

OHIO ENVIRONMENTAL PROTECTION AGENCY
PERMIT-TO-INSTALL

Application Number: 06-07993
Application Received: October 27, 2005
Permit Fee: \$80,000.00
Permit Fee Balance: \$79,600.00

Applicant: Cardinal Operating Company – Cardinal Plant
Address: P.O. Box B
Brilliant, Ohio 43913

Name: Cardinal FAR1 Residual Waste Landfill

Location: The facility is located approximately one mile north of the Cardinal Plant, which is located near Brilliant, Ohio. The facility is within Wells Township, Jefferson County.

Permit: New Residual Solid Waste Facility

Issuance Date:

Effective Date:

The above-named entity is hereby issued a permit-to-install (permit) for the above-described source pursuant to Ohio Administrative Code (OAC) Rule 3745-30-05. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed and/or modified in accordance with the plans, specifications, and/or information accompanying the permit application, the above-described source of environmental pollutants will operate in compliance with applicable state and federal laws, rules, and regulations, and does not constitute expressed or implied assurances that, if constructed and/or modified in accordance with those plans, specifications, and/or information accompanying the permit application, the above-described source of environmental pollutants will be granted the necessary operating permits and/or licenses. This permit is issued subject to the attached conditions which are hereby incorporated and made a part hereof.

Ohio Environmental Protection Agency

Chris Korleski, Director

PERMIT SUMMARY

This is a DRAFT permit (PTI Number 06-07993) which, if issued as a final permit, authorizes construction of Cardinal FAR1 Residual Waste Landfill (Facility), a proposed new residual solid waste landfill in Jefferson County. The Cardinal Operating Company – Cardinal Plant (Cardinal) is the applicant for the permit to install.

Cardinal proposes to construct a 127-acre disposal area, which will have a capacity of approximately 18.2 million cubic yards, on top of the Cardinal Plant's Fly Ash Reservoir 1 and the adjacent strip mining bench. The projected total annual quantity of waste to be disposed of at the Facility is 545,000 tons. The Facility's anticipated life is 40.1 years.

The Facility's design includes the following: a two-foot thick subsurface drainage layer; a contouring fill layer; a five-foot thick added geologic material layer; a composite (clay/geosynthetic membrane) liner system; a leachate collection system; a surface water management system; a ground water monitoring system; and a final closure cap system. The permit also incorporates 15 years of post-closure care and financial assurance for closure and post-closure care.

This permit grants Cardinal a variance from OAC Rule 3745-30-07(C)(1)(h), which requires that a recompacted soil liner be constructed with a minimum bottom slope of two percent. This permit also grants Cardinal an exemption from OAC Rule 3745-30-07(C)(3)(f)(iv), which requires that leachate pipelines be double-cased outside of the limits of solid waste placement, and an exemption from OAC Rule 3745-30-07(C)(4)(d)(iv), which requires that a sedimentation pond be lined.

This summary is provided solely for informational purposes and does not constitute a part of, or otherwise affect, the attached permit.

PERMIT CONDITIONS

1. The director of the Ohio Environmental Protection Agency (Ohio EPA), or an authorized representative, may enter upon the premises of the above-named applicant (permittee) at any reasonable time during construction and operation for the purpose of making inspections, conducting tests, or examining records or reports pertaining to the construction, modification, or installation of the above-described source of environmental pollutants (residual solid waste disposal facility).
2. The proposed facility shall be constructed in strict accordance with the plans, specifications, and information submitted as part of the permit application. There may be no deviation from the approved plans without the express, written approval of Ohio EPA. Any deviation from the approved plans or the permit conditions may lead to such sanctions and penalties as provided under Ohio law. Approval of these

plans does not constitute an assurance that the proposed facility will operate in compliance with all Ohio laws and regulations. Additional landfill components shall be installed upon orders of Ohio EPA if the proposed residual solid waste disposal facility is inadequate or cannot meet applicable standards.

3. Issuance of this permit approval does not relieve the permittee of the duty to comply with all applicable federal, state, and local laws, ordinances, and regulations.
4. This permit shall apply only to those facilities shown on the plans submitted as part of PTI Application Number 06-07993 as received on October 27, 2005, with subsequent revisions received on the following dates: May 31, 2006; November 30, 2006; and February 7, 2007.
5. This permit may be modified, or alternatively revoked and reissued, to comply with any revisions to OAC Chapter 3745-30 applicable to this residual solid waste disposal facility.
6. The permittee shall provide for the proper maintenance and operation of the residual solid waste disposal facility in accordance with the provisions of OAC Chapter 3745-30.
7. Nothing in this permit shall be construed to authorize any waiver from the requirements of any applicable federal or state laws or regulations except as specified herein. This permit shall not be interpreted to release the permittee from responsibility under Ohio Revised Code (ORC) Chapters 3704, 3714, 3734, or 6111; under the Federal Clean Water Act, the Resource Conservation and Recovery Act, or the Comprehensive Environmental Response, Compensation, and Liability Act; or from other applicable requirements for remedying conditions resulting from any release of contaminants to the environment.
8. This permit does not authorize the acceptance of any hazardous or infectious wastes.
9. This permit does not authorize the acceptance of any asbestos or asbestos-containing waste material that is subject to the provisions of NESHAP, 40 CFR Part 61, Subpart M. No such asbestos or asbestos-containing waste material may be accepted without first obtaining the necessary permits from Ohio EPA.
10. Not later than seven days prior to starting any construction authorized by this permit, the permittee shall submit to Ohio EPA, Southeast District Office (SEDO) and the Jefferson County Health Department written notification of the anticipated construction start date so that construction of this Facility can be routinely inspected by Ohio EPA, SEDO and the Jefferson County Health Department before the

Facility is placed into operation.

11. The permittee shall perform the following activities during construction and operation of the Facility in accordance with the cited provisions of OAC Chapter 3745-30 as follows:
 - a. The test pad required by OAC Rule 3745-30-07(F)(1) shall be constructed, as necessary, and a report containing the test results shall be submitted to Ohio EPA, SEDO not later than 14 days prior to the initial construction date of the landfill component that the test pad models.
 - b. The pre-construction tests required by OAC Rule 3745-30-07(D) shall be performed and the test results submitted to Ohio EPA, SEDO not later than seven days prior to the intended use of the materials in construction.
12. The permittee shall install added geologic material (AGM) that shall comply with the following:
 - (a) Provide at least five feet of isolation distance between the uppermost aquifer system and the bottom of the recompacted soil liner.
 - (b) Be free of debris, foreign material, and deleterious material.
 - (c) Not be comprised of solid waste.
 - (d) Have low permeability, good compactability, cohesiveness, and relatively uniform texture, and not contain large objects in such quantities as may interfere with its application and intended purpose. The soil shall be a well compacted loam, silty loam, clay loam, silty clay loam, silty clay, or other soil types that can achieve the intended purpose.
 - (e) Not have any abrupt changes in grade that may result in damage to the composite liner system.
 - (f) Have pre-construction testing of the borrow soils performed on representative samples to determine the following:
 - (i) The maximum dry density and optimum moisture content according to ASTM D698-00a (standard proctor), or ASTM D1557-00 (modified proctor) at a frequency of not less than once for every 10,000 cubic yards.

- (ii) The recompacted laboratory permeability using ASTM D5084-00e1 (falling head) at a frequency of not less than once for every 10,000 cubic yards.
 - (iii) The grain size distribution according to ASTM D422-63 (sieve and hydrometer) at a frequency of not less than once for every 3,000 cubic yards.
 - (g) Be constructed in lifts to achieve uniform compaction. Each lift shall comply with the following:
 - (i) Be constructed in loose lifts of 12 inches or less.
 - (ii) Be constructed of a soil with a maximum clod size that does not exceed the lift thickness.
 - (iii) Be compacted to at least 95 percent of the maximum dry density as determined by ASTM D698-00a (standard proctor) or at least ninety percent of the maximum dry density as determined by ASTM D1557-00 (modified proctor).
 - (iv) Be placed with a soil moisture content that shall be not more than two percent below or more than four percent above the optimum moisture content as determined by ASTM D698-00a or ASTM D1557-00.
 - (v) Have a maximum permeability not more than one times ten to the negative five centimeters per second (1×10^{-5} cm/sec).
 - (h) Be determined to have adequate strength to satisfy bearing capacity and slope stability strength requirements.
 - (i) Have quality control testing of the constructed lifts performed to determine the density and moisture content according to ASTM D2922-01 and ASTM D3017-01 (nuclear methods), ASTM D1556-00 (sand cone), ASTM D2167-92 (rubber balloon), or other methods acceptable to the director or his authorized representative at a frequency of not less than five tests per acre per lift. The locations of the individual tests shall be adequately spaced to represent the constructed area. Any penetrations shall be repaired using bentonite.
13. The recompacted soil barrier of the final cap system shall be a minimum of two feet thick, constructed in accordance with the specifications in OAC Rules 3745-30-07(C)(1)(a) to (C)(1)(e), and modeled by the construction of a test pad in

accordance with OAC Rules 3745-30-07(F)(1) to (F)(3).

14. The permittee shall provide for the following inspections and facility maintenance:
 - a. The permittee shall provide for daily inspection of the disposal facility and completion of the Residual Solid Waste Landfill Facility Inspection Checklist. Written results of the inspections, including any corrective measures employed, shall be made available to Ohio EPA or the Jefferson County Health Department upon request.
 - b. Surface water control structures, including sedimentation ponds, sedimentation pond discharge structures, pipes, ditches, and culverts, shall be inspected at least monthly for erosion, clogging, or failure, and prompt corrective action shall be taken, if necessary. A log documenting inspection results, any corrective measures taken, any water quality samples taken, and the date and weather conditions during any water quality sampling shall be maintained on site and submitted to Ohio EPA, SEDO or the Jefferson County Health Department upon request.
15. Pursuant to ORC Sections 3745.11(Q) and (V), payment of the solid waste permit to install fee balance, in the amount of \$79,600.00 payable to "Treasurer, State of Ohio," shall be submitted to Ohio EPA, Attn: Fiscal Administration, P.O. Box 1049, Columbus, Ohio 43216-1049. The fee balance shall be submitted within 30 days of the effective date of this permit. Failure to timely submit the required permit fee balance will result in assessment of late penalties in accordance with ORC Sections 3745.11(Q) and (V).

END OF PERMIT CONDITIONS

ORC Section 3734.02(A) Variance

The permittee has requested a variance from OAC Rule 3745-30-07(C)(1)(h), which requires that a recompacted soil liner (RSL) be constructed with a minimum bottom slope of two percent.

The proposed RSL at the Facility is designed with a minimum bottom slope of three percent except along flow lines augmented by the leachate collection pipes. The proposed slopes along the flow lines of the leachate collection pipes are adequate to ensure removal of the leachate from the residual solid waste disposal areas.

Pursuant to ORC Section 3734.02(A), the director may, by order, grant a variance if the applicant demonstrates to the director's satisfaction that construction and operation of the

solid waste facility in the manner allowed by the variance and any terms or conditions imposed as part of the variance will not create a nuisance or a hazard to the public health or safety or the environment.

Because adequate slope is provided along the flow lines of the leachate collection pipes, granting a variance from OAC Rule 3745-30-07(C)(1)(h) will not create a nuisance or a hazard to the public health or safety or the environment. Therefore, pursuant to ORC Section 3734.02(A), the permittee is hereby granted a variance from OAC Rule 3745-30-07(C)(1)(h), which requires that a recompacted soil liner (RSL) be constructed with a minimum bottom slope of two percent. In lieu of complying with Rule 3745-30-07(C)(1)(h), the permittee shall construct the RSL in accordance with Plan Sheet 5I of the permit application. This variance shall remain in effect throughout the effective period of this permit unless otherwise revoked.

ORC Section 3734.02(G) Exemption from OAC Rule 3745-30-07(C)(3)(f)(iv)

The permittee has requested an exemption from OAC Rule 3745-30-07(C)(3)(f)(iv), which requires that leachate pipelines be double-cased outside of the limits of solid waste placement.

All leachate pipelines at the Facility are to be non-perforated HDPE pipe with segments joined by butt-welding or prefabricated couplers. Pipeline diameters range from 18 inches to 36 inches. At the time of installation, all pipelines will be gravity pressure tested at low-head and visually examined prior to backfilling to verify no leakage, and the pipe will be inspected upon placement of protective cover to confirm that no damage has occurred. The leachate pipelines will be installed on a grade allowing passive (gravity) flow and as a result will not be pressurized. The permit application calculations demonstrate adequate factors of safety based on pipe strength calculations. The predicted leachate concentrations are expected to meet primary drinking water standards with the possible exception of arsenic. The specified pipe is the same pipe used for sewer, gas, and oil pipelines, which are all typically single walled pipelines. All storm water runoff from the active waste disposal areas will be conveyed through the leachate collection system. Also, all leachate pipelines are within the area covered by the Facility's ground water monitoring system. The proposed leachate pipelines will adequately contain and convey leachate outside the limits of residual solid waste placement.

Pursuant to ORC Section 3734.02(G), the director may, by order, exempt any person generating, collecting, storing, treating, disposing of, or transporting solid wastes, or processing solid wastes that consist of scrap tires, in such quantities or under such circumstances that, in the determination of the director, are unlikely to adversely affect the public health or safety or the environment from any requirement to obtain a registration certificate, permit, or license or comply with other requirements of ORC Chapter 3734.

For the reasons noted above, the proposed leachate pipelines will adequately contain and convey leachate outside the limits of solid waste placement, and granting an exemption from OAC Rule 3745-30-07(C)(3)(f)(iv) is unlikely to adversely affect the public health or safety or the environment. Therefore, pursuant to ORC Section 3734.02(G), the permittee is hereby granted an exemption from OAC Rule 3745-30-07(C)(3)(f)(iv), which requires that leachate pipelines be double-cased outside of the limits of solid waste placement. This exemption shall remain in effect throughout the effective period of this permit unless otherwise revoked.

ORC Section 3734.02(G) Exemption from OAC Rule 3745-30-07(C)(4)(d)(iv)

The permittee has requested an exemption from OAC Rule 3745-30-07(C)(4)(d)(iv), which requires that a sedimentation pond be lined.

The proposed sedimentation pond for the Facility is the existing Fly Ash Reservoir 2 (FAR2) impoundment. The FAR2 impoundment is located downstream of Fly Ash Reservoir 1 (FAR1) on the main branch of Blockhouse Run and serves as Cardinal Plant's currently active fly ash reservoir operating under a valid NPDES discharge permit (#OIB00009*OD). The FAR2 impoundment meets all of the other design criteria specified in OAC Rules 3745-30-07(C)(4)(d) for storage volume and spillway design, but it was not constructed with an engineered liner system. The existing ground water monitoring system associated with FAR2 has been included and expanded within the proposed Facility's ground water monitoring system. DSIWM engineers believe FAR2's liner is adequate.

Pursuant to ORC Section 3734.02(G), the director may, by order, exempt any person generating, collecting, storing, treating, disposing of, or transporting solid wastes, or processing solid wastes that consist of scrap tires, in such quantities or under such circumstances that, in the determination of the director, are unlikely to adversely affect the public health or safety or the environment from any requirement to obtain a registration certificate, permit, or license or comply with other requirements of ORC Chapter 3734.

Because FAR2 is designed such that it meets all storage volume and spillway design requirements, and because FAR2 is currently operating under a valid NPDES discharge permit, and because FAR2 will be monitored by the Facility's ground water monitoring system, granting an exemption from OAC Rule 3745-30-07(C)(4)(d)(iv) is unlikely to adversely affect the public health or safety or the environment. Therefore, pursuant to ORC Section 3734.02(G), the permittee is hereby granted an exemption from OAC Rule 3745-30-07(C)(4)(d)(iv), which requires that a sedimentation pond be lined. This exemption shall remain in effect throughout the effective period of this permit unless otherwise revoked.