DRAFT ENVIRONMENTAL ASSESSMENT

Proposed Yellowstone Disposal, LLC Class II Landfill Project
Sidney, MT

Prepared by

Montana Department of Environmental Quality
Waste Management and Remediation Division
Waste and Underground Tank Management Bureau
Solid Waste Section
1520 East Sixth Avenue
PO Box 200901
Helena, MT 59620-0901

November 28, 2017

Table of Contents

1 PURPOSE AND NEED FOR ACTION 4
1.1 SUMMARY 4
1.2 PURPOSE AND NEED 5
1.3 PROJECT LOCATION AND STUDY AREA 5
1.4 REGULATORY RESPONSIBILITIES AND REQUIREMENTS 8
1.5 PUBLIC PARTICIPATION 8
2 DESCRIPTION OF ALTERNATIVES 9
2.1 INTRODUCTION 9
2.2 NO ACTION ALTERNATIVE 9
2.3 PROPOSED ACTION 9
2.3.1 LANDFILL DESIGN AND CONSTRUCTION 9
2.3.2 LANDFILL OPERATIONS, MAINTENANCE, AND MONITORING 23
2.3.3 FINANCIAL ASSURANCE 38
2.3.4 POST-CLOSURE CARE 38
2.4 ALTERNATIVES CONSIDERED BUT DISMISSED 39
3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES BY RESOURCE 40
3.1 INTRODUCTION 40
3.2 LOCATION DESCRIPTION AND STUDY AREA 40
3.3 TERRESTRIAL AND AQUATIC LIFE AND HABITATS 41
3.3.1 ANALYSIS AREA AND METHODS 41
3.3.2 AFFECTED ENVIRONMENT 41
3.3.1 ENVIRONMENTAL CONSEQUENCES 42
3.4 HYDROLOGY 55
3.4.1 ANALYSIS AREA AND METHODS 55
3.4.2 AFFECTED ENVIRONMENT 55
3.4.3 ENVIRONMENTAL CONSEQUENCES 58
3.5 GEOLOGY AND SOILS 69
3.5.1 ANALYSIS AREA AND METHODS 69
3.5.2 AFFECTED ENVIRONMENT 69
3.5.1 ENVIRONMENTAL CONSEQUENCES 70
3.6 VEGETATION 75

3.6.1 ANALYSIS AREA AND METHODS 75
3.6.2 AFFECTED ENVIRONMENT 75
3.6.3 ENVIRONMENTAL CONSEQUENCES 75
3.7 AIR QUALITY 76
3.7.1 ANALYSIS AREA AND METHODS 76
3.7.2 AFFECTED ENVIRONMENT 76
3.7.3 ENVIRONMENTAL CONSEQUENCES 76
3.8 INDUSTRIAL, COMMERCIAL, AND AGRICULTURAL ACTIVITIES 78
3.8.1 ANALYSIS AREA AND METHODS 78
3.8.2 AFFECTED ENVIRONMENT 79
3.8.3 ENVIRONMENTAL CONSEQUENCES 79
3.9 TRAFFIC 80
3.9.1 ANALYSIS AREA AND METHODS 80
3.9.2 AFFECTED ENVIRONMENT 80
3.9.3 ENVIRONMENTAL CONSEQUENCES 80
3.10 PROPERTY VALUES 81
3.10.1 ANALYSIS AREA AND METHODS 81
3.10.2 AFFECTED ENVIRONMENT 81
3.10.3 ENVIRONMENTAL CONSEQUENCES 81
3.11 SOCIOECONOMIC 82
3.11.1 ANALYSIS AREA AND METHODS 82
3.11.2 AFFECTED ENVIRONMENT 82
3.11.3 ENVIRONMENTAL CONSEQUENCES 82
3.12 CUMULATIVE EFFECTS 83
3.13 UNAVOIDABLE ADVERSE EFFECTS 85
4 CONCLUSIONS AND RECOMMENDATIONS 85
4.1 A LISTING AND APPROPRIATE EVALUATION OF MITIGATION, STIPULATIONS AND OTHER CONTROLS ENFORCEABLE BY THE AGENCY OR ANOTHER GOVERNMENT AGENCY 85
4.2 RECOMMENDATION 85
4.3 OTHER GROUPS OR AGENCIES CONTACTED OR CONTRIBUTING TO THIS EA 88
4.4 AUTHORS 88
5 REFERENCES: 88

APPENDIX A: Definitions
APPENDIX B: Acronyms

1 PURPOSE AND NEED FOR ACTION

1.1 SUMMARY

On June 16, 2015, Yellowstone Disposal, LLC, (YD) submitted a Solid Waste Management System license application to the Department of Environmental Quality (DEQ) for the licensure of a Class II landfill. YD proposes to construct a new Class II landfill for the disposal of municipal solid waste and special waste, including oilfield exploration and production waste. Special wastes are solid wastes that have unique handling, transportation, or disposal requirements to ensure protection of the public health, safety, and welfare and the environment.

A Class II solid waste management facility is a system that provides the storage, treatment, recycling, recovery, and/or disposal of Group II, III, and IV solid wastes. Wastes are grouped based upon their physical and chemical characteristics to determine the degree of care required in their handling and disposal, and the potential of the wastes to cause environmental degradation or public health hazards. Group II wastes include decomposable wastes and mixed solid wastes containing decomposable materials, but exclude regulated hazardous waste. Group III wastes include clean wood wastes and other clean non-water soluble or inert solids. This category includes, but is not limited to, brick, rock, dirt, concrete, unpainted and unglued wood materials, and tires. Group IV wastes include construction and demolition wastes and asphalt, but exclude regulated hazardous wastes. A Class II facility design requires the most stringent and protective features to ensure the protection of human health and the environment.

The Yellowstone Disposal Facility (Facility) is a proposed new solid waste disposal facility owned and operated by YD. The Facility is located approximately 4.5 miles southeast of Sidney, Montana on State Highway 23 near the intersection of County Road 352 (Figure 1.1). YD owns a total of 2,660 acres of land in Sections 23, 24, and 26 in Township 22 North, Range 59 East, Richland County, Montana. The boundary of the proposed Facility would occupy 650.7 acres of the 2,660-acre YD-owned property. Only 650.7 acres is proposed for licensure, the remaining acreage would provide a buffer zone around the Facility from surrounding property. The proposed landfill disposal units would occupy 130.2 acres of the 650.7-acre licensed area.

The Facility would include two separate Class II landfills: a municipal solid waste (MSW) landfill and a special waste (SpW) landfill. Each landfill would be equipped with a composite liner and leachate collection system. The two landfills are separated by access roads and storm water management systems.

The MSW Landfill footprint encompasses approximately 75.2 acres with a total disposal capacity of 8,522,100 cubic yards. The SpW Landfill footprint encompasses approximately 55.0 acres with a total disposal capacity of 5,457,900 cubic yards for special waste disposal. Special waste would primarily include exempt and non-hazardous exploration and production

(E&P) wastes associated with crude oil and natural gas production. In addition to the landfill units, YD would construct ponds, roads, buildings, and ditches disturbing an additional 129.8 acres. Construction of the Facility would result in a total disturbance of 260 acres within the 650.7-acre proposed location.

The perimeter of the landfill would be surrounded by an access road and storm water perimeter channels. When final closure is completed, final cover would extend approximately 11 feet beyond the landfill boundary waste unit, leaving a road width of approximately 34 feet.

1.2 PURPOSE AND NEED

The Montana Integrated Waste Management Act (IWMA) establishes goals for waste reduction in the state through the development of an integrated approach to solid waste management. The IWMA's priority for solid waste management focuses first on source reduction, reuse, recycling, and composting. Landfill disposal and incineration are the final options for solid waste management. While source reduction, reuse, recycling, and composting all play a role in solid waste management in Montana, most solid waste is landfilled.

The Montana Solid Waste Management Act (SWMA) establishes the minimum requirements for the development of solid waste management facilities. The SWMA is the result of long range planning efforts that were performed to ensure landfill capacity in the state exists to meet the state's growing population needs. The administrative rules adopted in accordance with the authority provided by the SWMA establish requirements for the design, operation, financial assurance, closure, and post-closure care of solid waste management facilities.

YD has applied to DEQ for licensure of a Class II solid waste management facility. The purpose of the proposed action is YD's construction and operation of the solid waste management system as proposed. The proposed action would allow YD to provide waste generators an option for waste disposal services.

Because DEQ's Solid Waste Program received an application for licensure of the proposed facility, DEQ is required to review an application to determine the need for an environmental impact statement (EIS). The purpose of this environmental assessment is to provide the results of the environmental review conducted in accordance with the Montana Environmental Policy Act.

1.3 PROJECT LOCATION AND STUDY AREA

The proposed 650.7-acre solid waste management facility would be located on property owned by YD, just off Montana Highway 23, in Sections 23, 24, and 26, Township 22 North, Range 59 East, Montana Principal Meridian, Richland County, Montana (Figure 1.2). The site of the proposed Facility is zoned agricultural rural property and is presently largely undeveloped. However, there are currently four operating oil and gas production wells and a communications service building located on property adjacent to the site of the proposed Facility. A saltwater pipeline and a natural gas pipeline are located beneath a portion of the site of the proposed Facility. The site is presently used for livestock grazing. The topography of the site consists of rolling upland grassland and low-lying drainages dominated by wooded areas. There are no local restrictions that prohibit the location of the proposed Facility at the site the applicant selected. The study area includes the location of the proposed YD solid waste management facility and areas adjacent to the project location that may be impacted. The size of the study areas vary by resource. Adjacent land uses include rural residential, agricultural, and light industrial.

Figure 1.1 – General Location of Proposed Yellowstone Disposal Class II Facility
(Source: Yellowstone Disposal License Application, 2015)

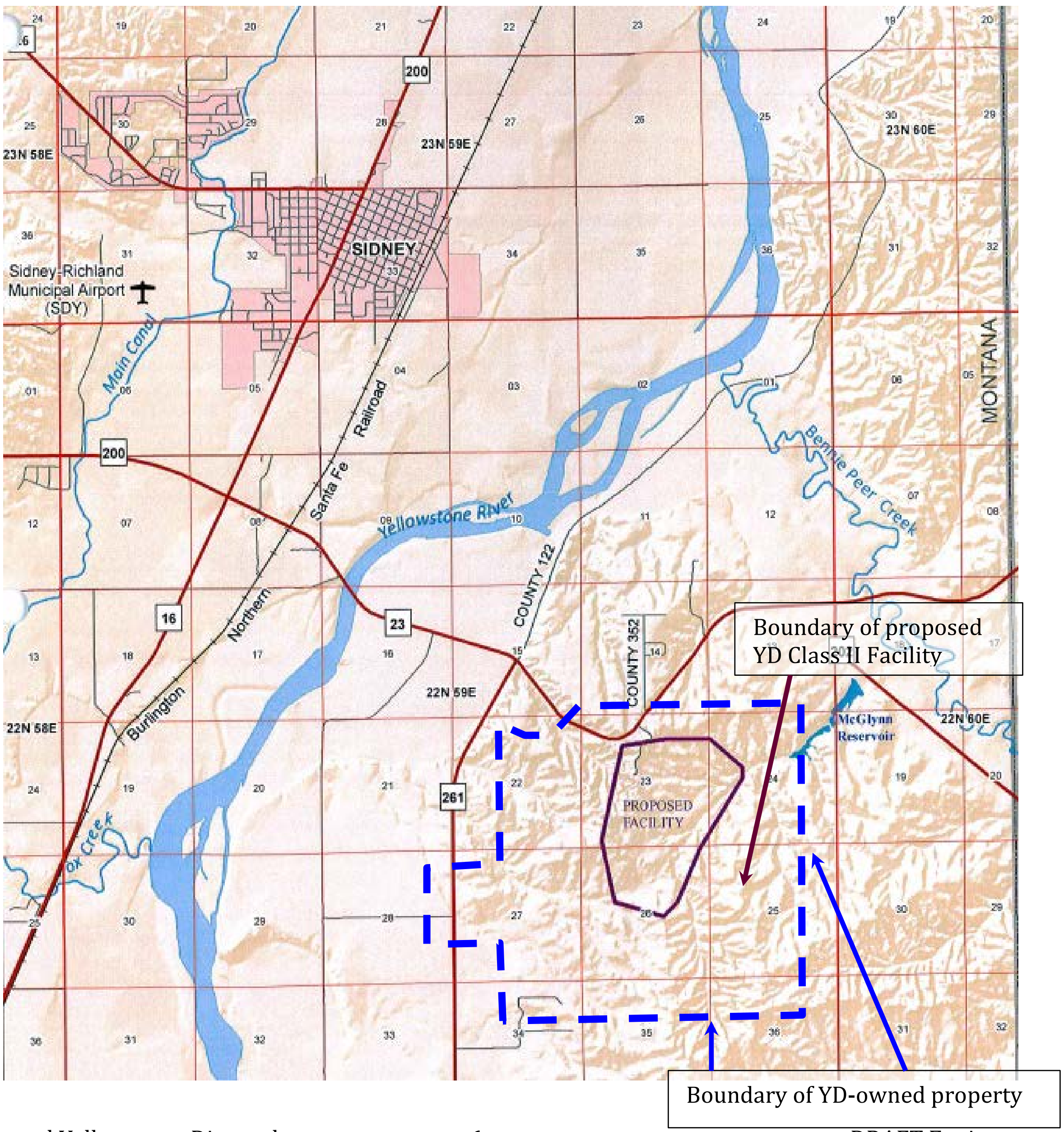
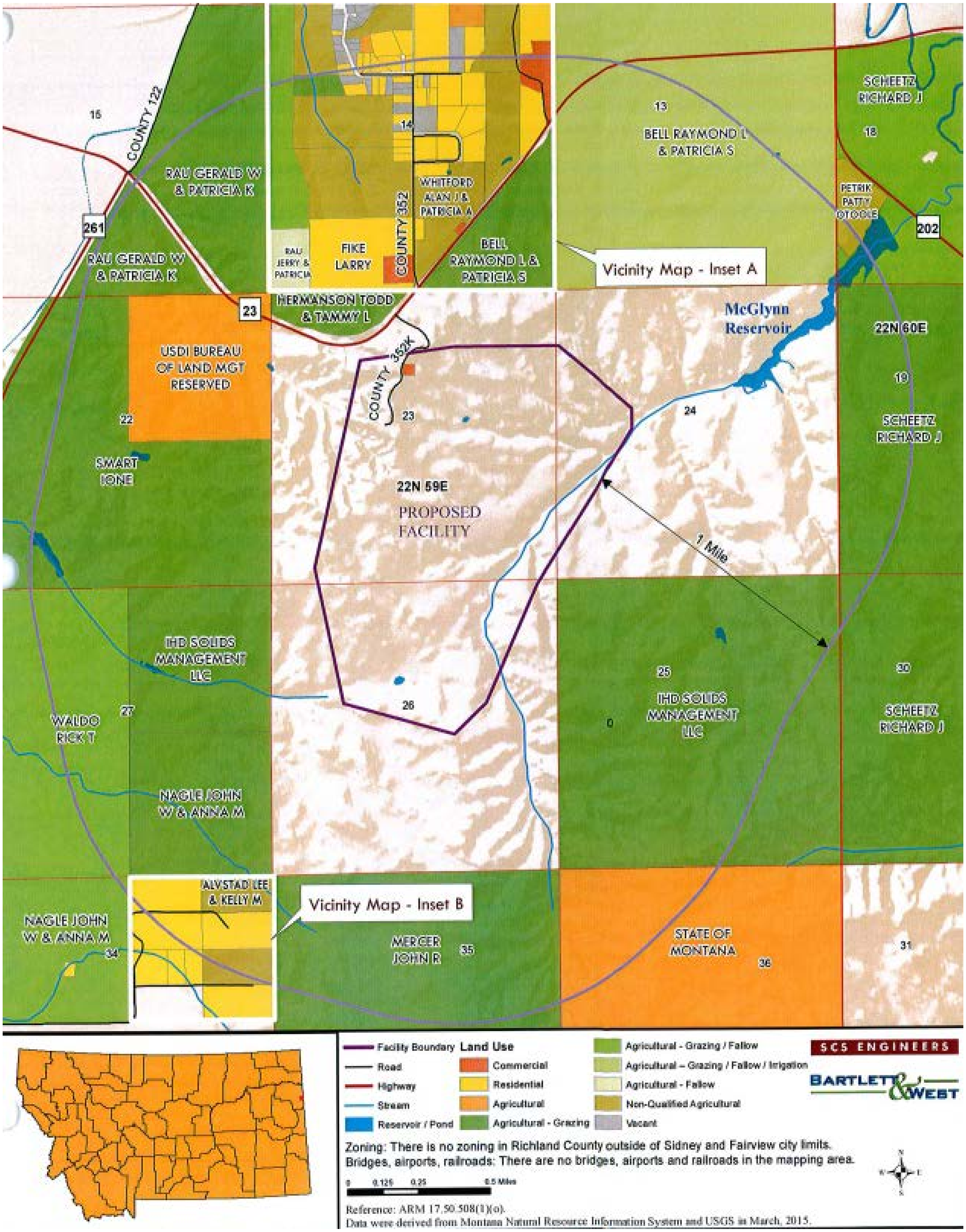


Figure 1.2 – Proposed Yellowstone Disposal Class II Facility Vicinity Map



(Source: Yellowstone Disposal License Application, 2015)

1.4 REGULATORY RESPONSIBILITIES AND REQUIREMENTS

DEQ must comply with the requirements of the Montana Environmental Policy Act (MEPA) and the SWMA including the administrative rules adopted pursuant to these state laws. DEQ is responsible for analyzing the possible environmental impacts of a proposed solid waste management system under the procedural requirements of MEPA. In order for DEQ to approve a proposed solid waste management system, DEQ must determine that the proposed solid waste management system complies with the requirements of the SWMA

Upon completion of the Environmental Assessment (EA) process, DEQ may 1) deny the application as submitted; 2) approve the application as submitted, 3) approve the application with agency mitigations; or 4) determine the need for further MEPA review to disclose and analyze potentially significant environmental impacts.

Table 1.1 provides a listing of agencies and their respective permit/authorizing responsibilities.

TABLE 1.1- Regulatory Responsibilities

ACTION	REGULATORY AGENCY
Solid Waste Management System License	DEQ – Waste and Underground Tank Management Bureau
Air Quality Permitting	DEQ – Air Quality Bureau
General Permit for Storm Water Discharge Associated with Industrial Activity	DEQ-Water Protection Bureau
Montana Pollutant Discharge Elimination System Permit (MPDES)	DEQ – Water Protection Bureau
SWMS License Validation by County Health Officer	Richland County Health Officer
County Road Construction, Maintenance, and Land Use, Weed Plan Approval	Richland County
State Highway Encroachment Permit	Montana Department of Transportation
Wetland Modification (404 Permit)	U.S. Army Corps of Engineers
Waterway Construction (310 and 318 Permits)	Montana Department of Natural Resources and Conservation and Richland County Conservation District

1.5 PUBLIC PARTICIPATION

DEQ has prepared this draft EA analyzing the possible environmental consequences related to the proposal. DEQ is publishing this draft EA for distribution to adjacent landowners and interested persons for review. Upon publication of this draft EA, a 60-day public comment period will commence. DEQ will hold a public meeting on December 18, 2017, to obtain public comment on the draft EA. DEQ will respond to comments received during the 60-day public comment period. Responses will be incorporated in the Final EA and Record of Decision.

2 DESCRIPTION OF ALTERNATIVES

2.1 INTRODUCTION

This chapter summarizes alternatives to the proposed plan including the No Action alternative required by MEPA. MEPA requires the evaluation of reasonable alternatives to the Proposed Action. Reasonable MEPA alternatives are those that are achievable under current technology and are economically feasible as determined solely by the economic viability for similar projects having similar conditions and physical locations and determined without regard to the economic strength of the specific project sponsor.

2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the proposed landfill would not be approved by DEQ. Therefore, the Facility could not be built by YD and disposal of waste would have to occur at another approved landfill facility.

2.3 PROPOSED ACTION

The Proposed Action is licensure of the Class II landfill. The Proposed Action would consist of a landfill facility as depicted on Figure 2.1.

2.3.1 LANDFILL DESIGN AND CONSTRUCTION

2.3.1.1 Landfill Features

The proposed landfill design and operation includes construction of the following components: (i) gatehouse and scale, (ii) landfill maintenance building, (iii) controlled point of entrance, (iv) interior roads, (v) waste disposal units, (vi) leachate collection, removal, and conveyance system, (vii) leachate ponds, (viii) storm water control system, (ix) storm water ponds. During construction of the waste disposal units, excavated soils would be stockpiled on-site. Tables 2.1 and 2.2 provide the details for acreage and soil excavation volumes for each phase of construction.

2.3.1.2 Landfill Liner Design

Both landfills, the municipal waste and special waste landfills, are designed with Subtitle D liner systems that consist of a 2-foot compacted soil liner, a 60-mil high density polyethylene (HDPE) geomembrane, and a leachate collection system (Figure 2.2).

Figure 2.1 – Proposed Yellowstone Disposal Class II Facility Site Layout

(Source: Yellowstone Disposal License Application, 2015)

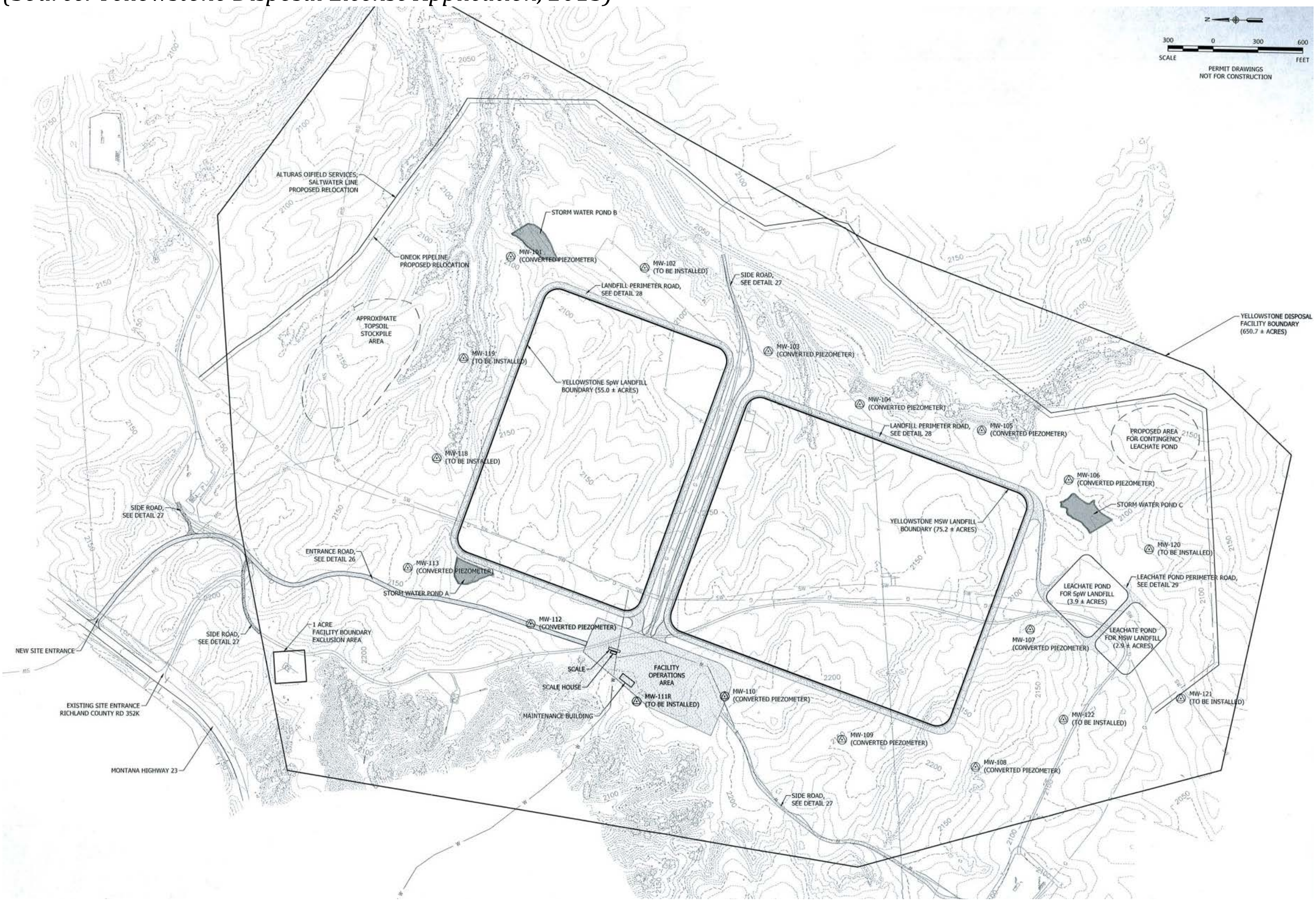


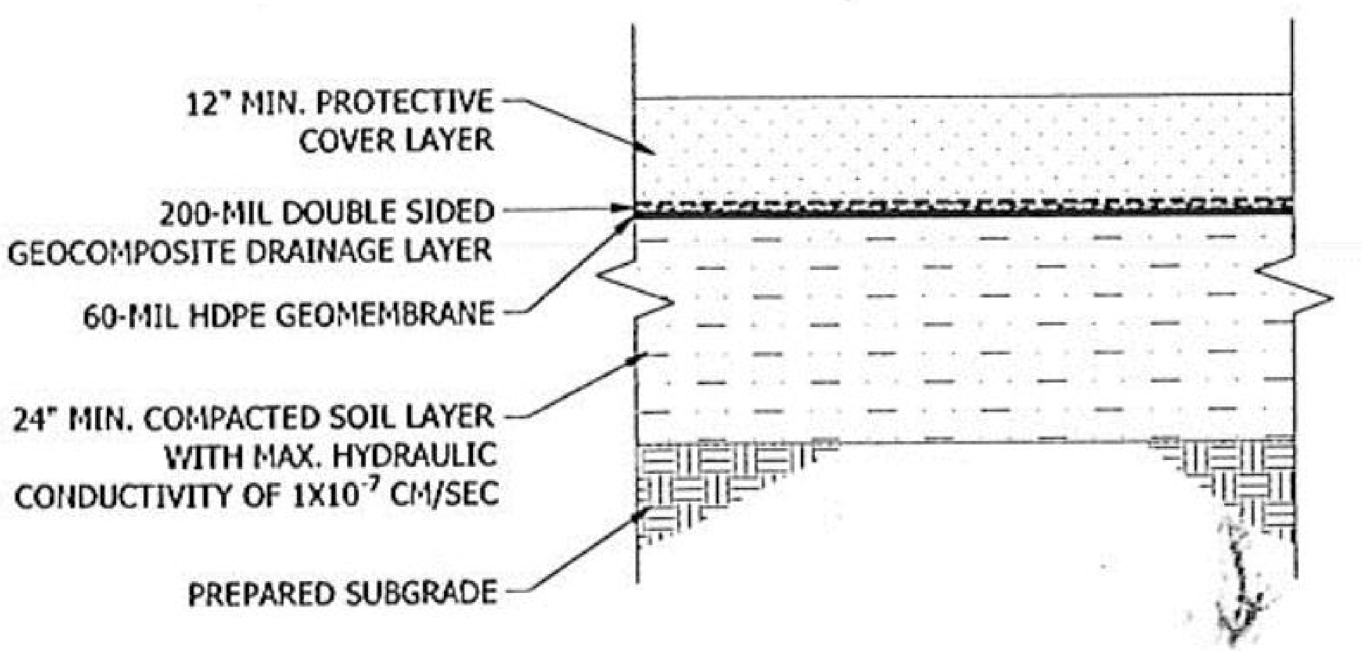
Table 2.1 - Site Development Sequence and Phase Areas
(Source: Yellowstone Disposal License Application, 2015)

MSW LANDFILL	ACREAGE	SpW LANDFILL	ACREAGE
Phase 1	7.1	Phase A	6.7
Phase 2	7.4	Phase B	6.7
Phase 3	8.0	Phase C	6.7
Phase 4	9.6	Phase D	7.4
Phase 5	9.9	Phase E	6.7
Phase 6	10.7	Phase F	6.7
Phase 7	7.1	Phase G	6.7
Phase 8	7.4	Phase H	7.4
Phase 9	8.0		

Table 2.2 – Landfill Capacity, Soil Needs, and Life Expectancy

Phase	Total Airspace (yds^3)	Final Cover (yds^3)	Total Fill Required for Construction (yds^3)	Total Excavation (yds^3)	Acres	Tonnage	Life (years)
Roads, ponds, ditches					*129.8*		64
MSW Landfill Unit	8,522,100	443,600	1,007,800	1,451,800	75.2	6,009,600	64
SpW Unit	5,457,900	325,800	300,900	1,616,800	55.0	6,570,000	30
TOTAL	*13,980,000*	*769,400*	*1,308,700*	*3,068,600*	*260*	*12,579,600*	*64*

Figure 2.2 – Typical Section - Liner Design
(Source: Yellowstone Disposal License Application, 2015)



The base liner system would consist of the following bottom to top:

- Prepared subgrade and fill materials to achieve grade
- A 24-inch compacted soil layer with a permeability no greater than
  1x10-7 centimeters per second (cm/sec)
- A 60-mil HDPE geomembrane:
- MSW Landfill: 60-mil geomembrane to be textured (both sides) on slopes, smooth allowed on floor
- SpW Landfill: 60-mil geomembrane to be textured (both sides) on slope and floor

The leachate collection system includes a 200-mil double-sided geocomposite overlain by one-foot of protective gravel. Three leachate extraction sumps would be constructed in the MSW Landfill to collect leachate, while two sumps would be constructed in the SpW Landfill for leachate collection. Leachate would drain across the landfill floor into six-inch perforated HDPE pipes that drain directly to the sumps. The pipes are surrounded by non-calcareous gravel and wrapped in a non-woven geotextile to reduce the potential for clogging. Cleanouts would be provided on both ends of the leachate collection pipe. Submersible pumps would be installed via riser pipes into the sumps to pump the leachate through pipes to one of two separate leachate ponds: one pond for leachate generated in the SpW Landfill and one pond for leachate generated in the MSW Landfill.

2.3.1.3 *Landfill Unit Construction*

Development of each landfill would occur with construction of individual cells ranging from 6 to 11 acres in size. The proposed 75.2-acre MSW landfill unit would be comprised of nine disposal cells that would be constructed in separate phases. Construction of a new cell would not begin until the prior cell reaches near capacity. The 55-acre SpW landfill unit would be comprised of eight disposal cells that would also be constructed in separate phases. As noted previously, Table 2.1 provides the acreage for each phase of cell development. Cell construction events in the landfills may occur at the same time, or construction events may be conducted in different years pending landfill filling rates. For the SpW Landfill, the first cell (Cell A) for development would be located in the southeast corner of the landfill and encompass the southern leachate sump. For the MSW Landfill, the first cell (Cell 1) for construction would be located in the northeast corner, and encompass the northern-most sump. Although some infrastructure can be constructed over the life of the landfills, certain infrastructure would be necessary at the onset of operations to support Facility functions. During the initial phase of construction, the necessary infrastructure would be constructed including:

- Entrance road and site access controls
- Signs
- Operations area, scale, scalehouse
- Perimeter access roads
- Initial disposal cells
- Leachate ponds and access roads
- Relocation of gas lines in the leachate pond area
- Leachate pipes from sumps to ponds
- Storm water ponds
- Gas monitoring probes
- Groundwater monitoring network
- Relocation of gas lines between landfills

Additional infrastructure including storm water control channels and access to ponds would be constructed as landfill development continues over the life of the Facility.

The liner system would be overbuilt to extend over the edge of the new cell to tie-in the next cell's liner-leachate systems and maintain a setback from waste after filling.

Liner termination berms (Figure 2.3) would be used to protect the overbuilt liner, provide a boundary for waste placement, and keep leachate separated from storm water runoff. The base of all landfill cells would slope toward the central leachate pipe swale to initially retain all runoff as leachate. Cell construction would progress uphill within each landfill unit from the lowest corner within the disposal footprint. The MSW landfill would be constructed with a 3% to 5.5% slope on the floor towards the leachate sump. The SpW landfill would be constructed with an approximate 3.6% slope on the floor towards the leachate sump. The liner perimeter side slopes would be constructed with 3:1 slopes.

Soil excavated during landfill unit construction would be salvaged and used to (i) provide subgrade fill to establish the base elevations for the landfill units, and (ii) construct the compacted soil component of the landfill, final cover, and leachate pond liners. During construction, the compacted soil component of each liner would be built up in six-inch thick lifts. Each lift would be wetted, compacted, and tested to ensure that it meets the compaction specifications before another six-inch lift is installed; the complete compacted surface of the two-foot thick soil barrier layer would be rolled and inspected for adequate smoothness before the high density polyethylene geomembrane liner is installed. The high density polyethylene geomembrane panels would then be overlaid in direct and uniform contact with the underlying compacted soil layer with a three to six inch overlap on both sides that would then be dual-track heat fusion welded to adjacent panels and pressure tested along each edge to form a complete flexible membrane liner.

Figure 2.3 – Typical Section - Liner Termination Berms

(Source: Yellowstone Disposal License Application, 2015)

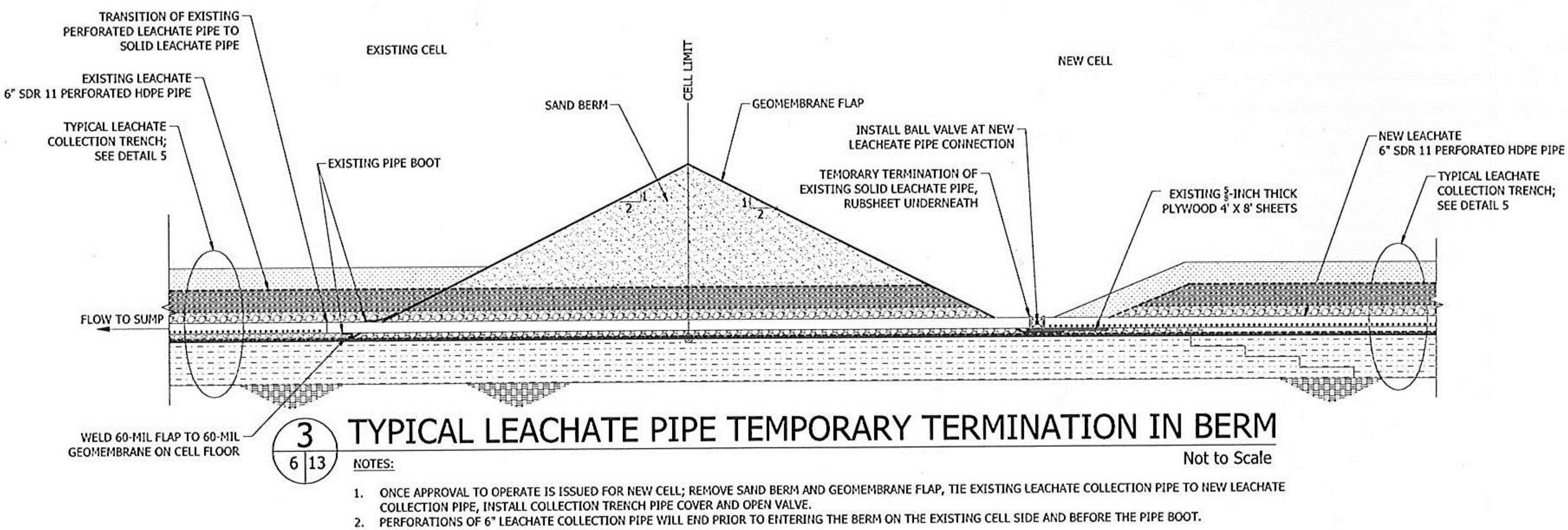
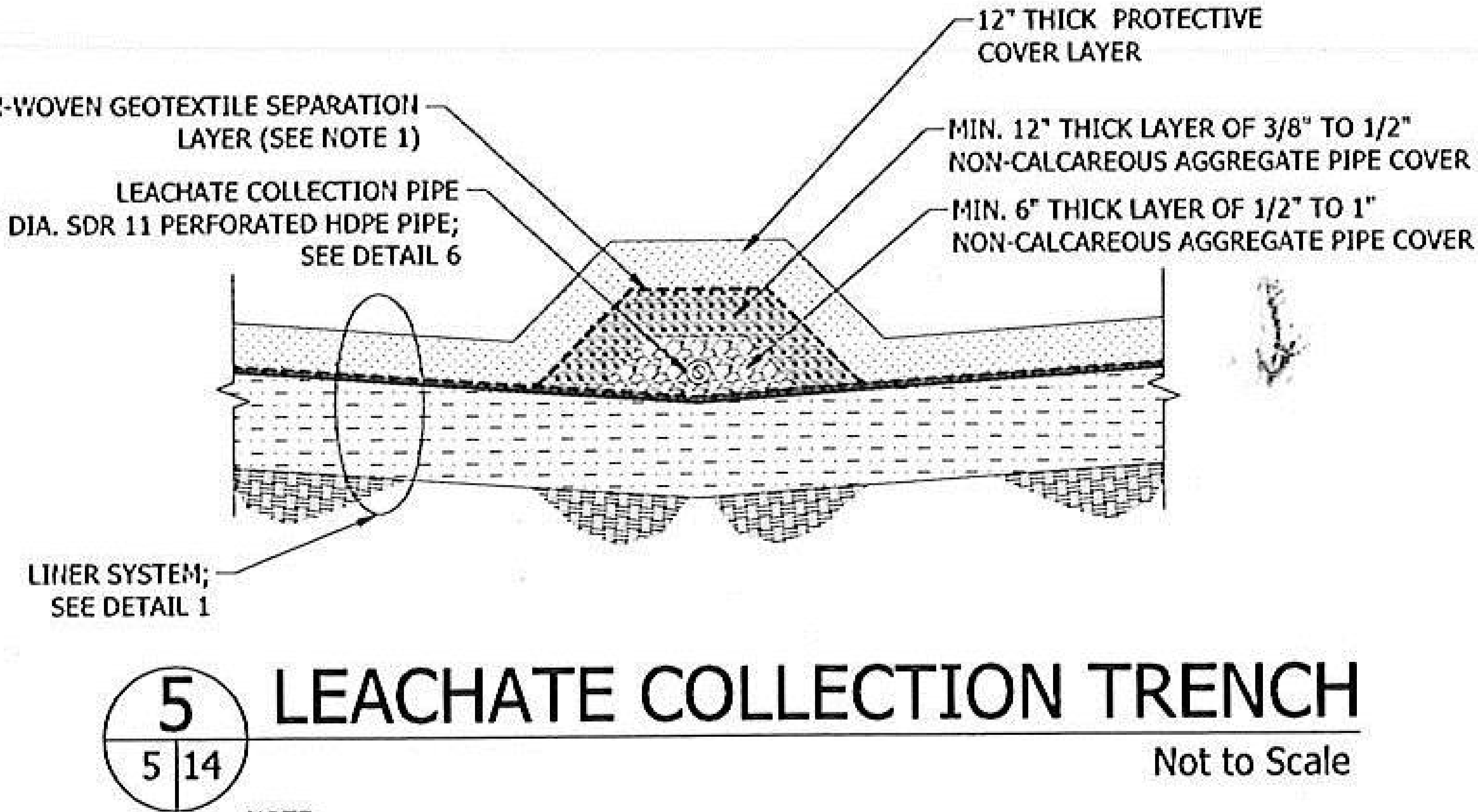


Figure 2.4 – Typical Section – Leachate Collection Trench
(Source: Yellowstone Disposal License Application, 2015)



NOTE:

1. GEOTEXTILE WILL BE "BURRITO-WRAPPED" AND LYSTERED ON THE TOP OR LAID OVER AGGREGATE AND LYSTERED TO THE FABRIC OF THE GEOCOMPOSITE.

2.3.1.4 *Leachate Collection and Removal System and Leachate Pond Construction*

A separate leachate collection and leachate removal system would be installed in the municipal solid waste and special waste units according to DEQ-approved project design plans and Construction Quality Assurance/Construction Quality Control (CQA/CQC) requirements. The leachate collection and leachate removal system elements placed in the central swale of each cell would consist of the following components from top to bottom (Figure 2.4):

- 12-inch soil protection layer
- 8-oz nonwoven geotextile separator
- 12-inch outer fine drainage gravel filter
- 6-inch inner coarse drainage gravel bedding
- 6-inch perforated leachate collection pipe
- 200-mil double-sided nonwoven geocomposite (transmissivity > 5.5×10^{-4} meters^2/sec)

All leachate would be collected over the entire landfill unit liner within the geocomposite drainage blanket and flow into a west-to-east sloping network of leachate collection pipes bedded in gravel. The centralized leachate collection pipe in each landfill cell would connect downslope and terminate at the sump. The sump is bedded within coarse gravel surrounding a five-foot concrete manhole (Figure 2.5). All leachate removal risers would be bedded in at least 18 inches of gravel drainage material wrapped by eight-ounce nonwoven geotextile. A 12-inch protective cover soil layer would be placed over all components of the leachate collection and leachate removal system and composite liner system covering the base and slopes.

Both leachate ponds (Figure 2.6) would be constructed with composite liner components from top to bottom as follows:

- 80-mil double-textured Linear Low-Density Polyethylene liner
- Two-foot Compacted soil layer (K_s no more than 1×10^{-7} cm/sec)

The bottom and side slope composite liners for each of two leachate ponds would be installed in a manner equivalent to the landfill base liner according to DEQ-approved project design plans and CQA/CQC requirements. The side slopes would be constructed with

Figure 2.5 – Typical Section – Leachate Collection Sump and Riser Details

(Source: Yellowstone Disposal License

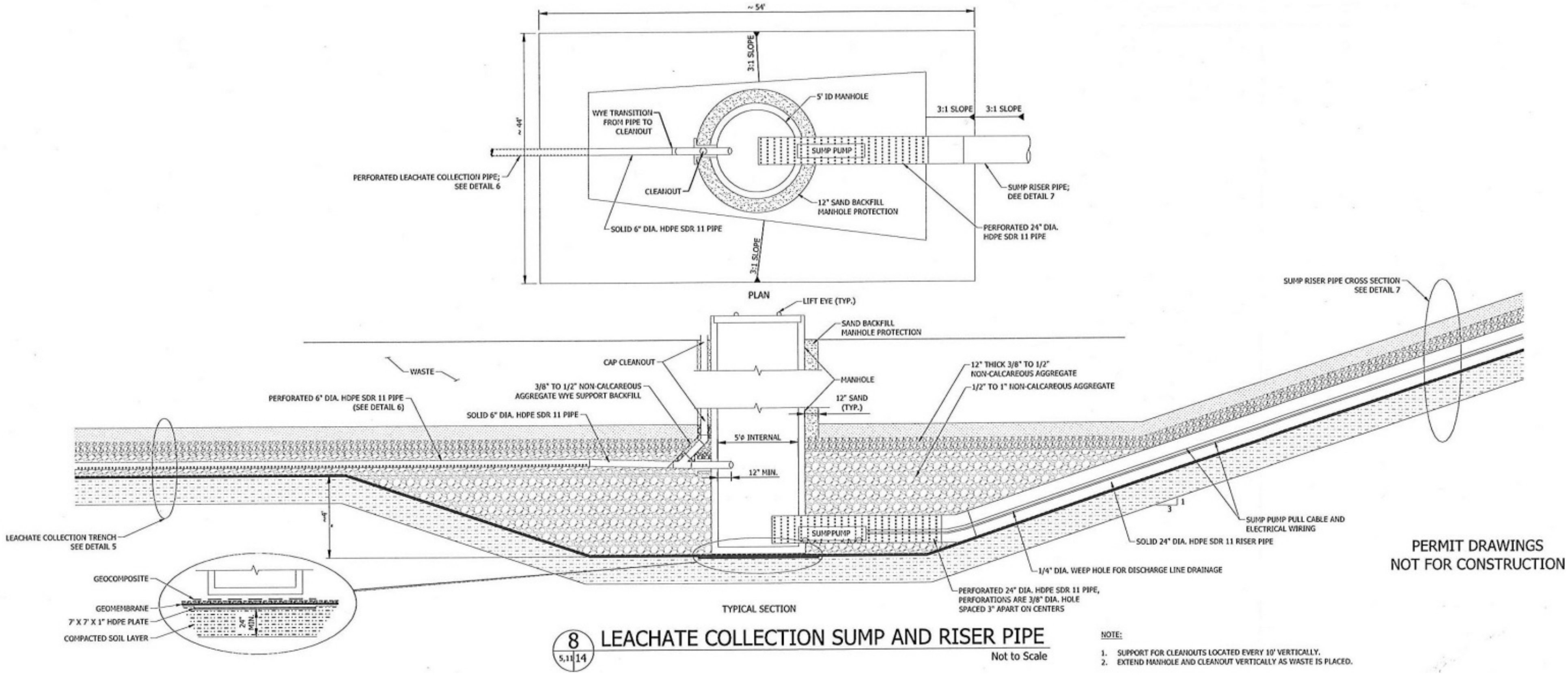
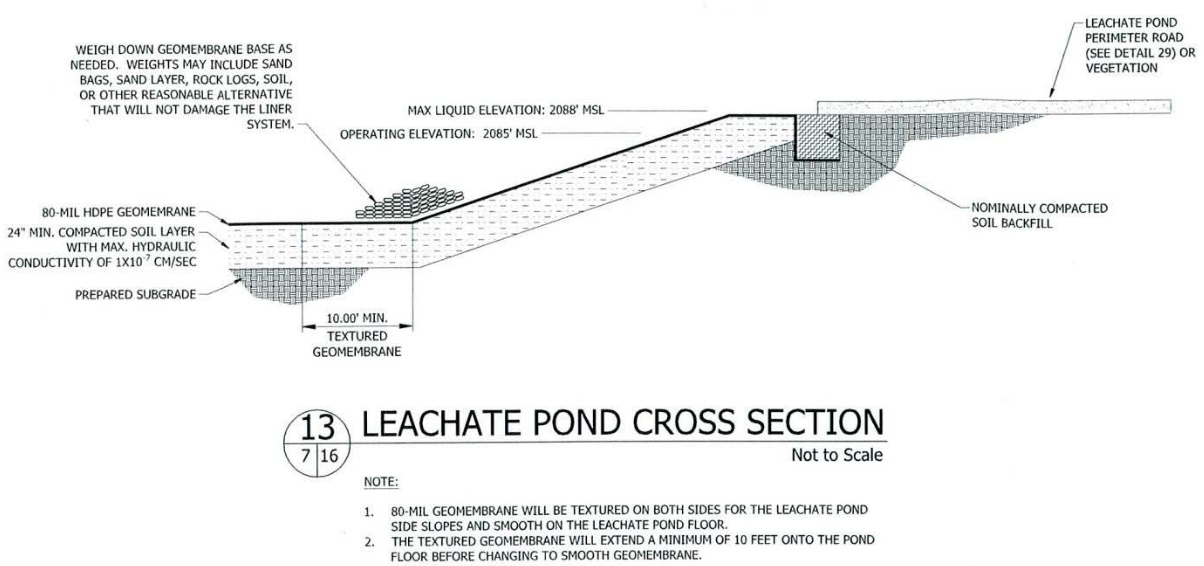


Figure 2.6: Typical Section – Leachate Pond Liner Details
(Source: Yellowstone Disposal License Application, 2015)



a maximum 3:1 slope. The pond bottoms would be constructed to slope slightly (0.4-0.5%) toward adjacent corners for central access during leachate removal by portable load-out pumping.

The three-acre, five-foot deep leachate pond servicing the MSW unit would store up to 3.26 million gallons (435,200 cubic feet) of leachate, leaving at least three feet of freeboard (1.0 million gallon reserve). The four-acre, seven-foot deep leachate pond servicing the SpW unit would store up to 6.49 million gallons (867,300 cubic feet) of leachate, leaving at least three feet of freeboard (additional 1.3 million gallon capacity). The leachate evaporation ponds are sized for multiple extreme events, based on both historic annual precipitation averages and 100-year maximums.

2.3.1.5 Storm Water Controls Construction

Perimeter channels surround the footprint of both the MSW and SpW Landfills. These channels are located along the outside of the access roads and would direct storm water flow from each letdown to the appropriate detention pond. Several culverts would be necessary to route storm water beneath site access roads to the appropriate pond. All culverts would be constructed of reinforced concrete pipe using the largest anticipated peak flow from the appropriate inlet channel.

Three detention ponds would be constructed to control storm water from the MSW and SpW Landfills. These ponds have been identified as Pond A, Pond B, and Pond C. The size and components of these ponds were developed to attenuate the outlet flows to less than the pre-developed 25-year, 24-hour storm run-off.

Pond A, located at the northwest corner of the MSW Landfill, is designed to manage the runoff from approximately 15.7 acres. A single outlet structure is located at the north side of the pond that is designed to control the outflow of storm water during a 25-year, 24 hour storm event.

Pond B, located at the northeast corner of the MSW Landfill, is designed to manage the runoff from approximately 103 acres. A single outlet structure is located at the northeast side of the pond to control the outflow of storm water during a 25-year, 24-hour storm event.

Pond C, located at the southeast corner of the SpW Landfill, is designed to manage the runoff from approximately 50 acres. A single outlet structure is located at the south side of the pond to control the outflow of storm water during a 25-year, 24-hour storm event.

2.3.1.6 Scale House and Equipment Building

As depicted in Figure 2.1, the Facility entrance is located off Highway 23 in the northwest portion of the site. The scale house office and maintenance building would be located adjacent to the landfill units on the west central side of the site.

2.3.1.7 Soil Stockpiles

The soils removed as each landfill unit is excavated would be stockpiled within the disposal footprint area near the active and in subsequent disposal cells. Selected soils from these sources would be used as-needed for compacted liner components, and for daily, intermediate, and final cover soils. Best management practices (BMP's), including erosion control mats, screens, wattles, or berms, would be used to control erosion from these stockpiles as necessary. All runoff from soil excavation, borrow areas, and stockpiles would be routed to the storm water ponds, but BMP's (like revegetation) may allow clean runoff from some of these areas to also be routed off site if necessary.

2.3.1.8 Final Closure

Final closure of the Facility would occur once all waste disposal units have reached full capacity and wastes are no longer accepted for management at the Facility. Once each landfill cell reaches final grade, the cell would be covered with a final cover. When all cells are full, the final cover would be tied together into a single continuous cap (Figure 2.7). Prior to the commencement of closure activities, all necessary final closure plans would be submitted to DEQ for review and approval. Once the closure plans have been approved, YD would submit a Notification of Intent (NOI) to close to DEQ. The final closure activities would commence and would be completed within 180 days of the NOI.

A composite cap has been designed and proposed as the final cover system in accordance with Subtitle D regulations (Figure 2.8). The final cover system would consist of the following from top to bottom:

- Native vegetation
- A 6-inch erosion layer consisting of earthen material capable of sustaining native plant growth
- An 18-inch infiltration layer consisting of earthen material
- A 300-mil double-sided geocomposite drainage layer
- A 40-mil linear LLDPE geomembrane
- An 18-inch compacted soil layer with a permeability no greater than $1x10^{-7}$ cm/sec
- Prepared subgrade and fill materials above waste to achieve grade

The final cover slopes would be constructed at an approximately 5:1 slope (20% slope). The waste limits have been set so at the toe of the slope, the geomembrane layer of the final cover is able to be welded directly to the geomembrane layer of the liner system. The crown of the landfill would be sloped to maintain drainage. The crown slope would be approximately eight percent for the MSW Landfill and approximately three percent for the SpW Landfill. The maximum elevation for the MSW Landfill is approximately 2321 feet msl and for the SpW Landfill is approximately 2254 feet msl.

Figure 2.7: Final Cover – Final Grades
(Source: Yellowstone Disposal License Application, 2015)

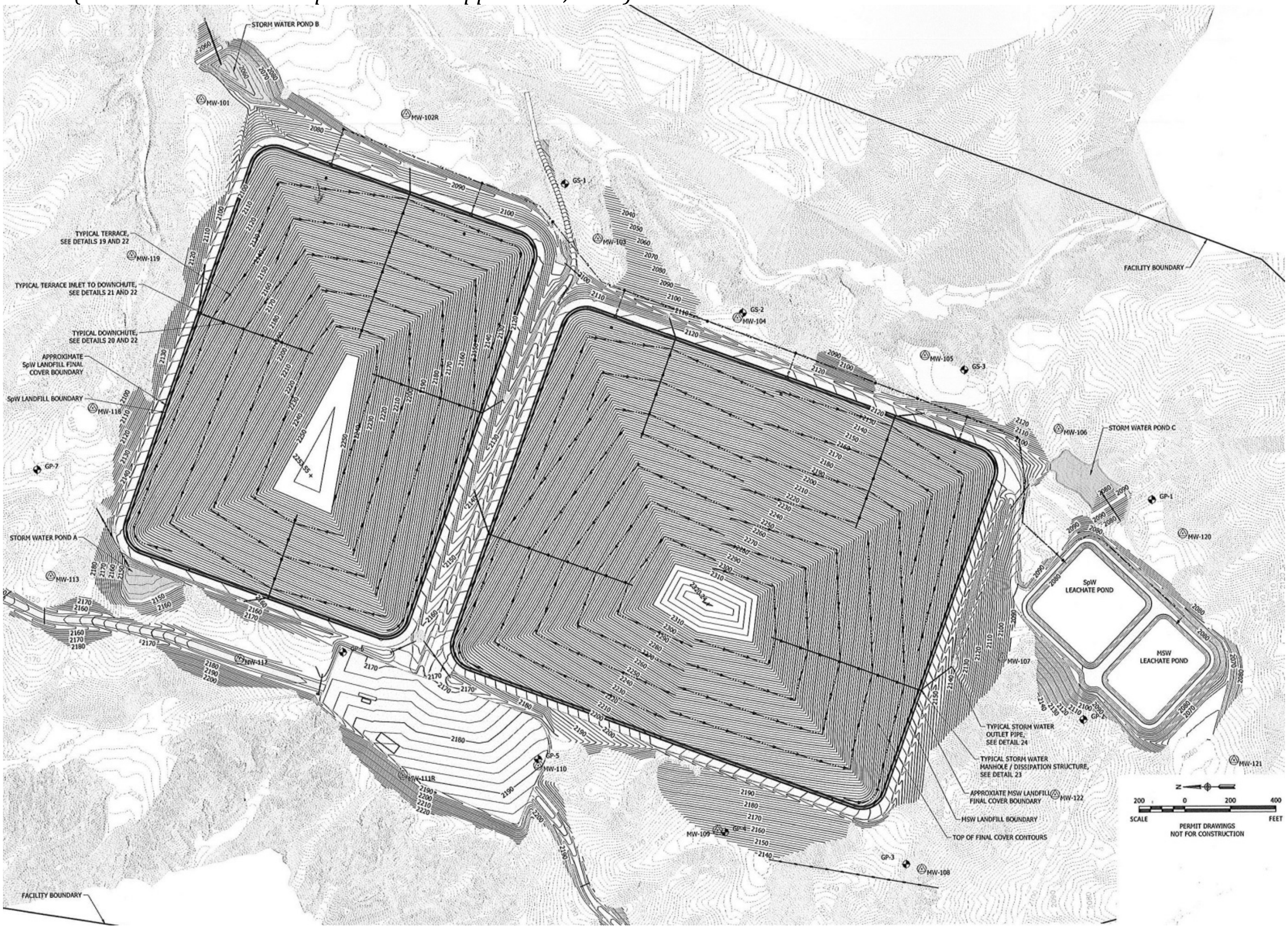
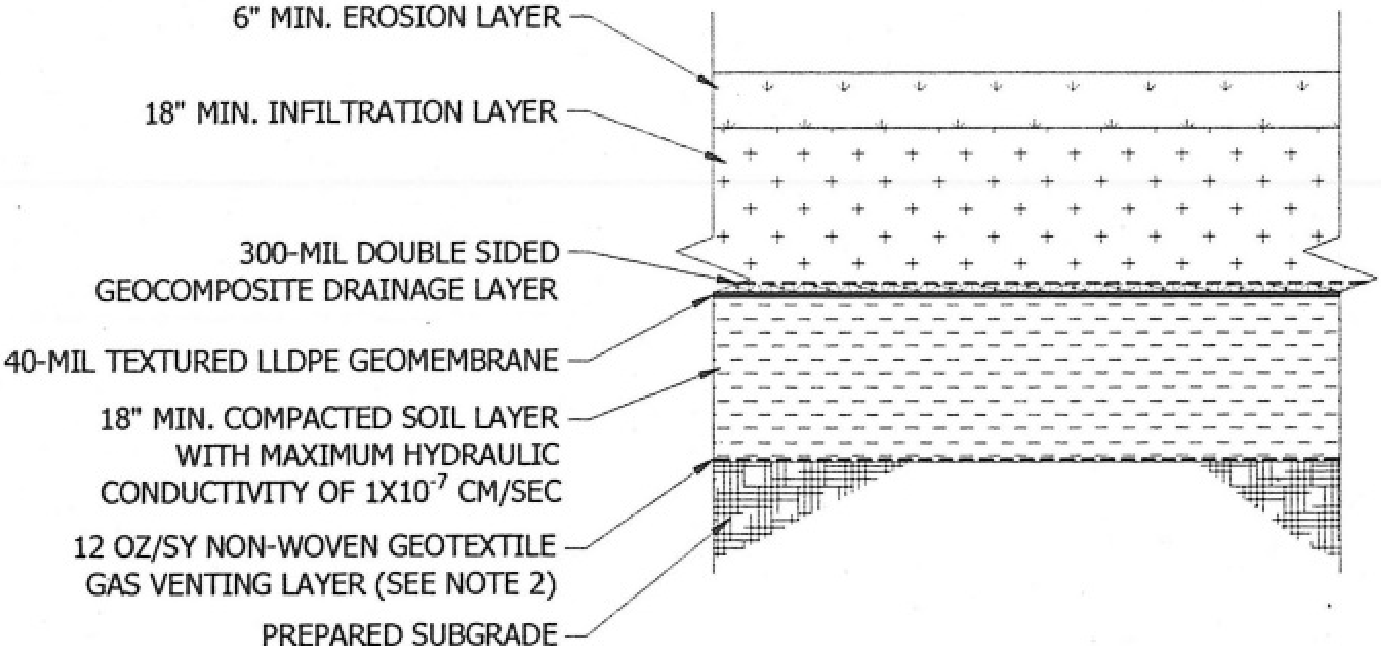


Figure 2.8: Typical Section – Final Cover Design
(Source: Yellowstone Disposal License Application, 2015)



Storm water generated on the final cover would be controlled by a network of terraces and downchutes constructed above the final cover elevations. Storm water that does not run off the landfill as storm water would infiltrate through the initial layers of the final cover system and be drained from the final cover by the geocomposite drainage layer.

The perimeter of the landfill is surrounded by an access road and storm water perimeter channels. When final closure is completed, final cover would extend approximately 11 feet beyond the landfill boundary leaving a road width of approximately 34 feet. At specific locations around the boundary, the road width may become narrower to allow for manholes and headwalls to be placed between the landfill boundary and the perimeter road.

2.3.2 LANDFILL OPERATIONS, MAINTENANCE, AND MONITORING

The proposed YD landfill would follow a DEQ-approved Operations and Maintenance (O&M) Plan. Current regulations require DEQ-approval prior to the commencement of facility operations and the implementation of changes to facility operations. The Facility must comply with applicable requirements of the SWMA and associated administrative rules, including the payment of fees and submittal of an annual application for renewal. Failure to operate the Facility according to these requirements could result in enforcement actions, license revocation, or denial of an application for renewal.

2.3.2.1 *Personnel*

The proposed YD landfill would be operated by at least three employees trained to properly operate the Facility and effectively manage site issues as they arise. Site personnel would inspect incoming loads, review incoming waste load records, direct site users to the proper disposal area, operate landfill equipment, and apply the necessary soil cover. Additional site personnel would be added as needed.

2.3.2.2 *Operating Hours*

The proposed YD MSW landfill unit would be open to receive wastes Monday through Friday from 7:00 a.m. to 6:00 p.m., and Saturday from 7:00 a.m. to 5:00 p.m. The municipal solid waste unit would be open to commercial and residential haulers and the general public during these times. The SpW Landfill would be open on an as needed basis to receive waste from commercial haulers that have an approved disposal contract with the Facility. The SpW Landfill would not be open to the general public.

2.3.2.3 *Site Access*

The Facility would be accessed from Montana Highway 23. The Facility approach is located on MT 23 where a truck climbing lane currently exists. A new approach would be constructed at the entrance to the proposed Facility from Montana Highway 23. Any modification to the Facility access from Montana Highway 23 would first have to be approved, directed and overseen by the MDT.

Access to landfill operations would be controlled by the entrance gate and fences. The MSW Landfill and SpW Landfill would have signs posted which clearly indicate the purpose of each Landfill, the hours of operation, and the types of waste accepted, as well as those specifically excluded. At the conclusion of each operating day, the entrance gate would be locked to prohibit vehicle access. If special waste is to be accepted outside of normal hours of operation, an operator would be present to open and close the Facility. Landfill personnel would prohibit any unauthorized access and would record all incidences of unauthorized access. The scale attendant would direct waste laden vehicles to the appropriate unloading area. Access to the site by leaseholders and stakeholders with operations on the property is authorized.

2.3.2.4 *Landfill Equipment*

YD owns and operates equipment at the Facility adequate for the waste handling and processing as needed. Yellowstone Disposal would be responsible for adequately training personnel to operate the equipment. Available equipment includes front-end loaders, scrapers, motor graders, bulldozers and compactors. Equipment may be rented on an as-needed basis. The minimum equipment on site would include a 950 Cat front end loader, A D6N Cat dozer and an 816 Cat landfill compactor or equivalents.

2.3.2.5 *Acceptable Wastes*

2.3.2.5.1 *MSW Landfill Wastes*

The types of waste accepted for disposal in the MSW Landfill include Class II, Class III and Class IV solid waste, including:

- Putrescible municipal solid waste
- Bulky waste
- Wood waste
- Non-water soluble solids such as brick; dirt; rock; rebar-free concrete; brush; lumber and vehicle tires as defined in ARM 17.50.503(1)(b)
  - General construction and demolition waste
  - Asphalt
  - Special waste as defined in ARM 17.50.1115

2.3.2.5.2 *SpW Landfill Wastes*

The types of waste accepted for disposal in the SpW Landfill include exempt and non-hazardous special waste related to the exploration and production (E&P) of crude oil and natural gas with technologically enhanced radioactive material (TENORM) concentrations not exceeding 50 picocuries per gram; soils heavily contaminated with petroleum; inert waste; and non-hazardous industrial waste. Group III and IV solid waste would be accepted in the SpW Landfill, Group II putrescible solid waste would not be accepted in the SpW Landfill. Although allowable for disposal in the SpW Landfill as a Group III or IV solid waste, significant volumes of wood, construction materials and fibrous demolition materials would not be disposed of in the SpW Landfill. These types of materials would be disposed of in the MSW Landfill. Wastes accepted in the SpW Landfill would generally have the consistency of soil or be associated with E&P operations such as liners and tarps, tanks and other non-recyclable equipment. An exception to this characterization would be that asbestos containing wastes would be disposed of in the SpW Landfill. Although technically allowable for disposal in the

MSW Landfill, management of these wastes would be more easily tracked and contained to a designated area in the SpW Landfill.

2.3.2.6 Prohibited Wastes

Waste from an unknown origin would not be accepted at the Facility.

The following materials are not to be accepted for disposal at the Facility:

- Mercury containing devices
- Hazardous materials
- Hazardous waste
- TENORM waste exceeding 50 picocuries per gram
- Un-rinsed pesticide containers
- Regulated infectious materials
- Electronic waste
- Used motor or hydraulic oil
- Batteries
- Septic tank pumpings
- PCB contaminated materials
- Liquid wastes

2.3.2.7 Waste Screening and Waste Acceptance Procedures

Waste screening procedures, including random and targeted load inspections, would be implemented to prevent prohibited wastes from entering the Facility.

2.3.2.7.1 MSW Screening and Waste Acceptance Procedures

Gate checks would be conducted by the gate attendant at the scale house each time waste is received for acceptance at the facility. Acceptable wastes, as described above and in the Facility's O&M Plan, would proceed to the appropriate working face or to the designated waste screening area if a random or target inspection is required.

Gate checks where the load is rejected require documentation. Waste delivered to the Facility which appears to contain "free liquids" would be sampled and subjected to the Paint Filter Liquids test (EPA Method 9095) or sent for off-site solidification. If testing reveals that the waste does not contain "free liquid" and the material meets the Facility's remaining acceptance criteria, the waste may be accepted and disposal procedures may be conducted.

Random inspections would be conducted on a frequency of once per week or approximately every 1,000 tons of waste accepted to the MSW Landfill, whichever occurs first. A separate area, designated by a sign labeled "Waste Screening Area," would be set aside near the working face where the waste is emptied for visual inspection. Unacceptable materials would be removed and handled according to the waste type. Acceptable waste would be pushed into the working face. Random inspection activities would be recorded on a form and stored onsite.

If unacceptable waste is found during a gate check, random inspection, or targeted inspection, the waste load would be rejected and documented. For rejected loads, the gate attendant or inspector would document the date, time, driver's name, license plate number, company name and address, size of the loads, reason load was rejected, and inspector's name. If appropriate, the gate attendant would supply the driver with the DEQ contact number or other suitable companies to contact for assistance in determining a suitable disposal facility. If regulated hazardous, regulated PCB, or infectious wastes are found during the gate check, the Facility would notify DEQ and other appropriate authorities.

2.3.2.7.2 SpW Screening and Waste Acceptance Procedures

The SpW waste screening and acceptance procedures enable the Operator to prepare for receiving and disposing of waste at the Facility and to assure all necessary business arrangements with the waste generator are finalized prior to the arrival of the waste. The standard acceptance procedure is a three-part process including:

- Pre-screening
- Waste profiling and documentation
- Waste inspection and verification

The pre-screening process is the first step in determining whether the waste can be disposed of at the Facility. It is especially critical for uncommon or new waste streams. Pre-screening consists of:

- Phone interview(s) to determine the material, its origin, and the identity of the generator
- In the case of a new waste type, consultation with regulations, regulators, and outside

consultants, as necessary, to determine if the waste may be accepted.

- A site visit, if necessary, to confirm the nature and origin of the waste

If the waste is determined to be acceptable, the next step in the acceptance procedure, waste profiling, is implemented. Prior to the transportation of the waste material to the Facility, the waste generator must submit a completed Waste Certification Form to the Operator for each type of waste the generator has proposed to dispose of at the Facility. The Waste Certification Form requires the generator to provide background information on the generator and transporter of the waste, a detailed waste profile including the results of any necessary analytical requirements, and a certification that the waste is non-hazardous and does not include any materials that once accepted would cause the Facility to be in violation of applicable regulations.

For waste streams that are approved for acceptance, a Waste Hauling Manifest must be provided for each load transported to the Facility. The manifest for each load would describe any significant discrepancies, if there are any, noticed in the waste material compared to the information provided in the Waste Certification Form for that particular waste material.

No special waste would be accepted at the Facility without satisfying the required pre-screening, profiling and documentation acceptance procedures described above, including receipt and approval of the Waste Certification form.

2.3.2.8 Landfilling Procedures

2.3.2.8.1 MSW Landfilling Procedures

The first lift of waste to be placed on the liner is installed with greater care and using special methods to protect the liner from damage. Prior to placement of waste in a new leachate collection area, the leachate collection system would be inspected for proper operation. To preserve the integrity of the liner system, no disposal vehicles would be permitted directly on the protective cover layer. Soil platforms or similar protection measures would be placed adjacent to the working face for the initial blocks of each cell phase to keep vehicles off the protective cover layer. Landfill personnel would be positioned at the working face for the start-up of each new area to direct vehicles to their unloading points. For the first lift, select soft waste would be spread out about five feet high and compacted only on the top of that lift. To assist in the uniform placement of select waste in the first layer, only ordinary municipal solid waste would be directed to that area. No bulky waste or demolition waste would be landfilled in the first lift.

Liner construction and subsequent landfilling in the MSW fill area would begin along the east side adjacent to the access road and then proceed from the northernmost sump to the west side of the landfill, and then south to repeat the east-west fill progression.

When the last load of waste for the day has been spread and compacted, daily cover would be applied, regardless of weather conditions. Daily cover typically consists of the placement of six inches of soil material.

All areas that would not receive waste for a period of 90 days or more would have at least one foot of compacted soil cover.

2.3.2.8.2 SpW Landfilling Procedures

Special waste accepted at this SpW Landfill would generally consist of RCRA Subtitle C exempt and non-hazardous E&P wastes associated with crude oil and natural gas exploration and production, such as drill cuttings and filter socks. Although other wastes may be accepted into the SpW Landfill, the majority can be identified as E&P waste. The SpW Landfill would be operated using a layered and stacking dump method with lift heights of approximately 15 feet or less, layer thicknesses no more than one-foot and an open fill area not typically greater than 10 acres. Under this method E&P waste materials generally consisting of soils and clays are off-loaded onto a relatively flat disposal area. As waste is off-loaded, conventional earth-moving equipment such as bulldozers, and front end loaders would be used to place the waste in thin layers, and these layers would be stacked until design elevations are reached. Cell construction would alternate between various lifts to allow E&P traffic to discharge waste at varying elevations.

The first lift of waste to be placed on the liner would be installed with greater care and using special methods to protect the liner from damage. Prior to placement of waste in a new area, the leachate collection system would be inspected for proper operation. To preserve the integrity of the liner system, no disposal vehicles would be permitted directly on the protective cover layer. Soil platforms or similar protection measures would be placed adjacent to the working area for the initial cells of each phase to keep vehicles off the protective cover layer. To ensure liner integrity, the waste would be rolled onto the protective cover layer in a manner that limits pushing and pulling forces that may be transmitted to the liner below. To provide adequate protection of the liner and leachate drainage layer, the first lift would have a minimum in-place thickness of four feet. To protect the liner system, a dozer would be used as the primary spreading and compacting machine for the first lift. No bulky waste or demolition material would be landfilled in the first lift.

Liner construction and subsequent landfilling would begin along the eastern side adjacent to the perimeter road, continue west from the southernmost sump to the west side of the landfill, and then north to repeat the east-west fill progression.

All areas that would not receive waste for a period of 90 days or more would have at least one-foot of compacted soil cover.

2.3.2.9 Inclement Weather Operations

2.3.2.9.1 **Wet Weather**

Temporary berms and ditches would be provided to divert run-off from the working areas and from traffic areas. Temporary access roads to the working areas would be maintained to keep them passable. Stockpiles of aggregate would be maintained on the site to bolster interior roads as necessary during weather events. No wet weather storage of waste is proposed. Waste haulers would be contacted to stop hauling if wet conditions make the internal haul roads impassable or prevent the proper placement and compaction of waste. If the operator is unable to maintain normal operations due to wet weather, site operations may be halted.

2.3.2.9.2 Cold Weather

Operations during the winter require snow removal on access roads and ramps, and on the active working areas of the Facility. Facility equipment would perform snow removal and maintain access as required. Snow that is removed from the active areas of the landfills would be stockpiled within the lined landfill footprint. Snow that must be removed from non-landfill areas (i.e., roads) or areas covered with intermediate cover can be pushed off of the landfill footprint and stockpiled to allow for eventual drainage to the storm water management system for the Facility. The ongoing placement and compaction of the waste would be performed in a timely manner to avoid freezing of the unloaded material. Snow accumulation in the working areas would be removed to avoid waste placement on top of snow. Any snow that has come into contact with waste would be kept within the lined area. If the operator is unable to maintain normal operations due to cold weather, site operations may be halted.

2.3.2.9.2.1 ***Windy Weather***

The main difficulty encountered during windy weather is the proper control of nuisance litter and dust. Litter control and dust control are discussed in greater detail in Sections 2.3.18 and 2.3.20 below, respectively. If the operator is unable to maintain normal operations due to windy weather, site operations may be halted.

2.3.2.9.2.2 ***Weather Related Opacity Issues***

Visibility at the site can be affected as the result of various weather conditions producing windblown dust, snow, and fog. Where visibility is reduced to a level where safe operation of vehicles and equipment is affected, operations would be discontinued until conditions improve.

2.3.2.9.2.3 ***Severe Weather***

The Facility staff would monitor severe weather development as it progresses and take appropriate action. Various forms of monitoring include television, internet and mobile communications. Onsite communication systems would be utilized to warn and direct staff to safety. For safety reasons, significant lightning activity in the area is a shutdown event. Cloud to ground lighting within a few miles of the site is actionable. Tornado warnings in the vicinity of the facility are actionable. Staff would take appropriate actions to protect themselves and their customers. The Facility office would have a basement suitable for storm shelter.

2.3.2.10 Litter Control

Litter produced by the MSW Landfill would be kept to a minimum at all times. Any refuse that is easily moved by wind would be covered as necessary to prevent it from scattering or becoming airborne. During operation, temporary or portable litter fences would be used as necessary to aid in litter control. A laborer would walk the grounds to patrol the access road to collect litter that has escaped the fences. At the end of each working day, all litter that has been collected would be returned to the working face to be incorporated into the MSW Landfill. In windy conditions, the operator would be prepared to implement measures to keep litter to a minimum. The primary means of litter control during windy operations is the placement of temporary or portable litter fences on the leeward side of the working face. If the operator is unable to keep litter from scattering or becoming airborne, the Facility Manager would halt operations to mitigate litter migration.

2.3.2.11 Vector Control

Facility staff would utilize proper operating procedures in the MSW Landfill (spreading and compacting waste, use of daily soil cover) to prevent favorable conditions for harboring vectors. Furthermore, stagnant pools of water and open containers with standing water would be eliminated to prevent mosquito breeding. If vectors become a problem, the operator would take the necessary corrective action to eliminate the dangers. Options may include modification of operational procedures, deterrents, or professional assistance.

2.3.2.12 Dust Control

The operator would control dust on the Facility roads by application of water or other dust palliatives on an as-needed basis. The water would be applied by a water truck at an application rate that would not result in runoff, erosion, or water/waste interaction. In windy conditions, the operator would implement dust control measures to prevent dust generation. If the operator is unable to control dust generation, the site manager may halt operations to mitigate dust generation. To minimize dust during landfilling operations, leachate may be used to suppress dust only within the lined landfill units. This leachate application to the landfill would not be intended to recycle leachate through the Facility, but would only be applied in an adequate amount to achieve the desired results.

2.3.2.13 Onsite Traffic Control

The design of the onsite roadways would allow for two-way traffic and accommodate the physical and performance characteristics of a WB-67 (Interstate Semitrailer) design vehicle type. The typical road cross section would provide a crowned 35-foot top width, gravel surfaced roadway for access in and around the landfill operations. Road design parameters established a maximum of 4.5% grade on any Facility roadway. Snow removal activities were considered in the design process and stockpiling areas are identified for accumulated snow that falls in and outside of the landfill footprints. It is anticipated the access road from Montana Highway 23 to the Facility gate would be asphalt paved to reduce dust generated from waste disposal activities. Traffic routing in and around the scale house would allow for:

- Vehicles to pull of the main routes to allow other vehicles to pass
- Adequate turning space to turn around and reenter incoming and outgoing scale operation
- Provide adequate room for vehicles waiting in the receiving and existing lines
-

2.3.2.14 Leachate Collection and Control System Management and Maintenance

The Facility features various leachate collection, conveyance and storage systems to collect and convey landfill leachate to lined evaporation ponds in accordance with the engineering report and permit application drawings. The leachate collection system would be routinely inspected and tested for proper operation. Any components of the leachate collection system that fail to operate properly would be repaired or replaced as soon as possible. The leak detection zone of the dual-wall containment pipe used to convey leachate would be regularly inspected for leaks, and any leaks noted would be documented and repaired as soon as possible. The dual contained leachate forcemain piping would be installed with manholes located periodically along the line to serve as leachate detection points for the containment piping. At a minimum, the leak detection manholes would be monitored on a weekly basis for accumulation of leachate from the inner conveyance pipe.

The leachate pond has no outlet and leachate may not be discharged from the leachate pond or landfill. A dual-wall containment leachate pipe would be installed to receive leachate pumped from each collection sump and discharge the leachate into a lined leachate pond. Leachate collected in the pond would be evaporated primarily by natural means, and when appropriate weather conditions exist, use a mister evaporator to increase the volume of leachate evaporated. The mister evaporator would be operated in accordance with the manufacturer's recommendations and to ensure that no leachate is allowed to accumulate on surfaces outside of the leachate pond. Leachate may also be used to control dust, but only on areas of the landfill that are within the liner and leachate collection system.

As a contingency for the management of leachate from the MSW unit, the applicant would construct an additional leachate pond if leachate generation is in excess of what the leachate pond is designed to hold. Prior to construction, the Facility would submit a request for approval to DEQ, along with the necessary pond design and construction detailed drawings. In addition, the applicant proposes to use a tank to store excess leachate, or haul the leachate offsite for disposal at a permitted waste water treatment facility if leachate is generated in excess of the capacity that the leachate pond can contain. The Facility would need to obtain permission for disposal from the receiving entity prior to transportation for offsite disposal.

As a contingency for the management of leachate from the SpW unit, the applicant proposes to dispose of excess leachate at the nearest approved saltwater injection well. If this occurred, leachate would be pumped into a tanker truck from the leachate pond or sump and then transported to an approved disposal well. The Facility would need to obtain permission for disposal from the receiving entity prior to transportation for offsite disposal.

2.3.2.15 Storm Water Control

Each landfill area would be surrounded by a perimeter berm that would prevent storm water runoff originating outside the disposal unit from entering the disposal unit and contacting the waste. Each cell would also be constructed with a runoff containment berm along the interior liner margins where the perimeter berm is not yet in place. The runoff containment berm is designed to prevent storm water runoff from up-gradient areas entering the active landfill unit and mixing with leachate inside the disposal unit. As each landfill cell is constructed, temporary berms, ditches and other measures to prevent water from entering the cell and minimize erosion would also be provided. The locations of the temporary berms would be adjusted as filling in the waste unit progresses. Waste lifts would be sloped toward the contact-runoff containment area within each cell to minimize storm water ponding on the waste and to prevent discharge of contact-runoff out of the lined area. Storm water that contacts waste is considered leachate; all leachate would be captured by the leachate collection system, as required.

The overall Facility design features various storm water structures, including channels, culverts, pipes, and basins, to collect and convey storm water. Three storm water ponds would be constructed at the Facility to retain storm water for sediment control. The storm water ponds are designed to settle solids from the storm water in the event a discharge is ever required, it would not contain the sediment that is contained in natural runoff. During routing, this storm water runoff would be managed using standard Best Management Practices (BMP's). The storm water BMP's include berms and swales to divert and prevent storm water runoff from entering the active landfill area; terrace channels; downchute pipes; energy dissipation manholes; outlet pipes; perimeter channels; drainage culverts; and storm water ponds. These features would be constructed according to the Facility Storm Water Pollution Prevention Plan (SWPPP). These structures would be inspected in accordance with the site Montana Pollutant Discharge Elimination System (MPDES) permit after each significant rain event (greater than 0.25 inches) to ensure they are free of any damage, sediment, or debris. Sediment build-up, debris or clogs would be removed as soon as possible to help ensure proper operation of the storm water system. Erosion would be identified and repaired as soon as possible after the storm. Storm water BMP's damaged or disturbed would be repaired or replaced.

A Notice of Intent to discharge storm water from industrial activities and Industrial MPDES Permit would be obtained from DEQ's Water Protection Bureau prior to beginning any landfill construction activities at the Facility. Development of a SWPPP to protect against erosion and other surface water impacts is required as part of this MPDES Permit. Surface water monitoring would be performed in accordance with permit requirements. Sampling and analysis for total dissolved solids and iron is required to ensure that sediments are not released when a discharge of storm water from the ponds is necessary.

2.3.2.16 Erosion control

The Facility would implement short-term and long-term erosion control to prevent degradation of the constructed grades and sedimentation of storm water. Short-term erosion control such as mulch, silt fence, straw bales and waddles would be provided to prevent erosion of topsoil until adequate vegetation has been established. Management of erosion would be of particular concern during construction of long slopes required for site development. Prior to construction activities, a Notice of Intent to discharge storm water from construction activities would be submitted and an MPDES Construction Permit obtained. A Construction SWPPP would be prepared in accordance with this permit. The SWPPP would specifically address erosion control from long slope construction as well as other areas of the site. Development of a SWPPP to protect against erosion and other surface water impacts is required as part of this MPDES Permit.

Areas of final constructed grade, intermediate cover slopes and final cover slopes would be seeded to establish vegetation and would be contoured for positive drainage so that surface runoff would be routed away from the active disposal area. Runoff from fully re-vegetated and closed areas of the landfill final cover may discharge naturally to adjacent off-site coulees. Routine visual inspection would be used to assess the condition of the vegetation. Seeded areas that fail to establish dense cover would be reseeded. If warranted, a soil test may be performed to determine fertilizer or other amendment needs. Areas with high erosion potential due to concentrated flow would be inspected after a significant rain event (greater than 0.25 inches). Needed repairs and re-seeding of eroded areas would be completed promptly. Fiber blankets, mulch, or other erosion control methods would be placed as needed to control erosion until vegetation is re-established.

2.3.2.17 Fire control

Fire control consists of prevention and protection. Landfill personnel would be alert for any indication that a load may be smoldering or about to ignite. If a smoking or smoldering load is observed at or on the landfill, the waste would immediately be pushed away from the active working face and isolated as much as possible. A thick layer of soil then be spread over the waste and compacted to effectively smother the fire. Water from the water truck may also be used to help extinguish the fire. The suspected load would not be incorporated into the working face until the fire is confirmed to be extinguished for a length of time. If a smoking or smoldering load is observed at the scale or on the access road, the driver would be directed to the gravel parking lot away from the building and instructed to unload. A thick layer of soil would then be spread over the waste and compacted to effectively smother the fire. Water from the water truck may also be used to help extinguish the fire. The suspected load would not be incorporated into the working face until the fire is confirmed to be extinguished for a length of time.

All landfill equipment would have a fire extinguisher on board to immediately address small fires. If an area of the daily cell ignites or show signs of smoldering, a thick layer of soil would then be spread over the waste and compacted to effectively smother the fire. Water from the water truck may also be used to help extinguish the fire. Future operations in the area of the fire would be halted until a thorough investigation as to the cause of the fire has been completed and confirmation that the fire has been extinguished has been completed. Until such time as these investigations and clearances have been accomplished, the area would be monitored closely for signs of continued combustion or pyrolysis that could cause a flare up.

2.3.2.18 Groundwater Monitoring

Groundwater sampling and reporting would be conducted in accordance with ARM 17.50.1305 and the DEQ-approved Groundwater Monitoring Plan. In general, a network of 18 wells would be used to monitor the quality of groundwater up-gradient and down-gradient of the landfills. Quarterly groundwater sampling would be conducted prior to the commencement of landfill operations to establish the baseline groundwater quality. Semiannual monitoring events would be completed and statistical analysis of the results would be performed to ensure that the landfill does not impact underlying groundwater quality. Results of the groundwater monitoring would be submitted to DEQ for review.

2.3.2.19 Methane Monitoring

The decomposition of organic materials in the MSW Landfill produces landfill gas (LFG), a mixture of methane, carbon dioxide, and trace amounts of other compounds. At concentrations of 5to 15 percent methane by volume equivalent in air, LFG is explosive. The purpose of LFG management is to monitor and control LFG migration. Monitoring for LFG would be performed on a quarterly basis to ensure that decomposition gases do not concentrate in buildings on the Facility property or at the Facility boundary. Monitoring would be conducted using a portable methane detection unit and landfill gas monitoring probes installed near the Facility boundary. Monitoring would be performed quarterly as specified in the DEQ-approved Methane Monitoring Plan. The Methane Monitoring Plan also includes provisions to address instances where methane gas is detected at levels equal to or greater than those specified ARM 17.50.1106, including immediate response actions such as evacuation, notification to DEQ, and corrective action.

Monitoring for LFG would not be necessary in and around the SpW Landfill, since disposal of Group II putrescible solid waste producing LFG would not occur in this landfill unit.

2.3.3 FINANCIAL ASSURANCE

In accordance with ARM 17.50.540, all Class II landfills must provide and maintain a Financial Assurance mechanism to cover costs associated with facility closure and post-closure care. Financial assurance ensures that work associated with facility closure and post-closure care is completed in the event the operator cannot or would not do so of their own accord. Financial assurance is required for the proposed YD Facility, and would be funded prior to the placement of waste in the landfill units.

The amount of financial assurance required is based upon the proposed maximum costs associated with third-party closure of the maximum exposed landfill area and the performance of post-closure care activities. The current projected total cost for the financial assurance is $3,771,568, including the projected closure costs of $1,253,186 for the open municipal solid waste area, closure costs of $1,055,382 for the open special waste area, and post-closure costs of $1,463,000 for the 30-year post-closure care period.

The applicant has proposed a bond as the mechanism for providing the required financial assurance for closure and post-closure care. A separate bond for the total closure of the municipal solid waste unit ($1,253,186) and the special waste unit ($1,055,382) would be established. Likewise a bond for the total post closure care of the individual municipal solid waste unit ($1,314,500) and the special waste unit ($148,500) would be established.

DEQ would be the beneficiary of the bond and would control all release of money from this mechanism. The Facility would annually update the financial assurance cost estimates and attach a rider for changes to the bonds yearly to ensure that the financial assurance is adequately funded.

2.3.4 POST-CLOSURE CARE

Once all final closure activities have been completed and approved by DEQ, the Facility owner/operator would begin the 30-year post-closure care period for the Facility. Post-closure care would be conducted according to the DEQ-approved Post-Closure Care (PCC) Plan. The PCC Plan identifies the operational, inspection, maintenance, and monitoring activities, along with the frequency for conducting these activities, during the 30-year post-closure care period.

According to the proposed Facility PCC Plan, detailed inspections of the closed landfill facility would be conducted quarterly during the post-closure care period and would include:

- Evaluation of the final cover for settlement, erosion, and quality of vegetation;
- Inspection of leachate removal, monitoring, and evaporation systems for damage or degradation;
- Inspection of active methane collection and flare systems for damage or degradation;
- Inspection of drainage control features (berms, ditches, catch basins, piping, manholes, outlets and sediment ponds) for erosion, damage, blockage or accumulation of sediment;
- Condition and functionality of groundwater and methane monitoring wells, and;
- General site conditions (gates, locks, fencing, survey monuments, etc.).

The leachate pumps would be removed and inspected annually, and cleaned and repaired as necessary. The leachate collection pipes would also be cleaned as necessary. Methane extraction and flare control systems would remain operational and adjusted annually to provide optimal performance. If damage or degradation to the final cover, drainage control facilities, monitoring systems or general site features is noted, maintenance would be completed by the owner on a timely basis. Such maintenance activities would be described in the Post-Closure Operations and Maintenance Manual, would follow manufacturer's specifications as necessary, and meet all approved CQA/CQC procedures. The nature of the maintenance completed would be noted on the inspection form and added to the operating record.

A report describing the inspections, conditions observed, methane control operations, corrective actions, maintenance activities, and monitoring activities performed in connection with the closed Facility would be entered into the facility operating record and submitted to DEQ annually. Semiannual groundwater monitoring and quarterly methane monitoring would be performed by the owner during the post-closure care period in accordance with the approved Groundwater and Methane Monitoring Plans.

2.4 ALTERNATIVES CONSIDERED BUT DISMISSED

In addition to the proposed action, DEQ considered an alternative under which it would approve only the disposal of special wastes at the YD landfill. Under this alternative, the municipal solid waste would likely be transported to the Richland County Class II Landfill located northwest of Sidney for disposal instead of the proposed YD landfill.

The Richland County Landfill is licensed as an intermediate Class II landfill. Over the course of the last six years, the facility has seen an increase in disposal volumes as a result of the increased oilfield exploration and production activities. During 2010, the Richland County Landfill disposed of approximately 16,000 tons of solid waste. Waste tonnages then increased up through 2014, when approximately 28,000 tons of solid waste was disposed at the facility. During 2015, landfill tonnages declined and the facility landfilled approximately 15,000 tons of solid waste. Based upon a disposal rate of 15,000 tons annually, the Richland County Landfill has a projected remaining life of approximately 78 years.

As noted in Section 1.1, YD projects an incoming municipal solid waste tonnage of 300 tons per day or 90,000 tons per year. If municipal solid waste was diverted to the Richland County Landfill, the projected life of the facility would drop from 78 years to 11 years. In addition, the Richland County Landfill would be required to increase the amount contributed to the facility's financial assurance so that it was fully funded upon closure in 11 years instead of 78 years. The Richland County facility would also be required to upgrade their license from an intermediate Class II landfill to a major Class II landfill. An increase in wastes disposed at the facility would increase the overall annual license fees by approximately $37,000 per year. As a result of increased costs to Richland County for landfill operations, and a decrease in facility life, DEQ dismissed from detailed analysis an alternative under which it would approve only the disposal of special wastes at the proposed YD landfill. Consideration of this alternative does not accomplish the purpose and need of the application.

DEQ also considered an alternative under which it would approve only the disposal of municipal solid waste at the proposed YD landfill. Under this alternative, special wastes likely could be transported to the licensed, active Class II Oaks Disposal Landfill located near Lindsey, Montana, or to a licensed facility in North Dakota approved to manage special wastes. DEQ determined that consideration of this alternative does not accomplish the purpose and need of the application, so this alternative was dismissed from further detailed analysis.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES BY RESOURCE

3.1 INTRODUCTION

Section 3 describes resources that could be affected by the Proposed Action and discusses the environmental effects of the Proposed Action and the No Active Alternative.

3.2 LOCATION DESCRIPTION AND STUDY AREA

The project location and associated study area for the Proposed Action include all lands and resources in the proposed Project Area, plus those additional areas identified by technical disciplines as "resource analysis areas" that are beyond the Project Area. Resource analysis areas are identified for each technical discipline.

3.3 TERRESTRIAL AND AQUATIC LIFE AND HABITATS

3.3.1 ANALYSIS AREA AND METHODS

The analysis area for wildlife is the proposed license boundary of 650.7-acre YD project site. The analysis methods included DEQ's research of the Natural Resource Heritage Program database to determine the presence of threatened, listed, and/or endangered plant and animal species. The applicant's consulting engineers conducted biological surveys of the proposed project site on June 7, 2014. The entire project area and immediate surroundings within one-half mile of the proposed license boundary were surveyed on foot to assess biological resources. Biologists evaluated botanical resources, potential habitat for threatened and endangered wildlife species, existing development and land uses, and completed wetland/waterbody surveys. Drainage patterns and dominant vegetation composition were documented. These surveys were not conducted, nor were they designed, to determine if threatened or endangered species were present in the project area. However, the surveys were designed to detect the presence of potential habitat for these species. Therefore, the following analysis provides a habitat-based approach to determine effects of the proposed project on listed species.

3.3.2 AFFECTED ENVIRONMENT

The proposed YD Facility is located in the Plains Grassland ecosystem of eastern Montana. Plants in this ecosystem are adapted to extreme temperatures and low moisture.

The project area and immediate surroundings is dominated by rolling upland grassland and low-lying drainages that are dominated by woody species. Upland grassland is the most dominant land cover where native western wheatgrass covers the majority of the landscape. Native needlegrasses are also common, especially on hillsides and crests. Forb species were the most common and diverse on the hillsides, but decreased in abundance where the topography was lower and flatter in the landscape. Kentucky bluegrass was abundant in the flat low-lying areas within the upper grassland.

Low-lying drainages within the project area and immediate surroundings are dominated by native woody species. Silver sagebrush and western snowberry are abundant on the upper tips of drainages. Lower portions of the drainages are dominated by Rocky Mountain juniper and green ash in the overstory, with chokecherry present in the understory.

The proposed 650.7-acre project area is not located within a Sage Grouse core, general habitat, or a connectivity area. A search of the Montana Natural Heritage Program found records for Richland County as a whole of two threatened species and three endangered animal species (Table 3.1). A search of the U.S. Fish and Wildlife Service (USFWS) listing of endangered, threatened, proposed, and candidate species in Montana revealed the presence of two candidate and one proposed species (Table 3.2).

Table 3.1 – Montana Natural Heritage Program Threatened or Endangered Animal Species
(Accessed February 2014)

Species Subgroup	Scientific Name	Common Name	Family Scientific Name	Family Common Name
Birds (Aves)	Charadrius melodus	Piping Plover	Charadriidae	Plovers
Birds (Aves)	Coccyzus americanus	Yellow-billed Cuckoo	Cuculidae	Cuckoos
Birds (Aves)	Grus americana	Whooping Crane	Gruidae	Cranes
Birds(Aves)	Sternula antillarum	Interior Least Tern	Laridae	Gulls/Terns
Fish(Actinopterygii)	Scaphirhychus albus	Pallid Sturgeon	Acipenseridae	Sturgeons

3.3.1 ENVIRONMENTAL CONSEQUENCES

3.3.1.1 No Action Alternative

Under this alternative, the site would not be developed, and there would be no additional impacts to terrestrial and aquatic life and habitats.

3.3.1.2 Proposed Action

The applicant's consultants performed biological surveys on June 7, 2014. The entire project area and immediate surroundings was surveyed on foot to assess biological resources. Biologists evaluated botanical resources, potential habitat for threatened and endangered wildlife species, existing development and land uses, and completed wetland/waterbody surveys. Drainage patterns and dominant vegetation composition were documented.

The project area was dominated by upland grassland with a low abundance of sagebrush. Silver sagebrush was present in low lying-drainages with western snowberry, but these areas were not extensive in the project area, isolated to the upper portions of low lying upland drainages. These silver sagebrush areas would not provide suitable habitat due to the habitat size requirements of the sage grouse. There were no alfalfa fields or greasewood bottoms within the project area. No suitable habitat is present for this species in the project area or immediate surroundings.

3.3.1.2.1 Greater Sage Grouse

Sage grouse Core Areas and Special Management Core Areas are approximately 90 miles south of the project area. Core Areas are areas of highest conservation value for sage grouse. Montana Fish, Wildlife and Parks (FWP) estimates the Core Areas include approximately 76% of the displaying males in Montana, as of 2013. The distance to these Core areas further reinforces the lack of habitat within the project area.

Table 3.2 - U.S. Fish and Wildlife Service Endangered, Threatened, Proposed and Candidate Species Montana Counties *(Accessed December 2014)*

Common Name	Scientific Name	Status	Range/Habitat
Pallid Sturgeon	*Scaphirhynchus albus*	Endangered	Bottom dwelling; Missouri, Yellowstone Rivers
Interior Least Tern	*Sterna antillarum athalassos*	Endangered	Yellowstone, Missouri River sandbars, beaches.
Piping Plover	*Charadrius melodus*	Threatened; Designated Critical Habitat	Missouri River sandbars, alkali beaches; northeastern Montana. Alkali lakes in Sheridan County; riverine and reservoir shoreline in Garfield, McCone, Phillips, Richland, Roosevelt and Valley counties
Whooping crane	*Grus americana*	Endangered	Wetlands; migrant eastern Montana
Greater Sage-Grouse	*Centrocercus urophasianus*	Candidate	Eastern, central, and southwestern Montana in sagebrush, sagebrush-grasslands, and associated agricultural lands.
Sprague's Pipit	*Anthus spragueii*	Candidate	Grassland habitats with little or no shrub cover east of the Continental Divide
Northern Long-eared Bat	*Myotis septentrionalis*	Proposed	Eastern Montana; caves, abandoned mines; roosts in live trees and snags

Source: USFWS 2014a and USFWS 2014b.

Construction and operation of the proposed project would not reduce or degrade potential foraging or nesting habitat for greater sage grouse within the project area since no potential habitat exists.

Suitable habitat for the sage grouse is not present within the project area or surroundings. No direct or secondary impacts would occur to this species as a result of the proposed project. Therefore, the proposed project would have no effect on the greater sage grouse.

3.3.1.2.2 Piping Plover

The piping plover was federally listed as endangered under the ESA on December 11, 1985. The USFWS designated 19 areas as designated critical habitat, including alkali wetlands, inland lakes, and reservoirs totaling approximately 183,422 acres and portions of four rivers totaling approximately 1,207.5 river miles in the States of Minnesota, Montana, Nebraska, North Dakota and South Dakota.

According to the USFWS, piping plover do not forage more than one-mile away from their nest sites. Piping plovers are small shorebirds that breed only in three geographic regions in North America: the Atlantic

Coast, the Northern Great Plains, and the Great Lakes. A designated critical habitat for piping plover exists along the Missouri River 21 miles north of the proposed Facility location. Suitable nesting habitat for piping plovers in the Missouri and Yellowstone River systems is characterized as sparsely vegetated channel sandbars, sand and gravel beaches on islands, temporary pools on sandbars and islands, and island margins that interface with the river channel. Piping plovers forage on open beaches, primarily consuming insects and crustaceans. A similar habitat that could sustain piping plover exists 2.5 miles north of the proposed Facility location along the Yellowstone River, which is the nearest river to the proposed Facility. Piping plovers could use Bennie Peer Creek as foraging habitat, which is located approximately two miles from the project area. However, studies show that plovers do not forage more than one mile from their nest sites. There is no riverine system on the proposed project site. Therefore, there would be no direct or secondary impacts to the habitats of the piping plover.

No direct impacts would likely occur to these riverine systems as a result of the proposed project. Therefore, the proposed project would not result in direct impacts to the piping plover or designated critical habitat.

Operation of the proposed landfill could pose concerns over contaminated runoff entering drainages that lead to potential habitat for this species. This could potentially indirectly impact piping plover habitat. All water that contacts the landfill working surface would be captured and directed into the leachate collection system and contingency water treatment plans. The leachate collection system would be designed to capture and isolate all contaminated water, thereby reducing the probability of wastewater entering groundwater or surface water resources in the project area that could drain to potential piping plover foraging or nesting habitat and indirectly degrade this habitat.

Increased human activities in the project area would not likely result in indirect impacts to foraging piping plovers. The project area is located over 2.5 miles from potential habitat for this species, and is considerably higher in elevation than the shoreline. Since piping plovers are documented to not travel more than one mile from their nests, they would not be expected to foraging near the project area. Therefore, increased human activity including construction, operation and reclamation of the Facility in the area would not result in indirect displacement of foraging piping plovers.

Therefore, the proposed project would have no effect to the piping plover and have no effect on piping plover designated critical habitat.

3.3.1.2.3 Sprague's Pipit

Sprague's pipit was designated a candidate species under the ESA in September 2010. The Sprague's pipit is a ground nesting bird that breeds and winters on open grasslands. It is closely tied with native grassland habitat and breeds in the north-central United States in Minnesota, Montana, North Dakota and South Dakota, as well as south-central Canada. During the breeding season, Sprague's pipits prefer large patches of well-drained, open native grassland and avoid grasslands with excessive shrubs. They may avoid trees, roads, trails, habitat edges, and vertical structures, i.e., features in the landscape that are structurally different than grassland. Sprague's pipits avoid roads, vertical structures including wind towers, and oil and gas well pads by more than 1,100 feet. Sprague's pipits avoid features in the landscape that are structurally different than grassland and rarely occur on croplands or planted, non-native grassland. They would use exotic vegetation such as crested wheatgrass but are significantly more abundant in native prairie grassland. They appear to avoid areas with low visibility and low litter cover and have been observed using dry lake bottoms and alkali lake borders. Within grazed mixed-grass areas in North Dakota, abundance of Sprague's pipits was positively associated with percent clubmoss cover and plant communities dominated by native grasses. Adult diet consists mostly of insects during the spring and summer months with limited consumption of grass and forb seeds. Adults depend more on seeds during the winter months.

The project area is dominated by native grassland dissected by low-lying drainages dominated by woody species. These woody drainages, and oil and gas access roads present in the surrounding area, are features that are structurally different than native grassland and areas that this species would likely avoid by more than 1,100 feet. Since the project area is along established access roads, this species is unlikely to use this area for nesting or foraging habitat. However, the surrounding environment, especially south of the proposed project area, is native mixed grass prairie which could be potential habitat for this species. Therefore, increased activity associated with the Facility in the project area as a result of the proposed project could indirectly impact the Sprague's pipit. Specifically, noise and vehicle traffic may cause this species to avoid the project area and immediate surroundings, and instead use native mixed grass prairie to the south.

Oil and gas and other human developments in the project area would likely continue at similar rates to existing conditions. Construction and operation of the proposed project would not accelerate oil and gas development in the area since landfills are not currently the limiting factor in oil and gas production. However, it would provide an efficient and effective means to dispose of municipal and industrial waste, thereby reducing travel times and distances, and reducing the potential for waste to be dumped illegally. Construction and operation of the proposed project would not reduce or degrade potential foraging or nesting habitat for the Sprague's pipit within the project area since no potential habitat exists. Therefore cumulative effects as a result of the proposed project would be negligible and discountable.

Suitable habitat for the Sprague's pipit would likely be avoided in the project area and surroundings due to roads and other human developments associated with the Facility. However, since the area is primarily native mixed grass prairie, this species could still be present in the surrounding area. Construction and operation of the facility would result in the removal of a total of 260 acres of existing vegetation while the facility is operational. However, upon closure, the waste disposal units would be capped and seeded with Secondary impacts as a result of increased activity of the Facility would cause this species to relocate to the extensive native mixed grass prairie south of the project area. Indirect effects would occur to this species as a result of the proposed project. Therefore, the proposed project may affect but not likely to jeopardize the Sprague's pipit.

3.3.1.2.4 Northern Long-eared Bat

The northern long-eared bat and its habitat are proposed for listing as an endangered species under the Endangered Species Act (ESA). The northern long-eared bat has been considered for listing primarily because of white nose syndrome, an infectious fungus that is responsible for severe population declines. The northern long-eared bat is an insectivorous bat that utilizes different roost sites in different seasons. In winter, Northern Long-eared bats hibernate in humid caves or mines with high humidity, large passages and entrances, constant temperatures, and high humidity with no air currents. During the summer months, this species relies less on caves and more on old growth and late successional forests for roosts and reproduction. They roost singly or in colonies under bark or in crevices of both live and dead trees. They seem opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. It has also been found, rarely, roosting in structures such as barns or sheds. Feeding takes place at dusk in the understory of forested hillsides and ridges. The main food sources are moths, flies, leafhoppers, caddisflies and beetles which they catch in flight, and by gleaning motionless insects from vegetation and water surfaces.

Suitable forested habitat is used to describe known or potential summer maternity/non-maternity habitat and known or potential spring staging/fall swarming habitat. Suitable habitat for the northern long-eared bat consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields, and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags at least three inches in diameter that have exfoliating bark, cracks, crevices, and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Summer habitat may include forested wind breaks and hedgerows (tree-lined linear features) used by bats in the fragmented forest agricultural landscape for commuting between roosts and foraging areas. In a study on the movements of northern long-eared bats, researchers found that the bats have a strong preference for foraging and commuting within forested landscapes. They also noted that if bats were located in open areas, they were clustered within 255 feet of forest features. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree and are less than 1,000 feet from the next nearest suitable roost tree, woodlot, or wooded fencerow.

The proposed project would be located entirely on upland grassland habitat. No trees, forested habitat, or cave systems would be directly impacted by the project. Trees are present in low-lying drainages in the immediate surroundings, which could provide summer roosting or foraging habitat for this species. However, these trees are not the old growth or late successional forests that the species prefers. During construction and operation of the proposed project, noise and increased human activity in the project area could indirectly disturb roosting bats using these areas. Bats would then likely relocate to other forested habitat outside of the immediate surroundings. Secondary impacts would be reduced by avoiding construction and operation during the night hours when bats are typically active. Facility construction activities would be performed during the day, although wastes may be received for disposal in the SpW landfill unit during the nighttime hours, such receipt would be scheduled in advance and is anticipated to be infrequent.

No suitable habitat is present within the project area that would support northern long-eared bats. Potential habitat is present in the immediate surroundings, and roosting bats may be indirectly disturbed by increased human activity in the area during construction and operation of the project. Therefore, the proposed project may affect but would not likely jeopardize the northern long-eared bat due to the lack of suitable habitat present in the project area.

3.3.1.2.5 *Yellow-billed Cuckoos*

Yellow-billed Cuckoos use wooded habitat with dense cover and water nearby, including woodlands with low, scrubby, vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes. In the West, nests are often placed in willows along streams and rivers, with nearby cottonwoods serving as foraging sites. The preferred habitat of the yellow-billed cuckoo consists of open woodland, parks, and deciduous riparian woodland.

Little to no information regarding yellow-billed cuckoo migratory patterns exists for Montana. Of the few records containing any details on the month of observation (many of them are historic records with limited detail) the yellow-billed cuckoo is known in Montana only in June and July. All of these observations indicate no behavioral evidence to suggest breeding. No systematic censuses have been performed and no other information is available on migration.

Throughout their range, preferred breeding habitat includes open woodland (especially where undergrowth is thick), parks, and deciduous riparian woodland. In the arid West, they nest in tall cottonwood and willow riparian woodlands. Nests are found in trees, shrubs or vines, an average of three to 10 feet above ground. Western subspecies require patches of at least 25 acres of dense, riparian forest with a canopy cover of at least 50 percent in both the understory and overstory. Nests are typically found in mature willows. This bird is rarely found at higher elevations.

No ecological information for the species is known from Montana, but some information is available from studies completed in other parts of their range. Territory size averages 50 to 60 acres. In addition, no existing records indicate direct evidence of breeding in Montana. Several observations, however, record behavior that indirectly suggests breeding. Of the limited records (there are 18 records for the state), more than half of them are for observations of individuals showing no breeding behavior and are presumed to be transient (migratory) in nature. Reproductive information from other locations within the species' range reveals breeding often coinciding with the appearance of massive numbers of cicadas, caterpillars, or other large insects.

The western distinct population segment of the yellow-billed cuckoo was listed as Threatened west of the Continental Divide in Montana under the ESA by the USFWS on November 3, 2014. In the listing decision, the USFWS noted the primary factors threatening the western distinct population segment as loss and degradation of habitat for the species from altered watercourse hydrology and natural stream processes, livestock overgrazing, encroachment from agriculture, and conversion of native habitat. No critical habitat or special rules were included in the listing decision.

The proposed project would be located entirely on upland grassland habitat. No trees would be directly impacted by the project. However, trees are present in low-lying drainages in the areas adjacent to the landfill units. These trees could provide summer nesting or foraging habitat for this species. During construction and operation of the proposed project, noise and increased human activity in the project area could indirectly disturb any nesting yellow-billed cuckoos using these areas. However as noted above, observations of yellow-billed cuckoos in the state are presumed to be for migrating individuals and not nesting or breeding populations.

No suitable habitat is present within the project area that would support this species. The yellow-billed cuckoo is only known to be present in Montana during June and July. Observations made of the yellow-billed cuckoo suggest that no breeding occurs during their time in Montana.

3.3.1.2.6 Interior Least Tern

The least tern was federally listed as endangered under the ESA on May 28, 1985. Interior least terns are generally restricted to larger meandering rivers with a broad floodplain, slow currents and greater sedimentation rates, which allow for the formation of suitable habitat. The species constructs bowl-shaped depression nests on sparsely vegetated sandbars and sandy beaches during the nesting period. The interior least tern is known to nest on midstream sandbars along the Yellowstone and Missouri River systems. Discharge of water from hydroelectric power plants and navigation threaten least terns in these river segments. Annual variations in river flow can also change availability of nest sites during periods of flooding. Least terns nesting on riverine sandbars usually forage for small fish close to the nesting colony. There is a high variation in published distances that least terns will travel for feeding, varying from several hundred feet from the nest up to 8 miles.

The proposed project would be located approximately 2.5 miles from Yellowstone River, which is the nearest potential nesting habitat for this species. Least terns nest on barren to sparsely vegetated sandbars along rivers, sand and gravel pits, lake and reservoir shorelines, and occasionally gravel rooftops. They hover over and dive into standing or flowing water to catch small fish. The interior least tern breeding season is April through August. Least tern nest in shallow depressions scraped in open sandy areas, gravelly patches, or exposed flats. Interior least terns use Bennie Pierre Creek as foraging habitat, which is approximately two miles from the project area. However, this creek would not support nesting habitat due to the lack of sandbars and sandy beaches. No direct disturbance would occur to these riverine systems as a result of the proposed project. Therefore, the proposed project would not result in direct impacts to interior least tern habitat or nesting terns.

Operation of the proposed landfill could pose concerns over contaminated runoff entering drainages that lead to potential habitat for this species. This could potentially indirectly impact least tern habitat. All water that contacts the landfill working surface would be captured and directed into the leachate collection system. The leachate collection system would be designed to capture and isolate all contaminated water, thereby reducing the probability of wastewater entering groundwater or surface water resources in the project area that could drain to potential interior least tern foraging or nesting habitat and indirectly degrade this habitat.

Increased human activities in the project area could indirectly impact foraging least terns. The proposed project is located within the flyover radius of forging least terns, which could avoid the project area due to human activities. The project area is considerably higher in elevation than the shoreline of Bennie Pierre Creek or The Yellowstone River, so these indirect impacts would be mitigated by the natural topography of the area. However, it does not completely reduce the probability of displacing foraging least terns.

The proposed project would not result in direct effects to interior least tern nesting or foraging habitat. However, it is within the potentially flyover radius of foraging least terns. Increased human use in the area as a result of the proposed project could deter least terns from foraging in the nearby area. Therefore, the proposed project may affect, but is not likely to adversely affect the interior least tern.

3.3.1.2.7 Whooping Crane

According to the Montana Bird Distribution Committee, the migration route of the Whooping Crane includes a portion of the northeastern corner of Montana. Migration occurs during the Spring as early as April, and during the Fall as late as October. The Whooping Crane has no year-round range in Montana. During migration, the species is most likely to be present in wetlands, but may also be found during migration in marshes, shallow lakes, lagoons, salt flats, grain and stubble fields.

The whooping crane was federally listed as threatened with extinction in 1967 and endangered in 1970; both listings were “grandfathered” into the ESA of 1973. Critical habitat for the whooping crane was designated in 1978. The individuals representing the Aransas Wood Buffalo Population (AWBP) comprise one of the rarest and most imperiled self-sustaining avian populations in the world, with a population size of less than 300 individuals. The species breeds in wetland habitat associated with Wood Buffalo National Park in Alberta and the Northwest Territories of northern Canada, and overwinters on the Texas coast. The migration corridor for the AWBP follows an approximate straight path, with the cranes traveling through Alberta, Saskatchewan, extreme eastern Montana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas. The migration route approximately follows the Missouri River corridor through the mid-western United States. Though whooping cranes historically nested in Montana, they are currently a migrant in the spring and fall through the eastern portion of the state. During migration, whooping cranes use stopover habitat opportunistically. In general, they avoid rocky substrates and heavily vegetated sites. They typically use shallow marshes with minimal to no emergent zone for roosting, and nearby (within two miles) upland cropland and pastures for foraging.

The project area is within the migration corridor where 95% of whooping crane sightings have been made. The nearest confirmed observation was approximately 20 miles north/northeast in a crop field along the Yellowstone River. Since the proposed project is within the whooping crane migratory corridor, whooping cranes may occur in the vicinity of the project during the April 1 – May 15 and/or September 10 – October 31 migration periods.

The project area is dominated by grassland cover with upland drainages leading to McGlynn Reservoir. A shallow stock dam with little to no emergent vegetation is present within several hundred feet of the landfill boundaries and is also within 0.7 mile of cropland. However, this stock dam is small in size (less than 0.5 acre) and less than one-half mile from two oil and gas wells, making stopover by migrating whooping cranes unlikely. In addition, the nearest whooping crane observation was over 20 miles north of the project area, making stopovers in this area unlikely. However, according to scientific literature, this wetland has the constituent elements for stopover habitat including lack of emergent vegetation, and the presence of nearby cropland. Therefore, there is still a potential for whooping cranes to use this area for stopover habitat between April 1 – May 15 and/or September 10 – October 31 migration periods according to scientific literature. In the unlikely event that whooping cranes are sighted within one-half mile of the proposed project during construction or operation, all activities would cease and the USFWS could be contacted immediately on how to proceed.

No direct impacts to this stock dam would occur as a result of construction or operation of the proposed project. However, increased human activity would likely indirectly deter whooping cranes from using this area as stopover habitat. Other stock dams and/or wetland resources are present in the greater surroundings, so finding additional stopover habitat would not likely be an issue. Secondary impacts would be reduced by halting all activities when whooping cranes are present. Therefore, secondary impacts to migrating whooping crane are unlikely to occur as a result of the proposed project.

3.3.1.2.8 Pallid Sturgeon

The pallid sturgeon was listed as an endangered species by the USFWS on September 6, 1990. The pallid sturgeon evolved in the turbid river systems of the Missouri, Yellowstone, and Mississippi river systems. Pallid sturgeons prefer turbid, main stem shallow river channels with sand and gravel bars. They are present, but scarce, in the upper Missouri River and lower Yellowstone Rivers between the Garrison Dam and Fort Peck Dam. They are very scarce in other Missouri River reservoir reaches, except downstream of Gavins Point Dam where they are slightly more common.

The proposed project would be located over eight drainage miles from Yellowstone River, which is the nearest potential habitat for this species. Water would drain from the project area approximately 1.5 miles through natural upland drainages to the McGlynn Reservoir. It is a short distance (>0.5 miles) from the McGlynn Reservoir to Bennie Pierre Creek. Bennie Pierre Creek would drain the remaining approximately six miles to the Yellowstone River.

Construction of the proposed project would result in soil and vegetation disturbance. During soil moving activities, there is a potential to liberate sediment, which could move downstream into pallid sturgeon habitat. To minimize these risks, erosion control structures would be installed and maintained during all excavation and soil disturbance activities. These structures would include fiber rolls, straw waddles, silt fences, fiber mats, or a combination of methods. With these structures in place, the likelihood of sediment movement would be negligible.

Operation of the proposed landfill could pose concerns over contaminated runoff entering drainages that lead to potential habitat for this species. The landfill would be designed to capture all water that comes into contact with the landfill working surface (i.e. waste materials) and direct the water into the leachate collection system and have leachate contingencies as well. The leachate collection system would be designed to capture and isolate all contaminated water, thereby reducing the probability of wastewater entering groundwater or surface water resources in the project area that could drain to potential pallid sturgeon habitat.

3.3.1.2.9 Transient Wildlife Populations

Transient wildlife populations, including whitetail deer, mule deer, and pronghorn antelope, occupy the habitat within and surrounding the proposed facility boundary. Transient, by definition, means “lasting only for a short time”, or “impermanent”. Whitetail deer, mule deer, and pronghorn antelope exhibit transient behavior, relocating regularly and rarely remaining in one area for long periods of time. Construction and operation of the proposed facility would cause transient populations to relocate to habitats surrounding the proposed facility boundary. However, considering the vast amount of similar habitat surrounding the proposed facility boundary, the impacts anticipated for these species are negligible. The proposed project would not add to the cumulative effects of whitetail deer, mule deer, and pronghorn antelope.

3.4 HYDROLOGY

3.4.1 ANALYSIS AREA AND METHODS

The analysis area for hydrology is the proposed 650.7-acre proposed YD project site. Some discussion of regional geology, based upon published reports, is also provided herein. The analysis methods for hydrology included reviewing wetlands and jurisdictional waters information, on-site drilling reports, publications of the Montana Bureau of Mines and Geology, and published topographic maps of the area.

3.4.2 AFFECTED ENVIRONMENT

3.4.2.1 Surface Water

The proposed YD project site is located within the Missouri Plateau of the Northern Great Plains physiographic province, approximately two to three miles south/southeast of the

Yellowstone River, the main drainage mapped on the United States Geological Survey (USGS) Sidney NE MT 1:24,000 quadrangle. Topography of the region is characterized by floodplains and raised benches along the Yellowstone and Missouri Rivers and their tributaries. The project area is not located in a floodplain. The local topography of the proposed Facility is characterized as rolling prairie between entrenched intermittent streams. Surface elevations at the proposed site range from approximately 1,980 to 2,250 feet above mean sea level.

One wetland, one unnamed stream located along the southeastern edge of the proposed facility boundary, and four first-order, intermittent, unnamed drainages on the west-northwest edge of the proposed facility boundary are present within the project area.

One isolated wetland feature, located approximately 500 feet north of the proposed SpW landfill unit, is about 0.33 acres in size and is associated with a man-made stock dam. This wetland was created by excavation and construction of an earthen berm across a natural drainage area.

Surface water at the proposed site drains primarily towards the east to the unnamed stream on the southeastern edge of the proposed facility that flows into McGlynn Reservoir. This unnamed stream is located east of the two proposed landfill units and appears to carry water throughout the year. McGlynn Reservoir is located outside the proposed facility license boundary, approximately one-mile northwest of the landfill units.

The four first-order intermittent drainages, located along the west-northwest boundary of the proposed facility, are separated from the proposed landfill units by natural topography. A topographic divide exists between this drainage area and the landfill units. The area east of this topographic divide, where the landfill units would be located, would drain towards the east; the area west of this divide, where the four unnamed intermittent drainages are would drain towards the west.

3.4.2.2 Ground Water

The distribution and physical properties of the underlying geologic units affect the availability, movement, and quality of ground water. The geologic units in eastern Montana that contain usable ground water are comprised of unconsolidated alluvial and terrace deposits found within the major stream valleys and the sedimentary strata that lie above the Pierre

Shale. Deep regional aquifers are present beneath the Pierre Shale, however the water in these aquifers is too saline to be used as a potable supply. Regionally, ground water occurs within three hydrologic units: a Shallow Hydrologic Unit composed of aquifers within 200 feet of the land surface; a Deep Hydrologic Unit composed of aquifers at depths greater than 200 feet below the land surface in the Fort Union Formation and the upper part of the Hell Creek Formation; and the Fox Hills–lower Hell Creek aquifer.

The uppermost aquifer beneath the proposed Facility is found within the Shallow Hydrologic Unit at depths ranging from approximately 103 feet below ground surface (bgs) to 210 feet bgs. The groundwater beneath the proposed Facility appears to be within the same flow system based upon measurements of the potentiometric surface. The groundwater elevation ranges from approximately 1990 feet above mean sea level (amsl) near the south end of the Facility to 1975 feet amsl near the northwest end of the Facility. The aquifer is unconfined and the water table intersects a variety of aquifer materials that include interbedded silt and clay, silt, siltstone, sand, sandstone, shale, coal, interbedded shale and coal, and gravel. Groundwater flow beneath the Facility is generally from southwest to northeast and northwest; flow roughly follows the site topography and moves from drainage divides toward valley drainages. As it moves from the Facility north it flows northwest toward the Yellowstone River valley and northeast toward the drainage leading to McGlynn Reservoir and the Bennie Peer Creek valley.

Locations of nearby ground water wells, including stock wells and public water supply wells, within one-mile of the proposed expansion area boundary were identified by a search of the Montana Bureau of Mines and Geology's (MBMG) Groundwater Information Center (GWIC) database. The GWIC database identified 32 water-supply wells within a one-mile radius of the proposed YD project site, seven of which are located on the proposed Facility property. Because the GWIC database locates wells by section, all wells in the sections containing the proposed expansion area were included in this analysis. The wells identified by GWIC that are located within the proposed YD Facility boundary are greater than 292 feet deep and have static water levels greater than 90 feet below ground surface. One of the wells on the Facility property was drilled to 1233 below ground surface, completed in the Fox Hills-Lower Hell Creek aquifer, and is under artesian pressure. The remaining wells identified in the GWIC search are located within Sections 14 and 27, Township 22 North, Range 59 East, to the north, and to the south and west of the proposed Facility. The majority of these wells are completed in the Fox Hills or Hell Creek formation, with a few being completed in the Shallow Hydrologic Unit of the Fort Union formation.

The overall water quality and well yields in the Shallow Hydrologic Unit are variable, reflecting the variable nature of the aquifer materials. Measurements of total dissolved constituents in the Shallow Hydrologic Unit range from less than 500 to more than 5,000 mg/L. Nitrate was detected above the maximum contaminant level of 10 mg/L in 7% of the wells sampled from the Shallow Hydrologic Unit.

3.4.3 ENVIRONMENTAL CONSEQUENCES

3.4.3.1 No Action Alternative

Under this alternative, because the site would not be developed, there would be no impacts to site surface water or ground water.

3.4.3.2 Proposed Action

3.4.3.2.1 Surface Water

Storm water is water that originates during precipitation events and snow and ice melt. Storm water can soak into the ground, be held on the surface to evaporate, or run off towards downstream surface water bodies. Surface water flow may occur at the proposed site when water generated by rain or snowfall, melting of accumulated snow, or seepage from groundwater springs flows freely over the land surface into the intermittent drainages. Surface water flow may occur over bare rock or ice, when the soil is saturated and its holding capacity is exceeded, when precipitation falls more quickly than the soil can absorb it, or more typically, when a combination of these conditions exists. Storm water runoff can cause erosion and may transport sediments some distance from their source depending upon the intensity of the runoff, vegetative cover, soil characteristics, and topography.

YD would be required to obtain a General Construction Storm Water Permit from DEQ's Water Protection Bureau prior to any landfill construction activities. The general storm water discharge permit coverage is for construction activities that include clearing, grading, grubbing, excavation, or other earth disturbing activities that disturb one or more acres and discharge storm water to state surface waters. Conditions of the general permit require the Facility to implement BMP's to control sediment and erosion during construction activities. Storm water BMP's are control measures used to manage changes in the quality and quantity of storm water runoff. BMP's are designed to reduce the volume, peak flows, and/or quality of storm water through evaporation, infiltration, detention, and filtration.

The storm water control system for the proposed YD landfill is designed to enhance the existing natural drainage patterns of the site, directing storm water discharges outside the landfill units to the existing natural drainage areas. The design includes general site grading and the construction of berms and ditches surrounding the municipal solid waste and special waste landfill units to keep runoff from entering and keep leachate from exiting the landfill units.

The proposed storm water control system includes the construction of storm water terrace channels, downchute pipes, energy dissipation manholes, drainage culverts, berms and conveyance piping to direct storm water to one of three storm water sediment retention ponds. The sediment retention ponds would be located on the southwest, southeast, and northwest sides of the Facility. One pond, 0.9-acre in size, would be located at the northwest corner of the municipal solid waste landfill unit. The pond is designed to manage the runoff from approximately 15.7 acres. A second pond, one acre in size, would be located at the northeast corner of the municipal solid waste landfill unit. This pond is designed to manage the runoff from approximately 103 acres. The third pond, 1.5-acres in size, would be located at the southeast corner of the special waste landfill unit. This pond is designed to manage the runoff from approximately 50 acres.

The regulations require storm water control systems at landfills be designed to accommodate runoff from a 25-year, 24-hour rainfall event. The system proposed by YD is designed to accommodate runoff from the 100-year, 24-hour storm event without overtopping the storm water ponds or berms. The pond design provides a minimum of 2-ft freeboard for the 100-year storm event and would collect and retain a total 4,580,000 gallons of water and sediment generated by runoff after a storm event.

As designed, the storm water sediment retention ponds would contain any expected storm water runoff generated by an intense rainfall or snowmelt event, allowing any suspended sediment to settle in the ponds. Because the ponds are designed to settle out any solid particles contained in the storm water, any discharge from the storm water ponds would not contain the sediment found in the natural runoff events at the site.

Each pond is designed with a single outlet structure that would control any necessary flows out of the pond. Because the ponds have an outlet structure, YD must obtain an MPDES Permit from DEQ's Water Protection Bureau. If a discharge occurs, the discharge permit requires that the storm water be sampled for total suspended solids and iron to ensure that the waters that are released do not deposit sediment downstream. The Water Protection Bureau may require additional analyses based upon the characteristics of the wastes managed at the Facility.

The U.S. Army Corps of Engineers (USACE) provided a preliminary jurisdictional determination of waterways located within the Yellowstone Disposal study area in Sections 23, 24, 25, and 26, Township 22 North, Range 59 East, in Richland County, Montana. Under the authority of Section 404 of the Clean Water Act, Department of the Army permits are required for the discharge of fill material into waters of the United States. Waters of the U.S. include the area below the ordinary high water mark (OHWM) of stream channels and lakes or ponds connected to the tributary system, and wetlands adjacent to these waters. Isolated waters and wetlands, as well as man-made channels and ditches, may be waters of the U.S., but must be determined on a case-by-case basis.

As noted above, one isolated wetland feature associated with a man-made stock dam is located approximately 500 feet north of the SpW landfill unit. According to the USACE this wetland is not a jurisdictional wetland because it lacks an ordinary high water mark and does not exhibit evidence of hydrology. As part of the facility construction activities, a berm would be constructed on the upgradient side of this wetland feature and would not be impacted by Facility operation activities.

Therefore, any aquatic life currently inhabiting this man-made feature would not be impacted.

The unnamed stream located east of the two proposed landfill units flows into McGlynn Reservoir; McGlynn Reservoir flows into Benny Peer Creek which flows into the Yellowstone River. USACE defined this unnamed stream as jurisdictional based on its connection to the Yellowstone River. USACE indicated that these waters were treated as jurisdictional waters of the U.S. for the purposes of determining project impacts and compensatory mitigation requirements. Prior to any construction activity, YD would obtain a Section 404 Permit if any jurisdictional waters would be impacted by the project. There are no other jurisdictional waterways in the project area.

As noted in Section 3.4.2.1, the four intermittent drainages, located along the west-northwest boundary of the proposed facility, are separated from the proposed landfill units by a topographic divide. The area east of this topographic divide, where the landfill units would be located, would drain towards the east; the area west of this divide, where the four unnamed intermittent drainages are would drain towards the west. Construction and operation of the landfill would not impact this area.

The unnamed drainage that is present would not be filled during site construction, operation, or closure of YD's proposed landfill. Instead, if road crossings over this unnamed drainage are necessary, YD would be required to install culverts in this unnamed drainage when dry. Prior to any construction activities in the unnamed drainage on site, in addition to the Section 404 permit, YD would also be required to obtain a 310 and 318 permit for construction in the waterway.

The storm water retention ponds are designed to settle out any solid particles contained in the storm water, any discharge from the storm water ponds would not contain the sediment found in the natural runoff events at the current location. In addition, if any construction in the unnamed drainage is necessary, YD would obtain a 310 and 318 permit, and a Section 404 permit for any construction in the waterway to ensure that impacts to the waterway are minimized. Finally, YD would construct a berm on the upgradient side of the wetland feature associated with the man-made stock dam to prevent impacts from Facility construction and operation.

Construction and operation of the Facility would not negatively impact surface water in the project area. The stormwater management system features are designed to control stormwater runoff so that it doesn't contain the volume of sediments that currently run off the site during natural runoff event. The ponds would retain stormwater that falls within the facility and settle any solids, so that any necessary stormwater discharge would not contain the sediment found in the natural runoff events at the current location. The stormwater dissipation features would reduce the velocity of the natural runoff to prevent the further erosion of stream bank sediments.

3.4.3.2.2 Ground Water

Landfills are carefully designed structures constructed in such a way that the discarded wastes disposed in them are isolated from the surrounding environment. Landfill liners may be constructed using either natural clay soils, synthetic liners, or a combination of both. When a combination of natural clay soils and synthetic liners are used in landfill design, this is known as a composite liner. Montana regulations provide the standards for landfill design. These standards are based on protecting groundwater. The composite liner design standard is proven effective in protecting groundwater resources beneath solid waste landfills.

Normal household garbage contains approximately 26% moisture. The moisture in the waste would drain once there is more liquid in the waste than the waste is able to absorb and hold onto. The garbage and other wastes in landfills would absorb and hold onto a certain amount of liquid. However, once the waste becomes saturated, the excess liquids would drain from the waste. This liquid that drains from the waste is known as leachate. Landfills are designed with a leachate collection and removal system so that these liquids can be collected, removed, and properly managed. The regulations require landfills to properly manage leachate so that it doesn't pool on the landfill liner. As a result, landfill leachate must be collected and removed from the lined waste disposal units. The base of a landfill is constructed with a slope so that the leachate is directed to a central leachate collection sump where it can then be removed by pumping it to a leachate pond. The typical arid climate in Montana, with high evaporation and low precipitation rates, results in a net loss of moisture.

In the MSW Landfill, precipitation and liquids in the landfill can percolate through the waste to the underlying leachate collection system. In the SpW Landfill, precipitation is not expected to percolate through the waste column. Therefore a runoff containment berm located near the toe of the special waste would act as a barrier to collect and contain storm water that has been in contact with the waste. This contact storm water is then considered to be leachate, and is therefore allowed to percolate into the leachate drainage layer of the SpW Landfill. The specific dimensions necessary for the berm are dependent on the size of open face to be managed. Berm sizing would be evaluated prior to each cell construction.

The effectiveness of the leachate drainage layer has been evaluated using the Hydrologic Evaluation of Landfill Performance (HELP) model. The characteristics of the landfill profile components and weather data were generated by the HELP model. Williston, North Dakota, located approximately 40 miles to the northeast of the site was chosen as the default city having data most similar to that of the site; the weather data appears to be reasonably close to that of Sidney, Montana.

The HELP model was used to determine anticipated leachate volumes produced during the life of the landfill, as well as the maximum hydraulic head on the liner system. The HELP model was run for three different operating scenarios to model the landfill at various stages of its development. Open, intermediate, and closed conditions of the landfill were modeled for a 30-year period to estimate leachate production. Modeling indicated that the leachate collection system design would result in a leachate head less than 30 centimeters (approximately 12 inches) on the liner system (outside of the sump), as required by ARM 17.50.1204(1)(b).

According to the regulations in the Administrative Rules of Montana (ARM) 17.50.1204, a new Class II landfill unit must either be designed to ensure that ground water concentrations are not exceeded at the relevant point of compliance or use a composite liner and a leachate collection and removal system that is designed and constructed to maintain less than 30-cm of leachate over the liner. ARM 17.50.1202(5) defines "composite liner" as a system consisting of two components. The upper component must consist of a minimum 30-mil flexible membrane liner, and the lower component must consist of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. The flexible membrane liner components consisting of high density polyethylene must be at least 60-mil thick. The flexible membrane liner component must be installed in direct and uniform contact with the compacted soil component.

The high density polyethylene liner is a very low permeability (highly impermeable), flexible, synthetic membrane (geomembrane). This is the same material that is often used to contain or control liquid and gas migration in an engineered project, structure, or system. High density polyethylene pipe is commonly used to convey water or wastewater for municipal systems because it is impermeable to water. For landfill construction, high density polyethylene liners are used as highly impermeable barriers to prevent the contamination of groundwater from chemicals in liquids that may be derived from the waste.

Hydraulic conductivity is a measure of the speed (rate or velocity) at which liquids flow through a material and depends upon how well the pores in the material are connected to transmit fluid. The landfill design consists of a standard composite liner comprised of an upper 60-mil thick, HDPE liner that would be installed in direct and uniform contact with the lower component consisting of two feet of compacted clay soil. The lower soil component would have a saturated hydraulic conductivity (Ks) of no greater than 1×10^{-7} cm/sec. The liner system is designed to impede the flow of liquids. If liquids were able to migrate through the solid 60-mil HDPE liner, the underlying clay component would have to be completely saturated before any flow through the clay would occur. The clay liner component of the liner system has a hydraulic conductivity of not more than $1.0x10^{-7}$ cm/sec, meaning that any liquids passing through the clay liner would pass through at a rate of 0.0000001 cm/sec or 0.103465 feet per year. Clay is extremely absorbent and hydrates rapidly when exposed to liquid, such as water or leachate. As a result, when the clay hydrates, it swells, giving it the ability to 'self heal'; any leachate that would make it through the HDPE liner would be retained in the clay liner. When saturated, the hydraulic conductivity of clay typically drops an order of two magnitudes to less than $1x10^{-9}$ cm/sec, equal to 0.00103465 feet/year. If a leak were to occur, it would take approximately 53,158 years for leachate to reach the uppermost aquifer, located 103 feet bgs.

The composite liner system for the proposed YD solid waste management facility is designed to intercept leachate within each landfill unit landfill and route it through the collection system where it would ultimately be pumped to one of two designated leachate ponds. The composite liner and overall design of the leachate collection and removal system is proven effective in protecting groundwater resources beneath solid waste landfills by preventing the ponding of leachate over the liner and thus the potential migration of contaminants through the impermeable liner and into the uppermost aquifer. Wastes would absorb roughly a quarter of the moisture that infiltrates through the waste mass. This, combined with the overall landfill liner and the placement and design of the leachate collection and removal system would result in a very small volume of leachate on the liner at any given time. Because the proposed liner system would provide an effective impermeable barrier to prevent the contamination of groundwater beneath the Facility, impacts to groundwater and nearby groundwater wells in the area is unlikely.

Ground water monitoring is conducted at Class II facilities to ensure that the liner and leachate collection system are performing as designed. The required analytical parameters are based upon the characteristics of the landfill wastes. Monitoring wells would be sampled for Radium-226 and Radium-228 in addition to the constituents required according to

ARM 17.50.1306 (Table 3.3). The Facility would be required to conduct groundwater monitoring twice per year, during high and low groundwater conditions, by sampling the wells in a DEQ-approved multi-level groundwater monitoring network. Groundwater monitoring would be performed during the active life of the Facility and during the 30-year post-closure care period.

Baseline groundwater sampling for these constituents would be performed prior to construction. The first preconstruction baseline sampling event would be conducted prior to initiation of landfill construction activities; a second baseline sampling event would be conducted prior to acceptance of waste at the Facility. Routine groundwater monitoring would then be conducted quarterly during the first year of landfill operation, and then on a semi-annual basis thereafter. The groundwater quality information collected prior to landfill development and operation would be gathered to establish a statistical baseline for the Facility against which subsequent water quality data would be compared. If contamination detected is attributable to landfill operations, remediation would be required. Remedial activities would be based upon the nature and extent of contaminants detected and would be approved by DEQ. If this happens, the Facility would be required to develop an assessment of corrective measures to evaluate the available remedial actions to mitigate any contamination. This information would be subject to a public comment period, including a public meeting, prior to implementation. Any necessary corrective action required as a result of contaminant detection would be performed until groundwater quality returns to baseline conditions. If the Facility enters corrective action monitoring, the FA for corrective action would be fully funded to ensure that adequate funds are available to perform corrective action monitoring activities until the groundwater quality returns to baseline conditions. If groundwater remedial activities are occurring at the time of Facility closure, the post-closure care period would be extended and all necessary corrective action activities would be completed until groundwater quality returned to baseline conditions. At that time, final closure would not be approved until the facility completes the minimum 30-year post-closure care period.

Table 3.3 – Proposed Yellowstone Disposal Landfill - Ground Water Monitoring Constituents

Inorganic Constituents	
Antimony	Lead
Arsenic	Nickel
Barium	Selenium
Beryllium	Silver
Cadmium	Thallium
Chromium	Vanadium
Cobalt	Zinc
Copper	
Organic Constituents	
Acetone	Ethylbenzene
Acrylonitrile	2-Hexanone; Methyl butyl ketone
Benzene	Methyl bromide; Bromomethane
Bromochloromethane	Methyl chloride; Chloromethane
Bromodichloromethane	Methylene bromide; Dibromomethane
Bromoform; Tribromomethane	Methylene chloride; Dichloromethane
Carbon disulfide	Methyl ethyl ketone; MEK; 2-Butanone
Carbon tetrachloride	Methyl iodide; Idomethane
Chlorobenzene	4-Methyl-2-pentanone; Methyl isobutyl ketone
Chloroethane; Ethyl chloride	Styrene
Chloroform; Trichloromethane	1,1,1,2-Tetrachloroethane
Dibromochloromethane; Chlorodibromomethane	1,1,2,2-Tetrachloroethane
1,2-Dibromo-3-chloropropane; DBCP	Tetrachloroethylene; Tetrachloroethene; Perchloroethylene
1,2-Dibromoethane; Ethylene dibromide; EDB	Toluene
o-Dichlorobenzene; 1,2-Dichlorobenzene	1,1,1-Trichloroethane; Methylchloroform
p-Dichlorobenzene; 1,4-Dichlorobenzene	1,1,2-Trichloroethane
trans-1, 4-Dichloro-2-butene	Trichloroethylene; Trichloroethene
1,1-Dichlorethane; Ethylidene chloride	Trichlorofluoromethane; CFC-11
trans-1, 2-Dichloroethylene; trans-1,2-Dichloroethene	1,2,3-Trichloropropane
1,2-Dichloropropane; Propylene dichloride	Vinyl acetate
cis-1,3-Dichloropropene	Vinyl chloride
trans-1,3-Dichloropropene	Xylenes
Radionuclides	
Radium-226	Radium-228

A composite cap would be provided as the final cover per Subtitle D regulations. The compacted soil layer component of the final cover system would be placed in six- to eight-inch lifts. A geomembrane layer would be installed above the compacted soil layer. The same construction quality assurance and oversight procedures used for the composite liner system (base of landfill) would apply to the final cover. A two-foot layer of vegetative soil cover would be placed above the composite cover system and proof-rolled to achieve a firm layer capable of supporting terraces and other storm water management features.

The stability of the final cover was evaluated over the indefinite landfill closure period. Critical to this long-term performance was proper drainage within the final cover; therefore, the final cover system has been designed with a 300-mil double-sided geocomposite drainage layer above the geomembrane to convey infiltration water out of the system. This geocomposite drainage layer would help prevent saturation of the landfill cover soils, as this saturation can reduce strength and allow movement of the cover components. In order to allow the geocomposite to drain appropriately, a small drain pipe would be installed at the toe of the slope to capture water from the final cover system and drain it from the geocomposite.

Seeding the vegetative soil cover layer would proceed as soon as the weather allows after the topsoil cover has been completed. The topsoil would be fertilized, seeded, and mulched (where necessary) to establish a dense vegetative growth. The landfill would be sown with native grasses using a seed mix recommended and approved by the Natural Resource Conservation Service (NRCS). Mulching would be applied to help establish growth and minimize erosion. The seeding would be completed during the appropriate growing season following placement of the topsoil. Vegetation would be established within 180 days of application of or repairs to the final cover.

Impacts to groundwater associated with construction, operation and closure of the Facility would be limited. The distance between anticipated groundwater elevations is approximately 103 feet. The liner system is designed to impede the flow of liquids, the leachate collection and removal system is designed to ensure that leachate doesn't pool on the landfill liner, and ground water sampling would be performed on a semi-annual basis to ensure these components are performing as designed. Once capped, storm water that does not run off the landfill as storm water would infiltrate through the initial layers of the final cover system and be drained from the final cover by the geocomposite drainage layer.

3.5 GEOLOGY AND SOILS

3.5.1 ANALYSIS AREA AND METHODS

The analysis area for geology is the proposed 650.7-acre YD Facility. A discussion of regional geology, based upon published reports, is also provided herein. The analysis methods for geology included reviewing on-site drilling information, publications of the Montana Bureau of Mines and Geology, the U.S. Geological Survey, and the U.S. Department of Agriculture's Natural Resource Conservation Service, along with their associated geology and soil maps and drawings.

3.5.2 AFFECTED ENVIRONMENT

The proposed YD project site is situated within the Missouri River Plateau of the Northern Great Plains physiographic province. The regional topography of the area is characterized by floodplains and benches along the Yellowstone and Missouri Rivers. The proposed Facility location is primarily rolling prairie that has been incised by intermittent drainages.

Regionally, the geology generally consists of alluvium and glacial deposits that overlie the bedrock of the Tertiary age Fort Union Formation. Alluvium is derived from unconsolidated sediments that have been eroded and redeposited by water in a non-marine setting and is made up of a variety of fine to coarse-grained sand, silt, clay, and gravel. The alluvium is primarily present at the surface in deep, steep-sided drainages.

The continental glaciers that extended into northeastern Montana left behind deposits of glacial sediments known as glacial till and glacial outwash. Glacial till is the unsorted sediment left behind by the ice, while glacial outwash is the sediment deposited by running water coming off the melting glacier. In some places, the glacial sediments deposited by the melting ice buried the older stream valleys in the area. Unconsolidated sediments make up the upper five to 50 feet of sediment beneath the site.

The glacial deposits are underlain by discontinuous beds of poorly cemented sandstone, shale, clay, and coal of the Fort Union Formation. In Eastern Montana, the Fort Union Formation has been subdivided from oldest to youngest into the Tullock, Lebo and Tongue River Members. The bedrock in this part of northeastern Montana lies on the western flank of the Williston Basin, which is a large-scale geologic structure centered near Williston, North Dakota.

The geologic units exposed at the surface of the study area range from Upper Tertiary to Quaternary age materials. The older units, namely the Pierre, Fox Hills and Hell Creek formations, are at or close to the land surface near the Poplar Dome and the Cedar Creek Anticline. The Poplar Dome is evident in western Roosevelt County, near the Weldon-Brocton-

Froid fault zone, approximately 50 miles northwest of the proposed YD project site. The Cedar Creek anticline is a narrow, 125-mile long, northwest plunging asymmetrical anticline with a steep west limb that extends from northwestern South Dakota through the southwestern corner of North Dakota to east-central Montana. This feature is located approximately 60 miles south of the proposed YD project site. The Tertiary Fort Union Formation is exposed at the land surface over most of the study area. Construction of the landfill units would remove the upper 45 feet of this formation, leaving a 58 foot barrier between the base of the landfill and the uppermost aquifer.

The youngest geologic units in the study area are the unconsolidated alluvium and terrace deposits associated with the major river valleys. Stratigraphic relationships, thicknesses, lithologic contacts, and bedding are summarized in the Figure 3.2.

The soils associated with the glacial till parent materials are typically silty-clay type soils and are generally thin and poorly developed. The natural soils at the proposed YD project site include the Lambert Dimyaw silt loam complex, the Zahill Lambert clay loam complex and the Lambert-Badland silty loam complex. Minor occurrences of Badland soils and Shambo loam are also present. Table 3.4, provides a summary of the soil properties for the major soils identified at the proposed YD project site. Figure 3.3 shows the areal distribution of on-site soils. These soils were developed from the glacial tills and alluvium derived from underlying shale and siltstone. The topsoil excavated during landfill construction would be set aside in a stockpile and salvaged for installation of the final landfill topsoil cover.

3.5.1 ENVIRONMENTAL CONSEQUENCES

3.5.1.1 No Action Alternative

Under this alternative, because the site would not be developed, there would be no additional impacts to site geology and soils.

3.5.1.2 Proposed Action

The site would be excavated to accommodate the proposed landfill disposal units. Additionally, general site grading would be necessary to facilitate the storm water control features. Excavation of the existing ground to a maximum depth of 45-ft below natural grade to establish the landfill footprints for the MSW and SpW would yield 4,068,600 cubic yards of loose soil and geologic material. These materials would be used to (i) provide subgrade fill to establish base elevations for the landfill units, and (ii) construct the compacted soil component of the landfill, final cover, and leachate pond liners.

Figure 3.2 Generalized hydrogeological stratigraphy of the region
(Source: Ground-Water Resources of the Lower Yellowstone River Area: Dawson Fallon, Prairie, Richland, and Wibaux Counties, Montana, Part A, Montana Ground-Water Assessment Atlas No. 1, Montana Bureau of Mines and Geology, 2000).

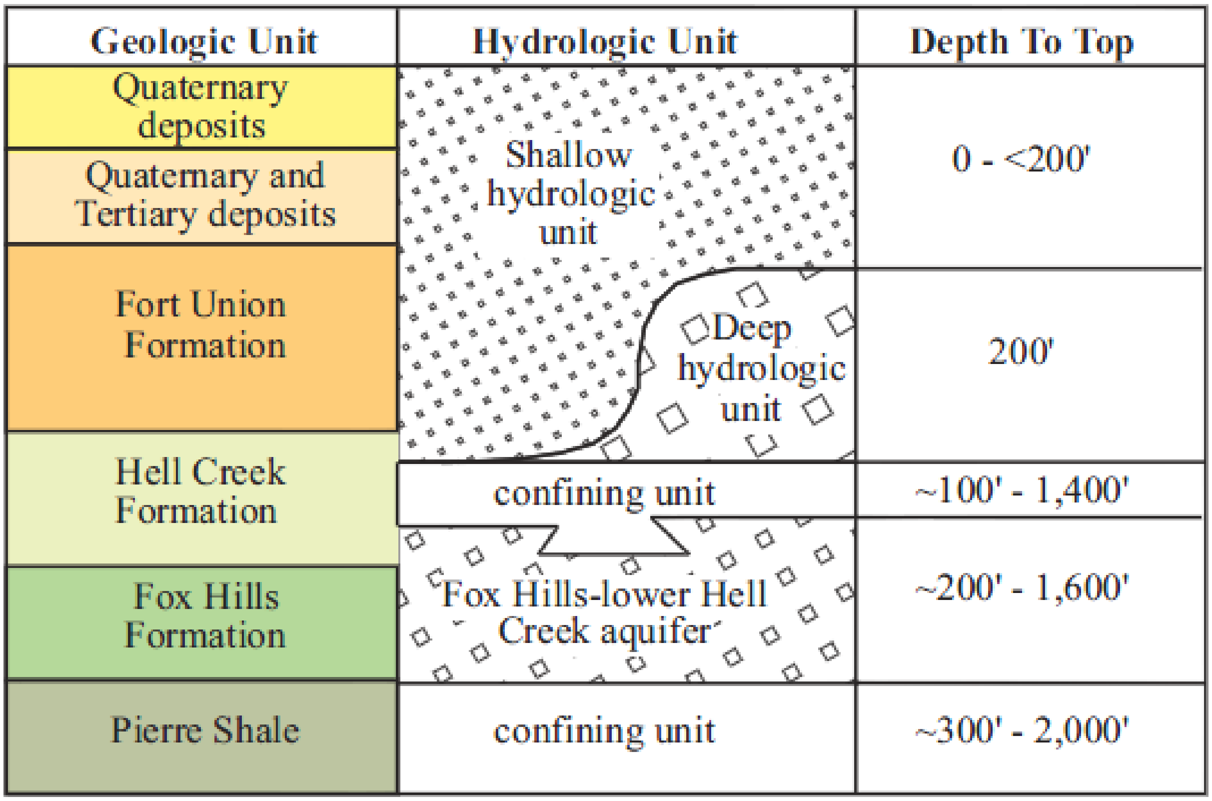
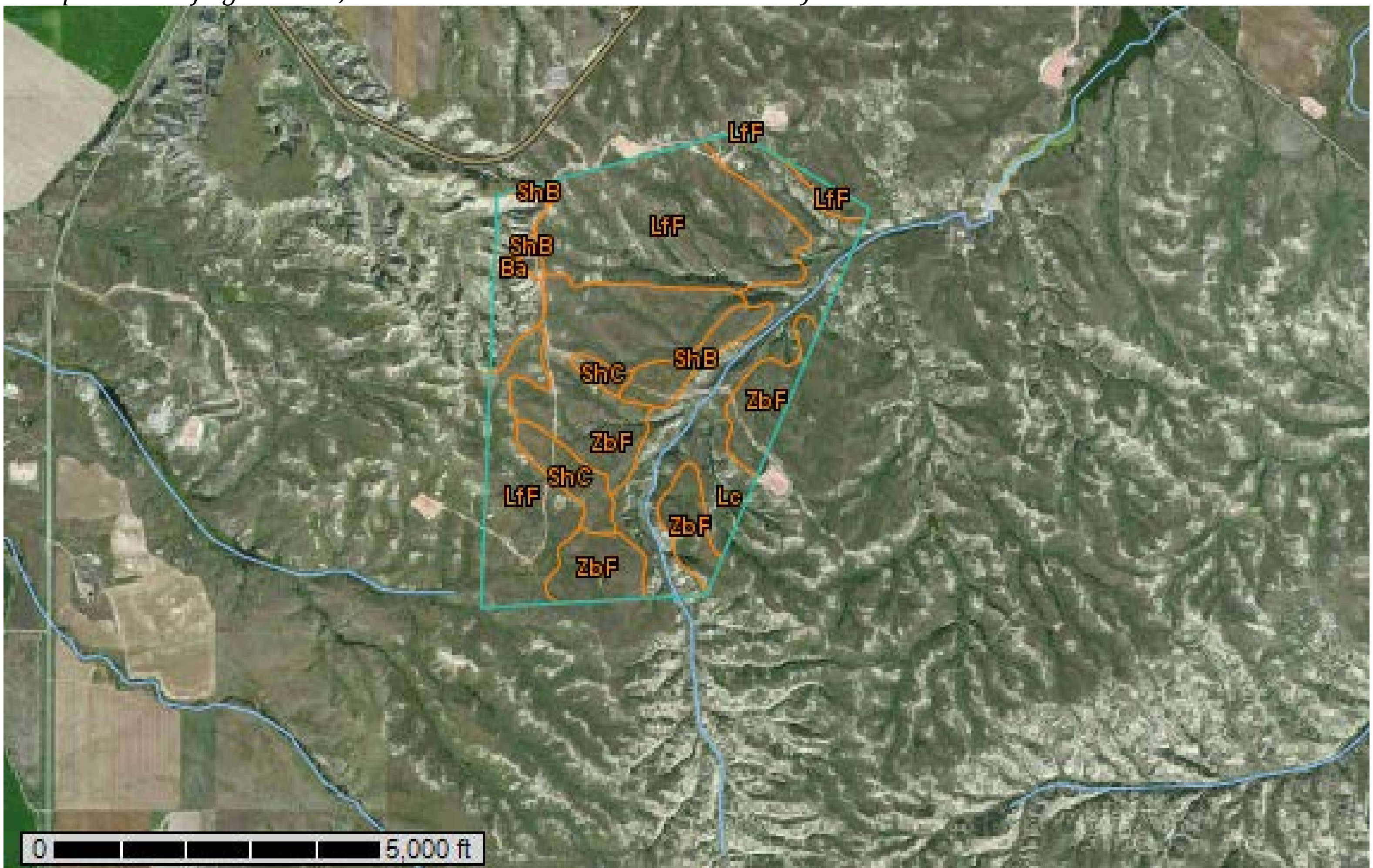


Table 3.4: Summary of Major Soil Properties
(Source: USDA-NRCS, Web Soil Survey, Richland County, Montana)

Soil Type	Map Key	Depth profile	Drainage	Permeability	Available Water Capacity	Erosion Hazard	Soil Compaction Resistance
Lambert-Dimyaw complex	LtF	0 to 18 inches: Silt Loam. 18 to 60 inches: Unweathered bedrock	Well Drained	Moderately High	High	Medium	Low Resistance
Zahill-Lambert complex	ZbF	0 to 4 inches: Loam. 4 to 60 inches: Clay loam	Well Drained	Moderately Low – Moderately High	High	Medium	Low Resistance
Lambert-Badland complex	Lc	0 to 18 inches: Silt Loam. 18 to 60 inches: Unweathered bedrock	Well Drained	Moderately High	Very low	Medium	Low Resistance

Figure 3.3: Map of the soil types in the proposed facility area (approximate facility boundary outlined in blue)
(Source: U.S. Department of Agriculture, Natural Resource Conservation Service)



SOIL KEY		
LfF: Lambert-Dimyaw complex	Lc: Lambert-Badland complex	
ZbF: Zahill-Lambert complex	ShB and ShC: Shambo Loam	Ba: Badland

The subsurface profile in the exploratory borings performed during the initial site investigation was conducted in April 2014; further investigations occurred in December 2014 and April 2015, and consisted of:

- Drilling and lithologic logging of 36 borings within the landfill foot print;
- Drilling and lithologic logging of 7 borings outside of the landfill foot print ;
- Drilling and lithologic logging and installing piezometers at 2 locations within the landfill footprint;
- Drilling and lithologic logging and installing piezometers at 14 locations outside the landfill footprint;
- Hydraulic conductivity testing (slug tests) on 8 piezometers; and,
- Geotechnical laboratory testing on selected soils samples from four soil borings within the landfill footprint.

The 59 soil borings were drilled using a combination of hollow stem augers and air rotary methods. Of the 59 soil borings drilled, 40 were drilled to collect data for characterization of the hydrogeologic and soil conditions below the proposed YD project site. The remaining 19 soil borings were drilled to the depth representing the elevation 20 feet immediately below the base of landfill units. During the site investigation, 16 piezometers or monitoring wells were installed. The results of the on-site characterization efforts confirm that the glacial till is relatively uniform across the proposed landfill footprint.

The subsurface cores collected during the site investigation were submitted for laboratory testing to measure the average vertical hydraulic conductivity, moisture content, grain size distribution and critical water contents (shrinkage, plastic limit and liquid limit). Laboratory test results indicate that the soils above the Fort Union bedrock generally contain a low percentage of gravel at 4.1-22.8%; sand at 10.6-99%; and silt and clay at 42%-98%. The measured hydraulic conductivities provided by the laboratory analysis of the soil borings ranged from 4.37×10^{-8} cm/sec to 2.3×10^{-9} cm/sec. This range is typical for glacial till and silts. The aquifer hydraulic conductivity testing performed on the eight piezometers ranged from 3.73×10^{-5} cm/sec for a siltstone material, to 7.49×10^{-3} cm/sec for silt. The mean hydraulic conductivity for all of the piezometers was 6.53×10^{-4} cm/sec. This range of hydraulic conductivities is typical for glacial till and silt aquifers. The result of the hydrogeological and soils investigation was generally consistent with published technical studies of the region.

Any impacts to geology and soils are anticipated to be minor due to some rock exposure by the landfill cut after removal of soils and placement in cover stockpiles. Because these soils are well drained, construction and operation of the proposed Facility would not result in soil erosion or the substantial loss of viable topsoil through appropriate placement of berms, ditches, and other previously identified storm water BMPs minimizing erosion. Additionally, the landfill design consists of a standard composite liner designed to impede the flow of liquids and a leachate collection and removal system designed to transmit leachate off the liner and into one of two designated leachate ponds. If liquids were able to migrate through the solid plastic HDPE liner, the underlying clay component would have to be completely saturated before any flow through the clay would occur.

The clay liner component of the liner system has a hydraulic conductivity of not more than $1.0x10^{-7}$ cm/sec, meaning that any liquids passing through the clay liner would pass through at a rate of 0.0000001 cm/sec or 0.103465 feet per year. However, clay is extremely absorbent and hydrates rapidly when exposed to liquids. As a result, when the clay hydrates, it swells, giving it the ability to 'self heal'; any leachate that would migrate through the HDPE liner would be retained in the clay liner. When saturated, the hydraulic conductivity of clay typically drops two orders of magnitude to less than $1x10^{-9}$ cm/sec (0.00103465 feet/year). The composite liner system for the proposed YD solid waste management facility is designed to intercept leachate within each landfill unit landfill and route it through the collection system where it would ultimately be pumped to one of two designated leachate ponds. The composite liner and overall design of the leachate collection and removal system is proven effective in protecting groundwater resources beneath solid waste landfills by preventing the ponding of leachate over the liner and thus the potential migration of contaminants through the impermeable liner and into the uppermost aquifer. Wastes would absorb roughly a quarter of the moisture that infiltrates through the waste mass. This combined with the overall landfill liner and the placement and design of the leachate collection and removal system would result in a very small volume of leachate on the liner at any given time. Therefore, contamination as result of the infiltration of leachate through the base liner system is unlikely.

Construction and operation of the Facility would result in a total disturbance of approximately 260 acres of the 650.7-acre parcel. A total of 3,068,600 cubic yards of native soil and subgrade materials would be excavated during the life of the facility for construction of landfill units. The developed topsoil materials removed during excavation would be set aside in a separate stockpile and salvaged for use as the topsoil component of the final cover. Other native soil and subgrade materials would be stockpiled on site and salvaged for the construction of berms, landfill liner components, landfill cover, and in on-site road construction. Once closed, the landfill units would be capped and revegetated to stabilize the cover soil and minimize erosion. Storm water that does not run off the capped landfill would infiltrate through the initial layers of the final cover system and then be drained from the final cover by the geocomposite drainage layer.

3.6 VEGETATION

3.6.1 ANALYSIS AREA AND METHODS

The analysis area for vegetation is the Great Plains Wooded Draw and Ravine landscape in eastern Montana, including the proposed YD project site. The analysis method for vegetation consisted of published reports from the Montana Natural Heritage Program, the U.S. EPA, and Richland County.

https://www.ndhealth.gov/wm/Publications/ExemptionOfOilAndGasExplorationAndProductionWastesFromFederalHazardousWasteRegulations.pdf

3.6.2 AFFECTED ENVIRONMENT

The common native species in the Great Plains Wooded Draw and Ravine landscape in eastern Montana are the Rocky Mountain juniper, green ash, and chokecherry. The Great Plains Riparian landscape of eastern Montana is dominated by narrowleaf cottonwood and Plains cottonwood. The understory consists of western wheatgrass and American licorice. The upland grassland is dominated by western wheatgrass; the hillsides and crests are dominated with needlegrasses. Forb (herbaceous flowering plant) species cover the hillsides, but dwindle in valleys and in flatter areas of the landscape. Kentucky bluegrass is more abundant in the low, flat areas within the upland grassland. The low-lying drainages are occupied with woody species, with silver sagebrush and western snowberry at the upper areas of the drainages.

3.6.3 ENVIRONMENTAL CONSEQUENCES

3.6.3.1 No Action Alternative

Under this alternative, because the site would not be developed, there would be no additional impacts to existing vegetation.

3.6.3.2 Proposed Action

A search of the Montana Natural Heritage Program website revealed that there are no records of plant species of concern in the area surrounding the proposed YD Facility. During the life of the Facility construction and operation, vegetation would be removed and salvaged from approximately 260 acres of the site for establishing the proposed landfill disposal units, roads, buildings, and storm water control features. Not all 260 acres of vegetation would be removed at once. Construction activities would begin with the excavation of 7.1 acres for the Phase I MSW cell and 6.7 acres of the Phase A SpW cell. Additional vegetation would be removed for the construction of the stormwater and leachate ponds as well as for on-site roads and buildings. As these cells approach final grade, the Facility would begin excavation and construction of the MSW Phase II and SpW Phase B cells.

The existing vegetation at the location of the proposed YD project site, as noted in 3.6.2 Affected Environment, consists of needlegrass and western wheatgrass. This vegetation is not unique or limited. The YD project site is surrounded by an extensive amount of similar land. Further, at final closure, the final cap would be fully revegetated with native plant species. To ensure vegetative success, the upper six inches of the final cover must be comprised of a top soil capable of supporting vegetation. In addition, the seed mix used for revegetation must be approved by the NRCS to ensure the vegetation is adapted to the local climate. During the minimum 30-year post-closure care period, YD would manage noxious weeds according to a county approved noxious weed plan.

3.7 AIR QUALITY

3.7.1 ANALYSIS AREA AND METHODS

The analysis area for air quality is the site of the proposed YD project site. The analysis methods for air quality included a review of the application documents for projected incoming waste volumes and DEQ's knowledge of other Major Class II Landfill facilities.

3.7.2 AFFECTED ENVIRONMENT

At the present time, four active and producing gas wells are located adjacent to the proposed YD project site. Traffic associated with maintenance of these locations is common and varies depending upon the maintenance needs of the facilities. Landfill operational activities resulting in the generation of windblown dust would vary depending upon the time of year, demand for services, and maintenance needs of the Facility. The proposed YD Facility is not located in a special or designated air-quality zone.

3.7.3 ENVIRONMENTAL CONSEQUENCES

3.7.3.1 No Action Alternative

Under this alternative, because the site would not be developed, there would be no additional impacts to existing air quality.

3.7.3.2 *Proposed Action*

Air quality concerns related to landfills are frequently associated with fugitive dust emissions from landfill traffic, construction activities, and day-to-day facility operations. Air quality concerns also include the generation of methane and non-methane organic compounds resulting from waste decomposition. The open burning of solid waste at this Facility is prohibited.

Traffic to the proposed Facility would not result in an increase in the levels of airborne dust because Highway 23 is paved. Construction of new landfill cells would cause an increase in internal landfill traffic which would result in an increase in airborne dust during the period of excavation and construction. During normal operational traffic within the Facility could cause a minor increase of suspended dust during the dry summer months of the year relative to the current agricultural and well maintenance activities in the area. Water would be applied to the road via water truck any time the operator observes dust beginning to circulate into the air more than about three feet, where visibility of the drivers could be obstructed.

During construction and operation of the Facility, fugitive dusts would be mitigated by implementing dust control measures, including the application of a dust palliative or water, on the interior roads and in areas where excavation and construction is taking place. Since the construction periods would be short in relation to the operating life of the Facility, these effects would be minor. Data from Sidney Municipal Airport indicates that prevailing winds are generally from the south, northwest, and north. Average wind speeds vary between seven to 11 miles per hour, with the highest average wind speeds occurring in the spring. Easterly winds are reported to be rare; therefore as the Facility develops, the filling pattern would be modified to provide a high area to the west. This allows for a low fill zone on the east side of the fill, so that operations can continue during periods of high winds.

The excavation and placement of cover material could increase the amount of dust in the air. Fugitive dusts generated from the application of daily cover would be mitigated by applying a dust palliative or water to the cover material prior to its placement. Further, all long-term soil stockpiles would be seeded to prevent the generation of airborne dust.

Odors related to landfilling activities would be controlled by the application of daily soil cover. Wind dispersion in the area would also alleviate odors resulting from the placement of wastes in the working face prior to the application of soil cover.

The wastes proposed for disposal at the municipal solid waste landfill site would generate methane and non-methane organic compounds. As each phase of the municipal solid waste landfill unit is developed, a series of landfill gas monitoring wells would be installed to surround the waste disposal unit footprint at locations and depths approved by DEQ prior to construction of each waste unit. Methane levels would be monitored on a quarterly basis to ensure the concentration of methane gas generated by the Facility does not exceed 25-percent of the lower explosive limit (LEL) for methane in Facility structures, and the LEL for methane is not exceeded at the Facility property boundary. Any exceedance of these specified levels of methane in the soil would be immediately reported to the DEQ followed by the submittal of a landfill gas remediation plan for DEQ approval.

To meet the U.S. EPA's New Source Performance Standards for municipal solid waste landfills, an active landfill gas control system would be installed as each discrete phase of the municipal waste landfill unit is closed. The active gas system would include vertical gas vents and a gas venting layer. Vertical gas vents would be installed at a rate of approximately one per acre to provide relief of pressure that is generated by the degradation of waste after closure. The gas venting layer would be installed at the base of the final cover system. The landfill unit final covers and methane control systems would be installed according to the manufacturer's guidelines for each component, with all elements tested for conformance with the DEQ approved Closure Plan and Landfill Gas Control System specifications and CQA/CQC requirements.

The landfill gas generated as the municipal solid waste decomposes would be controlled by the Landfill Gas Control System; fugitive dusts would be controlled by the application of water as a dust palliative and vegetation of long-term soil stockpiles. Therefore, construction and operation of the Facility would have a minor impact on air quality in the area.

3.8 INDUSTRIAL, COMMERCIAL, AND AGRICULTURAL ACTIVITIES

3.8.1 ANALYSIS AREA AND METHODS

The analysis area for industrial, commercial, and agricultural activities is the site of the proposed YD Facility and surrounding area. The analysis methods for these activities included a site reconnaissance to determine current land uses.

3.8.2 AFFECTED ENVIRONMENT

The site proposed for the YD Facility encompasses approximately 650.7 acres. Another 2,110 acres of property surrounding the proposed YD Facility is owned by the applicant. However, this property is not being proposed for solid waste management activities, but would provide a buffer zone around the Facility from surrounding property. Four oil and gas production facilities (wellheads and/or tank battery's) exist within the 2,660 acres of land owned by YD. However, none of these facilities are located within the proposed 650.7-acre landfill site. One saltwater pipeline and one gas pipeline are currently located on the 650.7-acre YD parcel. A communications service building owned by Mountain States Telephone and Telegraph is located on a parcel adjacent to the proposed project site. Land use in the area surrounding the proposed YD Facility consists of agricultural rural land, vacant rural land, and rural residential property. Adjacent properties are currently used for farming and ranching activities and private residences. There are no other known commercial or industrial uses of the YD Facility property

3.8.3 ENVIRONMENTAL CONSEQUENCES

3.8.3.1 No Action Alternative

Under this alternative, because the site would not be developed as a solid waste management facility, there would be no additional impacts to existing land use activities.

3.8.3.2 Proposed Alternative

Construction and operation of the proposed YD Facility would cause an increase in the industrial activity of the area. There would be a slight decrease in agricultural activities associated with construction, operation and closure of the Facility due to the fact that the areas of the proposed site currently used for livestock grazing would not be available for ongoing grazing activities until the Facility is closed and the waste disposal units are capped and vegetated. The current agricultural activity in the area occurs mostly along the Yellowstone River west of the proposed site and to east of the eastern property boundary.

The saltwater and gas pipeline would be cleaned of any remaining fluids, capped, and abandoned where they are located in the landfill footprints prior to landfill construction activities. The nearest resident is located approximately 2,900 feet from the proposed Facility license boundary; however the landfill disposal units are shielded from view by higher topography at the proposed Facility entrance and along the western portion of the proposed license boundary. The final cover of the landfill units would be seeded with an NRCS-approved seed mix adapted to the local area climate.

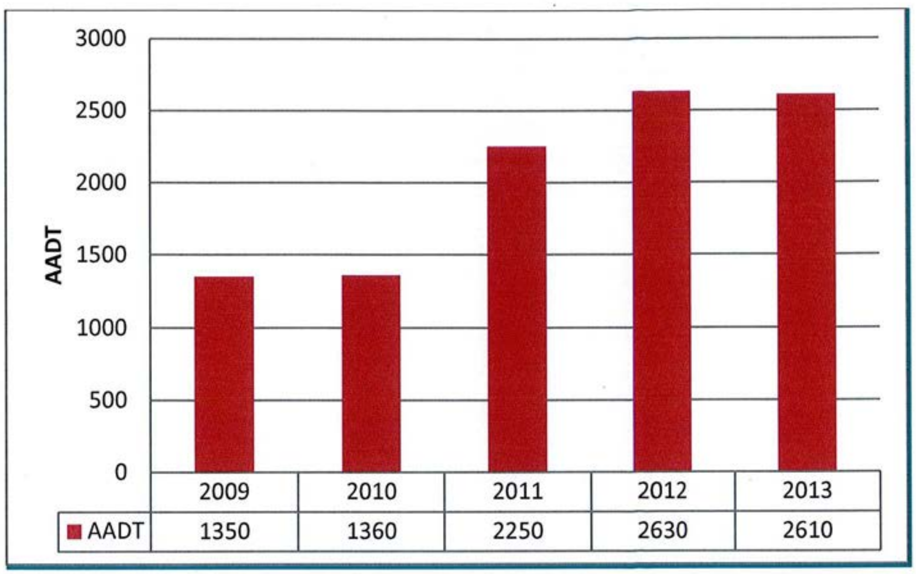
3.9 TRAFFIC

3.9.1 ANALYSIS AREA AND METHODS

The analysis area for traffic is the site of the proposed YD Facility and Montana Highway 23 as it approaches the entrance to the proposed Facility. The analysis methods for these activities included a site reconnaissance to identify potential traffic issues and necessary improvements and research conducted by the Montana Department of Transportation.

3.9.2 AFFECTED ENVIRONMENT

The Montana Department of Transportation (MDT) maintains records of average annual daily traffic on state roadways; data for Montana Highway 23 is available at the intersection with Montana Highway 261, located approximately one mile west-northwest of the proposed Facility's approach. According to the MDT data, the annual average daily traffic (AADT) observed in 2014 along Montana Highway 23 was 2,610 vehicles. This is a 52% increase from the AADT of 1,360 vehicles counted in 2010. A graph showing past AADT estimates is provided below.



Source: AADT Recorded on Montana Highway 23 Southeast of Montana Highway 261 (MDT 2014)

3.9.3 ENVIRONMENTAL CONSEQUENCES

3.9.3.1 No Action Alternative

Under this alternative, because the site would not be developed as a solid waste management facility, there would be no additional impacts to existing traffic attributable to the Facility.

3.9.3.2 Proposed Alternative

A new approach would be constructed at the intersection of Montana Highway 23 to allow truck access to the proposed Facility. During construction and early operation of the Facility, approximately 10 to 20 trucks would access the site per day.

During later operation, approximately 30 to 50 trucks would access the Facility on a daily basis. Therefore, the estimated maximum average trucks per day to the proposed project would be 50 trucks; this would increase AADT on Montana Highway 23 by approximately 2%. An increase in traffic of this magnitude may result in localized changes in traffic patterns at the intersection of the proposed Facility approach, but would not result in unmanageable changes in traffic patterns along Montana Highway 23 in general.

Any modification to the Facility access from Montana Highway 23 would be approved, directed and overseen by the MDT. The Facility approach is located on MT 23 within a truck climbing lane. According to MDT, a Traffic Impact Study would be required to determine if there are any modifications necessary to address the access and to maintain the safety of the travelling public on MT 23. The applicant has discussed the installation of turning lanes, relocating the access approach, entrance signage, and road grade improvements with the MDT, but has not yet obtained the necessary encroachment permit. MDT could implement these improvements as conditions for the approval of the required encroachment permit. To ensure the safe access into the Facility from Highway 23, MDT may require a realignment of the access point. Although the applicant has not yet applied for the necessary encroachment permit, one would be required prior to any Facility construction activities.

3.10 PROPERTY VALUES

3.10.1 ANALYSIS AREA AND METHODS

The analysis area is the site of the proposed YD Facility and properties within a one-mile radius of the project area. The analysis method consisted of DEQ's research of the Montana State Library's (MSL) cadastral database for property tax assessment information.

3.10.2 AFFECTED ENVIRONMENT

At the present time, the property proposed for the YD Class II Landfill encompasses approximately a 650.7-acre parcel owned by the applicant. Land surrounding the project site is agricultural rural, vacant rural, and rural residential properties.

3.10.3 ENVIRONMENTAL CONSEQUENCES

3.10.3.1 No Action Alternative

Under this alternative, because the site would not be developed as a solid waste management facility, there would be no impacts.

3.10.3.2 Proposed Alternative

DEQ conducted a search of the MSL's database to determine assessed property values of properties within one-mile of the project location over the past three years. According to the MSL records, existing property values have increased an average of 49.68% from 2014 to 2016.

Data collected from MSL's cadastral database for properties near other licensed Class II landfills in Montana suggest that the existence of landfills do not result in decreased property values for the areas surrounding the facilities, but have actually resulted in increased values as roads are constructed or reconstructed and additional infrastructure is developed. The proposed YD Facility is not expected to result in a decrease to property values in the area.

3.11 SOCIOECONOMIC

3.11.1 ANALYSIS AREA AND METHODS

The analysis area is the general location of the proposed landfill. Data was collected from the YD's application.

3.11.2 AFFECTED ENVIRONMENT

At the present time, the property proposed for the YD Class II Landfill encompasses approximately a 650.7-acre parcel owned by the applicant. Land surrounding the project site is agricultural rural, vacant rural, and rural residential properties.

3.11.3 ENVIRONMENTAL CONSEQUENCES

3.11.3.1 No Action Alternative

Under this alternative, because the site would not be developed as a solid waste management facility, additional workers that would be hired during the construction and operational phases of the proposed landfill would not be hired. No long-term impacts, either positive or negative, are anticipated.

3.11.3.2 Proposed Alternative

During the construction phases of the landfill expansion, especially during the initial startup of the expansion area operations, there would be a minor increase in local employment due to the additional need for contractors, site operators, and associated support. Landfill construction activities would employ approximately 15 additional people as construction workers for about six months. However, because this would occur only during the construction of landfill features, the impact of these activities on employment are of short duration compared to the life of the landfill.

The long-term employment requirements would result in the addition of five to ten employees for Facility operations and maintenance activities. Therefore, construction and operation of the proposed Facility could have a minor impact on the local tax base and revenues to businesses in the area.

3.12 CUMULATIVE EFFECTS

Cumulative impacts are the effects of the Proposed Action added to the impacts of past and present activities in the area along with the potential impacts of future actions under consideration by the state. Cumulative impact analyses help to determine whether an action would result in significant impacts when added to other activities.

The proposed YD Facility is the only proposed landfill in the immediate area, and no other known large or medium scale commercial enterprises exist within the property area owned and controlled by the applicant.

According to the Richland County Planning office, there are currently no other projects proposed on properties adjacent to or near the proposed Facility.

The necessary modifications to MT 23 would result in short-term inconveniences to local users, but the overall long-term effect of road reconstruction activities would result in increased site distances and a safer approach to the proposed Facility. According to MDT, the construction of a roundabout at the intersection of MT 16/MT 200/MT 23 is scheduled for 2017; a modification on MT 261 (S-261) to rebuild the roadway to address pavement is planned, but the timing of construction is not known at this time.

Oil and gas and other human developments in the project area would likely continue at current rates. Construction and operation of the proposed project would not accelerate oil and gas development in the area since landfills are not currently the limiting factor in oil and gas production. However, it would provide an efficient and effective means to dispose of municipal and industrial waste, thereby reducing travel times and distances for wastes generated closer to the proposed facility, and reducing the potential for waste to be dumped illegally.

Construction and operation of the proposed project would not reduce or degrade potential whooping crane stopover habitat within the project area, and therefore cumulative effects as a result of the proposed project would be negligible and discountable.

Construction and operation of the proposed project would not reduce or degrade potential foraging or nesting habitat for greater sage grouse within the project area since no potential habitat exists. Therefore cumulative effects as a result of the proposed project would be negligible and discountable.

Oil and gas and other human developments in the project area would likely continue at similar rates to existing conditions. Construction and operation of the proposed project would not accelerate oil and gas development in the area since landfills are not currently the limiting factor in oil and gas production. However, it would provide an efficient and effective means to dispose of municipal and industrial waste, thereby reducing travel times and distances, and reducing the potential for waste to be dumped illegally. Construction and operation of the proposed project would not reduce or degrade potential foraging or roosting habitat for the northern long-eared bat within the project area since no potential habitat exists. Therefore cumulative effects as a result of the proposed project would be negligible and discountable.

Oil and gas and other human developments in the project area would likely continue at similar rates to existing conditions. Construction and operation of the proposed project would not accelerate oil and gas development in the area since landfills are not currently the limiting factor in oil and gas production. However, it would provide an efficient and effective means to dispose of municipal and industrial waste, thereby reducing travel times and distances, and reducing the potential for waste to be dumped illegally. Construction and operation of the proposed project would not reduce or degrade potential foraging or nesting habitat for the yellow-billed cuckoo within the project area since no potential habitat exists. Therefore cumulative effects as a result of the proposed project would be negligible and discountable.

Continued oil and gas and other human developments in the project area would likely continue at similar rates to the existing conditions. Construction and operation of the proposed project would not accelerate oil and gas development in the area since landfills are not currently the limiting factor in oil and gas production. However, it would provide an efficient and effective means to dispose of municipal and industrial waste, thereby reducing travel times and distances, and reducing the potential for waste to be dumped illegally. Construction and operation of the proposed project would not reduce or degrade potential foraging or nesting habitat within the project area, and therefore cumulative effects as a result of the proposed project would be negligible and discountable.

Oil and gas development in the project area would likely continue at similar rates to existing conditions. Construction and operation of the proposed project would not accelerate oil and gas development in the area since landfills are not currently the limiting factor in oil and gas production. However, it would provide an efficient and effective means to dispose of municipal and industrial waste, thereby reducing travel times and distances, and reducing the potential for waste to be dumped illegally. Construction and operation of the proposed project would not reduce or degrade potential foraging or nesting habitat for the least tern, and therefore cumulative effects as a result of the proposed project would be negligible and discountable.

Since no direct or indirect impacts are anticipated to the pallid sturgeon, the proposed project would not add to cumulative effects to the pallid sturgeon.

Land uses in the area southeast of the Sidney include rural commercial, agricultural, and residential activities. Cumulative impacts from the Proposed Action would be negligible for all resources.

3.13 UNAVOIDABLE ADVERSE EFFECTS

Residual impacts from the Proposed Action would include irreversible commitments of YD's privately owned land resources. Developed topsoil would be removed from approximately 260 acres of the 650.7-acre site, but would be salvaged for use as the topsoil component of the final cover system. The remaining soil and subgrade materials removed during excavation would be stockpiled and salvaged for use on roads, for cover soils, and for the construction of berms and other landfill features. The topsoil would be reseeded with native vegetation. Some sediment control structures would remain and the capped landfill units would appear as man-made features across the landscape. Post-closure land use would be restricted to animal grazing only over the landfill cells. No structures that require the placement of footings or foundations are allowed over the closed landfill units. Any disturbance of the closed landfill final cover for construction of any structure would have to be approved in advance by DEQ.

Plant communities dominated by native plants would be replaced by reclaimed plant communities on the property. Noxious weeds would increase from the soil disturbance, but weeds would be treated to ensure revegetation by native local grasses occurs as required by the county weed control program. The disturbed areas would be reclaimed, reseeded, revegetated, and a program implemented to inventory and treat noxious weeds would be implemented.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 A LISTING AND APPROPRIATE EVALUATION OF MITIGATION, STIPULATIONS AND OTHER CONTROLS ENFORCEABLE BY THE AGENCY OR ANOTHER GOVERNMENT AGENCY

The proposed licensure of the YD Facility would meet the minimum requirements of the Montana Solid Waste Management Act and associated administrative rules regulating solid waste disposal. Adherence to the solid waste, water quality, and air quality regulations and the DEQ-approved facility Operation and Maintenance Plan would mitigate the potential for harmful releases and impacts to human health and the environment by the proposed Facility.

4.2 RECOMMENDATION

In order to determine whether preparation of an environmental impact statement is necessary, DEQ is required to determine the significance of the impacts associated with the proposed action. The criteria that DEQ is required to consider in making this determination are set forth in ARM 17.4.608 as follows:

4.2.1 The severity, duration, geographic extent, and frequency of the occurrence of the impact;

4.2.2 The probability that the impact will occur if the proposed action occurs; or conversely, reasonable assurance in keeping with the potential severity of an impact that the impact will not occur;

4.2.3 Growth-inducing or growth-inhibiting aspects of the impact, including the relationship or contribution of the impact to cumulative impacts;

4.2.4 The quantity and quality of each environmental resource or value that would be affected, including the uniqueness and fragility of those resources or values;

4.2.5 The importance to the state and to society of each environmental resource or value that would be affected;

4.2.6 Any precedent that would be set as a result of an impact of the proposed action that would commit the department to future actions with significant impacts or a decision in principle about such future actions; and

4.2.7 Potential conflict with local, state, or federal laws, requirements, or formal plans.

The proposed Yellowstone Disposal Class II Facility (Facility) would be constructed and operated approximately 4.5 miles south of Sidney and accessed from Montana Highway 23. The Facility would consist of two separate Class II landfills, each equipped with a composite liner and leachate collection system.

A Municipal Solid Waste landfill would encompass 75.2 acres and accept Class II, Class III and Class IV solid wastes, generally including putrescible municipal solid waste, bulky waste, wood waste, non-water soluble solids (brick, dirt, rock, rebar-free concrete, brush, lumber and vehicle tires), general construction and demolition waste), asphalt and special waste defined in ARM 17.50.1115. A Special Waste Landfill would encompass 55.0 acres and accept exempt and non-hazardous exploration and production waste associated with crude oil and nature gas production with technologically enhanced radioactive material concentrations not exceeding 50 picocuries per gram, soils heavily contaminated with petroleum, inert waste, and non-hazardous industrial waste, and Group III and IV solid waste. Waste with an unknown origin that has not been certified as non-hazardous would not be accepted by the facility. In addition to the two landfills, the Facility will require construction of ponds, roads, buildings, and ditches disturbing an additional 129.8 acres.

Thus, the Facility will disturb an area of approximately 650.7 acres. The life of the Municipal Waste Landfill is expected to be more than 60 years while the life of the Special Waste Landfill is expected to be more than 30 years. When each cell within each landfill has reached capacity, the cell will be covered with a final cover (a subgrade, an 18-inch compacted soil layer, a 40-mil LLDPE geomembrane, a 300-mil double-sided geocomposite drainage layer, an 18-inch infiltration layer consisting of earthen materials, and a 6-inch erosion lawyer consisting of earthen material capable of sustaining native plant growth) which will then be seeded with native vegetation. Thus, the disturbed area will be returned to native vegetation after the 60-plus and 30-plus respective lives of the two landfills.

The Facility is located in the Plains Grassland ecosystem of Eastern Montana. The existing vegetation at this location is not unique or limited, consisting of Rocky Mountain Juniper, green ash, chokecherry, cottonwood, western wheatgrass, needlegrass, silver sagebrush and western snowberry. The Facility site is surrounded by an extensive amount of similar land. The Facility location is not located within Sage Grouse core habitat, general habitat, or connectivity area.

Construction and operation of the Facility will not adversely affect any threatened or endangered species.

Construction and operation of the Facility is not expected to impact surface water resources. A storm water control system will be constructed to accommodate runoff from a 100-year, 24 hour storm event, in excess of the 25-year, 24-hour capacity required under state law. Storm water sediment retention ponds will contain any expected storm water runoff generated by intense rainfall or storm melt, allowing sediments to settle out.

Impacts to groundwater are also not expected. Under ARM 17.50.1204(1), an owner may only construct a Class II landfill after gaining DEQ approval that the design either a) ensures that specified concentration values will not be exceeded at the relevant point of compliance; or b) uses a composite liner and a leachate collection and removal system that is designed and constructed to maintain less than a 30-cm depth of leachate over the liner. ARM 17.50.1202(5) defines "composite liner" as a system consisting of two components. The upper layer must consist of a minimum of 30-mil flexible membrane liner and the lower component must consist of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than $1x10^{-7}$ cm/sec. Flexible membrane liner components consisting of high density polyethylene must be at least 60-mil thick. The flexible membrane liner component must be installed in direct and uniform contact with the compacted soil component. The liner design proposed for the Facility complies with the liner specifications set forth in ARM 17.50.1204(1) and are deemed sufficient to be protective of the environment.

High density polyethylene liners is highly impermeable and is the same material used to contain or control liquid and gas migration in an engineered project, structure or system. Moreover, the Facility will construct the lower component with two feet of compacted clay soil. The clay liner component has a hydraulic conductivity of not more than $1.0x10^{-7}$, meaning that any liquids passing through the clay liner would pass through at a rate of 0.0000001 cm/sec or 0.103465 feet per year. If the clay liner were exposed to liquid, it would swell. Any leachate that would permeate the high density polyethylene liner would be retained in the clay liner. When saturated, the hydraulic conductivity of clay typically drops to less than $1x10^{-9}$ cm/sec, an order of two magnitudes to 0.00103465 feet/year. Finally, the distance between anticipated groundwater levels is approximately 100 feet. Thus, while groundwater is a valuable environmental resource, there is reasonable assurance that groundwater will not be impacted.

DEQ has not identified any growth-inducing or growth-inhibiting aspects of the Facility. DEQ's approval of the Facility does not set any precedent and would not commit the DEQ to any future action with significant impacts, nor is it a decision in principle about any future actions that DEQ may act on. Finally, construction and operation of the Facility does not conflict with any local, state, or federal laws, requirements, or formal plans.

Based on consideration of all of the criteria set forth in Arm 17.4.608, DEQ has determined construction and operation of the Facility will not significantly affect the human environment. Therefore, an environmental assessment is the appropriate level of environmental review and preparation of an environmental impact statement is not required.

4.3 OTHER GROUPS OR AGENCIES CONTACTED OR CONTRIBUTING TO THIS EA

Montana Natural Heritage Program
State of Montana Historic Preservation Office
SCS Engineers
Bartlett & West
U.S. Geological Survey
Montana Bureau of Mines and Geology
U.S. Department of Agriculture - Natural Resource Conservation Service
Montana Department of Transportation
Richland County Planning Department

4.4 AUTHORS

Draft EA prepared by:
Mary Louise Hendrickson, Tim Stepp, John Collins, and Fred Collins - Montana DEQ, Solid Waste Section

Date: November 28, 2017

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