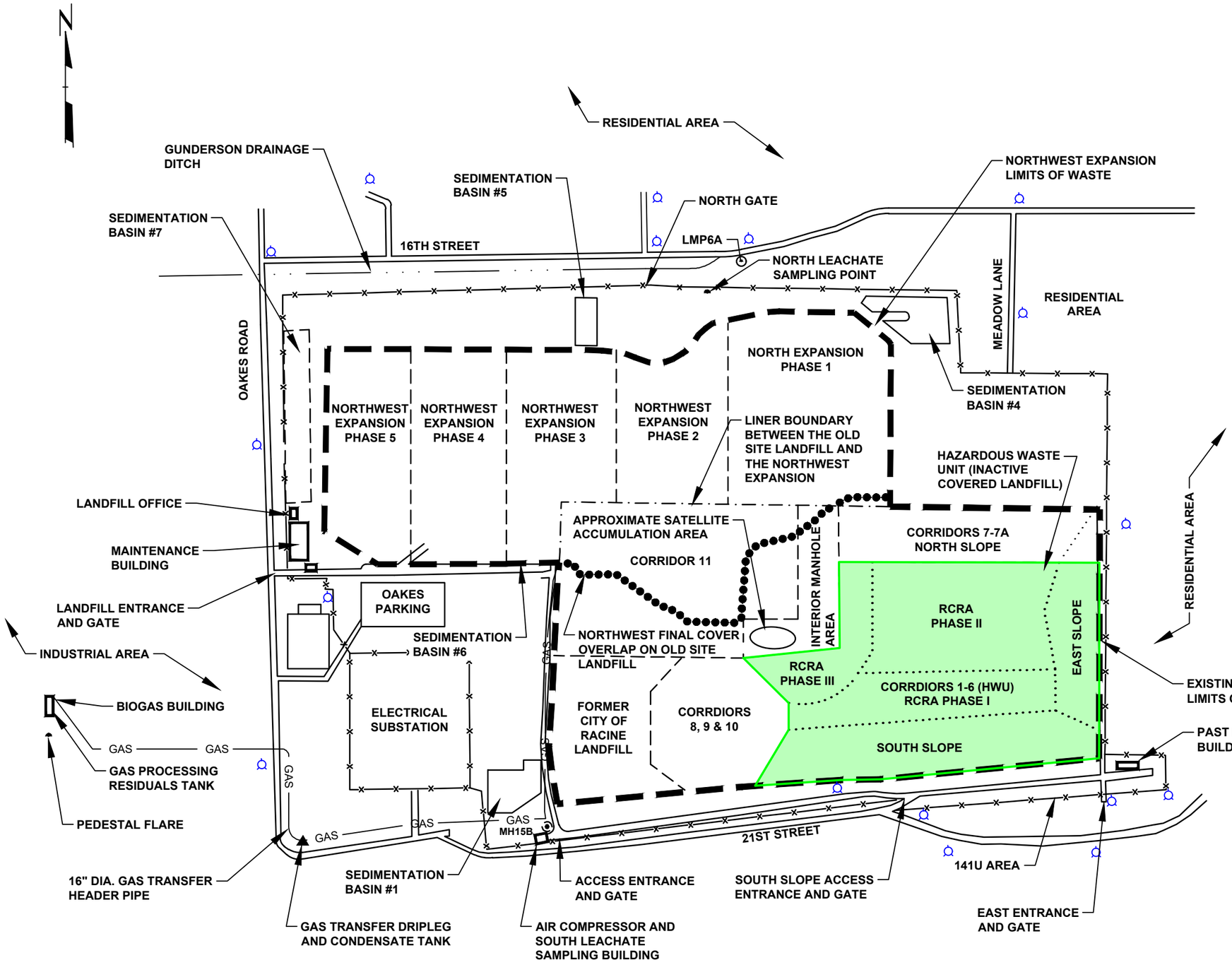
DRAWN BY: BPS
REVIEWED BY: CJB
DATE: 03/25/2025
FILE: 0120-184-DWG
CAD: KH000542.dwg
FIGURE 1

Weaver Consultants Group
NAPERVILLE, ILLINOIS
(630) 717-4848 www.wcgrp.com

SURFACE WATER FLOW TO NAVIGABLE WATERWAYS
KESTREL HAWK LANDFILL
RACINE, WISCONSIN

REUSE OF DOCUMENTS
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PREPARED FOR:
KESTREL HAWK LANDFILL



LEGEND

- APPROXIMATE CORRIDOR AND PHASING LINER BOUNDARIES
- APPROXIMATE LIMITS OF WASTE BOUNDARY FOR OLD-SITE LANDFILL AND THE NORTHWEST EXPANSION LANDFILL
- EXISTING FENCE LINE
- EXISTING ROADS
- NORTHWEST EXPANSION FINAL COVER OVERLAY ON TO OLD-SITE LANDFILL
- FIRE HYDRANT
- LINER BOUNDARY BETWEEN THE OLD-SITE AND THE NORTHWEST EXPANSION LANDFILLS
- GAS — 16" DIA. GAS TRANSFER HEADER PIPE
- APPROXIMATE EXTENTS OF HAZARDOUS WASTE UNIT (INACTIVE COVERED LANDFILL)

PROJECT:
KESTREL HAWK LANDFILL
INSPECTION MANUAL
RACINE, WISCONSIN

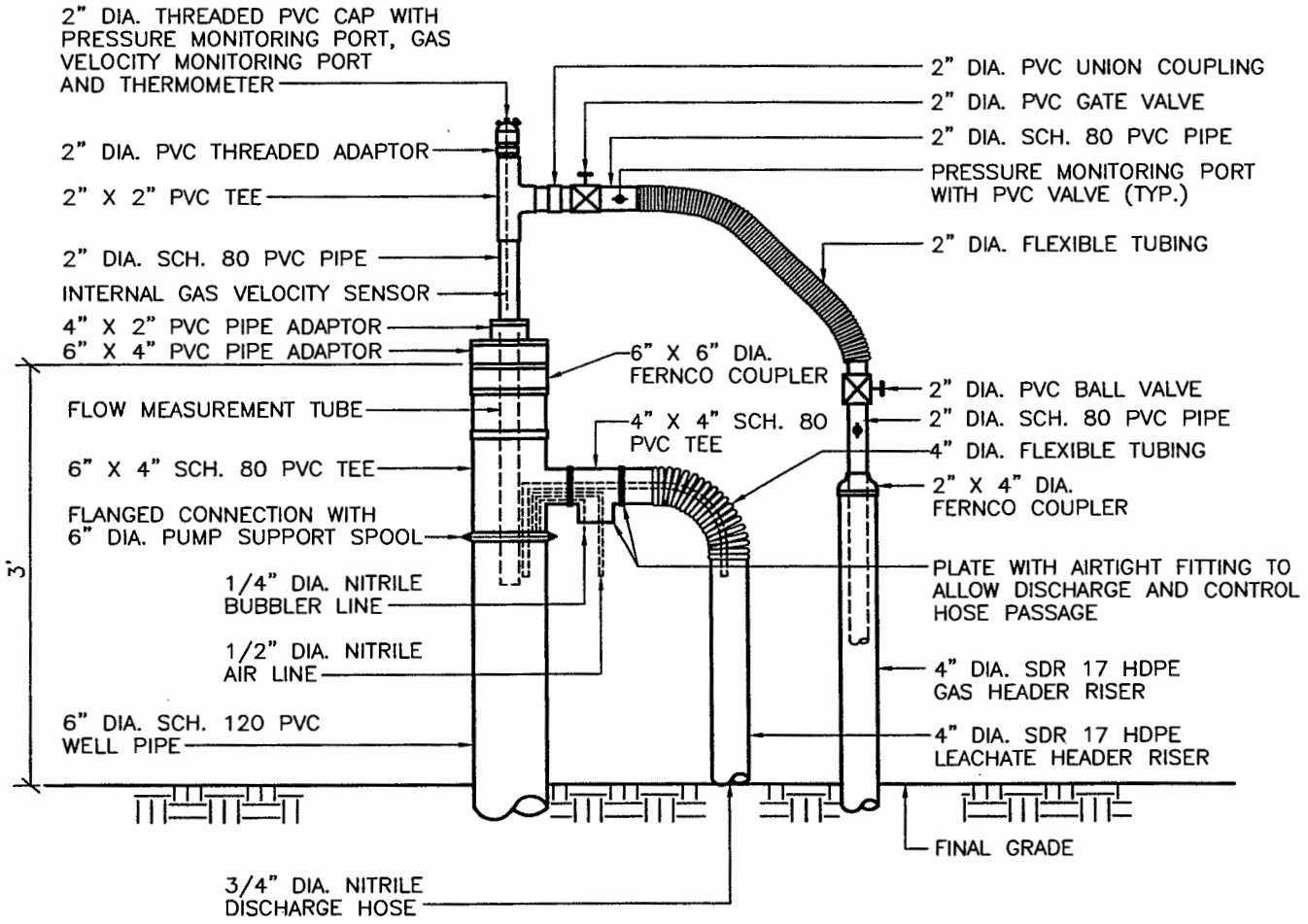
TITLE:
SITE PLAN

DRAWN BY:	T. FIEBRANZ	PROJ NO.:	557469.0000
CHECKED BY:	B. KAHNK		FIGURE 3
APPROVED BY:	T. MARTIN		
DATE:	APRIL 2025		

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FILE NO.: 557469.0000.03 - Site Plan-IM.dwg

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DRAWING NAME: j:\Republic\Kestrel Hawk\557496 - Closure Process\0000\557469.0000.03 - Site Plan-IM.dwg --- PLOT DATE: April 02, 2025 - 3:12PM --- LAYOUT: FIGURE 3



TYPICAL LEACHATE/GAS EXTRACTION WELLHEAD DETAIL

SCALE: 3/4" = 1'

NOTES

1. THE LANDTEC ACCU-FLO MODEL 200 WELLHEAD INCLUDES THE EQUIPMENT FROM THE 4" X 2" PVC PIPE ADAPTOR AT THE WELL PIPE. ACROSS TO, AND INCLUDING, THE 2: FLEXIBLE TUBING.
2. ACCU FLO™ IS A REGISTERED TRADEMARK OF LANDFILL CONTROL TECHNOLOGIES (LANDTEC).

FIGURE 4

Developed By DTL	Drawn By DLF	**WELLHEAD DETAIL**	Drawing Number 2082574 01180101 A2
Approved By Dale T. Lane	Date 2-20-03	INSPECTION MANUAL FOR THE HAZARDOUS WASTE UNIT REPUBLIC SERVICES KESTREL HAWK RECYCLING AND DISPOSAL FACILITY RACINE, WISCONSIN EPA ID NO. WID-076171008 WDNR LICENSE NO. 572	MWH MONTGOMERY WATSON HARZA
Reference 2081788.01180101-A2			
Revisions			

Management Review Other
Technical Review Project Manager DTL 1-29-03
Graphic Standards DI 1-29-03
QUALITY CONTROL Lead Professional

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