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December 15, 2022

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Waukesha County
SW/Correspondence

Mr. Brett Coogan
Orchard Ridge Recycling & Disposal Facility
W124 N9355 Boundary Road
Menomonee Falls, WI 53051

Subject: Conditional Plan of Operation Approval for the Orchard Ridge Recycling & Disposal Facility (RDF) Eastern Expansion, Southern Unit, License #4491

Dear Mr. Coogan:

The Department of Natural Resources (department) is approving the plan of operation for the proposed Orchard Ridge Recycling & Disposal Facility (RDF) Eastern Expansion, Southern Unit subject to compliance with chs. NR 500 – 538, Wis. Adm. Code and the conditions listed in the attached approval. Please include the attached approval in the written operating record for the landfill as specified in s. NR 506.17, Wis. Adm. Code.

The attachments to this letter include a project summary, the plan of operation approval, environmental monitoring tables, closure and long-term care cost estimate tables, and a summary of existing conditions. This approval does not include the requested NR 140 groundwater standard exemptions in Section 1.5 and the proposed PALs and ACLs for groundwater monitoring wells. The department is continuing to review these items and will issue a separate approval for these items.

Please carefully read the conditions of this approval and the summary of existing conditions since they contain requirements for the construction and operation of the landfill.

Please be aware that a condition of this approval requires revised proof of financial responsibility for closure and long-term care be established within 60 days. The revised proof of financial responsibility must be established based upon the approved costs contained herein and ch. NR 520, Wis. Adm. Code. Please contact Dustin Sholly, owner financial responsibility specialist, at Dustin.Sholly@wisconsin.gov or (608) 866-0154 if you have questions.

Please keep in mind that this approval does not relieve you of obligations to meet all other applicable federal, state and local permits, as well as zoning and regulatory requirements. If you have any question regarding this letter, please contact Ann Bekta at (608) 287-4492 or email at Ann.Bekta@wisconsin.gov or David Buser at (414) 550-8189 or email at david.buser@wisconsin.gov.

Sincerely,

James C. Delwiche

James C. Delwiche
Waste and Materials Management Program Supervisor
Southeast Region

Attachments

cc: Tyler Field – tfield1@wm.com
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PROJECT SUMMARY
ORCHARD RIDGE RECYCLING & DISPOSAL FACILITY (RDF) EASTERN EXPANSION, SOUTHERN UNIT LANDFILL
PLAN OF OPERATION

GENERAL INFORMATION

AUTHORIZED CONTACT

Waste Management of Wisconsin, Inc.
Brett Coogan, District Manager
N96 W13073 County Line Road
Menomonee Falls, WI 53051

LICENSEE AND PROPERTY OWNER: Waste Management of Wisconsin, Inc. (WMWI)

SITE LOCATION: The Orchard Ridge RDF Eastern Expansion, Southern Unit (Southern Unit) is the proposed expansion, which will be located in the South ½ of NE ¼ and SE ¼ of Section 1, T8N, R20E, in Menomonee Falls, Waukesha County, Wisconsin.

ACREAGE AND ACCESS: The existing landfill, Orchard Ridge RDF East Expansion, consists of 44.8 acres. The Southern Unit will consist of a 59.4-acre horizontal expansion and a 17-acre vertical overlay. The combined existing landfill and Southern Unit are referred to as the Eastern Expansion, which will be approximately 104.2-acres. The Orchard Ridge RDF property consists of an approximate 725-acre parcel of land owned by WMWI. Other landfills located on the property include the Parkview RDF (License #3108) located to the north of the Eastern Expansion and the Orchard Ridge RDF (License #3360) located to the west of the Eastern Expansion. The Boundary Road Landfill is also located on the property within the footprint of the Southern Unit. Vehicle access to the landfill is from the site entrance along County Line Road.

DESIGN CAPACITY AND WASTE QUANTITIES: The Southern Unit will provide approximately 10,219,880 cubic yards of design capacity, for a total approved landfill capacity of 15,642,735 cubic yards within the Eastern Expansion. WMWI anticipates it will receive approximately 750,000 tons or 940,000 cubic yards of waste annually. Additionally, the Eastern Expansion will receive approximately 2.3 million cubic yards of waste and soil over the life of the landfill from the proposed exhumation of the Boundary Road Landfill.

SITE LIFE: The Southern Unit will add approximately 7.5 years to the existing site life based on projected disposal rates and the project volume from the exhumation of the Boundary Road Landfill.

ANTICIPATED GEOGRAPHIC SERVICE AREA: The primary areas served by the Orchard Ridge RDF are Ozaukee, Washington, Waukesha, and Milwaukee Counties.

ANTICIPATED WASTE TYPES: The composition of the waste accepted for disposal is expected to be similar to the waste currently disposed of at the existing landfill and will consist of nonhazardous municipal, commercial, industrial, construction and demolition, and special wastes. In addition to the waste that is currently accepted at the Orchard Ridge RDF, the Southern Unit will also accept waste and soil from the Boundary Road Landfill exhumation.

SITE CHARACTERISTICS

For a detailed description of the site characteristics refer to the project summary included with the Feasibility Determination for the Orchard Ridge RDF Eastern Expansion, Southern Unit issued by the department July 30, 2021. Site characteristics of particular relevance to the design and operation of the landfill are summarized below.

GROUNDWATER: The depth to groundwater reported in on-site monitoring wells is typically 7 to 10 feet below the ground surface surrounding the Southern Unit. Section NR 504.06(2)(b), Wis. Adm. Code, requires a 10-foot separation from the bottom of the clay component of liner to the seasonal high-water table, except for zone-of-saturation landfills. Section NR 504.06(4)(a), Wis. Adm. Code, requires that zone-of-saturation landfills be located in a fine-grained soil environment. The feasibility determination determined that site-specific geotechnical information does not sufficiently demonstrate the site meets the definition of a "fine-grained soil environment" under s. NR 500.03 (86), Wis. Adm. code. The site-specific geotechnical information does indicate a significant presence of fine-grained soils; however, coarse grained deposits and non-plastic soils were identified in many boring logs. Many of the coarse-grained deposits are connected making up coarse-grained soil layers and pockets. The geotechnical investigation was limited in scope in the area of the BRL to avoid drilling through waste. The excavation before liner construction of the eastern half of the Eastern Landfill revealed sand seams and areas of non-plastic soils. The eastern half of the Eastern Landfill is a zone-of saturation design. Therefore, the Southern Unit is not a zone-of-saturation landfill, and the design includes a groundwater underdrain under the liner to route groundwater away from the bottom of the clay liner. The feasibility determination granted an exemption to s. NR 504.06(2)(b), Wis. Adm. Code, for the 10-foot separation requirement to the seasonal high-water table.

BALD EAGLE NEST: A bald eagle nest was identified to the south of the Southern Unit. Bald Eagles are not on the endangered list but are still protected by the Bald and Golden Eagle Protection Act (Eagle Act) and the Migratory Bird Treaty Act. Before each construction event, an evaluation will be performed to specifically review the potential for the construction event to create impacts to bald eagles to the extent that these impacts may constitute "disturbance." The assessment of impacts and subsequent mitigation strategies to address construction event impacts that may cause a disturbance of bald eagles will be generally carried out using the U.S. Fish and Wildlife Services "National Bald Eagle Management Guidelines" published in May 2007. Potential mitigation strategies that may be implemented during construction events to limit potential "disturbances" to bald eagles include providing an adequate buffer from identified nesting sites, limiting the duration of the event, or avoiding certain construction activities such as clearing and grubbing within specified distances of an identified nest during the breeding season.

WETLANDS AND REALIGNMENT OF WATERWAY: As part of the Southern Unit development, 3.72 acres of wetlands are proposed to be permanently impacted, 0.19 acres of wetlands are proposed to be temporarily impacted, and approximately 2,578 linear feet of existing waterway are proposed to be impacted and/or realigned. A wetland and waterway permits were issued by the department and US Army Corps of Engineers (Appendix B of the February 18, 2022 plan of operation report) to address these impacts. Additional wetlands will remain around the perimeter of the landfill and will need to be protected.

To protect the proposed non-impacted wetlands and waterways, measures will be taken to prevent inadvertent impacts or destruction of wetlands and waterways not approved for disturbance. Stormwater Best Management Practices (BMPs) will be implemented as prescribed in the site-specific Stormwater Pollution Prevention Plan (SWPPP) (Appendix P of the February 18, 2022 plan of operation report).

The boundary between the permanently disturbed wetlands and wetlands to remain undistributed will be demarcated with signs spaced along the wetland boundary with bold lettering that say, "WETLAND PROTECTION AREA – THIS AREA NOT TO BE DISTURBED", or equivalent. Buffer zones, allowable work areas, wetland locations, and waterway locations will be established and shown on construction drawings.

When practical, a minimum 20-foot-wide undisturbed buffer zone between delineated wetlands and construction features will be established. The undisturbed buffer zones will be demarcated by temporary features that will be visible to equipment operators. These features may include gravel berms constructed end-to-end, fencing, flagging, boulders, or other structures. Gravel berms, if used, would be constructed from gravel and would be 3 feet in height and have 2:1 sideslopes. The base of the berms would be approximately 6 feet in width and will come to a peak at the top. The berms would be constructed in lengths between 0 and 20 feet with spacing between the berms of 4 to 6 feet.

Because of the extent of wetland areas in the vicinity of the Southern Unit, a 20-foot-wide buffer zone is not practicable along the western and portions of the southern boundaries of the Southern Unit. In these areas, other BMPs will be installed and maintained in accordance with the SWPPP and include the following:

- Along the western boundary of the Southern Unit, the proposed perimeter berm is located within Wetland W-1. Therefore, a 20-foot-wide buffer zone is not practicable. A 5-foot-wide "work zone" will be located along the toe of western perimeter berm. This work zone was identified as permanently disturbed in the submitted Wetland and Waterway application and will be used to stage construction equipment for both the construction of a realigned waterway path and the western perimeter berm.

  Wetlands that will remain undisturbed will be demarcated. In addition, a double row of erosion control silt fencing will be placed along the work zone to protect wetland areas that are to remain undisturbed and provide contactors with a visible, physical barrier to warn contractors to prevent equipment encroachment. Temporary construction fencing may be installed, as needed, to further prevent inadvertent wetland disturbance.

- Along the northwestern boundary, a series of ditches are proposed between wetland areas. During construction of these ditches, the wetland areas are not to be impacted. Erosion control fencing and/or temporary construction fencing will be installed near the boundaries of these wetlands to prevent disturbance. Near the interface between the wetland and ditch, care will be taken to avoid impact to the wetland through the use of smaller construction equipment or work will be completed by hand.

- Several areas of temporary wetland disturbance are proposed during the installation of stormwater management and leachate management infrastructure. Erosion control fencing

and/or temporary fencing will be used to provide a physical barrier to prevent equipment encroachment into areas not to be disturbed. Areas of temporary disturbances will be restored to their natural condition to the extent practicable. Features to demarcate the wetland areas to be protected (berms or other BMPs) will be constructed and installed to protect wetland and waterway features. Protective measures will be identified on construction drawings.

The proposed realigned waterway is located within Wetland W-1 along the western boundary of the Southern Unit. It is designed to provide a pathway for discharge (from Stormwater Basin 1 and northern areas) to the remaining segment of the existing waterway. The realigned waterway is approximately 1-foot deep and 5 feet wide and will meander within a 30-foot corridor of Wetland W-1. The realigned waterway is part of the approved wetland and waterway permit (Appendix B of the February 18, 2022 plan of operation report).

Following construction activities within and in the vicinity of wetland and waterway features, the area will be restored to its previously existing or improved condition, to the extent practicable. A copy of the wetland and waterway restoration, monitoring, and corrective measures plan is provided in the Quality Assurance Manual (Attachment 10 of the October 17, 2022 plan of operation report addendum 3). The restoration and improvement activities include the following:

1. Following the construction of the proposed realigned waterway, coir-logs (or similar alternative) will be installed along both inside edges of the realigned waterway's carved path to stabilize and maintain bed and bank for the waterway. The coir-logs will be seeded using a native seed mix that is suitable for establishing native vegetation in low-lying areas. Shrubs and live staking will be planted within the wetland area to enhance the floristic quality of the riparian wetlands. Root wads and footer logs will be installed within the waterway to protect the outer bank of the waterway meanders from erosion and to provide an aquatic habitat.

2. Areas of temporary wetland disturbance will be restored to their former condition following construction. These areas include the proposed east culvert at a section of Wetland W-1, an area adjacent to a riprap pad installation at the discharge of Stormwater Basin 1, and in the working area near the existing sanitary manhole along Hwy 100. In these areas, topsoil will be segregated from the subsoil during construction. Following construction, the soil will be returned, and the area will be restored using applicable seed mixes.

BOUNDARY ROAD LANDFILL: Boundary Road Landfill (BRL) (License #11, EPA ID #WID0558735994) is a National Priorities List (NPL) listed site located on the Orchard Ridge RDF property, including within the footprint of the Southern Unit. Development of the Southern Unit includes the excavation of BRL waste (both inside and outside the footprint of the Southern Unit) and re-disposal of the waste within an adjacent landfill phase.

BRL accepted waste from around 1954 until 1971. In the early 1980s, WMWI installed a vegetated soil cover on BRL and constructed a slurry cutoff wall and leachate collection system along the southern perimeter of BRL. In the late 1990s, WMWI performed remedial action (RA) according to an approved Record of Decision (ROD) and the department's Environmental Repair Contract (#SF-90-01). The RA included replacement of the existing soil cover with a final cover consisting of 2 feet of compacted clay, 1.5 feet of rooting zone and 6 inches of topsoil. WMWI also completed 12 acres of asphalt on the

Orchard Ridge RDF property, which overlies a portion of the BRL waste. WMWI constructed three leachate extraction wells, landfill gas and leachate piping, blower, and a flare for BRL.

The BRL waste volume is estimated to be 1.3 million cubic yards with waste thicknesses ranging from 10.5 feet to 27 feet. In addition to the BRL waste, materials to be excavated will include the final cover soils (estimated 400,000 cubic yards), the grading layer (estimated 300,000 cubic yards), and soil below the BRL waste that is excavated to reach the design subbase grades (estimated 300,000 cubic yards) for the Southern Unit. This will result in a total estimated excavation volume of 2.3 million cubic yards.

LANDFILL DESIGN

The Southern Unit will be divided into three phases (Phases 5, 6, and 7). Each phase will be divided into two modules (Module 1 and Module 2). The modules are proposed to stretch east to west across the Southern Unit.

SUBBASE GRADES: Subbase grade development will consist of clearing and grubbing existing vegetation, removal of BRL soil and waste to subbase grades, soil testing, construction of the perimeter berms, backfilling with clean soil where required, construction of the underdrain system, undercutting leachate collection system lines and sumps, finish-grading, and documentation.

As mentioned, all BRL waste and impacted soils within the footprint of the Southern Unit will be removed during the establishment of subbase grades. BRL waste is expected to be encountered at depths above and below the proposed subbase grades so additional cut and fill will be required following removal of waste. Because BRL waste is below the high groundwater table, subbase grades will also be below the high groundwater table to minimize the amount of backfill required following waste removal. Subbase grades were designed to maintain separation from an intermediate sand seam located within or near the base of the BRL waste within the western portion of the Southern Unit. The excavation for subbase preparation will extend to approximately 1-foot below the base of the BRL waste or to the proposed subbase grades (whichever is deeper). Additional excavation may be required if confirmation soil sampling indicates impacted soils are present greater than 1-foot below BRL waste. Subbase fill, meeting the requirements of a fine-grained environment, will be used to backfill areas to achieve the designed subbase grades, as needed.

During excavation, should waste and/or soils be found in a saturated condition to the extent that they cannot be removed and replaced using traditional undercut and backfill methods, dewatering will be performed as needed to allow for removal and fill where required.

The proposed construction sequence and procedures for removing and replacing saturated waste and/or soils to achieve subbase grades are described below:

- Remove BRL waste and overburden soils to subbase grades and evaluate if remaining waste and soils below subbase grades can be removed and replaced with subbase fill utilizing traditional excavation and backfilling methods without dewatering. This may be evaluated by excavating a pit in waste and soils below subbase and visually inspecting to see if the pit fills in with free liquids or if the sidewalls of the excavation slough due to saturated conditions.

- If the conditions above are not exhibited, subbase excavation and backfilling may proceed without dewatering. Should these conditions be exhibited, a dewatering system will be constructed and operated to maintain free liquid levels below the bottom of the subbase over excavated areas until backfilling with subbase fill material to subbase elevations is complete.

- Dewatering may be accomplished by excavating a temporary sump below the excavation elevation and placing and operating a pump to remove and maintain free liquid level below the excavation. Dewatering will continue until all materials have been removed and subbase fill has been adequately placed and compacted to the proposed subbase grades.

After subbase grades have been established, an investigation of the subbase grades will be performed to determine the presence of unsuitable subgrade soil as required by s. NR 504.06(4)(d), Wis. Adm. Code. The test pits will be performed on a 100-foot grid to determine if granular or silty soils are detected within 5 feet of subbase grade. The investigation will not be done in areas where the BRL waste is 5 feet or more below subbase grades, since fill will be placed in those areas below subbase grades. A layout of the test pit locations and areas to be evaluated are provided on Plan Sheet 5 of the February 18, 2022 plan of operation report. Soil borings may be used to supplement the test pits or conducted in areas where test pits are not practicable. If granular or silty soils are encountered within 5 feet of subbase grade, the granular or silty soils will be removed and replaced with compacted, fine-grained soils.

Subbase grades are shown on Plan Sheet 6 of the February 18, 2022 plan of operation report. The proposed subbase grades range from approximately 732 to 755 feet below mean sea level (MSL).

Because the development of subbase grades will include the exhumation of BRL waste, stormwater that enters the excavation area will be treated as leachate and routed to temporary sumps located within the low area of the excavation. This contact water will be collected and pumped into the leachate collection system to be discharged to the sanitary sewer system or recirculated on to waste in areas of the Eastern Expansion with active gas extraction systems.

UNDERDRAIN SYSTEM: An underdrain system will be installed below subbase grades along the base and sidewalls to intercept and collect potential groundwater seepage. The underdrain system will consist of a double-sided geocomposite below the subbase grades, which mimic the base grades and flow of leachate within the landfill. The geocomposite layer will extend up the sidewalls to the approximate elevation of the existing ground surface. Below the underdrain geocomposite, an additional minimum 18-inch-wide high capacity single-sided geocomposite will be placed below the centerline of each leachate collection trench cut.

The intercepted groundwater collected by the geocomposite in the east half of the landfill will drain to the east edge of each module and groundwater collected within the west half of the landfill will drain towards the west edge of each module. The groundwater will be collected within an underdrain header trench which drains towards an underdrain sump and/or the groundwater will drain directly to the underdrain sump via the geocomposite drain layers. The underdrain header trench will be located along the toe of the sidewall slope of the landfill. The underdrain header trench will be approximately 3-feet wide and will be filled with select aggregate fill underlying a geotextile filter. Six underdrain collection sumps will be located along the eastern toe of slope and seven underdrain sumps will be located along the western toe of slope. Each module will have one sump on each end except Phase 7, Module 2, Phase 6, Module 1 and Phase 7, Module 1. The west end of Phase 7, Module 2 will drain towards Phase 7,

Module 1 sump. Phase 6, Module 1 and Phase 7, Module 1 will each have two sumps on each end. Each sump will have a 12-inch diameter (SDR 11) HDPE riser pipe and a pump, which will pump leachate to either the leachate forcemain or an optional underdrain system forcemain.

The calculated allowable design transmissivities of the proposed underdrain geosynthetics and the design hydraulic conductivity of the proposed underdrain header trench select aggregate fill are provided in Appendix G of the February 18, 2022 plan of operation report. The geometry of the drainage features, as well as the transmissivities of underdrain geosynthetics and hydraulic conductivity of the select aggregate fill used for the construction of the Southern Unit will meet or exceed the values used in the analysis. Further analysis of drainage properties of geosynthetics will be performed prior to construction.

As shown in the results table (Appendix G of the February 18, 2022 plan of operation report), a second geocomposite drainage layer is required for the underdrain collection trench to convey the upgradient flow at the low end of the trench. This second geocomposite is the high capacity geocomposite mentioned above. The second geocomposite is only required for the lower half of the underdrain collection trench. However, additional geocomposite may need to be placed based on-site conditions during construction.

The underdrain liquid will be handled in one of three ways over the course of the Southern Unit's operation and closure:

1. If testing of the underdrain liquids does not meet applicable Wisconsin Pollutant Discharge Elimination System (WPDES) permit requirements, the liquids will be pumped to the local wastewater treatment plant with the leachate.

2. If testing of the underdrain liquids indicates that the WPDES permit requirements are met, the underdrain liquids may be discharged to the perimeter drainage ditch.

3. If testing of the underdrain liquids shows that the liquids marginally miss the WPDES permit requirements and can be treated to meet those requirements, then the underdrain liquids may be treated onsite to meet the standards.

BASE GRADES: The proposed base grades are depicted on Plan Sheet 7 of the February 18, 2022 plan of operation report. The base grades range from approximately 736 to 759 feet MSL. The interior sidewalls are designed at a maximum of 3 horizontal to 1 vertical slope from the base to the top of the berm. The base grades are designed with a minimum 2% slope towards the leachate collection pipes and a flow distance of less than 130 feet to the leachate collection pipes.

LINER DESIGN: The base liner will consist of 4 feet of compacted clay overlain by a 60-mil textured HDPE geomembrane. The clay used in the liner will meet the specifications listed in s. NR 504.06(2), Wis. Adm. Code. The 60-mil HDPE smooth or textured geomembrane will be placed directly on top of the compacted clay liner. A geotextile cushion will be placed directly above the geomembrane to protect the geomembrane. The geotextile will consist of a minimum 16 oz/sy nonwoven, needle punched, polyester or polypropylene fabric that will meet the requirements in s. NR 504.06(5), Wis. Adm. Code.

If compacted clay liner is partially constructed and left exposed over a winter, the 1-foot-thick clay layer below the top 6-inch lift shall be re-tested for density and hydraulic conductivity in accordance with ch. NR 516, Wis. Adm. Code. If the results of this testing indicate the compacted clay layer meets the requirements specified in ch. NR 504, Wis. Adm. Code, then the top 6-inch clay layer shall be disked, recompacted, and tested in accordance with ch. NR 516, Wis. Adm. Code. If the compacted clay layer does not meet the requirements for density and/or hydraulic conductivity, the 1-foot-thick clay layer and the top 6-inch lift shall be disked, recompacted, and tested in accordance with ch. NR 516, Wis. Adm. Code.

TRIANGLE AREA: To maximize airspace within the Southern Unit, Phase 5 Module 1 consists of a triangle shaped area at the northwest corner where Phase 5 Module 1 will tie into existing Phase 2. This area is referred to as the Triangle Area. Piping and other structures along the edge of Phase 2 will need to be extended or relocated during construction of the Triangle Area as follows.

During development of the subbase grades and proposed perimeter berms in the Triangle Area, two gravity flow underdrain discharge pipes and one underdrain cleanout riser will be impacted. The non-perforated underdrain discharge pipes will be extended during the construction of the Southern Unit northwestern perimeter berm and the northwest access road. The pipe extensions will be rerouted from the current location of the pipe discharge to the proposed enlarged riprap pad located near the discharge of Stormwater Basin 1. The existing discharge pipes will be fused or connected with a flange to the proposed pipe extensions at its existing discharge location.

During construction of the composite liner within the Triangle Area, manhole SSR03E will be removed and relocated to the proposed western perimeter berm. In addition, portions of the leachate cleanout riser and leachate head well will be removed and temporarily capped in order to construct the composite liner system. The sideslope riser will be propped/held up with a temporary structure to maintain the alignment of the feature. During the removal of access manhole SSR03E, the existing forcemain will need to be disconnected from the manhole. During this time, the leachate collection pumps within the Eastern Expansion will be temporarily turned off to avoid leachate from being pumped into the forcemain during its rerouting.

During the composite liner tie-in, the existing leachate collection drainage layer will be tested (with a minimum of three representative samples) to confirm the hydraulic conductivity meets a minimum requirement of 1 x 10-1 centimeters per second (cm/sec).

During construction of the Triangle Area, temporary leachate extraction infrastructure will be used such as aboveground leachate forcemain, manual extraction operations, or other similar options. At no time during construction of the extension of the sideslope riser will head be allowed to accumulate in amounts greater than 1-foot on the liner as discussed in the September 16, 2022 plan of operation report addendum 1.

The construction sequence for this sideslope riser extension is:

- Keep existing leachate sideslope riser, and pump, active by utilizing a temporary forcemain pipe within the limits of waste of East Expansion Phase 2 to convey liquids from the SSR03E north to

a connection point on the existing forcemain outside the tie-in limits proposed for Southern Unit Phase 5 Liner.

- Construct the Phase 5 Module 1 composite liner.
- Construct the perimeter infrastructure, including the new sideslope riser manhole, forcemain, and electric panel.
- Abandon the existing sideslope riser, install the 18-inch sideslope riser pipe from Phase 2 to the new sideslope riser manhole, install pump, and energize system.
- Abandon the old electrical panel.

Following installation of the leachate collection drainage layer in the Triangle Area, one leachate collection sideslope riser and access manhole, one leachate cleanout riser, and one leachate head well will be impacted. To maintain operation of these features, they will be extended to the western perimeter berm of the Southern Unit. The leachate collection cleanout riser (CO1EA) and sampling port riser for leachate head well LHW05E will be extended during construction of the composite liner system in the Triangle Area. The leachate collection cleanout riser and head well will be extended to the proposed western perimeter berm to maintain access to the features. The pipe extensions for the leachate collection sideslope riser, cleanout riser, and head well sampling point riser will be placed atop the base grades of the Triangle Area. To avoid additional bends in the pipe extensions, additional select aggregate fill will be mounded under the pipe extensions to support the structures. Select aggregate fill will also be placed above the pipe extension to protect the pipe from the waste. The select aggregate fill will be placed at a 3:1 slope to provide a stable base and smooth transition for the pipe extensions.

LEACHATE COLLECTION AND MANAGEMENT: The leachate collection system will consist of a 12-inch-thick leachate collection drainage layer having a permeability of 1 cm/s or greater. The drainage layer will be placed over the liner on the base and sidewalls to facilitate leachate flow toward a network of leachate collection pipes. The base grades are designed in a herringbone pattern with a minimum 2% slope towards leachate collection trenches.

The leachate collection pipes will be located within the leachate collection trenches and will be sloped at a minimum of 1 percent to the west and east edges of the landfill. The leachate collection pipes will either drain into a leachate collection sump or a leachate collection header that drains towards a leachate collection sump. The leachate collection lines are spaced to maintain a maximum flow length to the leachate collection pipe of less than 130 feet.

The leachate collection piping will consist of 6-inch-diameter perforated SDR 11 HDPE pipes. The perforated leachate collection pipe will be bedded in select aggregate fill within the leachate collection trenches constructed in the liner base. The trench will have a V-shaped cross-section, be a minimum of 18-inches deep, and have trench sidewall slopes of 6:1. The header trenches near the sidewalls will be no steeper than 3:1. The proposed leachate collection line length for the Southern Unit is detailed below. Leachate collection lines are measured from the clean-out to the toe of the opposite slope.

Leachate Collection Line Lengths

Phase	Line Location	Maximum Line Length (feet)
Phase 5, Module 1	West Header	490
	East Header	300
	North Line	1,540
	South Line adjacent to MH05E and MH11E	1,490
Phase 5, Module 2	Line adjacent to MH06E and MH12E	1,440
Phase 6, Module 1	East Header	550
	North Line adjacent to MH13E	1,450
	South Line adjacent to MH07E and MH14E	1,710
Phase 6, Module 2	Line adjacent to MH08E and MH15E	1,660
Phase 7, Module 1	East Header	390
	North Line adjacent to MH09E and MH16E	1,610
	South Line adjacent to MH17E	1,560
Phase 7, Module 2	West Header extending north through Phase 7, Module 1	460
	East Header	320
	North Line adjacent to MH10E	1,510
	South Line	1,480

The leachate collection sumps are located along the east and west sides of the Southern Unit. A pump will be installed in each leachate collection sump to remove liquids via a sideslope riser pipe. An 18-inch-diameter perforated pipe will be placed horizontally along the bottom of the sump and perpendicular to the sideslope of the perimeter berm. The pipe will rest on an HDPE base plate in each sump. The perforated section of the riser pipe will extend from the bottom of the sump approximately 5 feet vertically up the landfill sideslope. A non-perforated section of the leachate sideslope riser pipe will extend to the perimeter access manhole. The riser pipe along with leachate collection cleanouts located adjacent to the sideslope riser will be bedded in a flat-bottom trench constructed up the sidewall.

Leachate is pumped from the sumps via a sideslope riser pump to the double-encased (dual-contained) forcemain. From there, it will be pumped to the existing sewer connection located along County Line Road via lift station LPS01 or a proposed connection located at the existing sanitary sewer located along Brown Deer Road, south of the Southern Unit. WMWI has a treatment agreement with the Milwaukee Metropolitan Sewerage District (MMSD) for this discharge (Appendix J of the February 18, 2022 plan of operation report).

Two leachate head wells will be installed in each landfill module (LHW09E through LHW20E) to measure the leachate head.

Proposed leachate conveyance forcemain will be located along the eastern and western perimeters of the Southern Unit. The leachate forcemain will consist of a 4-inch diameter conveyance pipe inside an 8-inch-diameter containment pipe. The existing leachate collection forcemain located along the southern boundary of the East Expansion, it will remain in place and be avoided during the Southern Unit liner tie-in construction with the East Expansion. Following the connection of the new forcemain, the existing portion of the forcemain located along the southern boundary of the East Expansion will be abandoned in-place.

CLAY WEDGE ON TOP OF SIDEWALL: A clay wedge will be constructed on top of the sidewall, outside the limits of waste on the Southern Unit. The clay wedge maximizes the waste filling volume while maintaining the originally designed footprint. It also assists in controlling odors by terminating the leachate collection drainage layer lower on the sidewall.

The clay wedge is proposed to be a maximum 3-foot vertical high clay wedge located along the interior edge of the sidewall within the Southern Unit horizontal expansion. The clay wedge thicknesses may vary in the Triangle Area and northeastern corner of the Southern Unit to allow for the tie-in with the Eastern Expansion.

The exterior slope of the clay wedge will be 3:1 to the perimeter drainage ditch rather than the 2:1 slope approved for the Eastern Expansion. The clay wedge will be constructed with a 1:1 interior slope. The clay wedge will be constructed with the same materials used for the clay liner.

FINAL GRADES AND COVER SYSTEM: There are three final cover system options for the Southern Unit. These final cover system options include the following layers, from the bottom up:

- **Option 1**
  - 6-inch-thick grading layer
  - 24-inch-thick compacted select clay fill, meeting the requirements of s. NR 504.06(2)(a), Wis. Adm. Code
  - A minimum 40-mil-thick double-sided textured geomembrane, meeting the requirements of s. NR 504.07(5), Wis. Adm. Code
  - Geocomposite drainage layer, meeting the requirement of s. NR 504.07(6)(a), Wis. Adm. Code
  - 30-inch-thick general fill rooting zone layer (treated biosoil with diesel range organics (DRO) and gasoline range organics (GRO) concentrations <10 mg/kg or clean general fill)
  - 6-inch-thick topsoil layer

- **Option 2**
  - 6-inch-thick grading layer
  - 24-inch-thick soil barrier layer, meeting the requirements of s. NR 504.07(4)(a)(12), Wis. Adm. Code
  - Geosynthetic clay layer (GCL), meeting the requirements of s. NR 504.07(4)(a), Wis. Adm. Code
  - A minimum 40-mil-thick double-sided textured geomembrane, meeting the requirements of s. NR 504.07(5), Wis. Adm. Code
  - Geocomposite drainage layer, meeting the requirement of s. NR 504.07(6)(a), Wis. Adm. Code
  - 30-inch-thick general fill rooting zone layer (treated biosoil with GRO/DRO concentrations <10 mg/kg or clean general fill)
  - 6-inch-thick topsoil layer

- **Option 3**
  - 6-inch-thick grading layer

- 24-inch-thick soil barrier layer, meeting the requirements of s. NR 504.07(4)(a)(12), Wis. Adm. Code
- Geosynthetic clay layer (GCL), meeting the requirements of s. NR 504.07(4)(a), Wis. Adm. Code
- A non-woven geotextile cushion and integrated drainage system geomembrane, meeting the requirement of s. NR 504.07(6)(a), Wis. Adm. Code
- 30-inch-thick general fill rooting zone layer (treated biosoil with GRO/DRO concentrations <10 mg/kg or clean general fill)
- 6-inch-thick topsoil layer

Per s. NR 504.06(4)(a), Wis. Adm. Code, the compacted select clay layer may be replaced with a GCL overlying a minimum 24-inch-thick soil barrier layer. The 24-inch-thick soil barrier layer, which may consist of treated biosoil if allowed for beneficial reuse per the BRL Property Redevelopment Plan (Attachment 8 of the October 17, 2022 plan of operation report addendum 3), will meet the soil requirements of s. NR 504.07(4)(a)(12), Wis. Adm. Code, and will be placed in accordance with s. NR 504.07(4)(a), Wis. Adm. Code, and as detailed in the quality assurance manual. The biosoil must also have GRO/DRO concentrations less than 10 mg/kg as required by the department's June 6, 1995, plan of operation approval for the biopile solid waste processing facility (License # 3783).

An optional integrated drainage system (IDS) is proposed that incorporates a combined geomembrane barrier and a drainage media to replace the traditional geocomposite drainage layer placed above the geomembrane. The IDS will consist of the following components:

1. A combined geomembrane / drainage geosynthetic product. The bottom-facing side of the liner will be textured similar to existing geomembrane applications. The upper-facing side of the liner includes nubs to provide voids for drainage. Multiple products may meet this definition that include current products manufactured by Agru such as Super Gripnet® Liner and MicroDrain® Liner. Other manufacturers / products may also become available as the use of IDS develops.

2. A non-woven geotextile will be placed above the IDS layer to provide filtration of the soil and stormwater and reduce intrusion of the soil into the drainage voids. The non-woven geotextile will be a minimum 6 oz/sy.

The optional IDS will meet the design intent of s. NR 504.07(6)(a), Wis. Adm. Code, including:

- A geosynthetic drain layer of equivalent or greater capacity compared to one foot of sand with a minimum hydraulic conductivity of 1.0E-03 cm/sec.

- The maximum head in the drain layer shall be confined within the thickness of the drain. Drain calculations are based on saturated characteristics of the overlying soils.

The IDS products available are manufactured using both linear low-density polyethylene (LLDPE) and high-density polyethylene (HDPE) materials. WMWI proposes to use either material for the geomembrane provided the product meets the minimum average roll values (MARVs) outlined in the Plan of Operation and the current Geosynthetic Research Institute (GRI) GM17 LLDPE Standard Specification.

In addition to hydraulic capacity, the layering must also achieve stable conditions for the final cover slopes based on interface and internal shear strength of the cover components. Prior to construction, veneer stability analyses will be performed to evaluate the cover configuration, slope section and length, with interface testing results for the proposed cover materials and normal loads.

The IDS products are manufactured with a smooth edge to allow double-wedge welding between adjacent sheets. A special cutting tool or grinder can remove nubs or spikes from cross seams as needed for welding to meet installation specifications.

STORMWATER CONTROL SYSTEM: The stormwater management system is designed to provide stormwater and sediment controls that will meet the requirements of s. NR 504.09, chs. NR 103, NR 151, and NR 216, Wis. Adm. Code. The stormwater control system consists of ditches, culverts, diversion berms, downslope flumes, sedimentation basins, and an updated biofilter. The surface water and sediment management system are designed to:

- Provide temporary and permanent erosion and sediment control features during construction, operation, and post-closure care.

- Control increases in point or nonpoint sediment load and runoff discharged onto adjacent property and adjacent wetlands.

- Control the erosion of existing and constructed surface water drainage features.

- Provide containment of surface water that might come in contact with waste or leachate.

- Protect the water quality–related functional values of adjacent wetlands.

Erosion control measures will be incorporated into each aspect of development and operation. During construction, temporary diversion berms and/or ditches, silt fence, and/or hay bale check dams will be used to divert surface water and control erosion in active areas.

The proposed Southern Unit will affect existing stormwater and sedimentation basins as follows:

- The existing east sedimentation basin will be enlarged to received additional runoff from the Southern Unit. An additional culvert will be added for the east sedimentation basin to account for the additional runoff from the final cover of the Southern Unit. The current discharge from the east sedimentation basin will be used and the biofilter will be rerouted and shortened to extend just past the existing emergency spillway. The biofilter will discharge from the southeastern side of the east sedimentation basin into the east culvert that will convey treated stormwater into the west-east perennial waterway (Waterway S-1).

- The configuration of stormwater basin 1 will remain unchanged. During construction of the realigned waterway, the discharge from stormwater basin 1 will be pumped to the proposed south sedimentation basin or other on-site sedimentation basin. However, after the realigned waterway is established, its outflow will be reinstated and directed into Wetland W-1 and the realigned waterway.

- The existing BRL Pond (stormwater basin 3) located on the southern side of the BRL is located partially within the footprint of the Southern Unit. The stormwater basin will be redeveloped into the proposed south sedimentation basin as part of the subbase grade development of the Southern Unit.

- The proposed south sedimentation basin will be located to the south of the Southern Unit. Seven culverts will be placed under the access road to discharge flow from the perimeter ditches into the basin. An outlet structure and emergency spillway will be constructed along the eastern side of the sedimentation basin to discharge into the southeastern ditch.

- Stormwater basin 2 (located in the southeastern corner of the Southern Unit) is currently used as part of a passive surface water treatment area located in the eastern boundary of the BRL. Stormwater basin 2 will be dewatered for the construction of the east culvert and reconstructed to be used as a potential treatment area for underdrain liquids, while the modules of the Southern Unit are developed. During the last construction event, the basin will be dewatered again and most of its area will be used for the construction of the southeastern corner perimeter berm.

Following closure, surface water collected over the final cover will be controlled by the perimeter drainage ditches, diversion berms, downslope flumes, energy dissipaters, and culverts. Water managed through this infrastructure will be directed to the sedimentation basins.

GAS COLLECTION AND CONTROL SYSTEM: An active gas management system currently exists on-site and collects gas from the East Expansion. Landfill gas generated by the Eastern Expansion, which includes the Southern Unit, will be extracted by a series of vertical gas extraction wells, belly collectors, and side slope gas extraction collectors connected to the existing landfill blower via laterals and headers. Landfill gas will continue to be routed to either a flare for combustion or the landfill gas to energy plant.

Vertical gas extraction wells will have a maximum 150-foot radius of influence, with a lesser radius of 125 feet (typical) along the landfill perimeter. Vertical gas extraction wells will be installed to meet the requirements of s. NR 504.08, Wis. Adm. Code. Additionally, to provide for earlier landfill gas collection, belly gas collectors may be installed along the floor of the constructed cells, and leachate collection lines may be connected to vacuum to provide early gas collection.

Four new gas probes will be constructed at the time that the adjacent liner areas of the Southern Unit are constructed for a total of 9 gas probes around the perimeter of the Eastern Expansion landfill.

BRL EXHUMATION

BRL EXHUMATION AND SOUTHERN UNIT DEVELOPMENT: During the development of the Southern Unit's horizontal expansion, the existing BRL final cover, grading layer, waste, and underlying impacted soil will be exhumed to the proposed subbase grades or to approximately one foot below the base of waste, whichever is lower. For any areas below waste, confirmation soil sampling will be conducted to identify whether additional impacted soils require removal. Once excavation is completed, any and the over-excavation will be backfilled with fine grained soils to proposed subbase grades.

BRL exhumation will occur in stages as the Southern Unit is constructed in phases. For each of the Southern Unit's liner construction events, waste and soil will be exhumed within the construction footprint for that module (liner construction event). The extent of BRL waste and soils excavated during a construction event will be generally limited to the excavation area needed to construct the module liner, except for the eastern boundary of each liner event. BRL waste extends to the east beyond the eastern boundary of the Southern Unit; therefore, over-excavation will be required to remove waste to the east of the Southern Unit. There is no minimum depth of soil proposed to be removed below the waste, but it is likely that approximately the upper foot of soil will be removed in order to remove all waste. Additional soil may be removed in selected areas if highly contaminated soil is present based on the proposed confirmation sampling.

The existing BRL final cover will be removed as waste removal progresses. The BRL final cover design includes 2 feet of compacted clay overlain by 1.5 feet of rooting zone soil and 6 inches of topsoil. The final cover soils, above the BRL waste, will be stockpiled for future use as daily/intermediate cover and/or in the liner/final cover system construction. The BRL biosoil grading layer, below the final cover and above the waste, consists of petroleum-contaminated soil that had been treated in a biopile prior to use. In addition to biosoil, the existing BRL grading layer may also include general fill soil. Waste and soil removed from within the BRL exhumation will be categorized, handled, and disposed of (waste) or classified to be reused (soil) as specified in the BRL Property Redevelopment Plan (Attachment 8 of the October 17, 2022 plan of operation report addendum 3).

Completing the BRL exhumation in this phased approached allows for additional design capacity to be created while the BRL waste and soils are consuming design capacity in the previous modules. Thus, the impact of the BRL exhumation on the Eastern Expansion design capacity will be spread out over the 6-7 years it will take to construct the Southern Unit. In addition to the waste and soil exhumation, the existing BRL leachate extraction and collection system and landfill gas management system will be removed in stages. As Southern Unit modules are constructed, impacted BRL infrastructure will be removed and capped at the construction limits. To maintain operation of the existing infrastructure, temporary modifications will be made in the field to continue to the use of the BRL leachate and landfill gas system. The existing gas system is currently routed to the southeastern corner of the Southern Unit, therefore, minimal modifications to the BRL gas collection system is anticipated.

In areas where excavation extends below the proposed subbase grades, fine-grained soil fill will be placed and compacted to achieve the subbase grades. Upon completion of subbase preparation for a given phase, the liner system will be constructed.

CUTOFF WALL: In 1981, an approximately 1,685 feet long slurry cutoff wall was constructed along the southern perimeter of BRL to collect leachate and to prevent it from migrating to the south into the pond. The wall is a minimum of 2 feet thick with a maximum permeability of 1x10-7 centimeters per second (cm/s). The wall was designed to be keyed into a minimum 5 feet of clay that was underlying the site. The wall was constructed from a bentonite slurry mixture. The slurry cutoff wall was constructed to base elevation of approximately 725 to 730 msl with a final total length of approximately 2,200 feet. The associated leachate collection system was designed to be located approximately 7 feet upgradient from the wall and run along the entire length of it.

The slurry wall is planned to be removed as needed during the liner construction of Phase 7, Module 1 and Phase 7, Module 2. The slurry wall will be removed in segments as construction advances

southward. The slurry wall area within the limits of waste will be over-excavated and removed in a top to bottom fashion. The resulting excavation (within the limits of waste) will be backfilled with subbase fill and compacted, as specified in the Quality Assurance Manual (Attachment 10 of the October 17, 2022 plan of operation report addendum 3).

In areas outside the proposed limits of waste, the slurry wall may stay in place if not impacted by the removal of the BRL waste and leachate conveyance system. If the slurry wall is removed in the areas outside the limits of waste, the resulting excavation will be backfilled with general fill and compacted to at least 90% of dry density based on the modified proctor (or 95% based on the standard proctor).

BRL WASTE CHARACTERISTICS: BRL waste characteristics were evaluated as part of the 1993 Remedial Investigation (RI) Report by Warzyn. Additional waste characterization investigation performed since the 1993 RI report is documented in SCS Engineers (SCS) May 2020 Waste Characterization Investigation Report (WCIR), which is included in Appendix B of the Property Redevelopment Plan (Attachment 8 of the October 17, 2022 plan of operation report addendum 3).

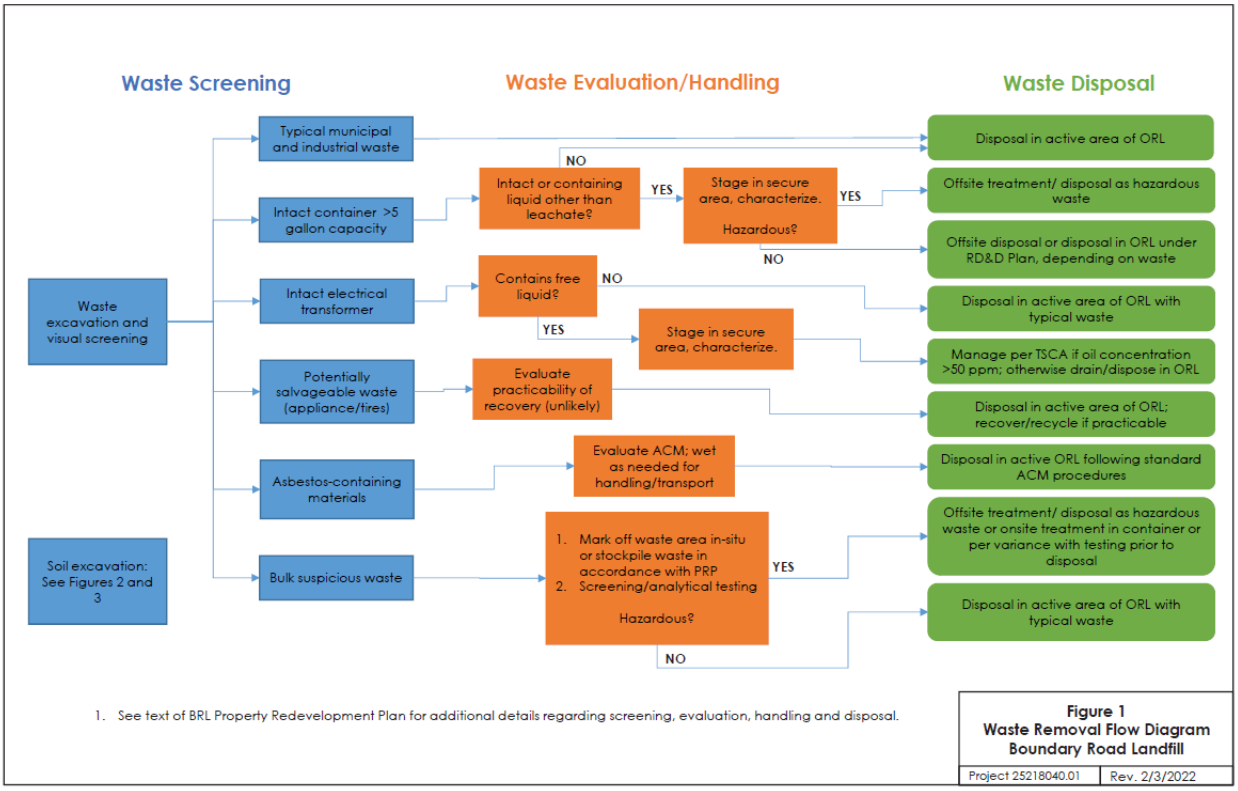
Based on the investigations performed at BRL, the waste thickness ranges from approximately 10.5 feet to 27 feet and the waste quantity estimate is approximately 1.3 million cubic yards. Waste materials encountered during sampling at the facility were generally consistent with typical municipal solid waste. Crushed metal drums and parts of drums were encountered in borings WC-5 and WC-8. Green and yellow paint were observed in boring WC-8. Petroleum, paint and/or solvent-like odors were noted in several borings. In general, waste characteristics include the following:

- The disposal history indicates primarily municipal solid waste with some possible liquid hazardous waste.

- The waste characterization investigation indicated primarily municipal soli waste with some drums. Petroleum or solvent odors were noted for some bulk municipal waste/daily cover, and most waste samples contained VOCs. The only waste sample exceeding toxicity characteristic leaching procedure (TCLP) limits was for waste impacted by paint waste (benzene and lead).

- VOCs are typically the contaminants of concern for landfills of this vintage (accepting waste from 1954 to 1971).

WASTE SCREENING, HANDLING AND DISPOSAL: As waste is excavated, it will be screened and evaluated for handling and disposal as shown on Figure 1 of the Property Redevelopment Plan (Attachment 8 of the October 17, 2022 plan of operation report addendum 3) and included below.



Waste will be screened by the following waste types to determine handling and disposal requirements:

- Typical municipal and industrial waste
- Intact containers
- Intact electrical transformers
- Potentially salvageable waste (i.e. appliances, tires)
- Asbestos containing materials
- Bulk suspicious waste

Containers of liquid waste, intact transformers or ones that contain liquid, potentially hazardous waste, asbestos-containing material, and bulk suspicious waste will need to be evaluated further and/or follow special handling and disposal procedures. The waste will be evaluated to determine whether it needs to be managed and disposed of as a hazardous waste, Toxic Substance Control Act (TSCA) regulated waste, liquid waste or other waste with special handling and disposal requirements. Typical municipal and industrial waste, non-intact containers, non-intact transformers that do not contain liquid, and unsalvageable appliances or tires will be disposed of following typical waste handling procedures.

<u>Typical Waste Handling Procedures</u>
Typical municipal or industrial waste, or other solid wastes accepted at ORL, such as construction and demolition debris or coal ash, will be handled as follows:

- Excavators or other heavy equipment will remove the waste and load it into articulated dump trucks.

- If typical waste materials are waterlogged with leachate when excavated, they will be allowed to drain and/or be mixed with drier waste prior to loading into trucks to prevent the separation of liquids from the waste during transportation or placement, unless the disposal of BRL leachate in ORL is approved under the ORL Research, Development, and Demonstration (RD&D) Plan. Leachate drained from excavated waste within BRL will be managed as described below. Hazardous waste will not be mixed with other waste to dilute hazardous constituent concentrations.

- BRL waste will be moved to active areas in ORL where it will typically be commingled with incoming waste and compacted.

- The redeposited wastes will be covered daily with alternative daily cover (ADC) or general site soils. A minimum 15-foot separation distance will be maintained between the redeposited waste and the granular drainage layer.

Salvageable Waste

Experience from other waste exhumation projects has shown that segregation of recyclable or compostable materials is generally not feasible. Recovery of salvageable wastes for recycling is unlikely but may be pursued if sufficient discrete quantities of such materials are encountered. Materials such as scrap metal or white goods that cannot reasonably be separated for recycling will be disposed of in an active area of the Eastern Expansion without segregation from other wastes.

Asbestos Containing Materials

If suspected asbestos-containing materials (ACM) are encountered, they will be evaluated to determine the following information:

- The quality and type of ACM present (e.g., friable or nonfriable).

- The location, depth, and extent of ACM.

- Whether the ACM will need to be wetted so that they will not pose a dust hazard during transport.

All suspected ACM will be treated as ACM. If the materials are determined to pose a dust hazard, they will be sprayed with water or an alternative dust suppression agent prior to handling and transport. Suspected ACM will be transported to ORL for disposal where they will be handled in accordance with standard ORL ACM management procedures.

Waste Types Requiring Further Evaluation

The following waste types will be suspicious waste that need to be evaluated further to determine handling and disposal requirements:

- Intact, non-empty drums or containers.

- Intact electrical transformers and non-intact transformers that contain liquid that is not obviously the result of leachate infiltration.

- Bulk Suspicious Waste

    - Waste that looks like paint, sludge, foundry sand, or other obvious industrial waste, or has an obvious solvent odor, and is present in a significant, recoverable volume (e.g., more than 20 cubic yards). The recoverable volume is a practical limit based on the size of excavation equipment and the required pace of waste relocation for the project to be feasible. Small quantities of sludge or foundry sand mixed with municipal waste will not be feasible to identify or separate.

    - Soil that appears to be foundry sand, has an obvious solvent odor, or has significant staining.

    - Waste or soil encountered that creates conditions requiring a stoppage of work due to potential worker health and safety concerns.

Waste or soil in the immediate vicinity of samples collected during the waste characterization investigation where laboratory testing indicated that the sampled material could be characteristically hazardous or contain PCBs greater than 50 mg/kg (e.g., waste within 5 feet in any direction from the samples collected in borings WC5 and WC6).

The waste characterization investigation sampling and laboratory TCLP analysis identified hazardous concentrations of benzene and lead in the area of boring WC5 in materials that exhibited strong paint/solvent, odors, elevated PID readings, and crushed drums. Additional representative sampling and testing of the waste in this area, and other areas with similar observed characteristics, will be performed prior to removing the material from the BRL area of contamination (AOC) to identify whether the waste exceeds TCLP limits. If applicable TCLP limits are exceeded, then additional analysis for the identified contaminants of concern will be performed on samples collected at the apparent limits of impacts to confirm the extent of hazardous materials.

Waste that is identified as potentially suspicious waste will initially be evaluated through field observations or screening. Based on that evaluation, waste that appears to be potentially hazardous will be subject to representative sampling and testing, as described below, to determine whether the material is hazardous waste.

The waste screening process and outcomes will be documented in daily construction observation reports and a log of suspicious wastes. When a new suspicious waste is identified (e.g., bulk waste area with strong odor or intact container), it will be added to the suspicious waste log, field screening results, laboratory testing results (if tested), and subsequent disposition of the waste will be added to log as the material is evaluated and managed.

<u>Suspicious Waste Handling Procedures</u>
If suspicious waste is encountered, it will be segregated from the exhumed waste stream and retained within the BRL footprint for additional characterization, potential on-site treatment and disposal and/or

off-site disposal. Suspicious waste may be temporarily stockpiled within the Eastern Expansion or BRL provided that the placement is either 1) within the area of the current BRL footprint, or 2) in accordance with an approved hazardous waste remediation variance.

A hazardous waste remediation variance which allows on-site storage and treatment of bulk wastes determined to be hazardous will be submitted to the department for review and approval in a separate document.

Waste handling procedures are described in the BRL property development plan (Attachment 8 of the October 17, 2022 plan of operation report addendum 3) for intact drums or containers, transformers, and for bulk suspicious wastes, such as waste or soil containing high concentrations of solvents. Potentially intact waste containers smaller than 55-gallon drums, will be segregated from the waste during the exhumation process to the extent that identification and separation of such containers is practicable while using large equipment to excavate thousands of cubic yards of material per day.

Hazardous Waste Determination

Suspected hazardous waste or any waste requiring a hazardous waste determination will be characterized following the hazardous waste determination steps provided in s. NR 662.011, Wis. Adm. Code. Evaluation of the excavated BRL material for hazardous waste characterization will occur either upon exhumation or prior to removing the waste from the BRL AOC. If the waste characterization evaluation indicates the exhumed material is hazardous, then the hazardous waste will be considered to be “generated” when it is placed outside the AOC. Material that would be considered “hazardous waste” if removed from the AOC will not be redeposited in the Eastern Expansion.

Bulk waste or soil identified as potentially hazardous will be evaluated on the waste characteristics including toxicity, ignitability, corrosivity, or reactivity. Bulk waste or soil may be determined to be or to contain a listed hazardous waste if the source can be adequately characterized to make this determination.

An intact container of industrial waste, such as a 55-gallon drum, may only be determined to contain a listed hazardous waste if the source and/or generating process can be documented to meet the definition of a specific hazardous waste listing. If legible labels are visible on containers, the containers will be evaluated to identify whether the material may fall into the category of a listed waste. Otherwise, if an intact container of waste is encountered, the hazardous waste determination will be based on the characteristics of the industrial waste (i.e., toxicity, ignitability, corrosivity, or reactivity).

Suspicious waste temporarily stockpiled within the BRL footprint that is subsequently determined to be hazardous must be treated on-site (in containers or in accordance with a remediation variance) prior to disposal or removed from the site for off-site disposal at a facility licensed to accept it. Management of hazardous waste shipped off site will be in accordance with the applicable generator requirements of ch. NR 662, Wis. Adm. Code.

GAS COLLECTION SYSTEM: The BRL landfill gas collection system will be operated to the extent practicable throughout the multi-year waste removal process, with a primary goal of controlling odor and other emissions.

The blower and flare are located near the southeast corner of BRL, which will allow continued operation as the waste removal is completed in phases from north to south. As the waste removal progresses, gas collection system components within each waste removal phase will be removed. Temporary condensate sumps will be installed as needed and will be moved as additional sections of the header are abandoned.

Due to the expected low gas production volume and methane percentage, the system will likely be operated on an intermittent basis rather than continuously, particularly in the later phases of the project. A vent flare such as the Solar Spark® vent flare (LSC Environmental) may also be evaluated for use for continued odor/emissions control.

AMBIENT AIR MONITORING: During the project, ambient air will be monitored on and off the ORL/BRL property to assess air quality in areas where the public may be present. The proposed ambient air monitoring plan is outlined below and will be modified as needed based on observed results.

- Parameters: VOCs will be the primary air contaminants of concern. Particulate matter (PM-10) will also be monitored to address non-volatile contaminants that could be transported via fine particulates during excavation. Additional parameters could be added if observations during waste removal or results of soil testing indicate a potential for ambient air impacts.

- Sampling and analysis methods: VOC samples for laboratory analysis will be collected using a Summa canister. Particulate monitoring (PM-10) will be performed using a personal air sampling pump. Weather conditions will be recorded for the site or for the closest weather station, including temperature, precipitation, barometric pressure, pressure trend, wind speed, and wind direction. Samples will not be collected when the wind speed is greater than 15 mph. The location and day/time of collection of each sample will be recorded.

- Locations: For each sampling event, the sampler will select monitoring locations as follows, based on the wind direction, active waste removal areas and other observations:

  — Upwind – One location upwind of the ORL and BRL facilities.

  — On-Site – One location in the public access areas of ORL, downwind from the waste removal area if possible; otherwise in a public access area near the waste removal area. For example, if the wind is blowing from the south, the sample could be collected in the scale area. If the wind is blowing from the north, there are no on-site public access areas downwind from the waste removal area, so a nearby upwind or crosswind location would be used.

  — Off-Site Downwind – Two locations beyond the BRL/ORL property limits and downwind from the waste removal area at locations chosen considering the wind direction and locations of streets, residences, or other places where people are likely to be present.

- Frequency: Air monitoring will be performed on a weekly basis for at least the first six weeks of each phase of waste excavation. If noticeable odors, field screening, or other indicators of potential air quality issues are identified, the monitoring frequency may be increased as needed to evaluate the issue. Samples may not be collected on the same day or time each week, subject to the schedule of excavation work and field conditions. To the extent possible sampling, will be

scheduled to occur when active excavation work is in progress. If all results for the first six weeks are below background or ambient air quality standards, the sampling frequency may be decreased to biweekly. Sufficient sampling containers and equipment will be maintained on site to allow immediate air sampling for VOCs or particulates if necessary.

- Air quality sample results for VOCs will be compared to site background air quality data and to air quality standards from the following sources:

  — U.S. EPA Regional Screening Levels (RSLs) for Resident Ambient Air (TR=1E-06, HQ=1) May 2021, https://www.epa.gov/risk/regional-screening-levels-rsls-generictables.

  — Ambient air concentrations listed in NR 445, Wis. Adm. Code, Table A or Table B.

- Air quality sample results for PM-10 will be compared to the 24-hour National Ambient Air Quality Standard (NAAQS) value of 150 micrograms per cubic meter (µg/m3).

The regional screening levels provide a conservative point of comparison, based on an assumption of continuous chronic exposure over a time period much longer than the proposed project. Therefore, a result exceeding these levels does not indicate an immediate hazard, but does indicate that additional evaluation, engineering controls, and/or follow-up monitoring may be warranted. WMWI will notify the department if monitoring results exceed screening levels. The notification will include the sampling results, description of immediate actions, if any, taken in response to the results, and proposed follow up actions. Immediate actions may include, but are not limited to increasing monitoring frequency, upgrading worker PPE, limiting the size of the open working face in the area of concern, applying temporary covers, or applying water for dust suppression.

DUST AND ODOR CONTROL MEASURES: To the extent practicable, waste excavation activities will take place during the winter weather (November through March) months to help reduce odors and dust; however, the large waste removal volumes may require waste removal beyond the winter months. Additional odor control strategies will include operation of the BRL landfill gas collection system and the use of daily and intermediate cover. Note that although the gas collection system will be gradually phased out, the blower and flare are at the south end of the site and will continue to operate as waste is removed from north to south. Additional cover materials may be applied if odor problems arise.

If the strategies described above are insufficient to adequately control nuisance odors, WMWI may use odor control misters with masking or neutralizing agents to reduce odors.

Dust will be controlled by watering the waste excavation working face, access roads, stockpiles, and other areas at which dust may be generated. The site operators are responsible for the maintenance of access roads. The roads will be cleaned as necessary to minimize the risk of dirt, mud, and litter carried off site.

SURFACE WATER MANAGEMENT MEASURES: Surface water controls (e.g., berms, swales, and ditches) will be put in place to prevent clean runoff from entering the working face at BRL. The surface water controls will be relocated as needed as waste excavation activities progress. Surface water that comes into contact with waste will be collected and managed as leachate.

LEACHATE AND GROUNDWATER MANAGEMENT: Leachate and/or groundwater that is encountered during excavation of BRL, including contact water that is generated by precipitation falling on the waste, will be collected, and discharged to the sanitary sewer.

Leachate from the BRL is currently collected from leachate extraction wells and a trench drain and discharged under a permit to the Milwaukee Metropolitan Sewerage District. Periodic testing of the discharge confirms that the leachate discharge complies with MMSD permit requirements. The characteristics of the leachate or contact water produced during waste exhumation are expected to be similar to the currently permitted discharge.

SOIL REMOVAL AND MANAGEMENT: The primary sources of soil that will be excavated during the exhumation process include:

- Final cover: topsoil, rooting zone and clay.
- Grading layer: used treated bio-pile soil and general fill below final cover and above waste.
- Native soil underlying the waste.

Soil will be segregated by soil type and contaminant levels for beneficial reuse and/or disposal. Excavated soils will be classified into types as defined below, based on the contaminant concentrations, with the allowable reuse options defined for each type.

Laboratory testing parameters for soil will include:

- VOCs.
- PCBs.
- RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver).

Testing for Polynuclear aromatic hydrocarbons will be added where direct contact exposures are a concern.

The proposed soil classification types and the associated reuse options are described below. Soils may not be used outside the landfill footprint, unless the criteria in s. NR 718.12(1)(c), Wis. Adm. Code are met, and a Material Management Plan (MMP) is prepared and approved by the department.

- **Clean soil** does not contain detectable VOCs or PCBs and does not contain metals at concentrations exceeding Background Threshold Values (BTVs). Clean soil is not subject to ch. NR 718, Wis. Adm. Code, and may be reused anywhere on the contiguous WMWI property where fill placement is allowed.

- **Type 1 soil** is not impacted above the residual contaminant levels (RCLs) established under ch. NR 720, Wis. Adm. Code. Type 1 soil may be used as daily or intermediate cover, final cover, or other uses within the lined landfill limits. Other uses of Type 1 soil outside of the lined landfill limits, such as filling to achieve sub-base grades or construction of berms or roads, are required to be done in accordance with an approved MMP. Soil impacts will be evaluated based on visual and odor observations, field screening (e.g., PID) and laboratory testing. Laboratory testing is necessary to classify any soil in the grading layer, within the waste or below the waste.

- **Type 2 soil** is impacted soil that may contain contaminants at concentrations that exceed the ch. NR 720, Wis. Adm. Code, RCLs or BTVs, but does not exceed the TCLP limits for any constituent and does not contain visually identifiable waste mixed in with the soil. Type 2A soils meet the industrial direct contact RCL and do not exhibit strong odors but may exceed the groundwater pathway RCL. **Type 2B** soils exceed both the industrial direct contact RCL and the groundwater pathway RCL. **Type 2A** soil may be used within the lined area of the landfill for purposes such as daily cover or intermediate cover on interior slopes. Type 2B soil that does not initially meet the Type 2A criteria for use as daily or intermediate cover, may be treated and retested for Type 2A uses, or may potentially be used for internal berms or other uses that will not result in surface exposure of significantly contaminated soils. This soil may also be disposed of within the Eastern Expansion if it meets the TCLP limits set in the special waste management plan for a non-hazardous waste.

- **Type 3 soil** is impacted soil that may contain contaminants at concentrations that exceed the ch. NR 720, Wis. Adm. Code, RCLs for direct contact, but does not present a threat to groundwater quality. VOC-contaminated soil will generally not fall into this category, because the standards for the groundwater migration pathway are generally lower than for the direct contact pathway; however, it is included in the plan to allow flexibility if soil materials meeting these criteria are encountered. Criteria for classification as Type 3 include concentrations of VOCs or other tested parameters that are less than ch. NR 720, Wis. Adm. Code, generic or site-specific RCLs for groundwater migration, or less than BTVs. Type 3 soils may be used within the landfill limits for the same uses allowed for Type 2B soils, such as internal berms or other uses that will not result in surface exposure. Type 3 soils may only be used outside of the lined landfill footprint in accordance with an approved MMP.

- **Type 4** soil exceeds the TCLP limits for one or more constituents and will be classified as a hazardous waste when it is removed from the AOC. Type 4 soils must be treated prior to use or disposal within the Eastern Expansion since the landfill is not approved to accept hazardous waste.

TEMPORARY STOCKPILE LOCATIONS: Temporary stockpile locations for contaminated soil will be selected based on the origin and characteristics of the soil. Given the duration of the project over several years and the unknown quantity of soil that will be suitable for onsite reuse under each classification type (pending soil sampling and testing below the waste), specific locations for stockpiles will likely change with time. Type 1 soil meets ch. NR 720, Wis. Adm. Code, standards and is approved for reuse on the contiguous ORL property, subject to the locational criteria in s. NR 718.12(1)(c), Wis. Adm. Code; therefore, it can be stockpiled in the proposed stockpile and laydown area designated for stockpiling or other approved general fill stockpile location. Type 2 and Type 3 soils exceed one or more ch. NR 720, Wis. Adm. Code, standards and will be stockpiled either within the lined landfill limits, on top of remaining BRL final cover, or on a temporary liner in the Proposed Stockpile and Laydown Area designated for stockpiling, or other approved general fill stockpile location. Contaminated soil will be stockpiled separately by type and the ultimate use of the soil will be documented.

MATERIAL MANAGEMENT PLAN: WMWI will submit a stand-alone Material Management Plan (MMP) to address contaminated soil reuse on site as needed. Type 2 or Type 3 soils will not be placed or stockpiled outside the lined landfill limits, unless approved under an MMP. Placement of contaminated

soil outside of the limits of a licensed landfill will be limited to Type 1 soil (meets ch. NR 720, Wis. Adm. Code, standards but contaminants detected, such as VOCs).

For Type 1 soil, the following uses within the lined landfill limits will not require an MMP:

- Daily or intermediate cover
- Final cover system
- Other use within the lined landfill limits

Other uses of Type 1 soil, which may include the following, will require an MMP:

- Filling to achieve sub-base grades following the removal of waste
- Construction of berms, roads, or other features outside the limits of waste

The MMP for each proposed soil reuse will include a review of the locational criteria in s. NR 718.12(1)(c), Wis. Adm. Code, demonstrating that the criteria are met or providing justification for any requested exemptions.

BRL FINAL COVER SOILS: The existing final cover over the closed BRL consists of the following layers and average documented thicknesses, from top to bottom:

- Topsoil layer, 0.5 feet
- General fill rooting zone layer, 1.5 feet
- Clay cap, 2 feet
- Grading layer, ranging from 2 to 9 feet, including general fill and treated petroleum-contaminated soil

The screening and evaluation process and final use options for final cover soils are shown graphically as a flow diagram on Figure 2 included in the Property Redevelopment Plan (Attachment 8 of the October 17, 2022 plan of operation report addendum 3) and included below.

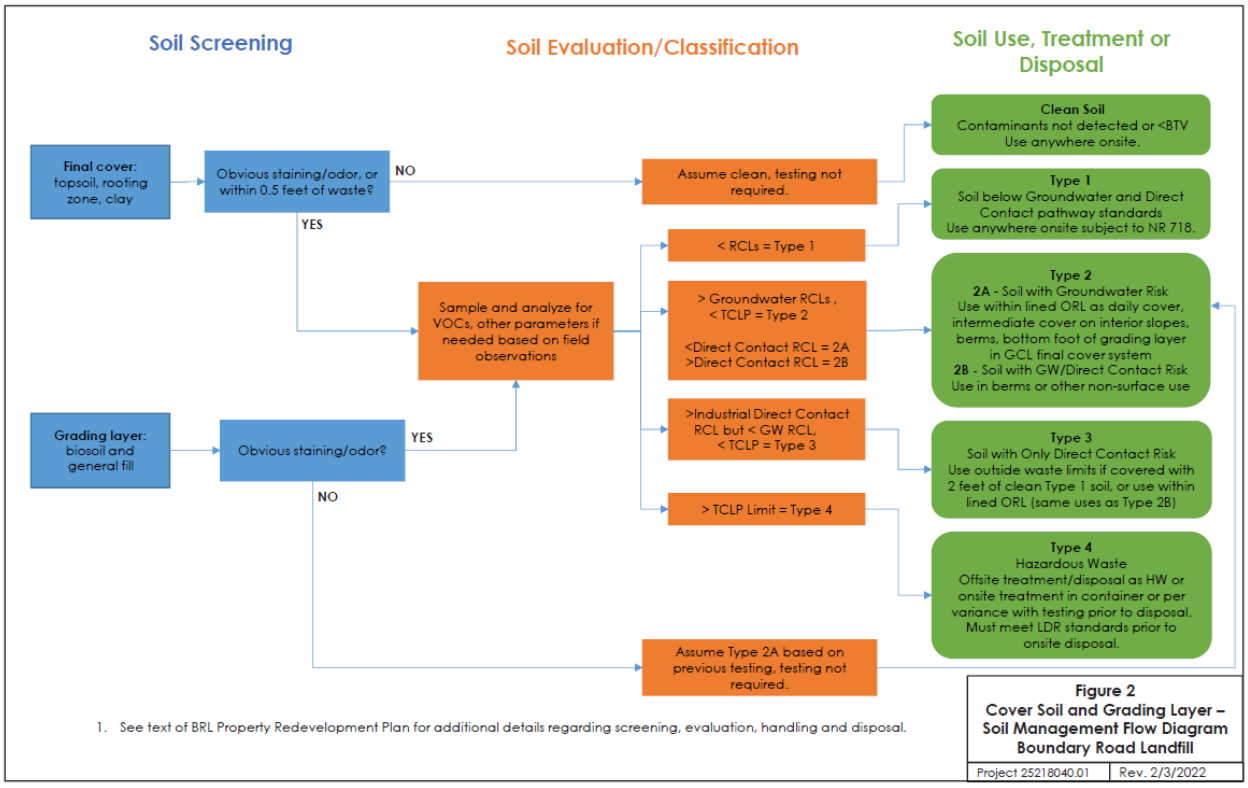


Figure 2
Cover Soil and Grading Layer – Soil Management Flow Diagram
Boundary Road Landfill
Project 25218040.01 | Rev. 2/3/2022

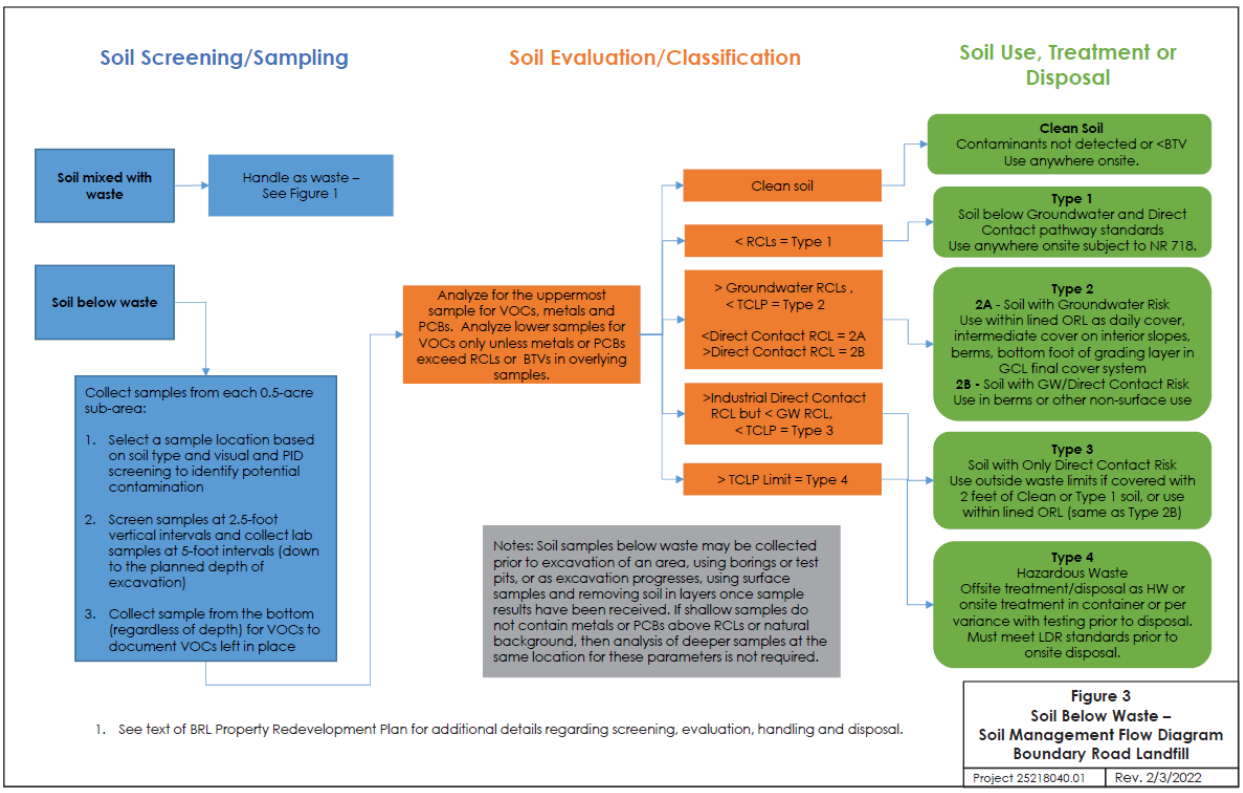
SOIL BETWEEN BOTTOM OF BRL WASTE AND SOUTHERN UNIT SUBBASE: Soil will be excavated below the base of the waste to reach the subbase grades in many areas of the Southern Unit. There is no minimum depth of soil proposed to be removed below the waste, but it is likely that approximately the upper foot of soil will be removed to remove all the waste. In areas where the subbase grades are more than 1 foot below the waste, additional soil will be excavated to reach the subbase grades.

Underlying soil that is not excavated with the waste will be evaluated and sampled for contaminants prior to excavation, placement of fill, or liner construction. Soil that is visually or otherwise noticeably impacted by waste byproducts may be excavated and classified as Type 2B soil without testing, for disposal or limited uses within the lined landfill, unless it meets the criteria for classification as a suspicious waste. Soil considered for use as Type 1 or Type 2A will be tested for evaluation with respect to the ch. NR 720, Wis. Adm. Code, groundwater pathway and direct contact pathway standards prior to classification. The estimated volume of soil to be excavated below the waste to achieve the desired sub-base grades for the new landfill construction is 167,600 cubic yards.

Soil impacts will be evaluated based on visual and odor observations, field screening (e.g., PID) and laboratory testing. Laboratory testing parameters for soil classification will include:

- RCRA Metals (lab methods 6010 and 7471)
- VOCs (lab method 8260)
- PCBs (lab method 8082)

The screening and evaluation process for soils between the bottom of BRL waste and Southern Unit subbase are shown graphically as a flow diagram on Figure 3 included in the Property Redevelopment Plan (Attachment 8 of the October 17, 2022 plan of operation report addendum 3) and included below.



POST-EXCAVATION GROUNDWATER MONITORING: To evaluate groundwater conditions within the footprint following waste removal, short-term groundwater monitoring wells will be installed and sampled as the waste removal work proceeds. At the completion of each phase of waste removal operations, there will be an exposed strip of sub-base grade soil between the limits of the new liner and the remaining BRL waste. For each of the first five waste removal phases, a shallow monitoring well will be installed in this area to allow collection of groundwater samples below the BRL footprint. Each well will be installed at the high point of the exposed sub-base so that the well location is not inundated with surface runoff.

The temporary groundwater monitoring wells likely will extend no more than 10 feet below the sub-base grades and will likely be completed with 3 to 5 feet of slotted screen. The wells will be constructed in general conformance with the applicable requirements of ch. NR 141, Wis. Adm. Code; however, due to the shallow desired sampling depth, a short screen and/or shortened annular space seal will be utilized. The department has authority to approve this as an alternate design in s. NR 507.06, Wis. Adm. Code.

Soil samples will be collected continuously during well drilling. At least one soil sample collected from each boring will be analyzed for VOCs and additional parameters, if necessary, based on previous testing of overlying soil.

A minimum of two rounds of groundwater samples will be collected from each temporary groundwater monitoring well, at least two months apart, with additional monitoring conducted semi-annually thereafter until the well is abandoned to make way for the next liner construction. The groundwater samples will be analyzed for the same parameters as the existing BRL monitoring wells.

The temporary groundwater monitoring wells will be installed as each Phase of BRL waste removal and Southern Unit cell construction is completed and will need to be abandoned prior to the next cell construction event. The construction schedule for the initial phases includes a new cell every year, so the temporary wells will typically be in place for less than a year. The temporary wells will be abandoned by over-drilling or excavation prior to the start of the next adjacent phase of waste/soil removal.

Other existing BRL groundwater monitoring wells within the Southern Unit footprint will need to be abandoned.

WASTE REMOVAL DOCUMENTATION AND REPORTING: At the end of each phase of the BRL waste removal, a report will be prepared and submitted to the department to document the waste removal and characterize the post-removal site conditions. Documentation of the waste removal activities for each phase will include:

- The total estimated volume of waste removed during the phase.
- The total estimated volumes and disposition of each type of soil material removed during the phase (soil that is mixed with waste will not be quantified).
- A summary of each type and amount of suspicious material encountered.
- Whether or not the suspicious material was determined to be hazardous waste.
- The treatment method for each type of material treated.
- The post-treatment confirmation sampling results if the material was treated on site.
- The disposal method for each type of material (on-site and off-site).
- Analytical results for soil and waste sampling completed during the phase of waste removal.
- Soil boring and/or test pit logs for soil sampling conducted below the waste, if sampling is performed using borings or test pits.
- Soil boring logs and monitoring well construction and development forms for temporary wells installed during the phase.
- Abandonment forms for previously installed temporary wells that were abandoned during the current waste removal phase.
- Groundwater sampling analytical results for a least the first round of groundwater samples from newly installed temporary monitoring wells as well as samples collected from previously

installed temporary wells since the previous waste removal documentation report was submitted.

- Drawings documenting the waste removal activities, including:
  - Existing conditions prior to waste removal, including topography, monitoring points, phase limits, remaining BRL landfill gas and leachate collection infrastructure, and stormwater management features.
  - Conditions following waste removal, including same elements as above plus newly installed monitoring points.
  - Sampling locations.

A report for each phase of BRL exhumation will be submitted to the department within 120 days of completion of the waste removal activities, including waste relocation, treatment, and collection of the initial groundwater samples from the newly installed temporary wells.

FINAL REPORT: Following completion of the entire BRL waste relocation project, a final construction completion report will be submitted to department, with waste exhumation and site closure documentation. This report will include:

- Groundwater and soil data in tabular format
- Figures depicting extent of contamination
- Evaluation of residual contamination if any
- Evaluation of whether institutional controls/continuing obligations (ICs/COs) might be needed/updated post-removal and a long-term stewardship plan for any ICs/COs
- Updated O&M Plan (if needed)

SITE CONTRUCTION AND DEVELOPMENT

INITIAL CONSTRUCTION: Prior to and during the BRL waste exhumation and composite liner construction, several design features will be constructed:

1. Enlarge the existing east sedimentation basin and reroute, shorten, and construct a new biofilter discharge. The basin will be dewatered, and unsuitable soils will be removed from the base of the East Sedimentation Basin.

2. Construct the east culvert along the eastern perimeter of the Southern Unit. Restore wetland disturbance within Wetland W-1 and stormwater basin 2 following construction.

3. Construct the southeastern ditch at the discharge of installed east culvert and proposed south sedimentation basin.

4. Construct the eastern run-on ditch along the eastern perimeter of the Southern Unit and associated riprap pad located near the northern edge of Wetland W-1.

5. Construct the south sedimentation basin. The stormwater basin 3 will be dewatered, and unsuitable soils will be removed from the base of stormwater basin 3. Install proposed outlet structure and emergency spillway at the inlet of the riprap lined ditch.

6. Construct realigned waterway, northwest access road, and the associated culvert and ditches along the western boundary of the Southern Unit. Stabilize the realigned waterway and remove the remainder of wetlands to be permanently impacted along the western boundary of the Southern Unit.

Groundwater monitoring wells, BRL gas probes, BRL leachate extraction wells, and BRL head wells located inside and within the vicinity of the proposed limits of waste will be abandoned and/or removed during construction of the specific module in which the feature is located. BRL infrastructure will be removed during waste excavation. The schedule of well and BRL infrastructure abandonment is detailed below.

Well and BRL Infrastructure Abandonment Schedule

Feature Label	Feature Type	Approximate Abandonment Schedule	Abandonment/ Removal Method
S302	Monitoring Well	Phase 5 Module 1	Overdrill per NR 141
S302A	Piezometer	Phase 5 Module 1	Overdrill per NR 141
S302B	Piezometer	Phase 5 Module 1	Overdrill per NR 141
P101	Piezometer	Phase 5 Module 1	Overdrill per NR 141
TW02R	Monitoring Well	Phase 5 Module 1	Overdrill per NR 141
TW03R	Monitoring Well	Phase 5 Module 1	Overdrill per NR 141
LHW1	Leachate Head Well	Phase 5 Module 1	Remove with waste
LHW4	Leachate Head Well	Phase 5 Module 1	Remove with waste
LHW6	Leachate Head Well	Phase 5 Module 1	Remove with waste
LGP3	Gas Probe	Phase 5 Module 1	Overdrill and remove
LGP4	Gas Probe	Phase 5 Module 1	Overdrill and remove
LGP7	Gas Probe	Phase 5 Module 1	Overdrill and remove
LEW101	Leachate Extraction Well	Phase 5 Module 2	Remove with waste
LEW102	Leachate Extraction Well	Phase 5 Module 2	Remove with waste
G-5	Gas Extraction Well	Phase 5 Module 2	Remove with waste
G-9	Gas Extraction Well	Phase 5 Module 2	Remove with waste
G-10	Gas Extraction Well	Phase 5 Module 2	Remove with waste
LEW103	Leachate Extraction Well	Phase 6 Module 1	Remove with waste
LHW3	Leachate Head Well	Phase 6 Module 1	Remove with waste
LHW5	Leachate Head Well	Phase 6 Module 1	Remove with waste
G-3	Gas Extraction Well	Phase 6 Module 1	Remove with waste
G-4	Gas Extraction Well	Phase 6 Module 1	Remove with waste
G-8	Gas Extraction Well	Phase 6 Module 1	Remove with waste
LHW7	Leachate Head Well	Phase 6 Module 2	Remove with waste
LHW8	Leachate Head Well	Phase 6 Module 2	Remove with waste
LGP5	Gas Probe	Phase 6 Module 2	Overdrill and remove
LGP6	Gas Probe	Phase 6 Module 2	Overdrill and remove
G-7	Gas Extraction Well	Phase 6 Module 2	Remove with waste
TW09RR	Monitoring Well	Phase 7 Module 1	Grout casing (outsite LOW)
LHW2	Leachate Head Well	Phase 7 Module 1	Remove with waste
G-1	Gas Extraction Well	Phase 7 Module 1	Remove with waste

G-6	Gas Extraction Well	Phase 7 Module 1	Remove with waste
G-2	Gas Extraction Well	Phase 7 Module 1	Remove with waste
TW22	Monitoring Well	Phase 7 Module 2	Overdrill per NR 141
P104R	Piezometer	Phase 7 Module 2	Overdrill per NR 141
P105A	Piezometer	Phase 7 Module 2	Overdrill per NR 141
P105B	Piezometer	Phase 7 Module 2	Overdrill per NR 141
P105C	Piezometer	Phase 7 Module 2	Overdrill per NR 141
P106A	Piezometer	Phase 7 Module 2	Grout casing (outside LOW)
P106B	Piezometer	Phase 7 Module 2	Grout casing (outside LOW)
P106C	Piezometer	Phase 7 Module 2	Grout casing (outside LOW)

SOIL REQUIREMENTS: Soil quantities for the development of the Southern Unit are provided in Table F-1 of Appendix F of the February 18, 2022 plan of operation report. The tables contain summaries of soil material volumes necessary for each construction event along with quantities that will need to be excavated during each construction event. For liner construction, approximately 423,800 cubic yard of clay will be needed. Clay material may be obtained from the approved onsite borrow source or other approved clay borrow sources.

PHASED DEVELOPMENT: During the phased construction, measures will be implemented to minimize the potential for off-site erosion into adjacent drainage areas and to minimize stormwater from entering the construction areas. Erosion control fencing will be maintained or replaced until it is no longer needed. Erosion control fencing will be removed once construction activities are completed, and vegetation is established.

Landfill phase construction will include construction of the following primary features:

- Surface water control features
- Subbase excavation and investigation
- Underdrain system
- Perimeter berms and access road
- Composite liner system
- Leachate collection and transfer system
- Gas collection and control system (GCCS) header piping
- Gas probes that are adjacent to liner areas
    - Phase 5, Module 1 install GP06E
    - Phase 6, Module 1 install GP03E
    - Phase 7, Module 1 install GP04E
    - Phase 7, Module 1 install GP05E

Prior to the final cover events, if overfilled waste has not settled to the approved final waste grades, intermediate cover will be removed, and waste will be regraded to approved final grades. Erosion control measures will be installed as needed. Individual cover events for the final cover will include construction of the following primary features:

- Remaining GCCS components
- Grading layer
- Final cover system

- Surface water management features

Final closure will consist of installing the remaining GCCS components, the final cover system, the permanent final cover surface water management features, and establishing permanent vegetation. The site will be closed in increments as substantial areas reach final grades. The proposed Southern Unit module overlays the previous modules, the cover events will be spread over the course of the site life of the landfill.

Phase development, filling and closure sequencing will be conducted in a manner to minimize the time and area of the outer slope that is under intermediate cover. In order to relocate waste from BRL as quickly as possible and minimize the timeframe that this waste mass is uncovered during excavation, the sequencing presented does require the presence of intermediate slopes on the north side of Phases 3 and 4B for an extended time to allow development and filling adjacent to BRL. WMWI will place and maintain 24 inches of intermediate cover on these slopes during the BRL waste relocation process, and until this area is laid over with waste placed in Phases 3B and 4C.

The phased closure of the landfill will reduce total leachate generation rates and will control the off-site migration of landfill gas. If interruptions occur during site closure that delay final cover construction, WMWI will take temporary efforts to manage surface water and prevent erosion through temporary stormwater controls and the replacement of intermediate covers until final cover construction can resume. The proposed liner and cap construction schedule is detailed below.

Construction Sequencing

Year Constructed	Landfill Liner and Final Cover Construction Events	Construction Event Area (Acres)	Open Area (Acres)
2019	Phase 1A liner	9.8	9.8
2019	Phase 2 liner	8.2	18.0
2020	Phase 1B liner	4.4	22.4
2020	Phase 3A liner	6.4	28.8
2021	Phase 4A liner	5.1	33.9
2022	Phase 4B liner	4.8	38.7
2023	Phase 5 Mod 1 liner	10.9	49.6
2024	Phase 5 Mod 2 liner	5.8	55.4
2025	Phase 6 Mod 1 liner	13.2	68.6
2026	Phase 6 Mod 2 liner	6.7	75.3
2027	Phase 7 Mod 1 liner	12.8	88.1
2027	Area A cap	(8.2)	79.9
2029	Phase 7 Mod 2 liner	10.0	89.9
2030	Area B cap	(14.5)	75.4
2031	Phase 3B & 4C liner	6.2	81.6
2031	Area C cap	(11.5)	70.1
2032	Area D & E cap	(20.7)	49.4
2033	Area F & G cap	(24.2)	25.2
2034	Area H & I cap	(25.2)	0.0

MAXIMUM INTERIM WASTE GRADES AND DELAYED CAPPING: At each location within the vertical and horizontal expansion areas, the maximum elevation to which waste may be placed will be no more than 5% higher than the final waste elevation when compared to the depth of waste. Drawing 15 of the plan of operation shows the maximum elevations to which waste may be placed. Prior to placement of final cover in a given area, waste grades will be surveyed and regraded as necessary to accommodate placement of the composite cover to the approved final grades. Excess materials will be relocated to the active area or hauled off site to a licensed disposal facility.

Final cover installation may be delayed for up to 2 years within each final cover phase following cessation of waste deposition to allow for settlement of the final waste grades as allowed by s. NR 514.07(3), Wis. Adm. Code. A minimum of one foot of intermediate cover will be placed and seeded as portions of a phase reach maximum interim waste grades. At a minimum, the vertical active gas extraction system within each phase will be installed and made operational following attainment of maximum interim waste grades within that phase.

STORMWATER PERMIT: Before commencing construction of the proposed Southern Unit, WMWI will apply for and be issued an updated Tier 2 industrial stormwater permit, as needed. The facility will need to control stormwater in accordance with applicable local, state, and federal regulations. The SWPPP associated with the Tier 2 Industrial Stormwater Permit (N WI-SO67857-4) for the Orchard Ridge complex has been amended to include the Southern Unit (Appendix P of the February 18, 2022 plan of operation report).

AIR POLLUTION CONTROL PERMIT: Before commencing construction of the landfill, WMWI is required to apply for and be issued an air pollution control construction permit and apply for a revision to Air Pollution Control Operation Permit. The facility will need to control its air emissions in accordance with applicable local, state, and federal regulations.

Federal New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) for Municipal Solid Waste Landfills will be included in the construction permit as applicable, including a requirement to conduct surface emission monitoring on a quarterly basis. State Hazardous air pollution regulations in ch. NR 445, Wis. Adm. Code, may apply to emissions from equipment not covered under the NESHAP.

OPERATIONS

SPECIAL WASTE PLAN: A special waste acceptance plan (Attachment 1 of the November 11, 2022 plan of operation report addendum 4) is approved for the landfill as part of the plan of operation. This plan will be used to screen industrial and other special waste that requires special handling or approval prior to disposal. This plan identifies physical and chemical material/waste characteristics, analytical requirements, and disposal methods for special and industrial waste streams that the WMWI may accept for disposal. An alternate daily cover and beneficial use plan is also included as an attachment to the special waste plan to address waste materials that may be used as alternate daily cover and/or for beneficial use. The plan references separate approvals, such as the research, development and demonstration (RD&D) plan for liquid waste and the bioremediation plan approvals for treated petroleum-contaminated soils.

ALTERNATE DAILY COVER: The following alternate daily cover (ADC) materials are approved for use within the Eastern Expansion: geotextiles/tarps, foundry sand, shredder fluff, bioremediated (treated) petroleum contaminated soil, soils from remediation projects within approved limits, and residual glass from WMWI's nearby materials recovery facility and from Strategic Materials. Additional waste materials may be evaluated and used in accordance with the special waste plan requirements for use as ADC or other beneficial uses (Attachment 1 of the November 11, 2022 plan of operation report addendum 4).

DUST CONTROL: Dust may be generated by the stripping and placement of cover materials, compaction of waste, vehicular traffic on access roads, and the force of wind over barren areas. WMWI intends to control dust by wetting the roads, working face, stockpiles, and other areas where dust may be generated with water or commercially available compounds. Soil stabilization is required to comply with the storm water permit and will also help control dust.

ODOR CONTROL: Odors will be minimized through the use of the following good landfill management practices:

1. Active areas will be controlled with the operation of the gas collection and control system.
2. Covered areas will be stripped as needed, to minimize odor sources.
3. Daily cover will be placed at the end of the operating day.
4. Installation and operation of the gas collection and control system will be performed in compliance with NSPS requirements.
5. Putrescible materials will be immediately compacted and covered.
6. Exposed BRL waste during exhumation will be covered as detailed in the BRL Property Redevelopment Plan.

If the strategies described above are insufficient to control nuisance odors, WMWI may use odor control misters with masking or neutralizing agents to reduce odors.

LITTER CONTROL: Litter will be controlled through daily maintenance of the site at the working face. In addition, the following will be done to minimize litter:

1. Maintaining a small working face.
2. Applying daily cover over the active area.
3. Positioning temporary fencing around the working face to intercept blowing debris
4. Taking advantage of prevailing wind directions and orienting daily landfill operations accordingly.
5. Collecting wind-blown litter on a daily basis.
6. Erecting permanent fences around the landfill perimeter to intercept blowing debris.

WET WEATHER: Roads leading to the working face will be kept passable in all weather conditions. Covered slopes will be maintained to promote positive drainage during wet weather, and to minimize leachate generation and traffic problems associated with poor drainage. If roads should become impassable due to adverse conditions, a disposal area closer to the module entrance will be used for the duration of the adverse weather.

Vehicle movement within the waste fill area during wet conditions can cause rutting and disturbance to cover layers, which may cause ponding. If this occurs, as soon as weather permits, areas disturbed will be regraded.

Berms and drainage ditches will be maintained to minimize disruptions of surface water flow and divert run-on away from active areas.

COLD WEATHER: During cold weather, a snowplow or other heavy equipment will be used to clear roads. The edges of roadways, culverts, and monitoring wells will be marked by stakes or flags. In freezing weather, a sufficient quantity of cover soils will be protected so that daily cover can continue to be applied.

WINDY WEATHER: During windy weather, the active disposal area will be moved to a screened location if available (typically the lowest level of the landfill), and/or portable wind screens will be utilized. Depending on the velocity of the wind, exposed waste will be covered, only certain waste types will be accepted, or operations will cease entirely for the day.

ORGANIC STABILITY PLAN

BACKGROUND: The waste accepted includes nonhazardous municipal solid waste, commercial solid waste, industrial solid waste, and special waste as described in the Special Waste Plan (Attachment 1 of the November 11, 2022 plan of operation report addendum 4). The total potentially organic waste mass can be estimated from annual tonnage reports for prior years. The organic stability plan used the following waste categories from the annual tonnage reports to estimate amounts of organic waste:

- Category 1: Municipal Waste
- Category 3: Pulp/Papermill Manufacturing waste
- Category 5: Public owned treatment work (POTW) sludges
- Category 6: All other solid waste (not hazardous waste).

The approximate expected filling rate for the Southern Unit is 750,000 tons per year. Of this quantity approximately 62% is expected to be municipal solid waste and other solid waste (Categories 1 and 6) and the remainder is expected to be industrial and specials wastes, materials for beneficial reuse, and other waste. In addition to the waste profile currently accepted in the East Expansion, the Southern Unit will also accept waste and soils from the Boundary Road Landfill (BRL) exhumation. It is estimated that approximately 1,300,000 cubic yards (cy) of BRL waste, up to 167,000 cy of impacted soil removed below the waste, and up to 334,250 cy of treated biosoil removed from within the BRL cover system grading layer will be exhumed from the BRL and placed in the Eastern Expansion.

OVERVIEW AND MEASURES TO BE TAKEN: WMWI will use the same methods used in the East Expansion to decrease the time required for the landfill to reach organic stability, which include:

- Continue in-landfill anaerobic decomposition.

- Increase the moisture content in the waste mass to increase the waste degradation rate by leachate recirculation into the waste mass (optional) and adding liquids other than leachate as indicated in the RD&D Plan to promote landfill gas generation.

- Delay of final cover to allow additional rainwater to infiltrate the site over the active site life.

GOALS: The goal of the Organic Stability Plan is to reduce the amount of non-degraded organics remaining in the landfill after site closing and shorten the time the landfill will require to achieve landfill organic stability to 40 years or less after closure. The specific goals, as stated by s. NR 514.07(9)(c), Wis. Adm. Code, with a timeframe of 40 years after closure are:

- A monthly average total methane plus carbon dioxide gas production rate less than or equal to 5 percent of the maximum monthly average total gas production rate observed during the life of the facility or less than 7.5 cubic feet (cf) of total gas per year for each cubic yard of waste in the facility.

- A steady downward trend in the rate of total methane plus carbon dioxide gas production.

- Production of total methane plus carbon dioxide cumulatively representing 75 percent or greater of the projected total gas production of the landfilled waste.

- Reduction of the time necessary to reach landfill organic stability to 40 years or less after closure.

MONITORING AND EVALUATION: WMWI will monitor the effectiveness of the Organic Stability Plan using gas extraction data compared to the projected gas generation rates estimated by the LandGEM models.

Moisture content samples will be collected when the vertical landfill gas extraction wells are constructed to provide an indication of changes in the overall waste moisture content. Waste samples will be collected at approximately every 20 vertical feet.

Environmental monitoring will be performed in accordance with the environmental monitoring plan for the landfill.

CONTINGENCY PLAN: A contingency plan will be implemented if monitoring and evaluation of the organic stability plan indicates the goals outlined will not be met. The organic stability plan proposes the following measures if evaluations of the landfill organic stability plan efforts indicate the goals are not being attained. Note that many of these measures would require prior department approval.

- Increase liquid addition into the waste mass (increase outside sources of liquids under the RD&D Plan).
- Re-evaluate phasing to allow large flat areas open for rain infiltration.
- Re-evaluate the leachate recirculation system and modify, if able to more effectively distribute liquid into the waste.
- Evaluate improvements to the landfill gas control system.
- Addition of compatible organic material (such as wastewater treatment plant sludge).
- Delay final cover construction.

REPORTING: WMWI will evaluate the performance of the organic stability plan and prepare a report on an annual basis in accordance with s. NR 514.07(9)(d), Wis. Adm. Code. The report will describe progress, results, changes in waste composition, and problems encountered, if any. The annual report will also evaluate whether changes are needed in the plan to correct problems or improve results, and any modifications to the contingency plan. The organic stability plan annual report may be submitted with the annual report for the landfill.

WMWI will prepare a 5-year report (as part of that year's annual report) and evaluate the likelihood that the landfill organic stability plan will enable the site to achieve the goals outlined in s. NR 514.07(9)(c), Wis. Adm. Code, and determine if any items within the contingency plan should be implemented. If it is determined at some point in the future that liquid addition may not achieve the landfill organic stability goals due to technical or operational considerations, then WMWI will evaluate other options for achieving organic stability and will update the contingency plan as part of the annual reporting process.

LEACHATE RECIRCULATION PLAN

WMWI may recirculate leachate (Appendix L of the February 18, 2022 plan of operation report) in areas of the landfill which have an active landfill gas extraction system. Leachate will generally be recirculated in the same manner that was previously approved in the July 2018 plan of operation for the Eastern Expansion. The proposed methods for leachate recirculation include the following:

- Surface application at the working face per s. NR 504.095(2), Wis. Adm. Code.
- Horizontal distribution system per s. NR 504.095(4), Wis. Adm. Code.

RECIRCULATION RATES: The maximum average daily liquid recirculation rate is 7,450 gal/acre/day.

WARNING SYMPTOMS: Leachate recirculation will be suspended upon discovery of warning symptoms and may not resume in the area where the problem occurred until changes are made to the system, or the warning symptoms have declined to acceptable levels. The department will be notified in writing within 7 days of the discovery of warning symptoms and suspension of leachate recirculation. Warning symptoms may include the following:

- Leachate head on the liner of greater than 1 foot, as measured at the leachate head wells.

- Significant or persistent odors. In the event of odors, the source would be investigated to determine if it is related to the liquid addition.

- Excessively acidic leachate chemistry (5.5 or below), and landfill gas lacking in methane. This would be measured quarterly.

- Seeps and other surface expressions of liquid. Leachate seeps can occur in areas regardless of whether liquids are added. Engineering judgment will be used to determine if the seep is related to liquid addition. This may involve a review of the proximity of liquid addition to the seep location. In general, the warning symptom will be leachate seeps that are constant or reoccurring in areas near active liquid addition.

- Excessive landfill gas pressure within the waste mass. This would be measured on landfill gas extraction wellheads as part of the regular monitoring program. If the gas generation rates require major adjustments, in addition to the gas collection and control system, to manage the pressures in the waste, this will be indicative of a warning symptom.

Failure thresholds: Leachate recirculation will be suspended whenever any of the failure thresholds are exceeded. Leachate recirculation may not resume until the department has reviewed and approved changes to the system that will result in meeting the thresholds. The department will be notified within 3 days of the discovery of exceeding any failure threshold. Failure thresholds may include the following:

- Saturated conditions in the waste mass. This will be observed during monitoring of leachate head wells. If heads greater than 1 foot are observed, then modification will be made to the leachate recirculation methods or input rates. This will also be observed during drilling of landfill gas extraction wells. Saturated conditions can and do occur in wells regardless of liquid addition. If well drilling observations indicate saturated waste above the bottom 20 feet of the borehole, samples of the drill cuttings will be taken. Average moisture content of these samples above 55 percent or at field capacity will be the threshold level.

- Reduced shear strength of the waste mass. Observations of open or closed cracks across the waste surface, or other signs of large block movements of waste, or visible signs of changes in outline of the waste mass (i.e., bulging or obvious changes in slope), or collapse of access roads or other soil structures such as biopiles/stockpiles would be considered a failure threshold.

The warning symptoms and failure thresholds must be monitored during all weather conditions. Should any of the warning symptoms or failure thresholds be triggered as a result of climate, weather, or seasonality changes recirculation operations will cease until further investigation or operational modifications can prove the conditions causing the warning symptom are no longer present. Specific measure to be taken during expected weather or seasonal changes include:

- Measures shall be taken to prevent cold weather freeze up of leachate distribution equipment if used during the winter months.

- Leachate recirculation will be suspended upon discovery of warning symptoms. Should weather/climate or seasonality events be attributed to the root cause of the warning symptom recirculation will be suspended until the warning symptom subsides or is remedied.

- Leachate recirculation will be suspended whenever the failure thresholds are exceeded due to weather/climate or seasonality events and will not resume until the department has reviewed and approved changes to the system that will result in meeting the thresholds.

MONITORING: Monitoring specific to leachate recirculation includes the following, as required by s. NR 507.215, Wis. Adm. Code:

- Monthly volume of leachate extracted from each leachate drainage basin.
- Monthly volume of leachate recirculated in each leachate drainage basin.
- Monthly precipitation.
- Monthly leachate head on the liner.

- Quarterly samples of leachate tested for biological oxygen demand (BOD), chemical oxygen demand (COD), ammonia-nitrogen, field pH, field specific conductance, alkalinity, and hardness.
- Semi-annual sample of leachate for volatile organic compound (VOC) scan.
- Monthly total volume of gas extracted from each leachate drainage basin.

RECORDKEEPING: Operational logs will be maintained for the leachate recirculation operation. The logs will be completed by, or under the responsible charge of, the landfill manager. Information recorded in these logs will, at a minimum, include the following (for each drainage basin):

- Amount/type of precipitation.
- Quantities of leachate applied to the waste mass and the recirculation method employed.
- Date and location at, or over, which leachate was applied (i.e. phase/module and/or approximate on-site coordinates).
- Approximate leachate application rate.
- Observation's indicative of leachate recirculation issues warranting refinement or immediate attention.
- Corrective actions taken in response to leachate recirculation issues identified.

REPORTING: An annual report will be submitted to the department by April 30 of each year for leachate recirculation activities occurring during the previous calendar year as required by s. NR 506.135(5), Wis. Adm. Code. The following leachate recirculation information will be included in the annual report:

- Results of the liquid mass balance measurements for each leachate collection drainage basin.
- Leachate head levels measured at each leachate head well.
- Graphs showing the volumes of leachate recirculated and extracted and precipitation for each leachate drainage basin.
- Graphs over the time period since leachate recirculated was initiated for each parameter required to be sampled.
- Summary of warning symptoms, terminations, resumptions of recirculation after termination, and any operational problems and resolutions.
- Documentation drawings showing the installed details of the leachate distribution system added or revised since the last annual report, including, but no limited to piping, pumps, and distribution media.

RESEARCH, DEVELOPMENT, AND DEMONSTRATION (RD&D) PLAN

Refer to the July 8, 2022, plan of operation modification approval for a research, development, and demonstration plan. WMWI will continue to add liquids to the waste mass in accordance with the approved plan.

ENVIRONMENTAL MONITORING

Environmental and performance monitoring will be performed for groundwater, water supply wells, underdrain, leachate, leachate recirculation, gas, and surface water. Environmental and performance monitoring will extend through active site operation and long-term care. Monitoring data will be reported to the department in an electronic format, as required by s. NR 507.26(3), Wis. Adm. Code.

Sampling procedures will follow the Sampling and Analysis Plan (Appendix R of the February 18, 2022 plan of operation report). See attached tables for the approved environmental monitoring schedule.

The groundwater detection monitoring plan consists of semi-annual groundwater elevation measurements, sampling for analyses of indicator parameters and some inorganic substances, as well as semi-annual to annual analyses of VOCs.

CLOSURE AND LONG-TERM CARE

Although WMWI will be perpetually responsible, in accordance with s. 289.41(1m)(c), Wis. Stats., for the long-term care of this landfill, proof of owner financial responsibility is only required for the closure of the most expensive area, and for long-term care of the entire facility for a period of 40 years. Actions to be taken during closure and long-term care, along with the associated cost estimates, are summarized in the attached tables.

Closure costs reflect the most expensive area to close, which includes 89.9 acres of the landfill. The closure costs include: the purchasing, hauling, placement and documentation testing of all the final cover materials including soils, membranes, fabrics, and grids and topsoil; seeding, fertilizing, mulching and labor; the installation of gas removal and treatment devices; the cost of preparing an engineering report documenting the work performed and a 10% contingency per s. NR 520.02(2), Wis. Adm, Code.

Long-term care costs include land surface care; gas removal, treatment and monitoring; vertical gas extraction well and pump replacement; gas flare/blower replacement; unsaturated zone monitoring; leachate pumping, transportation, monitoring and treatment; groundwater monitoring including sample collection and analysis; leachate collection line cleaning on an annual basis; leachate collection line televising every 5 years; annual cost of electricity for maintaining the closed site; and a 10% contingency per s. NR 520.02(3), Wis. Adm. Code.

The long-term care items to maintain or inspect are included in the checklist below.

Long-Term Care Inspection Checklist

Maintenance / Inspection Item	Comments
Final Cover Maintenance	
Settlement Repair	Fill/regrade low spots as required to maintain positive drainage
Erosion Repair	As Required
Vegetation Maintenance	
Mowing	Annually or as required
Revegetation of Bare Areas	Place seed, fertilizer, and mulch as required
Stormwater Runoff Management System Maintenance	
Sediment Accumulation	Remove sediment as required
Control Structures	Inspect annually and repair as required
Erosion Repair	As required
Landfill Gas System Maintenance	
Vegetative Stress / Landfill Gas Odor	Evaluate as part of system performance review

System Performance	Evaluate possible header pipe blockages and need for blower, flare, gas-to-energy system maintenance / replacement
Leachate Collection System Maintenance	
Leachate Collection Line Cleaning	Clean annually
Leachate Line Televising	Televise every 5 years
Underdrain System Maintenance	Inspect components still in use annually and repair as required
Monitoring Well Maintenance	
Groundwater Monitoring Well and Gas Probe	Repair any damage as required

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL PLAN OF OPERATION APPROVAL
FOR THE
ORCHARD RIDGE RECYCLING & DISPOSAL FACILITY (RDF) EASTERN EXPANSION, SOUTHERN UNIT
LICENSE #4491

FINDINGS OF FACT

The Department of Natural Resources (department) finds that:

1. Waste Management of Wisconsin, Inc. (WMWI) owns and operates a non-hazardous solid waste disposal facility, the Orchard Ridge Recycling and Disposal Facility (RDF) Eastern Expansion, Southern Unit in the South ½ of NE ¼ and SE ¼ of Section 1, Township 8 North, Range 20 East, Menomonee Falls, Waukesha County, Wisconsin.

2. WMWI is proposing to construct a contiguous vertical and horizontal expansion of the Orchard Ridge RDF East Expansion, referred to as the Eastern Expansion, Southern Unit (Southern Unit).

3. The department issued a conditional plan of operation approval for Orchard Ridge Recycling & Disposal Facility (RDF) East Expansion on February 27, 2019.

4. The department issued a determination of need and feasibility for the Orchard Ridge Recycling & Disposal Facility (RDF) Eastern Expansion, Southern Unit on July 30, 2021.

5. On February 21, 2022, TRC, on behalf of WMWI, submitted to the department a plan of operation for the proposed Orchard Ridge RDF Eastern Expansion, Southern Unit. The department received the review fee of $7,700 for the plan of operation on March 7, 2022.

6. The information submitted as part of the plan of operation includes the following:

    a. A report and appendices titled "Plan of Operation, Orchard Ridge RDF Eastern Expansion, Southern Unit, Village of Menomonee Falls, Waukesha County Wisconsin" and 42 accompanying plan sheets, dated February 18, 2022. This submittal was received by the department on February 21, 2022.

    b. A report titled “Waste Management of Wisconsin, Inc. - Orchard Ridge Recycling and Disposal Facility, Proposed Eastern Expansion, Southern Unit Plan of Operation - Addendum 1, Village of Menomonee Falls, Waukesha County, Wisconsin, License No. 4491”, dated September 16, 2022. This submittal was received by the department on September 19, 2022.

    c. A report titled “Waste Management of Wisconsin, Inc. - Orchard Ridge Recycling and Disposal Facility, Proposed Eastern Expansion, Southern Unit Plan of Operation - Addendum 2, Village of Menomonee Falls, Waukesha County, Wisconsin, License No. 4491”, dated September 30, 2022.

This addendum includes revised pipe strength calculations and was received by the department on September 30, 2022.

d. A report titled "Waste Management of Wisconsin, Inc. - Orchard Ridge Recycling and Disposal Facility, Proposed Eastern Expansion, Southern Unit Plan of Operation - Addendum 3, Village of Menomonee Falls, Waukesha County, Wisconsin, License No. 4491", dated October 17, 2022. This addendum includes a letter and attachments, including revised plan sheets 19, 20, and 41. The submittal was received by the department on October 17, 2022.

e. An October 19, 2022, WMWI email (Ryan Baeten) which contains a table of the southern unit leachate lines lengths.

f. A report titled "Plan of Operation – Addendum No. 4, Alternate Daily Cover, Proposed Eastern Expansion, Southern Unit, Waste Management of Wisconsin, Inc. - Orchard Ridge Recycling and Disposal Facility, Village of Menomonee Falls, Waukesha County, Wisconsin, License No. 4491", dated November 11, 2022.

7. Additional documents considered in the review of the plan of operation include the following:

a. A hazardous waste treatment variance request titled "Remediation Variance Request for Boundary Road Landfill Waste Removal Project", dated October 7, 2022.

b. The department's July 8, 2022, plan of operation approval modification for the research, development and demonstration plan renewal.

c. The department's May 26, 2022, plan of operation approval modification for an onsite clay borrow source.

d. The department's March 23, 2022, plan of operation incompleteness letter.

e. The department's July 30, 2021, feasibility determination for the Orchard Ridge RDF Eastern Expansion, Southern Unit.

f. The department's June 4, 2021, plan of operation approval modification for final cover drainage system and gas well abandonment for the Orchard Ridge Recycling and Disposal Facility, License # 3360.

g. The April 15, 2021, plan of operation modification request for final cover drainage system and gas well 847 abandonment, License No. 03360, Orchard Ridge Recycling and Disposal Facility, Menomonee Falls, Wisconsin.

h. The department's April 14, 2021, plan of operation approval modification for gas system, PALs/ACLs, clay over winter, and other items.

i. The department's November 23, 2020, plan of operation approval modification for Phase 4 liner design and Phase 3 liner phasing.

j. The department's 2019 guidance document titled, Managing Container Glass, PUB-WA1835 2019.

k. The department's February 27, 2019, plan of operation approval for the Orchard Ridge RDF East Expansion.

l. A January 29, 2019, SCS Engineers report titled "Addendum No. 4 to the July 2018 Plan of Operation Orchard Ridge RDF, East Expansion" which includes information on wood chips and residual glass as ADC.

m. The department's June 6, 1995, plan of operation approval for a solid waste processing facility (biopile) for the treatment of contaminated soil, License # 3783. This approval contains conditions on how the treated biosoils may be used based on the concentrations of diesel range organics (DRO) and gasoline range organics (GRO).

n. The department files for the Orchard Ridge RDF, License #4491.

8. Additional facts relevant to the review of the plan of operation include:

a. Wetland individual permit for the Orchard Ridge Recycling and Disposal Facility was issued on September 13, 2021, for the proposed wetland disturbances (place a culvert crossing, change a stream course, and construct a pond within 500 ft of a waterway) with a permit amendment issued on September 30, 2021.

b. U.S. Army Corps of Engineers (USACE) issued their permit on December 7, 2021, authorizing Orchard Ridge Recycling and Disposal Facility to permanently discharge fill material into 3.72 acres of wetland and along 95 linear feet (0.03 acre) of waterway (S1 east/west), the temporarily discharge fill material into 0.20 acre of wetland and along 190 linear feet of waterway, and permanently discharge fill material into 2,578 linear feet (12,890 square feet) of waterway (S1 north/south) for the purpose of exhuming the Boundary Road Landfill and expanding the Orchard Ridge RDF Southern Unit.

c. Chapter 40 Code of Federal Regulations (CFR) § 761.62(b)(1) allows PCB bulk product waste to be disposed of in a licensed nonhazardous solid waste landfill. The special waste acceptance plan included within the plan of operation includes the acceptance shredder fluff, a PCB bulk product waste.

d. Section 289.54(2), Wis. Stats., prohibits the department from approving a request by the operator of a solid waste disposal facility to accept dredge materials that contain PCBs or heavy metals for disposal in the solid waste disposal facility until after the department holds a public meeting in the city, village or town in which the solid waste disposal facility is located, and requires the department to describe the nature of the requested disposal and solicit public comments.

e. A public information meeting has not been held for this solid waste disposal facility in accordance with s. 289.54(2), Wis. Stats. Therefore, the landfill may **not** accept dredge material containing PCBs or heavy metals for disposal.

f. The parameters in ch. NR 538, Wis. Adm. Code, Table 2 for foundry sand are Phase II Constituents of Concern per EPA Risk Assessment 530-R-14-003. The parameters listed in Table 2 are appropriate to evaluate the chemical characteristics of foundry sand and slag.

g. Based on WMWI's September 15, 2020, email for Timberline Trail landfill, License #3455, the review process for beneficial use of contaminated soil and related materials includes documentation of site history and contaminants of concern for each material source. The review process will include comparison of totals analysis data to OSHA standards, s. NR 720.12, Wis. Adm. Code, residual contaminant levels for direct contact in industrial setting or other standards to confirm that the proposed beneficial use does not present a threat to human health and the environment. Sources of contaminated soils may include:

   i. Historic fill from locations with known metals contamination
   ii. Material from shotting ranges and ammunition sites
   iii. Material determined to have impacts from lead-based paint, petroleum/volatile organic compounds, or pesticides / herbicides.

h. A condition of this approval includes requirements for making test results available to the department upon request for contaminated soil and related materials so the department may confirm the materials present a low risk to human health and the environment when used as ADC or beneficially used within the landfill.

i. The chemical and physical characteristics of filter cake and water treatment sludge are expected to vary based on source. Therefore, this approval contains a condition requiring department review of each new source of filter cake or water treatment sludge. Because of the characteristics and potential for odors, it may be necessary to limit the length of time these materials may be stored.

j. The above Findings of Fact 8.f. - 8.i., relate to the approval of the special waste management plan that WMWI has used at its other landfill facilities in Wisconsin. As noted in Addendum 3 of the plan of operation, WMWI intends to use the same special waste management plan template at Orchard Ridge RDF Eastern Expansion. A revised special waste management plan was provided within Addendum 4 of the plan of operation.

k. Under NR 718.05, Wis. Adm. Code (storage of excavated contaminated soil and NR 718.12 (management of contaminated soil), soil stored or managed outside a licensed solid waste facility requires a Materials Management Plan (MMP) prior to excavation. Potential uses of soils removed from BRLs grading layer or soils excavated below waste that would require an MMP include filling to achieve sub-base grades following the removal of waste and construction of berms roads or other features outside the limits of waste of the Southern Unit.

l. The department approved the following in the July 8, 2022, Research, Development and Demonstration plan renewal:

   i. Application of liquids into the waste mass within 100 feet of the outboard slopes.

ii. Application of liquids in waste thickness less than 20 feet (between base and the lowest point of distribution).

m. The department is not approving the exemption request to continue leachate recirculation in the event leachate builds up over the 1-foot drainage layer thickness. WMWI did not provide the information required NR 500.08(4), Wis. Adm. Code.

n. The department granted exemptions for six (6) of the water supply wells in the feasibility determination for the Southern Unit. These wells include the following:

i. PWE-07 at 9050 N. 124th St., current owner is Flint Matuszcak
ii. PWE-08 at 9060 N. 124th St., current owner is Stoney Creek, LLC
iii. PWE-09 at 9100 N. 124th St., current owner is Dale Liebherr and Gary Liebherr
iv. PWE-11 at 9400 N. 124th St., current owner is 17H, LLC
v. PWE-12 at 9300 N. 124th St., current owner is LPT Properties, LLC (Industrial Recyclers)
vi. PWE-13 at 9168 N. 124th St., current owner is Shoreline Support Corporation

o. On July 30, 2021, the department issued variances for wells PWE-07 and PWE-08, from the locational setback requirement of s. NR 812.08(4)(g)1, Wis. Adm. Code. On April 13, 2010, the department issued similar variances for wells PWE-09, PWE-11, PWE-12 and PWE-13.

p. Monitoring groundwater quality for volatile organic compounds at the water supply wells listed in findings of fact 8.f. above is warranted to confirm that the landfill or related landfilling activities are not impacting groundwater quality at the water supply wells due to the need for the s. NR 504.04(3)(f), Wis. Adm. Code exemption, and s. NR 812.08(4)(g)1, Wis. Adm. Code variance.

q. Additional review of requested NR 140 groundwater standard exemptions and proposed PALs and ACLs in the report is warranted to resolve some discrepancies.

9. The proposed temporary groundwater monitoring wells likely will extend no more than 10 feet below the sub-base grades and will likely be completed with 3 to 5 feet of slotted screen. The wells will be constructed in general conformance with the applicable requirements of ch. NR 141, Wis. Adm. Code; however, due to the shallow desired sampling depth, a short screen and/or shortened annular space seal will be utilized. The department has authority to approve this as an alternate design in s. NR 507.06, Wis. Adm. Code.

10. The applicant has greater than 10% interest in the WMWI-Metro Recycling and Disposal Facility, License #1099, located in the city of Franklin, Wisconsin that is in noncompliance with the plan of operation approval for the facility issued by the department on July 31, 1981. WMWI has greater than 10% interest in the Omega Hills North Landfill, License #1678, located in the City of Germantown, Wisconsin, which is in noncompliance with a Stipulation and Judgment with the State of Wisconsin from 1989. WMWI has provided the department with proof of financial responsibility for the WMWI-Metro Recycling and Disposal Facility and the Omega Hills North Landfill to ensure the availability of funds to comply with the plan approval using a method under s. 289.41, Stats.

11. With the exception of the Metro RDF and the Omega Hills North Landfill, neither WMWI, nor any person owning 10% or greater legal or equitable interest in WMWI, or the assets of WMWI are:

    a. In noncompliance with the plan approvals or orders issued by the Department for a solid or hazardous waste facility in Wisconsin.

    b. An owner or previously owned a 10% or greater legal or equitable interest in person, or in assets of a person, who is not in compliance with a plan approval or order issued by the Department for a solid or hazardous waste facility in Wisconsin.

12. If the special conditions set forth below are complied with, the proposal will meet the requirements of chs. NR 500 through 538, Wis. Adm. Code.

CONCLUSIONS OF LAW

1. The department has authority under s. 289.30, Wis. Stats. to approve a plan of operation with special conditions if the conditions are needed to ensure compliance with chs. NR 500 through 538, Wis. Adm. Code.

2. The department has authority under s. 289.35, Wis. Stats., to accept proof of financial responsibility ensuring the availability of funds to comply with a plan or order using a method under s. 289.41, Wis. Stats.

3. The department has authority under s. NR 507.06, Wis. Adm. Code to approve an alternate design from ch. NR 141, Wis. Adm. Code requirements for the design and installation of groundwater monitoring wells used to monitor groundwater quality at approved landfills.

4. The conditions of approval set forth below are needed to ensure compliance with chs. NR 500 through 538, Wis. Adm. Code.

5. In accordance with the foregoing, the department has the authority under ch. 289, Wis. Stats., to issue the following conditional approval.

DETERMINATION OF EXEMPTIONS

1. The requested NR 506.135(1)(d), Wis. Adm. Code, leachate recirculation exemption in Section 1.5.1 of the plan of operation report is not granted. Refer to Finding of Fact 8.m above.

2. The requested NR 140, Wis. Adm. Code, groundwater standard exemptions in Section 1.5.1 of the plan of operation report are not granted. Refer to Finding of Fact 8.q. above.

CONDITIONAL PLAN OF OPERATION APPROVAL

The department hereby approves the plan of operation for the Orchard Ridge RDF Eastern Expansion, Southern Unit, except for the proposed preventative action limits for indicator parameters and proposed alternative concentration limits for substances of public welfare or health concern, subject to compliance with chs. NR 500 through 538, Wis. Adm. Code, and the following conditions:

General

1. The design capacity of the Southern Unit expansion (combined refuse, daily cover and intermediate cover) shall not exceed 10,219,880 cubic yards (cy). The total capacity of the Orchard Ridge RDF Eastern Expansion shall not exceed 15,642,735 cy (existing 5,422,855 cy + proposed 10,219,880 cy).

2. All aspects of construction and operation of the landfill shall be performed in accordance with the plan of operation, the requirements of chs. NR 500 to 538, Wis. Adm. Code, and the conditions of approval. In the case of any discrepancies between the approval conditions and the plan of operation, the approval conditions shall take precedence.

3. Any proposed changes to the plan of operation or this approval shall be presented to the department. If the changes are compatible with the desired performance of this landfill, as determined by the department, an addendum will be added to this approval indicating acceptance of those changes. Written department approval is necessary prior to implementing any changes with the exception of minor field modifications that are documented in accordance with s. NR 516.04(3)(d), Wis. Adm. Code, and that are discussed with the department prior to implementation. Other changes may be handled as plan modifications under s. NR 514.09, Wis. Adm. Code, as appropriate.

Boundary Road Landfill (BRL) Exhumation

4. Prior to each phase of BRL waste exhumation, WMWI shall provide the department with a copy of the quality assurance consultant's health and safety plan. If the plan does not change from the previous year, a new plan would not need to be submitted.

5. WMWI shall notify the department for each of the following scenarios relating to BRL exhumation:

    a. Prior to the start of each waste removal phase.

    b. When a suspicious waste is encountered.

    c. When a complete work stoppage for potential worker health and safety concerns occurs.

    d. When a field modification to the approved plan is needed in order to adapt to conditions encountered during waste removal activities.

    e. When modifications to the Material Management Plan or monitoring plan are necessary.

6. Type 1 soils shall not be used for intermediate cover on exterior slopes or as topsoil or rooting zone materials in the final cover, unless WMWI submits a plan for supplemental sampling and receives department approval. The plan shall meet the sampling frequency specified in ch. NR 718, Wis. Adm. Code or propose an alternative sampling frequency for collecting representative samples. Analysis shall use methods with limits of detection that are able to detect levels down to the applicable soil residual contaminant levels.

7. Grading layer soils shall meet the DRO/GRO limit of 10 mg/kg if used in the final cover or for intermediate cover on exterior slopes.

8. Within 120 days of completion of each phase BRL exhumation (including waste relocation, treatment, and collection of the initial groundwater samples from the newly installed temporary wells each phase of the BRL waste removal), WMWI shall submit a waste exhumation documentation report to the department. The report shall include the following:

    a. The total estimated volume of waste removed during the phase.

    b. The total estimated volumes and disposition of each type of soil material removed during the phase (soil that is mixed with waste will not be quantified).

    c. A summary of each type and amount of suspicious material encountered.

    d. Whether or not the suspicious material was determined to be hazardous waste.

    e. The treatment method for each type of material treated.

    f. The post-treatment confirmation sampling results if the material was treated on site.

    g. The disposal method for each type of material (on-site and off-site).

    h. Analytical results for soil and waste sampling completed during the phase of waste removal.

    i. Soil boring and/or test pit logs for soil sampling conducted below the waste, if sampling is performed using borings or test pits.

    j. Soil boring logs and monitoring well construction and development forms for temporary wells installed during the phase.

    k. Abandonment forms for previously installed temporary wells that were abandoned during the current waste removal phase.

    l. Groundwater sampling analytical results for a least the first round of groundwater samples from newly installed temporary monitoring wells as well as samples collected from previously installed temporary wells since the previous waste removal documentation report was submitted.

    m. Drawings documenting the waste removal activities, including:

i. Existing conditions prior to waste removal, including topography, monitoring points, phase limits, remaining BRL landfill gas and leachate collection infrastructure, and storm water management features.

ii. Conditions following waste removal, including same elements as above plus newly installed monitoring points.

iii. Sampling locations.

9. Following completion of the BRL waste relocation, WMWI shall submit a final construction completion report to the department, with waste exhumation and site closure documentation. The report shall include the following:

   a. Groundwater and soil data in tabular format.

   b. Figures depicting extent of contamination.

   c. Evaluation of residual contamination, if any.

   d. Evaluation of whether institutional controls/continuing obligations (ICs/COs) might be needed/updated post-removal and a long-term stewardship plan for any ICs/COs.

   e. Updated O&M Plan (if needed).

<u>Design and Construction</u>

10. The subbase testing required by s. NR 504.06(4)(d), Wis. Adm. Code, and the plan of operation shall be performed on the grid provided on plan sheet 5 of the plan of operation plan set. Testing, removal, and replacement of granular and silty subbase soils shall include the side slopes and extend a minimum 5-feet below subbase grades measured perpendicular to slopes.

11. A qualified engineer or qualified technician under the supervision of a qualified engineer shall be onsite during removal of unsuitable soils and prior to backfilling subgrade areas to verify that all unsuitable subbase soil has been removed in accordance with the approved plan. The areas requiring verification shall include any non-clay soil areas within 5-feet of the finished subbase design elevations or saturated subbase soil areas within the landfill liner limits.

12. The construction documentation report required by ch. NR 516, Wis. Adm. Code, for each phase of liner shall include:

    a. The volume of unsuitable soil removed, the volume of the backfill material placed as sub-base material, verification of acceptable soil material left in the subgrade of removed unsuitable or unstable soils (hand probe readings or other documentation of shear strength), and results of all testing performed on the unsuitable soil as well as the backfill material. Backfill testing shall include Proctor curves, moisture, and density tests.

b. Documentation of the underdrain system installation below the landfill liner.

c. Documentation of the location and size of stockpiles constructed from soil excavated for the landfill construction.

d. Documentation of the perimeter clay wedge construction.

e. Documentation of the location of all new gas probes and groundwater monitoring wells included in the monitoring for the landfill shown on a plan view drawing.

f. Documentation of the abandonment of monitoring points that occurred as part of construction.

This condition supersedes condition 11 of the department's February 27, 2019, plan of operation approval for the Orchard Ridge RDF East Expansion.

13. If a geocomposite drain layer or an integrated drainage system (IDS) are used in the final cover system, transmissivity tests shall be performed on the geocomposite or IDS under conditions representative of the field, including types of soils in contact with the geocomposite and a representative compressive load. Transmissivity testing shall be performed using a seating period of minimum 100 hours and a hydraulic gradient of one. The calculation shall include reduction factors for intrusion of filter geotextiles into the geonet, chemical clogging, biological clogging, creep, and laboratory uncertainties. If all soil and geosynthetic materials to be used are identical to those that were tested for a previous construction event, then the test need not be conducted again.

14. WMWI shall notify the department's waste management engineer assigned to this site a minimum of one week prior to beginning each of the construction events listed below for the purpose of allowing the department to inspect the work. A fee shall be paid to the department for each required inspection in accordance with s. NR 520.04(5), Wis. Adm. Code. The inspection fees shall be paid at the time the construction documentation review fee is submitted to the department.

Liner Construction Events

a. Sub-base grade excavation and storm water controls
b. Drainage layer placement and collection piping installation for the underdrain system
c. Clay placement
d. Geomembrane deployment and seaming
e. Sump construction/side slope riser placement
f. Drainage blanket placement/leachate line installation
g. Leak location survey and/or repairs
h. Triangle area construction
i. Each phase of Boundary Road Landfill exhumation

Final Cover Construction Events

j. Barrier soil or clay layer placement and storm water controls
k. Geomembrane cap installation/seaming
l. Geosynthetic clay liner installation (if used)
m. Drainage layer installation (sand or geocomposite)
n. Placement of piping within the drainage layer

o. Rooting zone and topsoil placement

Gas System Construction Events

p. Gas extraction well placement
q. Gas header pipe installation

This condition supersedes condition 12 of the department's February 27, 2019, plan of operation approval for the Orchard Ridge RDF East Expansion.

Operations and Maintenance

15. WMWI shall provide a way to prevent clay fines from washing into the leachate drainage layer material below the clay wedge on the sideslopes. If fines do wash into to the leachate drainage layer, the drainage material and fines shall be removed and replaced with new stone before waste is placed on the slopes.

16. The underdrain system shall remain active until the department approves the shut-down of the ground water extraction pumps.

17. All pumps and flow recording devices shall be maintained to ensure that leachate is pumped out of the landfill as required and the report flows are accurate.

18. In case of leachate extraction pump malfunction, the pump shall be made operational or replaced in a timely manner to allow for gravity drainage of leachate in accordance with s. NR 506.07(5), Wis. Adm. Code.

19. Leachate manholes shall be inspected semi-annually (at a minimum) for liquid accumulation. Storm water shall be prevented from infiltrating or accumulating in manholes. Leachate accumulation in the manholes shall be reported to the department, promptly investigated, and appropriate repairs, if required, shall be made.

20. Any active vertical gas extraction well experiencing leachate head levels covering 50 percent or more of the screened interval shall be re-measured within 90 days of the initial measurement. The landfill owner shall submit a proposed corrective action plan to the department within 180 days after confirmation of the liquid level in any vertical gas extraction well that exhibits leachate head levels covering 50 percent or more of the screened interval during two or more consecutive monitoring periods. The plan shall include an assessment of the gas extraction system's ability to control gas surface emissions in the area of the gas well with high liquids and proposed corrective actions. Corrective actions may include pump installation, gas extraction well replacement, gas extraction well addition, or other actions with department concurrence. A summary of gas wells experiencing high leachate head levels and corrective actions taken shall be included in the annual report. The department may require installation of leachate extraction equipment in wells, including those that exhibit leachate head levels covering less than 50 percent of the open screened interval, if, in the department's opinion, dewatering is necessary to maintain an effective gas extraction system or if it is determined that the head levels are a result of actual leachate head levels on the liner in that location of the landfill.

21. Final cover placement may be delayed up to 2 years after attaining maximum waste filling grades in each phase of closure provided that the requirements of s. NR 514.07(3), Wis. Adm. Code, are met. At no time shall the waste grades exceed the approved maximum waste filling grades for this facility as shown on plan sheet 15 and table on plan sheet 16 of the plan of operation.

    This condition supersedes condition 42 of the department's February 27, 2019, plan of operation approval for the Orchard Ridge RDF East Expansion.

22. Following attainment of approved maximum waste filling grades, one foot of intermediate cover shall be placed, and the area vegetated to prevent erosion as soon as practical. Areas of intermediate cover where vegetation has not been established within a year of placement and that will not receive final cover within a year shall be covered with a minimum 4-inches of topsoil and re-vegetated.

23. Following attainment of intermediate grades on the north slopes of Phases 3A and 4B, a two-foot intermediate cover shall be placed, and the area vegetated to prevent erosion as soon as practical. Areas of intermediate cover where vegetation has not been established within a year of placement and that will not receive final cover within a year shall be covered with a minimum 4-inches of topsoil and re-vegetated.

24. The department shall be notified within 24 hours of any of the following: subsurface oxidation events or elevated temperatures, fires with the potential to damage landfill systems (e.g., leachate, gas, liner), or fires that require the assistance from a fire department to contain.

<u>Special Waste Plan/Alternative Daily Cover (ADC)</u>

25. Dredge materials that contain PCBs or heavy metals shall not be accepted unless WMWI obtains department approval.

26. The special waste plan contained in Addendum 4 to the plan of operation shall replace previously approved special waste plans.

27. WMWI may use geotextiles/tarps, residual glass from WMWI's nearby materials recovery facility and from Strategic Materials, foundry sand, bioremediated (treated) petroleum contaminated soil, soils from remediation projects, and shredder fluff (or auto shredder residue). Other ADC materials shall only be used as allowed under the approved special waste management plan or in accordance with s. NR 506.055(1), Wis. Adm. Code.

28. All waste materials used as ADC or for beneficial use shall comply with the meet the universal conditions for ADC beneficial use contained in Section II or the universal conditions for non-ADC beneficial use contained in Section III of the special waste management plan.

    This condition supersedes conditions 14 through 28 of the department's February 27, 2019, plan of operation approval for the Orchard Ridge RDF East Expansion.

29. WMWI shall request department concurrence for each new source of foundry sand or slag proposed for use as ADC or beneficial use, and written department concurrence shall be received prior to use.

The request shall include test results of the chemical and physical characteristics of new sources of foundry system sand and slag. The analytical test results for foundry system sand shall include the parameters listed below, grain size analysis to the #200 sieve, and data for other tests (e.g., TCLP) specified by the solid waste management plan (SWMP). The analytical results for foundry slag shall include the parameters listed below and any other tests specified by the SWMP.

Parameter (total concentrations)	**Foundry Sand**	**Foundry Slag**
Antimony	x	x
Arsenic	x	x
Barium		x
Beryllium	x	x
Cadmium	x	
Chromium, Hexavalent	x	x
Cobalt	x	x
Lead	x	x
Nickel	x	x
Thallium		x
Benz(a)anthracene	x	
Benzo(a)pyrene	x	
Benzo(b)fluoranthese	x	
Benzo(k)fluoranthese	x	
Chrysene	x	
Dibenzo(ah)anthracene	x	
Indeno(123-cd)pyrene	x	
1-methylnaphthalene	x	
2-methylnaphthalene	x	
Naphthalene	x	
Pyrene	x	

30. WMWI shall request and receive written department concurrence prior to using ground-up railroad ties within the landfill. The request shall include TCLP analytical results from representative samples of the ground-up railroad ties.

31. WMWI shall notify the department in writing prior to conducting a trial for the use of papermill sludge as ADC and provide a copy of the waste characterization including the percent solids. WMWI shall notify the department if the trial is terminated and include in the notification the results of the trial and the reason for the termination. The trial shall last no longer than 3 months and a report shall be provided to the department at the conclusion of the trial. If the trial is successful, the use of papermill sludge as ADC may continue with written department concurrence.

32. Contaminated soil, gravel, or other waste materials (e.g., concrete, block, or brick) shall not be used as ADC or other beneficial uses within the landfill if PCB levels are greater than or equal to 1 mg/kg without prior written concurrence or approval from the department. This condition does not apply to shredder fluff.

33. Contaminated soil, gravel, or other waste materials (e.g., concrete, block, or brick) shall not be used as ADC or other beneficial uses if they contain any asbestos.

34. Analyses for total concentrations of contaminants of concern shall be conducted on contaminated soils and related contaminated materials that are intended for beneficial use or ADC prior to acceptance. The data shall be compared to appropriate standards to ensure contaminants are present at low levels and do not present a risk to human health and the environment. The analytical results shall be made available to the department upon request.

35. Filter press cake from industrial sources and water supply treatment sludge (non-NORM) shall not be used as ADC without prior written approval from the department for each new source. Requests for written approval shall include test results documenting the physical and chemical characteristics and anticipated volume in addition to other information required by s. NR506.055(1), Wis. Adm. Code.

Organic Stability

36. The waste sampling program at borings for gas extraction wells shall include analyses for moisture content and organic matter content at maximum 20-foot intervals in the boreholes, at a minimum of one gas well borehole in each five-acre area where gas wells are being installed. The elevations of any standing leachate levels in the borings shall be documented for all gas well borings.

Leachate Recirculation

37. Leachate recirculation methods shall be through surface application or horizontal distribution lines constructed within the waste mass.

38. The leachate recirculation rate shall be limited to 7,450 gallons per acre per day within the landfill.

Environmental Monitoring

39. Environmental monitoring shall be performed during both the active life and post-closure care in accordance with the schedules of the attached environmental monitoring tables (Attachment 1), as well as air quality, storm water and wastewater monitoring in accordance with the appropriate department permits.

    This condition supersedes condition 43.a of the department's February 27, 2019, plan of operation approval for the Orchard Ridge RDF East Expansion.

Inspection and Reporting

40. An annual report shall be submitted to the department no later than April 30th of each year that summarizes the following activities from the previous calendar year:

    General

    a. Provide one or more plan view drawings clearly annotating the following:

i. The landfill development and filling status information specified in s. NR 506.19(2)(a), Wis. Adm. Code on a color-coded topographic site map depicting all landfill phases.

ii. Existing environmental monitoring points and systems (e.g. leachate, landfill gas) on a color-coded site map depicting all landfill phases.

b. A copy of the compliance certification required by s. NR 506.19(1), Wis. Adm. Code.

c. A copy of the annual topographic survey.

Operations

d. The actions used to minimize windblown debris. The report shall contain at a minimum the following information:

i. Dates when the wind speed was greater than or equal to 30 mph at the working face.

ii. Dates when the landfill was shut down due to wind.

iii. Dates when the landfill collected debris off-site.

Special Waste and Alternate Daily Cover (ADC)

e. Total tonnage of special wastes and a list of special waste types which were accepted for disposal the previous calendar year. The list of types of special waste shall include the common waste name, profile number and tonnage.

f. Tonnage for each waste used as ADC or other approved beneficial use (specify use), the ratio of waste to ADC by volume or weight, and a discussion of any changes and/or problems encountered with the use of the wastes within the landfill. The performance of sludges used as ADC shall be specifically discussed.

g. A summary of test results in table format for each source of shredder fluff and construction and demolition fines. The department may request analytical data for ADC materials as needed.

h. A list of all contaminated soils and related materials (e.g., gravel, brick, concrete), used as ADC or beneficial use, and corresponding information (e.g., profile number, source/generator, quantity).

i. The following information for coal slag or clinkers for beneficial use within the landfill:

i. A list of the utility power plant facilities that generated the coal slag used on the roads,
ii. Indication that the coal slag is only from the combustion of coal,
iii. The actual amount of coal slag used as road base material during the year,
iv. Any problems encountered as a result of using coal slag as road base material.

Gas Extraction System

j. Copies of the surface emissions monitoring reports submitted to the department's air management program.

k. Records of periods of shutdown of the gas extraction system, length of time of shutdown, and corrective action for the system or individual extraction wells.

l. Any maintenance, cleaning, repair, or replacement of gas extraction wells, header or lateral lines, gas condensate knock-outs, blower or gas combustion equipment components, or valve assemblies.

m. An assessment of the performance of the gas extraction system, including liquid levels in the gas extraction wells, the condition of each gas well and identification of any wells which need to be replaced or that have been replaced, the quality and quantity of gas and gas condensate produced from the facility, and the removal of volatile organic compounds and other substances in the gas and gas condensate. Also, include a summary of gas wells experiencing high leachate head levels and any corrective actions taken.

Groundwater and Underdrain System

n. An assessment of the groundwater flow patterns and quality trends.

o. A determination of the groundwater flow rates and direction(s) of flow (vertical and horizontal) in the uppermost aquifer.

p. An assessment of the condition and operation of the underdrain systems (including pumping operations). Include summaries of discharge volumes and quality for groundwater extracted/gravity drained through the underdrain systems.

q. In 2025 and every 5 years thereafter, include a plan sheet depicting groundwater elevation contours for the entire WMWI property and landfills including the Omega Hills property, using groundwater elevation data collected from every active monitoring well located on both properties. Static water levels for the 5-year event across the entire landfill complex will be collected as quickly as possible, and before any other tasks are performed on the wells.

Leachate Collection and Recirculation

r. An annual report for leachate recirculation in accordance with s. NR 506.135(5), Wis. Adm. Code, including a summary and tabulation of monitoring required within ss. NR 507.215(1) – (4), Wis. Adm. Code.

s. A summary report of each pipe cleaning and each video camera inspection event as required by s. NR 506.07(5)(g), Wis. Adm. Code.

t. A summary report of the removal of any dams or barriers used to separate clean water in a prepared cell from solid waste and leachate as required by s. NR 506.07(5)(h), Wis. Adm. Code, unless previously submitted to the department.

u. Documentation of inspections of the secondary containment structures for leachate transfer pipes and inspections of dry manhole including volume of liquid removed if any, the cause of liquid accumulation and repairs or maintenance performed.

v. A summary table of the leachate testing conducted for Milwaukee Metropolitan Sewage District (MMSD).

Organic Stability

w. An evaluation of the performance and a report of the implemented landfill organic stability plan as required by s. NR 514.07(9)(d), Wis. Adm. Code.

x. Every 5 years, a report describing the evaluation of the plan and likelihood that the plan will enable the landfill to reach the organic stability goals as required by s. NR 514.07(9)(e), Wis. Adm. Code.

Research, Development and Demonstration (RD&D)

y. An annual report in accordance with the approved research, development and demonstration plan and s. NR 514.10(1)(f), Wis. Adm. Code, unless submitted separately or no longer required.

Surface Water Controls and Final Cover Maintenance

z. A copy of the annual compliance inspection/evaluation required by the storm water permit and a summary of any maintenance of storm water controls.

aa. A summary of surface water monitoring results, including visual inspections.

bb. An evaluation of settlement which the landfill has undergone, and any evidence of surface water ponding, poor drainage, differential settlement, erosion or other disruption of the final cover structure.

cc. An evaluation of the integrity of the vegetation on the final covered or interim covered areas, integrity of the final cover, summary of erosion control efforts, surface stabilization efforts and any evidence of animal intrusion.

This condition supersedes condition 45 of the department's February 27, 2019, plan of operation approval for the Orchard Ridge RDF East Expansion.

Financial Responsibility for Closure and Long-Term Care

41. Revised proof of financial responsibility for closure and long-term care shall be established in accordance with ch. NR 520, Wis. Adm. Code, within 60 days of the date of this approval. The proof of financial responsibility shall be established based upon the approved closure and long-term care cost estimates included in the attached tables.

42. Vegetative cover shall be maintained on all areas of final cover to prevent erosion. The final cover vegetation shall be mowed to prevent the growth of tall weeds and woody vegetation.

This approval is based on the information available to the department as of the date of approval. If additional information, project changes or other circumstances indicate a possible need to modify this approval, the department may ask you to provide further information relating to this activity. Likewise, the department accepts proposals to modify approvals, as provided for in state statutes and administrative codes.

NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision made by the department, you should know that Wisconsin statutes and administrative codes establish time periods and requirements for reviewing department decisions.

To seek judicial review of the department's decision, sections 227.52 and 227.53, Wis. Stats., establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the department to file your petition with the appropriate circuit court and serve the petition on the department. The petition shall name the Department of Natural Resources as the respondent.

Dated December 15, 2022

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

James C. Delwiche

Jim C. Delwiche
Waste and Materials Management Program Supervisor
Southeast Region

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