UTAH SOLID AND HAZARDOUS WASTE CONTROL BOARD
SOLID WASTE PERMIT

San Juan County
CLASS I LANDFILL

Pursuant to the provisions of the *Utah Solid and Hazardous Waste Act*, Title 19, Chapter 6, Part 1, Utah Code Annotated (UCA) 1953, as amended (the Act) and the *Utah Solid Waste Permitting and Management Rules*, Utah Administrative Code (UAC) R315-301 through 320 adopted thereunder,

San Juan County as owner and operator

is hereby approved to own and operate the San Juan County Class I Landfill located in Sections 3, 4, 9, 10 Township 39 south, Range 22 east , Salt Lake Base and Meridian, San Juan County, Utah as shown in the permit renewal application that was determined complete on August 7, 2007.

The operation of the landfill is subject to the conditions that San Juan County (Permittee) meets the requirements of UAC R315-301 through 320 and the requirements set forth herein.

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

This permit shall become effective September 30. 2007.

This permit shall expire at midnight September 30, 2017.

Signed this 25th day of September, 2007.

Dennis R. Downs, Executive Secretary
Utah Solid and Hazardous Waste Control Board

FACILITY OWNER/OPERATOR INFORMATION

LANDFILL NAME:	San Juan County Class I Landfill
OWNER NAME:	San Juan County
OWNER ADDRESS:	117 South Main Street, Monticello, Utah 84535
OWNER PHONE NO.:	435-587-3225
OPERATOR NAME:	San Juan County
TYPE OF PERMIT:	Class I Landfill
PERMIT NUMBER:	93-05R2
LOCATION:	Landfill site is located in Township 39 south, Range 22 east , Section 3, 4, 9, 10 SLMB San Juan County, Lat. 37 25' 03", Long. 109° 29' 23"

The San Juan County Class I Landfill is located southwest of the intersection of U.S. Route 191 and State Route 262.

PERMIT REQUIREMENTS

Permit as used in this document is defined in UAC R315-301-2(55).

The renewal application as deemed complete on the date shown on the signature page of this permit, is hereby incorporated by reference into this Solid Waste Permit and will be referred to as the permit application throughout this permit. All representations made in the permit application are part of this permit and are enforceable under UAC 315-301-5(2). The permit application will become part of the operating record of the Landfill. Where differences in wording exist between this permit and the permit application, the wording of the permit supersedes that of the permit application.

This permit consists of the signature page, Facility Owner/Operator Information section, sections I through V, Statement of Basis and the permit application as defined above.

The facility as described in this permit consists of a Class I municipal solid waste disposal cell, a Class IVb construction/demolition waste disposal cell. And a dead animal disposal pit. A small drop box is provided outside the facility gates for after-hours disposal of municipal solid waste. Additional on-site facilities include an emergency municipal disposal cell, a gatehouse and weigh

scales, a maintenance shop, a storage shed, a pit toilet, perimeter fencing, storage tanks for waste automotive and cooking oil, and water supply well.

By this permit to own and operate, the Permittee is subject to the following conditions.

I. GENERAL COMPLIANCE RESPONSIBILITIES

A. General Operation

The Permittee shall operate the landfill in accordance with all applicable requirements of UAC R315-302 and 303, 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 UCA 19-6-101 through 123 and applicable portions of UAC R315-301 through 320 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.

B. Acceptable Waste

This permit is for the disposal of non-hazardous solid waste that may include municipal solid waste, commercial waste, industrial waste, construction/demolition waste, and special waste as allowed by UAC R315-315 and authorized in section IIIJ of this permit. The permittee may accept conditionally exempt small quantity generator hazardous waste as specified in UAC R315-303-4(7)(a)(i)(B) and PCB's as specified by UAC R315-315-7(2).

C. Prohibited Waste

No hazardous waste as defined by UAC R315-1 and R315-2 or PCB's as defined by UAC R315-301-2, except as allowed in Section IB (Acceptable Waste) of this permit, may be accepted for treatment, storage, or disposal at the landfill. Any prohibited waste received and accepted for treatment, storage, or disposal at the facility will constitute a violation of this permit, of UCA 19-6-101 through 123 and of UAC R315-301 through 320.

D. Inspections and Inspection Access

The Permittee shall allow the Executive Secretary of the Utah Solid and Hazardous Waste Control Board or an authorized representative of the Board, or representatives from the Southeastern Utah District Health Department, to enter at reasonable times and:

1. Inspect the landfill or other premises, practices or operations regulated or required under the terms and conditions of this Permit or UAC R315-301 through 320;

2. Have access to and copy any records required to be kept under the terms and conditions of this Permit or UAC R315-301 through 320;

3. 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 UAC R315-301 through 320; and

4. Create a record of any inspection by photographic, videotape, electronic, or any other reasonable means.

E. Noncompliance

If monitoring, inspection, or testing indicates that any permit condition or any applicable rule under UAC R315-301 through 320 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. In the event of any noncompliance with any permit condition or violation of an applicable rule, the Permittee shall promptly take any feasible 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. The Permittee shall: document the noncompliance or violation in the operating record on the day the event occurred or the day it was discovered; notify the Executive Secretary of the Solid and Hazardous Waste Control Board by phone within 24 hours or the next business day following documentation of the event; and give written notice of the noncompliance or violation and measures taken to protect public health and the environment within seven days of Executive Secretary notification. Within thirty days of the documentation of the event, the Permittee shall submit, to the Executive Secretary, 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 Executive Secretary may order the Permittee to perform appropriate remedial measures including development of a site remediation plan for approval by the Executive Secretary.

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 UAC R315-301 through 320 and this permit.

Compliance with the terms of 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.

F. Revocation

This permit is subject to revocation if any condition of this permit is not being met. The Permittee will be notified in writing prior to any proposed revocation action and such action will be subject to all applicable hearing procedures established under UAC R315-12 and the *Utah Administrative Procedures Act*.

Revocation of this permit does not revoke the financial assurance established for closure and post-closure care of the facility, nor remove any responsibility on the part of the permittee for completion of closure and post-closure care for the facility required in UAC R315-302-3.

Revocation of this permit will necessitate that the Executive Secretary exercise the option to require the funds or other mechanism provided for financial assurance for completion of closure and post-closure care for the facility required in UAC R315-302-3 be called.

G. Attachment Incorporation

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

A. Design and Construction

The Permittee shall construct any landfill cell, sub-cell, run-on diversion system, runoff containment system, waste treatment facility, or final cover in accordance with the design submitted as part of the permit application and in accordance with the Utah Solid Waste Permitting and Management Rules (UAC R315-301 thru 320).

B. Run-On Control

Drainage channels and diversions shall be constructed as specified in the permit application and maintained at all times to effectively prevent runoff from the surrounding area from entering the landfill.

C. Alternative Design

This facility has demonstrated through geologic, hydrogeologic, climatic, waste stream, and other factors that the landfill will not contaminate ground water and is approved for the alternative design as outlined in the permit application. Any contamination of ground water resulting from operation of the landfill may result in the revocation of this alternative design approval. The basis for approval of the alternative design is found in the "Alternative Design Statement of Basis" found in Appendix A of this permit.

III. LANDFILL OPERATION

A. Operations Plan

The Operations Plan included in the permit application and the solid waste permit issued by the Executive Secretary shall be kept onsite at the landfill or at the location designated in section IIIL of this permit. The landfill shall be operated in accordance with the operations plan as included in the permit application. If

necessary, the facility owner may modify the Operations Plan, provided that the modification meets all of the requirements of UAC R315-301 through 320, is as protective of human health and the environment as that approved in the permit application, and is approved by the Executive Secretary as a minor modification under UAC R315-311-2(1)(a)(xiii). Any modification to the Operations Plan shall be noted in the operating record.

Any modification to the operations plan must be submitted to the Executive Secretary for approval and is considered a minor permit modification in compliance with UAC R315-311-2(1)(a)(xiii) unless the Executive Secretary determines the change should be subject to public comment under UAC R315-311-2(1)(b).

B. Security

The Permittee shall operate the Landfill so that unauthorized entry to the facility is prevented. All facility gates and other access routes shall be locked during the time the landfill is closed. At least one person, employed by the San Juan County Class I Landfill, shall be at the landfill during all hours that the landfill is open. Fencing and any other access controls as shown in the permit application shall be constructed to prevent access of persons or livestock by other routes.

C. Training

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

D. Burning of Waste

Intentional burning of solid waste is prohibited and is a violation of UAC R315-303-4(2)(b). The burning of material when meeting the requirements of UAC R307-202-5 is allowed in a segregated area within the landfill site. All accidental fires shall be extinguished as soon as reasonably possible.

E. Daily Cover

The solid waste received at the landfill shall be completely covered at the end of each working day with a minimum of six inches of earthen material.

An alternative daily cover material may be used when the material meets the requirements of UAC R315-303-4(4)(b) through (d) or when the alternative daily cover meets the requirement of UAC R315-303-4(4)(e).

F. Ground Water Monitoring

This facility has demonstrated through geologic, hydrogeologic, climatic, waste stream, and other factors that the landfill will not contaminate ground water. For these reasons the ground water monitoring requirement for the San Juan County Class I Landfill has been waived in accordance with R315-308-1(3). Any contamination of ground water resulting from operation of the landfill will result in the revocation of this waiver.

G. Gas Monitoring

The Permittee shall monitor explosive gases at the landfill in accordance with the Gas Monitoring Plan contained in the permit application and shall otherwise meet the requirements of UAC R315-303-3(5). If necessary, the Permittee/s may modify the Gas Monitoring Plan, provided that the modification meets all of the requirements of UAC R315-301 through 320 and is as protective of human health and the environment as that approved in the permit application, and is approved by the Executive Secretary as a minor modification under UAC R315-311-2(1). Any modification to the Gas Monitoring Plan shall be noted in the 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 UAC R315-303-2(2)(a), the Permittee shall immediately take all necessary steps to ensure protection of human health and notify the Executive Secretary. Within seven days of detection, place in the operating record the explosive gas levels detected and a description of the immediate steps taken to protect human health. Implement a remediation plan that meets the requirements of UAC R315-303-3(5)(b) and shall submit the plan to, and receive approval from, the Executive Secretary prior to implementation.

H. Waste Inspections

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. A complete waste inspection shall be conducted at a minimum frequency of 1 % of incoming loads. Loads to be inspected are to be chosen on a random basis.

All loads suspected or known to have containers capable of holding more than five gallons of liquid will be inspected to assure that the container is empty.

All loads that the operator suspects may contain a waste not allowed for disposal at the landfill will be inspected.

Complete random inspections shall be conducted as follows:

1. The operator shall conduct the random waste inspection at the working face or an area designated by the operator.

2. Loads subjected to complete inspection shall be unloaded at the designated area;

3. Loads shall be spread by equipment or by hand tools;

4. A visual inspection of the waste shall be conducted by personnel trained in hazardous waste recognition and recognition of other unacceptable waste; and

5. The inspection shall be recorded on the waste inspection form found in the permit application. The form shall be placed in the operating record at the end of the operating day.

I. Disposal of Liquids

Disposal of containers larger than household size (five gallons) holding any liquid, noncontainerized material containing free liquids, sludge containing free liquids, or any waste containing free liquids in containers larger than five gallons is prohibited.

J. Disposal of Special Wastes

If loads of incinerator ash are accepted for disposal it shall be transported in such a manner to prevent leakage or the release of fugitive dust. The ash shall be completely covered with a minimum of six inches of material, or use other methods or material, if necessary, to control fugitive dust. Ash may be used for daily cover when its use does not create a human health or environmental hazard.

Animal carcasses may be disposed at the bottom of the landfill working face and must be covered with other solid waste or earth by the end of the operating day in which they are received. Alternatively, animal carcasses may be disposed in a special trench or pit prepared for the acceptance of dead animals. If a special trench is used, animals placed in the trench shall be covered with six inches of earth by the end of each operating day.

Asbestos waste shall be handled and disposed in accordance with UAC-315-315-2.

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K. Self Inspections

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. These general inspections shall be completed no less than quarterly and shall cover the following areas: Waste placement, compaction, cover; fences and access controls; roads; run-on/run-off controls; final and intermediate cover; litter controls; and records. A record of the inspections shall be placed in the daily operating record on the day of the inspection. Areas needing correction, as noted on the inspection report, shall be corrected in a timely manner. The corrective actions shall be documented in the daily operating record.

L. Recordkeeping

The Permittee shall maintain and keep on file at the landfill office, a daily operating record and other general records of landfill operation as required by UAC R315-302-2(3). 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.

1. The daily operating record shall include the following items:

    a. 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;

    b. Major deviations from the approved plan of operation recorded at the end of the operating day the deviation occurred;

    c. Results of other monitoring required by this permit recorded in the operating record on the day of the event or the day the information is received;

    d. Records of all inspections conducted by the Permittee/s, results of the inspections, and corrective actions taken shall be recorded in the record on the day of the event.

2. The general record of landfill operations shall include the following items:

    a. A copy of the permit including the permit application;

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b. Results of inspections conducted by representatives of the Utah Solid and Hazardous Waste Control Board and/or representatives of the Southeastern Utah District Health Department, when forwarded to the Permittee;

c. Closure and Post-closure care plans;

d. Records of employee training; and

e. Results of landfill gas monitoring.

M. Reporting

The Permittee shall prepare and submit, to the Executive Secretary, an Annual Report as required in UAC R315-302-2(4). 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, the results of gas monitoring, and all training programs completed.

N. Roads

All access roads, within the landfill boundary, 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.

IV. CLOSURE REQUIREMENTS

A. Closure

Final cover of the landfill shall be as shown in the permit application. The final cover shall meet, at a minimum, the standard design for closure as specified in the UAC (R315-303-3(4)) plus sufficient cover soil or equivalent material to protect the low permeability layer from the effects of frost, desiccation, and root penetration. A quality assurance plan for construction of the final landfill cover shall be submitted to, and approval of the plan must be received from the Executive Secretary prior to construction of any part of the final cover at the landfill. A qualified third party person shall perform permeability testing on the recompacted clay placed as part of the final cover.

B. Title Recording

The Permittee shall meet the requirements of UAC R315-302-2(6) by recording

with the San Juan County Recorder as part of the record of title that the property has been used as a landfill. The recording shall include waste locations and waste types disposed.

C. Post-Closure Care

Post-closure care at the closed landfill shall be done in accordance with the Post-Closure Care Plan contained in the permit application. Post-closure care shall continue until all waste disposal sites at the landfill have stabilized and the finding of UAC R315-302-3(7)(c) is made.

D. Financial Assurance

The Permittee/s shall keep in effect and active the currently approved financial assurance mechanism or another mechanism that meets the requirements of UAC R315-309 to cover the costs of closure and post-closure care at the landfill. The financial assurance mechanism shall be adequately maintained 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.

E. Financial Assurance Annual Update

An annual revision of closure costs and financial assurance funding as, required by R315-309-2(2), shall be submitted to the Executive Secretary as part of the annual report.

V. ADMINISTRATIVE REQUIREMENTS

A. Permit Modification

Modifications to this permit may be made upon application by the Permittee or by the Executive Secretary. The Permittee will be given written notice of any permit modification initiated by the Executive Secretary.

B. Permit Transfer

This permit may be transferred to a new permittee or new permittees by meeting the requirements of the permit transfer provisions of UAC R315-310-11.

C. Expansion

This permit is for a Class I Landfill. The permitted landfill must operate according to the design and Operation Plan described and explained in the permit application. Any expansion of the current footprint designated in the description contained in the permit application, but within the property boundaries designated in the permit application, will require submittal of plans and specifications to the Executive Secretary. The plans and specifications must be approved by the Executive Secretary prior to construction.

Any expansion of the landfill facility beyond the property boundaries designated in the description contained in the permit application will require submittal of a new permit application in accordance with the requirements of UAC R315-310.

Any addition to the acceptable wastes described in Section 1B will require submittal of all necessary information to the Executive Secretary and the approval of the Executive Secretary

D. Expiration

Application for permit renewal shall be made at least six months prior to the expiration date, as shown on the signature (cover) page of this permit. If a timely renewal application is made and the permit renewal is not complete by the expiration date, this permit will continue in force until renewal is completed or denied.

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Attachment A

SUSPENSION OF GROUND WATER MONITORING AND LINER REQUIREMENTS

at the

SAN JUAN COUNTY CLASS I LANDFILL

STATEMENT OF BASIS
for the
SUSPENSION OF GROUND WATER MONITORING AND LINER REQUIREMENTS
at the
SAN JUAN COUNTY CLASS I LANDFILL

Background

The *Utah Solid Waste Permitting and Management Rules* (Rules) require municipal landfills, which receive over 20 tons of solid waste per day, to have a ground water monitoring system and to have disposal cells designed with a composite liner with a leachate collection system. However, these requirements may be suspended by the Executive Secretary of the Solid and Hazardous Waste Control Board if a demonstration can be made that meets the conditions of Section R315-308-1 and Section R315-303-4(3) of the Rules.

Section R315-308-1. Ground Water Monitoring Requirements

(3) Ground water monitoring requirements may be suspended by the Executive Secretary if the owner or operator of a solid waste disposal facility can demonstrate that there is no potential for migration of hazardous constituents from the facility to the ground water during the active life of the facility and the post-closure care period. This demonstration must be certified by a qualified ground water scientist and approved by the Executive Secretary, and must be based upon:

(a) site-specific field collected measurements, sampling, and analysis of physical, chemical, and biological processes affecting contaminant fate and transport; and

(b) contaminant fate and transport predictions that maximize contaminant migration and consider impacts on human health and the environment.

Section R315-303-3(3)(c). Alternative Design.

(i) The owner or operator may use, as approved by the Executive Secretary, an alternative design.

(ii) The owner or operator must demonstrate that the ground water quality protection standard of Subsection R315-303-2(1) can be met. The demonstration must be approved by the Executive Secretary, and must be based upon:

(A) the hydrogeologic characteristics of the facility and the surrounding land;

(B) the climatic factors of the area;

(C) the volume and physical and chemical characteristics of the leachate;

(D) predictions of contaminate fate and transport in the subsurface that maximize contaminant migration and consider impacts on human health and the environment; and

(E) predictions of leachate flow from the base of the waste to the uppermost aquifer;

The San Juan County Class I Landfill is located in Township 39 south, Range 22 east , Section 3, 4, 9, 10 SLMB, Lat. 37 25' 03", Long. 109° 29' 23", San Juan County, Utah. The Landfill may accept nonhazardous waste, including municipal, commercial, industrial, and special nonhazardous wastes.

San Juan County was originally granted an exemption from ground water monitoring and liners at the San Juan County Landfill in a June 22, 1998 approval letter from the Executive Secretary. Currently, San Juan County, as part of the permit renewal process, has requested the exemption to be continued. The geologic and climatic conditions have not changed at the site. The details of the site and plan of operation are provided in *Application to Renew a Permit to Operate a Class I Landfill, San Juan County Landfill-May 17, 2005.*

Following is a summary of the information that was submitted by San Juan County in support of the request.

Climatic Conditions

The climate in the area of the landfill is semi-arid, the seasons are well defined and is characterized by warm summers and cool winters. No weather records are available for the landfill site , however, records are available for the communities for Blanding, approximately 15 miles north of the site and Bluff, approximately 11 miles south of the site. The monthly average temperature for January is between 27.3°F at Blanding and 28.7°F at Bluff. The July average is 73.3°F for Blanding and 77.6°F for Bluff. Average annual precipitation in Blanding is approximately 12 inches while at Bluff the average is approximately 8 inches. The site average participation is estimated at 10.5 inches per year.

Landfill Design and Operation

The landfill is located on Big Bench Mesa, a 5,000-foot-high plateau in the Blanding Basin. Surface water is diverted away from the landfill by berms, ditches, and roads designed to protect the landfill units from runon water from a 25-year storm event.

The following operational practices also minimize the amount of water that may contact the solid waste. The active area of the landfill will be limited to the smallest practical size; bulk liquid waste is excluded; all waste are thoroughly compacted and receive a daily cover of six inches of soil or an alternative cover that deflects water from storm events; and the active area periodically receives an intermediate cover of 12 inches of soil. The size and progression of the landfill units will result in the units being brought to the final elevation and covered with a cap consisting of a 18-inch low permeability layer overlain by an 18-inch erosion layer. The final cover will be graded to prevent ponding and minimize infiltration of run-on water.

Computer Modeling of Leachate Generation and Infiltration

The volume of leachate produced in the landfill needs to be evaluated to determine the landfills potential impact on ground water. Leachate is the liquid that has passed through or emerged from solid waste and may contain soluble, suspended, miscible, or immiscible materials removed from the waste. This liquid has the potential to migrate to ground water.

Computer modeling is often used to predict the amount of leachate a landfill can be expected to produce. The Hydrologic Evaluation of Landfill Performance (HELP) model was developed to evaluate the hydrologic performance of proposed landfill designs. The model accepts weather, soil and design data and uses solution techniques that account for the effects of surface storage, snowmelt, runoff, infiltration, evapotranspiration, vegetative growth, soil moisture storage, subsurface drainage, unsaturated vertical drainage, and leakage through soils. Various combinations of layers and materials may be modeled. Results are expressed as monthly, annual, and long-term average water budgets.

The HELP model has been used to predict leachate production in several Utah landfills. The HELP model was used to evaluate the San Juan County Landfill. Conservative values were chosen for most of the input parameters in the San Juan County Landfill model. For example, initial moisture content of the waste is a primary factor in the creation of leachate. Typical moisture contents for municipal solid waste range from 8% to 20% with the average being about 12%. If the initial moisture content of waste is increased, the waste mass will retain a smaller volume of incoming fluids; consequently more leachate would be generated. Computer simulations were run with moisture content set at 12% and 20%.

The HELP computer model was run for a 80-year simulation period. To be conservative, the simulation evaluated the landfill with only a 12-inch cover soil as a cap. The construction of the final cover for the landfill incorporates an 18-inch low permeability layer overlain by an 18-inch erosion layer. The computer model simulation incorporated 20 alternating layers of waste and intermediate cover soil. Each waste layer is 36 inches thick and each intermediate cover soil is 12 inches thick. The estimated average amount of leachate generated during the 80-year simulation is 0.00076 inches per year. With this limited amount leachate, the total head needed to induce vertical flow through the underlying clay rich material will not be generated. Thus, the potential for vertical migration of

leachate to the uppermost aquifer, more than 770 feet below the landfill, is negligible.

Subsurface Conditions

The subsurface geotechnical data demonstrates that:

- the stratigraphy underlying the San Juan County Landfill was shown to contain numerous layers of relatively impermeable siltstone, sandstone, and mudstone;
- subsurface layers are laterally continuous on the scale of the landfill property;
- the first water-bearing zone encountered beneath the site exists at an approximate depth of 770 feet;
- based on interpretations by Gloyn et al (1995), ground water beneath the site most likely exists under confined conditions with an unknown average pressure head;and,
- laboratory analyses on the variably-indurated mudstone which immediately underlies the landfill yielded an undisturbed permeability of $5x10^{8}$ cm/sec.

Depth to Ground Water

A drill hole, at the landfill, was completed to a depth of 780 feet below ground surface. Free water was encountered I the hole at a depth of 770 feet with an estimated flow rate of 30 gallons per minute.

Migration of Leachate

Due to the limited amount of leachate generated, the low permeability of the clay layers beneath the landfill, and the depth to ground water of 770 feet, it is estimated that more than 8,400 years of continuous, open operation and leachate generation would be required foe leachate to migrate to a depth of 755 feet below the base of the landfill.

Summary

The site investigation at the San Juan County Landfill indicates that the potential for hazardous constituents from the landfill to migrate to the ground water during the projected active life and post-closure care period of the landfill is de minimis. This conclusion is reached from the following information:

- The landfill is located in a semi arid climate with an annual rainfall estimated at 10.5 inches.
- The site geology reveals a continuous layers of low permeability clay beneath the landfill. Depth to ground water at the site is 770 feet below the ground surface.
- The landfill is constructed with water run-on and run-off controls to minimize the amount of water entering the landfill disposal cell.
- The landfill's operational practices include the use of a small working face, daily cover, periodic intermediate cover, and excluding liquid waste. All of which will minimize the amount of liquids water that may contact the waste.
- Leachate production modeling simulations indicate that the maximum amount of leachate leaving the bottom of the landfill will be much less than one inch per year.

The San Juan County Landfill design, included in the permit application, did not incorporate a bottom landfill liner or groundwater monitoring. The permit application was review by the Division of Solid & Hazardous Waste and was released for public comment. As part of the Permit # 9305R2, ground water monitoring is suspended and an alternative landfill design which excludes the requirements for the installation of a low permeable bottom landfill liner is approved for the San Juan Class I Landfill.