HydroGeo Solutions LLC

5951 Allen Road, Little
Suamico, WI 54141

Long Term Care Re-License Application Waupaca Foundry, Inc. Landfill

Hazardous Waste Long-Term Care License No. 2638

EPA ID WID981093248

Waupaca Foundry, Inc.

Submitted May 27, 2022
Revised January 2023

January 18, 2023

Mr. Douglas Coenen
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, WI 53707-7921

Re: Revision to Long Term Care Re-License Application, Waupaca Foundry, Inc. Landfill, (Hazardous Waste Long-Term Care License No. 2638; EPA ID WID981093248), Waupaca County, Wisconsin

Dear Mr. Coenen:

On behalf of Waupaca Foundry, Inc. (WFI), HydroGeo Solutions LLC (HGS) prepared and submitted the hazardous waste long-term care re-license application for the Waupaca Foundry, Inc. Landfill (WDNR License No. 2638) on May 27, 2022. This application for the re-licensing of this facility provided the information required under NR 670, Wisconsin Administrative Code.

After submittal of the long-term care re-license application and conditional plan approval modification for Waupaca Foundry Landfill License No. 2638, and as discussed in the telephone conversation between Douglas Coenen, WDNR and Paula Leier-Engelhardt, HGS, on January 4, 2023, it was determined that Table 4 – Long Term Care Costs, did not accurately summarize the annual costs of care and should be revised.

A revised Table 4, with revision date 12-22-22, has been inserted into this document and should be considered part of the final and approved application. In addition, please use the revised Table 4 to revise the costs listed in Attachment 3 of the final WDNR approval letter of this re-license application.

It is understood that Mr. Coenen will distribute the revised application to the appropriate WDNR and U.S.EPA personnel. Please contact Bryant Esch, Waupaca Foundry, Inc. (715-258-6674), or Paula Leier-Engelhardt, HydroGeo Solutions LLC (920-737-9811) if there are questions.

Sincerely,

Paula Leier-Engelhardt

Paula Leier-Engelhardt, P.G., CPG
Principal Geologist

Distribution list

Mr. Bryant Esch
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May 27, 2022

Mr. Douglas Coenen
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, WI 53707-7921

Re: Long Term Care Re-License Application, Waupaca Foundry, Inc. Landfill, (Hazardous Waste Long-Term Care License No. 2638; EPA ID WID981093248), Waupaca County, Wisconsin

Dear Mr. Coenen:

On behalf of Waupaca Foundry, Inc. (WFI), HydroGeo Solutions LLC (HGS) has prepared this long-term care re-license application for the Waupaca Foundry, Inc. Landfill (WDNR License No. 2638). Closure of this facility was approved with the receipt of the March 27, 1991, Conditional Construction Documentation Approval from the Wisconsin Department of Natural Resources (WDNR). A long-term care license was issued by the WDNR dated June 30, 1992, effective from June 30, 1992, until June 30, 2022. This application for the re-licensing of this facility provides the information required under NR 670, Wisconsin Administrative Code.

Approvals to be Superseded

The re-license application includes a Long-Term Care Plan for this facility. The approved application and new license will supersede the following four documents:

- *Groundwater Monitoring Plan Approval – Closure and Long Term Care Plan Approval, Waupaca Foundry Landfill* dated May 22, 1985
- *Closure and Long-Term Care Plan Modification Approval, Waupaca Foundry Landfill, DNR License No. 2638*, *EPA ID WID981093248*, dated September 18, 1987
- *Construction Documentation Approval, Waupaca Foundry Landfill, DNR License No. 2638*, *EPA ID WID981093248*, dated March 29, 1991
- *Conditional Plan Modification for the Landfill Facility; Groundwater Monitoring Plan, Sampling and Analysis Plan, and Operating Record Report, Waupaca Foundry Landfill, EPA ID WID981093248, dated June 30, 1992*

Groundwater Monitoring Program

WFI Landfill License No. 2638 is adjacent to the closed WFI Landfill License No. 3171. Historically, Monitoring Wells B-3A-88R, B-25, B-25A, B-25B, and B-30 were reported as part of the groundwater monitoring programs for both landfills. Per discussions with the WDNR, reporting wells under multiple landfill licenses is being phased out. Therefore, Monitoring Well B-3A-88R will be removed from the monitoring program for WFI Landfill License No. 2638.

Reporting requirements for WFI Landfill License No. 3171 will be addressed in a separate plan modification request for that facility.

The most recent modification to the environmental monitoring program for WFI Landfill License No. 2638 was approved March 9, 2016, by the WDNR. The approved program included the parameter total dissolved solids (WDNR ID No. 70295). As of July 2017, total dissolved solids was renamed total filterable residue, with the WDNR ID No. 70300. The re-license application reflects this name change and new WDNR ID number.

Checklist and Request for Approvals

A checklist has been prepared to assist with the review of this application and is included with this letter. Review and approval of the following are requested as part of the application:

- Elimination of Monitoring Well B-3A-88R from the groundwater monitoring program for Landfill No. 2638.
- Preventive Action Limits calculated for indicator parameters specific conductance (field), sodium (dissolved), total hardness (filtered), total alkalinity (filtered), and total filterable residue (Appendix B3) for each of the 12 monitor wells included in the groundwater monitoring program.
- Exemption request for an Alternative Concentration Limit for fluoride (dissolved) at monitor well B-25 (Appendix B3).

Certifications

The long-term cost estimates have been reviewed and approved by a licensed Wisconsin Professional Geologist as defined in NR 470.04, Wisconsin Administrative Code. Certification of this re-licensing application by the owner and operator, Waupaca Foundry, Inc., is provided in accordance with NR 670.011, Wisconsin Administrative Code.

Application Submittal

An electronic copy will be submitted to Douglas Coenen, Wisconsin Department of Natural Resources (douglas.coenen@wisconsin.gov), with other copies provided as shown in the distribution list. Please contact Bryant Esch, Waupaca Foundry, Inc. (715-258-6674), or Paula Leier-Engelhardt, HydroGeo Solutions LLC (920-737-9811) if you have questions.

Sincerely,

Paula Leier-Engelhardt, P.G., CPG
Principal Geologist

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Attachments:

Certifications

Checklist for Long-Term Care Re-License Application
Waupaca Foundry Inc. Landfill
Hazardous Waste License No. 2638; EPA ID WID981093248

Certifications

I, Paula Leier-Engelhardt, P.G., hereby certify that I am a licensed Professional Geologist in the State of Wisconsin in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code; that the preparation of this document has not involved any unprofessional conduct as detailed in ch. GHSS 5, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538 Wis. Adm. Code."

Paula Leier-Engelhardt 27 May 2022

Paula Leier-Engelhardt, P.G.
Principal Geologist

WAUPACA FOUNDRY, INC.
1955 Brunner Drive
P.O. Box 249
Waupaca, WI 54981
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May 17, 2022

Douglas W. Coenen, P.E.
Waste Management Specialist
Waste Prevention and Management Section, Waste and Materials Management Program
Wisconsin Department of Natural Resources
101 S. Webster Street
Madison, WI 53707-7921

RE: Long Term Care Re License Application, Waupaca Foundry, Inc. Landfill
Hazardous Waste Long-Term Care License No. 2638; EPA ID WID981093248

Waupaca Foundry (WFI) is herein providing the information requested regarding the long-term care re license application for WFI landfill license #2638 located at N4496 Elm Valley Road in Waupaca, Wisconsin. Regarding the information provided, please note that:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Michael Nikolai
President, COO and CEO

Checklist for Long-Term Care Re-License Application
Waupaca Foundry Inc. Landfill
Hazardous Waste License No. 2638; EPA ID WID981093248

Note:

- A checklist table is associated with each item, citing the appropriate regulation and providing additional information where needed.
- A code is provided that identifies the source(s) of the requirement within Attachment C of the WDNR Hazardous Waste Compliance Assessment Contingent Close Out letter dated October 14, 2021 (see Appendix A1). For example, the regulatory citation "C.2" refers to section 2 of Attachment C.

A. Long-Term Care Plan (C.5.a)

1. General Facility Description

A description of the facility and history (C.1 and C.14). This should be written to assist the unindoctrinated reader with understanding the key aspects of the facility and its hazardous waste requirements. At a minimum, this should be sure to include:

a. A brief description of the property, location, and current status of the facility (C.1). The property information should refer to and briefly describe WFI's two other non-hazardous waste industrial landfills located nearby.

General description the property, location, and current status of facility [NR 670.014(2)(a)]	**Sec. 2.0**

The location information should include the address, the name of the local municipality in which it is located, and the latitude/longitude (C.14.b). This should also address Indian lands (C.14.e) and floodplain information (C.4).

-Name, mailing address and local municipality, including latitude and longitude of the facility [NR 670.013(2)]	**Sec. 2.1**
-Facility is located on Indian lands {NR 670.013(6)]	**Sec. 2.1**
-Floodplain information [NR 670.014(2)(k)]	**Sec. 2.1**

b. Facility owner, operator, and contact information (C.5.d.iii, C.14.c, C.14.d.).

-Operator's name, address, telephone number, ownership status and status as federal, state, private, public, or other entity. [NR 670.013(4)]	**Sec. 2.1**
-The name, address, and phone number of the owner of the facility. [NR 670.013(5)]	**Sec. 2.1**
-Name/address/phone no. of contact during long-term care period [NR 664.0118(c)]	**Sec. 2.1**

c. A brief history of the waste management activities at the facility that may be relevant to current hazardous waste requirements, such as the types, approximate quantities, locations, and timeframe of hazardous wastes disposed (C.1, C.14.a, C.14.h). This should briefly describe the different Landfill sections/cells that were developed and used (i.e. Sections 1 – 5) and which sections were used for hazardous wastes.

-The activities conducted by the applicant which require it to obtain a license. [NR 670.013(1)]	**Sec. 2.2**
-Specification of wastes; waste quantity; processes to be used for the wastes. [NR 670.013(10)]	**Sec. 2.2**

d. A summary of closure and capping activities that were completed (C.5.b).

-Closure activities conducted	**Sec. 2.3**

e. A brief description of any other environmental licenses, permits, or authorizations (C.14.i).

-Permits, licenses or construction approvals received or applied for under any applicable federal or state regulations. [NR 670.013(11)]	**Sec. 2.3**

f. Maps and drawings, which include maps/drawings that are needed to support the general description of the facility and that are:

(i) required in NR 670.014(2)(s) (C.10). Note that if certain detailed NR 670.014(2)(s) mapping requirements are not of value, the applicant should identify them and state the reason they are not needed.

A topographic map showing a distance of 1000 feet around the facility at a scale and contour interval to show surface water flow. [NR 670.014(2)(s)]	**Figure LTCP-3**	**See Section 2.0 for discussion of items not included**
Were north arrows shown? [NR 670.014(2)(s)(6)]	**Figures LTCP-1, LTCP-2 and LTCP-3**	**-----**
Were map scale and date shown? [NR 670.014(2)(s)(1)]	**Figures LTCP-1, LTCP-2 and LTCP-3**	**-----**

(ii) required as part of the groundwater monitoring plan (C.11.b).

-A delineation of the waste management area, the property boundary, the point of compliance, the location of groundwater monitoring wells. [NR 670.014(3)(c)]	**LTCP-3**

(iii) required for the Part A application (C.14.f and C.14.j). Note that if certain NR 670.013 detailed mapping requirements are not of value, the applicant should identify them and state the reason they are not needed.

Scale drawing of facility showing location of past, present and future treatment, storage and disposal areas [NR 670.013(8)(a)]	**Figures LTCP-2 and LTCP-3**	**----**
Topographic map (or other map if a topographic map is unavailable) extending one mile beyond the property boundaries of the source, depicting the facility and each of its intake and discharge structures; each of its hazardous waste treatment, storage or disposal facilities; each well where fluids from the facility are injected underground; and those wells, springs, other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant within ¼ mile of the facility property boundary. [NR 670.013(12)]	**Figure LTCP-1**	**See Section 2.0 for discussion of items not included**

g. Photos (C.14.f). Please describe the purpose of the photo, and indicate the date, location from which the photo was taken, and the direction faced.

Photographs of the facility [NR 670.013(8)(b)]	**Appendix B1**

h. If corrective action requirements are not applicable, the facility description should assert and briefly substantiate this.

Corrective action requirements [NR 664.0118(2)(a)]	**Section 2.4**

i. If WFI chooses, a statement that the LTC Plan also is intended to address and meet the applicable solid waste rules (NR 500-series rules).

NR 500 applicability	**Section 2.5**

2. Long-Term Care Summary

a. Identification of the components and systems that require or facilitate long-term care (e.g. final cover, leachate collection systems, run-on control systems, run-off control systems, monitoring systems, etc.). (C.1) (C.5.c.i) (C.5.d.i) (C.5.d.ii) (6.c)

Identification of the components and systems that require or facilitate long-term care [NR 664.0118]	**Section 3.1**

b. A general summary of the site maintenance and repair program activities (e.g. for the final cover, run-on and run-off controls, leachate collection system, and monitoring equipment) (C.5.c.i) (C.5.d.ii) (C.6) (C.6.a through e)

Maintenance/repair program [NR 664.0118(2)(b) and NR 664.0310(2)(a - f)]	**Section 4.0**

c. A general description of LTC-related monitoring program (C.5.d.i) (C.6.d)

Environmental monitoring program [NR 664.0118(2)(a) and NR 664.0310(2)(d)]	**Section 3.2**

d. The minimum and remaining duration of LTC activities (see Area of Concern 3, cover letter to WDNR Hazardous Waste Compliance Assessment Contingent Close Out dated October 14, 2021).

Minimum and remaining duration of long-term care	**Section 3.3**

3. Long-Term Care Details

This should include a detailed description of each of the existing systems that require or facilitate long-term care and the detailed site maintenance and repair program activities. All discrete tasks and subtasks should be broken out and described such that they support the LTC cost estimate.

a. Final Cover (C.5.c.i) (C5.d.ii) (C.6.a) (C.6.e)

This should include a detailed description the entire final cover system, and drawings/schematics that depict its key components and location(s). Different caps placed in different areas should be addressed. If cover systems were left in place to separate and or/create barriers between landfill cells/sections this should be described. This should also address any perimeter berms that provide structural support.

Final cover description	**Sections 4.1 and 4.1.1; Appendix A2**

A detailed description of the routine and contingent operational and maintenance activities of the final cover systems should be provided.

Final cover maintenance activities [NR 664.0118(2)(b) and NR 664.0310(2)(a) and (e)]	**Sections 4.1.2**
Perimeter fencing/gate maintenance activities [NR 664.0115]	**Sections 4.2**

b. Leachate Management (C.5.c.i) (C.5.d.ii) (C.6.b)

This should include a detailed description the leachate collection system,

Summary of leachate collection systems in Sections 1, 2, 3, 4, 5	**Section 4.3**
Leachate management in Sections 1, 2, 3, 4	**Section 4.3.1**
Leachate collection system in Section 5	**Section 4.3.3**
Transfer mains, leachate collection manhole, leachate storage tank	**Section 4.3.4**

the pressure relief pipe between the Section 4 cover and the Section 5 liner,

Sections 4 and 5 separation zone and pressure relief pipe	**Section 4.3.2**

drawings/schematics that depict its key components,

Plan view as-built, Sections 4 and 5 pressure relief pipe and Section 5 leachate collection system	**Drawing 13344-5SCD, Appendix A2**
Construction cross sections	**Drawings 13344-6SCD and 13344-7SCD, Appendix A2**
Construction details for pressure relief pipe, Section 5 leachate collection system, cleanouts, manhole, and pipe penetration details	**Drawing 13344-8SCD and 13344-10SCD, Appendix A2**
Leachate tank installation and construction details	**Drawing 13344-9SCD, Appendix A2**

and all routine and contingent operational and maintenance activities.

Leachate management systems maintenance/inspection	**Section 4.3.5**
Leachate removal and treatment	**Section 4.3.6**

(i) Note that the department's February 6, 1988 letter leachate collection system establishes annual leachate collection pipe cleaning requirements. Please address these pipe cleaning activities.

Leachate collection pipes cleaned biennially; exemption request approved January 31, 2011	**Section 4.2.5; Appendix A5**

(ii) This should discuss the purpose of the leachate collection system and how it is operated and maintained to achieve its purpose.

Purpose of leachate collection system	**Section 4.3.3**
Operation of leachate collection system	**Sections 4.3.3 and 4.3.4**
Maintenance/inspection of leachate collection system	**Section 4.3.5**

(Note that the department's February 6, 1988 letter establishes annual pipe cleaning requirements; pipe cleaning should be addressed).

Leachate collection pipes cleaned biennially; exemption request approved January 31, 2011	**Section 4.3.5; Appendix A5**

Inspections of the leachate system components (e.g. the leachate tank, tank levels, backfill monitoring device, valve/valve manway, piping) should be built into the inspection plan.

Maintenance/inspection of leachate collection system	**Sections 4.3.5**	**The valve/valve manway is part of Landfill No. 3171 leachate collection system and is not discussed.**

(iii) This should describe how removed leachate quantities are measured and recorded, and how/where leachate is disposed. Note that the LTCP should also include how often leachate is removed (which is touched on in WFI's November 11, 2020 letter) and how leachate removal volumes are measured and recorded in the operating record. The "device monitoring the tank backfill" and "valve manway" mentioned in WFI's November 11, 2020 letter should be better described/depicted, and how these are inspected or checked.

(iv) We understand that the leachate tank is fed by gravity from the LCS piping within the Landfill. Please also describe how WFI prevents the tank from overfilling.

(v) Please include a discussion about frequency of leachate tank integrity inspections and the results of the most recent inspection.

Maintenance/inspection of leachate collection system	**Sections 4.3.5 and 4.3.6**	**The valve/valve manway is part of Landfill No. 3171 leachate collection system and is not discussed.**

e. Run-on and Run-off Controls (5.C.i, C.5.d.ii, C.6.e)

This should include a detailed description of the run-on and run-off control system(s), drawings/schematics that depict its key components, and all routine and contingent operational and maintenance activities.

Run-on/Run-off Controls	**Section 4.4**

f. Groundwater Monitoring Program (C.5.d.i) (C.6.d) (C.11) (C.13.a.iii)

This should include a detailed description the groundwater monitoring program, drawings/schematics that depict its key components, and all routine and contingent activities.

WFI's November 11, 2020 letter indicates that Landfill no. 2638 is currently implementing a detection monitoring program per ss. NR 664.0091(1)(d) and NR 664.0098, Wis. Adm. Code, so this should be articulated along with the basis for this status. The plan should then identify and describe how each of the applicable monitoring program requirements in NR 664.0091 through NR 664.0099 are met, including but not limited to requirements for well network/layout, parameters, frequencies, points of compliance, data evaluation, concentration limits, reporting, etc.); more information is presented in subsection C below. The plan should briefly address the triggers for moving into compliance monitoring.

(i) We recommend that the groundwater monitoring plan address the applicable requirements of NR 507. The plan may be written and organized in a manner typical of other monitoring plans (such as NR 507 plans) but must and address each of the applicable monitoring program requirements in NR 664.0091 through NR 664.0099.

(ii) Note that NR 670.014(3) requires information regarding protection of groundwater and the monitoring plan, including for example site hydrogeologic information, a map, and specific details regarding the monitoring program. Please see section 11 of Attachment (C.11) for more information.

NR 670.014(3)(b) -- Identification of the uppermost aquifer and aquifers hydraulically interconnected beneath the facility property, including groundwater flow direction and rate, and the basis for the identification (i.e., the information obtained from hydrogeologic investigations of the facility area).	**Section 5.1 Section 5.1.3 specifically describes hydrogeologic conditions. Appendix B2 provides seepage velocity calculations**
NR 670.014(3)(c) -- On the topographic map required under sub. (2) (s), a delineation of the waste management area, the property boundary, the point of compliance as defined under s. NR 664.0095, the proposed location of groundwater monitoring wells as required under s. NR 664.0097, and, to the extent possible, the information required in par. (b).	**Figs. LTCP-1, LTCP-2, LTCP-3**
NR 670.014(3)(e) -- Detailed plans and an engineering report describing the proposed groundwater monitoring program to be implemented to meet s. NR 664.0097.	**Section 5.2; Table 1 and Table 2**
NR 670.014(3)(F) -- If the presence of hazardous constituents has not been detected in the groundwater at the time of the license application, the owner or operator shall submit sufficient information, supporting data and analyses to establish a detection monitoring program which meets s. NR 664.0098. This submission shall address all of the following items specified under s. NR 664.0098: 1. A proposed list of indicator parameters, waste constituents or reaction products that can provide a reliable indication of the presence of hazardous constituents in the groundwater.	**Section 5.2.3; Table 1**
2. A proposed groundwater monitoring system. 3. Background values for each proposed monitoring parameter or constituent, or procedures to calculate the values.	**Section 5.2.3; Table 3; Appendix B3**
4. A description of proposed sampling, analysis and statistical comparison procedures to be utilized in evaluating groundwater monitoring data.	**Section 5.2.5 and Appendix B4, sampling procedures Section 5.2.6, analytical procedures Section 5.3, data evaluation**

(iii) The plan should address each of the applicable monitoring program requirements in NR 664.0091 through NR 664.0099. We recommend that the plan include a "crosswalk" that identifies where each of these requirements is addressed. The following is list of examples of these requirements for facilities in detection monitoring:

NR 664.0091(1)(e) Certified lab use

Section 5.2.6

NR 664.0091(2) Specific program elements

No specific elements at this time

NR 664.0092 Groundwater protection standard(s)

Section 5.2.3; Appendix B3

NR 664.0093(1), (2), and (2m) Hazardous constituents that apply

Section 5.2.3

NR 664.0093(3) Groundwater use/exempted aquifers

Section 5.1.3

NR 664.0094(1), (2), (2m) Concentration limits

Section 5.2.3; Table 3; Appendix B3

NR 664.0095 Point of standards application

Section 5.2.4

NR 664.0097(1) Number, location, and depth of wells (background, POS, and detection)

Section 5.2.1; Table 1; Fig. LTCP-3; Appendix A4

NR 664.0097(3) Casing

Section 5.2.1; Appendix A4

NR 664.0097(4) Sampling and analysis procedures

Section 5.2.5; Appendix B4

NR 664.0097(5) Sampling and analysis methods

Section 5.2.6

NR 664.0097(6) GW elevation

Section 5.2.3; Table 1

NR 664.0097(7) Sampling procedures (including establishment of background)

Section 5.2.3; Table 3; Appendix B3

NR 664.0097(8) and (9) Data evaluation and methods

Section 5.3

NR 664.0097(10) Recordkeeping and reporting

Section 5.4

(iv) Certain parts of NR 664.0091 through NR 664.0099 refer to requirements to be established in the license and/or by the department. The groundwater monitoring program plan presented by WFI should identify and propose these requirements for the department's consideration in reviewing and approving the plan as part of the re-issued LTC license.

Cover letter, and Appendix B3

(v) WFI's November 11, 2020 indicates that LF no. 2638 does not have any unsaturated zone monitoring. Please confirm this in the LTC Plan.

Environmental Monitoring Program	**Section 3.2**	**No unsaturated zone monitoring**

g. Benchmarks: Please describe the locations of surveyed benchmarks and how they are protected and maintained (C.6.f).

Benchmarks [NR 664.0309]	**Section 4.5; Section 7.4 and Appendix B8**

h. Please address any other facility components and systems identified in section 2 above that require or facilitate long-term care.

None

4. Other Applicable NR 664 Requirements

This should describe how the following requirements are met:

a. Security procedures and equipment (C.2.a) (C.5.c.ii).

Security procedures and equipment [NR 664.0014]	**Section 6.0**

b. Inspection program (C.2.b) (C.5.c.ii) (C.6). This should include documentation forms and protocols for maintaining the operating record.

(i) WFI's November 11, 2020 letter indicates that inspections are completed for the purpose of "checking the condition of the cover and the condition of the leachate tank". It also mentions a monthly site walkover for cover inspections. The inspection program should include all the components fitting within NR 664.0015(2)9(a), which includes "monitoring equipment, safety and emergency equipment, security devices and operating and structural equipment (such as dikes and sump pumps) that are important to preventing, detecting, or responding to environmental or human health hazards". This would also include, for example, monitoring wells, fencing/gates, run-off controls, etc.

(ii) The inspection program should identify the types of problems (e.g., malfunctions or deterioration) which are to be looked for during the inspection, per NR 664.0015(2)(c).

(iii) The inspection program should describe the frequencies of inspections, per NR 664.0015(2)(d).

(iv) In addition to meeting NR 664.0015(4), the inspection forms should match with the LTC plan's inspection program description. clearly identify the item(s) that are inspected. For example, it is recommended that the "Landfill Leachate Monitoring Records" form (see Appendix C of WFI's November 11, 2020 letter) appears to address two landfills, but it is not clear which component (lysimeters, leachate head wells, tanks, "leak detection" and "valve manway") relates to which landfill, and it is not clear what these components are. Also, the "Landfill Site Inspection Report" forms appears to involve ''Foundry Landfill 1-2-3-4" and "1-2-3", which are unclear.

(v) The inspection forms should provide for documentation of remedies/repairs per NR 664.0015(3).

Final Cover/Fencing [NR 664.0015)]	**Section 7.1**	**Appendix B5 - Forms revised to indicate which landfill an item is associated with.**
Leachate Collection System/Leachate Tank [NR 664.0015]	**Section 7.2**	**Appendix B6 - Forms revised to indicate which landfill an item is associated with.**
Groundwater Monitoring Wells [NR 664.0015]	**Section 7.3 and Appendix B7**	**----**

c. Personnel training program (C.5.c.ii) (C.13.a.ii). This should include documentation protocols for maintaining the operating record. *WFI's November 11, 2020 letter indicated that no training plan has been developed because hazardous waste is not generated, handled, or stored. However, it then refers to trained personnel regarding its "Consolidated Emergency Response Plan". The LTC Plan should briefly summarize this training, and associated documentation/records, as it relates to Landfill no. 2638. The LTC Plan should also describe any training that is appropriate to ensure that proper inspections and repairs for Landfill no. 2638 occur, and awareness training such that key facility components (e.g. the cap and monitoring equipment) are not inadvertently damaged by personnel doing work at the facility.*

Outline of introductory and continuing training programs [NR 670.014 (2) (L)	**Section 8.0**

d. The Contingency Plan (C.5.c.ii) (C.13.a.i), which should also address all applicable preparedness and prevention requirements in subch. C of ch. NR 664, Wis. Adm. Code.
   (i) WFI's November 11, 2020 letter refers to a "Consolidated Emergency Response Plan" covering its Waupaca-area facilities. The application should state that this functions as the required Contingency Plan. The application should briefly summarize this plan and describe how it addresses Landfill no. 2638, how often it is reviewed and updated, and where the plan is kept on file.
   (ii) WFI should ensure that the Consolidated Emergency Response Plan addresses the minimum contingency plan contents in subch. C of ch. NR 664.
   (iii) Regarding the arrangements with local authorities addressed in NR 664.0037, the letter indicated that no arrangements have been made. It is recommended that the LTC Plan refer to the fact that the regulation requires such arrangements "as appropriate for the type of waste handled at the facility and the potential need for the services of these organizations" and describe how Landfill no. 2638 may fit with this exception.

Preparedness and prevention requirements -- Contingency plan [Subchapter C, NR 664]	**Section 9.0**

e. The operating record requirements of NR 664.0073. WFI's November 11, 2020 letter suggests that old operating records have been archived and are maintained, and that monitoring records are submitted and maintained. It is recommended that the LTC plan describe this, and address the other (more current) applicable operating record and recordkeeping requirements, such as the following:
   (i) NR 664.0073(2)(d), contingency plan incident records
   (ii) NR 664.0073(2)(e), inspection records
   (iii) NR 664.0073(2)(h), LTC cost estimates
   (iv) NR 664.0016(4), training records

Summary reports and details of incidents requiring implementation of contingency plan [NR 664.0073(2)(d)]	**Section 10.0**
Final cover system and fencing inspection records [NR 664.0073(2)(e)]	
Leachate collection system and leachate tank inspection records [NR 664.0073(2)(e)]	
Groundwater monitoring well inspection records [NR 664.0073(2)(e)]	
Groundwater and leachate sampling and analytical results [NR 664.0073(2)(f) and NR 507.26]	
Training records [NR 664.0016(4]	

f. Annual reporting requirements per s. NR 664.0075, Wis. Adm Code.

Annual reporting [NR 664.0075]]	**Section 11.0**

g. Documentation regarding long-term care notices per s. NR 664.0119, Wis. Adm. Code (C.7).

Long-term care notices [NR 664.0119]	**Section 12.0**

5. Long-Term Care Cost Estimate (C.9)

The long-term care cost estimate should be certified by a qualified professional engineer or professional geologist. The cost estimate should be summarized in tabular form showing tasks and subtasks in rows, and units, quantities, unit costs, and extended totals, along with a grand total of all tasks and subtasks, and provide sufficient detail and support to ensure that they:

a. estimate LTC costs for the duration of the long-term care period;
b. are based on and present costs for each of the discreet tasks and subtasks described in the work descriptions contained in the LTC Plan. An example of a task may be groundwater monitoring, with example subtasks for sampling, lab analyses, data review, reporting, etc.;
c. for each discrete task and sub-task, include units, quantities, unit costs, and extended totals, along with a grand total of all tasks and subtasks.
d. for each quantity and unit cost, provide the source of or basis for the numbers;

e. are based on exclusive use of a third parties to perform the work, and include costs to procure, administer and manage the third-party work;
f. include a minimum 10% contingency for unforeseen activities;
g. clearly show the basis year of the cost estimate (costs "as of" year, e.g. "all costs are in 2021 dollars"); and
h. cover all costs until the end of the projected long-term care period. The department recommends that WFI establish a "rolling 30-year window" for its LTC cost estimate (and associated financial assurance) that annually maintains financial assurance for the following 30 years, until WFI demonstrates (and the department approves) that a shorter time period is justified.

See also Area of Concern no. 3 regarding the LTC cost estimate.

Long-term care cost estimate [NR 664.0119]	**Section 13.0; Table 4**	**Certification by a qualified professional geologist included in cover letter**

6. Long-Term Care Financial Assurance (C.9)

This should address documentation to demonstrate the establishment of LTC financial assurance. See Area of Concern no. 3.c regarding LTC financial assurance.

Establishment of long-term care financial assurance	**Section 14.0**

7. Solid Waste Management Units (C.12.a - c).

This should identify and describe all SWMUs (C.12.a - c). Note that NR 670.014(4)(a)1. through (a)5. specifies minimum information to be provided for each SWMU (C.12.a). Also note that that NR 670.014(4)(b) requires all available information pertaining to any release of hazardous wastes or hazardous constituents from the unit or units (C.12.c). Note that WFI may refer to previous reports rather than repeating such information, to the extent the previous reports may provide some of this information.

The discussion in section 5.c WFI's November 11, 2020 letter can be used as a basis for this application information. Please consider the apparent SWMU involving foundry waste that was the subject of Case No. 89-CV-302 (Stipulated Judgement letter dated January 11, 1990) and any other SWMUs.

Description and summary of solid waste management units	**Section 15.0**

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Long Term Care Re-License Application
Waupaca Foundry, Inc. Landfill
Hazardous Waste Long-Term Care License No. 2638
EPA ID WID981093248

1.0 Introduction

Waupaca Foundry, Inc. (WFI) owns a closed hazardous waste landfill (Hazardous Waste Long-Term Care License No. 2638; EPA ID WID981093248) known as WFI Landfill No. 2638 (Landfill 2638). A long-term care license for this facility had been issued by the Wisconsin Department of Natural Resources (WDNR) dated June 30, 1992, effective from June 30, 1992, until June 30, 2022. This application for the re-issuance of License No. 2638 for this facility provides the information required under NR 670, Wis. Adm. Code, for the long-term care requirements and completes the actions recommended in the Contingent Close Out – Hazardous Waste Compliance Assessment letter dated October 14, 2021 (Appendix A1). This document also fulfills the requirement for a facility long-term care plan under NR 664.0118, Wis. Adm. Code.

Long Term Care Re-License Application
Waupaca Foundry, Inc. Landfill
Hazardous Waste Long-Term Care License No. 2638
EPA ID WID981093248

1.0 Introduction

Waupaca Foundry, Inc. (WFI) owns a closed hazardous waste landfill (Hazardous Waste Long-Term Care License No. 2638; EPA ID WID981093248) known as WFI Landfill No. 2638 (Landfill 2638). A long-term care license for this facility had been issued by the Wisconsin Department of Natural Resources (WDNR) dated June 30, 1992, effective from June 30, 1992, until June 30, 2022. This application for the re-issuance of License No. 2638 for this facility provides the information required under NR 670, Wis. Adm. Code, for the long-term care requirements and completes the actions recommended in the Contingent Close Out – Hazardous Waste Compliance Assessment letter dated October 14, 2021 (Appendix A1). This document also fulfills the requirement for a facility long-term care plan under NR 664.0118, Wis. Adm. Code.

2.0 Long Term Care Plan – General Facility Description

The WFI Landfill 2638 is located on Elm Valley Road, approximately 0.25 mile north of the intersection of Elm Valley Road and State Highway 49, in the SW¼ SE¼ Section 6, T22N, R12E, Town of Waupaca, Waupaca County, Wisconsin. Access to the facility is from Elm Valley Road. Figure LTCP-1 is a portion of the Ogdensburg, Wisconsin, 7.5 Minute Quadrangle that shows the location of this facility. Private wells within 0.5 mile of the facility property boundary are shown on Figure LTCP-1, along with wetlands and surface water bodies.

Landfill 2638 ceased accepting waste in October 1989. The closure documentation for Landfill 2638 was approved in March 1991, with a long-term care license issued June 1992. WFI owns two other non-hazardous landfills also located in the area (Figure LTCP-2). WFI Landfill No. 3171, closed in October 1995, is L-shaped and located to the west and south of Landfill 2638. The two landfills are separated by a 100-foot-wide buffer zone that drains toward a sedimentation basin. South of the two closed landfills is the active landfill, WFI Landfill No. 3412. A series of photographs showing existing conditions and infrastructure associated with Landfill 2638 are included in Appendix B1.

There are no plans for future expansion of Landfill 2638 on Parcel 20 06 43 and WFI owns Parcel 20 06 42 directly north of that facility (Figure LTCP-1). The approximate boundaries of all WFI properties are shown on Figure LTCP-1; however, neither Figure LTCP-2 or Figure LTCP-3 extend 1000 feet north of Landfill 2638. As that portion of the WFI property north of Landfill 2638 has no impact on the long-term care and maintenance of Landfill 2638, it is believed the pertinent information critical to describe the site and surrounding area are illustrated on Figures LTCP-1, 2, and 3.

The final cover design for Landfill 2638 promotes positive drainage away from the landfill, and there are no structures directing stormwater or surface water onto the facility. Discharge structures include only the outlet from the sedimentation basin designed to receive stormwater from the south and west sides of the landfill (Figure LTCP-2). Runoff from the north and east sides of the landfill follow local off-site drainage patterns. There are no injection wells on or near this facility which could receive fluids originating from Landfill 2638. As the facility is closed with a final cover installed and maintained, there is no opportunity for exposure to waste. Therefore, a wind rose has not been included as part of any of the figures.

2.1 General Facility Information

Name	Waupaca Foundry, Inc. Landfill -- WDNR License No. 2638; EPA ID WID981093248
Local Municipality and Facility Mailing Address	Town of Waupaca N4496 Elm Valley Road, Waupaca, WI 54981
Location	Latitude: 44° 24' 13.35" Longitude: -89° 5' 30.42"
Nature of business	Waupaca Foundry, Inc. operates two plants in Waupaca, Wisconsin, manufacturing gray iron, ductile iron, compacted graphite, and austempered ductile iron castings
Operator and Owner	Waupaca Foundry, Inc. (private) 1955 Brunner Drive, P.O. Box 249, Waupaca, WI 54981 Telephone: (715) 258-6611
Operator/Owner representative and contact information	Bryant Esch, Director of Environmental Engineering 1955 Brunner Drive, P.O. Box 249, Waupaca, WI 54981 Telephone: (715) 258-6674
Indian lands	The facility is not located within the boundary of an American Indian reservation. The Menominee occupied Waupaca County until 1848, when the final treaty was signed relinquishing the last of the Menominee's land, which included Waupaca County (Waupaca County Historical Society https://www.waupacahistoricalsociety.org).
100-year floodplain	The facility is not located within a 100-yr. floodplain. The nearest 100-yr. flood plains are located along the South Branch Wolf River approximately one mile northeast of the landfill and along the unnamed creek flowing into Ebbe Lake approximately 0.66 mile southeast of the landfill (Fig. LTCP-1) https://public1.co.waupaca.wi.us/floodplain-viewer/?marker=-9917404.6653%2C5528364.8546%2C102100%2CLandfill%20No.%202638%2C%2C&level=16

2.2 Historic Hazardous Waste Management Activities

Disposal operations began at this site in 1976. WFI was issued a conditional plan approval from the WDNR dated September 20, 1976, for the construction of a landfill for the disposal of materials generated as part of normal manufacturing processes at Plant 1 and Plants 2/3 in Waupaca, Wisconsin. The site was constructed so that a continual layer of a minimum of two feet of compacted system sand, as specified in the August 13, 1976 engineering drawing, was placed on the bottom, sides, and top of the disposal site. The department did not require the installation of a leachate collection system. The materials approved for disposal included system sand, core sand, and slag, all generated during the casting process; and cupola sludge, consisting of the fines removed by a wet scrubber treating flue gas off the cupola at Plants 2/3 in Waupaca. The wet scrubber fines were sluiced through a series of settling ponds located directly west of Plants 2/3, with the sediment periodically dredged and then brought to the landfill. The dredged material was a relatively small portion of the total waste stream.

Landfill 2638 was not designed or licensed to accept hazardous waste. It was suspected that the practice of disposal of cupola wastewater in the pond system was not consistent with amendments eventually promulgated to the 1976 Resource Conservation and Recovery Act (RCRA), specifically the Solid Waste Disposal Act Amendments (1980). In 1983, the cupola sludge was determined to be hazardous waste based on lead and cadmium results from EP toxicity testing, the test method which proceeded the current TCLP test. Consequently, the landfill was not in compliance with hazardous waste landfill licensing requirements specified in NR 670.001(3), Wis. Adm. Code. WFI agreed to cease disposing of hazardous

waste at Landfill 2638 as of July 1984 in accordance with the consent agreement and final order dated July 23, 1984.

In 1984, Sections 1, 2, and 3 (Figure LTPC-2) were not receiving waste, and a final cover had been installed over these three cells. Cupola sludge, determined to be hazardous waste based on toxicity characteristics, had already been placed in Sections 1, 2, and 3. Section 4 (Figure LTPC-2) was the active cell in 1984 and was receiving waste, including hazardous waste.

2.3 Closure Activities

Although WFI agreed to cease disposing of hazardous waste at the landfill, it was recognized that by-products of WFI's manufacturing processes would continue to be generated as the business operated and would need to be properly managed and disposed. The negotiated agreement to allow the continued operation of the foundry was that Section 5 (Figure LTPC-2) could be built, but its volume would be limited to approximately 52,000 cubic yards, estimated to be one year of site life. This would provide WFI an engineered and approved disposal location for the period of time necessary to build and obtain construction documentation approval for Phase I of Landfill No. 3171, a separate and non-contiguous landfill. Note that no hazardous waste was placed in Section 5.

Section 5 was constructed to lay over the south slope of Section 4, with a perimeter berm constructed on the south and southwest sides (see Appendix A2, *Drawings 13344-1SCD through 10SCD, As-Built Construction Plan Sections 4 and 5*). Section 5 has a 2-foot-thick clay liner, and an engineered 6-foot-thick separation zone between Sections 4 and 5 which serves as both a cover for Section 4 and a liner for Section 5. A pressure relief pipe was installed in Section 4 to reduce any pressure build-up at the toe of the separation zone slope. The 2-foot-thick clay layer of the final cover of Section 5 was keyed in the clay cover of Section 4 and the Section 5 liner. The Section 5 final grades were designed as a smooth slope from the top of Section 4 to the base of the perimeter berm.

The timeline of activities was as follows:

- Fall 1986 - The northern and western parts of Section 4 were brought to grade and final cover was installed.
- Fall 1987 - The remaining portion of Section 4 was brought to grade and final cover was installed. Liner construction began for Section 5. Foundry sand was stockpiled on the western portion of Section 4 until construction documentation was approved for the Section 5 liner.
- February 1988 – Construction documentation approval granted for Section 4 cover and Section 5 liner in WDNR letter dated February 26, 1988.
- October 1989 - Construction documentation approval granted for Phase I of Landfill No. 3171
- 1990 to March 1991 – Final cover installation on Section 5, and the cover on Section 4 was repaired. All final closure activities related to Sections 1, 2, 3, 4, and 5 completed and conditional approval granted in WDNR letter dated March 29, 1991.
- June 30, 1992 – Conditions of the closure approval adequately addressed and hazardous waste facility long-term care license issued.

The effective date of the long-term care license is June 30, 1992, with the date of expiration June 30, 2022.

2.4 Corrective Action Requirements

All final closure activities related to Landfill 2638 have been completed and conditional approval of closure was granted by the WDNR in March 1991. The hazardous waste facility long-term care license dated June 30, 1992, was issued to WFI, subject to compliance of the conditions of that license, which has occurred throughout the duration of the license period. A detection monitoring program is conducted in substantial accordance with NR 664.0098, Wis. Adm. Code, and monitors for potential groundwater impacts past the points of compliance. No groundwater monitoring results have triggered the requirement for a corrective action program under NR 664.0100, Wis. Adm. Code.

2.5 NR 500 Wisconsin Administrative Code Applicability

This long-term care plan is also intended to address applicable requirements listed in the NR 500, Wis. Adm. Code series of solid waste rules. This would include, but is not limited to, NR 507, Wis. Adm. Code, *Environmental Monitoring for Landfills*; and NR 514, Wis. Adm. Code, *Plan of Operation and Closure Plans for Landfills*.

3.0 Long Term Care Plan – Summary

3.1 Systems Required for Long-Term Care

There are six systems associated with Landfill 2638 that require monitoring, maintenance, periodic repairs, and upkeep to facilitate the long-term care of this facility. These systems and their components ensure the proper containment of hazardous waste and monitor for potential releases to the environment.

- Sections 1, 2, 3, 4, and 5 final covers
- Perimeter fencing/gate
- Section 4 pressure relief pipe; Section 5 leachate collection system; leachate collection tank
- Buffer zone/sedimentation basin (run-on and run-off controls)
- Groundwater monitor wells monitoring groundwater quality
- Permanently surveyed benchmarks

Inspection, maintenance, and contingent repairs for these systems are detailed in Section 4.0 of the Long-Term Care Plan.

3.2 Environmental Monitoring Program

The current environmental monitoring program for Landfill 2638 is summarized on Tables 1 and 2 and detailed in Section 5.0 of the Long-Term Care Plan. Table 1 lists the groundwater monitor wells that are sampled in May and November, and the parameters that are analyzed as part of each of the sampling events. The leachate tank is also sampled semi-annually in May and November, and Table 2 lists the parameters analyzed. Groundwater analytical results are compared to the concentration limits summarized on Table 3 in order to determine compliance with the detection monitoring program. There are no lysimeters, gas monitoring wells, or surface water monitoring locations, nor is there any monitoring of the unsaturated zone as part of the environmental monitoring program.

3.3 Minimum and Remaining Duration of Long-Term Care

Long-term care is required for at least 40 years after closure per NR 664.0117(1), Wis. Adm. Code and until long-term care activities are no longer needed. WFI will perform long-term care until it obtains WDNR approval to terminate these activities. An estimate of annual long-term costs is summarized on Table 4. These annual costs include the total costs to complete the tasks necessary for the maintenance and upkeep of Landfill 2638 based on the use of third parties to complete the work and a 10% contingency fee. The duration of long-term care financial responsibility is a rolling 30-year window, whereby WFI annually maintains financial assurance for the following 30 years.

4.0 Long Term Care Plan – Details

Six systems are in place to ensure the proper containment of hazardous waste and monitor for potential releases to the environment. Descriptions of the final cover, perimeter fencing and gate, leachate collection system, buffer zone/sedimentation basin (run-on/run-off controls), and the permanent benchmarks are provided below. Details regarding the upkeep, repair, and maintenance activities for each of these systems are also described. The environmental monitoring program including groundwater and leachate monitoring, sampling, and analysis is discussed in Section 5.0.

4.1 Final Cover

Two different cover systems were installed on Landfill 2638. A two-foot-thick cover of earthen materials and topsoil were installed on Sections 1, 2, and 3. The final cover installed on Sections 4 and 5 consists of, from top to bottom: 6-inch topsoil layer; 2 feet of sand; and 2 feet of clay. There is an engineered 6-foot-thick separation zone between Sections 4 and 5 which serves as both a cover for Section 4 and a liner for Section 5. The separation zone will be described in greater detail in Section 4.3 – Leachate Management.

4.1.1 Final Cover Description

Sections 1, 2, and 3 are the oldest portions of Landfill 2638. These three sections were closed prior to the 1984 consent agreement, and before hazardous waste was identified as a portion of the waste stream being disposed at the landfill. The sections were covered with on-site earthen materials and topsoil with an overall thickness of approximately two feet for the final cover (see cross-section A-A′, Drawing 13344-6SCD, Appendix A2). As vegetation on this cover was well established and positive drainage was being maintained, it was determined that the final cover on Sections 1, 2, and 3 was performing adequately, would remain in-place, and would not be disturbed.

The final cover installed on Sections 4 and 5 consists of, from top to bottom: 6-inch topsoil layer; 2 feet of sand; and 2 feet of clay. Section 4 was covered first, with the final cover installed in stages. The final cover was installed on the western and northern part of Section 4 by fall 1986 so foundry materials could be stockpiled there during the construction of Section 5. The remaining portion of Section 4 was brought to grade and final cover was installed by fall 1987 in conjunction with the construction of the Section 5 liner and the separation zone between Sections 4 and 5. Drawings 13344-1SCD through 10SCD (Appendix A2) document the as-built construction details for the Section 4 cover and the Section 5 liner.

With WDNR approval of Section 5 construction (February 26, 1988) the stockpiles on Section 4 were removed and placed in Section 5, along with material below the stockpiles to a depth of 6 inches. Construction of the Section 5 final cover was completed in September 1990, with the clay cover of Section 5 keyed into the clay layer of Section 4. The final repairs to the Section 4 cover were completed in March 1991.

4.1.2 Final Cover Maintenance

<u>Monthly</u>
The final cover and the perimeter berm forming the south and southwest sides of Section 5 are inspected for:

- Erosion
- Stressed vegetation
- Evidence of leachate seeps
- Animal burrows
- Woody shrubs, trees, or other deep-rooted plants

If there are issues, they are addressed at the time of the inspection.

Semiannually
A summary report is completed in September/October and again in April/May documenting the condition of the cover. The report summarizes the monthly inspections and maintenance activities completed during the previous six months and is put into the operating record.

4.2 Perimeter Fencing/Gate Maintenance

Monthly
In conjunction with the inspection of the final cover, the perimeter fencing and the gate at the entrance to the facility off Elm Valley Road are inspected:

- To confirm each section of fencing is up, in place, and fastened to anchor posts.
- To confirm the gate opens and closes freely and can be securely locked.
- To confirm all signs are legible and are securely fasten to the fence and gate.
- To remove shrubs and woody plants encroaching on the fence line.

If there are issues, they are addressed at the time of the inspection.

Semiannually
Monthly inspections and maintenance completed on the perimeter fencing/gate are summarized and included as part of the semiannual report summarizing inspections and maintenance of the final cover.

4.3 Leachate Management

There is no leachate collection system in Sections 1, 2, 3, and 4. A pressure relief pipe installed during construction of the Section 4 cover and the Section 5 liner collects liquid which gravity drains to the east leachate tank and is treated as leachate. A leachate collection system was installed in Section 5, with leachate gravity draining to the east leachate tank. Leachate is removed monthly at a minimum for disposal at the City of Waupaca wastewater treatment plant.

4.3.1 Sections 1, 2, 3, and 4 Leachate Management

There is minimal as-built construction documentation for the base grades of Sections 1, 2, 3, and 4. A liner consisting of compacted foundry system sand was placed on the base and sides of each of these four sections. No system of leachate collection exists in either Section 1, 2, 3, or 4; therefore, leachate is not collected from, nor managed in these sections of Landfill 2638.

4.3.2 Sections 4 and 5 Separation Zone and Pressure Relief Pipe

During the installation of the Section 4 final cover and construction of Section 5, a separation zone was constructed which serves as both the cover for the south sideslope of Section 4 and the liner for Section 5. The horizontal extent of the separation zone is shown on Drawings 13344-4SCD and 5SCD (Appendix A2). The separation zone is a thickness of six feet consisting of, from top to bottom: 2 feet upper sand drainage layer; 2 feet of clay; and 2 feet lower sand drainage layer. The lower sand drainage layer was placed over the foundry sand on the south slope of Section 4. The 2 feet of clay was placed over the lower sand drainage layer, extended to the Section 5 liner, and upward to the Section 4 clay cover. The upper sand drainage layer was placed over the clay on the separation zone and joins with the sand drainage blanket in Section 5 and the sand layer of the final cover in Section 4. Construction cross-section A-A′ (Drawing 13344-6SCD, Appendix A2) illustrates the configuration of the Section 4 cover, the separation zone, and the Section 5 liner.

A pressure relief pipe was installed in Section 4. It is the northern pipe of the two pipes depicted on Drawing 13344-5SCD (Appendix A2). It was placed in Section 4 to reduce any pressure build-up at the toe of the separation zone slope. Drawing 13344-8SCD (Appendix A2) includes a typical construction

detail for the pressure relief pipe, consisting of 6-inch diameter perforated Schedule 80 PVC pipe. The pressure relief pipe gravity drains to a collection manhole, which gravity drains to the east leachate tank.

4.3.3 Section 5 Leachate Management

The Section 5 leachate collection system has been designed to collect and remove leachate at a rate sufficient to maintain a head of 1 foot or less over the liner. Section 5 has 2-foot-thick clay liner overlain with a 1-foot-thick (minimum) sand drainage blanket. One leachate collection pipe consisting of 6-inch diameter perforated Schedule 80 PVC pipe was installed along the length of Section 5 in a clay-lined trench with geotextile and gravel bedding. Drawing 13344-5SCD (Appendix A2) presents an as-built of the leachate collection pipe and Drawing 13344-8SCD (Appendix A2) includes a typical construction detail for the leachate collection pipe in Section 5. The leachate collection pipe gravity drains to a collection manhole, which gravity drains to the east leachate tank.

4.3.4 Transfer Mains, Leachate Collection Manhole, Leachate Storage Tank

The Section 5 leachate collection pipe and the Section 4 pressure relief pipe each gravity drain through a 6-inch Schedule 80 PVC pipe encased in an 8-inch Schedule 80 PVC pipe to a manhole located east of Section 5. Drawing 13344-5SCD (Appendix A2) shows the leachate transfer line location and Drawing 13344-8SCD (Appendix A2) depicts details of the manhole. Leachate from the manhole is then gravity-drained through a 6-inch Schedule 80 PVC pipe encased in an 8-inch Schedule 80 PVC pipe to a 20,000-gallon leachate storage tank.

The leachate storage tank for Landfill 2638 (east tank) is in the same excavation as the leachate storage tank for Landfill No. 3171 (west tank). The tank excavation is lined and capped with a 30 mil PVC secondary liner and backfilled with pea gravel. A monitoring well with a 10-foot screen was installed with the bottom of the well at the base of the tank excavation to monitor liquid levels within the backfill of the tank excavation and detect potential leakage from the tanks. Drawing 13344-9SCD (Appendix A2) illustrates the as-built construction details for the leachate tank installation and the tank backfill monitoring well.

Leachate production from Section 5 and the accumulation rate in the east leachate tank is relatively predictable, based on over 30 years of leachate monitoring and removal over a variety of climatic conditions and seasonal variations. To prevent overflow of the tank, the leachate level in the tank is conservatively maintained at 75% capacity of the tank. The leachate level in the east tank is measured weekly, or biweekly during periods of snow melt or increased precipitation to insure timely removal of leachate.

4.3.5 Leachate Management Systems Maintenance / Inspection

Monthly

The tank excavation monitoring well is checked monthly by measuring the depth to the top of liquid within the well and comparing that depth to previous measurements. The acceptable level of liquid in the well is no more than three feet from the bottom of the well to the top of the liquid.

Biennial

The pressure relief pipe in the Sections 4 and 5 separation zone and the leachate collection pipe in Section 5 are jetted and inspected biennially. The cleaning reports are submitted to WDNR after completion and are retained in the operating record. An exemption request to reduce leachate line cleaning from annual to biennial was submitted to the WDNR, and approval was granted in a letter dated January 31, 2011, to Bryant Esch, WFI, from James Zellmer, WDNR (Appendix A5).

4.3.6 Leachate Removal and Treatment

The leachate level in the east leachate tank is measured weekly using a water level tape to measure to the top of leachate in the tank. When the leachate tank is at approximately 75% capacity, the tank is scheduled for pumping to accommodate the ability to make it through an upcoming weekend, holiday, or

other downtimes. Leachate is removed at a minimum monthly and typically more often. Secondary containment measures are taken at hose connections during transfer of leachate from the tank to the tanker truck. If an atypical event occurs during leachate transfer, the landfill manager will review the occurrence and a notification will be provided to the WDNR.

The volume of leachate removed is tracked by truckload size and number of hauls. The total volume of leachate hauled is summarized monthly and put in the operating record semiannually. The leachate is hauled by tanker truck to the City of Waupaca wastewater treatment plant for disposal.

4.4 Run-on/Run-off Controls

Positive drainage is maintained on Landfill 2638 through the design of the final cover and monthly inspections of the cover to ensure its integrity. A buffer zone 100 feet in width exists between Landfill 2638 and Landfill 3171 (Figure LTCP-3). The buffer zone is graded to direct surface water and stormwater runoff to a sedimentation basin, which drains to the east. The sedimentation basin was constructed at the time of the construction of Phase I of Landfill 3171. Drawing 17004XF-14 (Appendix A3) provides the construction documentation details for the sedimentation basin and outfall. The sedimentation basin is inspected monthly for the presence of standing water and evidence of erosion.

4.5 Benchmarks

Benchmark locations are shown on Figure LTCP-2. Survey benchmarks for the landfills are located around the periphery of the landfills. These benchmarks are protected from traffic and are maintained as needed by clearing vegetation and upkeep of protective features, e.g., bollards or covers where applicable. The benchmarks are checked biennially and during normal construction events to confirm location and to confirm they will support use for construction documentation projects.

5.0 Groundwater Monitoring Program

A detection monitoring program has been established at the Landfill 2638 facility to monitor and assess groundwater quality. The program has been developed based on the site geology, hydrogeology, and waste characteristics.

5.1 Geology and Hydrogeology

5.1.1 Bedrock Geology

The bedrock beneath Landfill 2638 is fine- to medium-grained granite, likely associated with the emplacement of the Wolf River Batholith approximately 1,500 million years ago (LaBerge, 1994). Regionally, the bedrock surface slopes to the east and southeast, with a horizonal gradient of approximately 0.02 feet/feet. At the location of the landfill the bedrock surface dips from the northwest to the southeast, consistent with the original topography of the site. Isolated granite outcrops occur in Waupaca County, with some hills and drumlins being bedrock cored. Based on borings completed for the three WFI landfills, depth to the top of bedrock ranges from 100 to 120 feet from the ground surface.

5.1.2 Glacial Geology

Approximately 11 miles west of Landfill 2638 is the Johnstown Moraine marking the furthest advance of the western side of the Green Bay Lobe, 35,000 to 11,000 years ago during the last part of Wisconsin Glaciation. Approximately 4 miles east of Landfill 2638 is the younger Bowler/Green Lake Moraine, representing a retreat and stillstand of the Green Bay Lobe (Syverson et al., 2011). The glacial sediments in the area of Landfill 2638 are sand and gravel deposited directly by meltwater streams flowing east to west, originating from the margin of the Green Bay Lobe (Mode et al., 2015). These sediments are predominately fine to medium sand to silty sand with discrete lenses of gravel including occasional cobbles and boulders; silts; and silty clays, reflecting deposition by shallow braided channels continually shifting positions (see geologic cross-sections from *Sections 1, 2, 3, 4, and 5 Groundwater Monitoring Plan* [Appendix A4]).

5.1.3 Hydrogeology

Based on work completed for various investigations of the geology and hydrogeology of Landfill 2638, and the Feasibility Study for Landfill 3171, it has been determined that the uppermost aquifer is the sandy glacial sediments, 100 to 120 feet thick from the ground surface to the top of the granite bedrock. Historically, the water table ranges from an elevation of approximately 894 to 902 feet, mean sea level (ft., MSL) along the western property boundary to an elevation of approximately 884 to 891 ft. MSL along the eastern property boundary. The elevation of a wetland within a topographic low located approximately 500 feet east of the site correlates closely with the water table elevation and is likely a surface expression of the water table. The facility itself is within an upland area contributing to groundwater recharge. Groundwater discharges locally to the wetlands and small water bodies east of the site, while regional discharge is to the South Branch Little Wolf River, located approximately 1¾ miles east and northeast of Landfill 2638 (Figure LTCP-1).

In general, groundwater flow is from west to east across the site. Given the relative homogeneity of the uppermost aquifer, horizontal flow predominates, with slight to no vertical gradients measured in wells monitoring groundwater quality in the vicinity of Landfill 2638. Even during seasonal fluctuations in groundwater elevation, groundwater flow remains from west to east. Horizontal gradients and seepage velocities were calculated during historic high and low groundwater conditions (Appendix B2), and both remain relatively stable.

The property owned by WFI is zoned general rural industrial. All other property within a 1-mile radius of Landfill 2638 is zoned agricultural and woodland transition. There are no high-capacity wells within a 1-mile radius, nor are there any wells used for irrigation. Private water supply wells in the vicinity of Landfill 2638 (Figure LTCP-1) are screened within the uppermost sand and gravel aquifer, typically at depths of 80+ feet.

5.2 Environmental Monitoring Program

The most recent modification to the environmental monitoring program for Landfill 2638 was approved by the WDNR in a letter dated March 9, 2016 (Appendix A6). Details of the program are discussed in this section.

5.2.1 Groundwater Monitoring Wells

Figure LTCP-3 illustrates the location of the wells used to monitor groundwater quality at Landfill 2638. Table 1 lists the wells in the monitoring program and the monitoring position of each well relative to this landfill. All wells were constructed in substantial accordance with NR 141, Wis. Adm. Code. Construction for Monitoring Wells B-1, 1A, 1B; B-7, 7A; and B-25, 25A, 25B are shown on the geologic cross-sections in Appendix A4.

Details regarding the length and type of the annular space for Monitor Wells B-28, 28A; B-29, B-30; and B-3A-88R are not available. It is known that the water table wells were constructed with a 10-foot-long screen, while the piezometers have a five-foot-long screen.

5.2.2 Leachate Monitoring

Leachate generated from Landfill 2638 drains to and is collected at the east leachate tank (Figure LTCP-3). The leachate monitoring program is summarized on Table 2. Leachate is monitored for changes in quality and quantity over time, and to ensure that parameters indicative of a potential impact from Landfill 2638 are being monitored.

5.2.3 Groundwater Monitoring Program and Concentration Limits

Table 1 summarizes the groundwater monitoring program for Landfill 2638, including the sampling locations, the parameters, the months when samples are collected, and frequency of analysis. The parameters used to monitor potential impacts to groundwater quality were chosen based on waste and leachate characteristics, parameter concentrations and occurrence in leachate, and review of over 30 years of groundwater and leachate analytical data.

The parameters most mobile in groundwater in dissolved form, and the metals of concern (arsenic, cadmium, chromium, and lead) are sampled and analyzed semi-annually in May and November. Other parameters are sampled and analyzed annually in May due to their regional ubiquity in groundwater (iron and manganese) or due to their common occurrence in agricultural settings (total nitrate, and total nitrogen as nitrate plus nitrite). Semi-volatile organic compounds (SVOC; Appendix IV, NR 507, Wis. Adm. Code), volatile organic compounds (VOC; Appendix III, NR 507, Wis. Adm. Code), and phenols are also sampled and analyzed annually due to their sporadic detections in leachate. Groundwater elevations, pH, temperature, and specific conductance are measured in the field during each sampling event at each monitoring well, and the sample color, odor, and turbidity of each sample are also noted.

Concentration limits for monitored constituents are summarized on Table 3. For parameters of public health concern, these limits are the preventive action limit (PAL) and enforcement standard (ES) as established in NR 140, Wis. Adm. Code for each parameter. For the parameters specific conductance (field), sodium (dissolved), total hardness (filtered), total alkalinity (filtered), and total filterable residue, a PAL for each monitoring well was calculated per NR 140.20 (2), Wis. Adm. Code (Appendix B3). An alternative concentration limit (ACL) was also calculated to replace the PAL for fluoride (dissolved) at B-25, as historically fluoride has consistently exceeded the NR 140 PAL at this location (Appendix B3). The PALs and ESs have not been listed for SVOCs and VOCs analyzed as part of this groundwater monitoring program. If a SVOC or VOC is detected in a groundwater sample, the concentration limits will be the PAL and ES listed for that parameter in NR 140, Wis. Adm. Code.

5.2.4 Point of Standards Application

All the downgradient monitoring locations (Well Nest B-1, 1A, 1B; Well Nest B-28, 28A; B-29; Well Nest B-7, 7A) are located between the limits of waste of Landfill 2638 and the property boundary (Figure LTCP-3). As defined in NR 140.22(3)(d), Wis. Adm. Code, the design management zone for this facility, measured from the limits of waste, is 0 (zero) feet. Therefore, the point of standards application where concentration limits listed in Table 3 will apply shall be any point beyond the design management zone.

5.2.5 Groundwater Sampling Procedures

The standard operating procedures (SOP) used for collection of groundwater samples is included in Appendix B4. The SOP details the methods and equipment used to: conduct field analyses and document field observations; purge and sample wells; and collect samples for analyses. Chain of custody procedures, and definitions of quality control samples are included.

5.2.6 Certified Laboratory and Analytical Procedures/Methods

Groundwater and leachate samples will be analyzed by a laboratory accredited in accordance with NR 149, Wis. Adm. Code. Analytical methods and procedures will be used appropriate for the media being analyzed. Methods will be used to ensure accurate measurements of constituents with appropriate limits of detection and limits of quantification to allow comparison to each PAL, ACL, and ES.

5.3 Data Evaluation

The uppermost aquifer in the vicinity of Landfill 2638 is 100-120 feet thick, consisting of fine to medium sand to silty sand, with lenses of gravel, silt, and clay. There is little to no vertical gradient. Horizontal flow predominates, with groundwater flow moving from west to east at seepage velocities ranging from 120 to 160 feet/year, discharging locally to wetlands approximately 500 feet east of the easternmost property line. Potential impacts to groundwater quality originating from Landfill 2638 would be observed relatively quickly in such a flow regime.

Downgradient of Landfill 2638, potential future impacts to groundwater quality include migration from the unlined portions of Landfill 2638. Known historic impacts include stormwater runoff from the stockpiles staged on Section 4 before the approval of construction of Section 5, which continue to have residual effects on groundwater quality.

The PALs calculated in Appendix B3 and summarized on Table 3 are reliable indicators of current groundwater quality. For parameters of public health concern, NR 140 PALs and ESs are protective of human health and the environment. Given that downgradient monitoring wells are located between the limits of waste and wetlands (likely local discharge areas) and that the average groundwater seepage velocity is relatively fast, impacts are likely to manifest themselves relatively quickly. As an example, the downgradient water table wells nearest the former location of the Section 4 stockpile (B-1B, B-28, and B-29) showed groundwater impacts already in 1988 (stockpiling started in the fall 1987) with concentrations decreasing to calculated PALs by late 1997 to early 1998. Using the calculated PALs and NR 140 established PALs and ESs to evaluate groundwater quality is defensible and reasonable in such a flow regime.

Groundwater analytical results from a sampling event will be compared to concentration limits listed in Table 3. As part of the evaluation and submittal of these results (detailed in Section 5.4), the WDNR will be notified in writing of an exceedance of a PAL, ACL, and/or ES of when monitoring data is submitted. The notification shall provide a preliminary analysis of the cause and significance of the concentration per NR 140.24 (1)(a) and NR 140.26(1)(a), Wis. Adm. Code.

5.4 Recordkeeping and Reporting

The sampling and analysis activities and evaluation of analytical results for Landfill 2638 will be documented and reported as detailed in NR 507.26, Wis. Adm. Code, including electronic submittal of environmental monitoring in a format specified by the WDNR. A report will be submitted to the WDNR for each sampling event within 60 days from the end of the sampling period in accordance with NR 507.30(1), Wis. Adm. Code. The report will include:

- A summary of parameters for which standards have been attained or exceeded and the wells at which the standard was attained or exceeded.
- A preliminary analysis of the cause and significance of each concentration.
- An electronic file of the environmental monitoring for inclusion in the WDNR Groundwater and Environmental Monitoring System (GEMS) database.

Analytical reports and field notes for each sampling event will be placed in the operating record.

6.0 Site Security

Figures LTCP-2 and LTCP-3 show the location of fencing surrounding all three of the WFI landfills, restricting access to them from livestock and the public. 'No Trespassing' signs are posted on the fence, and access into WFI property and to the facilities is through one gate off Elm Valley Road (Appendix B1, Photo 1). The gate is open during hours of operation:

- 6:00 a.m. - 6:00 p.m. weekdays
- 7:00 am – 12:00 p.m. Saturday
- Closed Sundays and holidays

7.0 Inspection Program

7.1 Final Cover/Fencing

An inspection is completed monthly of the final cover, the perimeter berm forming the south/southwest sides of Section 5, and the sedimentation basin and discharge structure for evidence of erosion, stressed vegetation, animal burrows, and woody shrubs, trees, or other deep-rooted plants. As part of this inspection, the security fencing around the WFI property is assessed to ensure the fencing has not been damaged, and that emergent brush and grass is controlled. If there are issues, they are addressed at the time of the inspection. Observations and follow-up actions are documented on a landfill site inspection report (Appendix B5).

A summary report is completed in September/October and again in April/May documenting the condition of the cover. The report summarizes the monthly inspections, maintenance, and repair activities completed during the previous six months and is put into the operating record.

7.2 Leachate Collection System/Leachate Tank

The pressure relief pipe in the Sections 4 and 5 separation zone and the leachate collection pipe in Section 5 are jetted clean and inspected biennially for blockages and pipe damage. The cleaning reports are submitted to WDNR after completion and are retained in the operating record.

The leachate level in the east leachate tank is measured weekly using a water level tape to measure to the top of leachate in the tank. When the leachate tank is at approximately 75% capacity, the tank is scheduled for pumping to accommodate the ability to make it through an upcoming weekend, holiday, or other downtimes. Attempting to pump tanks when too low, or at too low of a level, can result in pump priming/surging problems or uptake of solids from the bottom of the tank.

The tank excavation monitoring well is checked monthly by measuring the depth to the top of liquid within the well and checking for evidence of leachate in the tank backfill. The depth of liquid from the top of the liquid to the bottom of the well should be $\leq$3 feet. Leachate levels in the tank are recorded monthly, and leachate is removed at a minimum monthly and typically more often. This information is recorded on the Landfill Leachate Monitoring Record form (Appendix B6).

7.3 Groundwater Monitoring Wells

The area around each groundwater monitor well is inspected monthly during the cover inspection to ensure wells are locked and undamaged (Appendix B5). All groundwater monitor wells are inspected annually in May to confirm the condition of each well and that samples can be obtained from that well, with the results recorded on the well inspection form (Appendix B7). This annual inspection also documents the condition of the outside of each well and the surface seal. As part of the semiannual groundwater sampling events, conditions are noted that would impact the integrity of a well or would keep the well from being sampled (groundwater monitoring record, Appendix B4).

Repairs will be completed before the next sampling event. If a well cannot be repaired, it will be abandoned and replaced in accordance with NR 507.13 and NR 141, Wis. Admin. Codes.

7.4 Benchmarks

Survey benchmarks for the landfills are located around the periphery of the landfills. These benchmarks are protected from traffic by bollards or covers where needed. The benchmarks are checked biennially and maintained as needed by clearing vegetation and performing upkeep of protective features. This information is recorded on the Landfill Site Survey Benchmark Inspection Report (Appendix B8). During normal construction events, benchmarks will be checked to confirm location and confirm they will support use for construction documentation projects.

8.0 Personnel Training Program

Hazardous waste is not generated, handled, or stored at Landfill 2638, and the facility is closed, with no ongoing hazardous waste management activities. Therefore, the training program for WFI personnel responsible for Landfill 2638 is consistent with the general training requirements necessary for the long-term care of closed landfills in Wisconsin, in that it should ensure:

- Upkeep, maintenance, and operation of the systems summarized in Section 3.1 critical to the long-term care of the facility,

  and
- Documentation that such work has been completed.

WFI will have on staff a certified landfill Facility Manager and a certified landfill Site Operator as defined by NR 524, Wis. Adm. Code. who are responsible for the operational and maintenance activities required for long-term care of Landfill 2638, including inspections as detailed in Section 7.0. The requirements for these certifications, and well as continuing education, constitute the training programs for these personnel. Copies of these certifications will be included as part of the operating record.

9.0 Preparedness and Prevention Requirements

As Landfill 2638 is a closed landfill with an approved and properly maintained final cover, the potential to release hazardous material into the environment, or be a source of fires and explosions, is greatly minimized, although it is recognized that an incident may still occur. It is anticipated such a release would be associated with a vehicle at the site, or with the monthly loading, hauling, and transport of leachate.

WFI has a Consolidated Emergency Action Plan (WFI Plan) in place and has trained personnel acting as an Emergency Response Team to respond to spills and other incidents at Waupaca Foundry facilities in Waupaca. They are available to respond to an incident at the facilities' local ancillary locations, including the landfills, on a 24/7 basis. The WFI Plan functions as the contingency plan required by Subchapter C, NR 664, Wis. Adm. Code. The WFI Plan is reviewed annually, updated as needed, and retained electronically. The document is also proactively shared on a periodic basis with local first responder institutions (police, fire, emergency government etc.) with an open invite to tour WFI facilities.

The WFI Plan has been developed to ensure all appropriate procedures are identified to protect the health and safety of employees and the surrounding community as well as prevent any adverse environmental impact from unforeseen emergencies. The contingency plan identifies the names and duties of emergency coordinators, facility layouts, evacuation plans, emergency shutdown procedures, and actions taken in response to fires, explosions, or unplanned discharges to any media of the environment. The preparedness and prevention section describes the on-going activities at WFI to prevent the spill of hazardous wastes/substances or fire incidents from occurring and discusses the activities undertaken to keep people and equipment ready for responding to hazardous waste/substances spills. The training plan describes the type and frequency of personnel training required of individuals who routinely handle hazardous materials and who presumably will be the first to respond to spills of hazardous materials. The plan discusses the routine training requirements, levels of training, and the recordkeeping requirements to show that training has been performed.

NR 664.0037, Wis. Adm. Code requires an operator attempt to make arrangements with local emergency response teams, as appropriate for the type of waste handled at the facility and the potential need for the services of these organizations. As no hazardous waste is being handled, the potential of a release of hazardous material at Landfill 2638 has been minimized, and WFI has an established emergency action plan, it has been determined that the services of local emergency response teams will not be required in the case of a release at Landfill 2638.

10.0 Operating Records

An operating record will be maintained as required by NR 664.0073, Wis. Adm. Code. Documentation of historical operations and activities at Landfill 2638 have been archived and are maintained for WFI by the Facility Manager. Currently the operating record is comprised of the following:

- Summary reports and details of incidents at Landfill 2638 requiring implementation of the WFI Consolidated Emergency Action Plan.
- Personnel training records for the certified landfill Facility Manager and landfill Site Operator
- Inspection records and results as detailed in Section 7.0

The operating record will be maintained until the end of the long-term care period.

11.0 Annual Reporting Requirements

NR 664.075 Wis. Adm. Code require several types of hazardous waste generators to report to the WDNR every year on their regulated waste activities. The report, which covers activity during the previous calendar year, must be submitted to the WDNR by March 1 each year. The report for Landfill 2638 is completed and submitted through an online reporting system:

Wisconsin hazardous waste annual report | Wisconsin DNR

12.0 Long-Term Care Notices

A notice of past disposal activities has been filed with the deed for Parcel No. 20 06 43 (Appendix B9). A copy of this notice has also been submitted to the WDNR.

13.0 Long-Term Care Cost Estimate

Table 4 details the tasks, units, quantities, and unit costs to complete the work required annually for the long-term care of Landfill 2638, based on the use of a third party to perform a task. A 10% contingency has been added to the annual cost, and the annual cost has been extended to provide a 30-year long-term care cost.

14.0 Long-Term Care Financial Assurance

A financial instrument (Letter of Credit) is issued by Waupaca Foundry's financial institution and held by the WDNR to demonstrate that funds/resources are available to pay for required post-closure care activities. As applicable, this mechanism may be adjusted annually for inflation.

15.0 Solid Waste Management Units

The following solid waste management units (SWMUs) have been identified as part of this re-license application:

- Landfill 2638, described as Sections 1, 2, 3, 4, and 5, with the boundary shown as the existing limits of waste (Figure LTCP-3)
- Landfill 3171, with the boundary shown as the existing limits of waste (Figure LTCP-3)
- East Leachate Tank, WDNR ID No. 417 (leachate collection for Landfill 2638) and West Leachate Tank, WDNR ID No. 436 (leachate collection for Landfill 3171) (Figure LTCP-3)
- The depression east of Well Nest B-1 (northeast corner of Landfill 2638) on private property adjacent to the WFI property boundary (Figure LTCP-3)
- Landfill 3412, with the boundary shown as the existing limits of waste (Figure LTCP-2)
- East Leachate Tank, WDNR ID No. 660 (leachate collection for closed eastern portion of Landfill 3412) (Figure LTCP-2)
- West Leachate Tank, WDNR ID No. 661 (leachate collection for active western portion of Landfill 3412) (Figure LTCP-2)

The only release to have occurred from a SWMU is associated with Landfill 2638. An undetermined amount of foundry waste that had been stockpiled on Section 4 from fall 1987 to February 1988 during the construction of Section 5 had moved into the depression east of Well Nest B-1 via runoff. Soil sampling was completed in the area of concern to define the extent of foundry materials in the depression and samples were collected and analyzed for lead, cadmium, and chromium to determine potential impacts. Identified foundry waste was removed and placed in Landfill 3171, and no impacts above background values were identified for lead, cadmium, and chromium in soil samples that were analyzed. The investigation was closed by the WDNR in 1991.

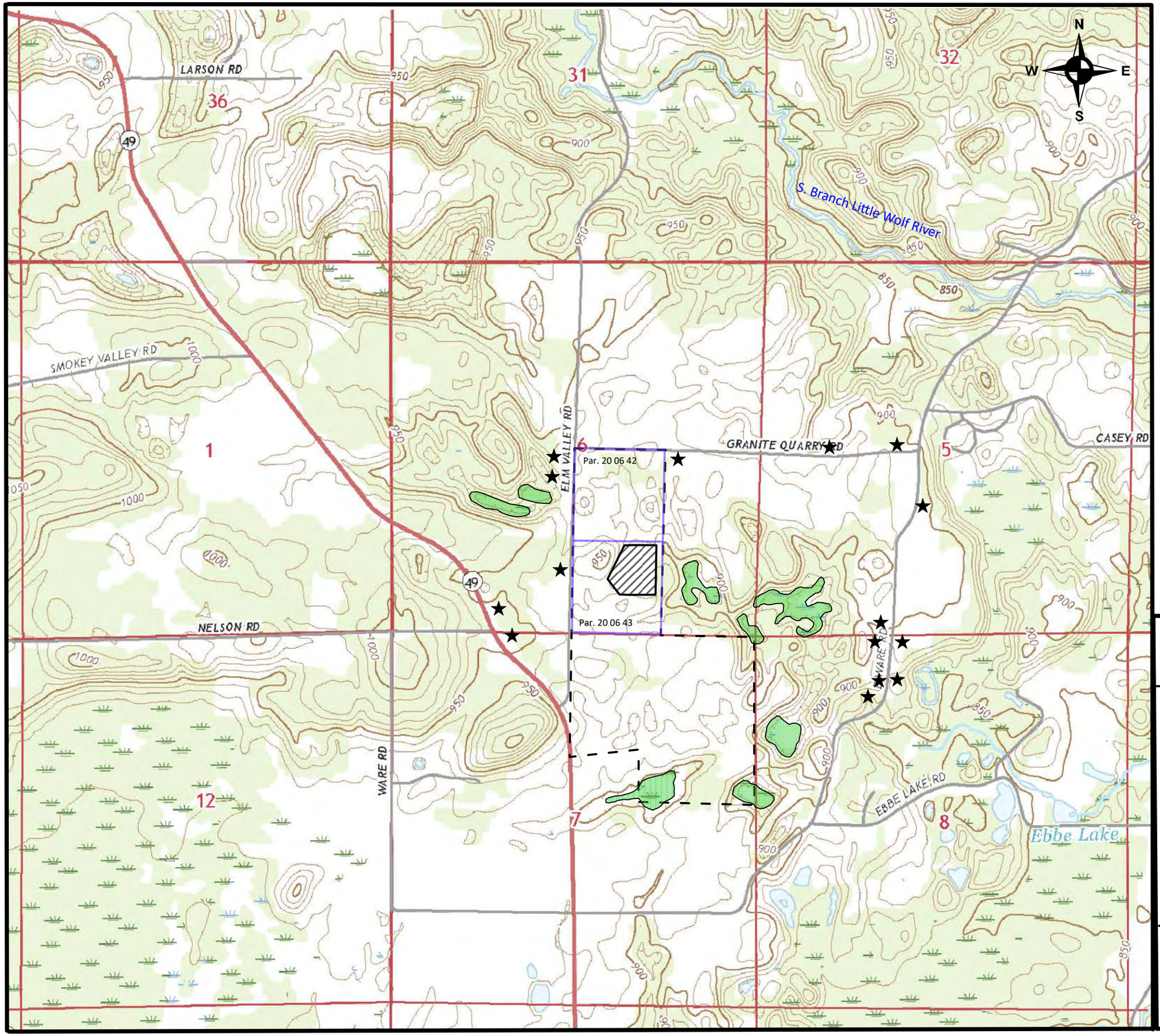
16.0 References

LaBerge, G.L., 1994, Geology of the Lake Superior Region: Geoscience Press, Inc., 313 p.

Mode, W.N., Hooyer, T.S., Attig, J.W., 2015, Preliminary Quaternary Geology of Waupaca County, Wisconsin: Wisconsin Geological and Natural History Survey Open-File Report 2015-03, Plate 1.

Syverson, K.M., Clayton, L., Attig, J.W., and Mickelson, D.M., eds., 2011, Lexicon of Pleistocene Stratigraphic Units of Wisconsin: Wisconsin Geological and Natural History Survey Technical Report 1, 180 p.

Figures



0 0.5 1
mile

Legend

- Landfill No. 2638
- WFI property boundary limits (approx.)
- Private water supply well (approx.)
- Wetlands
- Parcel boundary (approx.) and parcel number (Par. 20 06 42)

From Ogdensburg, Wisconsin, 7.5 Minute Quadrangle (2018)

Contours 1999, National Elevation Dataset
Contour interval 10 ft.

WFI property boundary and wetlands
https://www.waupacacounty-wi.gov/departments/land_information/maps_and_apps.php

Figure LTCP-1

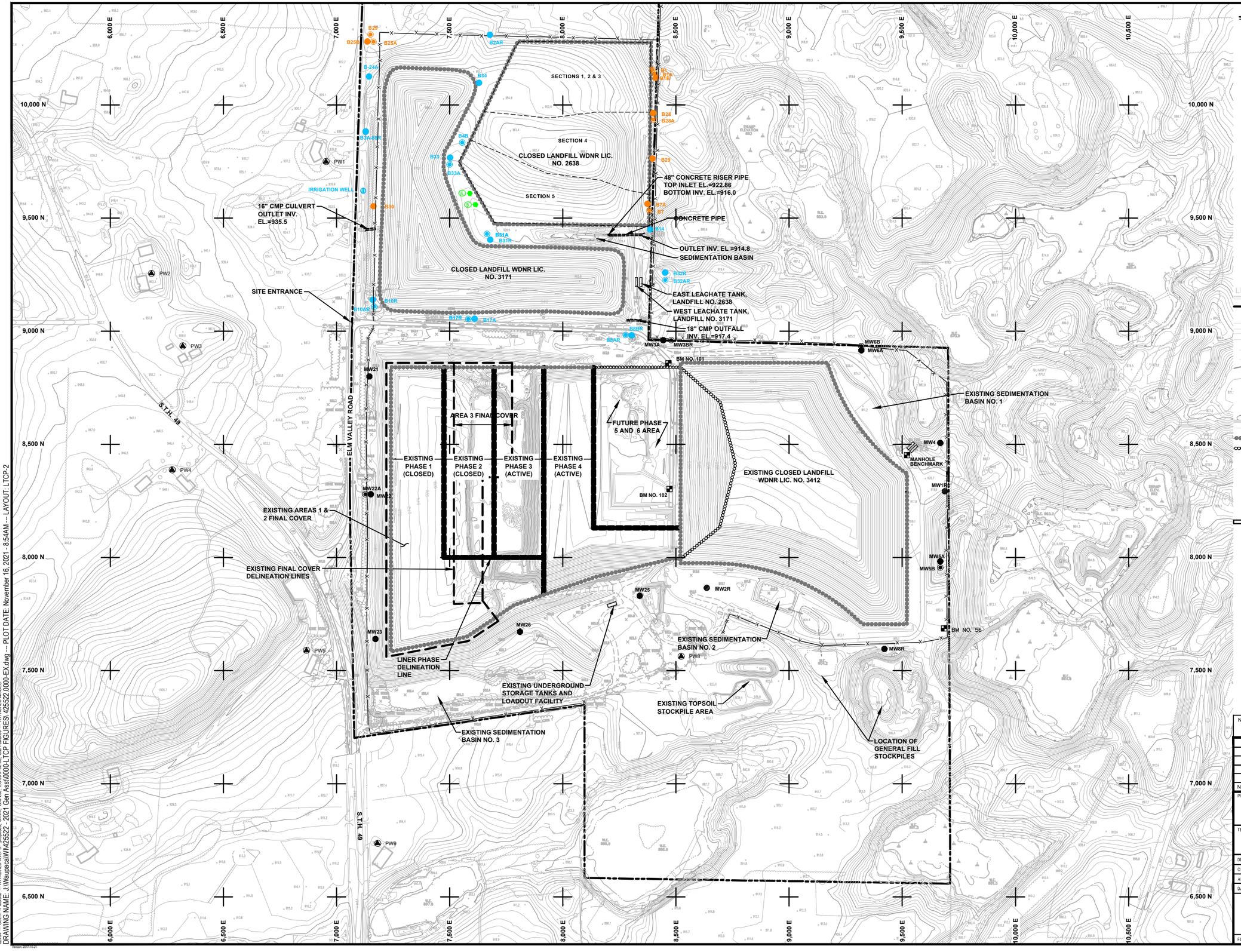
Site Location

Long Term Care Re-License Application
Waupaca Foundry, Inc. Landfill No. 2638

HydroGeo Solutions LLC

Date: 10-01-2021

Revision date: 04-02-2022



NOTES

1. SITE 2638 LOCATED IN THE SOUTHWEST 1/4 OF SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 22 NORTH, RANGE 12 EAST IN THE TOWNSHIP OF WAUPACA, WAUPACA COUNTY, WISCONSIN.
2. TOPOGRAPHY OBTAINED FROM GEOONE OF REYNOLDSBURG, OHIO. DATE OF PHOTOGRAPHY: AUGUST 4, 2006.
3. VERTICAL DATUM IS BASED ON MEAN SEA LEVEL DATUM NGVD 29 IN U.S. SURVEY FEET. TOPOGRAPHIC CONTOUR INTERVAL IS 2 FEET.
4. HORIZONTAL DATUM IS BASED ON A LOCAL GRID THAT WAS TIED INTO THE WAUPACA COUNTY COORDINATE SYSTEM BY WAUPACA LAND SURVEYING ON OCTOBER 25, 2001. THE WAUPACA COUNTY COORDINATE SYSTEM WAS THEN CONVERTED INTO THE WISCONSIN STATE PLANE COORDINATE SYSTEM USING WISCON (VERSION 1.7 beta) SOFTWARE PROVIDED BY THE WISCONSIN CARTOGRAPHER'S OFFICE.
5. THE APPROXIMATE LIMITS OF WASTE AT THE EXISTING LANDFILL AND THE APPROXIMATE PROPERTY LINE WERE SUPPLIED BY WAUPACA FOUNDRY, INC.
6. APPROXIMATE SECTION LINES PRESENTED FOR LANDFILL NO. 2638 WERE DIGITIZED FROM A SITEMAP: WAUPACA FOUNDRY LANDFILL PHASES 1 & 2 WDNR LICENSE NO. 3171 & SECTIONS 1, 2, 3, 4 & 5. WDNR LICENSE NO. 2638 BY AECOM OF GREEN BAY, WI DATED SEPTEMBER 2011.
7. FOR THE GROUNDWATER MONITORING PROGRAM, LANDFILL 3171 WELLS ARE DISPLAYED IN BLUE. LANDFILL 2638 WELLS ARE DISPLAYED IN ORANGE. THE MONITORING RESULTS FROM WELLS B3A-88R, B25, B25A, B25B, AND B30 ARE REPORTED FOR BOTH LANDFILLS, 2638 AND 3171.

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- GRID LOCATION
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING FENCE
- EXISTING BUILDING
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING SPOT ELEVATION
- EXISTING TREES AND/OR BRUSH
- EXISTING WET AREA AND WETLAND LIMITS
- EXISTING EDGE OF WATER
- DRAINAGE DITCH
- EXISTING LIMITS OF BY-PRODUCT BOUNDARY
- APPROVED LIMITS OF BY-PRODUCT BOUNDARY
- PHASE DELINEATION BERM LOCATION
- B7A B32R — EXISTING MONITORING WELL LOCATION (TYP.)
- B7 B32AR — EXISTING PIEZOMETER LOCATION (TYP.)
- PW2 — EXISTING PRIVATE WELLS (TYP.)
- BM NO. 56 — EXISTING BENCHMARK LOCATION (TYP.)
- EXISTING MANHOLE
- EXISTING CULVERT
- EXISTING RIPRAP APRON
- EXISTING LEACHATE STORAGE TANK
- EXISTING LEACHATE CLEANOUT PIPE INLET AND IDENTIFICATION LETTER/NUMBER (TYP.)

N

0 200 400 600 800
SCALE IN FEET

NOTE: THESE PLANS ARE ACCOMPANIED BY A REPORT OF THE SAME TITLE. THESE DOCUMENTS ARE INTERRELATED AND ARE INTENDED TO BE USED TOGETHER.

NO.	BY	DATE	REVISION	APP'D.

PROJECT:
WFI LANDFILLS, LIC. NOS. 2638, 3171, AND 3412
LONG-TERM CARE PLAN
WAUPACA, WI

TITLE:
SITE CONDITIONS

DRAWN BY:	T.FIEBRANZ	PROJ. NO.:	425522.0000.0000
CHECKED BY:	S.EDWARDS		
APPROVED BY:	J.HOTSTREAM		**LTCP-2**
DATE:	NOVEMBER 2021		

TRC
708 Heartland Trail
Suite 3000
Madison, WI 53717
Phone: 608.826.3600

FILE NO.: 425522.0000-EX.dwg

20:34 -- USER: TFiebranz -- ATTACHED XREFS: proposed - transf. Oct 200; EQ 2017-03-06; Site Features -- ATTACHED IMAGES:
DRAWING NAME: J:\Waupaca\WI\425522 - 2021 Gen Asst\0000-LTCP FIGURES\ 425522.0000-EX.dwg -- PLOT DATE: November 16, 2021 - 8:54AM -- LAYOUT: LTCP-2
Version 2017-10-31

NOTES

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4. HORIZONTAL DATUM IS BASED ON A LOCAL GRID THAT WAS TIED INTO THE WAUPACA COUNTY COORDINATE SYSTEM BY WAUPACA LAND SURVEYING ON OCTOBER 25, 2001. THE WAUPACA COUNTY COORDINATE SYSTEM WAS THEN CONVERTED INTO THE WISCONSIN STATE PLANE COORDINATE SYSTEM USING WISCON (VERSION 1.7 BETA) SOFTWARE PROVIDED BY THE WISCONSIN CARTOGRAPHER'S OFFICE.
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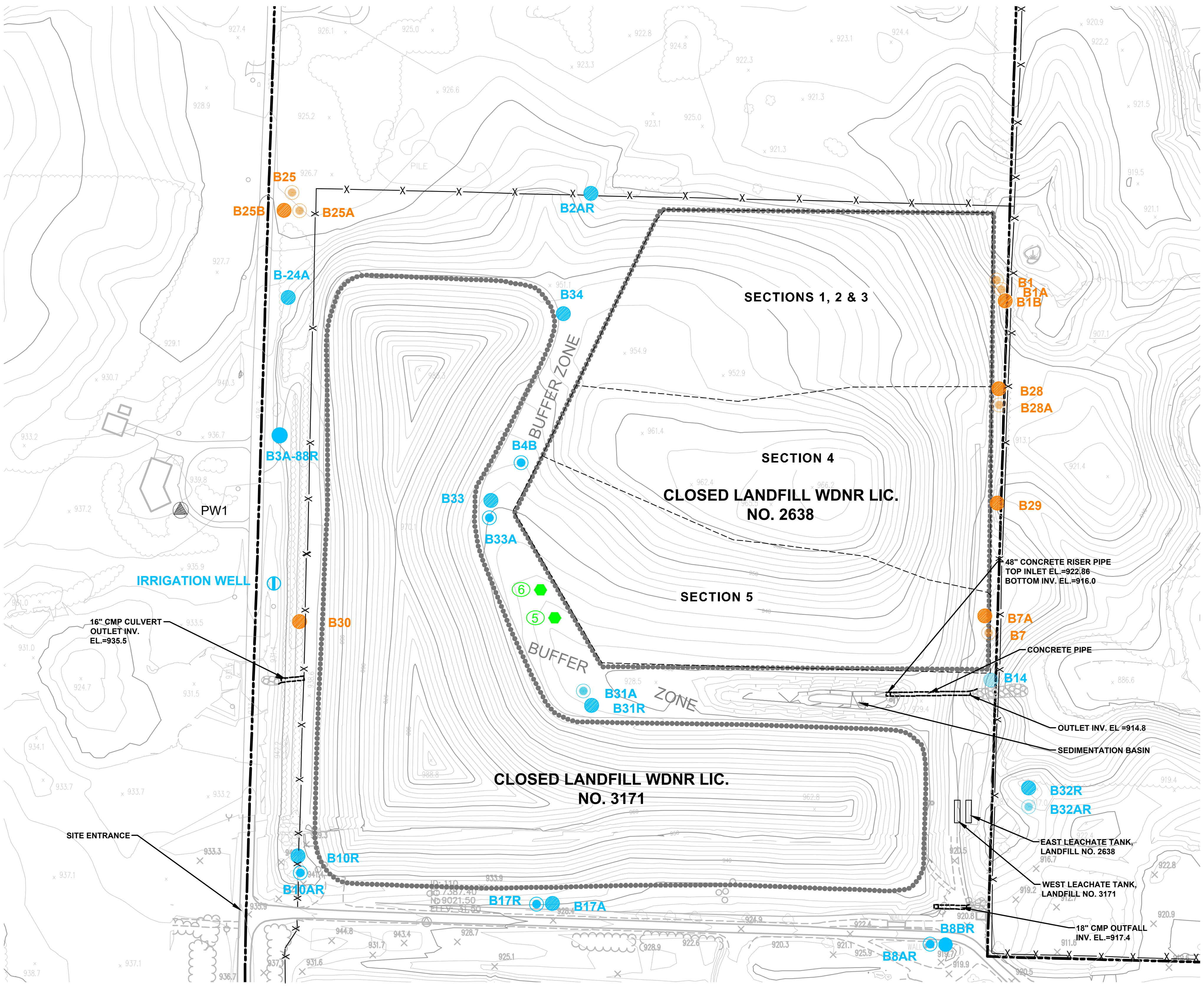

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- GRID LOCATION
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING FENCE
- EXISTING BUILDING
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING SPOT ELEVATION
- EXISTING TREES AND/OR BRUSH
- EXISTING WET AREA AND WETLAND LIMITS
- EXISTING EDGE OF WATER
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N

0 100 200 300 400
SCALE IN FEET

NOTE: THESE PLANS ARE ACCOMPANIED BY A REPORT OF THE SAME TITLE. THESE DOCUMENTS ARE INTERRELATED AND ARE INTENDED TO BE USED TOGETHER.

NO.	BY	DATE	REVISION	APP'D.

PROJECT: WFI LANDFILLS, LIC. NOS. 2638, 3171, AND 3412 LONG-TERM CARE PLAN WAUPACA, WI

TITLE: LANDFILL NO. 2638 SITE CONDITIONS

DRAWN BY:	T.FIEBRANZ	PROJ. NO.:	425522.0000.0000
CHECKED BY:	S.EDWARDS		LTCP-3
APPROVED BY:	J.HOTSTREAM		
DATE:	NOVEMBER 2021		

TRC
708 Heartland Trail
Suite 3000
Madison, WI 53717
Phone: 608.826.3600

FILE NO.: 425522.0000-EX.dwg

DRAWING NAME: J:\Waupaca\WI\425522 - 2021 Gen Asst\0000-LTCP FIGURES\425522.0000-EX.dwg --- PLOT DATE: November 16, 2021 - 8:54AM --- LAYOUT: LTCP-3

Tables

Table 1

Groundwater Monitoring Program
Waupaca Foundry, Inc. Landfill (License No. 02638)

Well Name	Location relative to landfill / Type of well	WDNR ID#	Parameter and WDNR Analytical Code														
			Total Alkalinity, Filt.	Arsenic, Diss.	Cadmium, Diss.	Chloride	Chromium, Diss.	Specific Conductance, Field	Residue, Total Filterable	Fluoride, Diss.	Ground water Elev.	Total Hardness, Filtered	Lead, Diss.	pH, Field	Sodium, Diss.	Sulfate, Diss.	Water Temp.
			39036	1000	1025	940	1030	94	70300	950	4189	22413	1049	400	930	946	10
B-1	Downgradient / deep	401	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A
B-1A	Downgradient / mid.	402	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A
B-1B	Downgradient / water table	403	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A
B-7	Downgradient / piezometer	408	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A
B-7A	Downgradient / water table	409	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A
B-25	Upgradient / deep	428	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A
B-25A	Upgradient / mid.	429	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A
B-25B	Upgradient / water table	430	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A
B-28	Downgradient / water table	420	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A
B-28A	Downgradient / piezometer	444	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A
B-29	Downgradient / water table	421	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A
B-30	Upgradient / water table	431	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A

Well Name	Location	WDNR ID#	Parameter and WDNR Analytical Code						
			Semivolatile Organic Compounds	Iron, Diss.	Manganese, Diss.	NO_3-N, Total	NO_2 & NO_3, N. Diss.	Phenols, Total	VOC Scan
			NR 507, Appendix IV	1046	1056	620	631	34043	NR 507, Appendix III
B-1	Downgradient / deep	401	A	A	A	A	A	A	A
B-1A	Downgradient / mid.	402	A	A	A	A	A	A	A
B-1B	Downgradient / water table	403	A	A	A	A	A	A	A
B-7	Downgradient / piezometer	408	A	A	A	A	A	A	A
B-7A	Downgradient / water table	409	A	A	A	A	A	A	A
B-25	Upgradient / deep	428	A	A	A	A	A	A	A
B-25A	Upgradient / mid.	429	A	A	A	A	A	A	A
B-25B	Upgradient / water table	430	A	A	A	A	A	A	A
B-28	Downgradient / water table	420	A	A	A	A	A	A	A
B-28A	Downgradient / piezometer	444	A	A	A	A	A	A	A
B-29	Downgradient / water table	421	A	A	A	A	A	A	A
B-30	Upgradient / water table	431	A	A	A	A	A	A	A

Notes:
S/A - Semi-annual (May and November)
A - Annual (May)
The sample color, odor and turbidity will also be noted at the time of sampling.
The most recent modification to the environmental monitoring program for Landfill 2638 was approved by WDNR March 9, 2016. The approved program included total dissolved solids. As of July 2017, total dissolved solids was renamed total filterable residue (WDNR ID No. 70300).

TABLE 2

Leachate Monitoring Program
Waupaca Foundry, Inc. Landfill (License No. 2638)

East Leachate Tank -- WDNR ID No. 417

WDNR Analytical Code	PARAMETER	FREQUENCY
1	COMMENT, SAMPLE ODOR	S/A
2	COMMENT, SAMPLE COLOR	S/A
3	COMMENT, SAMPLE TURBIDITY	S/A
10	TEMPERATURE, WATER (DEGREES CENTIGRADE)	S/A
32	LEACHATE, VOLUME PUMPED (1000 GALLONS)	S/A
94	SPECIFIC CONDUCTANCE-FIELD (UMHOS/CM @ 25C)	S/A
150	SUSPENDED SOLIDS, TOTAL (MG/L)	S/A
310	BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C)	S/A
340	CHEMICAL OXYGEN DEMAND, UNFILTERED (MG/L)	S/A
400	PH-FIELD (STANDARD UNITS)	S/A
410	ALKALINITY, TOTAL (MG/L AS CACO3)	S/A
665	PHOSPHORUS, TOTAL (MG/L AS P)	S/A
900	HARDNESS, TOTAL (MG/L AS CACO3)	S/A
929	SODIUM, TOTAL (MG/L AS NA)	S/A
940	CHLORIDE (MG/L AS CL)	S/A
945	SULFATE, TOTAL (MG/L AS SO4)	S/A
1002	ARSENIC, TOTAL (UG/L AS)	S/A
1027	CADMIUM, TOTAL (UG/L AS CD)	S/A
1034	CHROMIUM, TOTAL (UG/L CR)	S/A
1051	LEAD, TOTAL (UG/L PB)	S/A
34043	PHENOLICS, TOTAL (UG/L)	S/A
	VOC Scan (NR 507, Appendix III)	S/A
951	FLUORIDE, TOTAL (MG/L AS F)	A
1007	BARIUM, TOTAL (UG/L BA)	A
1042	COPPER, TOTAL (UG/L CU)	A
1055	MANGANESE, TOTAL (UG/L AS MN)	A
1067	NICKEL, TOTAL (UG/L NI)	A
1077	SILVER, TOTAL (UG/L AS AG)	A
1092	ZINC, TOTAL (UG/L AS ZN)	A
1147	SELENIUM, TOTAL (UG/L AS SE)	A
71900	MERCURY, TOTAL (UG/L HG)	A
74010	IRON, TOTAL (MG/L AS FE)	A

Notes:
S/A - Semi-annual (May and November)
A - Annual (May)

TABLE 3
Groundwater Monitoring Program Concentration Limits
Waupaca Foundry, Inc. Landfill
(Lic. No. 02638)

WDNR Analytical Code	Monitor well / Parameter	ACL	ES
950	B-25 / Fluoride, dissolved (mg/L)	1.2	4

WDNR Analytical Code	Parameter	PAL	ES
620	Nitrate Nitrogen, total (mg/L) [620]	2	10
631	Nitrate + Nitrite, dissolved (mg/L) [631]	2	10
940	Chloride (mg/L) [940]	125	250
946	Sulfate, dissolved (mg/L) [946]	125	250
950	Fluoride, dissolved (mg/L) [950]	0.8	4
1000	Arsenic, dissolved (μg/L) [1000]	1	10
1025	Cadmium, dissolved (μg/L) [1025]	0.5	5
1030	Chromium, dissolved (μg/L) [1030]	10	100
1046	Iron, dissolved (mg/L) [1046]	0.15	0.3
1049	Lead, dissolved (μg/L) [1049]	1.5	15
1056	Manganese, dissolved (μg/L) [1056]	60	300
34043	Phenolics, total (mg/L) [34043]	0.4	2

	Indicator Parameters [WDNR Analytical code]				
	Specific Conductance-field (μmhos/cm @ 25°C) [94]	Sodium, dissolved (mg/L) [930]	Total hardness, filtered (mg/L) [22413]	Total alkalinity, filtered (mg/L) [39036]	Total filterable residue (mg/L) [70300]
Well	PAL	PAL	PAL	PAL	PAL
B-1	730	15	390	350	520
B-1A	750	15	390	360	510
B-1B	830	63	400	430	570
B-7	750	16	400	370	530
B-7A	740	15	400	390	540
B-25	710	14	380	350	510
B-25A	800	16	420	380	560
B-25B	730	15	390	370	510
B-28	890	160	250	380	610
B-28A	890	56	440	410	600
B-29	1200	110	470	510	690
B-30	790	16	430	420	560

Notes:

PAL - Preventive Action Limit (NR 140, Wis. Admin. Code, June 2021)

ES - Enforcement Standard (NR 140, Wis. Admin. Code, June 2021)

ACL - Alternative Concentration Limit (NR 140.28, Wis. Admin. Code, June 2021)

μmhos/cm @ 25°C - micromhos/centimeter at 25 degrees Centigrade

μg/L - micrograms/liter

mg/L - milligrams/liter

Preventive action limits for indicator parameters and alternative concentration limit for fluoride (diss.) at B-25 were calculated per NR 140.20(2), Wis. Admin. Code (June 2021) and Guidance Document PUB-WA-1105 (rev. 2007).

TABLE 4
Long-Term Care Costs
Waupaca Foundry, Inc. Landfill (Lic. No. 2638)

MAJOR COST ITEM / BASIS	UNIT	UNIT COST	QUANTITY	AVERAGE COST PER YEAR (2022 dollars)
Groundwater/Leachate Monitoring				
WDNR Lic. 2638 monitoring plan approved 2022 (see Tables 1 and 2, LTCP). 12 wells, 1 leachate tank, 1 trip blank, 1 field blank, 1 duplicate. Mobilization costs/hourly efforts are an average based on sampling completed between 2016-2021. Unit analytical costs assume new client, WDNR approved laboratory.				
May - Annual sampling				
Mobilization	Each	$ 1,716.00	1	$1,716.00
Monitoring wells -- Field parameters, purging, field filtering	Each	$ 1,082.39	1	$1,082.39
Monitoring wells -- Analyses	Each	$ 5,890.73	1	$5,890.73
East leachate tank -- Analyses	Each	$ 655.25	1	$655.25
GEMS electronic deliverable report	Each	$ 40.00	1	$40.00
November - Semiannual sampling				
Mobilization	Each	$ 1,716.00	1	$1,716.00
Monitoring wells -- Field parameters, purging, field filtering	Each	$ 1,082.39	1	$1,082.39
Monitoring wells -- Analyses	Each	$ 2,546.46	1	$2,546.46
East leachate tank -- Analyses	Each	$ 550.70	1	$550.70
GEMS electronic deliverable report	Each	$ 40.00	1	$40.00
Monitoring Well Inspection				
Completed annually in May in conjunction with annual sampling event. Average hourly efforts based on inspections completed between 2016-2021.				
Annual inspection of groundwater monitoring wells	Each	$ 65.52	1	$65.52
Leachate Hauling				
Based upon mean of 2018 – 2020 annual value of actual leachate collection, Landfill #2638.				
262,800 gallons @ $55/hr hauling 1.25 hr and 6500 gallons/haul	Each	$ 68.75	40	$2,750.00
Leachate Disposal				
Based on leachate disposal at City of Waupaca POTW.				
$4.00/1000 gallon	GAL	$ 0.004	262,800	$1,051.20
Admin Fee ($1,300/year prorated for Landfill #2638)	LS	$ 42.25	1	$42.25
Leachate System Line Cleaning				
Completed biennially. Based on length of lines to be cleaned and typical effort required.				
1800 feet @ $0.095/ft	FT	$ 0.095	1800	$171.00
Mobilization @ $1,000	LS	$ 1,000.00	1	$1,000.00
			Subtotal	$1,171.00
			prorated biennially	$585.50
Leachate Collection Tank Maint./Inspection				
Weekly monitoring of leachate level in tank; monthly monitoring of tank excavation monitoring well				
12 hours @ $50/hr	LS	$ 800.00	1	$800.00
Leachate Tank Replacement				
Assume tank is replaced once every 30 years				
Leachate tank removal/disposal (Assumed value for removal and disposal of tank)	Each	$ 8,000.00	1	$8,000.00
Replacement tank (20,000 gallon single-walled, lined, steel tank. Estimate includes freight. Assume existing PVC base liner is intact and does not need to be replaced.)	Each	$ 81,525.00	1	$81,525.00
Tank installation (Assumes a crane and 2 laborers for one day, and 1/2 to reconnect plumbing.)	Each	$ 7,000.00	1	$7,000.00
Tank instrumentation	Each	$ 7,500.00	1	$7,500.00
Pipe boots (Anticipate up to 5 field fabricated pipe boots for riser pipes.)	Each	$ 500.00	5	$2,500.00
Removal/stockpiling of backfill (Assume excavation with 1.5H:1V sideslopes, a depth of 20 feet and bottom dimensions of 12 feet by 38 feet.)	CYD	$ 6.00	3900	$23,400.00
Replacement of backfill (Assume excavation with 1.5H:1V sideslopes, a depth of 20 feet and bottom dimensions of 12 feet by 38 feet.)	CYD	$ 4.00	3820	$15,280.00
Replacement of geomembrane cover (Footprint based on assumed area of excavation and installation cost for 60 mil HDPE. Will replace with PVC.)	SF	$ 1.00	4000	$4,000.00
Replace soil cover (Assume 0.1 acre of disturbance and 4 feet of cover soil.)	CYD	$ 12.00	81	$972.00
Revegetate area (Increased disturbance area to account for perimeter impacts.)	Acre	$ 3,000.00	0.25	$750.00
Engineering support/field observation/documentation report (Assume up to 2 weeks of engineering support to coordinate replacement tank and WDNR notification. Full time field observation for 2 weeks. No material testing required for re-using existing materials. Documentation report, ~40 hours of engineering and administrative support time.)	Each	$ 27,000.00	1	$27,000.00
			Subtotal	$177,927.00
			prorated over 30 years	$5,930.90
Site Inspection Activities				
Semiannual inspections (spring and fall), with report summarizing maintenance activities completed. Inspections include walkover of entire cover and perimeter berm; inspection of fencing and gate; observation of area around each groundwater monitoring well and leachate cleanout. Monthly maintenance completed as needed. Biennially, condition of benchmarks are checked.				
30 hours @ $50/hr	HR	$ 50.00	30	$1,500.00
Surface Care Costs				
One acre of surface repaired, requiring 100 cubic yds. soil				
Erosion Repair 100 cubic yards @ $16/cyd	CYD	$ 16.00	100	$1,600.00
Seeding 1 acre @ $3,000 acre	Acre	$ 3,000.00	1	$3,000.00
Semiannual Environmental Monitoring Reports				
Two reports prepared and submitted to GEMS. Each report includes all environmental monitoring data, summary and explanation of exceedances, and electronic file.				
Data review - 3 hours @ $150/hr	HR	$ 150.00	3	$ 450.00
Report prepartion and submittal - 3 hours @ $150/hr	HR	$ 150.00	2.5	$ 375.00
Postage	Each	$ 20.00	1	$ 20.00
Well Maintenance/Replacement				
One 55 ft. well replaced in accordance with NR141 standards during a 3-year period.				
$7,500 each/3 years prorated	LS	$ 7,500.00	0.33	$2,475.00
Administration				
Landfill manager activities. Including summarizing monthly leachate hauling records for inclusion in site operating record; review/preparation/submittal of WDNR required reporting; upkeep and maintenance of site operating record.				
20 hours @ $50/hr	HR	$ 50.00	20	$ 1,000.00
			Subtotal:	$36,965.29
			Contingency (10%):	$3,696.53
			ANNUAL GRAND TOTAL:	$40,661.82
30-YEAR LONG-TERM CARE COST =				**$1,219,854.57**

Note: Unit costs based on 2022 dollars

Revision date: 12/22/22