



State of Utah

SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF WASTE MANAGEMENT
AND RADIATION CONTROL

Douglas J. Hansen
Director

October 5, 2022

Kendal Hacking, Operations Manager
RN Industries, DHI
P.O. Box 1168
Vernal, UT 84078

RE: Draft Permit Review - RN Industries (RNI) Ace Landfill
SW476

Dear Mr. Hacking:

The Division of Waste Management and Radiation Control (Division) has received and evaluated the RNI Ace Landfill Application dated December 28, 2020 (DSHW-2020-018771) and the additional information provided July 12, 2022 (DSHW-2022-020545). A draft permit has been prepared and is attached with this letter for your review.

When you are finished reviewing the draft permit and your comments have been resolved, a 30-day public comment period will be started. Also, during this period, a public hearing may be scheduled. At the end of the comment period, any comments received will be addressed, and if necessary, changes will be made to the draft permit. Assuming no unresolvable issues remain, upon completion of this process you will be issued a final permit that is valid for 10 years.

If you have any questions, please call Doug Taylor at (801) 536-0240.

Sincerely,

Brian Speer, Solid Waste Program Manager
Division of Waste Management and Radiation Control

(Over)

BS/DWT/wa

Enclosures: Draft Permit – RN Industries (RNI) Ace Landfill (DSHW-2022-001164)
Attachment 1 – Landfill Design and Construction (DSHW-2022-001166)
Attachment 2 – Operations Plan (DSHW-2022-001168)
Attachment 3 – Groundwater Monitoring (DSHW-2022-001170)
Attachment 4 – Closure and Post-Closure Plan (DSHW-2022-001172)

c: Kirk Bengel, Health Officer, Tri-County Health Department
Darrin Brown, LEHS, Environmental Health Director, Tri-County Health Department
Nathan Hall, P.E., District Engineer, UDEQ
Joe Ozimek, Environmental Specialist, DHI (Email)
Jon Peadar, GEOSTRATA (Email)

DIVISION OF WASTE MANAGEMENT
AND RADIATION CONTROL
SOLID WASTE LANDFILL PERMIT

**Ace Disposal Oil and Gas
Exploration and Production Waste Landfill (Landfill)**

Pursuant to *Utah Solid and Hazardous Waste Act*, Title 19, Chapter 6, Part 1, Utah Code Annotated (Utah Code Ann.) (the Act) and the *Utah Solid Waste Permitting and Management Rules*, Utah Administrative Code R315-301 through 320 adopted thereunder, a Permit is issued to

RNI Industries as owner and operator (Permittee),

to own, construct, and operate the Landfill located in the NE ¼ of the NE 1/4 of Section 3 Township 6 South, Range 20 East, Salt Lake Base and Meridian, Uintah County, Utah as shown in the Permit Application that was determined complete on September 1, 2021 (DSHW-2021-012122).

The Permittee is subject to the requirements of R315-301 through 320 of the Utah Administrative Code and the requirements set forth herein.

All references to R315-301 through 320 of the Utah Administrative Code are to regulations that are in effect on the date that this permit becomes effective.

This Permit shall become effective _____ 2022.

Closure Cost Revision Date: _____ .2027

This Permit shall expire at midnight _____ 2032.

Signed this ____ day of _____, 2022

Douglas J. Hansen, Director
Division of Waste Management and Radiation Control

FACILITY OWNER/OPERATOR INFORMATION

LANDFILL NAME: Ace Disposal Oil and Gas Exploration and
Production Waste Landfill

OWNER NAME: RN Industries

OWNER ADDRESS: P.O. Box 1168
Vernal, Utah 84078

OWNER PHONE NO.: 435-722-2800

OPERATOR NAME: RN Industries

OPERATOR ADDRESS: P.O. Box 1168
Vernal, Utah 84078

OPERATOR PHONE NO.: 435-722-2800

TYPE OF PERMIT: Oil and Gas Exploration and Production (E&P)
Waste Landfill

PERMIT NUMBER: 2201

LOCATION: Landfill located in the NE ¼ of the NE ¼ of
Section 3 Township 6 South, Range 20 East, Salt
Lake Base and Meridian, Uintah County, Utah
Lat. 40° 20' 01", Long. -109° 38' 37"

The term, "Permit," as used in this document is defined in R315-301-2(55) of the Utah Administrative Code. "Director" as used throughout this permit refers to the Director of the Division of Waste Management and Radiation Control

The Permit application for the Landfill was deemed complete on the date shown on the signature page of this Permit. All representations made in the attachments of this permit are enforceable under R315-301-5(2) of the Utah Administrative Code. Where differences in wording exist between this Permit and the attachments, the wording of this Permit supersedes that of the attachments.

This Permit consists of the signature page, Facility Owner/Operator Information section, sections I through V, and all attachments to this Permit.

The facility as described in this Permit consists of an Oil and Gas Exploration and Production Waste Landfill.

Compliance with this Permit does not constitute a defense to actions brought under any other local, state, or federal laws. This Permit does not exempt the Permittee from obtaining any other local, state, or federal permits or approvals required for the facility operation.

The issuance of this Permit does not convey any property rights, in either real or personal property, or any exclusive privileges. Nor does this Permit authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations, including zoning ordinances.

The provisions of this Permit are severable. If any provision of this Permit is held invalid for any reason, the remaining provisions shall remain in full force and effect. If the application of any provision of this Permit to any circumstance is held invalid, its application to other circumstances shall not be affected.

By this Permit, the Permittee is subject to the following conditions.

PERMIT REQUIREMENTS

I. GENERAL COMPLIANCE RESPONSIBILITIES

I.A. General Operation

I.A.1. The Permittee shall operate the landfill in accordance with the requirements of this permit. For the purpose of this Permit, requirements pertaining to Class IIIb landfills found in R315-304 of the Utah Administrative Code, that are in effect as of the date of this Permit, shall apply regardless of any apparent or stated exemptions in the Utah Administrative Code. Any permit noncompliance or noncompliance with any applicable portions of Utah Code Ann. § 19-6-101 through 125 and applicable portions of R315-301 through 320 of the Utah Administrative Code constitutes a violation of the Permit or applicable statute or rule and is grounds for appropriate enforcement action, permit revocation, or modification, termination, or denial of a permit renewal application.

I.B. Acceptable Waste

I.B.1. This Permit is for disposal of nonhazardous industrial solid waste, as defined in R315-301-2(35) of the Utah Administrative Code, generated by the oil and gas industry as described in the Permit Application.

I.C. Prohibited Waste

- I.C.1. Hazardous waste as defined by R315-261 of the Utah Administrative Code;
- I.C.2. PCBs as defined by R315-301-2(53) of the Utah Administrative Code, except PCB's specified by R315-315-7(2)(a) and (c) of the Utah Administrative Code;
- I.C.3. Household waste;
- I.C.4. Municipal waste;
- I.C.5. Commercial waste; and
- I.C.6. Regulated asbestos-containing material.
- I.C.7. Any prohibited waste received and accepted for disposal at the facility shall constitute a violation of this Permit, of Utah Code Ann. § 19-6-101 through 125 and of R315-301 through 320 of the Utah Administrative Code.

I.D. Inspections and Inspection Access

I.D.1. The Permittee shall allow the Director or an authorized representative, or representatives from the Tri-County Health Department, to enter at reasonable times and:

- I.D.1.a Inspect the landfill or other premises, practices or operations regulated or required under the terms and conditions of this Permit or R315-301 through 320 of the Utah Administrative Code;
- I.D.1.a.(i) Have access to and copy any records required to be kept under the terms and conditions of this Permit or R315-301 through 320 of the Utah Administrative Code;
- I.D.1.a.(ii) Inspect any loads of waste, treatment facilities or processes, pollution management facilities or processes, or control facilities or processes required under this Permit or regulated under R315-301 through 320 of the Utah Administrative Code; and
- I.D.1.a.(iii) Create a record of any inspection by photographic, video, electronic, or any other reasonable means.

I.E. Noncompliance

- I.E.1. If monitoring, inspection, or testing indicates that any permit condition or any applicable rule under R315-301 through 320 of the Utah Administrative Code may be or is being violated, the Permittee shall promptly make corrections to the operation or other activities to bring the facility into compliance with all permit conditions or rules.
- I.E.2. In the event of noncompliance with any permit condition or violation of an applicable rule, the Permittee shall promptly take any action reasonably necessary to correct the noncompliance or violation and mitigate any risk to the human health or the environment. Actions may include eliminating the activity causing the noncompliance or violation and containment of any waste or contamination using barriers or access restrictions, placing of warning signs, or permanently closing areas of the facility.
- I.E.3. The Permittee shall:
 - I.E.3.a Document the noncompliance or violation in the daily operating record, on the day the event occurred or the day it was discovered;
 - I.E.3.b Notify the Director of the Utah Division of Waste Management and Radiation Control by telephone within 24 hours, or the next business day following documentation of the event; and
 - I.E.3.c Give written notice of the noncompliance or violation and measures taken to protect human health and the environment within seven days after Director notification.
- I.E.4. Within thirty days after the documentation of the event, the Permittee shall submit to the Director a written report describing the nature and extent of the noncompliance or violation and the remedial measures taken or to be taken to protect human health and the environment and to eliminate the noncompliance or violation. Upon receipt and review of the assessment report, the Director may order the Permittee to perform appropriate remedial measures, including development of a site remediation plan for approval by the Director.

I.E.5. In an enforcement action, the Permittee may not claim as a defense that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with R315-301 through 320 of the Utah Administrative Code and this Permit.

I.F. Revocation

I.F.1. This Permit is subject to revocation if the Permittee fails to comply with any condition of the Permit. The Director will notify the Permittee in writing prior to any proposed revocation action and such action shall be subject to all applicable hearing procedures established under R305-7 of the Utah Administrative Code and the Utah Administrative Procedures Act.

I.G. Attachment Incorporation

I.G.1. Attachments to this Permit are enforceable conditions of this Permit, as are documents incorporated by reference into the attachments. Language in this Permit supersedes any conflicting language in the attachments or documents incorporated into the attachments.

II. DESIGN AND CONSTRUCTION

II.A. Design and Construction

II.A.1. The landfill shall be constructed according to the design outlined in Attachment #1 and in the area designated in Attachment #1, including landfill cells, fences, gates, and berms prior to acceptance of waste.

II.A.2. The Permittee shall notify the Director upon completion of construction of any landfill cells or run-on and run-off diversion systems. No landfill cells or run-on and run-off diversion system may be used until construction is approved by the Director and this permit modified.

II.A.3. The Permittee shall notify the Director of the completion of construction of any final cover system and shall provide all necessary documentation and shall apply for approval of the construction from the Director and modification of this permit.

II.A.4. If ground water is encountered during excavation of the landfill, the Director shall be notified immediately, and an alternative construction design developed and submitted for approval.

All engineering drawings submitted to the Director shall be stamped by a professional engineer with a current registration in Utah.

II.B. Run-On Control

II.B.1. The Permittee shall construct drainage channels and diversions as specified in Attachment # 1 and shall maintain them at all times to effectively prevent runoff from the surrounding area from entering the landfill.

III. LANDFILL OPERATION

III.A. Operations Plan

III.A.1. The Permittee shall keep the Operations Plan included in Attachment #2 on site at the landfill or at the location designated in section III.H of this Permit. The Permittee shall operate the landfill in accordance with the operations plan. If necessary, the Permittee may modify the Operations Plan, provided that the modification meets all of the requirements of R315-301 through 320 of the Utah Administrative Code, is as protective of human health and the environment as the Operations Plan approved as part of this Permit, and is approved by the Director as a permit modification under R315-311-2(1) of the Utah Administrative Code. The Permittee shall note any modification to the Operations Plan in the daily operating record.

III.B. Security

III.B.1. The Permittee shall operate the Landfill so that unauthorized entry to the facility is restricted. The Permittee shall:

III.B.1.a Lock all facility gates and other access routes during the time the landfill is closed.

III.B.1.b Have at least one person employed by the Permittee at the landfill during all hours that the landfill is open.

III.B.1.c Construct all fencing and any other access controls as shown in Attachment #1 to prevent access by persons or livestock by other routes.

III.C. Training

III.C.1. The Permittee shall provide training for on-site personnel in landfill operation, including waste load inspection, hazardous waste identification, and personal safety and protection.

III.D. Burning of Waste

III.D.1. Intentional burning of solid waste is prohibited and is a violation of R315-303-4(2)(b) of the Utah Administrative Code.

III.D.2. The Permittee shall extinguish all accidental fires as soon as reasonably possible.

III.E. Cover

III.E.1. The Permittee shall cover the waste or apply moisture as necessary to control fugitive dust. The Permittee shall record in the daily operating record and the operator shall certify, at the end of each day of operation when waste, cover and moisture are placed; the amount and type of cover placed and the area receiving cover.

III.F. Waste Inspections

- III.F.1. The Permittee shall visually inspect incoming waste loads to verify that no wastes other than those allowed by this permit are disposed in the landfill. The Permittee shall conduct a complete waste inspection at a minimum frequency of 1 % of incoming loads, but no less than one complete inspection per day. The Permittee shall select the loads to be inspected on a random basis.
- III.F.2. The Permittee shall inspect all loads that the Permittee suspects may contain a waste not permitted for disposal at the landfill.
- III.F.3. The Permittee shall conduct complete random inspections as follows:
 - III.F.3.a The Permittee shall conduct the random waste inspection at the working face or at an area designated by the Permittee.
 - III.F.3.b The Permittee shall direct that loads subjected to complete inspection be unloaded at the designated area;
 - III.F.3.c Loads shall be spread by equipment or by hand tools;
 - III.F.3.d Personnel trained in hazardous waste recognition and recognition of other unacceptable waste shall conduct a visual inspection of the waste; and
 - III.F.3.e The personnel conducting the inspection shall record the results of the inspection on a waste inspection form as found in Attachment #2. The Permittee shall place the form in the daily operating record at the end of the operating day.
 - III.F.3.f The Permittee or the waste transporter shall properly dispose of any waste found that is not acceptable at the facility at an approved disposal site for the waste type and handle the waste according to the rules covering the waste type.

III.G. Self Inspections

- III.G.1. The Permittee shall inspect the facility to prevent malfunctions and deterioration, operator errors, and discharges that may cause or lead to the release of wastes or contaminated materials to the environment or create a threat to human health or the environment. The Permittee shall complete these general inspections no less than quarterly and shall cover the following areas: Waste placement, compaction, cover; fences and access controls; roads; run-on/run-off controls; ground water monitoring wells; final and intermediate cover; litter controls; and records. The Permittee shall place a record of the inspections in the daily operating record on the day of the inspection. The Permittee shall correct the problems identified in the inspections in a timely manner and document the corrective actions in the daily operating record.

III.H. Recordkeeping

- III.H.1. The Permittee shall maintain and keep on file at the facility, a daily operating record and other general records of landfill operation as required by R315-302-2(3) of the Utah Administrative Code. The landfill operator, or other designated personnel, shall

date and sign the daily operating record at the end of each operating day. Each record to be kept shall contain the signature of the appropriate operator or personnel and the date signed. The Daily operating record shall consist of the following two types of documents:

III.H.1.a Records related to the daily landfill operation or periodic events including:

III.H.1.a.(i) The number of loads of waste and the weights or estimates of weights or volume of waste received each day of operation and recorded at the end of each operating day;

III.H.1.a.(ii) Major deviations from the approved plan of operation recorded at the end of the operating day the deviation occurred;

III.H.1.a.(iii) Results of monitoring required by this Permit recorded in the daily operating record on the day of the event or the day the information is received;

III.H.1.a.(iv) Records of all inspections conducted by the Permittee, results of the inspections, and corrective actions taken shall be recorded in the record on the day of the event.

III.H.1.b Records of a general nature including:

III.H.1.b.(i) A copy of this Permit, including all attachments;

III.H.1.b.(ii) Results of inspections conducted by representatives of the Director of the Division of Waste Management and Radiation Control, and of representatives of the local Health Department, when forwarded to the Permittee;

III.H.1.b.(iii) Closure and Post-closure care plans; and

III.H.1.b.(iv) Records of employee training.

III.I. Reporting

III.I.1. The Permittee shall prepare and submit to the Director an Annual Report as required by R315-302-2(4) of the Utah Administrative Code. The Annual Report shall include: the period covered by the report, the annual quantity of waste received, an annual update of the financial assurance mechanism and all training programs completed.

III.J. Roads

III.J.1. The Permittee shall improve and maintain all access roads within the landfill boundary that are used for transporting waste to the landfill for disposal as necessary to assure safe and reliable all-weather access to the disposal area.

III.K. Ground Water Monitoring

III.K.1. The Permittee shall monitor the ground water underlying the landfill in accordance with the Ground Water Monitoring Plan and the Ground Water Monitoring Quality Assurance/Quality Control Plan contained in Attachment # 3. If necessary, the

Permittee may modify the Ground Water Monitoring Plan and the Ground Water Monitoring Quality Assurance/Quality Control Plan, provided that the modification meets all of the requirements of R315-301 through 320 of the Utah Administrative Code and is as protective of human health and the environment as that approved in Attachment #3, and is approved by the Director as a minor modification under R315-311-2(1)(a) of the Utah Administrative Code. The Permittee shall note in the daily operating record any modification to the Ground Water Monitoring Plan and the Ground Water Monitoring Quality Assurance/Quality Control Plan. A plan change that the Director finds to be less protective of human health or the environment than the approved plan is a major modification and is subject to the requirements of R315-311 of the Utah Administrative Code.

IV. CLOSURE REQUIREMENTS

IV.A. Closure

- IV.A.1. Final cover of the landfill shall be as shown in Attachment #4. The final cover shall meet, at a minimum, the standard design for closure as specified in R315-305-5(5)(b) of the Utah Administrative Code.
- IV.A.2. This Permittee has demonstrated through geologic, hydrogeologic, climatic, waste stream, cover material properties, infiltration factors, and other factors that the landfill will not contaminate ground water and is approved for the alternative cover design as outlined in the Permit Application. Upon a finding by the Director of any contamination of ground water resulting from the landfill, the Director may revoke this alternative cover design approval and the Director may require placement of a cover meeting the requirements of R315-303-3(4)(a) of the Utah Administrative Code or other remedial action as required by the Director.

IV.B. Title Recording

- IV.B.1. The Permittee shall meet the requirements of R315-302-2(6) of the Utah Administrative Code by recording a notice with the Duchesne County Recorder as part of the record of title that the property has been used as a landfill. The notice shall include waste disposal locations and types of waste disposed. The Permittee shall provide the Director the notice as recorded.

IV.C. Post-Closure Care

- IV.C.1. The Permittee shall perform post-closure care at the closed landfill in accordance with the Post-Closure Care Plan contained in the Permit Application. Post-closure care shall continue until all waste disposal sites at the landfill have stabilized and the finding of R315-302-3(7)(c) of the Utah Administrative Code is made.

IV.D. Financial Assurance

- IV.D.1. The Permittee shall establish and fund the approved mechanism, as described in the Permit Application, prior to receipt of waste. The Permittee shall adequately fund and

maintain the financial assurance mechanism(s) to provide for the cost of closure at any stage or phase or anytime during the life of the landfill or the permit life, whichever is shorter. The Permittee shall keep the approved financial assurance mechanism in effect and active until closure and post-closure care activities are completed and the Director has released the facility from all post-closure care requirements.

IV.D.2. The Permittee shall notify the Director of the establishment of the approved financial assurance mechanism and shall receive acknowledgment from the Director that the established mechanism complies with the approved method prior to the acceptance of waste.

IV.E. Financial Assurance Annual Update

IV.E.1. The Permittee shall submit an annual revision of closure and post-closure costs for inflation and financial assurance funding as required by R315-309-2(2) of the Utah Administrative Code, to the Director as part of the annual report.

IV.E.2. Closure Cost and Post-Closure Cost Revision

IV.E.3. The Permittee shall submit a complete revision of the closure and post-closure cost estimates by the Closure Cost Revision Date listed on the signature page of this Permit and any time the facility is expanded, any time a new cell is constructed, or any time a cell is expanded.

V. ADMINISTRATIVE REQUIREMENTS

V.A. Permit Modification

V.A.1. Modifications to this Permit may be made upon application by the Permittee or by the Director following the procedures specified in R315-311 of the Utah Administrative Code. The Permittee shall be given written notice of any permit modification initiated by the Director.

V.A.2. Permit Transfer

V.A.2.a This Permit may be transferred to a new Permittee or new Permittees by complying with the permit transfer provisions specified in R315-310-11 of the Utah Administrative Code.

V.B. Expansion

V.B.1. This Permit is for the operation of an Oil and Gas Exploration and Production Waste Landfill according to the design and Operation Plan described and explained in the Permit Application. Any expansion of the current footprint designated in the description contained in the Permit Application, but within the property boundaries designated in the Permit Application, shall require submittal of plans and specifications to the Director. The plans and specifications shall be approved by the Director prior to construction.

- V.B.2. Any expansion of the landfill facility beyond the property boundaries designated in the description contained in the Permit Application shall require submittal of a new Permit Application in accordance with the requirements of R315-310 of the Utah Administrative Code.
- V.B.3. Any addition to the list of acceptable waste in Section I.B shall require submittal of all necessary information to the Director and the approval of the Director.
- V.C. Expiration
- V.C.1. If the Permittee desires to continue operating this landfill after the expiration date of this Permit, the Permittee shall submit an application for permit renewal at least six months prior to the expiration date, as shown on the signature (cover) page of this Permit. If the Permittee timely submits a permit renewal application and the permit renewal is not complete by the expiration date, this Permit shall continue in force until renewal is completed or denied.
- V.D. Status Notification
- V.D.1. Eighteen months from the date of this Permit, the Permittee shall notify the Director in writing of the status of the construction of this facility unless construction is complete and operation has commenced. If construction has not begun within 18 months, the Permittee shall submit adequate justification to the Director as to the reasons that construction has not commenced. If no submission is made or the submission is judged inadequate by the Director, this Permit shall be revoked.
- V.E. Construction Approval and Request to Operate
- V.E.1. The Permittee shall meet each of the following conditions prior to receipt of waste:
- V.E.1.a The Permittee shall notify the Director that all the requirements of this Permit have been met and all required facilities, structures and accounts are in place.
- V.E.1.b The Permittee shall submit to the Director, for approval, documentation that all local zoning requirements and local government approvals have been obtained for operation of this landfill prior to construction of any portion of the landfill; including offices, fences, and gates.
- V.E.1.c The Permittee shall demonstrate that the lowest level of the landfill liner is greater than 5 feet from the historic high ground water elevation. The Permittee shall submit documentation of this demonstration for approval by the Director.
- V.E.1.d The Permittee shall obtain from the Director written approval, prior to receipt of waste that all information required by this section has been submitted and the information meets the requirements of this Permit and R315-301 through 320 of the Utah Administrative Code.

Attachments to this Permit

Attachment 1 – Landfill Design and Construction

Attachment 2 – Operations Plan

Attachment 3 – Groundwater Monitoring

Attachment 4 – Closure and Post-Closure Plan

DRAFT

Attachment 1
Landfill Design and Construction

BINDING EDGE

RN INDUSTRIES ACE DISPOSAL FACILITY

POND 6 LANDFILL CONVERSION

November 13, 2019

SECTION 3, TOWNSHIP 6 SOUTH, RANGE 20 EAST,
UINTAH SPECIAL BASE AND MERIDIAN



				SCALE NONE		LOCATION	UINTAH COUNTY, UTAH	
						PROJECT	ACE DISPOSAL LANDFILL	
A	10-18-19	BER	PERMIT DRAWINGS			TITLE	COVER SHEET	
REV	DATE	BY	DESCRIPTION					

BINDING EDGE

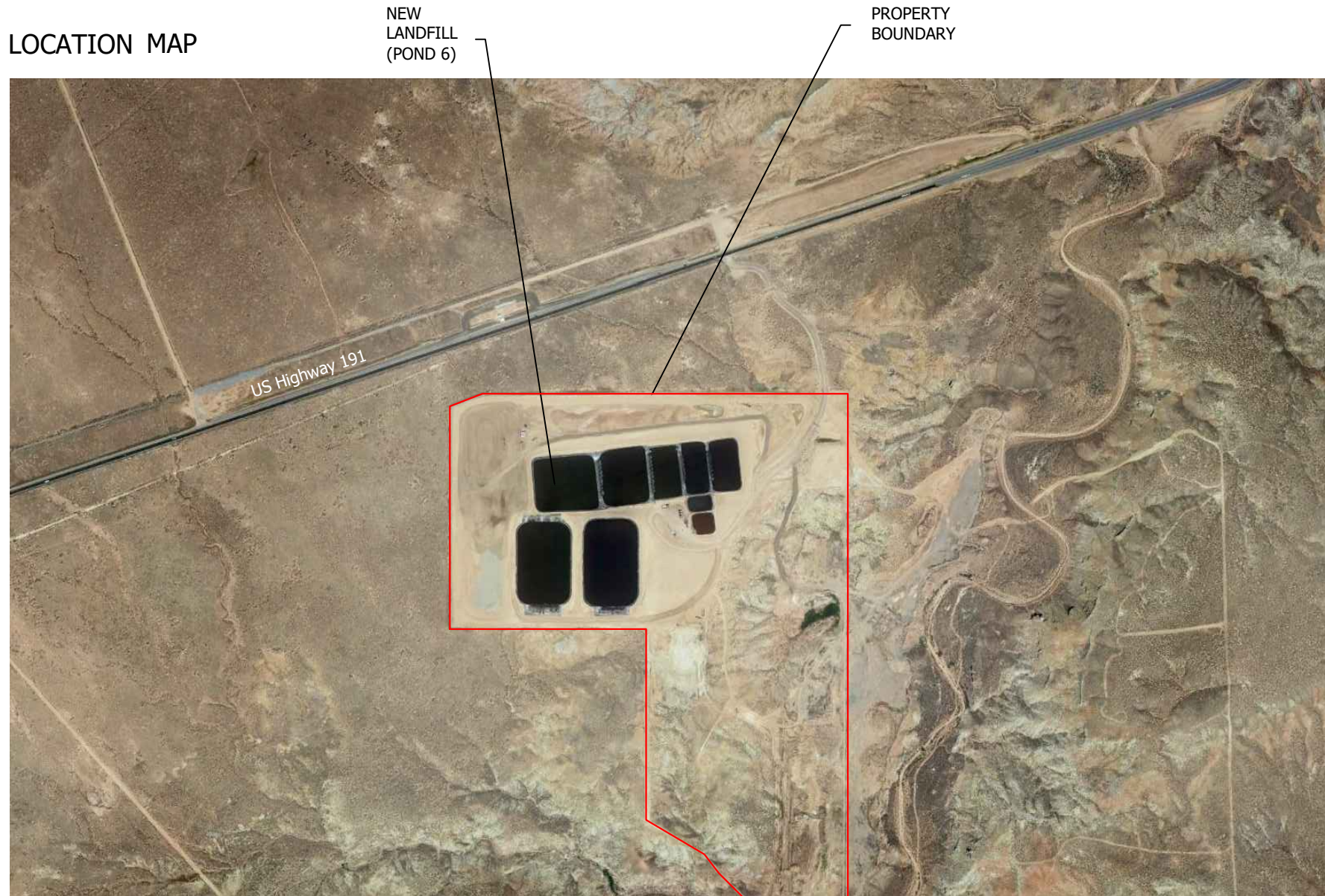
ABBREVIATIONS

ADJ	ADJUST
ADS	ADVANCE DRAINAGE SYSTEM
ARV	AIR RELEASE VALVE
BC	BAR AND CAP
BOW	BACK OF WALK
BVCE	BEGINNING VERTICAL CURVE ELEV.
BVCS	BEGINNING VERTICAL CURVE STATION
CB	CATCH BASIN
CH	CHORD BEARING
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
CONC	CONCRETE
COR	SECTION CORNER
D	DELTA ANGLE
DET	DETAIL
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DWG	DRAWING
EG	EXISTING GRADE
ELEV	ELEVATION
EOC	EDGE OF CONCRETE
EP	EDGE OF PAVEMENT
EVCE	END VERTICAL CURVE ELEV.
EVCS	END VERTICAL CURVE STATION
EW	EACH WAY
EX	EXISTING
FFE	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLOWLINE
FO	FIBER OPTICS
FT	FOOT
GB	GRADE BREAK
HC	HANDICAP
HDPE	HIGH DENSIT POLYETHYLENE
HP	HIGH POINT
INV	INVERT
IRR	IRRIGATION
LF	LINEAR FEET
LIP	LIP OF CURB
LP	LOW POINT
LT	LEFT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MON	MONUMENT
NTS	NOT TO SCALE
OC	ON CENTER
OHP	OVER HEAD POWER
PC	POINT OF CURVE
PI	POINT OF INTERSECTION
PL	PROPERTY LINE
PP	POWER POLE
PRC	POINT OF REVERSE CURVE
PRV	PRESSURE REDUCING
PT	POINT OF TANGENCY
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE PIPE
R	RADIUS
ROW	RIGHT OF WAY
RT	RIGHT
S	SEWER
SD	STORM DRAIN
SER	SOUTH END RADIUS
SSMH	SEWER MANHOLE
STA	STATION
STD	STANDARD
SW	SECONDARY WATER
TBC	TOP BACK OF CURB
TOA	TOP OF ASPHALT
TOE	TOE OF SLOPE
TOP	TOP OF SLOPE
TOW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND POWER
VPC	VERTICAL POINT OF CURVE
VPI	VERTICAL POINT OF INTERSECTION
VPT	VERTICAL POINT OF TANGENCY
W	WATER
WM	WATER METER
WV	WATER VALVE

SHEET INDEX

	COVER SHEET
B1	INDEX AND LEGEND
B2	GENERAL NOTES
B3	OVERALL SITE PLAN
B4	PLAN 7 PROFILE POND 6 EAST TO WEST
B5	PLAN 7 PROFILE POND 6 NORTH TO SOUTH
B6	LANDFILL DETAILS
B7	WORK SITE DETAIL
B8	STAGING AREA DETAIL
B9	COMPLETED DETAIL

LOCATION MAP



REV	DATE	BY	DESCRIPTION
A	10-18-19	BER	PERMIT DRAWINGS

SCALE
AS SHOWN



LOCATION	UINTAH COUNTY, UTAH	B-1
PROJECT	ACE DISPOSAL LANDFILL	
TITLE	INDEX & LEGEND	NO

BINDING EDGE

GENERAL NOTES

1. THE DESIGN IS AN ORIGINAL UNPUBLISHED WORK AND MAY NOT BE DUPLICATED, PUBLISHED AND/OR USED WITHOUT THE WRITTEN CONSENT OF GEOSTRATA, LLC.
2. ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH PERTINENT JURISDICTIONAL CODES, RESTRICTIONS, COVENANTS, AND/OR ORDINANCES. ANY CONFLICT BETWEEN DESIGN AND REQUIREMENT SHALL BE REPORTED TO GEOSTRATA, LLC BEFORE PROCEEDING. FAILURE TO DO SO VOIDS THE DESIGN.
3. ANY AND ALL PROPOSED CHANGE, MODIFICATIONS AND/OR SUBSTITUTION SHALL BE REPORTED TO GEOSTRATA, LLC BEFORE PROCEEDING. ANY DEVIATION FROM THE CONTRACT DOCUMENTS, WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF GEOSTRATA, LLC VOIDS THE DESIGN.
4. IN THE EVENT OF CONFLICT BETWEEN THE DESIGN DOCUMENTS AND/OR JURISDICTIONAL REQUIREMENTS, THE MORE RESTRICTIVE FROM THE STANDPOINT OF SAFETY AND PHYSICAL SECURITY SHALL APPLY.
5. ANY INSTALLATION OR WORK NEXCESSARY TO THE FUNCTIONING, SAFETY AND/OR PHYSICAL SECURITY OF DESIGN THAT IS TO BE ENCAPSULATED OR OTHERWISE PERMANENTLY OBSCURED FROM INSPECTION SHALL BE REPORTED TO GEOSTRATA, LLC A MINIMUM OF TWO (2) WORKING DAYS BEFORE ENCLOSURE.
6. ANY DAMAGE, DISRUPTION OR COMPROMISE OF AMBIENT RIGHTS-OF-WAY, UTILITIES, OR ENVIRONMENTAL QUALITY SHALL BE IMMEDIATELY RECTIFIED BY THE CONTRACTOR TO THE SATISFACTION OF GEOSTRATA, LLC AT NO COST TO THE OWNER.
7. ALL WORK SHALL BE INSPECTED BY GOVERNING AGENCIES IN ACCORDANCE WITH THEIR REQUIREMENTS. JURISDICTIONAL APPROVAL SHALL BE SECURED BEFORE PROCEEDING WITH WORK BY CONTRACTOR.

CONSTRUCTION NOTES

1. ALL WORK WITHIN THE SITE SHALL CONFORM TO CURRENT JURISDICTIONAL STANDARDS AND SPECIFICATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING ALL OF THE REQUIREMENTS ESTABLISHED FOR SAFE TRENCHING. (SEE OSHA AND UOSHA REQUIREMENTS, LATEST EDITIONS).
3. CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES BEFORE EXCAVATING WITHIN 200 FEET OF SAID UTILITIES WHICH MAY BE EXPOSED, DAMAGED, OR CROSSED AS SHOWN ON THE DRAWINGS OR AS "BLUE STAKED". THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE UTILITY COMPANY TO MOVE THE UTILITY IF NECESSARY OR OBTAIN PERMISSION FROM GEOSTRATA, LLC TO MODIFY GRADES OF PROJECT LINES IN ORDER TO GO AROUND EXISTING UTILITIES.
4. BURIED UTILITIES ARE SHOWN ON THE PLANS IN A GENERAL SCHEMATIC WAY ACCORDING TO INFORMATION RECEIVED FROM OTHERS. THE ACCURACY OR COMPLETENESS OF THE LOCATIONS SHOWN IS APPROXIMATE ONLY. THE CONTRACTOR SHALL DETERMINE THE ACTUAL LOCATION OF EXISTING SERVICE CONNECTIONS AND UTILITIES, VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS AND TAKE THE NECESSARY STEPS TO AVOID THEM.

EROSION CONTROL NOTES

1. AT ALL TIMES DURING CONSTRUCTION, CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING AND CONTROLLING EROSION DUE TO WIND AND RUNOFF. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING THE EROSION STORM WATER CONTROL FACILITIES READ BY CONTRACT DOCUMENTS.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING DRAINAGE AND EROSION CONTROL FACILITIES AS REQUIRED. ROADWAYS SHALL BE KEPT CLEAN OF CONSTRUCTION DEBRIS.
3. FUGITIVE DUST SHALL BE CONTROLLED BY SPRAYING WATER ON THE DRY AREAS OF THE SITE.
4. NO RUBBISH, TRASH, GARBAGE, OR THE OTHER SUCH MATERIALS SHALL BE DISCHARGED INTO DRAINAGE DITCHES OR WATERS OF THE STATE.
5. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS SHALL BE REMOVED IMMEDIATELY.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE EROSION CONTROL MEASURES (SILT FENCES, STRAW BALES, ETC.) DUE TO GRADE CHANGES OR OTHER UNFORESEEN CONDITIONS DURING DEVELOPMENT OF THE PROJECT.

LANDFILL #1 (POND 6 CONVERSION)

1. BOTTOM OF LANDFILL, NOMINAL EL. = 5,030 FT
2. TOP OF LANDFILL, NOMINAL EL. = 5,062 FT
3. INBOARD SLOPE = 3:1
4. OUTBOARD SLOPE = 3:1
5. FINAL COVER GRADE = 2%
6. LANDFILL VOLUME (EXCLUDING BASE AND CAP MATERIAL) = 105,863 CY
7. VOLUME OF 6" LEACHATE SAND = 2,500 CY
8. VOLUME OF 6" PROTECTIVE SOIL = 2,550 CY
9. VOLUME OF 8" OF TOP SOIL CAP = 4,400 CY
10. VOLUME OF 6" OF CLAY CAP (K=10^-6) = 3,300 CY
11. SURFACE AREA OF TOP SOIL = 180,000 SF



CAUTION NOTICE TO CONTRACTOR

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO STAKING OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

CONTRACTOR AGREES THAT IT SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY: THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO THE NORMAL WORKING HOURS; AND THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXPECTING FOR LIABILITY ARISING FROM SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.



				SCALE AS SHOWN		LOCATION	UINTAH COUNTY, UTAH	B-2
						PROJECT	ACE DISPOSAL LANDFILL	
A	10-18-19	BER	PERMIT DRAWINGS			TITLE	GENERAL NOTES	NO
REV	DATE	BY	DESCRIPTION					

BINDING EDGE



WORK SITE

GeoStrata

2016 PHOTOGRAPHY

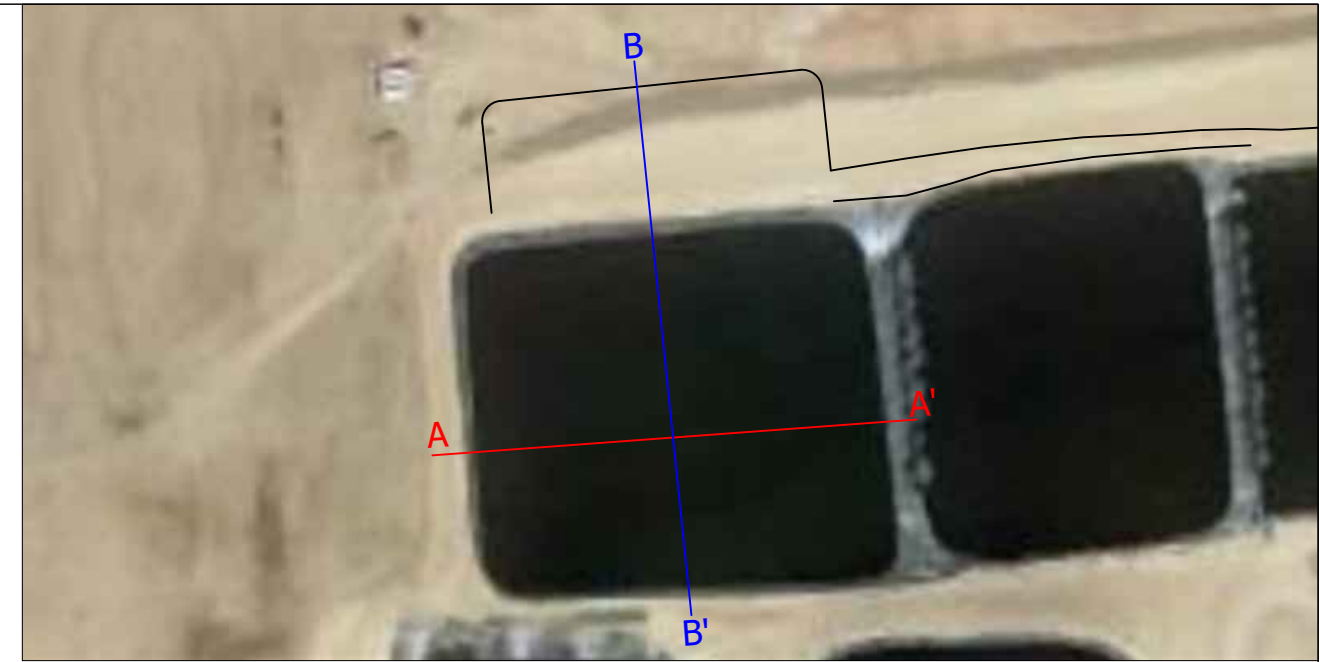
REV	DATE	BY	DESCRIPTION
A	10-18-19	BER	PERMIT DRAWINGS

SCALE
AS SHOWN



LOCATION	UINTAH COUNTY, UTAH
PROJECT	ACE DISPOSAL LANDFILL
TITLE	OVERALL SITE PLAN

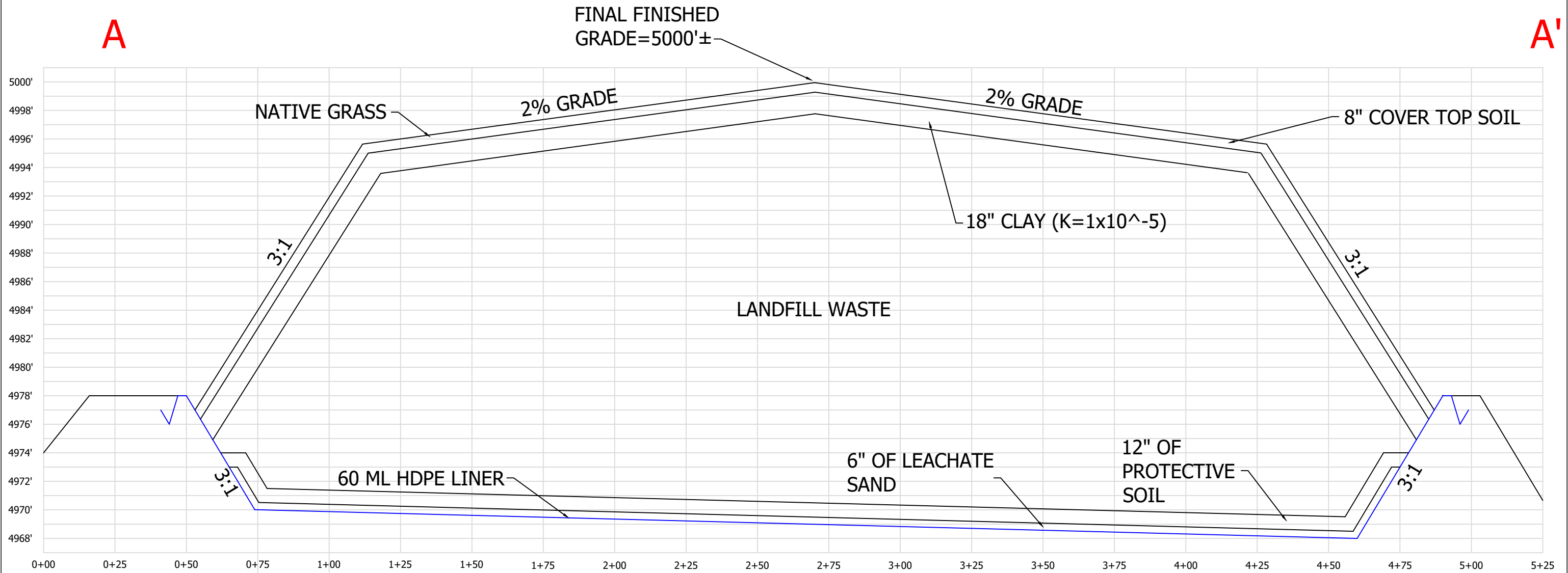
B-3
NO



A

A'

BINDING EDGE

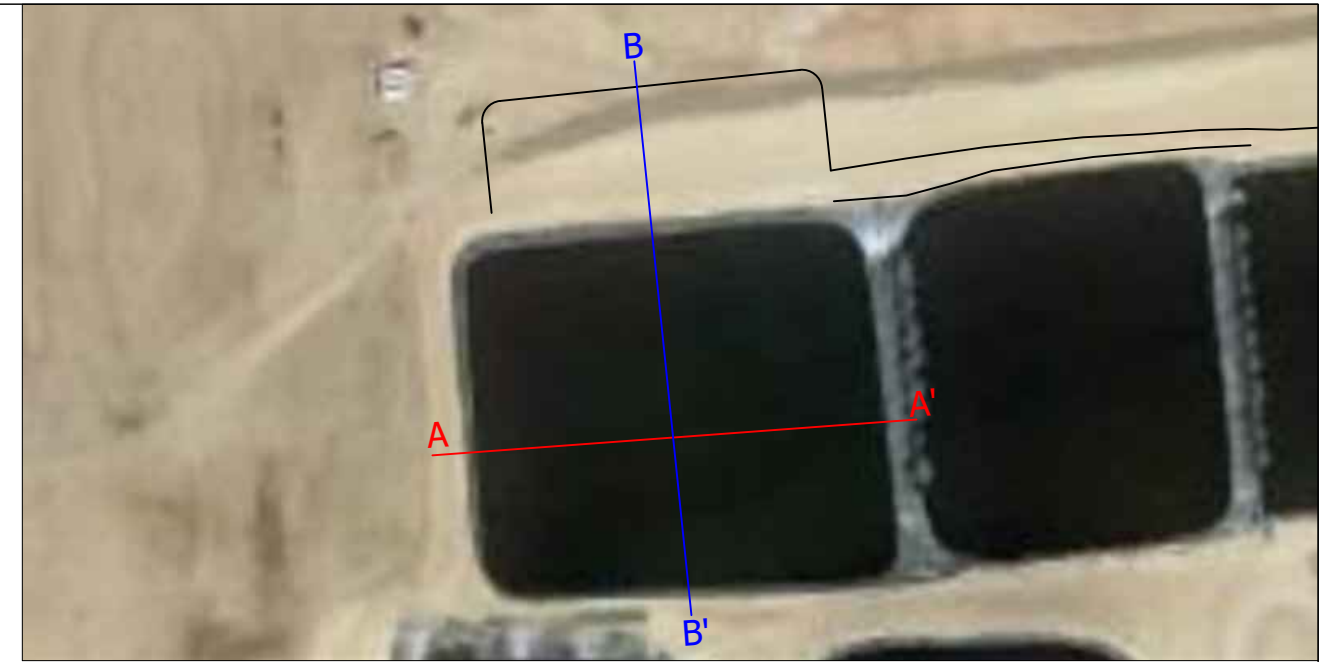


A	10-18-19	BER	PERMIT DRAWINGS
REV	DATE	BY	DESCRIPTION

SCALE
AS SHOWN



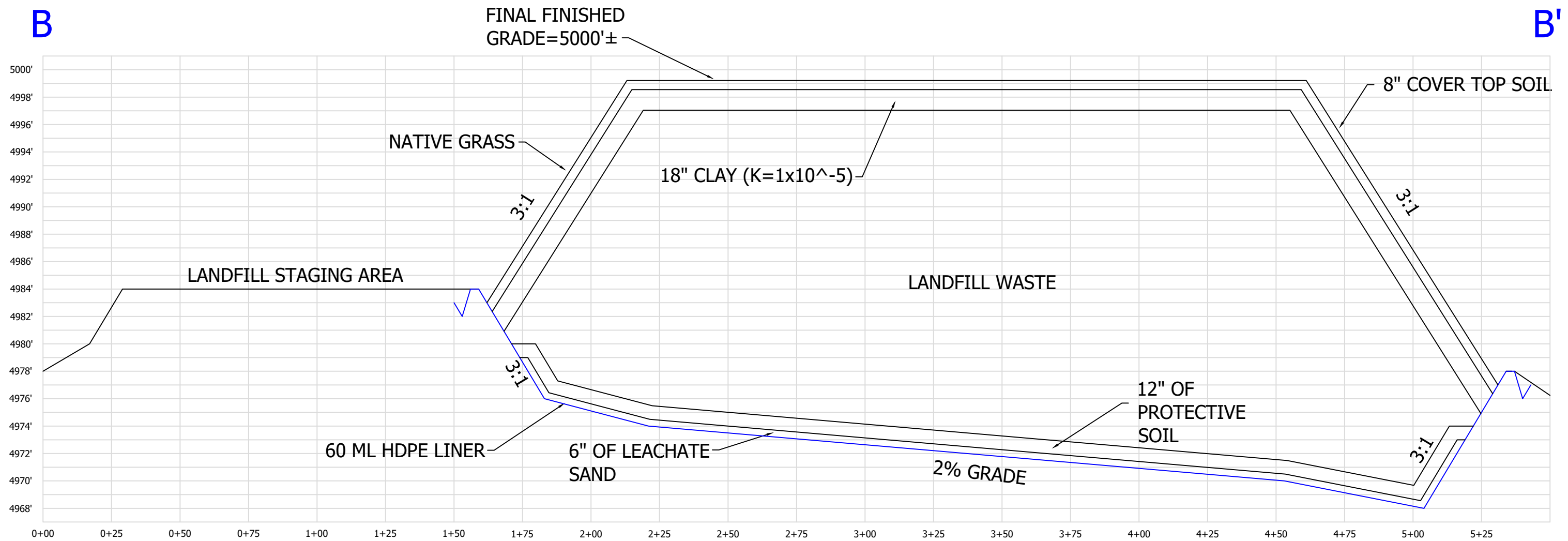
LOCATION	DUCHESNE COUNTY, UTAH	B-4
PROJECT	ACE DISPOSAL LANDFILL	
TITLE	PLAN & PROFILE POND 6 EAST TO WEST	NO



BINDING EDGE

B

B'

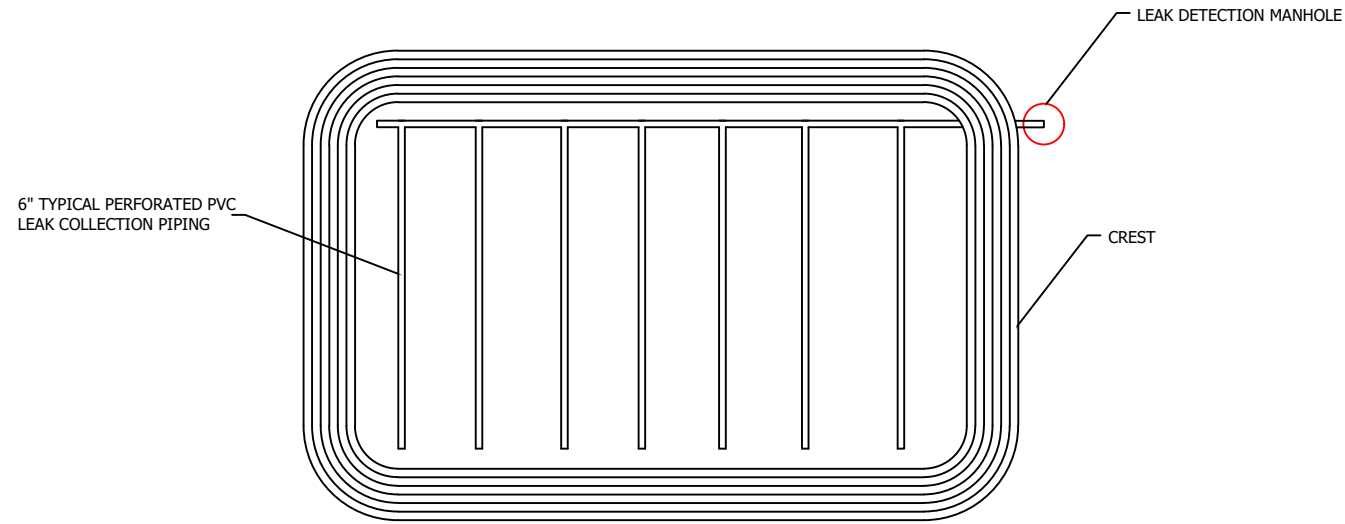


A	10-18-19	BER	PERMIT DRAWINGS
REV	DATE	BY	DESCRIPTION

SCALE
AS SHOWN

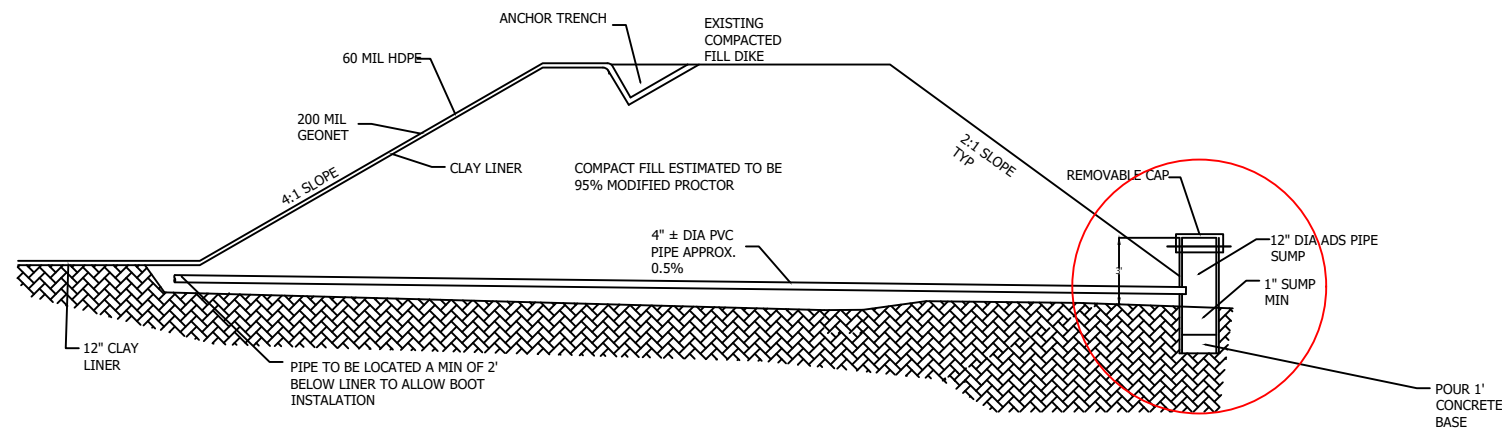


LOCATION	DUCHESNE COUNTY, UTAH	B-5
PROJECT	ACE DISPOSAL LANDFILL	
TITLE	PLAN & PROFILE POND 6 NORTH TO SOUTH	NO



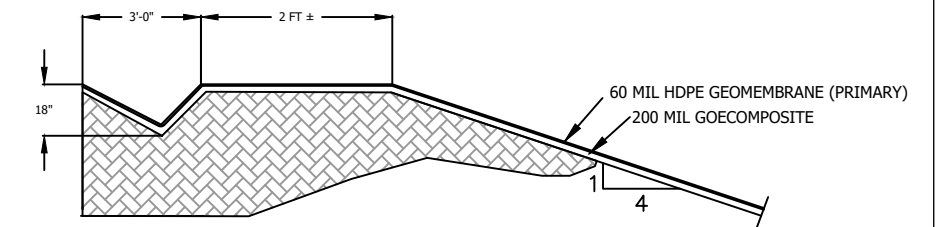
TYPICAL LEAK PIPING PLAN

LEAK COLLECTION PIPING IS SHOWN AS HAS BEEN DESCRIBED BY THE POND BUILDERS. IT IS AT BEST AN APPROXIMATE REPRESENTATION OF WHAT HAS BEEN INSTALLED. ACTUAL PIPE MATERIALS, SLOPES, PERFORATIONS, AND INSTALLATION DETAILS ARE UNKNOWN.



LEAK DETECTION DETAIL

(VERTICAL OR HORIZONTAL)
NOT TO SCALE



TYPICAL ANCHOR TRENCH (4:1 SLOPE)

NOT TO SCALE

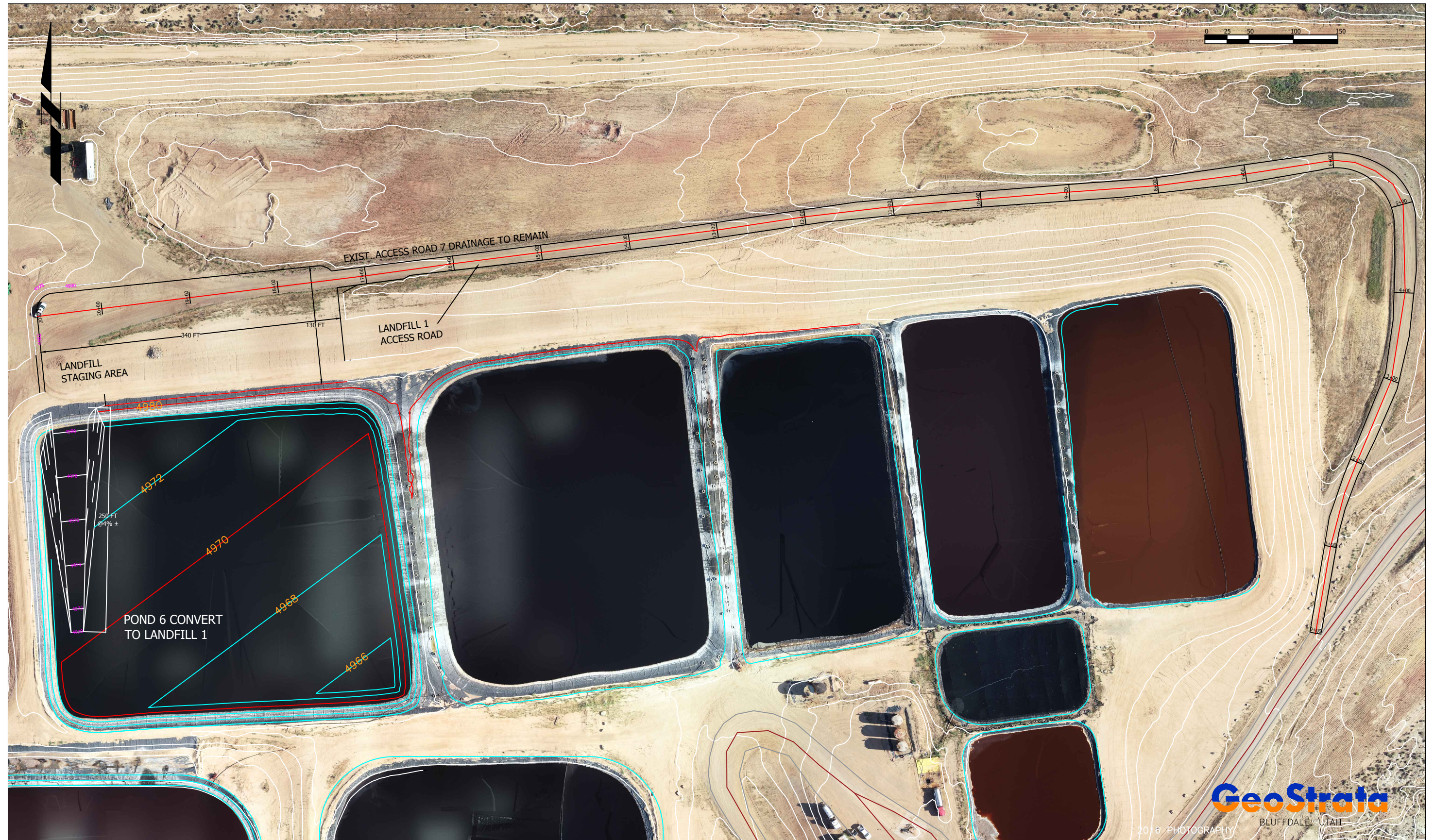


REV	DATE	BY	DESCRIPTION
A	10-18-19	BER	PERMIT DRAWINGS

SCALE
AS SHOWN



LOCATION	UINTAH COUNTY, UTAH	B-6
PROJECT	ACE DISPOSAL LANDFILL	
TITLE	LANDFILL DETAIL	NO



REV	DATE	BY	DESCRIPTION
A	10-18-19	BER	PERMIT DRAWINGS

SCALE
AS SHOWN

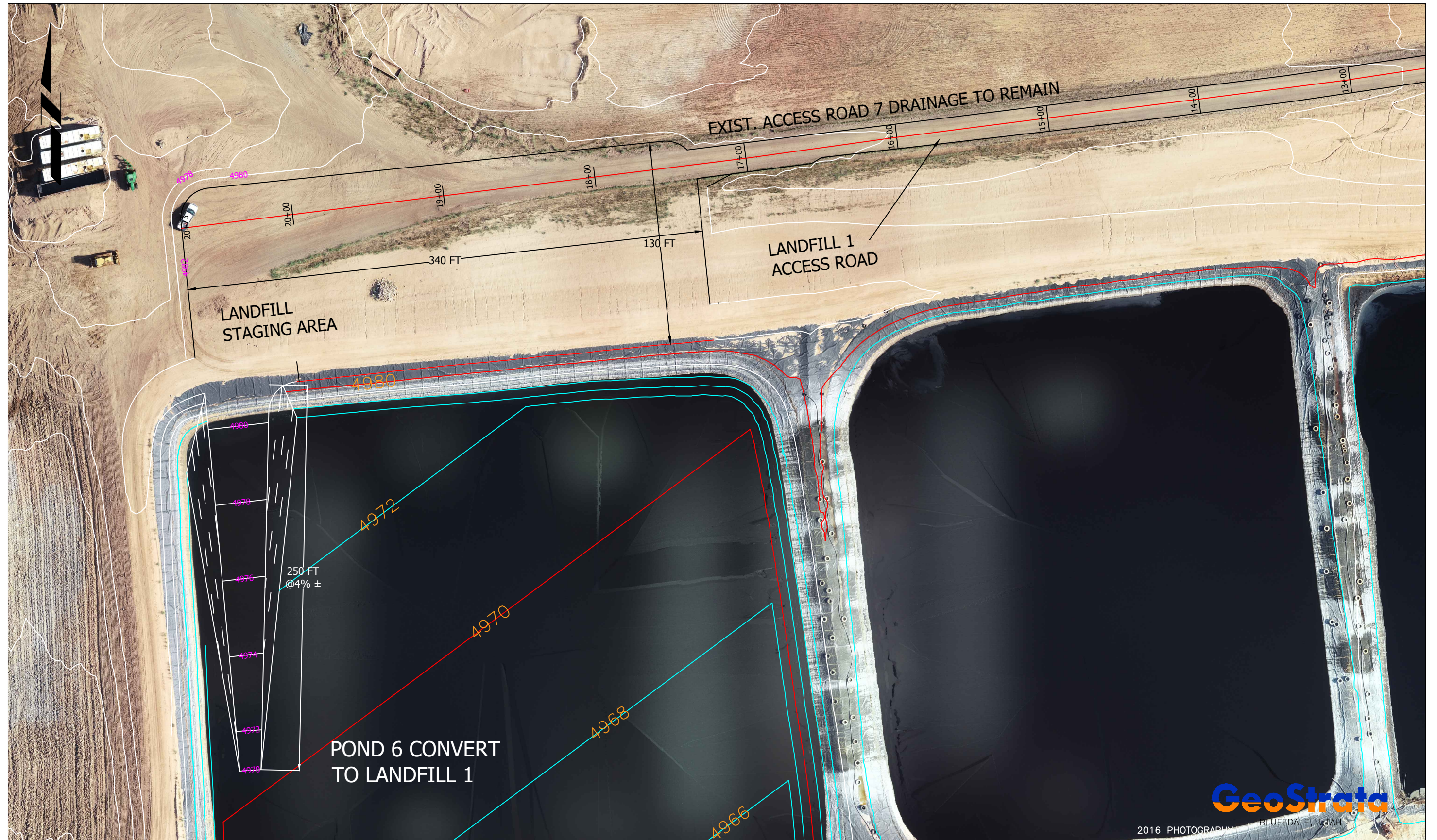


LOCATION	UINTAH COUNTY, UTAH
PROJECT	ACE DISPOSAL LANDFILL
TITLE	WORK SITE DETAIL

NO
B-7
NO

GeoStrata
BLUFFDALE, UTAH

2016 PHOTOGRAPHY



GeoStrata
BLUFFDALE, UTAH

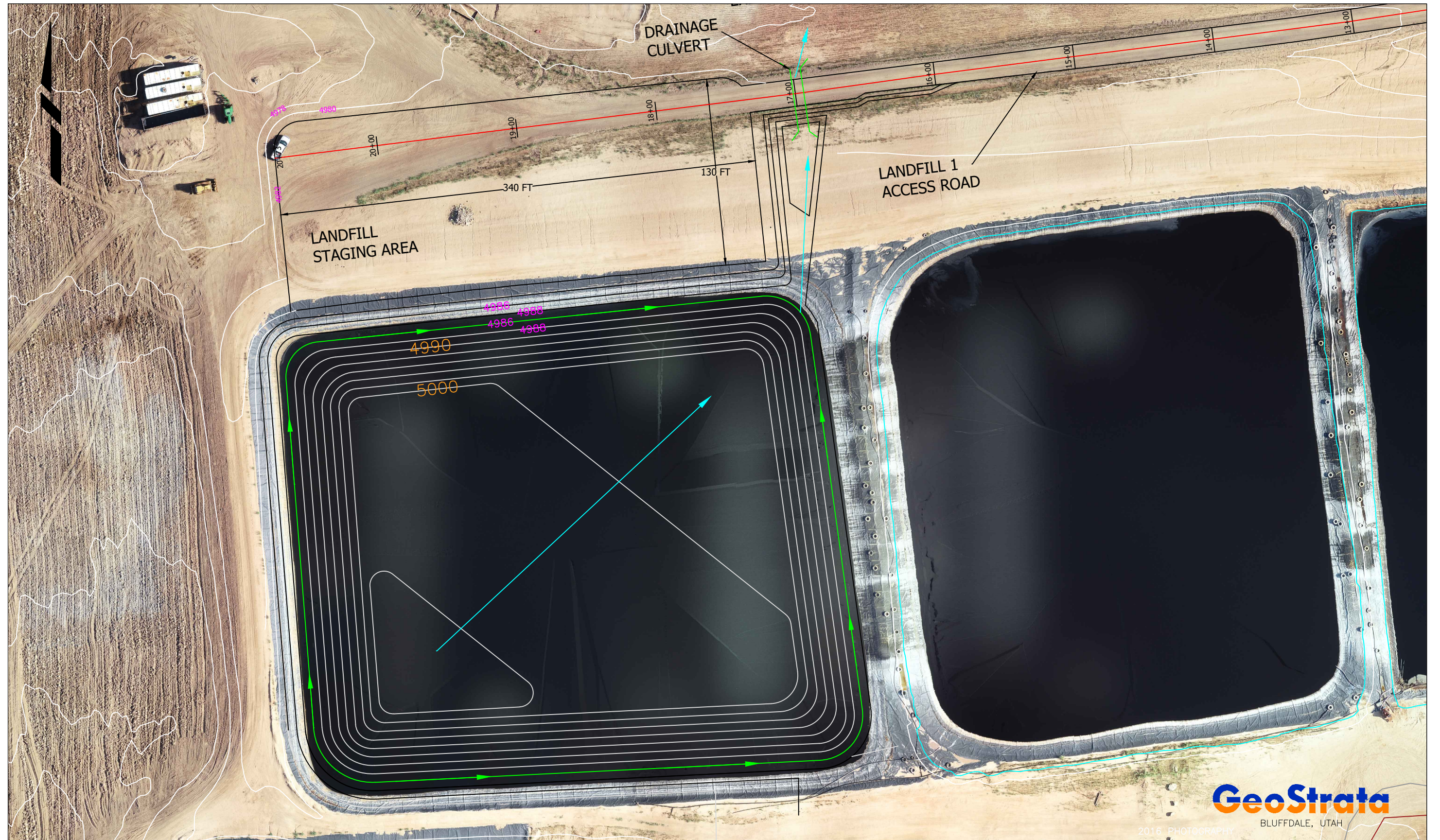
2016 PHOTOGRAPHY

REV	DATE	BY	DESCRIPTION
A	10-18-19	BER	PERMIT DRAWINGS

SCALE
AS SHOWN



LOCATION	UINTAH COUNTY, UTAH	B-8
PROJECT	ACE DISPOSAL LANDFILL	
TITLE	STAGING AREA DETAIL	NO



GeoStrata
BLUFFDALE, UTAH

2016 PHOTOGRAPHY

REV	DATE	BY	DESCRIPTION
A	10-18-19	BER	PERMIT DRAWINGS

SCALE
AS SHOWN



LOCATION	UINTAH COUNTY, UTAH	B-9
PROJECT	ACE DISPOSAL LANDFILL	
TITLE	STORMWATER DETAIL	NO

Attachment 2
Operations Plan

3.0 OPERATIONS PLAN

3.1 SCHEDULE OF CONSTRUCTION

The Ace Disposal Facility was originally permitted and constructed as a wastewater disposal site in 1988 by Ace Oil Field Disposal Inc. The original permit was for the construction of 3 evaporation ponds. Additional ponds were permitted, and authorization was given from DOGM to construct Pond 6 as an evaporation pond in 1996. There are no available records from DOGM that include construction records, documentation, or certifications of Pond 6. The facility was then purchased from Ace Oil Field Disposal Inc by Dalbo Inc, a subsidiary of Dalbo Holdings Inc. in 2005.

There are no available records of the completed construction of Pond 6 from the time of original construction. There is some correspondence from DOGM outlining the general requirements for evaporation ponds and leak detections systems that was sent at the time of the permit application for Pond 6. A site visit conducted at Pond 6 of the Ace facility confirmed that the pond was constructed with a single liner of 60 mil HDPE Geomembrane. There is also a leak detection system located at the south end of the pond. There are no records from DOGM of water observed in the leak detection system. All records for the Ace Facility that were obtained from DOGM are included in Appendix D.

GeoStrata conducted a survey of the pond 6 liners to evaluate the integrity of the liners in April 2019. The results of the liner integrity survey indicated that there were no observable holes in the liner at the time of the survey.

The pond has operated as a wastewater disposal and evaporation pond since the time it was constructed. The pond will be drained of all wastewater before landfill construction and the HDPE liner will remain intact for the operational use of the landfill. To the east adjacent to Pond 6 there is wastewater pond. This pond was also constructed using 60 mil HDPE liner and the liners are welded together and are covering the earthen berm that separates the two ponds. The HDPE covered berm is used as a sprinkler pad for enhancing the evaporation of the wastewater. The construction of the landfill cell will require the removal this pad.

As part of the landfill design a waste staging area will be constructed. This staging area will be used for parking heavy equipment and equipment storage, waste inspection and truck unloading. The staging area will also have a waste mixing area to stabilize any wastes that do not meet the requirements of waste disposal in Ace Landfill. Ramps will also be

constructed to allow heavy equipment into the cell and to allow trucks to unload directly within the landfill. A set of plans for the landfill cell is provided in Appendix B.

At the start of landfill operation DHI anticipates that approximately 1 to 7 truckloads of E&P waste will be transported to the facility per day. Each truck load will have a volume of approximately 15 cubic yards. All waste accepted to the landfill will be from internal DHI sources during the remediation of their facilities and landfarm soils. Some of the waste may consist of soils that have high moisture content that will require processing prior to disposal. DHI is considering using several different techniques and processes to meet the states requirement of waste to be free of liquids and pass a paint filter test. Some of the techniques that may be utilize include but are not limited to a pugmill mixer or mixing basin where the waste may be combined with sawdust, fly ash, native soils, or other components to stabilize the more liquid waste. Waste acceptance procedures and quality control of waste being disposed in the landfill are out line in sections 3.2.1 and 3.2.2 of this report.

As the landfill is put into operation, the waste acceptance and mixing processes will be further refined and modified throughout the life of the landfill based on available equipment and characteristics of the landfill waste. Adjustments to the design life of the landfill will be made based on adjustments made to the mixing process and characteristics of the waste.

Using the throughput assumptions described in the previous paragraph, the life duration of the landfill is defined assuming that half of the waste arriving at the landfill will be suitable for direct placement into the land fill and the remaining waste will be needing to be processed (drying or mixing) prior to placement in the landfill. Waste that will be mixed with additional material will need to reach a moisture content that corresponds with passing the paint filter test. It is assumed that mixing of native soils with waste at a ratio of approximately 1:0.5 will reach a waste moisture content that will pass the paint filter test. For example, every 1 ton of waste there will be approximately 0.5 tons of native soils added to reach a moisture content that will pass the paint filter. Calculations used to estimate the mixing ratio are provided in Appendix E as plate E-1.

Based on waste mixing assumptions described above and assuming waste throughput of 3 truckloads per day and a 10% growth rate over the life of the landfill, the projected life of the landfill is approximately 3 years and 9 months. However, the projected life may increase or decrease based on the type of processing and or mixing methods utilized. A copy of the spreadsheet used to calculate this estimated life is included in Appendix E. All

the assumptions presented in the previous paragraphs were used in the spreadsheet calculations.

3.2 DESCRIPTION OF WASTE HANDLING PROCEDURES

The following section describe the general procedures that will be followed under this permit application for accepting, disposing, recording, and excluding landfill waste at the Ace Landfill.

3.2.1 General Procedures

Waste from other DHI facilities will be hauled to the Ace Landfill using commercial or independently owned trucks. Trucks will enter at the main gate and check in with the landfill office. Every truck load of waste will be inspected for liquids prior to disposal and a paint filter test will be performed on each load of waste. On site sourced waste will be transported to the waste staging area for inspection. Waste that is free of liquids and passes the paint filter test will be directed to the landfill cell for direct placement in the landfill. Waste that has liquids and fails to pass the paint filter test will be placed in a temporary storage basin for further processing. The temporary storage basin will be constructed to ensure that the waste will be isolated from the underlying soils and liquids will collect at one end of the basin. The liner material for the storage basin will be composed of either concrete, clay, or an HDPE liner. Liquids that are collected in the temporary storage basin will be removed as needed and disposed at a proper facility for accepting RCRA exempt liquids. Collected liquids from the temporary storage are may also be mixed with sufficient dry soils or other materials as to allow them to pass a paint filter test.

Additional paint filter tests will be conducted every 15 cubic yards of waste that requires processing prior to being disposed into the landfill. Waste that fails the second paint filter test will remain in the temporary storage area and will be reprocessed by mixing with other materials and re-tested after mixing. Paint filter test procedures are attached to this application in Appendix D.

After passing the paint filter test waste will be removed from the temporary storage area and then placed in the landfill using heavy equipment or a conveyor system. All Waste will then be placed in a uniform layer in the landfill as described in section 3.2.3 Waste Disposal.

3.2.2 Waste Shipment Records

The landfill manager will retain waste shipment records as part of the daily record keeping of disposal activities. Each truck load of E&P waste delivered to the facility will have a waste shipment ticket completed. The waste shipment ticket will be completed by the truck driver and then verified by the landfill operating staff. An example of the waste shipment ticket is included in Appendix D. The waste shipment ticket will include the following data for record keeping:

- Date and time of arrival
- Load ID number
- Quantity in cubic yards and estimated tons based on unit weight
- Type of waste
- Origin of waste
- Name of trucking company and truck number
- Truck drivers name and signature

3.2.3 Waste Disposal

The E&P waste will be transported into the landfill cell by means of either direct placement by dumping from the delivery truck or placed by heavy equipment conveyor system. Waste will be deposited at the bottom of the landfill cell and will be placed in 1ft thick lifts. Lifts will be distributed by use of an onsite dozer and then compacted with the dozer and other truck traffic. Waste will be compacted to reach a firm and unyielding surface to maximize landfill capacity.

Waste deposited in the landfill will not come in contact with the HDPE liner. A protective 12-inch layer of fill material will be in place between the waste and HDPE liner. The 12-inch fill layer will be comprised of a free draining soil. The protective layer will be placed on all surfaces of the HDPE liner that will be covered with the landfill waste. All equipment moving in or on the landfill will not have contact with the liner and will remain on the fill layer. Waste will also be placed in such a way as to avoid puncturing liner during the compaction process.

DHI does not have any plans currently to introduce any recycling programs at the facility. In addition, due to the nature of the type of waste accepted at the facility it is unfeasible to recycle the waste that is generally accepted.

3.2.4 Plans for Excluding Waste

DHI will maintain a comprehensive waste screening process prior to receiving waste from potential sources and waste generators. Waste that is not RCRA exempt E&P waste will not be accepted at the Ace landfill. All third-party or outside sources of waste apart from other DHI sourced waste delivered to the site will be excluded.

3.3 WASTE FACILITY INSPECTION AND MONITORING

DHI personnel will inspect the facility to prevent malfunctions and deterioration, operator errors, and discharges which may cause or lead to the release of wastes to the environment that may be a threat to human health or other natural resources. Facility inspections will be conducted weekly and will be recorded using the weekly inspection log. Some items will be monitored daily. An example of these inspection logs is provided in this permit application in Appendix D.

3.3.1 Fugitive Dust Control

As required in Utah Administrative Code R315-302-2(2)(g) RNI has prepared a plan for controlling fugitive dust as part of this permit application. As part of the daily operations of the facility, fugitive dust will be monitored, and controls will be put in place as deemed necessary by the landfill operations manager.

During the construction and operational phases of the landfill, sources of dust within the landfill cell will be identified by the landfill operations manager. These sources of dust will be controlled by watering and proper placement of waste in the landfill. DHI will have staff on site that are trained in monitoring opacity and will periodically check the facility for dust control issues. When opacity of the dust exceeds 10% watering controls will be put in place.

The landfill operations manager will also monitor dust on all haul roads on DHI property. Haul roads leading from the main gate to the landfill cell are unpaved. Proper maintenance of haul roads, speed limit controls and watering when dust opacity exceeds 10% will aid in reducing fugitive dust emissions.

3.3.2 Plan for Litter Control

DHI does not anticipate accepting waste materials that will cause a wind-blown litter problem. DHI personnel will complete a daily inspection of the landfill and surrounding area and identify any potential waste material that may escape the facility.

3.3.3 Contingency Plan for Fire or Explosion

In the event of a fire or explosion at the facility, the landfill operations manager will be notified. The landfill operations manager will then contact local emergency authorities to initiate emergency response. A list of the local emergency responders is provided in Appendix D of this permit application.

3.3.4 Alternative Waste Handling Plan

In the event of a landfill closure due to an emergency or repairs, DHI will make arrangements to have the waste disposed at alternative DHI landfill facilities if necessary. If in the case that Ace landfill must close due to an emergency, waste will be transported to the Wonsit landfill or the Bluebell Landfill that are owned and operated by DHI.

3.3.5 General Training Plan

As required in R315-302-2(2), each permitted landfill must have a detailed training program. DHI currently has a training program that educates their employees on how to handle E&P waste and how to operate the existing components of the waste facility. DHI will utilize the Personnel Training Program that is in place for the Wonsit Landfill. The site-specific training is modified for application to the Ace facility. A copy of the existing Personnel Training Program is part of this permit application and is included in Appendix D.

All personnel that will be working on the landfill will be required to participate in monthly safety meetings and morning tailgate safety meetings held on site. All employees are to review this landfill permit semi-annually. Annual refresher training of the above-mentioned training program will be conducted for all employees involved with the permitted landfill. Any new information relevant to the permitted landfill will also be

covered in the annual refresher training. New employees that are assigned to work associated with the landfill will receive training during the first month of employment and will be trained by a supervisor that has completed the required training. Records of this training will be kept in the DHI database.

3.4 RECORD KEEPING

During the operation of the landfill, the operator will maintain records of landfill activities as required by the division (315-302-2-(3)). These records will be stored electronically in the DHI database at their main office in Vernal.

3.4.1 Daily Permanent Record

The landfill manager will record the following data daily and maintain the data in a permanent file:

- Waste shipment records as described in section 3.2.2
- The estimated weight in tons and volume in cubic yards of E&P waste received for the day
- The estimated weight in tons and volume in cubic yards of E&P waste that required treatment prior to disposal in the landfill cell.
- The estimated weight in tons and volume in cubic yards of material added to treat the waste and the total weight and volume of treated waste
- Number of trucks visiting the Landfill
- Type of E&P waste received
- Paint filter test results
- Deviations from the DWMRC approved Operations Plan
- Staff training records
- Status of groundwater, leachate, and gas monitoring
- A written report of daily activities at the landfill site

3.4.2 Other Records

The landfill manager will also include the following data in the permanent records:

- Design documentation of the placement or recirculation of leachate or gas condensate into the landfill

- Closure and post closure care plans and activities
- Cost estimates and financial assurance documentation
- Safety training and landfill specific training for all employees associated with the landfill

WASTE SHIPMENT RECORD

Date: _____

Departure Time from Origin: _____

Load ID No.: _____

Arrival Time at Landfill: _____

Generator of Waste: _____

Origin: _____

Quantity (cubic yards):
Estimated Tons (based on unit weight):
Type of Waste:
Description of Waste:

Name of Trucking Company:
Truck Number:
Truck Driver's Name:
Truck Driver's Signature:

COMMENTS:

DATE : _____ TIME : _____

DAILY PERMANENT RECORD

ITEM	YES	NO	COMMENTS
SITE SECURITY			
Perimeter fence and security gate are in good condition?			
Lock functioning and in place?			
ROADS			
Do roads require watering? If so, record in the operator's log the volume of water used and the section of road watered.			
OPERATIONS			
Collect daily landfill gas monitoring levels and compare to Integrated Water Management Health and Safety Plan Action levels. Upgrade PPE if necessary.			
Estimated Weight in Tons of E&P waste received today			
Estimated Volume in Cubic Yards of E&P waste received today			
Estimated Weight in Tons of E&P waste that required treatment prior to disposal in the landfill cell			
Estimated Volume in Cubic Yards of E&P waste that required treatment prior to disposal in the landfill cell			
Estimated Weight in Tons of material added to treat the waste			
Estimated Volume of material added to treat the waste			
Estimated Total Weight in Tons of treated waste			
Estimated Volume in Cubic Yards of treated waste			
Record daily volumes and weights of wastes received, solidified, and placed in the landfill cell.			
Record volume and weight of solidification material used each day.			
Are slopes at which the waste is placed in accordance with the guidance provided by the Project Geotechnical Engineer? If not, contact the Waste Disposal Facility Manager.			
INSPECTION OF GEOCOMPOSITE AND HDPE LINER UNTIL FULLY COVERED			
Are geocomposite and HDPE anchors in place and in good condition?			
Is the geocomposite and/or HDPE systems free of rips, excessive weathering, or excessive tension? Monitor daily until the geocomposite layer is completely covered with waste or a protective layer of soil.			
SURFACE WATER MONITORING			
Check daily during March, April and May of each year. Is there water flowing in the ephemial stream near monitoring wells XXXX and YYYYY? If so, call the Waste Disposal Facility Manager by the end of the day to make arrangements for annual surface water sampling.			
EMBANKMENT			
Inboard Slope			
Has the geofabric material been covered by soil or water within two weeks of placement? If not, cover with at least 4 inches of soil by the end of the day.			
NOTES: (Record any other significant issues below. Fill out additional pages and attach if necessary.)			
If any checks appear in the "No" column, provide a detailed description of what you observed, including: accurate location, extent of affected area, and a description of the condition. Refer to the Operations Manual, initiate the prescribed corrective action and estimate time of completion. Inform the appropriate Integrated Water Management personnel (Supervisor, and/or Environmental Manager) per the Operations Manual and document the corrective action taken (notes, photos, etc.)			
Completed By:			
Name _____	Signature _____		

DATE: _____

TIME: _____

WEEKLY PERMANENT RECORD

ITEM	YES	NO	COMMENTS
SITE SECURITY			
Fire extinguisher is charged, not exceeding inspection deadline?			
Spill kits are stocked on site?			
Emergency eyewash stations are functioning properly and well stocked?			
Signage visible and in good condition?			
Warning signage every 250 feet of exterior fencing and at closest approach of gravel road?			
OPERATIONS			
If there is water in the leachate collection system? If so, remove and record volume transferred to Evaporation Pond 1.			
If there is water in the leak detection sump? If so, remove and record volume transferred to Evaporation Pond 1. Call the landfill Supervisor to inform him.			
Estimated Weight in Tons of E&P waste received this week			
Estimated Volume in Cubic Yards of E&P waste received this week			
Estimated Weight in Tons of E&P waste that required treatment prior to disposal in the landfill cell this week			
Estimated Volume in Cubic Yards of E&P waste that required treatment prior to disposal in the landfill cell this week			
Estimated Weight in Tons of material added to treat the waste this week			
Estimated Volume of material added to treat the waste this week			
Estimated Total Weight in Tons of treated waste this week			
Estimated Volume in Cubic Yards of treated waste this week			
Record weekly volumes and weights of wastes received, solidified, and placed in the landfill cell.			
Record volume and weight of solidification material used each week.			
GROUNDWATER MONITORING			
Check depth to groundwater from top of well casing weekly during March, April and May.			
Is there groundwater present in wells XXXX, YYYYY and ZZZZ?. If so, call the Waste Disposal Facility Manager by the end of the day to arrange for annual groundwater sampling. (Once sampling is completed, monitoring of groundwater levels can be discontinued for the year. Measure water levels from the top of well casing to the nearest 1/100 th of a foot)			
EMBANKMENT			
Crest			
Are there any signs of erosion gullies greater than 6 inches deep?			
Are there any signs of settlement, cracks slides, slumps, boils, sinkholes or other?			
Outboard Slope to 10 feet past the Toe			
Are there any signs of erosion gullies greater than 6 inches deep?			
Are there any signs of settlement, cracks slides, slumps, boils, sinkholes or other?			
Are ther any debris or weeds that prevent the inspection?			
Are there new signs of seepage (ie: flows of water, wet spots, or ponding)?			
Is there evidence of burrowing animals?			
Are the diversion channels serviceable and unobstructed?			
NOTES:			
(Record any other significant issues below. Fill out additional pages and attach if necessary.)			
If any checks appear in the "No" column, provide a detailed description of what you observed, including: accurate location, extent of affected area, and a description of the condition. Refer to the Operations Manual, initiate the prescribed corrective action and estimate time of completion. Inform the appropriate Integrated Water Management personnel (Supervisor, and/or Environmental Manager) per the Operations Manual and document the corrective action taken (notes, photos, etc.)			
Completed By:			
_____		_____	
Name		Signature	

Attachment 6-A Employee Training Record Form

Personnel Training Plan

Name: _____

Hire Date: _____

Job Title: _____

Job Description: _____

Initial Training

Annual Refresher Training

The above employee has received the following RNI-specific training which is appropriate for the job description. Check all boxes that apply.

I have completed the initial RNI-prepared Compliance and Task Training (CATT) and received my "Passport."

I have completed general training that describes health and safety issues associated with working with exploration and production wastes.

I have received site-specific health and safety training at all of the facilities I will be expected to work at.

I understand how to distinguish hazardous wastes and incompatible wastes from wastes normally received by RNI facilities.

I understand how to implement the contingency plan in the event of a large spill or release.

I understand how to implement emergency response measures in the event there is an emergency onsite.

I understand that annual refresher training is required while I am employed with RNI.

Employee Signature

Date

Supervisor/Trainer Signature

Date

Attachment 3
Groundwater Monitoring

2.2.5 Ground Water

Three monitor wells have been installed near the proposed landfill cells. Plate A-6 shows the locations of the monitor wells. There are one up-gradient (MW-1) and two down gradient monitor wells (MW-2 and MW-3). Water levels have been measured multiple times and were measured most recently on September 9, 2019. Ground water elevation data are included in table 2.2.5.a.

Table 2.2.5.a

		9-19-2019
Well No.	Surface Elevation (ft)	Water Elevation (ft)
MW-1	4980	4890.5
MW-2	4977	4875.5
MW-3	4983	4878.5

Plate A-6 show the location these borings and monitoring wells. Based on the geographic setting near surface ground water if present would likely flow to the Southeast towards Twelve Mile Wash. However Geologic Structure measurements show that bedrock in the general vicinity is North to Northeast dipping (Sprinkles 2007).

Based on our finding of groundwater at the facility, groundwater is measured as being greater than 5-feet below the lowest portion of the proposed landfill.

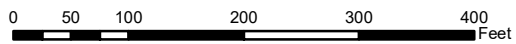
2.2.7 Groundwater and Surface Water Monitoring Plan

Groundwater was encountered at the subject site in the three monitor wells. The groundwater resides in the varicolored siltstone and sandstone of the Brennan Basin Member (Tdb). DHI proposes to sample groundwater from the three monitor wells on a semiannual basis. Water will be analyzed for the following analytes as required in R315-308-4:

- Heavy Metals including Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc
- Inorganic Constituents including Ammonia, Carbonate/Bicarbonate, Calcium, Chemical Oxygen Demand (COD), Chloride, Iron, Magnesium, Manganese, Nitrate, pH, Potassium, Sodium, Sulfate, Total Dissolved Solids (TDS), Total Organic Carbon (TOC)
- Acetone, Acrylonitrile, Bromochloromethane, Bromodichloromethane, Bromoform, Carbon disulfide, Carbon tetrachloride, Chlorobenzene, Chloroethane, Chloroform, Dibromochloromethane, 1,2-Dibromo-3-chloropropane, 1,2-Dibromoethane, 1,2-Dichlorobenzene (ortho), 1,4-Dichlorobenzene (para), trans-1,4-Dichloro-2-butene, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethylene, cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, 1,2-Dichloropropane, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, 2-Hexanone, Methyl bromide, Methyl chloride, Methylene bromide, Methylene chloride, Methyl ethyl ketone, Methyl iodide, 4-Methyl-2-pentanone, Styrene, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, Tetrachloroethylene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethylene, Trichlorofluoromethane, 1,2,3-Trichloropropane, Vinyl acetate, Vinyl Chloride
- Gasoline Range Organics (Method SW-846 8260C)

As required in R315-308-2(8) DHI will use a statistical method for determining whether a significant change has occurred as compared to background. To establish a background range of groundwater constituents, DHI will use the procedure as required in R315-308-2(5)(a) where eight independent samples will be collected from the upgradient well and four independent samples will be collected from down gradient wells. This sampling to establish background will occur in the first year of the landfill operation. Based on the sampling results after the first year, the 95% upper confidence interval will be calculated for each constituent. Resulting data will be normally distributed and will assume homoscedasticity.





During operations of the landfill semiannual samples will be collected and results of each constituent will be compared using a parametric analysis of variance. If concentrations of a constituent are greater than the 95% confidence interval, it will be considered an outlier and will be further evaluated to determine if it is a normal fluctuation in the groundwater or if it is a result of possible leachate or other contaminated water from the water disposal facility. A report of the data and outliers will be provided to the division and an appropriate response will be determined.



1:2,000



GeoStrata
Engineering & Geosciences
Copyright GeoStrata, 2019

- Legend**
-  Soil Sample
 -  Monitoring Well
 -  Ace Disposal Site Boundary
 -  Proposed Ace Landfill

Ace Landfill Permit Application
RN Industries
Project Number 524-099

**Ace Disposal Facility
Exploration Location Map**

**Plate
A-6**

Attachment 4
Closure and Post-Closure Plan

3.0 CLOSURE PLAN

3.1 CLOSURE SCHEDULE

The Ace landfill cell will be closed in a single operation that includes the final grading of the waste material and the placement of the final cover. The expected duration of the land fill operation is approximately 3 years and 9 months at a 10% growth rate. Sixty days prior to the expected final receipt of waste, DHI will notify the division of their intent to begin closure operations. DHI will begin its closure operations after the final receipt of waste is obtained. It is anticipated that the closure operation will take place over an anticipated duration of 90 to 120 days. During this period, the landfill cell will be graded, covered and surveyed. As-built plans will be generated for reference for the final inspection by the division.

3.2 DESIGN OF FINAL COVER

The final cover will consist of two soil layers. The lower layer will consist of a compacted clay soil liner which will be overlain by an upper layer of soil that will be seeded with native grasses. The construction of the lower layer portion of the final cover will be an Alternative Design that will achieve equivalent requirements as the Standard Design as prescribed in R315-303-3(4)(c)(i). The upper layer will follow the Standard Design requirements as explained in R315-303-3(4)(a)(ii). Cover soils will be constructed from soils that are available at the Ace Disposal site. All testing and calculations are based on samples of the native soils at the site.

The Utah regulation R315-303-3(4)(c)(i) requires that the alternative final cover of a soil liner must achieve an equivalent reduction in infiltration as achieved by the standard design. Standard design calls for at least 18 inches of compacted soil, or equivalent, with a permeability of 1×10^{-5} cm/sec or less, or equivalent. On site Soils used for the final cover are far less permeable than this requirement. The proposed lower layer will use 6 inches of clayey soils that have a permeability of no greater than 1×10^{-6} cm/s. Based on engineering calculations 6 inches of soils with a permeability no more than 1×10^{-6} cm/sec is equivalent to 18 inches of soils that are permeable up to 1×10^{-5} cm/second. The equivalency is based on calculated infiltration rates. These calculations are included as part of our mathematical model included in Figure 1 and explained in the following paragraph.

As part of the requirements of an alternative final cover design, expected performance of the alternative cover has been documented by use of a mathematical model as required in R315-303-3(4)(d). Line item 3 of the model includes a hydraulic conductivity test that

was performed on a sample of cover soils obtained from the Ace facility. The lab test was performed in accordance with ASTM D5084 method C that resulted in a lab measurement of 2.46×10^{-7} cm/second. This result exceeds minimum requirement of 1×10^{-5} cm/second of the standard design, i.e., the soil is less permeable. The mathematic model also includes other lab tests on the soil that demonstrate that the soil is non-dispersive (see line 1 of calculations). Lines 5 through 15 include the model that demonstrates the performance of the soils used for the alternative cover. Climatic conditions are referenced in line Item 5 and includes the normal precipitation and wettest 5 years on record as required in R315-303-3(4)(d)(i) and (ii). Using this data, we then calculated the annual soil erosion rate using the Revised Universal Soil Loss Equation that is commonly used by the EPA and NRCS. Using this equation, we are able to show that the proposed cover design would lose annually 0.006 inches of soil over the entire cap (line 14). Applying a factor of safety of 10, the unattended and unrepaired cover would lose half of the 6 inches of soil after 50 years. It is our engineering opinion that this alternative design is equivalent to the Standard Design.

In addition, R315-303-3(4)(a)(ii) also requires that a second layer of soil is to be use for reducing erosion consisting of at least 6 inches of soil capable of sustaining vegetative growth placed over the compacted soil cover and seeded with grass, other shallow rooted vegetation, or other native vegetation. Our proposed design follows the standard design requirements in that the compacted clay liner soils will be covered with a second soil layer that will be a minimum of 6 inches of soil as prescribed in R315-303-3(4)(a)(ii). This soil layer will be capable of sustaining vegetative growth and will be seeded with native shallow root vegetation or native vegetation to minimize erosion of the final cover. It is our understanding that locally available topsoil suitable for vegetative growth may be readily available to be utilized at the time of closure. These soils may be tested for organic content, permeability, and cohesion prior to use as final cover soil.

The final cover for the landfill cell will be graded to a slope no steeper than 3:1 around the outer perimeter. The top elevation of the landfill cap will be rectangular and will have a slope of no less than 2%. To control the run-off of storm water and minimize erosion of the final cover material, it is intended that the final cover soils be seeded with native grasses and use other erosion controls as may be needed. The final cover may be reseeded as needed during the post closure phase of the landfill. The final cover plans of each landfill cell are included in Appendix B of this permit application.

Figure 1:

RN Industries
Proposed Ace Landfill
Alternative Closure Cap Equivalency to Standard Design prescribed by Rule R315-303-3

Alternative Closure Cap Equivalency to Standard Design prescribed by Rule R315-303-3(4)(c)
Infiltration and Erosion Equivalency

RN Industries proposes a six-inch thick Alternative Final Cover in place of Standard Design specified in Rule **R315-303-3 (4) (a) (i)**. Because Rule **R315-303-3(4)** does not provide a quantitative erosion standard, the equivalency of proposed Final Cover erosion will be demonstrated by showing geotechnical testing for and calculating annual erosion of the Alternative Final Cover Design. The following uses mathematical model based on the geotechnical testing to demonstrate equivalency as required in **R315-303-3(4)(d)**. This model will demonstrate that the alternative cover achieves an equivalent infiltration rate and protection from erosion as required in **R315-303-3(4)(c)(i and ii)**.

The Alternative Final Cover will be constructed from compacted soil native available in sufficient quantity at the Bluebell Disposal Site.

The following summary of soil test lab results, tables and narrative outline various geotechnical and agronomic characteristics of the Alternative Final Cover Design. These characteristics were chosen because they are parameters used both for geotechnical design of the Landfill and for USEPA/NRCS/USDA Revised Universal Soil Loss Equation.

References

- 1 EPA Stormwater Phase II Final Rule - EPA has updated its Rainfall Erosivity Factor Calculator to correct known problems and to use updated data from the Natural Resources Conservation Service's (NRCS) Revised Universal Soil Loss Equation, Version 2 (RUSLE2) database, 2012-09-26
- 2 Wischmeier, W. H., and Smith, D.D. 1978. Predicting rainfall erosion losses -- a guide to conservation planning. U.S. Department of Agriculture, Agriculture Handbook No. 537.
- 3 Renard, K.G., G.R. Foster, G.A. Weesies, D.K. McCool, and D.C. Yoder, coordinators. 1997. Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE). U.S. Department of Agriculture, Agriculture Handbook No. 703, 404 pp.

Qualitative and Quantitative Effect of Erosion Computation Parameters Affecting RN Industries Alternative Landfill Cap Design				
Line	Erosion Computation Parameter	Alternative Design Final Cover		
1	ASTM D4647, Standard Test Methods for Identification and Classification of Dispersive Clay Soils Tests performed on sample compacted to optimum Procter Density confirmed Bluebell soil of interest is Non-Dispersive.	Exfiltration from sample had non-detectable turbidity which identifies a non-dispersive soil having a low erosion rate.		
2	ASTM D698 - 12e2, Standard Test Methods for Laboratory Compaction Characteristics.	Proctor optimum is 122 lb/cf at 14.6% moisture.		
3	ASTM D5084 - Method C, Standard Test Methods for Measurement of Hydraulic Conductivity. Lab measured Conductivity 7.74×10^{-7} cm/sec	Site soil used to construct the Alternative Design was selected and compacted to its Standard Proctor Optimum Density. It had a lab measured K value of 2.46×10^{-7} cm/sec. The lab measured conductivity is lower than 3.33×10^{-6} cm/sec required for Alternative Design infiltration equivalency. This meets the requirement of R315-303-3(4)(c)(i) .		
4	ASTM C117 - Standard Test Method for Materials Finer than 75- μ m (No. 200) Sieve.	Classification	Sieve Size	Sieve Size (in) Passing (%)
		Cobble	100.0 mm	4" 100
			75.0 mm	3" 100
		Very Coarse Gravel	50.0 mm	2" 100
			37.5 mm	1.5" 100
		Coarse Gravel	25.0 mm	1" 100
			19.0 mm	3/4" 100
		Medium Gravel	12.5 mm	1/2" 100
			9.5 mm	3/8" 100
		Fine Gravel	4.75 mm	No. 4 100
			2.36 mm	No. 8 99
		Coarse Sand	2.00 mm	No. 10 99
			1.18 mm	No. 16 99
		Medium Sand	0.60 mm	No. 30 97
			0.43 mm	No. 40 96

RN Industries
Proposed Ace Landfill
Alternative Closure Cap Equivalency to Standard Design prescribed by Rule R315-303-3

	Fine Sand	0.30 mm	No. 50	92
	Very Fine Sand	0.15 mm	No. 100	81
	Silt & Clay	0.08 mm	No. 200	66

RN Industries
Proposed Ace Landfill
Alternative Closure Cap Equivalency to Standard Design prescribed by Rule
R315-303-3

5	Five Wettest Year Total Precipitation & Average Annual Precipitation from USU Climatological Center for the Vernal Station. Data used as required in R315-303-3(4)(d)(i) and (ii)			
	9.31 Inches-Avg Annual Precip	Rank	Year	Precip
		1	1938	13.18"
		2	1941	14.78"
		3	1983	11.47"
		4	1997	12.01"
	5	2016	13.03"	
Ratio of Wettest Year to Average Year = 13.18 Inches / ##### = 1.42 To adjust Rainfall-Runoff Factor for the five wettest years, multiply Rainfall-Runoff Factor from NRCS Iso Erodant map by 1.42				
6	The following calculation uses procedures and data from USDA Handbooks No. 537 and its later revisions used by EPA and NRCS. NRCS has updated the original research for Handbook No. 537 and 703. The equations are now listed as Revised Universal Soil Loss Equation or RUSLE. Both the original and ongoing research to update, calibrate and automate RUSLE calculations were performed by University of Indiana, College of Agriculture staff over the past 40 years.			
7	Rainfall/Runoff Factor (EI Parameter NRCS Fig 1)	= 10 from Fig 1, Isoerodant Map	14.15682062	
8	Erodability Factor (NRCS Fig. 3 Nomograph)	using ASTM Gradation results	K = 0.64	
9	Topographic Factor (NRCS Slope-Length Nomograph)	Cap Slope = 3 on 1 or 33%	LS = 6	
10	Cover & Management Factor (NRCS Table 6)	using no cover and 80% mulch	S = 0.10	
11	Support Practice Factor (NRCS P Value Limits for Contouring)	using 250 Ft slope length	C = 1.0	
12	Annual Soil Loss	A = R * K * LS * C (Tons/ Year)	A = 5.1 Ton/ Yr	
13	Erosion Equivalency			
	Soil erosion equivalency is demonstrated by the applying the standard model for erosion assessment used by US EPA. It is based on the empirical Revised Universal Soil Loss Equation.			
14	Calculated Annual Soil Erosion			
	Annual soil volume loss			
	a.	The soil density determined by ASTM D4647 lab test is 126 Lb per CF		
	b.	The RUSLE equation estimates an annual soil loss of 5.1 Tons / Yr		
	c.	The corresponding volume of soil loss will be 80 CF / Yr		
	d.	Each proposed Landfill cap has a finished surface area of 171,000 SF		
	e.	The annual uniform soil loss over entire cap will be 0.006 Inches		
15	Allowance for non-uniform soil loss and a reasonable Factor of Safety			
	Applying a Factor of Safety of 10			
	The estimated uniform soil loss over the entire cap will increase to 0.06 Inch / Yr			
	Unattended & unrepaired, the top half of the 6" thick cap has a life of about 50 Years			
16	Conclusions			
	GeoStrata engineers submits that the above geotechnical tests showing non-dispersive soils and the subsequent erosion calculations support the claim of the equivalency of the proposed Alternative Design for Ace Landfill Cap to the Standard Cap Design prescribed in Rule R315-303-3(4)(a)(i and ii) . The infiltration rate in Line 3 and Erosion rate in Line 15 of this model demonstrate that the cover design meets the rerequirements of R315-303-3(4)(c)(i and ii) . Line 3 demonstrates that the infiltration rate is less than the standard design. Line 15 shows that the cover after 20 years without any maintenance will have only lost 6 inches of soil. The post closure plan will have cover soils replaced.			

3.3 CAPACITY OF LANDFILL

The estimated capacity of the Ace landfill cell up to the final cover is 105,836 cubic yards. With the assumptions of an average daily rate of 67.5 cubic yards of waste delivered at the site and half the waste being mixed with additional material and 10% growth every year, the combined life of the two landfills is estimated to be at least 3 years. A table with the projected duration for each landfill is provided in appendix E as Plate E-1. When the landfill cell reaches capacity limits DHI will initiate the closure process and notify the Division in advance as required.

3.4 FINAL INSPECTION

After the completion of the final cover, the final inspection of the landfill cell will be conducted by officials from DWMRC. DHI will notify the division of the anticipated date of completion and make arrangements for scheduling the inspection.

Task	Description	Unit Cost	No. Units Landfill #1	Unit Type	Total Cost	Details
Engineering	QCA (Laboratory/field Testing)	\$ 15,000.00	1	Estimate	\$ 15,000.00	Liner testing, lab testing, engineering support
	Construction Surveying	\$ 1,500.00	1	Estimate	\$ 1,500.00	Aerial drone imaging and processing
	As built survey	\$ 2,000.00	1	Estimate	\$ 2,000.00	GeoStrata As built survey and CAD drawing
	Letter of notification of closure	\$ 1,500.00	1	Estimate	\$ 1,500.00	Letter to DWMRC and County
Construction Cost	Topsoil Material	\$ -	4400	Cu Yd	\$ -	Topsoil is available on site
	Topsoil Testing	\$ 250.00	1	Estimate	\$ 250.00	Soil sampling and testing to ensure top soil is adequate
	Topsoil Graded	\$ 29.50	180	Sq Yd	\$ 5,310.00	RS Means 2019 - 31 22 16.10 - Steep Slope Large Quantities
	Trucking Topsoil	\$ 1.38	4400	Cu Yd	\$ 6,072.00	RS Means 2019 - 20 cyd truck, 15 min. wait/lid/uld, 20MPH, cycle 2 miles
	Clay Liner Soils	\$ -	3300	Cu yd	\$ -	Clay soils are on site
	Clay Soils Trucking	\$ 1.38	3300	Cu Yd	\$ 4,554.00	RS Means 2019 - 20 cyd truck, 15 min. wait/lid/uld, 20MPH, cycle 2 miles
	Clay Soils Graded	\$ 29.50	180	Sq ft	\$ 5,310.00	RS Means 2019 - 31 22 16.10 - Steep Slope Large Quantities
	Clay Soils Compacted	\$ 0.99	3300	Cu Yd	\$ 3,267.00	RS Means 2019 31 23 23.23 - Sheepsfoot 6" lift, 2 passes
	Clay Soils Testing	\$ 500.00	1	Estimate	\$ 500.00	Soil sampling and testing to ensure Clay liner is adequate
	Hydro Seeding with mulch and fertilizer	\$ 63.00	180	1000 Sq ft	\$ 11,340.00	RS Means
	Mobilization /Demobilization	\$ 3,000.00	3	Each	\$ 9,000.00	\$1500 per mobilization per piece of quipment
Contingency	10% of constuction cost	\$ 4,560.30			\$ 4,560.30	GeoStrata Estimate
TOTAL COST:					\$ 70,163.30	

Engineers opinion of probable Costs



Copyright GeoStrata , 2019

Closure Cost Summary

RN Industries
Ace Landfill Permit
Unitah County, UT
Project Number: 524-099

**Plate
H-1**

Task	Description	Unit Cost	No. Units	Unit Type	Total Cost	Total units 30 yrs.	Total cost 30 yrs.	Details/Source
Inspections	Quarterly 1st 2 years; Semiannually for 28 years	\$ 85.00	4	hours	340.00	64	\$ 21,760.00	4 inspections/year for the first 2 years and then 2 inspections/year for 28 years
Report	Quarterly 1st 2 years; Semiannually for 28 years	\$ 85.00	2	hours	170.00	64	\$ 10,880.00	4 reports/year for the first 2 years and then 2 reports/year for 28 years
TOTAL for 30 yrs							\$ 32,640.00	

Groundwater Monitoring	Groundwater Sampling labor	\$ 85.00	6	hour	510.00	13	\$ 6,630.00	Annual monitoring for first 5 years, biennial for next 10 years, then monitoring every 5th year for final 15 years. Sampling from 2 monitoring wells for 13 rounds of sampling
	GRO	\$ 130.00	2	sample	260.00	13	\$ 3,380.00	
	Heavy Metals	\$ 178.00	2	sample	356.00	13	\$ 4,628.00	
	Inorganic Constituents/other	\$ 234.00	2	sample	468.00	13	\$ 6,084.00	
	Groundwater sampling report	\$ 1,200.00	1	report	1200.00	13	\$ 15,600.00	
	Transport to lab	\$ 100.00	1	vehicle	100.00	13	\$ 1,300.00	
TOTAL for 30 yrs							\$ 37,622.00	

Maintenance	Re-grading top Soil	\$ 29.50	42.75	Sq Yd	1261.13	1	\$ 2,641.13	Assumes 25% of topsoil of final cover of both cells will have to be replaced over 30 years
	Soil replacement	\$ 1.38	1000	Cu Yd	1380.00	1	\$ -	
	Reseeding	\$ 63.00	171	1000 Sq Ft	10773.00	1	\$ 10,773.00	Assumes 1 total reseeded of final cover over 30 years
TOTAL for 30 yrs							\$ 13,414.13	

TOTAL for all tasks 30 yrs							\$ 83,676.13	
----------------------------	--	--	--	--	--	--	--------------	--

Contingency	10% of total cost for all tasks						\$ 8,367.61	
-------------	---------------------------------	--	--	--	--	--	-------------	--

TOTAL POST CLOSURE COST							\$ 92,043.74	
-------------------------	--	--	--	--	--	--	--------------	--

Engineers opinion of probable Costs