

WM-11

PDR

JUL 19 1979

Mr. Gerald W. Allen  
Director  
Bureau of Radiation Control  
Kansas State Department of  
Health and Environment  
Building 740 Forbes Field  
Topeka, Kansas 66620

Dear Mr. Allen:

This letter is to aid in your review of the Southwest Nuclear application to use the Carey Salt Mine as a low-level waste site.

We believe the concept of a mined cavity waste facility has merit. This type of facility has been identified in our study of alternatives for low-level waste disposal sites as one of the most viable of the alternatives to shallow land burial. However, the applicant has made only superficial efforts to describe the planned design and operation of the facility. The enclosed guide outlines the level of detail needed, and topics that must be addressed before an environmental assessment can begin. Actual licensing of the facility will require even greater detail in many of these areas.

Such a waste facility has never been operated before and it appears that major efforts and commitments are needed in the following areas that the applicant has not begun to address:

I. Limitations on Waste Acceptance

On the basis of the description of the facility and its operation in Southwest Nuclear's application, it appears that many major wastes types may be unsuitable for storage or disposal. These wastes have characteristic that pose special problems in a mine environment that must be dealt with. If nothing is done to allow the facility to handle these wastes safely, it is likely that the facility will not be a viable waste site since these wastes make up a major fraction of the low-level waste volumes generated in the U.S. The following design areas need much more effort to avoid this problem:

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Mr. Gerald W. Allen

- 2 -

JUL 19 1979

a. Size and Weight of Packages

The facility appears to be designed to handle wastes packaged in 55-gallon drums. A significant fraction of low-level wastes are disposed of in crates or packages much larger than 55-gallon drums. Cardboard and other small packages are also used. The larger packages will not fit down the present hoist or can be too heavy, and the smaller packages may crush when stacked and require a lot of handling thus increasing worker exposures.

b. Flammable Materials

Flammable materials may have to be excluded due to the warehouse-like operation of the mine. Flammable materials and containers may have to be processed (incinerated) on the surface or excluded from the mine if adequate fire protection is not designed into the facility. Some of these wastes can undergo spontaneous combustion and no amount of engineering will make these wastes acceptable.

c. Hazardous Fumes

Biological wastes, scintillation vials, and other non-solidified wastes (approximately 20% of the generated volume of LLW) can give off toxic or hazardous fumes. Strict measures for ventilation, filtration, and personnel control must be added if these wastes are not to be excluded.

d. Radiation Shielding

The higher-radiation, low-level wastes can significantly increase worker exposure in the mine situation if the facility design is insufficient in this respect. Shielding for these wastes during transport in the mine is especially a concern. Shielding of previously stored wastes must be adequate for control of direct exposures to personnel during normal operations. Elimination of the higher-radiation level wastes from the mine would eliminate a major fraction of the waste volumes generated (we estimate 15% to 50% depending on the amount of shielding engineered).

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Mr. Gerald W. Allen

- 3 -

JUL 19 1973

e. Corrosive or Leaking Wastes

In a salt mine operation, package integrity becomes much more important. Current practice is not to consider the compatibility of the waste form and packages. Provisions will have to be made to cope with container leakage and corrosion from inside packages.

II. Startup Costs and Eventual Waste Charges

The mined waste facility will require cost outlays before operation can begin that are significantly higher than those required to open a shallow-land burial site. Refurbishing the old shaft, drilling a required second escape shaft, addition of possible new ventilation and personnel shafts, and installation of underground ventilation are all costs that are beyond those required for a shallow-land burial site. The expected charge rate for waste disposal must also be estimated and supported with cost studies. If the disposal charges needed to make this site pay off are too high, the site might not be viable.

III. Contamination Spread by Ventilation

Due to the ventilation air flows, contamination can easily be spread throughout the mine if the ventilation system is not well designed. Extra air shafts to control contamination spread may be needed.

IV. Salt Disposal

Salt disposal, storage, or sale must be addressed for the salt mined and cleaned from the disposal areas. Not only does the salt's final disposition affect the operation of and effluents from the site, but it may determine some jurisdictional points that are as yet unresolved.

The Southwest Nuclear operation, as presently described, is a warehousing of wastes with the probable intent of abandoning it at the end of operations. Even if individual tunnels are isolated, we believe that final disposal would not occur until the site was closed, the mine isolated (i.e., the shaft closed), and the operator's license terminated. Based on our recent experiences with the Sheffield site, we believe that the operator's responsibility for the wastes until license termination should be defined. Termination would be legally equivalent to creating an exemption for the wastes, absent transfer of the license to a custodial agency for long-term care. The explicit possession limits for wastes at the site should be cumulative for all wastes stored, both above and below ground. This would

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Mr. Gerald W. Allen

- 4 -

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to avoid uncertainties and arguments over what is and is not disposal during operations and would emphasize that the materials are subject to licensing until formal action is taken to terminate the license. From a practical rather than legal view, we feel that waste in backfilled tunnels or tunnels with blocked entrances are potentially accessible and should be considered in safety and security programs. The bottom line of these legal and practical issues is that if any SNM will be accepted, a NRC SNM license will be required. The cumulative totals of stored wastes would certainly exceed the 10 CFR Part 150 limits for SNM regulation by the State soon after the facility started receiving wastes.

I am enclosing the following items to aid in your review:

1. A draft statement of work for an environmental assessment;
2. A guide for the level of detail needed for work on the environmental assessment; and
3. A copy of the draft Kansas-NRC-MUHA agreement.

Sincerely,

R. Dale Smith, Chief  
Low-Level Waste Licensing Branch  
Division of Waste Management

Enclosures:  
As stated

cc: W. Kerr, SP

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May 18, 1979

STATEMENT OF COOPERATION BETWEEN THE STATE OF KANSAS,  
AN AGREEMENT STATE, MINE SAFETY AND HEALTH ADMINISTRATION  
AND THE NUCLEAR REGULATORY COMMISSION

The purpose of the Statement is to establish the basis for the preparation of a joint environmental assessment and on-site safety assessment for Southwest Nuclear Corporation's low-level waste operation at Lyons, Kansas, as provided for under section 274 of the Atomic Energy Act, as amended. In addition to the statutory provision of the Act, each agreement entered into with a State for State assumption of regulatory authority over agreement materials contains an article pledging the use of best efforts on the part of the Commission and the State to achieve coordinated and compatible programs. The low-level waste operation proposed for the Lyons, Kansas salt mine is expected to have significant impact upon the human environment.

Whereas the State of Kansas Bureau of Radiation Control has the authority to issue the license necessary to operate the facility; and

Whereas the NRC has been requested by the State of Kansas, by letter dated August 30, 1978 and at a meeting between NRC and State representatives on April 18, 1979, to provide assistance under the provisions of section 274; and

Whereas the Mine Safety and Health Administration has the authority to oversee and inspect operations conducted in mines, it is mutually agreed that:

- I. The State of Kansas Bureau of Radiation Control (KBRC), the United States Nuclear Regulatory Commission (USNRC) and the Mine Safety and Health Administration (MSHA) will work jointly to prepare an environmental assessment and provide support where needed on the on-site radiological and non-radiological safety assessment for the Southwest Nuclear Corporation, Lyons, Kansas Salt Mine Waste Facility.
- II. The environmental assessment will describe the impacts, effects, and necessary mitigating measures for the proposed project, both on-site and off-site.
- III. Each agency will be responsible for data collection and analysis and the preparation of text and illustration in their respective areas of responsibility which will be described in a scoping document. The agencies will contribute towards the development of all sections of the environmental assessment (EA), with the objective of minimizing the environmental impacts and effects of each part of this project upon the site and adjacent area.
- IV. Each agency will provide leadership in specific areas as follows:

A. State of Kansas

1. On-site Radiological Safety, with assistance from NRC and MSHA.
2. Socio Economics.
3. Setting procedures for requiring a form of surety from Southwest Nuclear to guarantee its performance in site operations, site decommissioning, and long term maintenance and monitoring.
4. The state, as licensing authority, will contact the appropriate agency of the State and County of Kansas to verify that the necessary Federal, State and local permits and approvals required by Southeast Nuclear Corporation have been applied for.

B. NRC

1. Surface physical resources and operations with assistance from State.
2. Environmental impacts with assistance from State.
3. Lead action in preparing the scoping document for the EA with assistance from the State and MSHA.

C. MSHA

1. Mining and subsurface resources and operation with assistance from the State.
2. On-site non-radiological safety with assistance from the State.

V. It is the intent that the EA will be used by the State in the decisionmaking process for issuance of a license and is to be concurred in by:

- A. Secretary, Department of Health and Environment, Kansas.
- B. Director of MSHA.
- C. Director, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, NRC.

and each participating agency's separate view as to unresolved environmental issues will be accurately stated in the environmental assessment.

- VI. Each agency will designate an EA team member. The EA team will prepare operating documents for the following matters:
  - A. Detailing of each participating agency's area of responsibility and interface.
  - B. Coordination of effort, involvement of resource specialists, and review and approval procedures for both draft and final EA.
- VII. The NRC will act as coordinator of the EA and provide project management for the effort and will be responsible for incorporating the product of each agency into the draft and final EA.
- VIII. The State, MSHA, and NRC will cooperate, to the extent allowed by regulation, in public meetings or hearings to assure the dissemination of factual information and to provide testimony to those portions of the EA prepared by or for their respective agencies. The State will be responsible for organizing any local public meetings of an informational nature.
- IX. The State will not issue a license to the applicant prior to the completion of the EA.
- X. It is understood that work on the EA will receive appropriate attention and that each participating agency will fund its own activities and agrees to use its best efforts to complete the EA by October 1980.
- XI. The licensing process within the State shall continue to be the responsibility of the State. This agreement shall in no way alter, diminish or affect the Agreement between the State and NRC under section 274(b) of the Atomic Energy Act (as amended) effective February 1, 1968.
- XII. Nothing in this agreement is intended to restrict or alter the statutory authorities of NRC, MSHA, or the State.

Signature \_\_\_\_\_ Kansas

Signature \_\_\_\_\_ MSHA

Signature \_\_\_\_\_ NRC

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STATEMENT OF WORK  
ENVIRONMENTAL ASSESSMENT FOR LLW FACILITY IN  
THE CAREY SALT MINE NEAR LYONS, KANSAS

B9R SO-19-03-02-0 F.M. B-6609-C

**1.0 BACKGROUND**

Southwest Nuclear Company has proposed to establish and operate a facility for retrievable storage of low-level waste in the abandoned Carey Salt Mine near Lyons, Kansas. Kansas is an Agreement State and as such has the primary licensing authority for such a site. A license from the Nuclear Regulatory Commission (NRC) would be required if the special nuclear material to be possessed exceeds the small quantities which the states regulate under their agreements as defined in 10 CFR 150. The State of Kansas has requested assistance from the NRC in conducting the license review. This assistance will primarily be in the form of an environmental assessment of the site and the proposed activity.

The tentative scheduled date for issuance of a draft EA is April 1980,  
~~assuming no delays result from hearings that may be requested.~~

**2.0 WORK REQUIRED**

The contractor shall furnish the necessary qualified personnel, facilities, materials, and services to perform the following tasks:

**Task 1 - Review and Evaluation of Existing Information**

Review and evaluate the existing information on the proposed site, operations, and surrounding area. Sources shall include information from Southwest Nuclear as well as information available from the Department of Energy (DOE), NRC, Atomic Energy Commission (AEC) reports and files, and other existing information. Identify gaps in the information needed to complete an environmental assessment of the proposed

waste site and propose a method for obtaining missing information in a timely manner. The Project Manager shall be notified of gaps and proposed methods immediately by telephone and confirmed in writing. The results of this Task will be included in the Task 2 report.

Task 2 - Scope of the Environmental Assessment

Define the scope and content of the environmental assessment that will be performed in support of action on the Lyons license application. Define the methods to be used to evaluate the environmental impacts associated with the following alternatives:

- no site use
- retrievable storage operation
- for storage and disposal operation instead of retrievable storage
- use of different mine (alternate sites)
- use of different methods of storage or disposal (e.g., shallow land burial)
- co-use (use of an operating mine)

The contractor shall incorporate the results of this Task and Task 1 into a Task Report which shall be provided to the Project Manager (PM) by one month following the effective date of this contract.

Task 3 - Draft Environmental Assessment Preparation

Based on the Project Manager's comments on the Task 2 report and the project manager's approval of the environmental assessment outline, the contractor shall prepare a draft environmental assessment for the Lyons waste site application. The Project Manager shall provide comments within two weeks of receipt of the Task 2 report. The contractor shall recommend

potential improvements (i.e., segregation of waste types or sources) to the proposed operations at the site, and support the recommendations with analyses. The contractor shall specifically address the following areas as part of the environmental assessment:

- Potential problems or objections raised by government agencies and interested people
- Current and projected needs for low-level waste disposal capacity and storage
- The present and considered framework of State and Federal policies and regulations governing low-level waste disposal
- Proposed and alternate operations and types of wastes in the site
- Potential effluents from the site
- Monitoring programs
- Health effects (occupational and to the general population)
- Effects of potential accidents
- The need for long-term surveillance, care, and decommission activities for the site
- Other factors considered by NEPA or defined by the project manager
- Economic analysis and feasibility study

The State of Kansas will provide input on socio-economic impacts and the Mine Safety and Health Administration (MSHA) will provide input on the occupational hazards of the mine (to the Project Manager). If these sections of the report are not available when needed, the contractor shall continue with a report on what the contractor has done.

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Identification of gaps in the available information needed to prepare the environmental assessment is required as part of Task 1. In the event that such gaps are identified, part of the Task 3 effort--as approved by the Project Manager--will be delayed until such information is obtained. The contract proposal should therefore reflect flexibility as part of the Task 3 effort. Information gaps which must be filled to complete the environmental assessment may be discovered during the Task 3 effort. In this event, the Project Manager shall be notified by telephone immediately and by a written statement within five days.

Task 4 - Final Environmental Assessment

Upon consideration of NRC, State, and public comments on the draft environmental assessment and at the direction of the Project Manager, the contractor shall prepare a final environmental assessment for the proposed Lyons waste site. The contractor shall make all references used in the preparation of the environmental assessment available for public inspection.

Task 5 - Testimony

As requested by the NRC, prepare for and participate in any meetings or hearings requiring the presentation and defense of all work that the contractor completes under this statement of work. Resources needed under Task 5 are not to be included in the contract proposal.

**3.0 REPORTING REQUIREMENTS**

If at any time during the performance of this contract the contractor determines that a schedule cannot be met or all tasks completed without an increase in funding, the contractor shall notify the Project Manager immediately by phone and in writing.

### 3.1 Monthly Reports

Each month, the contractor shall submit a brief letter report that summarizes: (1) the work performed during the previous month, including the estimated percentage completion of all tasks; (2) personnel time and expenditures billed during the previous month; (3) all costs and obligations incurred under this contract but not yet billed to the NRC or billed to some other agency; and (4) any information developed for this contract that is proposed to be used for any other contract. This information shall cover the costs and progress during the previous month, cumulative costs and progress to date, and projected completion of the Task and final contract completion date. The first monthly report shall provide the initial projection, and subsequent reports shall provide revised projections or indicate that there is no change in these projections. The first report shall be due within 1-1/2 months of the effective contract date, and all subsequent reports due at the one month intervals beginning from the date of the previous report.

### 3.2 Task Reports

All task reports shall be prepared in accordance with paragraph 12 of the Standard Terms and Conditions.

#### Task 2

The contractor shall furnish to the Project Manager ten (10) copies of a Task Report defining the proposed scope, content, and methodology of the environmental assessment within one (1) month of the effective date of the contract. A summary of the existing information (from Task 1) and any identified gaps and proposed solutions shall be included in this report.

Task 3

Upon completion of each preliminary draft chapter of the draft EA, the contractor shall furnish five (5) copies of the chapter to the Project Manager. The Project Manager will furnish comments on the preliminary draft chapter to the contractor within three (3) weeks after receipt of the draft chapter. Based on those comments and continued work, the contractor shall revise the draft chapters and compile all chapters into a draft EA. Ten (10) copies of this task report shall be submitted to the Project Manager within four (4) months of receipt of the Project Manager's approval to begin work.

Task 4

The Project Manager shall furnish comments on the draft EA within (30) days of the receipt of the draft EA. (Public comments on the draft EA shall be solicited during this period. Public comments and NRC responses will be forwarded to the contractor within four (4) weeks of the closing of the public comment period. Based on these comments and continued work, the contractor shall revise the draft EA and furnish a final EA document within six (6) weeks of receipt of NRC and public comments on the draft EA. Ten (10) copies of this document shall be submitted.

**4.0 MEETINGS AND TRAVEL**

The contractor shall meet with the Project Manager within ten (10) days of the effective date of the contract, at the conclusion of Task 2, and within two (2) months following the completion of Task 3.

These meetings will be of one to two days duration and shall be held

at the NRC offices in Silver Spring, Maryland. At least one additional one-day meeting may also be held with representatives of the State of Kansas. In addition, the contractor shall visit the Lyons site and surrounding area to obtain necessary background information for the EA.

#### 5.0 NRC FURNISHED MATERIAL

NRC shall furnish to the contractor a complete copy of the Southwest Nuclear application to the State of Kansas and any supplements, the questions asked of Southwest Nuclear by Kansas, and correspondence between NRC and the State of Kansas regarding the application. In addition, NRC files on the Kansas site shall be made available to the contractor at the NRC's Silver Spring office. All information required from the applicant shall be obtained through the Project Manager.

#### 6.0 PERIOD OF PERFORMANCE

The period of performance shall commence November 1, 1979 and shall continue until August 1, 1980 at which time all work shall have been completed and all reports delivered. This period of performance is based on the assumption that no major information gaps will be found in Tasks 1 and 3. If the contractor cannot work by November 1, the start date can be delayed up to December 1. Identification of gaps, that cannot be resolved in a timely manner, in a manner will be a basis for renegotiation.

↳ for continuation of testimony under Task 5.

#### 7.0 TECHNICAL DIRECTION

Barry C. Mingst (FTS 427-~~5440~~) is designated the Project Manager for the purpose of assuring that the services required under this Statement of Work are delivered in accordance herewith. All technical instructions to the contractor shall be issued through the Project Manager. As used

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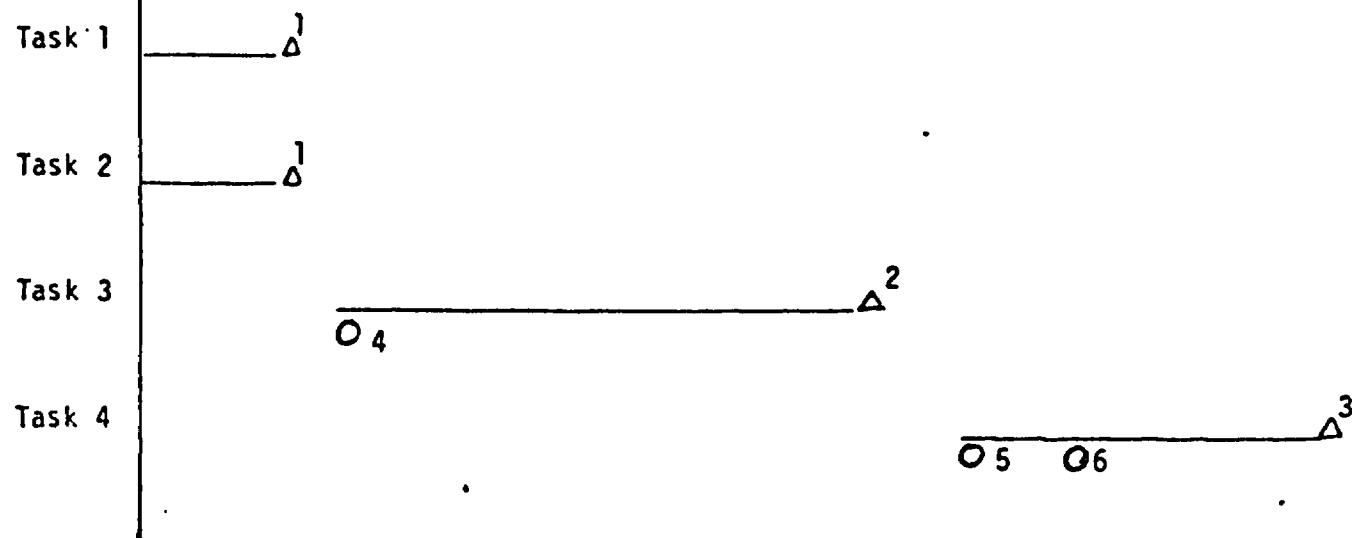
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herein, technical instructions are those that provide details, suggest possible lines of inquiry, or otherwise complete the general scope of work as set forth in this Statement of Work. Technical instructions shall not constitute new assignments of work or changes of such nature as to justify an adjustment in cost or period of performance.

8.0 LEVEL OF EFFORT

We expect that preparation of the environmental assessment will require approximately two man-years of effort over the 9 month duration of the contract. This estimate is furnished for the offeror's information only, and is not to be considered restrictive. Offerors are advised to use independent judgement in developing their estimates.

Nov'79 Dec'79 Jan'80 Feb'80 Mar'80 Apr'80 May'80 June'80 July'80 Aug'80



$\Delta^1$  - Task 2 Report

$\Delta^2$  - Draft EA (Complete)

$\Delta^3$  - Final EA

$O^4$  - Task 3 Go-ahead

$O^5$  - PM comments on DEA

$O^6$  - Public comments on DEA

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## Guide for Developing Operational Information for a Salt Mine Storage/Disposal Facility

This guide is provided to ensure that site information needed to complete the environmental assessment is available to permit a timely completion of the assessment. More detailed information will be needed in many areas before a license can be granted. This more detailed information will not be needed until the environmental assessment is complete, since it is not possible to issue a license before completion of the assessment. More detailed information may be provided at this time at the applicant's option.

### I. Pre-operational construction and mining [time estimate for this phase needed]

#### A. Above ground construction (physical description and estimated costs)

1. Road building or improving
2. Parking lots
3. Office, crew buildings
4. R.R. track removal, installation, or refurbishing
5. Truck docks
6. Inspection and decontamination areas
7. Repackaging area
8. Waste water processing
9. Above ground storage (capacity)
10. Fencing
11. Sanitary facilities
12. Hoist construction or repair
  - a. Size, purpose, power, capacity, emergency planning

#### B. Shaft building, rebuilding, or repairing (minimum of 2 required for mine safety)

1. Size, purpose, cost, lining, method of construction
2. Number of hoists, size, purpose, cost

#### C. Water control

1. Pumps, collars, power source, capacity, and costs for managing shaft  
see page or other sources of water

#### D. Ventilation

1. Size of fans, power sources, locations, capacities, adaptability to mine configurations, costs
2. Back up or emergency systems or sources
3. filter masks needed during operation

E. Tunnel and room repair (for the entire volume to be used)

1. Roof raising, floor leveling, heave removal, wall clearing
2. Rubble removal, rubble uses, amount of material removed
3. Costs (for various parts of mine and total)
4. Sanitary facilities

F. Mine car transport (description and costs)

1. Track removal or rebuilding
2. New vehicles (power, size, capacity, extra ventilation required)
3. Trailing vehicles, control, shielding for operator and others in mine
4. Repair areas and procedures for repair of loaded vehicles

II Operation [time estimate for this phase needed]

A. Waste receipt

1. Types of wastes and containers accepted
  - a. Limitations imposed by hoist system
  - b. Limitations imposed by mine car
  - c. Limitations imposed by retrievability
  - d. Limitations imposed by limited ventilation (i.e. prohibition of organics)
  - e. Other limitations imposed by safety considerations (i.e. flammability, pyrophoricity)
  - f. Limitations imposed on water content of the wastes due to salt disposal.
  - g. Simulations imposed by shielding needs.

B. Waste processing

1. Check-in and documentation
2. Truck or rail car parking, surge storage, radiation shielding, weatherproofing
3. Wipe tests, assays, decontamination, repackaging (how done and where)
4. Extra treatment (i.e. incineration) to reduce limitations imposed in "A."

C. Waste emplacement

1. Transport of waste from truck, rail, and surge storage to shaft
2. Hoist operations (e.g., avoiding moving personnel and waste at same time)
3. Capacity of hoists (waste/unit time)
4. Shaft to mine car transport (any surge storage) shielding
5. Mine car transport (number of cars, traffic patterns, speed, and shielding)
6. Mine car to room transport and shielding
7. Stacking, backfill, track removal (if appropriate)
8. Spill and accident cleanup (dropped containers, mine car breakdowns, etc)

D. Room and tunnel filling pattern

1. Usage factors, shielding, exposures
2. Backfill, doors and walls (location) or other close-out methods used

E. Mining

1. Mining operations effects on disposal operations

- a. Timing of disposal and mining
- b. Blasting, hoist usage, manpower usage, doses to miners, limitations on mining or disposal if the other moves faster or slower than expected

2. Use of mined salt and rock

- a. Backfill
- b. Commercial usage
- c. Other
- d. Cleanup at close-out

F. Health physics

1. Surface and mine, decontamination and protective suit storage and suit-up areas

III. Close-out of site [time estimate for this phase needed]

A. Disposal site close-out

1. Tunnel, room, and shaft backfill or closure
  - a. Materials, method, exposures, salvage, and cost
2. Need for long-term care and monitoring

B. Storage site close-out

1. Waste access

- a. Procedures for retrieval, repackaging, decontamination, transport to truck or train on surface
- b. Mine cleanup and decontamination
- c. Cost

2. Need for long-term care and monitoring

**IV. Effluent control**

**A. Airborne contamination**

1. Filter systems in mine air exhaust
2. Above ground release controls
3. Below ground release controls
4. Testing, and action to be taken

**B. Aquifer or off-site water contamination**

1. Waste water control

- a. Mine water
- b. Site surface water

2. Testing, and action to be taken (salinity as well as radioactivity)

**C. Waste solids control**

1. Salt shipped off-site control
2. On-site surface salt control
3. Testing, and action to be taken

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