State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF WASTE MANAGEMENT
AND RADIATION CONTROL
Ty L. Howard
Director

October 24, 2019

Garth Ogden, County Commissioner
P. O. Box 607
250 North Main Street
Richfield, UT 84701

RE: Finding of Completeness and Draft Permit Renewal

Dear Mr. Ogden:

The Division of Waste Management and Radiation Control has completed its review of the permit renewal request for the Sevier County Sage Flat Class I Landfill. The permit renewal has been determined complete.

Notice of the public comment period will be published in the Richfield Reaper on October 23, 2019 with the comment period beginning on October 24, 2019 and ending on November 25, 2019. Following the public comment period and resolution of any comments, final action will be taken on the draft permit.

Enclosed is a copy of the draft permit and associated attachments for your review.

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

Sincerely,

T. Allan Moore, Solid Waste Program Manager
Division of Waste Management and Radiation Control

TAM/DT/kl

(Over)

DSHW-2019-012902

195 North 1950 West • Salt Lake City, UT
Mailing Address: P.O. Box 144880 • Salt Lake City, UT 84114-4880
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Enclosures Draft Permit (DSHW-2019-0006302)
Attachment #1 (DSHW-2019-008180)
Attachment #2 (DSHW-2019-008178)
Attachment #3 (DSHW-2019-008176)
Attachment #4 (DSHW-2019-008174)

c: Kelly Conder, Landfill Manager
Sue Hilderbrand, MSN, Health Officer, Central Utah Public Health Dept.
Nathan Selin, Environmental Health Director, Central Utah Public Health Dept.
John Chartier, P.E., DEQ District Engineer

DIVISION OF WASTE MANAGEMENT AND RADIATION CONTROL SOLID WASTE LANDFILL PERMIT

Sevier County Class I Landfill

Pursuant to the provision of the 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, R315-301 through 320 of the Utah Administrative Code adopted thereunder, a Permit is issued to:

Sevier County
as owner and operator (Permittee)

to own, construct and operate the Sage Flat Class I Landfill.

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 _____, 2019

This Permit shall expire at midnight _____, 2029.

Closure Cost Revision Date: _____, 2024.

Signed this _____ day of _____, 2019.

_____
Ty L. Howard Director
Division of Waste Management and Radiation Control

I.A.1.

FACILITY OWNER/OPERATOR INFORMATION

LANDFILL NAME:	Sevier County Sage Flat Class I Landfill
OWNER NAME:	Sevier County
OWNER ADDRESS:	250 North Main Street P. O. Box 607 Richfield, Utah 84701
OWNER PHONE NO.:	435-979-8655
OPERATOR NAME:	Sevier County
OPERATOR ADDRESS:	250 North Main Street P. O. Box 607 Richfield, Utah 84701
OPERATOR PHONE NO.:	435-879-8655
TYPE OF PERMIT:	Class I Landfill
LOCATION:	Sections 3, 4, 9, and 10, Township 23 South, Range 1 West, Salt Lake Base and Meridian, Sevier County, Utah.
PERMIT NUMBER:	9407R3
PERMIT HISTORY	Permit Signed: INSERT DATE SIGNED

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 renewal application for Sevier County Sage Flat Class I 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 a Class I and a Class IV disposal cells. A dead animal pit, a green waste accumulation area, an asbestos cell, a waste tire collection and a metals recycling collection area.

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, other than the rights inherent in this Permit, in either real or personal property, or any exclusive privileges other than those inherent in this Permit. 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 all applicable requirements of R315-301 through 320 of the Utah Administrative Code, for a Class I landfill, that are in effect as of the date of this Permit unless otherwise noted in this Permit. Any permit noncompliance or noncompliance with any applicable portions of Utah Code Ann. § 19-6-101 through 126 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, modification, or denial of a permit renewal application.

I.B. Acceptable Waste

I.B.1. This Permit is for the disposal of non-hazardous solid waste that may include:

I.B.1.a Municipal solid waste as defined by R315-301-2(47) of the Utah Administrative Code;

I.B.1.b Commercial waste as defined by R315-302-2(14) of the Utah Administrative Code;

I.B.1.c Industrial waste as defined by R315-302-2(35) of the Utah Administrative Code;

I.B.1.d Construction/demolition waste as defined by 19-6-102(4), Utah Code Annotated;

I.B.1.e Special waste as allowed by R315-315 of the Utah Administrative Code and authorized in section III-I of this Permit and limited by this section;

I.B.1.f Conditionally exempt small quantity generator hazardous waste as specified in R315-303-4(7)(a)(i)(B) of the Utah Administrative Code; and PCB's as specified by R315-315-7(2) of the Utah Administrative Code. The Permittee is authorized to receive for disposal regulated asbestos-containing material in compliance with R315-315-2 of the Utah Administrative Code.

I.B.1.g Acceptable wastes are restricted to wastes that are received under sole contracts with local governments, within Utah, for waste generated within the boundaries of the local government. Each contract shall be approved by the Director prior to acceptance of the waste at the landfill.

I.C. Prohibited Waste

I.C.1. Hazardous waste as defined by R315-1 and R315-2 of the Utah Administrative Code except as allowed in permit condition I-B6 (Acceptable Waste) above;

I.C.2. Containers larger than household size (five gallons) holding any liquid; non-containerized material containing free liquids; or any waste containing free liquids in containers larger than five gallons; or

I.C.3. PCB's as defined by R315-301-2 of the Utah Administrative Code, except as allowed in Section I-B (Acceptable Waste) of this Permit.

I.C.4. Any prohibited waste received and accepted for treatment, storage, or disposal at the facility shall constitute a violation of this Permit, of Utah Code Ann. § 19-6-101 through 123 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 Central Utah 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;

I.D.1.b 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.c 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.d 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 reocrd, on the day the event occurred or the day it was discovered;

I.E.3.b Notify the Director 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.a Attachments to the Permit Application are incorporated by reference into this Permit and 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 Permittee shall construct any landfill cell, sub-cell, run-on diversion system, runoff containment system, waste treatment facility, leachate handling system, or final cover in accordance with the design submitted as shown in Attachment I and in accordance with R315-301 thru 320 of the Utah Administrative Code.

II.A.2. Prior to construction of any landfill cell, sub-cell, engineered control system, waste treatment facility, leachate handling system, or final cover, the Permittee shall submit construction design drawings and a Construction Quality Control and Construction Quality Assurance (CQC/CQA) Plans to the Director for approval. Approved design drawings and CQA/CQC plans will be incorporated into this permit through modification. Buildings do not require approval. The Permittee shall construct any landfill cell, sub-cell, cell liner, engineered control system, waste treatment facility, leachate handling system, and final cover in accordance with the design drawings and CQC/CQA Plans submitted to and approved by the Director.

II.A.3. Subsequent to construction, the Permittee shall notify the Director of completion of construction of any landfill cell, sub-cell, engineered control system, waste treatment facility, or final cover. Landfill cells may not be used for treatment or disposal of waste until all CQC/CQA documents and construction-related documents, including as-built drawings, are approved by the Director and this permit has been modified to reflect these changes. The Permittee shall submit as-built drawings for each construction event that are stamped and approved by an engineer registered in the State of Utah.

II.A.4. The Permittee shall notify the Director of any proposed incremental closure, placement of any part of the final cover, or placement of the full final cover. Design approval must be received from the Director and this permit modified prior to construction. The design shall be accompanied by a CQC/CQA Plan, for each construction season where incremental or final closure is performed.

II.A.5. A qualified party, independent of the owner and the construction contractor, shall perform the quality assurance function on liner components, cover components, and other testing as required by the approved CQC/CQA Plan. The results shall be submitted to the Director as part of the as-built drawings.

II.A.6. All engineering drawings submitted to the Director shall be stamped and approved by a professional engineer with a current registration in Utah.

II.B. Run-On Control

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

II.B.2. Future Trench Liner Design

Prior to construction of future trenches, the Permittee must choose to either construct the trench liner with the standard design as described in R315-303-3(3)(a) of the Utah Administrative Code, demonstrate that the current design or another chosen design is equivalent to the standard design as described in R315-303-3(3)(c) of the Utah Administrative Code, or, as an alternative design, demonstrate that no potential for contamination of ground water from the landfill exists and therefore no liner is necessary as described in R315-303-3(3)(b) of the Utah Administrative Code.

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 approved by the Director as a modification under R315-311-2 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.2. Lock all facility gates and other access routes during the time the landfill is closed.

III.B.3. Have at least one person onsite, employed by the Permittee, at the landfill during all hours that the landfill is open.

III.B.4. Construct all fencing and any other access controls as shown in the Permit Application 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. Except as provided in this paragraph, intentional burning of solid waste is prohibited and is a violation of R315-303-4(2)(b) of the Utah Administrative Code. The Permittee is allowed to burn material by complying with the requirements of R307-202-5 of the Utah Administrative Code. The Permittee shall perform such burning in a segregated area within the landfill site. The Permittee shall extinguish all accidental fires as soon as reasonably possible. The Permittees non-compliance with R307-202-5 of the Utah Administrative Code, as determined by the Director of the Division of Waste Management and Radiation Control, also constitutes non-compliance with this Permit.

III.D.3. The Permittee shall extinguish all accidental fires as soon as reasonably possible.

III.E. Daily Cover

III.E.1. The Permittee shall completely cover the solid waste received at the landfill at the end of each working day with a minimum of six inches of earthen material.

III.E.2. The Permittee may use an alternative daily cover material when the material and the application of the alternative daily cover meets the requirements of R315-303-4(4)(b) through (e) of the Utah Administrative Code.

III.F. Ground Water Monitoring

III.F.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 approved by the Director as a modification under R315-311-2of 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.

III.G. Gas Monitoring

III.G.1. The Permittee shall monitor explosive gases at the landfill in accordance with the Gas Monitoring Plan contained in Attachment 3 and shall otherwise meet the requirements of R315-303-3(5) of the Utah Administrative Code. If necessary, the Permittee may modify the Gas Monitoring Plan, provided that the modification meets all of the requirements of R315-301 through 320 of the Utah Administrative Code and is approved by the Director as a modification under R315-311-2 of the Utah Administrative Code. The Permittee shall note any modification to the Gas Monitoring Plan in the daily operating record. If the concentrations of explosive gases at any of the facility structures, at the property boundary, or beyond the property boundary ever exceed the standards set in R315-303-2(2)(a) of the Utah Administrative Code, the Permittee shall:

III.G.1.a Immediately take all necessary steps to ensure protection of human health and notify the Director;

III.G.1.b Within seven days of detection, place in the daily operating record the explosive gas levels detected and a description of the immediate steps taken to protect human health;

III.G.1.c Implement a remediation plan that meets the requirements of R315-303-3(5)(b) of the Utah Administrative Code; and

III.G.1.d Submit the plan to, and receive approval from, the Director prior to implementation.

III.H. Waste Inspections

III.H.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.H.2. The Permittee shall inspect all loads suspected or known to have one or more containers capable of holding more than five gallons of liquid to ensure that each container is empty.

III.H.3. The Permittee shall inspect all loads that the Permittee suspect may contain a waste not allowed for disposal at the landfill.

III.H.4. The Permittee shall conduct complete random inspections as follows:

III.H.4.a The Permittee shall conduct the random waste inspection at the working face or an area designated by the Permittee.

III.H.4.b The Permittee shall direct that loads subjected to complete inspection be unloaded at the designated area;

III.H.4.c Loads shall be spread by equipment or by hand tools;

III.H.4.d Personnel trained in hazardous waste recognition and recognition of other unacceptable waste shall conduct a visual inspection of the waste; and

III.H.4.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.H.4.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.I. Disposal of Special Wastes

III.I.1. If a load of incinerator ash is accepted for disposal, the Permittee shall transport it to the place of disposal in such a manner as to prevent leakage or the release of fugitive dust. The Permittee shall completely cover the ash with a minimum of six inches of material, or the Permittee shall use other methods or material, if necessary, to control fugitive dust. The Permittee may use ash for daily cover when its use does not create a human health or environmental hazard.

III.I.2. The Permittee may dispose of animal carcasses may in the landfill working face and shall cover them with other solid waste or earth by the end of the operating day in which the carcasses are received. Alternatively, the Permittee may dispose of animal carcasses in a special trench or pit prepared for the acceptance of dead animals. If a special trench is used, the Permittee shall cover animals placed in the trench with six inches of earth by the end of each operating day.

III.I.3. The Permittee shall handle and dispose of asbestos waste in accordance with R315-315-2 of the Utah Administrative Code.

III.J. Self Inspections

III.J.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; cell liner; leachate systems; 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.K. Recordkeeping

III.K.1. The Permittee shall maintain and keep on file at location of records, 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.K.1.a Records related to the daily landfill operation or periodic events including:

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

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

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

III.K.1.b.(i) A copy of this Permit, including the Permit Application;

III.K.1.b.(ii) Results of inspections conducted by representatives of the Director, and of representatives of the local Health Department, when forwarded to the Permittee;

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

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

III.L. Reporting

III.L.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, a re-application for approval of the financial assurance mechanism, any leachate analysis results, all ground water monitoring results, the statistical analysis of ground water monitoring results, the results of gas monitoring, the quantity of leachate pumped, and all training programs completed.

III.M. Roads

III.M.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 shall be improved and maintained as necessary to assure safe and reliable all-weather access to the disposal area.

III.N. Litter Control

III.N.1. Litter resulting from operations of the landfill shall be minimized. In addition to the litter control plans found in location in the permit application of the Permit Application, the Permittee shall implement the following procedures when high wind conditions are present:

III.N.1.a Reduce the size of the tipping face;

III.N.1.b Reduce the number of vehicles allowed to discharge at the tipping face at one time;

III.N.1.c Orient vehicles to reduce wind effects on unloading and waste compaction;

III.N.1.d Reconfigure tipping face to reduce wind effect;

III.N.1.e Use portable and permanent wind fencing as needed; and

III.N.1.f Should high winds present a situation that the windblown litter cannot be controlled, the Permittee shall cease operations of the landfill until the winds diminish.

IV. CLOSURE REQUIREMENTS

IV.A. Closure

IV.A.1. The Permittee shall install final cover of the landfill as shown in Attachment 4. The final cover shall meet, at a minimum, the standard design for closure as specified in the R315-303-3(4) of the Utah Administrative Code plus sufficient cover soil or equivalent material to protect the low permeability layer from the effects of frost, desiccation, and root penetration. The Permittee shall submit to the Director a quality assurance plan for construction of the final landfill cover, and approval of the plan shall be received from the Director prior to construction of any part of the final cover at the landfill. A qualified person not affiliated with the Permittee or the construction contractor shall perform permeability testing on the recompacted clay placed as part of the final cover.

IV.A.2. Title Recording

IV.A.2.a The Permittee shall meet the requirements of R315-302-2(6) of the Utah Administrative Code by recording a notice with the Sevier 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.B. Post-Closure Care

IV.B.1. The Permittee shall perform post-closure care at the closed landfill in accordance with the Post-Closure Care Plan contained in Attachment 4. 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.C. Financial Assurance

IV.C.1. The Permittee shall keep in effect and active the currently approved financial assurance mechanism or another approved mechanism that meets the requirements of R315-309 of the Utah Administrative Code and is approved by the Director to cover the costs of closure and post-closure care at the landfill. 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.

IV.D. Financial Assurance Annual Update

IV.D.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. For Permittees using the "Local Government Financial Test" or "Local Government Guarantee" (R315-309-8), use the following. The Permittee shall submit the information as required in R315-309-8 of the Utah Administrative Code and shall meet the qualifications for the "Local Government Financial Test" or "Local Government Guarantee" each year.

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

IV.E.1. 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/s or by the Director following the procedures specified in R315-311-2 of the Utah Administrative Code.. The Permittee shall be given written notice of any permit modification initiated by the Director.

V.B. Permit Transfer

V.B.1. 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.C. Expansion

V.C.1. 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.D. Any addition to the acceptable wastes described in Section I-B shall require submittal of all necessary information to the Director and the approval of the Director. use the following for all landfill unless a PCB bulk product approval has been given Acceptance for PCB bulk product waste under R315-315-7(3)(b) of the Utah Administrative Code can only be done after submittal of the required information to the Director and modification of Section I-C of this Permit.

V.D.1. 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 and Utah Code Annotated § 19-6-108(1)(d) and shall receive all approvals required in Utah Code Ann. § 19-6-108.

V.D.2. Any addition to the acceptable wastes described in Section I-B shall require a permit modification in accordance with R315-311 of the Utah Administrative Code.

V.D.3. Acceptance for PCB bulk product waste under R315-315-7(3)(b) of the Utah Administrative Code can only be done after submittal of the required information to the Director and modification of Sections I-B and I-C of this Permit. Acceptance of a broader waste stream may also require a new permit and compliance with the requirements for a new permit under R315-301 through 320 of the Utah Administrative Code and Utah Code Ann. § 19-6-108.

V.E. Expiration

V.E.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.

Attachments
Attachment 1 – Design and Construction
Attachment 2 – Plan of Operation
Attachment 3 – Ground Water Monitoring
Attachment 4 – Closure and Post Closure

Attachment 1
Design and Construction

The leachate collection pipe will be monitored by removing the cover, and lowering electric well probe into the standpipe to determine if free liquids exist

If and when free liquids initially appear in the collection pipe, the Department of Environmental Quality will be notified

Free Liquid will only be allowed to build up in the collection pipe to a minimal level and then the free liquid will be purged The collection pipe will be purged of free liquids when they are detected, unless a sampling event is planned and the volume is being accumulated to provide adequate sample volume for analysis Purging will be performed using a submergible pump and will be performed as needed so that the free liquid level does not exceed a depth of 12 inches in the collection pipe

4 8 2 Samplmg Free Liquids

Sampled of free liquids will follow established EPA sampling protocol The leachate collection pipes will be semi-annually unless free liquid is not present in the standpipe Sampling will be performed using a peristaltic pump or bailer

Initially, when free liquids appear, a sample will be collected without purging, if the flow rate appears to be low, and submitted for chemical analysis Based on the flow rate, additional sampling events will be proposed to characterize the free liquid (leachate)

5 0 ENGINERRING REPORT

5 1 General

Engineering designs were developed for the Sage Flat Landfill based on the State Solid Waste Rules Existing engineering and scientific data were review and incorporated into the design Specific site investigations were performed to assess the feasibility of the site and surrounding region to support and maintain the solid waste facility design Based on the available information and operations at the Sage Flat area, this facility will have minimal impacts to the quality of human and environmental health and safety for the surround area

The site is located in a remote region and will have insignificant impacts to surface and groundwater supply of quality The up gradient surface water and groundwater supply is minimal and is only partially used The area is completely surrounded by hillsides which provide both visual and security controls

The average annual precipitation is less than 10 inches/year The operation and design of the landfill facility will provide the necessary controls to minimize the long term impacts to the surrounding area The closure and post closure designs will minimize the mn-on and mn-off of surface drainage and reduce any potential development of leachate generation which would infiltrate to the underlying groundwater

The nearest aquifer underlying the Class 1 Landfill is relatively deep, approximately 165 feet below ground surface The total dissolved solids for the groundwater ranges from 500mg/1 to 1100mg/1

The design of the liner system is based on the depth and quality of the groundwater, the low annual precipitation for the site, and, the equivalent design requirements of the Rules The

landfill utilizes a trench-mound design The trenches will be constructed with low permeable clay bottom liners at a slope of 2 percent Leachate collection pipes will be installed below the bottoru liner to monitor and collect any potential leachate Modeling of potential leachate generation indicates that no infilfration will be detected through the underlying native clay liner for at least the first twenty years of the post closure period therefore, the bottom liner and cover design should provide adequate protection of the relatively deep groundwater system

5 2 Location Standards

5 2 1 Land Use Compatibility

The landfill is located in a remote area of Sevier County with a land use designation of GRF-1 (Grazing, Recreation and Forestry) No existing structures are in the immediate vicinity of the site Due to the distance of the site from any population, there is not expected to be any problems with complaints of odor or aesthetics of the landfill

5 2 2 Geology

The landfill site is located in a small, gently sloping basin The basin received runoff from the surrounding hills and therefore is filled with alluvium to substantial depths Local geological conditions are outlined in subsections 4 2 and 4 3 The soil profile at the site consists of interbedded layers of silty clay, silt, sand and gravel

5 2 3 Seismic

Municipal landfills must be designed to withstand seismic accelerations if they are located in a *seismic impact zone* A seismic impact zone is defined as an area with a 10% or greater probability that the maximum horizontal acceleration m lithified material will exceed 0 10 g m 250 years (Solid waste Rules) According to Algemissen et al (1990), there is a 10% probability of ground acceleration exceeding 0 43 g in a 250 year period at the landfill site The Sevier County landfill is located in an seismic impact zone and has been designed to account for the effects of earthquake accelerations

Sevier Valley is bordered by two faults the Sevier fault to the east and the Elsinore fault on the west side of the valley The Rules required that the facility may not be located within 200 feet of a Holocene fault The nearest fault according to Young (1965), is located approximately 3000 feet due east This fault is believed to be a minor fault and is assumed not to be a segment of the Sevier fault

Since the post-construction landfill cells will be at approximately the same grade as the existing grourid, waste cell structural integrity problems associated with seismic accelerations are not expected Because the groundwater is located at a considerable depth, liquefaction of the foundation soils is not an issue

5 2 4 Stability Analysis

The stability of the trench walls has been modeled using PCSTABL5M, a coruputer program developed to ruodel the stability of slopes that experience earthquake accelerations A horizontal earthquake acceleration of 0 43 g was used in the stability modeling Soil cohesion values that were assumed for the silty clay soil at the Sage Flat site were obtained from field pocket penetrometer measurements Values of cohesion from the field pocket penetrometer

measurements were on the order of 4500 psf, which is typical of a hard clay However, a conservative cohesion of 2500 psf was used in the stability modeling Native clay is mixed with the solid waste through daily placement Therefore, a conservative cohesive value was estimated for the solid waste/soil mixture

The minimum factor of safety computed by PCTAB5M for the disposal trench during an earthquake was 1 8 The input and output files for the PCSTABL5M are included in Appendix H

5 2 5 Surface Water

There are no perennial streams that discharge into the basin Several intermittent streams flow into the Sage Flat basm form the surrounding drainage basins Drainage structures to control run-on from the 25years/24 hour precipitation event have been constmcted at the landfill site The drainage stmctures consist of diversion channels that will follow the perimeter of the landfill site, and culverts which convey the flow under the access and equipment roads The site hydrology calculations completed by Bmgham Engmeering are included in Appendix I

5 2 6 Wetlands

There are no wefland located in the vicinity of the site, therefore the landfill will not adversely affect the wefland environment ot any wildlife associated with wetlands No threatened or endangered species are known to exist in the area of, or immediately surrounding, the landfill site

5 2 7 Groundwater

Groundwater at the site has been encountered at a depth of 165 feet below the ground surface in the area of the Class 1 site The aquifer below the site is not used for drinking water The TDS of the aquifer ranges from 590 to 1100mg/1 which classifies the groundwater as Class 11 Additional groundwater information is included in Section 4 4, Appendix B, Appendix C, and Appendix D

When the original landfill permit was issued in 1994, Sevier County was given an exemption from groundwater momtoring Based on the site conditions and landfill design, it appears this exemption status should remain

5 3 Solid Water Management Plan

It is anticipated that the landfill will continue to receive waste from all of Sevier County for more than the next 20 years The current population of Sevier County was 18,842 from the 2000 Census reports The current capacity of the Sage Flat Landfill is calculated to be 2,825,000 cubic yards The total area of the site is approximately 460 acres The waste is disposed using a trench-mound method

S 4 Cell Design and Development

The Class 1 Landfill disposal cells are being constrncted as trench-mound cells There are seven trenches planned, ranging in length between 1,400 and 2,100 feet The first trench is m use The maximum depth of each trench below ground surface is 40 feet at the center of the length of the trench The depth decrease towards each end of the trench due to the 2 percent slope on the bottom liner The 2 percent slope of the bottom liner slopes towards the center of each trench location of the leachate collection system The trenches will be mounded about 21 feet above the natural ground surface The maximum total depth of the cells will be about 61 feet

The bottom width of the trench will be 100 feet and the width of the top of the trench will be about 200 feet The side slopes vary from 1 horizontal to 2 vertical and 2 horizontal to I vertical Field investigations mdicate that there is a silty clay zone of soil to depths of at least 20 feet below the surface Silty clay soil should provide the slope stability necessary for the temporary 1 2 sideslopes The sideslopes may be flattened at the discretion of the landfill operator, to maintain stability of the slopes Berms will be located adjacent to the top of the vertical slopes to mamtain an adequate safe distance of personnel and vehicular traffic from the top of the slope The berms will be constrncted of the temporary stockpiled material excavated from the topsoil layer and the excavated trench Berms will be located an adequate distance away from the edge of the trench to avoid any stability problems

The cells will be constmcted in an orderly sequence from north to south The natural ground surface elevation at the northern most cell (cell1), located at the northern end of the site, is approximately 5842 feet The natural elevation of the maximum cover section of the cell will be approximately 21 feet greater than the existing ground surface elevation at the center of the cell The final cover will be graded to a minimum 3 percent slope extending from the center of the cell across the width of the cell

The trenches will be constmcted in a phased approach The phases will include (1) marking the boundary of the area to be excavated, (2) striping and stockpiling the topsoil layer for future final cover, (3) excavation of the trench and constrnction of low permeable clay liner at bottom of trench prior to disposal and waste placement, (4) intermediate cover over the full disposal cell, (5) placement of compacted embankment along outside edge of cell and placement of waste over intermediate cover, and, (6) final cover placement of clay, native soil, topsoil and vegetation over the full disposal cell

The topsoil cover will be stripped and stockpiled along the southern edge of the vertical sideslope This berm will create a barrier to restrict access along the top of the sideslopes The material excavated from the trench will be stockpiled along the north edge of the trench

The working face of the trench (west end) and the equipment access (east end) will be constmcted to a maximum slope of 3 horizontal to 1 vertical Waste will be unloaded at the top of the working face and spread over the working face and compacted The native clay is mixed with the solid waste throughout daily placement The unloading of waste is restricted to one area of the working face to limit vehicular traffic and to limit the amount of waste exposed

The material excavated from the trench is typically a silty clay material In the area of the landfill trenches, the silty clay material is expected to be found at depths greater than 20 feet The bottom of the trench will be lined with a mimmum of 2 feet of compacted clay with a permeability no greater than 10-7 c,/sec This clay material will be obtained from materials excavated onsite

An intermediate cover will be place over the solid waste once it has been place to the level of the existing underground The intermediate cover will consist of a minimum thickness of 18-inches of native soils stockpiled form the excavated trench The intermediate cover will be compacted to facilitate traffic ability over the waste in the cells A 6-inch layer of gravel will be placed over the intermediate cover in the unloading area at the top of the working face to improve traffic ability dunng inclement weather conditions This gravel material is a temporary measure to improve access to the working face A compacted embankment will be constmcted around the outside edges of the cell This will allow the additional waste to be placed above the existing ground surface After the compacted embankment is in place, the waste will be placed over the intermediate cover

The final cover will consist of 18-inches of compacted clay within in-place permeability of no greater than 10-7 cm/sec The compacted clay layer will be covered with 20 inches of material consisting of 14 inches of native soil and a 6 inch thick topsoil layer will be placed over the top The topsoil will be available from the stripped and stockpiled topsoil material The final cover will have a 3% cross slope and will be reseeded

Equipment will be maintained and stored in a maintenance building and storage buildings centrally located on site Access to the maintenance buildmg will be provided for the landfill operation equipment The landfill operatmg equipment will access the landfills trenches from the east end of the trench

The specification for constmction of the Class 1 Landfill cells are included in Appendix J The specifications include excavation, bottom liner, intermediate cover, final cover and revegetation Plans for the landfill are included in Appendix K The plans show the existing landfill facilities and the sites for the Class 1 and Class IV Landfill areas

5 5 Leachate Collection

The annual average precipitation for the landfill is less than 10 mches per year and the post closure modeling of infiltration through the landfill indicates no percolation through the bottom liner of the landfill for at least the first twenty years of post closure Landfill development is design to minimize any precipitation contact with the placed waste, and all mnoff within the open cell will be diverted away from the waste towards the bottom of the cell where it will be removed or allowed to evaporate

5 5 1 Grading

Any water generated in the open cell will collect at the low-point of each cell The trench bottom liner is design as a low permeable clay liner with a 20 percent slope to direct all leachate away from the placed waste and towards the low point where it will evaporate or be removed for evaporation somewhere else on site

5 5 2 Leachate Collection Pipe

Any moisture which does not evaporate could potentially infiltrate through the top clay cover and waste layer an be collected in the leachate collection pipe and removed through the collection pipe Any leachate collected will be sampled on a semi-annual basis The sample will be analyzed for the constituents for detection monitoring which are listed in State Solid Waste Rule R315-308-4

The leachate collection pipe will be place at the center of the waste trench at its lowest point The pipe will be a perforated 6-inch diameter polyethylene pipe placed in a 24 to 36-inch deep geomembrane-lined trench and will run perpendicular to the length of the landfill trench A 45-degree elbow will connect the 6-inch perforated pipe to an angled 10-inch diameter non-perforated pipe extending to the surface This 10-inch pip will have a locking protective cover and will be used to monitor the level of any potential leachate collected in the 24 to 36-inch-deep leachate collection trench below the landfill The 10-inch diameter pipe will accomruodate an appropriately sized subruersible purup in the event that evaluation of leachate is required

5 6 Run-On and Run-Off Control Systems

Control of run-on froru surrounding drainage basins and run-off from the landfill will be accomplished through drainage structures The structures consist of earthen drainage ditches and corrugated metal pipes Earth-lined drainage ditches have bee constructed around the perimeter of the site to divert run-on The culverts have been placed under roadways that access the site and equipment roadways within the landfill site The drainage structures are designed to divert the run-on and run-off of a 25 year-24 hour precipitation event The precipitation for the 25 year/24 hour storm event is 2 2 inches (NOAA Aflas, 1973) Run off for the surrounding drainage basins were calculated by Bingharu Engineering usmg the computer model STORM, which utilizes the Soil Conservation Service (SCS) method to calculate runoff The 25 year storm event runoff froru each drainage basin was used in the design of the drainage structures

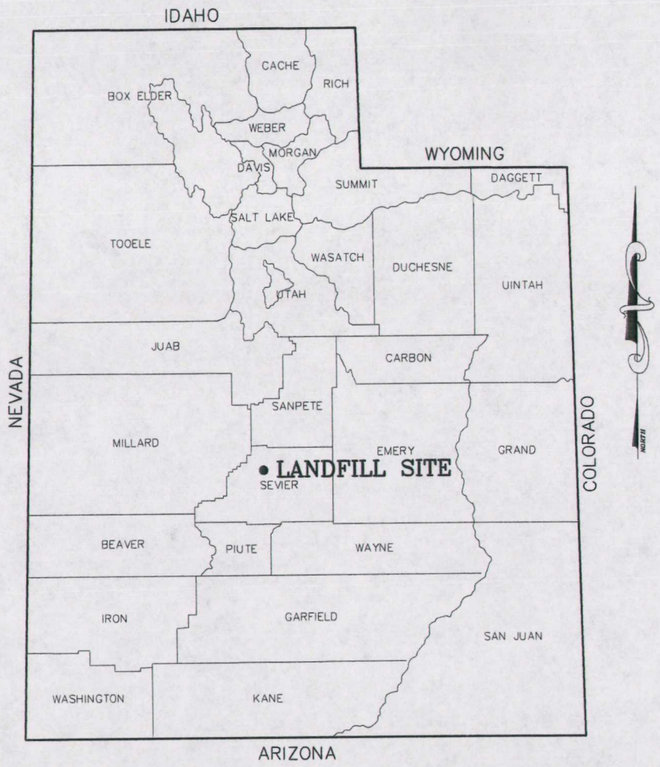
Drainages basin flow rate are very sensitive to the curve number (CN) used in the SCS calculations Curve numbers are a measured of the extent that a soil retains of sheds water, and are determined froru soil type and vegetation Soil classifications used in calculating CN values for the Sage Flat area were obtained from the SCS office in Richfield, Utah STORM only allows the input of one representative CN for each drainage basin, even though there may be several soil classifications within one drainage area An area-weighted CN value was calculated for each drainage basin

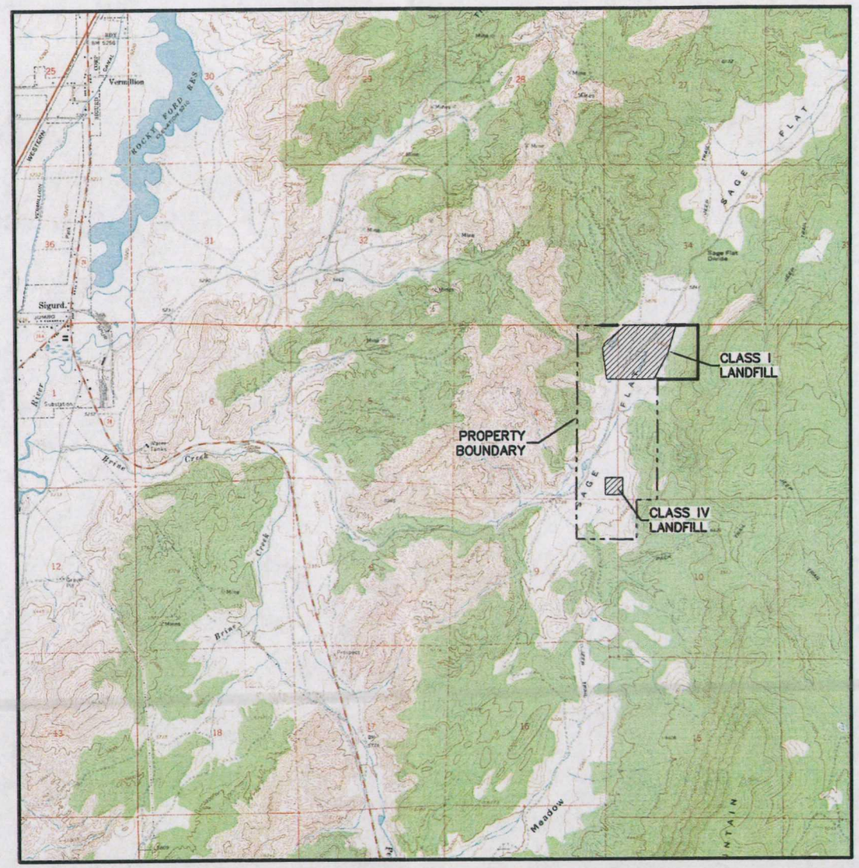
Seven drainage basins are identified which ruay potentially contribute run-on to the Sevier Landfill Drainage basins are characterized by area, CN values, and time of concentration and average slope of basm Dramage basin A has the largest flow of 75 cubic feet per second (cfs), while the flow from Basin G is essentially zero Characteristics and flow rates of the 7 drainage basins and STORM output are included in Appendix I

Depth and Velocity of flow were calculated using Manning's equation The depth of water in the channels and the maxiruum velocity of the water was utilized to size the chaimels arid to determine if the channels needed to be lined with riprap to prevent erosion If velocities exceed 6ft/sec in an earth-lined chaimel, riprap is necessary in the channel to prevent erosion

The final cover for each of the Class I landfill cells will have a 3% cross slope towards the edge Drainage swales will be constructed between each of the cells to direct the storm water runoff away from the cells The cross slopes of the drainage swales will vary with a 3 % mimmum slope and 3 1 maximum slope The longitudinal slopes of the drainage swales will vary froru a miniruum slope of 0 5% and ruaxiruum slope of 1% The drainage swales will generally slope from the east to the west The water will be collected in drainage channels on the West side of the landfill and flow away froru the site The drainage swales will generally slope from the east to the west The water will be collected m drainage channels on the West side of the landfill and

SAGE FLAT LANDFILL
SEVIER COUNTY, UTAH
2010





VICINITY MAP

INDEX TO DRAWINGS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	INDEX TO PLAN SHEETS
3–6	SITE PLAN SHEETS
7	CLASS I LANDFILL CROSS SECTIONS
8–9	LEACHATE COLLECTION DETAILS
10–11	TYPICAL SECTIONS
12	FENCE DETAILS

REGISTERED PROFESSIONAL ENGINEER
NO. 176995
TERRY L. LEONARD
STATE OF UTAH

Savage Surveying, Inc.

Richfield, Ut 84701
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Fax: 435-896-0220
www.savagesurveying.com

PROJECT NO.	SHEET NO.
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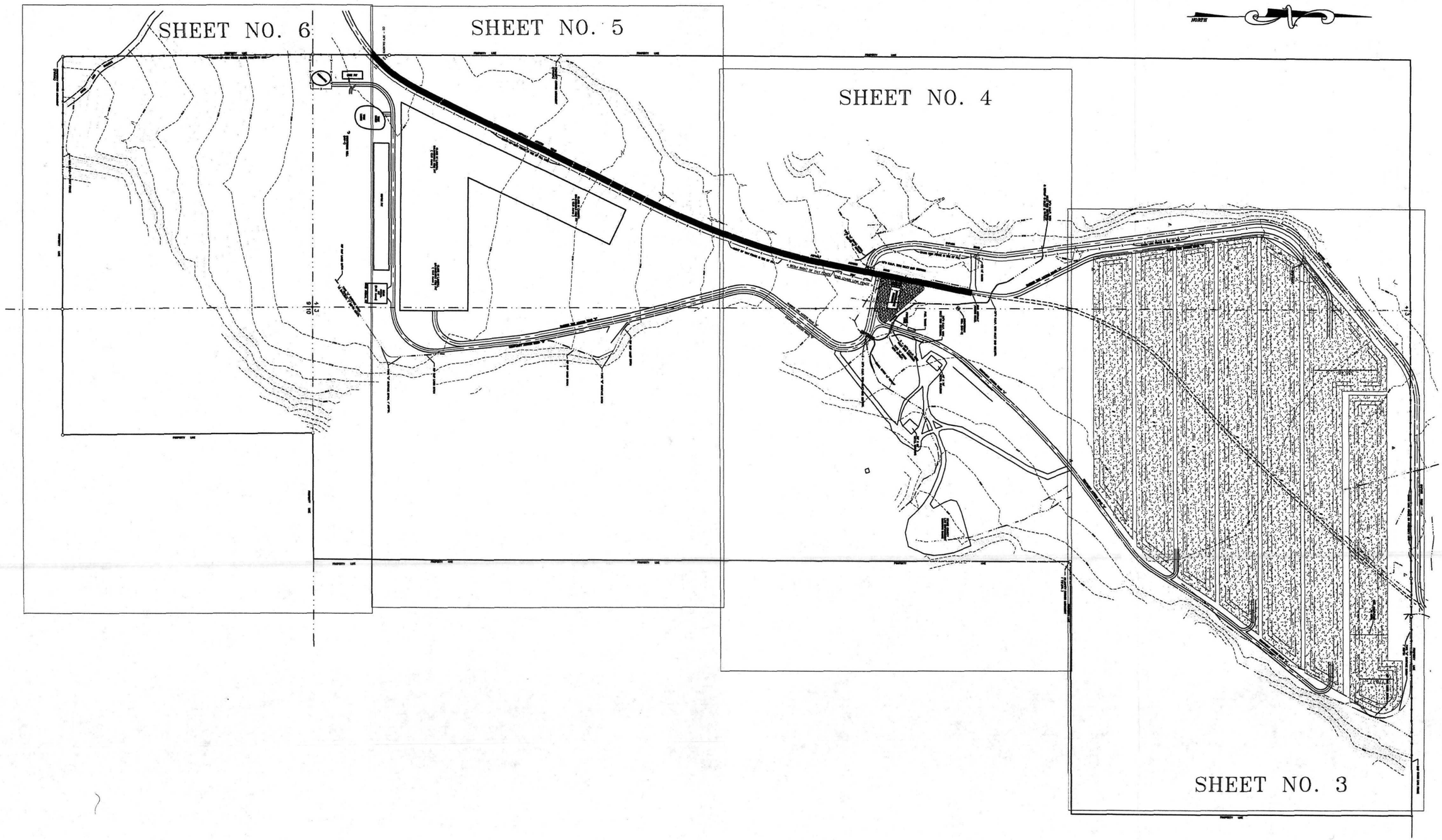

Savage Surveying, Inc.
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SAGE FLAT LANDFILL
INDEX TO SHEETS

ENGINEER	SCALE	SHEET NO.
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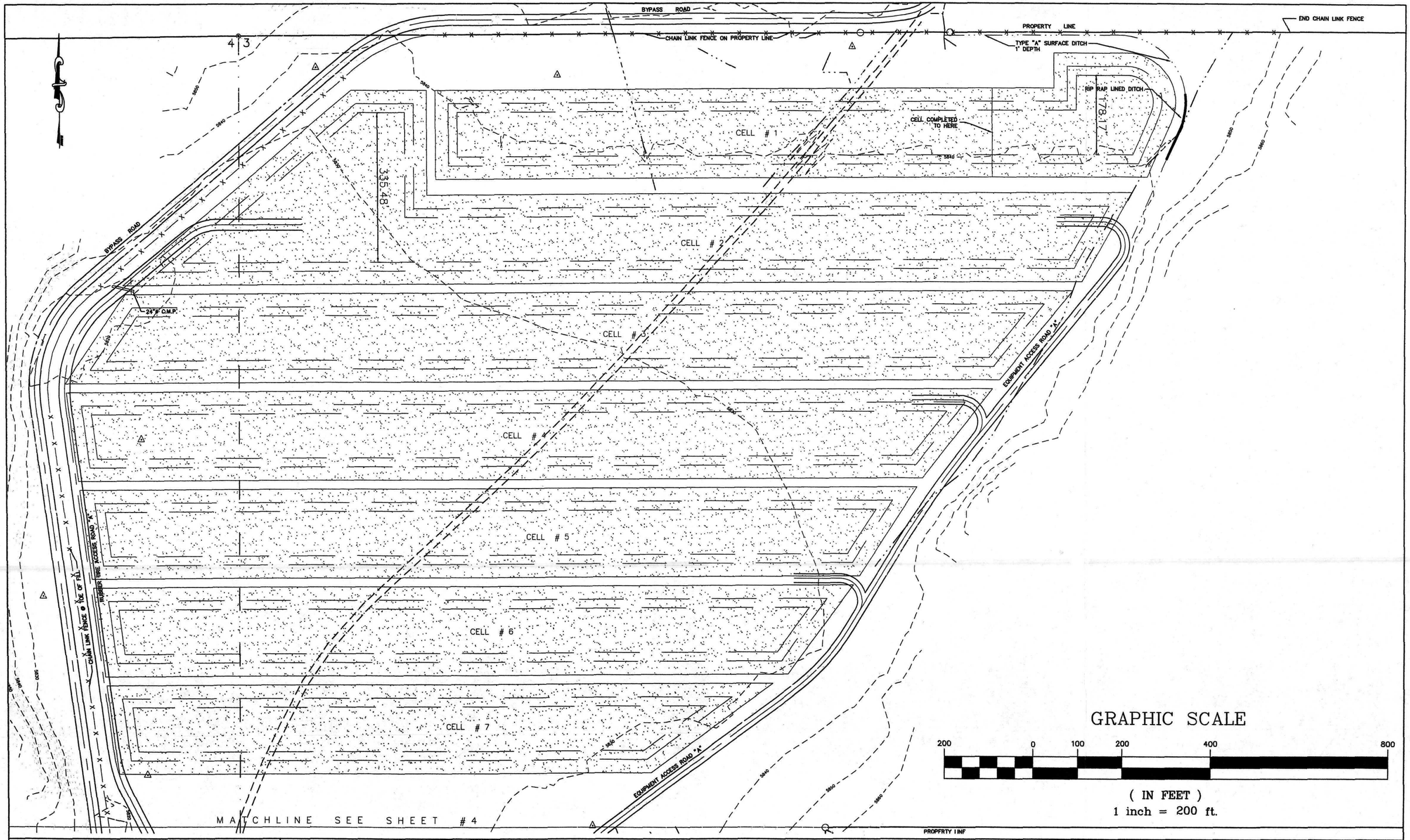
DRAWN: R.W.S.	DATE: 05/24/10	



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1925 South Industrial park Rd.
Richfield, UT 84701
Office: 435-896-8635
Fax: 435-893-0220

SAGE FLAT LANDFILL
SITE PLAN

ENGINEER T.M.	SCALE 1"=200'	SHEET NO. 3
CHECKED T.M.	PROJ#: 0809-002S DWG.NM: 2010PERMIT	
DRAWN R.W.S.	DATE 05/24/10	

MATCHLINE SEE SHEET #3

36"ø C.M.P. WITH INLET END SECTIONS & RIPRAP @ INLET & OUTLET.

RUBBER TIRE ACCESS ROAD 12'

36"ø C.M.P. WITH INLET END SECTION.

(2) 12' GATES

END ASPHALT ACCESS ROAD.

MONITORING WELL (MW-2)

30"ø C.M.P. WITH INLET END SECTIONS.

FUEL TANKS

PROPANE TANK

2 - 30"ø C.M.P. WITH INLET END SECTIONS.

TYPE 'B' DITCH WITH RIPRAP.

SMALL DITCH w/ RIPRAP

3 - 36"ø C.M.P. WITH INLET END SECTION.

40' X 70' METAL BUILDING

50' X 80' METAL BUILDING

SEVIER COUNTY LAW ENFORCEMENT SHOOTING RANGE

EQUIPMENT ACCESS ROAD 12'

BYPASS ROAD

CHAIN LINK FENCE @ TOE OF FILL

SCALES

MAINTENANCE BUILDING

15"ø C.M.P. WITH INLET END SECTION

ACCESS ROAD

TYPE 'A' SMALL DITCH 1' DEPTH W/ RIPRAP

200' END CHAIN LINK FENCE

BEGIN RIGHT OF WAY FENCE

ASPHALT

RIGHT OF WAY FENCE @ TOE OF FILL

RUBBER TIRE ACCESS ROAD 12'

EQUIPMENT ACCESS ROAD 12'

PROPERTY LINE

PROPERTY CORNER MONUMENT (TYPICAL)

PROPERTY LINE

MATCHLINE SEE SHEET #5

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)

1 inch = 200 ft.

Savage Surveying, Inc.

1925 South Industrial park Rd.
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SAGE FLAT LANDFILL
SITE PLAN

ENGINEER T.M.	SCALE 1"=200'	SHEET NO. 4
CHECKED T.M.	PROJ#: 0809-002S DWG.NM: 2010PERMIT	
DRAWN R.W.S.	DATE 05/24/10	

MATCHLINE SEE SHEET #4

PROPERTY LINE

PROPERTY CORNER MONUMENT (TYPICAL)

ASPHALT ACCESS ROAD

TOE OF FILL LINE

RIGHT-OF-WAY FENCE

5790

5780

5770

5760

5750

CLASS IV LANDFILL SALVAGEABLE ITEM PIT (12.0 Acres)

CLASS IV LANDFILL SALVAGEABLE ITEM PIT (12.0 Acres)

CLASS IV LANDFILL SALVAGEABLE ITEM PIT (12.0 Acres)

RUBBER TIRE ACCESS ROAD "B"

EQUIPMENT ACCESS ROAD "B"

RIP RAP LINED DITCH

TYPE "B" SURFACE DITCH

RIP RAP LINED DITCH

RIP RAP LINED DITCH

TYPE "A" SURFACE DITCH, 1' DEPTH.

(2) - 30"ø CULVERTS

TREE LIMBS

SEPTIC PIT

DEAD ANIMAL PIT (0.25 Acres)

MATCHLINE SEE SHEET #6

PROPERTY LINE

PROPERTY LINE

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)

1 inch = 200 ft.

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Fax: 435-893-0220

SAGE FLAT LANDFILL
SITE PLAN

ENGINEER T.M.	SCALE 1"=200'	SHEET NO. 5
CHECKED T.M.	PROJ#: 0809-002S DWG.NM: 2010PERMIT	
DRAWN R.W.S.	DATE 05/24/10	

MATCHLINE SEE SHEET #5

TREE LIMBS

WIRE PIT

ASBESTOS

MONITORING WELL (MW-1)

DEAD ANIMAL PIT

RIP RAP LINED DITCH

TYPE "A" SURFACE DITCH TO DAYLIGHT, 1' DEPTH REQ'D.

4 | 3
9 | 10

PROPERTY LINE

PROPERTY LINE

PROPERTY LINE ALONG RIGHT-OF-WAY FENCE

PROPERTY LINE

5760

5770

5780

5790

5800

5810

5820

EXISTING DIRT ROAD

END RIGHT-OF-WAY FENCE

PROPERTY CORNER MONUMENT (TYPICAL)

PROPERTY LINE

PROPERTY LINE

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

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1925 South Industrial park Rd.
Richfield, UT 84701
Office: 435-896-8635
Fax: 435-896-0220

SAGE FLAT LANDFILL
SITE PLAN

ENGINEER	SCALE	SHEET NO.
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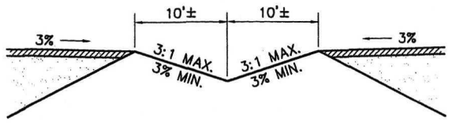
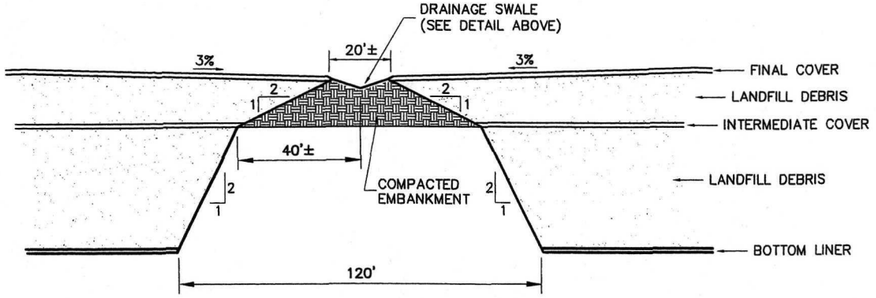
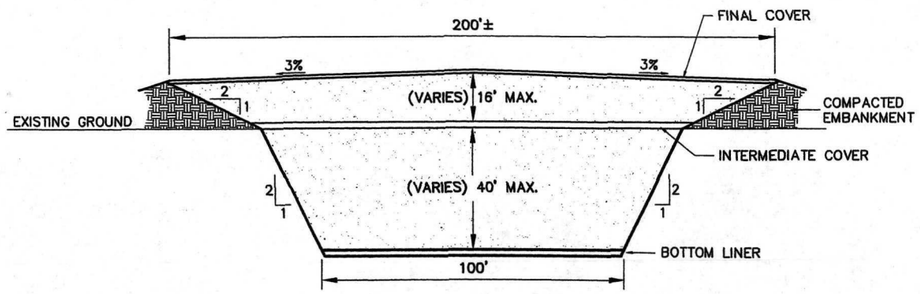


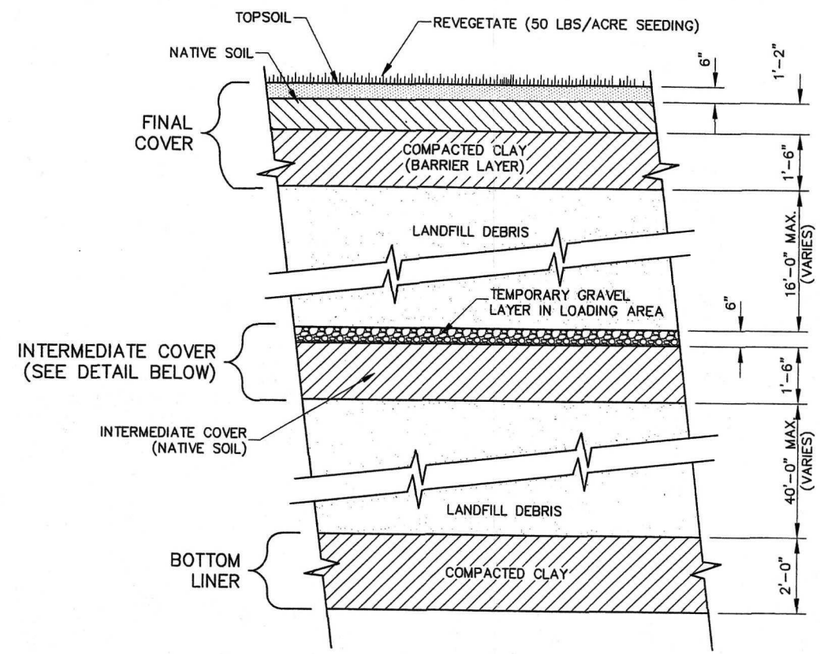
DRAINAGE SWALE



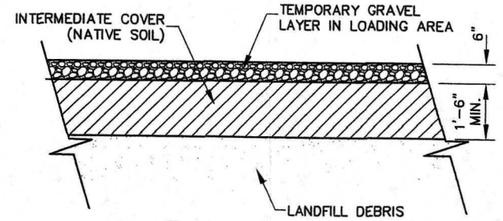
TYPICAL CROSS-SECTION BETWEEN CELLS



TYPICAL CELL CROSS-SECTION



CELL DETAIL



INTERMEDIATE COVER DETAIL

Jones & DeMille Engineering
1535 South 100 West – Richfield, Utah 84701
Phone (435) 896-8266
Fax (435) 896-8268
www.jonesanddemille.com

Sage Flat Landfill
Class I Landfill Cross Sections

ENGINEER J.F.S.	DRAWN TB/LG/BL	SHEET NO. 7
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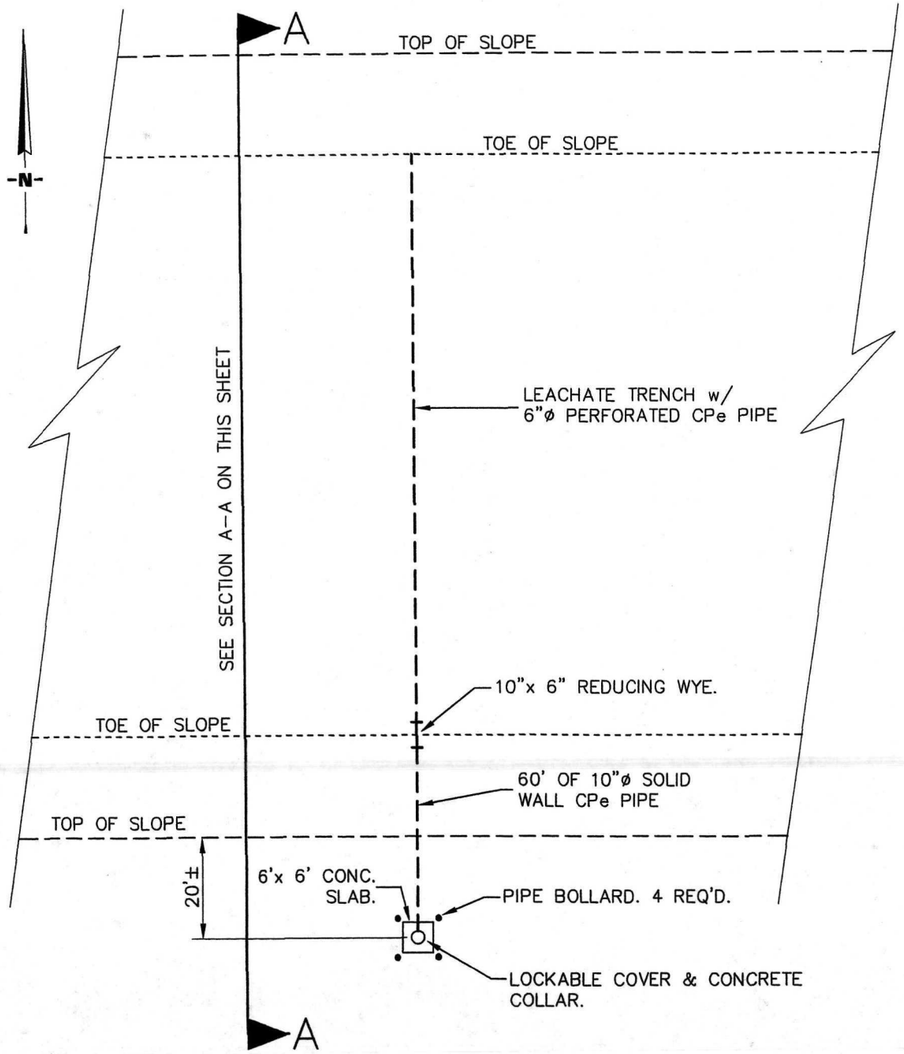
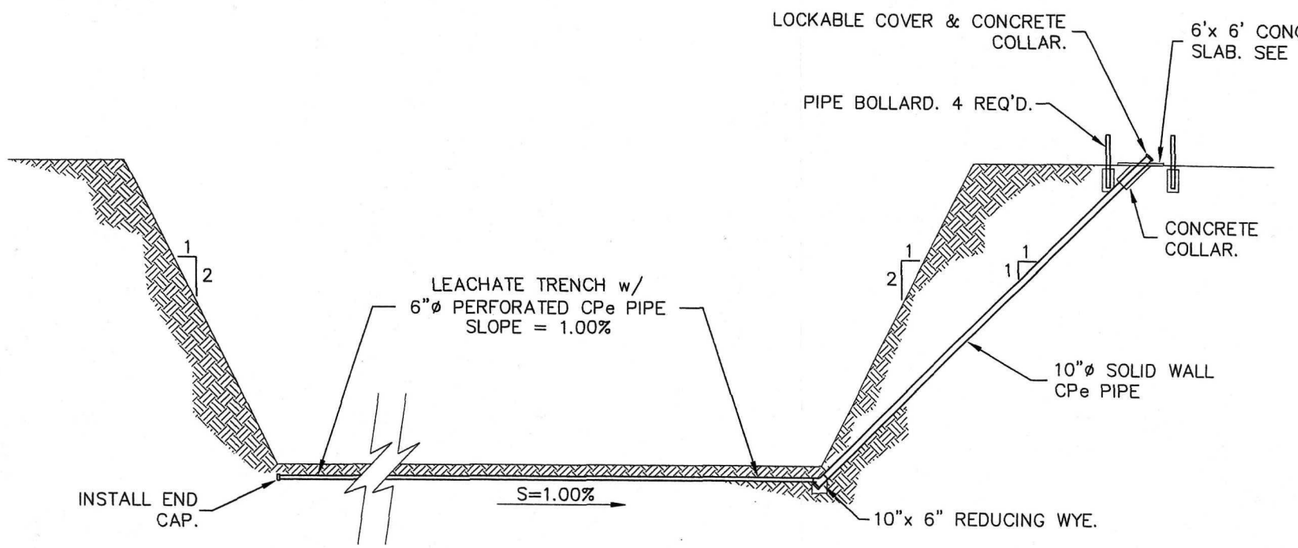


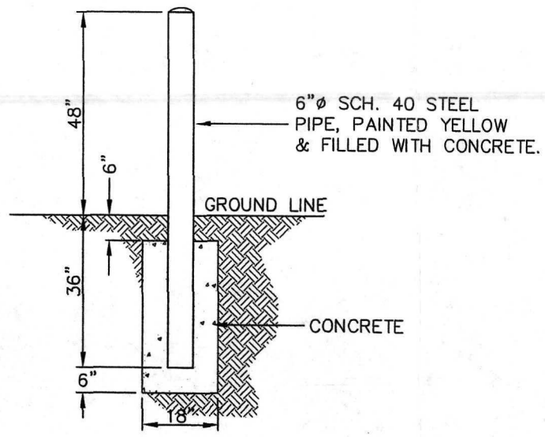
PLAN VIEW

SCALE: 1" = 30'



SECTION A-A

SCALE: 1" = 20'



PIPE BOLLARD DETAIL

NO SCALE

Jones & DeMille Engineering
1535 South 100 West – Richfield, Utah 84701
Phone (435) 896-8266
Fax (435) 896-8268
www.jonesanddemille.com

Sage Flat Landfill
Leachate Collection System Details

ENGINEER T.M.J.	DRAWN TB/LG/BL	SHEET NO. 8
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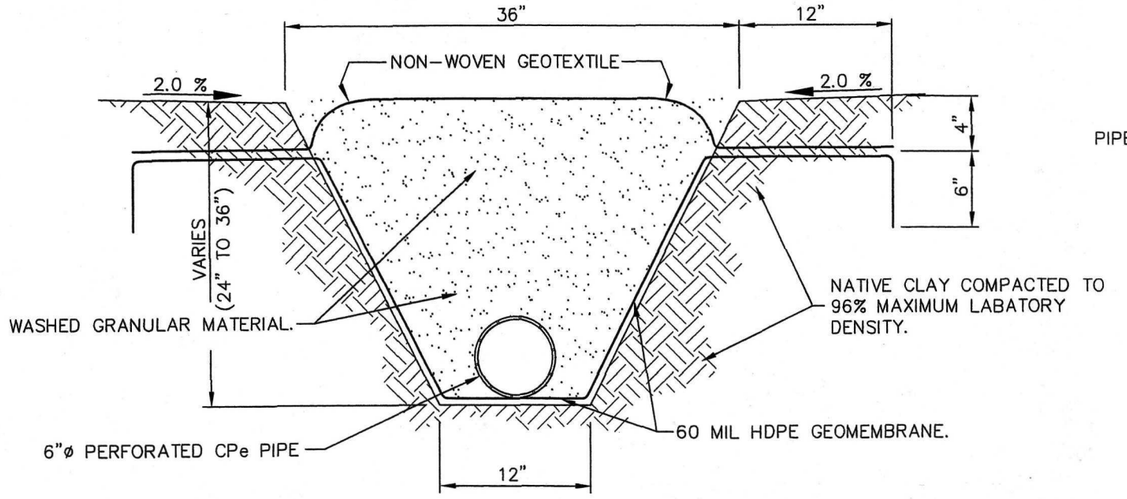
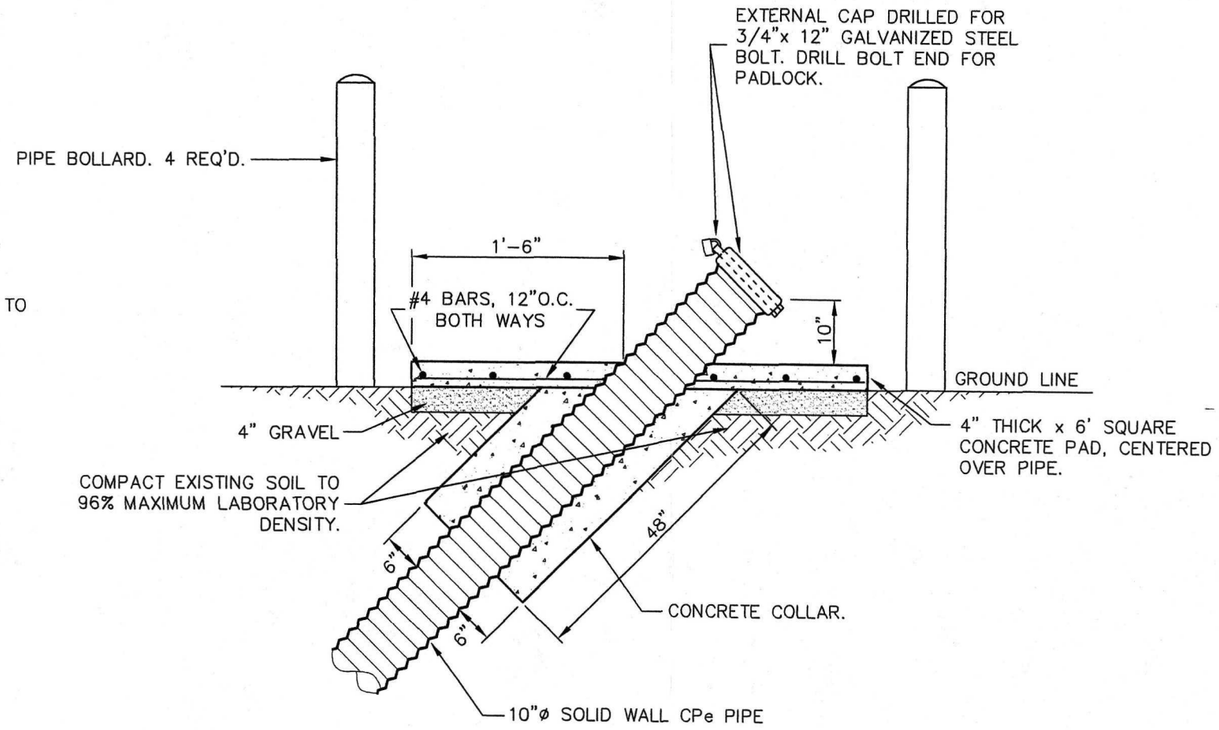
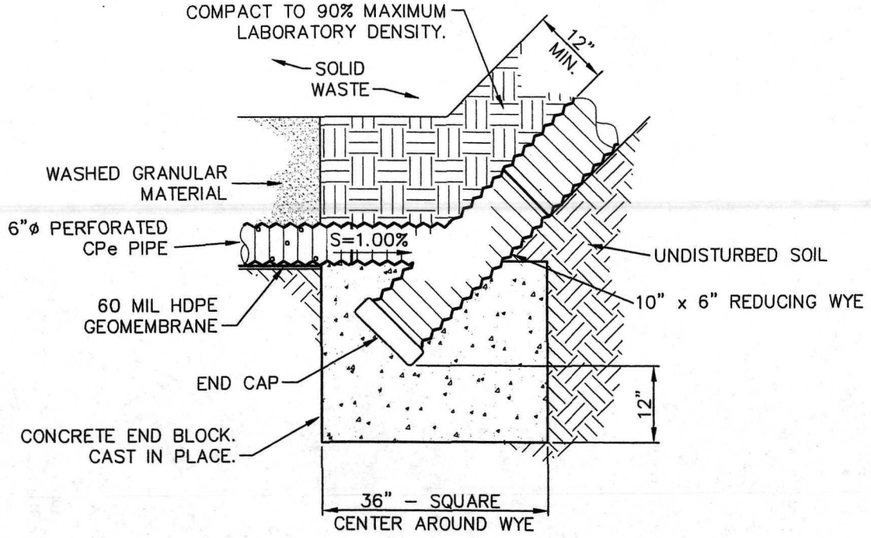


LEACHATE COLLECTION TRENCH DETAIL



PAD, LOCKABLE COVER & CONCRETE COLLAR DETAIL

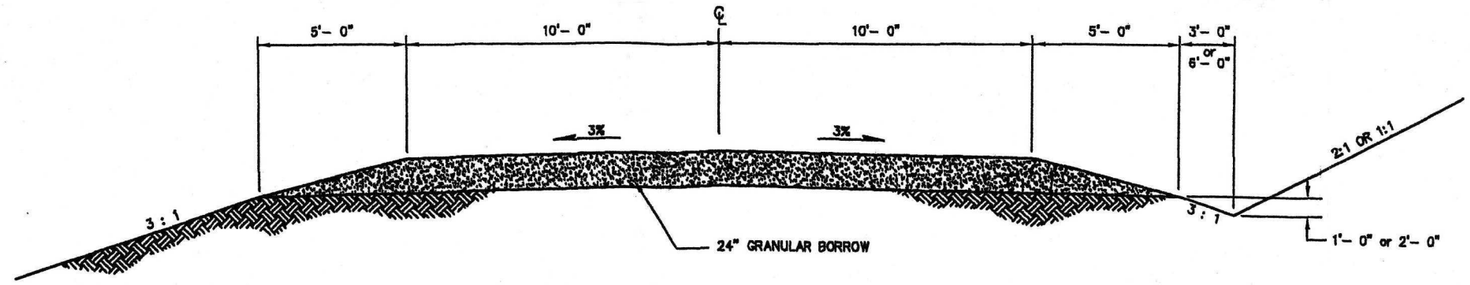


10" x 6" REDUCING WYE DETAIL

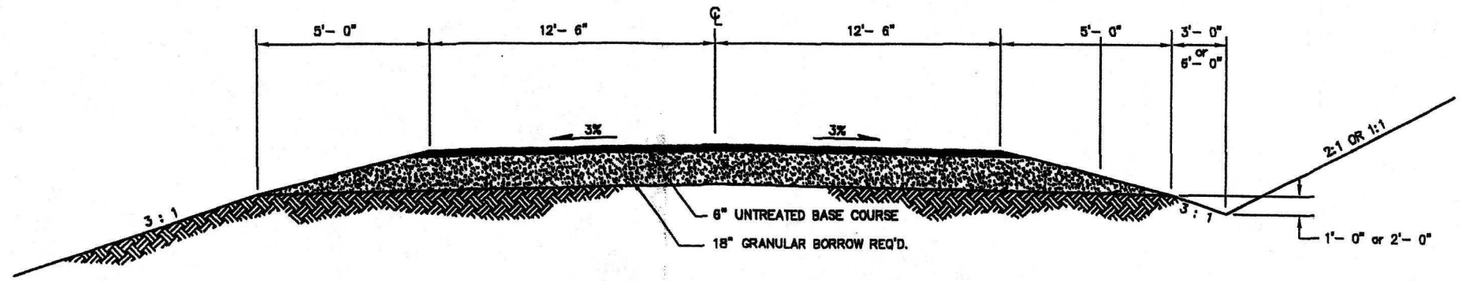
Jones & DeMille Engineering
1535 South 100 West - Richfield, Utah 84701
Phone (435) 896-8266
Fax (435) 896-8268
www.jonesanddemille.com

Sage Flat Landfill
Leachate Collection System Details

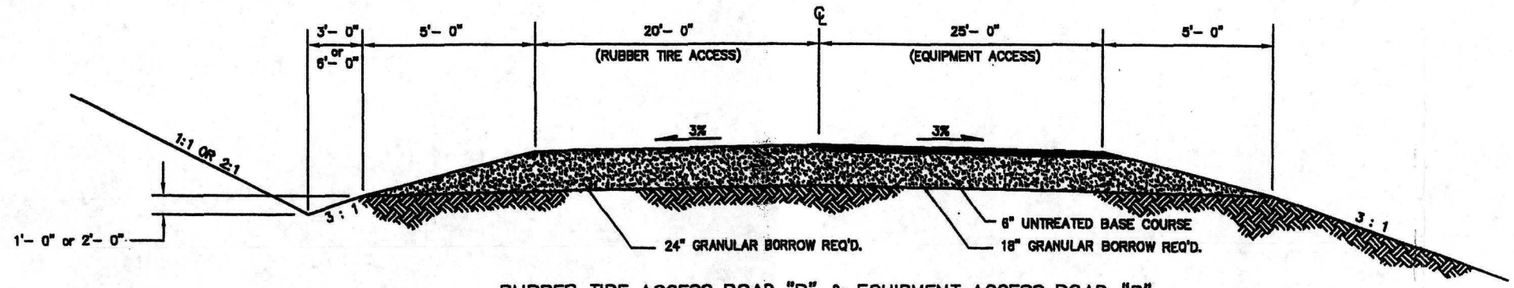
ENGINEER J.F.S.	DRAWN TRB/LG/BL	SHEET NO. 9
CHECKED J.F.S.	PROJ#: 0406-137 DWG.NM: permit\details	
SCALE none	DATE 12/16/2004	



EQUIPMENT ACCESS ROAD "A"



RUBBER TIRE ACCESS ROAD "A"



RUBBER TIRE ACCESS ROAD "B" & EQUIPMENT ACCESS ROAD "B"

TYPICAL ROADWAY SECTIONS

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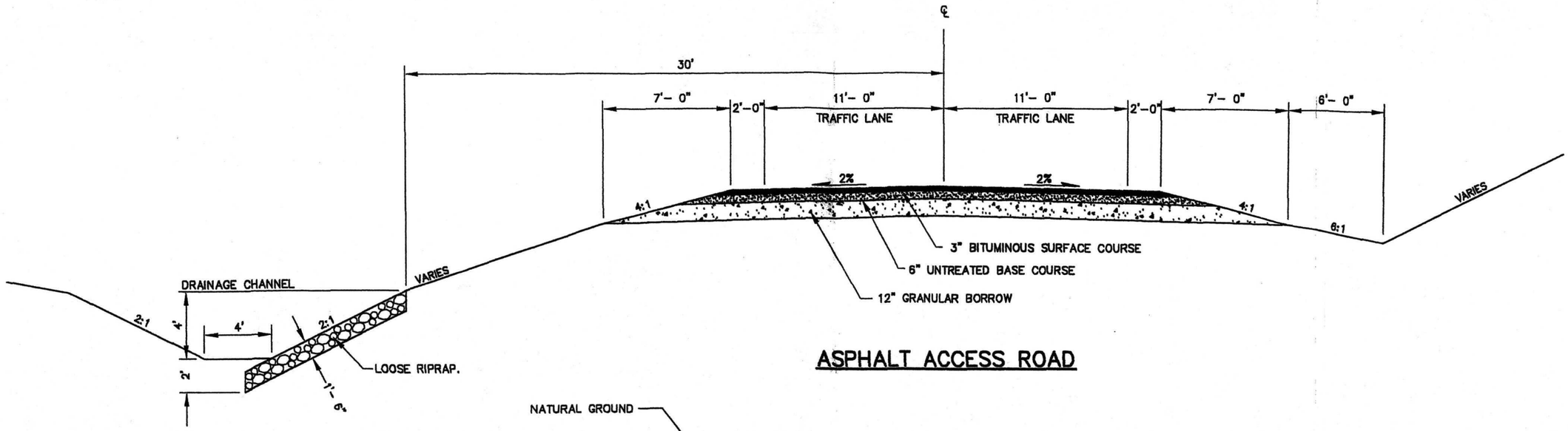
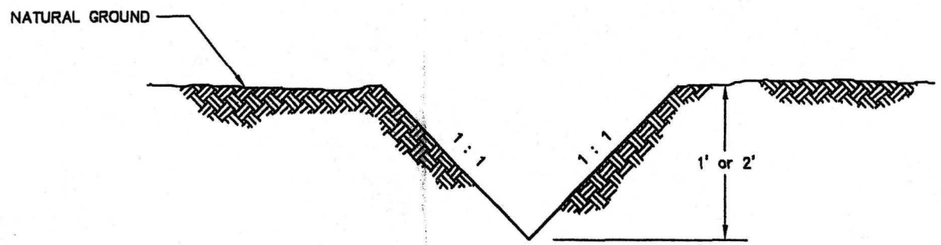
Fax (435) 896–8268
www.jonesanddemille.com

Sage Flat Landfill
Typical Sections

ENGINEER J.F.S.	DRAWN L.G.	SHEET NO. 10
CHECKED J.F.S.	PROJ#: 0406–137 DWG.NM: typ&det	
SCALE none	DATE 08/11/04	



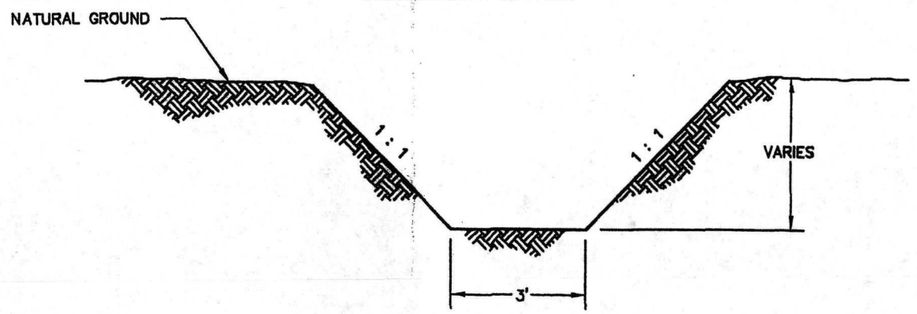
ASPHALT ACCESS ROAD



SURFACE DITCH – TYPICAL SECTION

TYPE "A" – 1' DEPTH
TYPE "B" – 2' DEPTH

NOTE: DITCH LINED WITH 12" DEPTH LOOSE RIP RAP WHERE INDICATED ON PLANS.



SMALL DITCH – TYPICAL SECTION

NOTE: DITCH LINED WITH 12" DEPTH LOOSE RIP RAP WHERE INDICATED ON PLANS.

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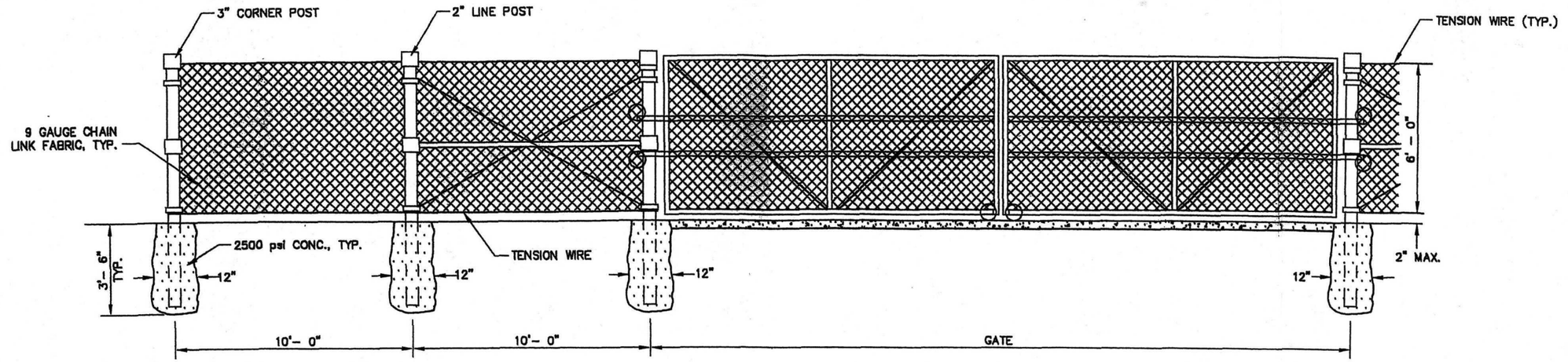
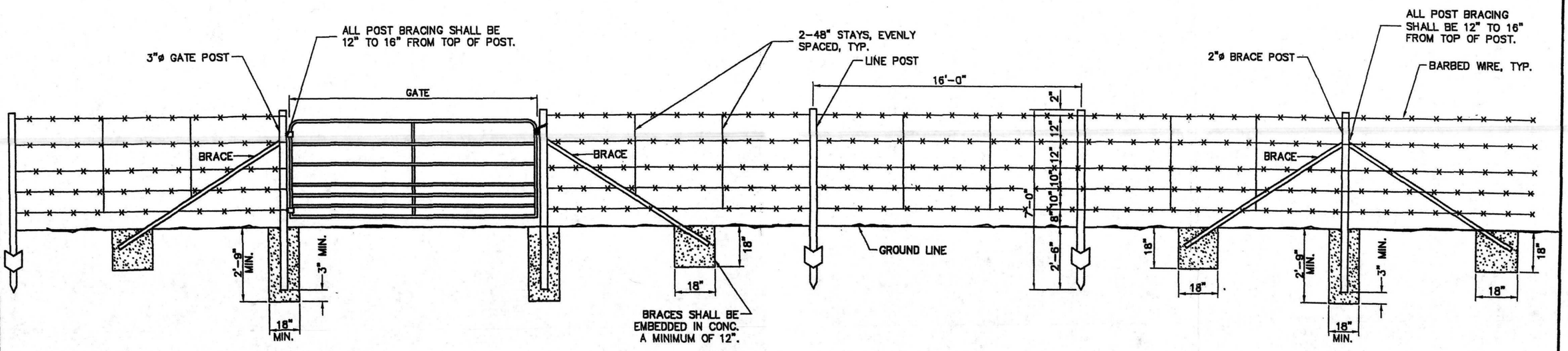
Sage Flat Landfill
Typical Sections

ENGINEER J.F.S.	DRAWN L.G.	SHEET NO. 11
CHECKED J.F.S.	PROJ#: 0406–137 DWG.NM: typ&det	
SCALE none	DATE 08/11/04	



CHAIN LINK FENCE AND GATE DETAIL



RIGHT-OF-WAY FENCE & GATE DETAILS

Jones & DeMille Engineering
1535 South 100 West - Richfield, Utah 84701
Phone (435) 896-8266
Fax (435) 896-8268
www.jonesanddemille.com

Sage Flat Landfill
Fence Details

ENGINEER J.F.S.	DRAWN L.G.	SHEET NO. 12
CHECKED J.F.S.	PROJ#: 0406-137 DWG.NM: typ&det	
SCALE none	DATE 08/11/04	

flow away from the site The storm water flow in the drainage swales for a 25-year storm event is calculated to be 1 9 cubic feet per second The velocity of the storm water in the drainage swales will be less than 3 feet per second, therefore, riprap is not needed for the drainage swales The storm water calculations for the drainage swales are also included in Appendix 1

5 7 Closure and Post-Closure Design and Maintenance

Closure and post-closure design, constmction and maintenance will be performed to, meet the requirements of the State Solid Waste Rules The closure of the operations at Sage Flat Landfill will minimize the need for further maintenance, minimize the threat to human health and the environment from post closure escape of solid waste constituents, leachate, landfill gases, contaminated mn-off or waste decomposition products to the groundwater, surface water of the atmosphere, and prepare the facility for the post closure period

The landfill will be covered with a final design cover which will consist of an 18 inch compacted silty clay layer and a 20 inch soil cover over the compacted silty clay The compacted silty clay layer will have a minimum field permeability of 1x10 7 cm/sec The 20 inch soil cover will include 14 inches of native soil from the trench excavation or BLM source nearby, and 6 inches of topsoil from the trench excavation The topsoil will be revegetated

The waste disposal cell is expected to experience some settlement The area is considered an arid site and will lessen the impacts attributed to settlement However, the closure plan is deigned to maintain a positive dramage off the trench area throughout the closure period The majority of settlement will take place during and prior to final grading and cover replacement The final grades will be constmcted to minimum 3 percent slope on the top of the trench cell All mnoff will be directed off and around the disposal cells The entire site will be constmcted with a perimeter drainage system which will minimize any mnoff from the adjacent hillside from contacting the waste cells

All material necessary for post closure maintenance is expected to be available on site Routine inspections and maintenance of slopes, dramage channels and covers will be performed periodically durirg the post closure period

6 0 CLOSURE AND POST_CLOSURE PLANS

6 1 General

Final closure activities will be implemented at the completion of each trench cell Final cover, grading and revegetation of the trenches will occur as each cell is completed to minimize infiltration into the waste cell Closure of the site is designed to be performed in such a manner as to minimize the need for post-closure maintenance and mimmize the potential effects of the landfill on the surrounding environment Post-closure operations will consist of gas and leachate monitoring at the landfill and periodic site inspections to determine that the site is performing as designed

6 1 1 Final Cover and Grading

The final cover of the proposed Sevier county Landfill will consist of 18 inches of compacted clay covered with 20 inches of material consisting of 14 inches of native soil and 6 inches of topsoil The final cover will be placed after the waste has been placed and compacted to the

Attachment 2
Plan of Operation

PLAN OF OPERATION

SAGE FLAT LANDFILL
SEVIER COUNTY, UTAH

AUGUST 2004

Prepared by
Jones & DeMille Engineering

1535 South 100 West
Richfield, UT 84701
Ph 435-896-8266
FAX 435-896-8268

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Appendices

Appendix A - Examples of Record Keeping Forms

1.0 INTRODUCTION

The purpose of the Plan of Operation is to provide a written description of the daily operation of the Sevier County Sage Flat Landfill A landfill is a dynamic system which undergoes regular development Changes may occur in types and quantities of disposal materials, demographics of the service area, or administrative and regulatory requirements These changes need to be reflected in the manner in which the landfill is operated to conserve landfill space and protect human health and the environment The intent of the Plan of Operation is to provide an accurate description of the daily operations and procedures while allowing for modification which may be required to compensate for operational changes

2 0 OPERATIONAL PROCEDURES

2 1 Class I Site

The cells at the Class I site will be constructed in an orderly sequence from north to south Each cell will be constructed in a phased approach The phases will include (1) marking the boundary of the area to be excavated, (2) stripping and stockpiling the topsoil layer for future final cover, (3) excavation of the trench for disposal and waste placement, (4) intermediate cover over the full disposal cell, (5) placement of compacted embankment along outside edge of cell and placement of waste over intermediate cover, and, (6) final cover placement of clay, native soil, topsoil, and vegetation over the full disposal cell

The topsoil cover will be stripped to a minimum depth of 4 inches and stockpiled along the southern edge of the cell Shrubs and debris will be removed from the topsoil The topsoil berm will create a barrier to restrict access along the top of the sideslopes The material excavated from the trench will be stockpiled along the north edge of the vertical sideslope to create a barrier to restrict access along the north edge of the trench The trench will be excavated so that only 180 feet of trench is exposed at any time

The working face of the trench (west end) and the equipment access (east end) will be constructed to a maximum slope of 3 horizontal to 1 vertical Waste will be unloaded at the top of the working face and spread over the working face and compacted The native clay will be mixed with the solid waste throughout daily placement The unloading of waste will be restricted to one area of the working face to limit vehicular traffic and to limit the amount of waste exposed

The bottom of the trench will be lined with a minimum of 2 feet of compacted clay with a permeability no greater than 10^{-7} cm/sec This clay material will be obtained from materials excavated from on-site The compacted clay layer at the bottom of the trench will be constructed in advance of the solid waste disposal

An mtermediate cover will be placed over the solid waste once it has been placed to the level of the existmg ground The intermediate cover will consist of a mimmum thickness of 18-inches of native soils stockpiled fiom the excavated trench The intermediate cover will be compacted to facilitate trafficability over the waste in the cells A 6-mch layer of gravel will be placed over the mtermediate cover m the unloadmg area at the top of the workmg face to improve trafficability durmg mclement weather conditions This gravel matenal is a temporary measure to improve access to the workmg face

A compacted embankment will be constructed around the outside edges of the cell This will allow for additional waste to be placed above the existing groimd surface After the compacted embankment is in place, the waste will be placed over the mtermediate cover

The final cover will consist of 18-mches of compacted clay withm m-place permeability of no greater than 10-7 cm/sec The compacted clay layer will be covered with 20 mches of matenal consisting of 14 mches of native soil and a 6 mch thick topsoil layer will be placed over the top The topsoil will be available fiom the stripped and stockpiled topsoil matenal The final cover will have a 3% cross slope and will be reseeded

2 2 Class IV Site

The Class IV site will be excavated approximately two to four feet below the groimd surface Cover matenal will be stockpiled from the excavated soil available form the imtial development of the Class IV site The final closure cover for the Class IV site will consist of 2 feet of cover, including 6-mches of topsoil that will be reseeded

3 0 WASTE HANDLING PROCEDURES

One of the County Commissioners has been designated as the Director of Solid Waste Services and has supervisory responsibility over the landfill Daily operation of the landfill is under the direction of the Landfill Manager When the Landfill Manager is absent, a semor operator will be designated m charge of the landfill

At the begimmg of each workmg day, the Landfill Manager is responsible for informmg his operators where to direct the various types of waste for disposal The operator will direct each customer to the proper location for disposal of the waste The landfill will be attended by an operator or the Landfill Manager at all times that the landfill is open

The landfill has a scale for weighmg waste loads that are brought to the landfill The scale is located next to the maintenance building, which is at the main entrance to the landfill Each waste land is weighed prior to disposal

The landfill specifically excludes the following types of waste

- hazardous waste
- toxic waste and pathological/infectious waste
- chemical wastes
- white goods containing chlorofluorocarbons

The person at the gate and the person at the working face are each responsible for identification and prohibition of excluded wastes All employees will be trained in methods and techniques for spotting liquid waste, drums, waste in sealed container, red-bag waste, and waste which exhibits unusual odors or markings All such waste will be refused access to the landfill, if such waste is discovered on the working face it will be segregated from the other waste pending alternative disposal

At least one percent of incoming loads are to be inspected Loads will be selected at random by the operator at the gate The vehicle will be stopped and the operator will conduct as thorough inspection as possible, looking specifically for prohibited waste materials A "Waste Inspection Report" form (see Appendix sheet A-2) will be completed and filed on every inspection conducted The daily operating log also notes waste inspection conducted (see Appendix sheet A-5)

The Landfill Manager will have the ultimate authority and responsibility to decide whether to accept or reject a waste material

Construction and demolition debris will be directed to the Class IV Landfill for disposal Dead animal carcasses will be directed to a separate pit designated for disposal of such waste, this pit will be covered regularly on a daily basis

The landfill is open Monday through Saturday and is closed on Sundays and Holidays The landfill will be open according to the following schedule

Summer Schedule April through September	Winter Schedule October through March
8 00 – 6 30 Mon – Sat	8 00 – 5 30 Mon – Sat

3 1 Litter Control

The prevailing winds at the landfill site are generally from the southwest Clay is mixed with the waste during daily placement and that helps reduce the amount of litter scattered by the wind The Class I landfill site is also partially enclosed by a chain link fence The fence helps stop litter from being blown away from the landfill site Occasionally there is litter from the landfill that is scattered by the wind At least once every two weeks, a work crew of inmates from the Sevier County Jail comes to the landfill site to pickup any scattered litter at the landfill These measures help the control and collection of litter

6.0 LEACHATE MONITORING

Leachate collection pipes will be installed in each cell to monitor any leachate-generation The collection pipes will be monitored monthly for the first year of landfill operation and quarterly thereafter depending on the rate of leachate generation

Inspection maintenance procedures for the leachate collection pipes will consist of a visual inspection performed annually which includes visually checking the leachate collection monitoring cover for cracks, shifting or other damage If damage to the pipes are discovered, these sections will be repaired as necessary and practical

Details of the inspection and maintenance activities will be recorded in a field notebook and copies will be kept on file at the Site This inspection/maintenance procedure will be conducted annually for the first five years after placement of the cover If the system has no problems during this time period, inspections will be performed every 2 years thereafter until completion of the post-closure monitoring

Leachate collection closure will be performed only when one of the following criteria are met

1) Post closure monitoring has been completed, or
2) The leachate collection system is damaged beyond repair, or
3) The leachate collection system is permanently abandoned

Leachate collection closure will be accomplished by pressure grouting, using sand, cement and a bentomite slurry mixture to a maximum pressure of 125 psi Grouting will be performed from the cleanout port back into the transfer pipe The volume of slurry mixture pumped will be measured to determine the quantity of slurry injected into the transfer pipe The standpipe will also be filled with the slurry mixture

7.0 EQUIPMENT

The Sevier County Sage Flat Landfill operation owns and maintains the following pieces of heavy equipment

- Caterpillar 140 Motor Grader
- Caterpillar D-7H Track-type Dozer
- Caterpillar 816F Compactor
- Caterpillar 621 Scraper
- Army Scraper 280 Michigan
- Caterpillar 973 Track Loader
- Caterpillar 950 Rubber Tire Loader
- Ingersoll-Rand Sheeps Foot Compactor
- 1993 Peter-built Dump Truck
- 1991 Peter-built Dump Truck
- Caterpillar Backhoe (Rubber Tire)
- Trailer (for Backhoe)
- 2 Pickup Trucks

Complete service is performed every 125 hours of operation Lubrication only every 10-15 hours of operation Service is performed according to the manufacturer's recommendations

8.0 PROCEDURES FOR CONTROLLING DISEASE VECTORS

Exclusion of specific types of solid wastes will be necessary to control disease vectors and the subsequent spread of disease Special wastes such as infectious waste and liquid wastes, which may directly carry disease or lead to the propagation of disease vectors, will be excluded from the Class I landfill Clay will be mixed with the waste for the Class I landfill and that will help control disease vectors Dead animals will be received at the Class IV landfill, however, they will be buried at a separate location at the site and will be covered with a minimum of six inches of backfill material daily or upon disposal

9 0 TRAINING & SAFETY PLAN FOR SITE OPERATION

Each employee who works with solid waste at the Sevier County Landfill facility will be trained and have a working knowledge of basic maintenance and operational techniques necessary to operate and maintain the landfill facility in a manner which does not endanger human health and safety or environmental quality Training will be accomplished through on-the-job training (OJT) and class room training sessions Training sessions will be those sponsored by the Solid Waste Association of North America (SWANA) All operators and managers will complete at a minimum the following courses of instruction "Landfill Operator Training", and "Waste Screening at Municipal Sohd Waste Landfills " The training program will be directed by the facility manager, or a designated professional trainer Initial on the job training will be completed within three months of employment followed by completion of SWANA courses within one year

TRAINING SCHEDULE

A *Introductory Training* (half hour minimum) Synopsis of solid waste regulations, record keeping and transporter requirements

Requirement	All Personnel
Method	OJT
Review	Annual

B *Policies and Procedures* (half hour minimum) Security, inspections and emergency response

Requirement	All Personnel
Method	OJT, lecture/video course
Review	Annual

C *Safety* (one hour minimum) Personal protection, hazardous waste recognition, hazardous material handling, emergency response and first aid

Requirement	All Personnel
Method	Lecture/video course
Review	Annual

Training documents will be kept with this Plan of Operation for five years

10 0 CONTINGENCY PLANS

This Contingency Plan is designed to minimize hazards to human health or the environment from any unplanned sudden or non-sudden discharge to air, soil, surface or groundwater The provisions of this plan shall be carried out immediately when there is an emergency situation or release which could threaten human health or the environment Emergency evacuation of the site will not be necessary given the nature of the waste materials stored and processed at the site The probability of fire, explosion, or toxic vapor generation from an emergency incident is remote

10 1 Fire or Explosion

A landfill fire or explosion would be particularly hazardous in the presence of discarded household chemicals, paints, fuels, etc , however, wastage load monitoring is expected to effectively eliminate this potential A fire may be started by spontaneous combustion in refuse containers, but is usually the result of vandalism or disposal of hot coals and ashes Mixing clay with the waste will help prevent fires from spreading throughout the landfill

The primary means of fire control will be the exclusion and or isolation of hot or burning loads In the event that fires do erupt during operating hours, the burning material will be separated from other material and covered with soil, using onsite earthmoving equipment This action will be supported, when necessary, by the availability of additional equipment owned and operated by the County Road Department

Small fires may be extinguished with fire extinguisher provided in the site vehicles or by using the water tank Upon notification of an onsite fire or explosion which is not controllable with onsite fire protection equipment, a long blast on a vehicle horn will be sounded, nonessential equipment will be shut down, and all site personnel will assemble outside the landfill entrance The Sigurd Fire Department will be alerted and all personnel will move to a safe distance from the involved area until the fire is extinguished Secondary fire control will be supported by the Richfield City Fire Department and other fire departments in Sevier County as needed The telephone number and location of the nearest fire station will be displayed in a conspicuous place in the site office The landfill employees will participate in a fire drill conducted semi-annually

Fires which occur durmg times that the landfill is closed are more difficult to control due to the time available for the fire to spread If a fire is reported after hours, the Landfill Manager may utihze site eqmpment to segregate the bummg portion and bury the fire with soil Otherwise, the local fire department will be summoned to fight the fire

10 2 Explosive Gas Release

Due to the size, remote location and and nature of the site, sigmficant amoimts of explosive landfill gas is neither expected to be generated nor to migrate offsite The landfill Manager is responsible for quarterly momtormg of landfill gas using a methane detection meter capable of measurmg methane at levels below the Lower Explosive Limit (LEL) Gas momtormg will be conducted to test for methane at the LEL at the facility boundary and at twenty five percent of the LEL m the facility stmctures In the event that explosive gases are detected above the LEL durmg momtormg, or at any other time, the emergency audible alarm and evacuatron procedures will be implemented

10 3 Failure of Contamment System

Based on the trench mound design bemg constmcted, there are no contamment systems proposed at the site

10 4 Contammated Groundwater

The proposed vadose zone moisture momtormg will momtor the performance of the final cover and natural clay lmer and provide early warning of any potential leachate migration toward the groundwater In the event that free liquids are detected m the leachate collection system, the leachate will be analyzed to determme the chemical composition If the leachate exhibits constituents with concentrations above groundwater maximum concentration limits, a program will be developed to install momtor wells and momtor groundwater quality In the event groundwater exceeds maximum concentration limits, a corrective action plan will be developed and submitted to the Utah Division of Solid and Hazardous Waste

11.0 RECORD KEEPING

11 1 Samples of Record Keepmg Forms

The followmg records will be kept on site at the landfill

1. A daily operatmg record containing the weights or volumes of waste, the number of vehicles entenng the landfill, and the types of waste received
2. Up to date trainmg records for landfill personnel
3. Leachate and gas momtormg mspection records
4. Operations Inspection Reports

5 Copies of the Class I and IV Permits

6 Landfill Operations Plan

7 Vehicle Maintenance Records

8 Permit Application

9 Financial Assurance Documentation

See Appendix A for examples of forms to be used for record keeping

12.0 REPORTING

An annual report will be submitted to the Executive Secretary by March 1 of each year for the most recent calendar year of facility operation The report will contain at a minimum

- Name and address of facility
- Calendar year covered by report
- Quantity of waste in tons or volume in cubic yards, by waste type
- Estimated in place density in pounds per cubic yards by waste type
- Annual update on financial assurance mechanism identifying any adjustments which may be necessary
- Leachate & gas monitoring results
- Training completed by personnel

APPENDIX A

EXAMPLES OF RECORD KEEPING FORMS

TICKET BOOK FORM W/PRESSURE SENSITIVE COPIES

Sevier County Landfill

DATE ____________ WASTE ____________
ORIGINATION ____________________
GROSS WEIGHT ____________________
TARE WT ____________________
NET WT ____________________

VOLUME ____________________
INSPECTED ☐ Y ☐ N

RESULTS ____________________
____

OPERATOR SIGNATURE ____________________

Sevier County Landfill

DATE ____________ WASTE ____________
ORIGINATION ____________________
GROSS WEIGHT ____________________
TARE WT ____________________
NET WT ____________________

VOLUME ____________________
INSPECTED ☐ Y ☐ N

RESULTS ____________________
____

OPERATOR SIGNATURE ____________________

Sevier County Landfill

DATE ____________ WASTE ____________
ORIGINATION ____________________
GROSS WEIGHT ____________________
TARE WT ____________________
NET WT ____________________

VOLUME ____________________
INSPECTED ☐ Y ☐ N

RESULTS ____________________
____

OPERATOR SIGNATURE ____________________

Sevier County Landfill

DATE ____________ WASTE ____________
ORIGINATION ____________________
GROSS WEIGHT ____________________
TARE WT ____________________
NET WT ____________________

VOLUME ____________________
INSPECTED ☐ Y ☐ N

RESULTS ____________________
____

OPERATOR SIGNATURE ____________________

Sevier County Landfill

DATE ____________ WASTE ____________
ORIGINATION ____________________
GROSS WEIGHT ____________________
TARE WT ____________________
NET WT ____________________

VOLUME ____________________
INSPECTED ☐ Y ☐ N

RESULTS ____________________
____

OPERATOR SIGNATURE ____________________

Sevier County Landfill

DATE ____________ WASTE ____________
ORIGINATION ____________________
GROSS WEIGHT ____________________
TARE WT ____________________
NET WT ____________________

VOLUME ____________________
INSPECTED ☐ Y ☐ N

RESULTS ____________________
____

OPERATOR SIGNATURE ____________________

SEVIER COUNTY
SAGE FLAT LANDFILL
WASTE INSPECTION REPORT

DATE	
OPERATOR	
WASTE ORIGINATION	
WASTE TYPE	
DRIVER	
COMPANY	
VEHICLE TYPE	
NET WEIGHT	
VOLUME	
INSPECTION RESULTS	

_____
Operator Signature

SEVIER COUNTY
SAGE FLAT LANDFILL
INDIVIDUAL TRAINING RECORD

NAME

JOB CLASSIFICATION

TRAINING RECEIVED, DATE & SPONSOR

Supervisors Signature Date

SEVIER COUNTY
SAGE FLAT LANDFILL
GENERAL INSPECTION REPORT

DATE	
INSPECTOR	
INSPECTION TYPE *	
EQUIPMENT USED.	
INSPECTION RESULTS	
COMMENTS	

*To be used for O&M inspections, gas monitoring leachate monitoring and leachate sampling

Inspectors Signature _____ Date _____

SEVIER COUNTY SAGE FLAT LANDFILL

DAILY OPERATING RECORD DATE _____ OPERATOR _____

WASTE ORIGIN		TOTAL WEIGHT	TOTAL VOLUME	WASTE TYPE	TOTAL WEIGHT	TOTAL VOLUME	TOTAL LOADS	NO WASTE INSPECTIONS
RICHFIELD	NO SEMI TRUCKS			HOUSEHOLD				
	NO LARGE TRUCKS			WHITE GOODS				
	NO PICKUPS			INERT INDUSTRIAL				
	NO CARS			DEAD ANIMALS				
				TIRES				
				CLASS IV				
AURORA, SALINA	NO SEMI TRUCKS			HOUSEHOLD				
SIGURD, REDMOND	NO LARGE TRUCKS			WHITE GOODS				
	NO PICKUPS			INERT INDUSTRIAL				
	NO CARS			DEAD ANIMALS				
				TIRES				
				CLASS IV				
ANNABELLA CENTRAL	NO SEMI TRUCKS			HOUSEHOLD				
GLENWOOD, VENICE	NO LARGE TRUCKS			WHITE GOODS				
	NO PICKUPS			INERT INDUSTRIAL				
	NO CARS			DEAD ANIMALS				
				TIRES				
				CLASS IV				
AUSTIN ELSINORE	NO SEMI TRUCKS			HOUSEHOLD				
MONROE, JOSEPH, SEVIER	NO LARGE TRUCKS			WHITE GOODS				
	NO PICKUPS			INERT INDUSTRIAL				
	NO CARS			DEAD ANIMALS				
				TIRES				
				CLASS IV				
BURRVILLE FREMONT JCT	NO SEMI TRUCKS			HOUSEHOLD				
KOOSHARAM	NO LARGE TRUCKS			WHITE GOODS				
	NO PICKUPS			INERT INDUSTRIAL				
	NO CARS			DEAD ANIMALS				
				TIRES				
				CLASS IV				
COUNTY	NO SEMI TRUCKS			HOUSEHOLD				
	NO LARGE TRUCKS			WHITE GOODS				
	NO PICKUPS			INERT INDUSTRIAL				
	NO CARS			DEAD ANIMALS				
				TIRES				
				CLASS IV				
OTHER	NO SEMI TRUCKS			HOUSEHOLD				
(FED LANDS/STATE LANDS)	NO LARGE TRUCKS			WHITE GOODS				
	NO PICKUPS			INERT INDUSTRIAL				
	NO CARS			DEAD ANIMALS				
				TIRES				
				CLASS IV				
				TOTALS				

Appendix D

Attachment 3
Ground Water Monitoring

The mineralogic makeup of the clay consisted mainly of calcite (35%), quartz (20%), plagioclase (14%) with minor percentages of illite-smectite, illite+mica, goethite, smectite and gypsum

Groimdwater occurs under both artesian (confined) and water-table (unconfined) conditions in the Central Sevier Valley Artesian conditions prevail in the central and downstream parts of the basins, where permeable beds of gravel and sand are confined by overlying beds of silt and clay Water-table conditions usually prevail along the sides and at the upper ends of the basins Groundwater occurrence in the Sage Flat basin appears to be consistent with major basins of the Central Sevier Valley, with groundwater occurring under water-table conditions in permeable beds of gravel and sand

The principal sources of recharge to the alluvium in the Central Valley are the Sevier River and its tributaries, irrigation canals and infiltration from irrigated fields Some groundwater also infiltrated the alluvium from bedrock sources surrounding the valley Unlike the major basins in the Central Sevier Valley, the Sage Flat basin does not have a major river, irrigation canals or irrigated fields to provided recharge to its alluvium The principle sources of recharge, therefore, are likely to occur by direct precipitation, exposed rock outcrops, which have permeable areas that readily absorb precipitation, convey the water to the basin through the down sloping aquifer

An unconfined aquifer is present below the Sage Flat Landfill that extends at least through the upper 180 feet of alluvial deposits The groundwater surface is relatively deep at the site with the groundwater surface at a depth of 165 feet below the Classis landfill (see Drill Hole Log MW-1 in Appendix E) and below the Class IV landfill the groundwater surface is at a depth of approximately 950 feet (see Drill Hole Log MW-2 in Appendix E)

Regionally, the groundwater is assumed to follow the slope of the ground surface, therefore, groundwater flow is to the south

4 4 Groundwater Quality

The groundwater from the shallow aquifer that underlies the Sage Flat Landfill was being used for domestic or industrial use until the landfill was constmcted Review of the Utah Division of Water Rights records within a three mile radius of the site indicates that the closet wells, with the exception of the newly installed monitor wells constmcted as part of the site charactenzation investigation, are located approximately 2 5 miles to the south and southeast

Groundwater samples were collected from momtor wells MW-1 and MW-2 and analyzed for Total Dissolved Solids (TDS) In addition, the MW-1 sample was analyzed for the monitoring constituents listed in Section R315-308-4(1) of the Rules Laboratory results indicate TDS levels in MW-1 and MW-2 of 590 mg/l and 100mg/1, respectively Several heavy metal constituents in MW-1 were found to be above EPA MCL's, including barium, cadmium, chromium and lead Based on these results, the groimdwater would not be fit for domestic use unless treated The results of the groundwater analysis for the momtoring wells are in Appendix B

The groundwater classification system established in the State of Utah Groundwater Quality Protections Regulations designates the shallow groundwater as Class II Drinking Water Quality Groundwater, based on total dissolved solids (TDS) greater than 500mb/1 and less than 3000mg/l

During the constmction of the landfill facilities, a well was drilled near the location of the mam entrance The well was drilled to a depth of 250 feet and static water level was at a depth of approximately 165 feet The well water was tested for volatile organic compounds, inorganic and metal The well log and water analysis results are included in Appendix B The well water has TDS content of 826 mg/l and sodium content of 234 mg/l The well water is not used for drinking The well water is used for the restroom in the maintenance building and for dust control and moisture conditiomng the compaction of soils

4 5 Surface Water

An intermittent stream is located adjacent to the site with flows occurring only during moderate to large precipitation events and spring rrnoff The site is located near the top of the drainage basin and therefore the flows expected from the intermittent stream are quite small

4.6 Water Rights

The records of the Utah Division of Water Rights were reviewed to locate wells and other water rights within the vicinity of the landfill A search was completed for wells and water rights within a three-mile radius of the landfill site The only wells or other water rights located immediately m the area of the landfill site are the landfill monitoring wells and landfill well The next closest water rights are over two miles from the landfill Those water rights are for wells and surface waters for irrigation, stock watering, and wildlife watering The nearest public drinking water sources are about three miles or more from the landfill The results of the water rights search are included m Appendix C

4.7 Site Water Balance Using Help Model

The amount of water that will percolate through a landfill and eventually reach the water table is a function of the amount of water applied to the landfill surface, the evaporation at the site, the permeability characteristics of the landfill, and the soil profile The HELP model was used by Bingham Environmental to estimate the amount of precipitation that would percolate through the soil profile

Landfill performance was modeled using conservative values of climatologically date, soil profile characteristics and surface drainage The following assumptions were made for input into the HELP model

- HELP is used to model post-closure conditions
- Precipitation from the wettest 5 consecutive years on record for Sigurd, Utah Average monthly temperatures from entire period of record
- Use evaporation values in database (Milford, Utah)
- Depth to water table is 165 feet
- Modeling period – 20 years

The average annual precipitation, used in HELP, was calculated using the average monthly precipitation for die wettest five years at Sigurd and the synthetic rainfall simulation option in HELP The average precipitation was calculated at 10 47 inches Based on this precipitation, HELP calculates the water balance for the site, which mcludes, evapotranspiration, runoff, percolation, and change in water storage for the subsurface soils Average aimual values for 20

grade outlined in the plans The cover will be constmcted with a 3% slope to the sides of the trench The compacted clay cover will have a maximum hydraulic conductivity of 1x10 7 cm/sec The native soil and topsoil will be obtained from the site, and will consist of soil that has been excavated from the top of the cell and stockpiled at the sides of the trench for placement as final cover

6 1 2 Volume Capacity

The total volume capacity of the proposed Class 1 landfill area is approximately 2,825,000 cubic yards (yd3) The current disposal rate is about 85 tons per days of waste The average placed waste density is estimated to be 1,000 pounds per cubic yard The life of the landfill is expected to exceed the estimated landfill requirements of the County's 20 year Solid Waste Management Plan Each of the larger trenched cells will provide over 5 years of landfill capacity

6 1 3 Closure Schedule

Each trenched cell will be closed separately upon the completion of filling in the cell The cell will have the clay cover, native soil and topsoil placed, as shown in the plans, after the cell has been filled Trenches will be excavated and closed starting from the north end of the site and working to the south

6 1 4 Final Inspection

A final inspection will be performed at the termination of the landfill activities at the Sage Flat facility The final inspection will determine if the landfill meets all the closure requirements as oufined in the permit and closure plans Inspection requirements of the closure plan will include, long-term operation of mn-on and run-off controls, maintenance of proper final grade on the cells to promote mn-off, control of access at the site (fencing) monitoring potential landfill leachate generation and gas monitoring

6 1 5 Recording

Within 60 days of the certification of closure, Sevier County will submit a plat and statement of fact concerning the location of disposal site to the Sevier County Recorder to be recored as the part of the record of title Sevier County will also submit a copy of the record of title filing to e Executive Secretary

6 2 Monitoring

In addition to periodic inspections, post closure monitoring of the landfill will include gas monitoring and monitoring of the leachate of the Class I landfill cells Leachate momtoring will be accomplished through the use of leachate collection pipes that will be installed at the low point of each cell Monitoring of groundwater in any site wells is not proposed due to the relatively slow flow rates through the landfill profile Groundwater modeling was performed utilizing the HELP (Hydraulic Evaluation of Landfill Performance) model A summary of the HELP results are provided in Section 4 7 and Appendix G

6 2 1 Monitoring Schedule

Groundwater Analysis of Monitoring Wells

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

INORGANIC ANALYSIS REPORT

Client Bingham Environmental — Contact Mark Taggert
Date Received February 25, 1993 — Received By Jennifer Habel
Lab Sample ID Number 13287-01
Field Sample ID Job #1687/Sevier County Landfill/MW-1

Analytical Results

	Method Used.	Detection Limit. mg/L		Amount Detected. mg/L
TOTAL METALS				
Antimony	6010	0 1		<0 1
Arsenic	7060	0 005		0 026
Barium	6010	0 002		3 8
Beryllium	6010	0 005		0 01
Calcium	6010	0 05		890
Cadmium	6010	0 004		0 041
Chromium	6010	0 01		0 14
Cobalt	6010	0 01		0 08
Copper	6010	0 004		0 21
Iron	6010	0 01		130
Lead	7421	0 005		0 097
Magnesium	6010	0 05		140
Manganese	6010	0 005		3 2
Mercury	7471	0 001		<0 001
Nickel	6010	0 005		0 02
Potassium	6010	0 1		57.
Selenium	7740	0 005		<0 005
Silver	6010	0 01		0.04
Sodium	6010	0 1		86
Thallium	6010	0 5		<0 5
Vanadium	6010	0 005		0 23
Zinc	6010	0 005		1.5
OTHER CHEMISTRIES				
Ammonia (as N)	350 1	0 05		<0 05
Bicarbonate (as $CaCO_3$)	310 1	10		305
Carbonate (as $CaCO_3$)	310 1	10		<10
Chloride	9056	0 5		190
COD	Hach 8000	5 0		10
Conductivity	120 1	10	990	µmhos/cm @ 25° C
Nitrate (as N)	9056	0 01		0 05
pH	150 1	0 1		8 3
Sulfate	9056	5 0		31
TDS	160 1	1 0		590
TOC	415 1	1 0		8 0

Released by _____
Laboratory Supervisor

Report Date 3/15/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Bmgham Envirnonmental
Date Received February 25, 1993
Set Identification Number 13287
Set Description Two Water Samples

Contact: Mark Taggert
Received By Jenmfer Habel

Analysis Requested.	Method Ref. Number.	Date Analyzed.
Volatile Orgamcs	EPA # 624 (SW-846 #8260) Purge & Trap GC/MS	February 25, 1993

Lab Sample ID. Number	Field Sample ID. Number
13287-01	Job #1687/Sevier County Landfill/MW-1

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/L (ppb)

Compound	Detection Limit	Amount Detected.
Acetone	10	< 10
Acrylonitrile	10	< 10
Benzene	2 0	< 2 0
Bromochloromethane	2 0	< 2 0
Brimodichloromethane	2 0	< 2 0
Bromoform	2 0	< 2 0
Bromomethane	5 0	< 5 0
2-Butanone	10	<10
Carbon disulfide	2 0	< 2 0
Carbon tetrachloride	2 0	< 2 0
Chlorobenzene	2 0	< 2.0
Chloroethane	5 0	< 5 0
Chloroform	2 0	< 2 0
Chloromethane	5 0	< 5 0
Dibromochloromethane	2 0	< 2 0
1,2-Dibromo-3-chloropropane	2 0	< 2 0
1,2-Dibromoethane	2 0	< 2 0
Dibromomediane	2 0	< 2 0
1,2-Dichlorobenzene	2 0	< 2 0
1,4-Dichlorobenzene	2 0	< 2 0
1,1-Dichloroethane	2 0	< 2 0
1,2-Dichloroethane	2 0	< 2 0
1,1-Dichloroethene	2 0	< 2 0
cis-1,2-Dichloroethene	2 0	< 2 0
trans-1,2-Dichloroethene	2 0	< 2 0
1,2-Dichloropropane	2 0	< 2.0
cis-1,3-Dichloropropene	2 0	< 2 0
trans-1,3-Dichloropropene	2 0	< 2 0

Report Date 3/11/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Lab Sample ID. Number:
13287-01

Field Sample ID. Number:
Job #1687/Sevier County Landfill/MW-1

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/L (ppb)

Compound	Detection Limit:	Amount Detected
Ethylbenzene	20	< 20
2-Hexanone	50	< 50
Methylene chloride	20	< 20
4-Methyl-2-pentanone	50	< 50
Styrene	20	< 20
1,1,1,2-Tetrachloroethane	20	< 20
1,1,2,2-Tetrachloroethane	20	< 20
Tetrachloroethene	20	< 20
Toluene	20	< 20
1,1,1-Trichloroethane	20	< 20
1,1,2-Trichloroethane	20	< 20
Trichloroethene	20	< 20
Trichlorofluoromethane	20	< 20
1,2,3-Trichloropropane	20	< 2.0
Vmyl acetate	50	< 50
Vmyl chloride	50	< 50
ortho-Xylene	20	< 2.0
meta and para-Xylene	20	< 20
Iodomethane	10	<10
trans 1,4-Dichloro-2-Butene	10	<20

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = p.g/L (ppb)

Compound	Detection Limit:	Amount Detected.
None Detected	20	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences

T = Trace Detectable amount is lower than the practical quantitation limit for this compound

Released by _____
Laboratory Supervisor

Report Date 3/15/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

163 West 3600 South
Salt Lake City, Utah
84115

(801) 263 8686
Fax (801) 263-8687

INORGANIC ANALYSIS REPORT

Chent. Bingham Environmental — Contact: Mark Taggart
Date Received August 25, 1993 — Received By Jenmfer Habel
Lab Sample ID Number· 15504-01
Field Sample ID Proposed Sevier County Landfill/MW-2

Analytical Results

	Method Used:	Detection Limit: mg/L	Amount Detected. mg/L
TDS	160 1	1 0	1,100

Released by _____
Laboratory Supervisor

Report Date 8/26/93 — 1 of 1

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

63 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263 8687

Client Bingham Envuonmental
Date Receıved Febmary 25, 1993
Set Identification Number 13287
Set Description Two Water Samples

Contact Mark Taggert
Received By Jennifer Habel

Analysis Requested.	Method Ref. Number.	Date Analyzed
Volatile Orgamcs	EPA # 624 (SW-846 #8260) Purge & Trap GC/MS	February 25, 1993

Lab Sample ID Number	Field Sample ID Number
13287-02	Job #1687/Sevier County Landfill/Trip Blank

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/L (ppb)

Compound	Detection Limit:	Amount Detected.
Acetone	10	< 10
Aerylomtrile	10	< 10
Benzene	2 0	< 2 0
Bromochloromethane	2 0	< 2 0
Bromodichloromethane	2 0	< 2 0
Bromofoim	2 0	< 2 0
Bromomediane	5 0	< 5 0
2-Butanone	10	<10
Caibon disulfide	2 0	< 2 0
Carbon tetrachlonde	2 0	< 2 0
Chlorobenzene	2 0	< 2 0
Chloroethane	5 0	< 5 0
Chlorofomi	2 0	< 2 0
Chloromethane	5 0	< 5 0
Dibromochloromethane	2 0	< 2 0
1,2-Dibromo-3-chloropropane	2 0	< 2.0
1,2-Dibromoethane	2 0	< 2 0
Dibromoiuediane	2 0	< 2 0
1,2-Dichlorobenzene	2 0	< 2 0
1,4-Dichlorpbenzene	2 0	< 2 0
1,1-Dichloroethane	2 0	< 2 0
1,2-Dichloroethane	2 0	< 2 0
1,1-Dichloroediene	2 0	< 2 0
cis-1,2-Dichloroediene	2 0	< 2 0
trans-1,2-Dichloroethene	2 0	< 2 0
1,2-Dichloropropane	2 0	< 2 0
cis-1,3-Dichloropropene	2 0	< 2 0
trans-1,3-Dichloropropene	2 0	< 2 0

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Lab Sample ID. Number:
13287-02

Field Sample ID. Number:
Job #1687/Sevier County Landfill/Trip Blank

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/L (ppb)

Compound	Detection Limit:	Amount Detected.
Ethylbenzene	20	<20
2-Hexanone	50	<50
Methylene chloride	20	<20
4-Methyl-2-pentanone	50	<50
Styrene	20	<20
1,1,1,2-Tetrachloroethane	20	<20
1,1,2,2-Tetrachloroethane	20	<20
Tetrachloroethene	20	<20
Toluene	20	<20
1,1,1-Trichloroethane	20	<20
1,1,2-Trichloroethane	20	<20
Trichloroethene	20	<20
Trichlorofluoromethane	20	<20
1,2,3-Trichloropropane	20	<20
Vinyl acetate	50	<50
Vinyl chloride	50	<50
ortho-Xylene	20	<20
meta and para-Xylene	20	<20
Iodomethane	10	<10
trans 1,4-Dichloro-2-Butene	10	<20

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/L (ppb)

Compound	Detection Limit.	Amount Detected.
None Detected	20	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences

T = Trace Detectable amount is lower than the practical quantitation limit for this compound

Released by _____
Laboratory Supervisor

Report Date 3/15/93

Level 1 QC

Lab #13787

CHAIN-OF-CUSTODY RECORD

CLIENT Sevier County

PROJECT TITLE Sevier County Landfill JOB NO 1687

FIELD PERSONNEL (Signature) Dean Henderson

DATE	TIME	SAMPLE I D NO	SAMPLE TYPE	NO OF CONTAINERS	SAMPLING SITE	REMARKS
2/25/93	11:00	MW-1	Water	6	MW-1	Analyze for Parameters on table 1. (See Att.
2/25/93	11:a	Trip Blank	"	2	Trip Blank	

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
Dean Henderson	2/25/93	14:48	Jennifer Hall	2/25/93	1448

LIENT Sevier County

DDRESS

HONE/FAX

ONTACT Mark Taggart

UOTE#/P O #

ITE Proposed Sevier County Landfill

AMPLER'S SIGNATURE

WEST ANALYTICAL LABORATORIES
463 West 3600 South
Salt Lake City, Utah 84115
(801) 263 8686
Fax (801) 263 8687

QA/QC Level II

LAB # 15504

SAMPLE ID	SAMPLE DATE/TIME	MATRIX	# OF CONTAINERS	D LIST METALS	VOLATILES (624)	SEMIVOLATILES (625)	TDS	TURN AROUND TIME	COMMENTS
MW-2	8-25-93/1100	Water				✓		5	

TURN AROUND TIMES
I = Priority I
II = Priority II
III = 5 Day Rush
S = Standard

ial Instructions Job # 1687

Relinquished By Signature	Date/Time	Received By Signature	Date/Time
PRINT NAME Dean C. Henderson	8-25-93/1616	PRINT NAME	
Relinquished By Signature	Date/Time	Received By Signature	Date/Time
PRINT NAME		PRINT NAME	
Dispatched By Signature	Date/Time	Received for Laboratory By	Date/Time
PRINT NAME			8/25/93 1616

Well Log and Groundwater Analysis of Landfill Well

State of Utah
Division of Water Rights

For additional space, use "Additional Well Data Form and attach

Well Identification WATER RIGHT APPLICATION 63-4080(A68081)

Owner *Name and Address* Sevier County
250 North Main
Richfield, UT 84701

Contact Person/Engineer _____

Well Location COUNTY Sevier
SOUTH 2809 feet WEST 121 feet from the NE Corner of
SECTION 4, TOWNSHIP 23S, RANGE IW, SLB&M

Location Description (address proximity to buildings landmarks ground elevation local well #) 3 miles E of Sigurd - Landfill

Drillers Activity Start Date 16 Jan 1995 Completion Date 28 Feb 1995 DOM

Check all that apply

[x] New [ ] Repair [ ] Deepen [ ] Abandon [ ] Replace [ ] Public Nature of Use

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	25	12	Cable Tool	Watar
25	121	10	" "	"
121	250	6	" "	"

Well Log

DLPTH (feet) FROM	TO	WATER	PERMIABILITY high	PERMIABILITY low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTIONS AND REMARKS (include comments on *water quality* if known)
0	14			x	x	x	x	x					Brown	when wet gray dry-loose
14	106		x		x		x	x	x				"	" " " " Fairly stable
106	158		x								x	Volcanics	Black	Very loose-likely talas material
158	182		x				x						"	
182	215	x	x								x	Same as 106-158		Water at 165'
215	232			x	x		x	x	x				Brown	Volcanic-clay mix
232	250		x		x	x	x						Red	Clay-volcanic mix

Static Water Level

Date 7 Feb 1995 Water Level 165 feet Flowing? [ ] Yes [ ] No

Method of Water Level Measurement Electric probe If Flowing Capped Pressure _____ PSI

Point to Which Water Level Measurement was Referenced Top of casing

Height of Water Level reference point above ground surface 2 feet Temperature 69 [ ] °C [x] °F

Construction Information

DEPTH (feet) FROM	TO	CASING: CASING TYPE AND MATERIAL/ GRADE	WALL THICK (in)	NOMINAL DIAM (in)	DEPTH (feet) FROM	TO	SCREEN [ ] PERFORATIONS [ ]: SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
0	250	Steel	.250	6	185	234	¼x1		4/8"

Well Head Configuration: Cast Iron well cap — Access Port Provided? ☒ Yes ☐ No

Casing Joint Type: Weld — Perforator Used: Mills Knife

DEPTH (feet) FROM	TO	FILTER PACK / GROUT / PACKER / ABANDONMENT MATERIAL: ANNULAR MATERIAL ABANDONMENT MATERIAL and/or PACKER DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs/gal # bag mix gal/sack etc.)
0	120	Cement grout	5½ yds	50/50 mix sand-cem

Well Development / Pump or Bail Tests

Date	Method	Yield	Units Check One GPM	CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
8-9 Feb 95	Develop-surge block & bailer					
15 Feb 95	Pump test	200	X		0.5	24 hrs

Pump (Permanent)

Pump Description: "Grundfos" 40S50-14 — Horsepower: 5 — Pump Intake Depth: 214 feet

Approximate maximum pumping rate: 50 GPM — Well disinfected upon completion? ☒ Yes ☐ No

Comments

Description of construction activity additional materials used problems encountered extraordinary circumstances abandonment / procedures *Use additional well data form for more space*

Unusually large body of clean, loose volcanic material (likley talas) that water moves through very freely.

Well Driller Statement

This well was drilled or abandoned under my supervision according to applicable rules and regulations and this report is complete and correct to the best of my knowledge and belief

Name: Fletcher Drilling Inc. (Person, Firm or Corporation - Print or Type) — License No: 521

Signature: (Licensed Well Driller) — Date: 24 Mar 1995

CHEMTECH • FORD

ANALYTICAL LABORATORIES

Chemical and Bacteriological Testing

LABORATORY REPORT

CLIENT	JONES & DEMILLE ENG c/o Tristan DeMille 45 E 500 North Richfield, UT 84701
LAB NUMBER	95-120330
SAMPLE ID	System # Source Sevier Co Landfill Tap from test pumping
DATE COLLECTED	2/15/95, 8 12 a m
COLLECTED BY	J S
DATE RECEIVED	2/15/95
REPORT DATE	2/27/95

REPORT SUMMARY

This drinking water sample was analyzed for volatile organic compounds/trihalomethanes inorganic and metals All analyzed compounds were below the associated MCL's

Results of all associated quality control samples were within acceptance limits No project-specific quality control was requested

If you have any questions concerning this report please call us at (801) 466-8761

Approved By _____

○ FORD • 40 West Louise Avenue • Salt Lake City, Utah 84115 • (801) 466-8761 • Fax (801) 466-8763
○ CHEMTECH • 6100 South Stratler • Murray, Utah 84107 • (801) 262-7299 • Fax (801) 262-7378

CHEMTECH • FORD

ANALYTICAL LABORATORIES

Chemical and Bacteriological Testing

CERTIFICATE OF ANALYSIS

CLIENT JONES & DEMILLE ENG

SAMPLE NAME System # 95-120330

Source Sewer Co Landfill Tap from test pumping

	Result	MDL	MCL	Units	Method	Notes
VOLATILE ORGANIC COMPOUNDS (VOC's)						
1,1,1-Trichloroethane	ND	0 5	200	ug/L	524 2	
1,1,2-Trichloroethane	ND	0 5	5	ug/L	524 2	
1,1-Dichloroethylene	ND	0 5	7	ug/L	524 2	
1,2,4-Trichlorobenzene	ND	0 5	70	ug/L	524 2	
1,2-Dichloroethane	ND	0 5	5	ug/L	524 2	
1,2-Dichloropropane	ND	0 5	5	gg/L	524 2	
Benzene	ND	0 5	5	ug/L	524 2	
Carbon Tetrachloride	ND	0 5	5	ug/L	524 2	
Chlorobenzene	ND	0 5	100	ug/L	524 2	
Dichloromethane	ND	0 5	5	ug/L	524 2	
Ethylbenzene	ND	0 5	700	ug/L	524 2	
Styrene	ND	0 5	100	ug/L	524 2	
Tetrachloroethylene	ND	0 5	5	ug/L	524 2	
Toluene	0 77	0 5	1000	ug/L	524 2	
Total Xylenes	ND	0 5	10000	ug/L	524 2	
Trichloroethylene (TCE)	ND	0 5	5	ug/L	524 2	
Vinyl Chloride	ND	0 5	2	ug/L	524 2	
cis-1,2-Dichloroethylene	ND	0 5	70	ug/L	524 2	
m-Xylene	ND	0 5		ug/L	524 2	
o-Dichlorobenzene	ND	0 5	600	ug/L	524 2	
o-Xylene	ND	0 5		ug/L	524 2	
p-Dichlorobenzene	ND	0 5	75	ug/L	524 2	
p-Xylene	ND	0 5		ug/L	524 2	
trans-1,2-Dichloroethylene	ND	0 5	100	ug/L	524 2	

TRIHALOMETHANES						
Bromodichloromethane	ND	0 5	100	ug/L	524 2	
Bromoform	ND	0 5	100	ug/L	524 2	
Chloroform	ND	0 5	100	ug/L	524 2	
Dibromochloromethane	ND	0 5	100	ug/L	524 2	
Total Trihalomethanes	ND	0 5	100	ug/L	524 2	

"ND" = None Detected above Utah MRL

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ANALYTICAL LABORATORIES

Chemical and Bacterialogical Testing

CERTIFICATE OF ANALYSIS

CLIENT JONES & DEMILLE ENG

SAMPLE NAME System # 95-120330

Source Sevier Co Landfill Tap from test pumping

	Result	MDL	MCL	Units	Method	Notes
UNREGULATED ORGANICS						
1 1 1,2-Tetrachloroethane	ND	1	—	ug/L	524 2	
1,1 2 2-Tetrachloroethane	ND	1	—	ug/L	524 2	
1,1-Dichloroethane	ND	1	—	ug/L	524 2	
1,1-Dichloropropene	ND	1	—	ug/L	524 2	
1,2,3-Trichlorobenzene	ND	1	—	ug/L	524 2	
1,2 3-Trichloropropane	ND	1	—	ug/L	524 2	
1,2,4-Trimethylbenzene	ND	1	—	ug/L	524 2	
1 3,5-Trimethylbenzene	ND	1	—	ug/L	524 2	
1,3-Dichloropropane	ND	1	—	ug/L	524 2	
1,3-Dichloropropene	ND	1	—	ug/L	524 2	
2 2-Dichloropropane	ND	1	—	ug/L	524 2	
Bromobenzene	ND	1	—	ug/L	524 2	
Bromochloromethane	ND	1	—	ug/L	524 2	
Bromodichloromethane	ND	1	—	ug/L	524 2	
Bromoform	ND	1	—	ug/L	524 2	
Bromomethane	ND	1	—	ug/L	524 2	
Chlorodibromomethane	ND	1	—	ug/L	524.2	
Chloroethane	ND	1	—	ug/L	524 2	
Chloroform	ND	1	—	ug/L	524 2	
Chloromethane	ND	1	—	ug/L	524 2	
Dibromomethane	ND	1	—	ug/L	524 2	
Dichlorodifluoromethane	ND	1	—	ug/L	524 2	
Fluorotrichloromethane	ND	1	—	ug/L	524 2	
Hexachlorobutadiene	ND	1	—	ug/L	524 2	
Isopropylbenzene	ND	1	—	ug/L	524 2	
m-Dichlorobenzene	ND	1	—	ug/L	524 2	
n-Butylbenzene	ND	1	—	ug/L	524 2	
n-Propylbenzene	ND	1	—	ug/L	524 2	
Naphthalene	ND	1	—	ug/L	524 2	
o-Chlorotoluene	ND	1	—	ug/L	524 2	
p-Chlorotoluene	ND	1	—	ug/L	524 2	
p-Isopropyltoluene	ND	1	—	ug/L	524 2	
sec-Butylbenzene	ND	1	—	ug/L	524 2	
tert-Butylbenzene	ND	1	—	ug/L	524 2	

"ND" = None Detected above Utah MRL

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ANALYTICAL LABORATORIES

Chemical and Bacteriological Testing

CERTIFICATE OF ANALYSIS

CLIENT JONES & DEMILLE ENG

SAMPLE NAME System # 95-120330

Source Sevier Co Landfill Tap from test pumping

	Result	MDL	MCL	Units	Method	Notes
INORGANICS AND METALS						
Cyanide	ND	0 05	0 2	mg/L	D2036	
Fluonde	0 4	0 1	4	mg/L	340.2	
Total Dissolved Solids (TDS)	826	20	1000	mg/L	160 1	
Turbidity	ND	0 5	5 or 1	NTU	120 1	
Antimony, Sb	ND	0 003	0 006	mg/L	200 7	
Arsenic, As	0.005	0 005	0 95	mg/L	200 7	
Banum, Ba	0 014	0 1	2	mg/L	200 7	
Beryllium Be	ND	0 001	0 004	mg/L	200 7	
Cadmium Cd	ND	0 001	0 005	mg/L	200 7	
Chromium, Cr	ND	0 007	0 1	mg/L	200 7	
Copper, Cu	ND	0 05	TT	mg/L	200 7	
Lead, Pb	ND	0 005	0 015, TT	mg/L	200 9	
Mercury, Hg	ND	0 0002	0 002	mg/L	245 1	
Nickel, Ni	ND	0 01	0 1	mg/L	200 7	
Selenium Se	ND	0 002	0 05	mg/L	200 9	
Sodium Na	234	1	—	mg/L	200 7	
Sulfate, SO4	23	5	500	mg/L	375 4	
Thallium Tl	ND	0 001	0 002	mg/L	200 9	
Nitrate NO3-N	0 779	0 02	10	mg/L	353 1	
Nitrite NO2-N	ND	0 005	1	mg/L	354 1	

"ND" = None Detected above Utah MRL

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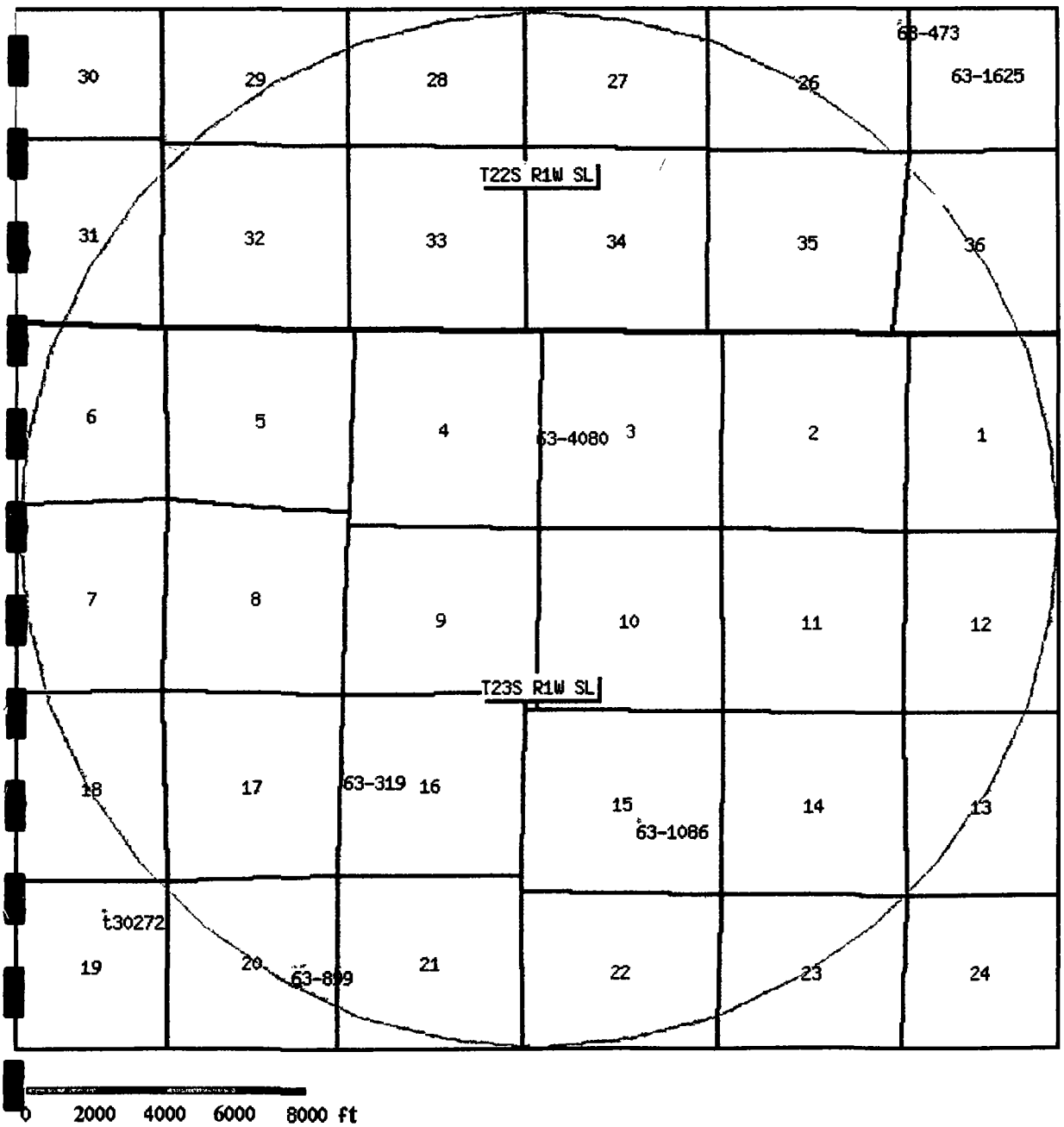
Utah Division of Water Rights

Output Listing

Version 2009 05 06 00 Rundate 05/26/2010 05 03 PM

Radius search of 15000 feet from a point N E from the SE corner, section 04, Township 23S, Range 1W, SL &m Criteria wrtypes=W,C,E podtypes=U,Sp status=U,A,P usetypes=all



Water Rights

WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS ACFT	Owner Name
63-1086	Underground		P	19000000	I	0 067 0 000	J L DAVIS
	N2044 E194 S4 15 23S IW SL						VENICE UT
63-1625	Underground		P	19380329	O	0 000 0 000	HANS P DITTEVSON
	S57 E1223 W4 25 22S IW SL						SALINA UT 84654
63-2504	Underground		P	18700000	M	0 640 0 000	TOWN OF SIGURD
	N2737 W1048 SE 20 23S IW SL						SIGURD UT 84657
63-319	Underground		P	19560121	S	0 015 0 000	A BRYANT AND J LLEWELL YOUNG
	N330 E100 W4 16 23S IW SL						RICHFIELD UT 84701
63-4080	Underground	well info	P	19940817	D	0 000 0 450	SEVIER COUNTY
	S2818 W138 NE 04 23S IW SL						250 NORTH MAIN
63-4378	Underground	well info	P	1920	IO	0 000 1 000	WOLVERINE GAS AND OIL CORPORATION
	S2431 W1779 NE 20 23S IW SL						ONE RIVERFRONT PLAZA
63-473	Underground		P	1908	MS	1 000 0 000	SALINA CITY
	S1452 W376 NE 26 22S IW SL						SALINA UT 84654
63-58	Underground		P	19390522	M	0 254 0 000	TOWN OF SIGURD
	N2737 W1048 SE 20 23S IW SL						SIGURD UT 84657
63-59	Underground		P	19390522	M	0 254 0 000	TOWN OF SIGURD
	N2737 W1048 SE 20 23S IW SL						SIGURD UT 84657
63-895	Underground		P	1909	I	0 080 0 000	KINGS MEADOW RANCHES L L C
	N6 W1438 E4 20 23S 1W SL						C/O KENNETH DASTRUP
63-896	Underground		P	1909	I	0 080 0 000	KINGS MEADOW RANCHES L L C
	S156 W1358 E4 20 23S IW SL						C/O KENNETH DASTRUP
63-897	Underground		P	1909	I	0 080 0 000	KINGS MEADOW RANCHES L L C
	S290 W1372 E4 20 23S IW SL						C/O KENNETH DASTRUP
63-898	Underground		P	1909	I	0 080 0 000	KINGS MEADOW RANCHES L L C
	S561 W1114 E4 20 23S						

	1W SL					C/O KENNETH DASTRUP
63-899	Underground	P	1909	I	0 080 0 000	KINGS MEADOW RANCHES L L C
	N15 W1320 E4 20 23S 1W SL					C/O KENNETH DASTRUP
30272	Underground	A	20050526	O	0 000 14 000	MACK T AND EARLENE S DASTRUP
	S869 W1901 SW 17 23S 1W SL					BOX 570125

Attachment 4
Closure and Post-Closure

flow away from the site The storm water flow in the drainage swales for a 25-year storm event is calculated to be 1 9 cubic feet per second The velocity of the storm water in the drainage swales will be less than 3 feet per second, therefore, riprap is not needed for the drainage swales The storm water calculations for the drainage swales are also included in Appendix 1

5 7 Closure and Post-Closure Design and Maintenance

Closure and post-closure design, constmction and maintenance will be performed to, meet the requirements of the State Solid Waste Rules The closure of the operations at Sage Flat Landfill will minimize the need for further maintenance, minimize the threat to human health and the environment from post closure escape of solid waste constituents, leachate, landfill gases, contaminated mn-off or waste decomposition products to the groundwater, surface water of the atmosphere, and prepare the facility for the post closure period

The landfill will be covered with a final design cover which will consist of an 18 inch compacted silty clay layer and a 20 inch soil cover over the compacted silty clay The compacted silty clay layer will have a minimum field permeability of 1x10 7 cm/sec The 20 inch soil cover will include 14 inches of native soil from the trench excavation or BLM source nearby, and 6 inches of topsoil from the trench excavation The topsoil will be revegetated

The waste disposal cell is expected to experience some settlement The area is considered an arid site and will lessen the impacts attributed to settlement However, the closure plan is deigned to maintain a positive dramage off the trench area throughout the closure period The majority of settlement will take place during and prior to final grading and cover replacement The final grades will be constmcted to minimum 3 percent slope on the top of the trench cell All mnoff will be directed off and around the disposal cells The entire site will be constmcted with a perimeter drainage system which will minimize any mnoff from the adjacent hillside from contacting the waste cells

All material necessary for post closure maintenance is expected to be available on site Routine inspections and maintenance of slopes, dramage channels and covers will be performed periodically durirg the post closure period

6 0 CLOSURE AND POST_CLOSURE PLANS

6 1 General

Final closure activities will be implemented at the completion of each trench cell Final cover, grading and revegetation of the trenches will occur as each cell is completed to minimize infiltration into the waste cell Closure of the site is designed to be performed in such a manner as to minimize the need for post-closure maintenance and mimmize the potential effects of the landfill on the surrounding environment Post-closure operations will consist of gas and leachate monitoring at the landfill and periodic site inspections to determine that the site is performing as designed

6 1 1 Final Cover and Grading

The final cover of the proposed Sevier county Landfill will consist of 18 inches of compacted clay covered with 20 inches of material consisting of 14 inches of native soil and 6 inches of topsoil The final cover will be placed after the waste has been placed and compacted to the

grade outlined in the plans The cover will be constmcted with a 3% slope to the sides of the trench The compacted clay cover will have a maximum hydraulic conductivity of 1x10 7 cm/sec The native soil and topsoil will be obtained from the site, and will consist of soil that has been excavated from the top of the cell and stockpiled at the sides of the trench for placement as final cover

6 1 2 Volume Capacity

The total volume capacity of the proposed Class 1 landfill area is approximately 2,825,000 cubic yards (yd3) The current disposal rate is about 85 tons per days of waste The average placed waste density is estimated to be 1,000 pounds per cubic yard The life of the landfill is expected to exceed the estimated landfill requirements of the County's 20 year Solid Waste Management Plan Each of the larger trenched cells will provide over 5 years of landfill capacity

6 1 3 Closure Schedule

Each trenched cell will be closed separately upon the completion of filling in the cell The cell will have the clay cover, native soil and topsoil placed, as shown in the plans, after the cell has been filled Trenches will be excavated and closed starting from the north end of the site and working to the south

6 1 4 Final Inspection

A final inspection will be performed at the termination of the landfill activities at the Sage Flat facility The final inspection will determine if the landfill meets all the closure requirements as oufined in the permit and closure plans Inspection requirements of the closure plan will include, long-term operation of mn-on and run-off controls, maintenance of proper final grade on the cells to promote mn-off, control of access at the site (fencing) monitoring potential landfill leachate generation and gas monitoring

6 1 5 Recording

Within 60 days of the certification of closure, Sevier County will submit a plat and statement of fact concerning the location of disposal site to the Sevier County Recorder to be recored as the part of the record of title Sevier County will also submit a copy of the record of title filing to e Executive Secretary

6 2 Monitoring

In addition to periodic inspections, post closure monitoring of the landfill will include gas monitoring and monitoring of the leachate of the Class I landfill cells Leachate momtoring will be accomplished through the use of leachate collection pipes that will be installed at the low point of each cell Monitoring of groundwater in any site wells is not proposed due to the relatively slow flow rates through the landfill profile Groundwater modeling was performed utilizing the HELP (Hydraulic Evaluation of Landfill Performance) model A summary of the HELP results are provided in Section 4 7 and Appendix G

6 2 1 Monitoring Schedule

Monitoring of leachate generation will be on a semi-annual basis through both the active period of the landfill operations and the post-closure period Monitoring will consist of removal of any leachate from the collection system, determination of the amount of leachate being produced from the landfill and the chemistry of the lachate Landfill inspections and gas monitoring will be completed quarterly

6 3 Maintenance

Post-closure maintenance will consist of leachate monitoring, gas momtoring and site mspections for assurance of site integrity It is anticipated that post-closure activities will be performed for 30 years after closure of the facility However, if the site becomes stabilized (i e , little or no settlement, gas production or leachate generation), then the State may consider discontinuing post-closure activities

7 0 FINANICAL ASSURANCE PLAN

Sevier County has established a tmst fund with the Utah Independent Bank of Salma The tmst fund was started in 1994 and the original annual payment was estimated to be $11,756 00 There have been some modifications to the cell configurations since that time The updated amount of the tmst fund is based on no requirement for post-closure groundwater monitoring, and the total area for final closure is approximately 9 64 acres for placement of final cover on the largest cell The tmst fund will be used to pay the costs for closure and post-closure activities Table 7 1 is the updated financial assurance calculation

Table 7 1
SUMMARY OF ESTIMATED CLOSURE AND POST-CLOSURE COSTS

TASK	QUANTITY	UNITS	UNIT COST	TASK COST
Obtain Clay *	23,335	CY	$0 00	$0
Move & Place Clay	23,335	CY	$2 00	$46,670
Obtain Native Soil *	18,150	CY	$0 00	$0
Move & Place Native Soil	18,150	CY	$2 00	$36,300
Obtain Topsoil *	7,780	CY	$0 00	$0
Move and Place Topsoil	7,780	CY	$1 25	$9,725
Final Grading	9 64	ACRES	$1,500	$14,460
Seeding	9 64	ACRES	$800	$7,712
Post-Closure Gas Monitoring (Quarterly)	120	JOB	@150	$18,000
Post-Closure Leachate Monitoring (Semiannually)	60	JOB	$150	$9,000
Post-Closure Inspections (Quarterly)	120	JOB	$150	$18,000
Post-Closure Annual Maintenance	30	JOB	$1,000	$30,000
			TOTAL	$189,867
			ANNUAL PAYMENT	$37,973

*1 Available on-site from stockpiled materials from trench excavation

8 0 CLASS IV LANDFILL

8 1 Class Landfill Location

A Class IV Landfill is also located at the Sage Flat Landfill site The location of the Class IV site is along the eastern hillside in the southern section of the Sage Flat Landfill boundary Access to the site is by a gravel road located along the toe of the adjacent hillside An equipment road is located adjacent to and up the slope from the access road Cover material will be stockpiled from the excavated material available from the initial development of the class IV site Expansion of the Class IV will continue in the immediate area

8 2 Class IV Landfill Closure

The Closure design and post closure maintenance for the Class IV site will include the final grading to the general slopes of the adjacent hillside The site will then be covered with a minimum 2 feet of cover which includes a minimum 6 inches of topsoil The area will then be seeded with grass, other shallow rooted vegetation, or other native vegetation

SECTION 02322

FINAL COVER

PART 1 GENERAL

1 1 SECTION INCLUDES

A Final cover placed over compacted waste

1 2 RELATED SECTIONS

A Section 02315 - Excavation and Embankment

B Section 02925 - Revegetation

1 3 REFERENCES

A American Association of State Highway and Transportation Officials (AASHTO)
1 AASHTO T99 - Moisture-Density relations of Soils Using a 5 5 lb (2 5 kg) Rammer and a 12-in (305 mm) Drop

B American Society for Testing and Materials (ASTM)
1 ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

PART 2 PRODUCTS

2 1 MATERIALS

A Clay Liner Natural clay excavated form trenches or obtained form borrow site

B Native Soil Soil excavated from trenches

C Topsoil Topsoil excavated from trenches

PART 3 EXECUTION

3 1 PREPARATION

A Verify waste is ready for final cover

3 2 CONSTRUCTION

A Place clay liner in lifts not exceeding 8 inches Compact each lift to at least 95 percent of maximum laboratory density Maintain optimum moisture content of clay material Construct clay liner to total compacted thickness of 18 inches

B Place native soil over clay liner in two equal lifts Compact each lift to 95 percent of maximum laboratory density Maintain opbmum moisture of native soil Construct native soil to total compacted thickness of 14 inches

C Place topsoil over native soil to 6 inches compacted thickness Compact to 85 percent of maximum laboratory density Maintain optimum moisture content of topsoil

D Grade finish cross slope of cell to slope at 3 percent grade toward edges

3 3 FINISHING

A Finish final grade to reasonable smooth and uniform surface

3 4 TOLERANCES

A Moisture Content Plus 3 percent or minus 1 percent of optimum

B Finish Grade Surface Plus or minus 0 1 feet of required elevation

3 5 QUALITY CONTROL TESTING

A Perform density tests in accordance with ASTM D2922 Determine maximum laboratory density in accordance with AASHTO T99, Method D

1 Frequency of Tests Take minimum of 1 random density test for each 500 cubic yards of matenal

2 Acceptance

a) Average density is 95 percent or greater for clay liner and native soil

b) Average density is 85 percent or greater for topsoil

c) Reject single tests 4 percent or more below specified density

3 If tests indicate Work is not acceptable, re-compact and retest

B Permeability Determine using sealed smgle nng infiltrometer apparatus Tesing required for clay lmer

1 Frequency Take one test for each 1,000 cubic yards Run duplicate test at same time for each third test

2 Acceptance Not exceed $1x10^{7}$ cm/sec

3 If tests indicated Work is not acceptable, re-compact and retest

3 6 PROTECTION

A Maintain clay liner until native soil is placed

B Keep surface of clay liner moist to prevent desiccation

END OF SECTION