2.0 Alternatives Analysis

2.1 Introduction

The purpose of the Geneva Landfill expansion project is two-fold. First, the physical expansion of the landfill footprint will add waste disposal capacity to the existing landfill and will thereby provide a long-term cost effective solid waste disposal site for Ashtabula County and surrounding area residents and businesses without a disruptive break in service. Second, this project is being undertaken to remediate "closed" portions of the GLI property where landfill activities performed by previous owners are not in compliance with current OEPA solid waste disposal standards. The upgrade of these former waste placement areas is intended to reconfigure past waste placement areas and thereby lower the potential for future ground and surface water contamination. These proposed remediation actions are intended to address an environmental issue of clear import and consequence to the local community and to the Lake Erie drainage basin. The old Doherty Landfill closure areas will be exhumed, and the old waste will be relocated to a "new" lined waste disposal "cell" within the proposed "state-of-the-art" landfill expansion area.

Landfill waste disposal areas are routinely divided into "cells" that facilitate incremental construction of required elements of modern landfill facilities. Construction elements include subgrade preparation, grading, and compaction, leachate collection piping, installation of synthetic liner materials, and often methane gas collection systems as well. As a cell is completed and approved to receive waste, incremental waste placement, compaction, and daily cover operations follow in a carefully managed sequence before the landfill operators move on into the next cell. **The three-dimensional geometry necessary for cells to ultimately generate sufficient "volume" for waste disposal, or "air space", to be economically feasible** (to offset the cost of the cell development and sustaining management of the landfill facilities) **is critical to the layout and design of the landfill.** In general, a base or landfill "footprint" that will support placement of roughly pyramidal volumes of waste is most efficient. Other configurations are possible, but generally are not as efficient to develop or as structurally stable following waste placement.

To accomplish the above objectives, construction of the **currently proposed *minimal degradation design alternative*** will necessitate encroachment into portions of three "flatwoods" wetland areas and the complete removal of three existing manmade ponds (including the ponds' emergent and shrubby littoral fringes) that are located within the currently proposed landfill expansion footprint.

These wetlands consist of Ohio EPA Category, "1" and "2", wetlands totaling 9.68 acres (based on the August-October 2009 and 2010 Delineations that are currently being reviewed by the USACE). Figure 17 (of the ORAM Scoring presented in Appendix D) and the wetlands delineation mapping of the GLI property show the location of each wetland with respect to the currently proposed landfill expansion and the GLI property lines. As a result of several deliberate design adjustments made to avoid

and minimize impacts during the last five years of the facility planning process, none of the currently proposed encroachments will impact Ohio EPA Category 3 wetlands. Nevertheless, authorization of this project requires the completion and approval of applications for an Individual Section 404 Department of Army Permit and a Section 401 Water Quality Certification from the Ohio EPA.

The Section 401 Water Quality Certification Application requires that alternative designs for the project be considered and evaluated to satisfy antidegradation requirements of the Clean Water Act; and, as such and where applicable, the antidegradation requirements are addressed in this document. The design alternatives to be evaluated are referred to as:

1) The ***Originally Preferred Design*** (the project originally presented as part of the GLI rezoning application in 2007/2008) (Figure 2-1 and Drawing 1 following Section 2 of this Document),

2) The initial Avoidance Design Proposal (***Interim Avoidance Alternative***) prepared concurrently with on-site wetlands and waters investigations late in 2009 (Figure 2-1 and Drawing 2 following Section 2 of this Document),

3) **The currently proposed and preferred *Minimal Degradation Alternative*** (the design that is currently being proposed following discussions with OEPA and USACE on various alternative layouts) (Figure 2-1, Drawing 3 following Section 2 of this Document, and enclosed larger-scale detailed plan view that accompanies the application package),

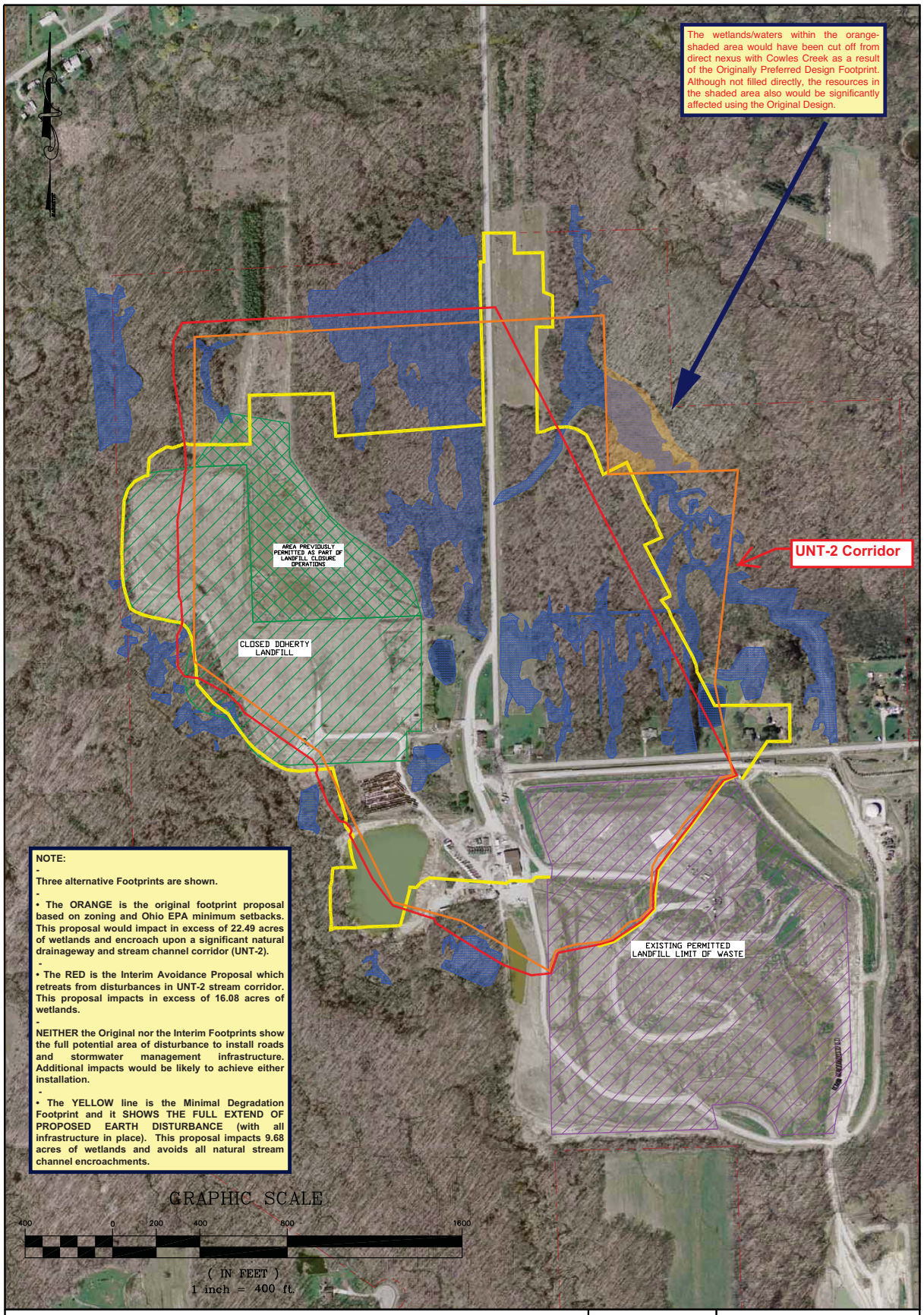
4) ***Off-site landfill development alternative*** (presented in a separate section), and

5) ***Non-Degradation Alternative*** (no impact to surface water resources) (a functional landfill design layout is not feasible with current state-of-the-art regulated technologies).

2.2 Alternatives

The following paragraphs describe the alternatives considered for the expansion project, including the *Originally Preferred Design*, *Interim Avoidance Alternative*, the **currently proposed *Minimal Degradation Alternative***, *Off-site landfill development alternative*, and the *Non-Degradation (Nominal Degradation) Alternative*. Engineering design, stream and wetland impacts, proposed mitigation, and conformance with the project purpose and objectives are evaluated for each alternative.

This alternatives analysis has been performed to meet and fulfill requirements of Section 404 of the federal Clean Water Act, for Ohio EPA Section 401 Water Quality



LEGEND:

- PROPERTY BOUNDARY
- ORIGINAL PROPOSED FOOTPRINT
- INTERIM AVOIDANCE DESIGN (DOES NOT INCLUDE ANCILLARY STRUCTURES, I.E. SED BASINS)
- CURRENT PROPOSED FOOTPRINT (INCLUDES TOTAL DISTURED ACREAGE)
- WETLANDS

FIGURE 2-1 of Alternatives Analysis

WHM consulting, INC.
2525 GREEN TECH DRIVE; SUITE B
STATE COLLEGE, PA 16803
TELEPHONE:(814)-[illegible] FAX:(814)-[illegible]

USA WASTE
GENEVA LANDFILL, INC.

REDUCED WETLAND IMPACT MAP

GENEVA TOWNSHIP ASHTABULA COUNTY OHIO

Certification, and to address the requirements for the Ohio Antidegradation Rule (OAC Rule 3745-1-05).

2.2.1 Originally Preferred Alternative

Design

In December 2007 and January 2008, GLI submitted an application to the Geneva Township Zoning Commission for rezoning of portions of the GLI property. This application included a potential design "footprint" for the future landfill expansion within the acreage proposed for rezoning. This proposed design was prepared in accordance with all OEPA guidance for siting setbacks and restrictions from property lines, residences, etc.. The landfill expansion proposed in this initial design would add approximately 19,100,000 cubic yards of airspace to the facility, allowing approximately 75 years of additional operation for the site. This expansion proposal included a vertical expansion over areas of existing waste placement (including the original "closed" Doherty Landfill) and additional areas of past agricultural and forestry use where waste previously had not been placed. The maximum elevation originally proposed, including cap placement for future landfill closure, was 965 feet above mean sea level. Figure A shows the proposed original expansion area.

Wetland Impacts

Table 2-1 lists wetlands that exist on the land surrounding and encompassing the current landfill rezoning footprint. Wetlands listed in this table have been formally scored using the Ohio Rapid Assessment Method (ORAM) Version 5.0 for categorizing wetland resources. Previously constructed mitigation wetlands due south of active landfill operations were not scored, and an area immediately east of an Unnamed Tributary to Cowles Creek (identified in delineation drawings as UNT-2) located in a third-growth wooded "flatwoods" area also was not scored. This area, noted in the delineation report as Wetland "EW", was considered to be outside of the potential project area because the acreage east of UNT-2 could not be accessed for use as a landfill(s) cell without removal of UNT-2. Wetland EW had been delineated and reviewed with the USACE in the late 1990's but was only field confirmed during the current wetlands/waters investigations. Although not specifically scored, it is the consensus of our consultants that an ORAM scoring would undoubtedly result in a solid Category 2 or possible Category 3 designation for this wetland area. (ORAM Scoring Forms and data are presented in Appendix D.)

As Table 2-1 (below) shows, the expansion proposed in 2007 and 2008 included impacts to 6.49 acres of Category 3 (Higher Quality) Wetlands. This design for expansion as seen in Figure 2-1 and Drawing 1, would necessitate the elimination of much of the Category 3 Wetlands associated with the UNT-2 riparian corridor and encroachment/removal of more than 2270 linear feet of defined natural "bed and banks" channel. In total, more than 22.47 acres of the ≥ 50.0 acres of wetlands on the GLI property would be eliminated by this proposed expansion. Of these 22.47 acres, approximately 29% (6.49 acres) would be ORAM Category 3 resources.

TABLE 2-1: Impacts, Ecological Characteristics, and ORAM Functional Assessment of Wetlands for the *Originally Proposed Design Alternative*

Wetland ID (ORAM BOUNDARY)	Wetland Area (acres)	HGM Classification	ORAM Score[a]	ORAM Category	Impact Acres within Original Design Alternative
A, B	14.71	Slope Depressional	34.5	2	9.88
C	0.39	Riverine Headwater Slope	29.5	1	0.39
D	2.57	Riverine	80.5	3	0
E (Pond)	0.44	Depressional	26.5	1	0.44
F	0.04	Depressional[b]	4.0	1	0.002
G, H, I, J, K, L, M, N	1.34	Riverine Depressional[b]	65.5	3	0.08 ("K" - Cat 2) See footnote [b] in Table 2-1
O	0.34	Depressional	28.0	1	0
P	0.13	Slope	32.0	3 (narrative) [c]	0
Q, R, S	0.95	Riverine Depressional	23.0	2 (narrative)	0.01
T (Pond)	0.52	Depressional	27.5	1	0.52
U (Pond)	0.50	Depressional	27.0	1	0.50
V (Phrag.)	0.72	Slope	7.0	1	0
W (X) Nursery	2.88	Depressional	34.5	2	1.61
X (drainage ditch)	0.47	Riverine	33.5	2	0.27
X (meadow and woods)	2.09	Depressional	28.5	1	2.07
Y (X) Terrace Vernal pool	0.21	Slope Depressional	52.5	2	0.213
Z and X Riparian Corridor	7.63	Riverine	63.0	3	6.487
Other GLI Wetlands	± 14.29	Wetlands on GLI Property but not within the proposed project area.	Not Scored	NA	0
	TOTAL ACRES ≥ 50.0				**INITIAL ACRES OF IMPACT 22.49[d]**

[a] Data compiled from "Ohio Rapid Assessment Method (ORAM Version 5.0) Scoring of Wetlands" completed for Geneva Landfill, Inc, located in Geneva Township, Ashtabula County, Ohio, October 2009-March 2010.

[b] A small portion of the upslope extent of Wetlands F and K will be affected by the excavation and relocation of waste from the former Doherty Landfill closure area. The areas to be affected are collectively less than 0.10 acre in size and are seepage

areas that developed on the side-slopes of the former landfill closure area. Although these wetlands extend from the landfill slope to the floor of the adjacent riparian corridor, the source and nature of the waters that drive their hydrology in the areas where impacts are proposed compromise their ORAM classifications. The F impact area was originally scored as a Category 1, and the K impact area was reevaluated as a Category 2 resource in this permitting scenario.

[c] The ORAM scoring protocol allows for this wetland to be included within the Category 3 classification due to its position within/along the riparian corridor of UNT 1.

[d] Initial wetland impact acreage within the *originally proposed* and the *Interim Avoidance Alternative* footprints were determined assuming that all wetlands shown within the proposed grading footprints would be totally excavated/filled. These design iterations did not include additional impacts likely to occur as a result of installation of perimeter roads, sediment/storm water detention basins, and other development infrastructure.

Under this design scenario, portions of several "**flatwoods" wetlands and wetlands within and along the UNT-2 riparian corridor** would be totally excavated/filled. After excavation, the areas once containing the wetlands would be modified by construction of landfill berms and ultimately by the placement of waste in lined landfill cells. Waters that would previously have flowed to Cowles Creek via the UNT-2 corridor would be redirected around the eastern side of the landfill footprint and through a series of storm water detention and sediment basin controls. As noted, this design alternative would also impact approximately 2270 linear feet of "bed and banks" of natural stream channel, 2511 linear feet of maintained road drainage ditches, 1784 linear feet of open drainage ditch and former agricultural drainage ditches, and 629 linear feet of ephemeral flow paths within the wooded understory

Mitigation

A conceptual plan for on-site wetland mitigation was discussed with USACE and OEPA representatives. The plan included development of on-site replacement wetlands at an average replacement ratio of 2:1 and purchase of adjoining lands to provide additional replacement wetland acreage needed to compensate for impacts to ≥ 21.34 acres of existing Category 3, Category 2, and Category 1 wetlands, floodplain buffer, and removal of ± 7400 linear feet of natural stream channel, drainage ditches, and ephemeral drainageways. Compensatory mitigation for stream impacts was proposed to be within the UNT-1 corridor, along Cowles Creek, and within the replacement "stream" that would have to be constructed to convey surface waters around the eastern side of the proposed landfill footprint.

Conformance with Project Purpose

This proposed design for landfill expansion was developed with efforts to ensure compliance with all appropriate OEPA Waste Management guidelines for offsets from property lines and residences. This **design provides for ample expansion area volume and also allows for remediation of the former Doherty Landfill closure site**. However, early discussions with the project wetland scientists that joined the planning team in 2009 resulted in conceptual **design modifications to avoid the UNT-2 corridor to the maximum extent practicable** (see ***Interim Avoidance Alternative***, Section 2.2.2).

2.2.2 Interim Avoidance Alternative

Design

Prior to completion of the 2009 field delineation flagging and GPS survey of apparent Jurisdictional Waters and Wetlands within the rezoning boundaries, the design team acknowledged the initial concerns of the project wetland scientists and prepared an alternative design intended to avoid any direct encroachment into the UNT-1 and UNT-2 "bed and banks" corridors. The footprint for this design is shown in Figure 2-1 and in Drawing 2. This alternative was designed to meet or exceed projected solid waste disposal needs, regulatory siting criteria, and economic and engineering constraints, but it did not necessarily consider the magnitude of impacts that would be necessary in the "flatwoods" acreage between the unnamed tributary corridors. Nevertheless, this design iteration was critical in arriving at the next design alternative, the ***minimal degradation alternative*** that follows in section *2.2.3*.

The *Interim Avoidance Alternative* would provide 16,700,000 cubic yards of landfill airspace capacity and would extend the expected site life to greater than 50 years.

Wetland Impacts

Table 2-2 lists wetlands that exist on the land surrounding and within the *Interim Avoidance Alternative* landfill footprint. This table also shows the reduction of acreage of wetlands that are directly affected by the *Interim Avoidance Alternative*. In addition, the table indicates that the Category 3 wetlands associated with the riparian corridor of UNT-2 are not impacted by the *Interim Avoidance Alternative*. All efforts were made to avoid encroachments of any kind within the corridors of UNT-1 and UNT2.

The *Interim Avoidance Alternative* would permanently impact a total of 16.08 acres of wetlands. This expansion alternative **eliminated impacts to all ORAM Category 3 (as scored) wetlands**. This alternative does not impact natural stream channels, but does impact 2511 linear feet of maintained road drainage ditches, 1784 linear feet of open drainage ditch and former agricultural drainage ditches, and 629 linear feet of ephemeral flow paths within the wooded understory.

Mitigation

The first step in the mitigation process is to **identify** and recognize the relative value of the wetland resources in a project area and to **avoid or minimize** impacts to higher quality resources wherever possible. This design approach was first employed with the development of the *Interim Avoidance Alternative* design and involved active participation by the project wetland scientists and early consultation with the USACE. The mitigation plan for this avoidance alternative followed a similar tact to the originally preferred design alternative. Both on-site and off-site acreage within the Cowles Creek watershed was proposed to be used to fashion replacement wetland acreage. Because the stream channels on the property were essentially avoided, limited stream channel impact mitigation was proposed to occur primarily within the UNT-1 corridor. (This would be mitigation associated with removal of man-made drainage ditches.)

TABLE 2-2: Impacts, Ecological Characteristics, and ORAM Functional Assessment of Wetlands for the *Interim Avoidance Alternative Design*

Wetland ID (ORAM BOUNDARY)	Wetland Area (acres)	HGM Classification	ORAM Score[a]	ORAM Category	Impact Acres within Interim Avoidance Alternative Design
A, B	14.71	Slope Depressional	34.5	2	9.88
C	0.39	Riverine Headwater Slope	29.5	1	0.29
D	2.57	Riverine	80.5	3	0
E (Pond)	0.44	Depressional	26.5	1	0.44
F	0.04	Depressional[b]	4.0	1	0.002
G, H, I, J, K, L, M, N	1.34	Riverine Depressional[b]	65.5	3	0.08 ("K" - Cat 2) See footnote [b]
O	0.34	Depressional	28.0	1	0
P	0.13	Slope	32.0	3 (narrative)[c]	0
Q, R, S	0.95	Riverine Depressional	23.0	2 (narrative)	0.20
T (Pond)	0.52	Depressional	27.5	1	0.52
U (Pond)	0.50	Depressional	27.0	1	0.50
V (Phrag.)	0.72	Slope	7.0	1	0
W (X) Nursery	2.88	Depressional	34.5	2	1.61
X (drainage ditch)	0.47	Riverine	33.5	2	0.27
X (meadow and woods)	2.09	Depressional	28.5	1	2.07
Y(X) Terrace Vernal pool	0.21	Slope Depressional	52.5	2	0.213
Z(X) corridor	7.63	Riverine	63.0	3	0
Other GLI Wetlands	± 14.29	Wetlands on GLI Property but not within the proposed project area.	Not Scored	NA	0
	TOTAL ACRES ≥ 50.0				**INITIAL ACRES OF IMPACT 16.08** [d]

[a] Data compiled from "Ohio Rapid Assessment Method (ORAM Version 5.0) Scoring of Wetlands" completed for Geneva Landfill, Inc, located in Geneva Township, Ashtabula County, Ohio, October 2009-March 2010.

[b] A small portion of the upslope extent of Wetlands F and K will be affected by the excavation and relocation of waste from the former Doherty Landfill closure area. The areas to be affected are collectively less than 0.10 acre in size and are seepage areas that developed on the side-slopes of the former landfill closure area. Although these wetlands extend from the landfill

slope to the floor of the adjacent riparian corridor, the source and nature of the waters that drive their hydrology in the areas where impacts are proposed compromise their ORAM classifications. The F impact area was originally scored as a Category 1, and the K impact area was reevaluated as a Category 2 resource in this permitting scenario.

[c] The ORAM scoring protocol allows for this wetland to be included within the Category 3 classification due to its position within/along the riparian corridor of UNT 1.

[d] Initial wetland impact acreage within the *originally proposed* and the *Interim Avoidance Alternative* footprints were determined assuming that all wetlands shown within the proposed grading footprints would be totally excavated/filled. These design iterations did not include additional impacts likely to occur as a result of installation of perimeter roads, sediment/storm water detention basins, and other development infrastructure.

Conformance with Project Purpose

The *Interim Avoidance Alternative* design **provides for expansion of Geneva Landfill and remediation of the former Doherty Landfill closure site**. The design meets the requirements of OAC 3745-27-07(H).

2.2.3 Minimal Degradation Alternative (Currently Proposed/Preferred Alternative)

Design

The ***minimal degradation alternative*** for this project has been described previously in Section 1 of this document. The footprint for this design is also shown in Figure A and was postulated through a concerted effort to analyze and project the local waste disposal market need and customer base for the next three decades. This analysis included variables such as "waste stream reduction" due to evolving technologies and more intensive market recycling efforts. This minimal degradation alternative has been designed to meet evolving and projected solid waste disposal needs of the local market, siting criteria, economic and engineering constraints and regulatory requirements. This project was designed to optimize the needed landfill capacity while utilizing available land surrounding current landfill operations. This design provides 14.6 million cubic yards of landfill airspace capacity, allows for remediation of the Doherty Landfill closure site, and extends the expected site life to approximately 38 years.

Wetland Impacts

Table 2-3 lists wetlands that exist on the land surrounding and within the current landfill footprint. This table also shows the reduction in the acreage of wetlands that are directly affected by the ***minimal degradation alternative***. In addition, the table indicates that all Category 3 wetlands have been avoided, are provided with buffers in most areas, and are not directly impacted by the ***minimal degradation alternative***. All efforts have been made to avoid encroachments of any kind within higher quality wetlands.

TABLE 2-3: Impacts, Ecological Characteristics, and ORAM Functional Assessment of Wetlands for the Currently Preferred *Minimal Degradation Alternative Design*

Wetland ID	Wetland Area (acres)	HGM Classification	ORAM Score	ORAM Category	Impact Acres within Original Design Alternative
A, B	14.71	Slope Depressional	34.5	2	3.97
C	0.39	Riverine Headwater Slope	29.5	1	0
D	2.57	Riverine	80.5	3	0
E (Pond)	0.44	Depressional	26.5	1	0.44
F	0.04	Depressional[b]	4.0	1	0.002
G, H, I, J, K, L, M, N	1.34	Riverine Depressional[b]	65.5	3	0.08 ("K" - Cat 2) See footnote [b] in Table 2-1
O	0.34	Depressional	28.0	1	0
P	0.13	Slope	32.0	3 (narrative)[c]	0
Q, R, S	0.95	Riverine Depressional	23.0	2 (narrative)	0
T (Pond)	0.52	Depressional	27.5	1	0.52
U (Pond)	0.50	Depressional	27.0	1	0.50
V (Phrag.)	0.72	Slope	7.0	1	0
W (X) Nursery	2.88	Depressional	34.5	2	1.61
X (drainage ditch)	0.47	Riverine	33.5	2	0.27
X (meadow and woods)	2.09	Depressional	28.5	1	2.07
Y (X) Terrace Vernal pool	0.21	Slope Depressional	52.5	2	0.213
Z &X corridor	7.63	Riverine	63.0	3	0
Other GLI Wetlands	± 14.29	Wetlands on GLI Property but not within the proposed project area.	Not Scored	NA	0
	TOTAL ACRES ≥ 50.0				TOTAL ACRES OF IMPACT 9.68 [d]

[a] Data compiled from "Ohio Rapid Assessment Method (ORAM Version 5.0) Scoring of Wetlands" completed for Geneva Landfill, Inc, located in Geneva Township, Ashtabula County, Ohio, October 2009-March 2010.

[b] A small portion of the upslope extent of Wetlands F and K will be affected by the excavation and relocation of waste from the former Doherty Landfill closure area. The areas to be affected are collectively less than 0.10 acre in size and are seepage areas that developed on the side-slopes of the former landfill closure area. Although these wetlands extend from the landfill slope to the floor of the adjacent riparian corridor, the source and nature of the waters that drive their hydrology in the areas where impacts are proposed compromise their ORAM classifications as Category 3 resources. The F impact area was originally scored as a Category 1, and the K impact area was reevaluated as a Category 2 resource in this permitting scenario.

[c] The ORAM scoring protocol allows for this wetland to be included within the Category 3 classification due to its position within/along the riparian corridor floodway of UNT 1.

[d] Total wetland impact acreage within the *Minimal Degradation Alternative* includes all potential wetland/waters impacts occurring as a result of the landfill development (based on a maximum "limit-of-disturbance" line established on the design drawings and flagged in the field). This design iteration includes all impacts likely to occur as a result of installation of perimeter roads, sediment/storm water detention basins, and other development infrastructure.

The *minimal degradation alternative* will **permanently impact a total of 9.68 acres** of the total of ≥ 50.0 acres of wetlands identified on the GLI property (approximately 19%). While this design also impacts 2511 linear feet of maintained road drainage ditches, 1784 linear feet of open drainage ditch and former agricultural drainage ditches, and 629 linear feet of ephemeral flow paths within the wooded understory, **no existing natural stream channels and no Category 3 wetlands will be affected using this design alternative.**

Mitigation

As previously noted, the first step in the mitigation process is to **identify** and recognize the relative value of the wetland resources in a project area and to **avoid or minimize** impacts to higher quality resources wherever possible. This step was initiated with the *Interim Avoidance Alternative* design and has been intensively applied in the development of the currently preferred ***minimal degradation alternative***. Through economic analysis, environmental risk management, and design flexibility, the size of the currently projected landfill footprint and volume have been pared down to the smallest acreage feasible to meet projected market needs and which is still economically feasible to construct, maintain, manage, and to process for ultimate closure.

The mitigation plan for the ***minimal degradation alternative*** followed a similar tact to the originally designed alternative. Both on-site and off-site acreage (which GLI now hopes to acquire) within the Cowles Creek watershed was proposed to be used to fashion replacement wetland acreage. Because the natural stream channels on the property have been avoided, limited stream channel impact mitigation is proposed to occur primarily within the UNT-1 corridor. However, GLI is open to alternative mitigation projects that might benefit one or more other streams in the watershed area and which may be provided as mitigation for other unavoidable wetland impacts.

At this stage in the design process, avoidance and minimization of impacts have been applied to the maximum extent feasible while still being able to meet the purpose and objectives of this project. This effort was facilitated through active solicitation of input from the regulatory agencies in the layout of various landfill footprint alternatives,

all of which have substantially and incrementally reduced the originally proposed landfill footprint, projected landfill volumes, and the anticipated life of active landfill operations. The geometry of the final landfill structure has dictated the position of structural slopes and projected wetland impacts. However, the applicant has made a very deliberate effort to adjust the siting of the landfill waste disposal limits to avoid direct impacts to defined riparian corridors that are tributaries to Cowles Creek. Category 3 wetlands have been carefully avoided and remaining unavoidable wetland impacts will be occurring entirely within Category 2 and Category 1 wetland resources.

The design and construction of wetland replacement acreage at a 1.5: 1 (potentially 2:1) ratio as well as protection and enhancement of existing wetland and waters resources are being offered as compensatory mitigation for the proposed wetland impacts. Mitigation details are being developed at this time (a preliminary conceptual mitigation plan is submitted with this proposal as Appendix B). Based on discussions with OEPA, the GLI mitigation plan presently proposes approximately 18.0 acres of replacement wetlands to compensate for loss of 9.68 acres of man-made ponds and emergent/wooded Category 1 and Category 2 wetlands that would be affected by the proposed landfill expansion. Additional mitigation enhancement efforts in UNT-1 and UNT-2 stream corridors and establishment of buffers and permanent conservation easements are also being considered. The storm water management facilities for the proposed landfill infrastructure are also being designed to ensure that similar volumes of water will enter the unnamed tributary channels at specific discharge points to ensure that the local hydrologic models for the streams are not significantly altered due to losses or increases associated with landfill grading and development.

The replacement wetlands will be sited, designed, and constructed in the Cowles Creek watershed to ensure development of functions and societal values similar to those occurring in the 9.68 acres of jurisdictional resources that are proposed to be affected by the landfill development. The mitigation plan for this minimal degradation alternative is being developed concurrently with the structural and drainage designs for the final landfill configuration and will be submitted in greater detail following detailed discussion with OEPA and the U.S. Army Corps of Engineers.

Conformance with Project Purpose

The ***minimal degradation alternative*** provides for needed expansion of Geneva Landfill that is in compliance with OAC 3745-27-07(H). This alternative also provides for the remediation of the former Doherty Landfill Closure site. The extended life expectancy for Geneva Landfill gained as a result of this project will ensure a long-term solution to waste management for the citizens of Ashtabula County and surrounding Northeastern Ohio communities, which in turn provides the funding necessary to accomplish the remediation efforts. This design provides for approximately 14.6 million cubic yards of landfill capacity, additional sediment basins, leachate storage and collection systems, and methane gas collection and conversion. The increase in capacity will result in an additional ± 38 years of life expectancy for the Geneva Landfill and, as noted, provides for the remediation of an old landfill closure site. Currently, Geneva

Landfill accepts up to 180,000 tons of solid waste annually and has a life expectancy of 3.75 years.

This ***minimal degradation alternative*** for expansion takes advantage of existing landfill infrastructure and environmental monitoring protocols already in place and proven to be effective at this location. Furthermore, the geo-technical evaluation of the subgrade soil materials at the proposed expansion location indicates that this site is uniquely suited to function as a landfill. The deep glacial tills and lacustrine sediments that underlie the site are extremely slowly-permeable materials that function remarkably well as a liner base to hold and sequester waste materials.

(See Figure 2-1 for a comparison drawing depicting the Originally Preferred Alternative, Interim Avoidance Alternative and the Minimal Degradation Alternative.)

2.2.4 Off-Site Alternative

Design

The siting of a new landfill facility in a new off-site location where there might be potential to cause fewer impacts to wetlands and waters was evaluated within a 25-mile radius of the GLI site. However, siting another disposal facility of similar volume capacity to the area proposed at the GLI expansion or, alternatively, several smaller disposal facilities, would require extensive on-site evaluation, field data collection, and environmental analyses….for each potential location. Nevertheless, the viability of this potential alternative was explored via real estate searches and research into local/regional zoning requirements. Given the topographic and watershed characteristics of northeastern Ohio, it is highly likely that significant areas of wetlands would exist on any property large enough to support a facility of similar capacity.

The real estate search conducted through the Centralized Real Estate Information Services (CRIS) database on December 27, 2009 identified available properties containing greater than 100 acres of contiguous area. Four properties were identified from this search. Each of the available properties is smaller in area than required to provide the landfill airspace needed to make this project viable. Additionally, each property has other siting/environmental/access development challenges including proximity to recreational areas, significant areas of mapped hydric soils (likely wetland areas), and site proximity to commercially viable roads. Appendix E presents the real estate search and the approximate three-dimensional configuration footprint necessary to provide a landfill capacity similar to that achievable on the existing GLI site. .

Wetland Impacts

Because the slopes of the existing landfill at the Geneva Landfill facilities would not be available to "work off of" to facilitate new waste disposal cell development, a new landfill facility in a new location with similar disposal capacity …actually requires a larger facility footprint than the area proposed at GLI (Appendix E). Siting another or

several smaller disposal facilities on acreage already zoned for commercial landfill use (or lands that might be available for rezoning) could not reasonably be expected to occur in or near Ashtabula County in northeast Ohio without some degree of wetland impacts. Given the origin of the soils in the region, past land uses, and the topographic and watershed characteristics it is probable that significant wetlands also exist on any property large enough to support a facility with similar capacity. In fact, based on the soil mapping and aerial photography examined for the available properties, all candidate sites appear to include similar or larger areas of existing wetlands.

Mitigation

Mitigation plans would be dependent upon design impacts. However, mitigation through avoidance and minimization of impacts would precede development of mitigation plans that include siting and design of replacement wetlands to offset unavoidable impacts. If an appropriate site can be found and can be proven to be economically viable, mitigation of unavoidable impacts to wetland and waters resources would proceed in a manner similar to that proposed for the currently preferred *minimal degradation design alternative.*

Conformance with Project Purpose

One or more new landfill facilities will not meet the economic goals of this proposed expansion. Moreover, any new facilities would result in the addition of one or more areas that must be monitored and/or potentially remediated at some time in the future. Additionally, in northeastern Ohio, a new facility large enough to replace the airspace contemplated by the on-site expansion at Geneva Landfill is also likely to disturb a significant acreage of wetlands. Depending on the distance to a new facility, the probability of providing remediation for the closed Doherty Landfill at an off-site location is extremely unlikely (issues related to exhumation of old waste, hauling of old waste on public roads, odor issues, exorbitant cost, etc.) Therefore, creation of one or more additional but dispersed landfill facilities would not result in a net environmental or social benefit to the region. Development of such a facility would be cost-prohibitive based on the expected return on investment, and would not accomplish the two-fold purpose of this project.

2.2.5 Non-Degradation Alternative

Design

In this scenario, the footprint of the landfill expansion would be configured to avoid all wetlands at the site. Based on the dispersal of wetlands on the GLI property (and in the region) and the need to provide minimal and precise geometric bases (footprints) for proper waste disposal in lined cells, there is very limited upland area available on the GLI property that would allow for appropriate and functional waste disposal in compliance with current OEPA regulations. Without presenting a detailed explanation of engineering protocols, it must be noted that proper waste disposal involves extensive preparation of the disposal area subgrade, installation of leachate collection and liner systems, and, in many cases, methane gas collection technology as well. As a result,

the nominal degradation alternative is entirely impractical and prohibitively expensive to install. Even rudimentary attempts to install minimally functional waste disposal areas would still require multiple wetland crossings to connect required landfill infrastructure (leachate and methane gas collection piping, etc.). Furthermore, the scattered distribution of disposal areas does not provide for a waste disposal volume that could reasonably be expected to extend landfill life for more than a few additional years, and any potential configuration of disposal areas would clearly not be able to generate sufficient income to justify the installation costs. In addition, remediation of the former Doherty Landfill closure area by placement of exhumed waste into properly lined cells is similarly difficult or impossible. The remediation effort would be entirely cost prohibitive without a modest economic return resulting from a minimal waste disposal expansion volume being available on this site.

Wetland Impacts

Wetlands are not directly impacted by this alternative (other than potential road and utility crossings that might be authorized to connect landfill infrastructure such as gas and leachate collection piping).

Mitigation

Since this alternative would theoretically be for nominal degradation (no impact) to surface waters, existing wetland and stream buffers would be expected to remain undisturbed. Mitigation efforts would be limited to ensuring proper installation of wetland crossings, re-grading of these areas, and appropriate revegetation.

Conformance with Project Purpose

This alternative is designed to avoid impacts to all jurisdictional wetlands and waters identified at the Geneva Landfill site. However, the ***nominal degradation alternative*** does not meet the project purpose and objectives and is unacceptable for the following reasons:

(1) This alternative does not provide the required air space and resultant life expectancy to qualify as a cost-effective and long-term solution to the rapidly diminishing waste disposal capacity at Geneva Landfill.

(2) This alternative would require additional long-term monitoring of small and dispersed waste disposal areas thereby complicating assessment and monitoring within regulatory guidelines

(3) Ashtabula County and Geneva Township would still need to pursue one or more alternate landfill facilities to meet solid waste disposal needs in the future. Increased costs to haul waste to alternate facilities in combination with increases in carbon emissions from expanded hauling operations do not result in an environmentally friendly alternative.

(4) Cost effective remediation of the former Doherty Landfill closure area through excavation and placement of exhumed waste into properly lined "new" landfill cells is difficult or impossible to achieve without the modest economic return that comes with permitting of a reasonable expansion area volume on this site.

2.3 Water Pollution Controls

Temporary and permanent water pollution controls will be designed, constructed, and maintained at the expansion site. Temporary controls for accelerated erosion and storm water runoff management during the construction phase will be utilized. Plans for erosion and sedimentation control and storm water management will be developed to specify measures such as construction entrances and roadways, silt fences, seeding, and sedimentation basins to control and contain eroded and water-borne materials. Estimated costs for the temporary construction controls are approximately 1.1 million dollars.

The design for the American Landfill expansion incorporates permanent erosion and sediment controls for prevention of water pollution at the site. These measures will include culverts, lined channels, storm water management ponds, seeding, and additional landscaping. Specifically, the permanent pollution control measures to be introduced at the expansion site are:

(1) Storm water diversion away from waste storage and leachate collection;

(2) Storm water collection and conveyance to a sedimentation basin;

(3) Installation of an interim or final cover system for areas that reach final grade will be completed as soon as practical.

The cost of permanent water pollution control measures for the proposed expansion site is estimated to be 8.1 million dollars.

2.4 Drawings of the Originally Preferred, Interim Avoidance, and Minimal Degradation Design Alternatives Follow