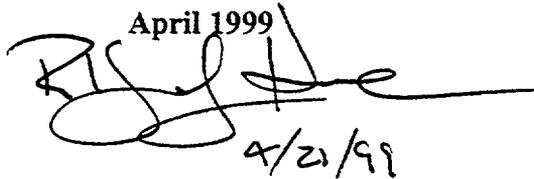


Calculation Notebook

Utilities, Energy and Construction Materials Impact Analysis
For Nevada Transportation

Prepared by:
R. Kingsley House, P.E.

April 1999



4/21/99

Checked by:

Name: Kevin Harris
Date: 4/15/99

Report made - 7/0

1.0 INTRODUCTION

The scope of the utilities, energy and construction materials impact analyses includes electric power, fossil fuel usage, and use of construction materials as discussed in Chapter 6 of the PDEIS. In general the impact analysis involves determining the extent of utility and material requirements for the construction of transportation facilities and evaluating the impact that meeting the requirements could have on the local supply capacity and distribution channels. The requirements are typically developed separately for different construction activities so that the process usually involves identifying and totaling the requirements to establish a total requirement for each transportation facility. The process is conducted for each rail route, each heavy haul route and each intermodal transfer facility. The rail routes considered are:

- Caliente
- Carlin
- Caliente-Chalk Mountain
- Valley Modified
- Jean

The rail corridors vary in length from 159 to 520 kilometers (99 to 323 miles)

The heavy haul truck routes considered are:

- Caliente
- Caliente-Chalk Mountain
- Caliente-Las Vegas
- Sloan/Jean
- Apex/Dry Lake

The heavy haul truck routes vary in length from 182 to 533 kilometers (113 to 331 miles)

The intermodal transfer stations considered are:

- Caliente
- Sloan/Jean
- Apex/Dry Lake

2.0 Impact Analysis

The first step in the analysis process is to compile the usage data for each commodity for the construction activity for each route/facility. The basic data is available in the engineering files for Nevada Transportation (Reference 1). A spreadsheet is used to compile the data, convert the data to consistent units and normalize the data to comparable quantities for the construction activity for each implementing alternative. The key data used in the PDEIS is then tabulated in a summary table and subsequently transferred to the appropriate place in the text.

2.1 Impacts from Rail Corridor Implementing Alternatives

The spreadsheet for rail corridor implementing alternatives during construction (see Attachment 1) includes:

- Diesel fuel useage
- Gasoline useage
- Fossil Fuel useage (total)
- Steel usage
- Concrete usage

Because all of the corridors run through sparsely populated areas with little access to support services, portable generators would be used to provide electricity during construction. Fossil fuel use reflects the fuels used for electricity generation.

Diesel fuel and gasoline are given directly in the references and are tabulated in the spreadsheet.

The amount of steel used in the rail routes is predominantly for rails. The rail is standard 115# rail (115 pounds per yard) and the quantity required is given in the EF in metric tons for each rail route. The quantities of reinforcing and structural steel steel are also given in the EF and tabulated in the spreadsheet in attachment 1.

Onsite pouring of concrete would be reduced to a minimum by using precast components if possible. For example, DOE would buy precast concrete railbed ties, bridge beams, and overpass components from a variety of suppliers. Actual onsite pouring of concrete would account for less than 1 percent of the total mass of concrete. Accordingly the principal use of concrete would be for precast rail ties. The number of ties required for each route is given in the EF and the amount of concrete required is based on a standard tie size of 8 inches high by 10 inches wide by 8.5 feet long spaced as required over the length of the rail route.

The commodity is then transferred manually to the PDEIS summary table given in attachment 1. Rounding to two significant figures is done in conjunction with transferring the data to the PDEIS summary tables.

2.2 Impacts of Heavy Haul Truck Implementing Alternatives

The heavy haul approach for transporting SNF and HLW in Nevada involves providing an Intermodal Transfer (IMT) Station to transfer the shipping cask, which arrives in Nevada by train, to a heavy haul truck for transport to the Repository. Implementing this approach would require constructing an IMT and upgrading existing highways to accommodate the heavy, slow moving heavy haul vehicles. There are three IMT sites currently being considered in combination with five heavy haul routes.

2.2.1 Impacts from Intermodal Transfer Stations to support Nevada Heavy-Haul Truck Implementing Alternatives

The intermodal transfer station design, although not yet complete, would be the same for any of the three potential sites and would include a small railyard with several sidings, a 220-metric-ton (200-ton) bridge crane, two steel Butler buildings (one for administration and one for maintenance), and a large paved area for heavy-haul vehicle parking and maneuvering. The basic facility would be classified as a light industrial site with moderate utility requirements. During construction the electrical requirements would be supplied by portable generating equipment. The current estimate of electrical demand during operation is about 165 kilowatts, which would include 30 kilowatts for lighting, 50 kilowatts for each of the two buildings, 5 kilowatts for the guard station, and 30 kilowatts for the crane. The actual usage rate would be substantially less than peak capacity because operations would be intermittent. Fossil-fuel use at the station, during either construction or operations, would be minimal. Therefore, intermodal transfer station energy demands would not produce any discernable environmental impacts. The table Appendix 2 lists the materials consumed during construction and operation. The quantities of concrete, asphalt, and steel listed in the table are not substantial and would not affect the regional supply system. Similarly, the demand for electricity and fossil fuel during operations would not be significant.

2.2.2 Impacts from Nevada Heavy-Haul Truck Implementing Alternatives

The upgrades required for the heavy haul routes include road width, thickness of pavement, turnout locations, special intersections and curves and truck lane locations. Overnight stopping areas are to be constructed on three of the routes. The upgrades will be constructed primarily with asphalt material and some concrete. Steel reinforcing bars will be used in the concrete and steel will be used for other heavy haul route upgrades. Fossil fuel would be used in the construction effort. These quantities have been estimated for each of the five routes and are included in Attachment 3. The material quantities are not expected to be significant with respect to the southern Nevada regional supply capacity

3.0 References for Utilities, Energy Material and Site Services Methods

1. Nevada Transportation Engineering File, MOL.19990324.0257, April 9, 1999.

This EF is a compilation of many documents as specified in the Table of Contents provided in section 3.1. The individual document references and copies of the original data pages from the EF are included in the attachments where the data are tabulated.

3.1 Table of Contents/Summary for the Nevada Transportation Engineering File.

EIS
Nevada Transportation Engineering File
Table of Contents/Summary

TOP DRAWER
RAIL

1. **(3/98) Nevada Transportation Study Construction Cost Estimate RIS: MOL.19981207.0258**—partial This report was prepared for TRW by Morrison Knudsen Corporation. This report contains a cost comparison summary for primary alignments, a cost comparison summary for the alternates for each route, cost estimate details for each route section, man-hour estimates, unit costs, route segment maps, tabulated earthwork quantities, and earthwork mass diagrams.
2. **(2/16/98) Rail - Land Use Analysis Considering 1/4 Mile Width**—Lotus notes from Phil Gehner; action item #97-0231 in support of the EIS.
3. **(1/8/98) Rail Line Construction (MK-Boise)**—Paper provided by Jeff Pullen, MK-Boise, on 1/8/98. Also discusses Heavy Haul Road Upgrades & IMT Station Construction (Heavy Haul Road Upgrades and IMT Transfer Station Construction)
4. **(1/98) Summary Structures Detail for EIS**—Rail material usage for the EIS.
5. **(11/97) Description of the Cost Estimating Method for the Five Primary Rail Alignment & Alternates, (Prepared by Morrison-Knudsen - Boise)**—The cost estimate was developed by estimating each individual segment within the 5 rail routes and alternates. The direct costs were broken down into 10 categories, and subdivided into work activities.
6. **(5/97) Rail Alignment Analysis (BCBI00000-01717-0200-00002, REV 00) RIS: MOL.19971212.0495**—The purpose of this engineering analysis was to identify the reasonable and representative rail alignments within the rail corridors for the five identified rail routes identified in B00000000-01717-4600-00050 REV 01, and B00000000-01717-4600-00077, REV 00). The Rail Alignment Analysis contains: (1) material to be used to produce a set of route drawings illustrating each alignment alternative, (2) material, including figures in the analysis and the route drawings in support of the EIS. The objective of the analysis is to identify reasonable and representative alignments, with 400 meter (1/4 mile) wide corridor boundaries, with the least environmental and stakeholder impact based on published environmental and land use data. In areas of known environmental concern or potential stakeholder impact, at least two alignments alternatives have been developed to allow the EIS analysis to evaluate the environmental impacts.

Titles of the four Rail Alignment Design maps (D.I. #BCBI00000-01717-0200-000002-00) as follows:
RIS # for the CD containing these maps: MOL.19981207.0252 (entire)

Figure III-1 Caliente/Carlin Combined Route..... Station 0+000 to 49+000

RIS: MOL.19971212.0512

Figure III-2 Caliente/Carlin Combined Route..... Station 49+000 to 77+000

RIS: MOL.19971212.0513

Figure III-3..... Caliente/Carlin Combined Route..... Station 77+000 to 127+000

RIS: MOL.19971212.0514

Figure III-4 Caliente/Carlin Combined Route..... Station 127+000 to 177+000

RIS: MOL.19971212.0515

Figure IV-1 Caliente Route Station 177+000 to 222+000

RIS: MOL.19971212.0516

Figure IV-2 Caliente Route Station 222+000 to 270+000

RIS: MOL.19971212.0517

Figure IV-3 Caliente Route Station 270+00 to 310+000

RIS: MOL.19971212.0518

Figure IV-4 Caliente Route	Station 310+000 to 354+000
RIS: MOL.19971212.0519	
Figure IV-5 Caliente Route	Station 354+000 to 383+000
RIS: MOL.19971212.0520	
Figure IV-6 Caliente Route	Station 383+000 to 425+000
RIS; MOL.19971212.0521	
Figure IV-7 Caliente Route	Station 425+000 to 455+000
RIS: MOL.19971212.0522	
Figure IV-8 Caliente Route	Station 455+000 to 494+945
RIS: MOL.19971212.0523	
Figure IV-9 Caliente, Eccles & Crestline Options	Station 494+945 to 532+779
RIS: MOL.19971212.0524	
Figure V-1 Carlin Route/Big Smoky Option	Station 164+917 to 210+000
RIS: MOL.19971212.0525	
Figure V-2 Carlin Route/Big Smoky Valley Option.....	Station 210+000 to 260+000
RIS: MOL.19971212.0526	
Figure V-3 Carlin Route/Big Smoky Valley Option.....	Station 260+000 to 300+000
RIS: MOL.19971212.0527	
Figure V-4 Carlin Route/Big Smoky Valley Option.....	Station 300+000 to 340+000
RIS: MOL.19971212.0528	
Figure V-5 Carlin Route/Big Smoky Valley Option.....	Station 340+000 to 380+000
RIS: MOL.19971212.0529	
Figure V-6 Carlin Route	Station 380+000 to 425+000
RIS: MOL.19971212.0530	
Figure V-7 Carlin Route	Station 425+000 to 472+000
RIS: MOL.19971212.0531	
Figure V-8 Carlin Route	Station 472+000 to 520+421
RIS: MOL.19971212.0532	
Figure V-9 Carlin Route/Monitor Valley Option.....	Station 174+698 to 244+500
RIS: MOL.19971212.0533	
Figure V-10 Carlin Route/Monitor Valley Option.....	Station 224+500 to 275+500
RIS: MOL.19971212.0534	
Figure V-11 Carlin Route/Monitor Valley Option.....	Station 275+500 to 327+000
RIS: MOL.19971212.0535	
Figure V-12 Carlin Route/Monitor Valley Option.....	Station 327+000 to 380+000
RIS: MOL.19971212.0536	
Figure VII-1 Valley Modified Route	Station 0+000 to 51+000
RIS: MOL.19971212.0537	
Figure VII-2 Valley Modified Route	Station 51+000 to 102+000
RIS: MOL.19971212.0538	
Figure VII-3 Valley Modified Route	Station 102+000 to 152+705
RIS: MOL.19971212.0539	
Figure VIII-1 .. Jean Route	Station 0+000 to 50+000
RIS: MOL.19971212.0540	
Figure VIII-2 .. Jean Route	Station 50+000 to 98+000
RIS: MOL.19971212.0541	
Figure VIII-3 .. Jean Route/Wilson Pass Option.....	Station 98+000 to 131+000
RIS: MOL.19971212.0542	
Figure VIII-4 .. Jean Route/Wilson Pass Option.....	Station 131+000 to 180+477
RIS: MOL.19971212.0543	
Figure VIII-5 .. Jean Route/State Line Pass Option.....	Station 106+200 to 156+000
RIS: MOL.19971212.0544	
Figure VIII-6 .. Jean Route/State Line Pass Option.....	Station 156+000 to 198+071
RIS: MOL.19971212.0545	

Figure IX-1 Caliente/Chalk Mountain Route Station 0+000 to 51+000
 RIS: MOL.19971212.0546
 Figure IX-2 Caliente/Chalk Mountain Route Station 51+000 to 93+000
 RIS: MOL.19971212.0547
 Figure IX-3 Caliente/Chalk Mountain Route Station 34+841 to 76+416
 RIS: MOL.19971212.0548
 Figure IX-4 Caliente/Chalk Mountain Route Station 0+000 to 39+000
 RIS: MOL.19971212.0549
 Figure IX-5 Caliente/Chalk Mountain Route Station 39+000 to 78+393
 RIS: MOL.19971212.0550
 Figure IX-6 Caliente/Chalk Mountain Route Station 93+000 to 135+000
 RIS: MOL.19971212.0551
 Figure IX-7 Caliente/Chalk Mountain Route Station 135+000 to 176+844
 RIS: MOL.19971212.0552

7. (12/97) Titles and Document Identifier for the 19 Rail Alignments Drawings for All Five Routes:

RIS # for the CD containing these maps: MOL.19981207.0252 (entire)

Plate 1 Carlin Route D.I.#BCBI00000-01717-2700-82003
 Crescent Valley Section RIS: MOL.19971217.0233

Plate 2 Carlin Route D.I.#BCBI00000-01717-2700-82004
 Grass Valley Section RIS: MOL.19971222.0279

Plate 3 Carlin Route D.I.#BCBI00000-01717-2700-82005
 Smokey & Monitor Valley RIS: MOL.19971218.0153

Plate 4 Carlin Route D.I.#BCBI00000-01717-2700-82006
 Smokey Valley Option RIS: MOL.19971218.1041

Plate 5 Carlin Route D.I.#BCBI00000-01717-2700-82007
 Monitor Valley Option RIS: MOL.19971222.0081

Plate 6 Caliente and Carlin Routes D.I.#BCBI00000-01717-2700-82008
 Tie-In to Combined Section RIS: MOL.19971222.0241

Plate 7 Caliente Route D.I.#BCBI00000-01717-2700-82009
 Warm Springs Section RIS: MOL.19971222.0326

Plate 8 Caliente/Chalk Mtn. Routes D.I.#BCBI00000-01717-2700-82010
 Combined Reveille Section RIS: MOL.19971222.0458

Plate 9 Caliente/Chalk Mtn. Routes D.I.#BCBI00000-01717-2700-82011
 Combined White River Section RIS: MOL.19971223.0246

Plate 10 Caliente/Chalk Mtn. Routes D.I.#BCBI00000-01717-2700-82012
 Combined Caliente Section RIS: MOL.19971224.0041

Plate 11 Caliente/Carlin Combined Section D.I.#BCBI00000-01717-2700-82013
 Mud Lake to Yucca Mountain RIS: MOL.19971229.0001

Plate 12 All Routes D.I.#BCBI00000-01717-2700-82014
 Yucca Mountain Section RIS: MOL.19971229.0111

Plate 13 Valley Modified Route-Mercury, D.I.#BCBI00000-01717-2700-82015
 & Jean Route - Amargosa Valley RIS: MOL.19971230.0092

Plate 14 Valley Modified Route - Indian D.I.#BCBI00000-01717-2700-82016
 Hills & Jean Route - Pahrump RIS: MOL.19971230.0085

Plate 15Valley Modified Route..... D.I.#BCBI00000-01717-2700-82017
Las Vegas RIS: MOL.19971229.0096

Plate 16Jean Route-Pahrump/Sandy Valley..... D.I.#BCBI00000-01717-2700-82018
Wilson & State Line Pass Options RIS: MOL.19971229.0284

Plate 17Jean Route - Spring Mountain D.I.#BCBI00000-01717-2700-82019
Wilson & State Line Pass Options RIS: MOL.19971229.0343

Plate 18Caliente-Chalk Mtn. Route D.I.#BCBI00000-01717-2700-82020
Nevada Test Site RIS: MOL.19971231.0001

Plate 19Caliente/Chalk Mtn. Routes D.I.#BCBI00000-01717-2700-82021
Combined Crestline Option RIS: MOL.19971231.0008

8. **(4/97) Fifth Corridor Boundary Evaluation (D.I. # BCBI00000-01717-0200-0001, Rev. 00)**
RIS: MOL.19981207.0253 (partial) RIS: MOL.19971208.0397—This analysis summarizes available information on conceptual design and operations of a fifth corridor rail route alternative for transporting SNF and High-Level Waste from an existing rail line to the potential repository site at Yucca Mountain. This analysis includes a description of the routing alternatives, information on construction requirements of the fifth corridor rail line, and how the fifth corridor rail line will be operated.
9. **(4/97) Nevada Potential Repository Preliminary Assessment of the Caliente-Chalk Mountain Rail Corridor, (B00000000-01717-4600-00077 REV 00, April 1997) RIS: MOL.19981207.0255 (partial), RIS: MOL.19970507.0136**—The report evaluates a fifth rail corridor as a result of public comments from the EIS Scoping process. The report evaluates this corridor to the same level of detail as the existing four rail corridors identified in Study 2, 1996. Input into the report include: land use, archaeology, socioeconomic, coordination and analysis by the systems analysis and modeling group, and engineering-cost input and engineering analysis for rail corridor development.
10. **(1/24/97) Rail Corridors Through Nevada Test Site**—Lotus notes to Jeff Tappen from Phil Gehner regarding conversations with BNC and DOE/NVO, etc.
11. **(12/31/96) Abandoned UP Branch - Caliente to Pioche**—Bill Jacobs Lotus notes to Phil Gehner.
12. **White Papers of the following:**
 - **Matrix Identifying the Rail Routes that Have Been Evaluated**—Identifies rail routes currently being considered; those routes rejected; description of route; and unique features associated with the route.
 - **(10/9/97) Why Routes/Alignments Are Selected**—White paper outlining why the rail routes and alignments were selected.
 - **(10/3/97) Decision for Selection of the Width for Alignment for the EIS**—(quarter mile total width vs. quarter mile from centerline)
 - **Engineering Viewpoint Why 1/4 Mile Alignments Are Satisfactory**
13. **(6/92) DeLew Cather - Yucca Mountain Rail Access Study - Caliente Route Rail Access Study Conceptual Design Report RIS: NNA.19940202.0235**—The report contains a conceptual design for the Caliente rail route, provides a preliminary environmental analysis, and cost estimate. This report also contains a conceptual design of an access highway from U.S. 95 to Yucca Mountain for auto and truck access.
14. **(6/92) DeLew Cather - Yucca Mountain Rail Access Study - Caliente Route Conceptual Plans - Appendix A (See #13)**—This appendix supplies conceptual rail alignment maps to supplement the conceptual design report. (190 pages)

15. **(6/92) DeLeuw Cather - Yucca Mountain Rail Access Study - Caliente Route Conceptual Design Report Appendices F&G (Environmental Report Ecology)**—This technical document contains the results of Dames & Moore's preliminary review of potentially significant biologic and geologic issues that may affect the siting of a proposed rail line that will be used to transport high-level radioactive waste to a proposed permanent repository at Yucca Mountain, extending across Nevada from Caliente to Yucca Mountain.
16. **(6/92) DeLeuw Cather - Yucca Mountain rail Access Study - Caliente Route Conceptual Design Report Appendix H (Hydrology Report) (See #13)**—This report describes the scope of the study, methods of analysis used, limitations to the use of the data and study results. This is a conceptual level study intended to provide approximate design discharges for use by DeLeuw Cather & Co. for estimating the cost of drainage structures associated with the alignments under consideration. This study also provides information regarding the portions of the route which will warrant special drainage design considerations.
17. **(9/91) The Nevada Railroad System: Physical, Operational, and Accident Characteristics (YMP 91-19, Sept. 1991) RIS: MOL.1992.0608.0151**—Study provides a description on the operational and physical characteristics of the Nevada railroad system that includes physical condition of the route, traffic type and volume, track conditions, and history; and provides additional analysis of Nevada railroad accident characteristics.
18. **(1/90) Preliminary Rail Access Study (DOE/YMP-89-16) RIS: NNA.19900220.0110**—Study identifies ten rail route options and three additional rail route options identified by Lincoln County and the City of Caliente, NV.
19. **(3/62) Feasibility Study for Transportation Facilities to Nevada Test Site RIS: MOL.19950509.0039**—Prepared for the U.S. Atomic Energy Commission, Nevada Operations Office by Holmes & Narver. This study is a preliminary determination of the technical feasibility of constructing and operating a railroad short line from the vicinity of Las Vegas to Camp Mercury and to Jackass Flats, and an aircraft landing facility at Jackass Flats for handling passengers and freight. Estimates or annual revenue from existing modes of transportation are discussed.
20. **(2/89) EST Pacific - Evaluate Alternative Rail Corridor Routes Through Lincoln Co., NV to Yucca Mountain, NV**—This study was made by ETS Pacific, Inc. for the City of Caliente. This document addressed special factors to be considered for construction of rail lines for shipment of high level nuclear waste, design criteria for route analysis, technical feasibility of rail routes through Lincoln County, identification of potential fatal flaws associated with each route, design and construction costs for each rail route, and recommended a favorable route.
21. **(4/94) - White Paper on High Speed Surface Transportation Between Las Vegas and the Nevada Test Site RIS: MOL.19950721.0007**—Paper expressing the need for high speed surface transportation for personnel between Las Vegas and the NTS. Several alternative methods for transit are also included.
22. **(7/10/97) Updated Figures for Private Land Acreage**—Lotus Notes from Jeff Pullen to Phil Gehner.
23. **(1/7/99) Rail Branch Line Construction Schedules Rev. C**—Rail branch line construction schedules for the bounding routes, Caliente Route and Valley Modified Route. Schedules include both a baseline and accelerated schedule for each route (four total).

**BOTTOM DRAWER
HEAVY HAUL**

1. **(NO DATE) Process & Results of Land Use Constraint Analysis at Proposed IMT Locations**—Four steps of process for analysis of land use constraints at the proposed intermodal locations and analyses for the Arden, Caliente, Apex/Dry Lake, Sloan and Jean routes.
2. **(NO DATE) Concept of Operations for Heavy Haul Transport**—Concept of operations for heavy haul truck transport based on the assumptions made and the conceptual designs developed in the Intermodal Transfer Station and Road Upgrades for Heavy Haul Trucks Design Analysis.
3. **(NO DATE) - Heavy Haul Truck Route Status**—This evaluation includes all of the heavy haul truck routes considered reasonable routes using the existing highway structure, both on public highways and federal highways on DOD lands and the Nevada Test Site.
4. **(5/98) Road Upgrades for Heavy Haul Truck Routes - Design Analysis (includes maps) (BCBI00000-01717-0200-00008, Rev. 00) RIS: MOL.19981207.0254**—Identifies the road upgrades required for the heavy haul truck transportation implementing alternate of the Nevada transportation system and this preliminary identification will be used to support the development of the EIS for the heavy haul truck implementing alternate.
5. **(5/6/98) Cost Estimate for Heavy Haul Truck Transport Design RIS: MOL.19981207.0257 (partial)**—Includes a detailed cost estimate for the design, construction and management of the initial road upgrades for public roads for each of the five heavy haul transport routes. (The Caliente-Chalk Mountain cost estimate also includes the costs for initial upgrade of the NAFR Valley Road).
6. **(5/21/98) Overdimensional/Overweight Permit Research Task Summary**—Task to count single-trip overdimensional/overweight truck permits issued for trip routes that overlap selected routes currently under consideration for heavy haul transportation of high level radioactive waster and spent nuclear fuel to the potential repository at Yucca Mountain.
7. **(4/98) Matrix Identifying the Heavy Haul Routes that Have Been Evaluated**—Identifies routes being considered, rejected routes, route description, and unique features associated with the routes.
8. **(1/6/98) State of Nevada, DOT Material Site Information for US-95, US-6, US-93, SR-375, and I-15**—Material site information for the following heavy haul truck routes for shipments of spent nuclear fuel and high level waste to Yucca Mountain: Caliente to Hiko to Tonopah to Lathrop Wells (US93-SR375-US6-US95); and Hiko to Apex (US93).
9. **(1997) Nevada Potential Repository Preliminary Assessment of the Caliente-Chalk Mountain Heavy-Haul Truck Route, (B00000000-01717-4600-00084, REV 00) RIS: MOL.19981207.0256 (partial), RIS: MOL.19970507.0140**—This report evaluates an additional heavy haul route as a result of EIS Scoping process. The report evaluates this route to the same level of detail as the three heavy haul routes identified in Study 2, 1996. Input for the report for cost estimates and engineering analysis was provided by engineering, with coordination and evaluation provided by the systems analysis and modeling group.
10. **(12/97) Yucca Mountain Site Characterization Project Intermodal Transfer Facility**—This report includes the following: Withheld by FOIA

Cost Estimate - Summary by Activity - prepared for TRW by Morrison Knudsen in December 1997

Cost Estimate - Summary by Activity - Detailed

Cost Estimate - Basis of Estimate/Clarifications

Cost Estimate - Detailed Estimate Sheets - prepared for TRW by Morrison Knudsen in November 1997

11. (12/97) **Intermodal Transfer Station Preliminary Design (BCBI00000-01717-0200-00007, Rev. 00)**
RIS: MOL.19980303.0024—Contains the following:

Design Analysis - includes figures of a generic intermodal transfer station and the results of the siting study, based on the generic design footprint;

Cost Estimate Summary by Activity, dated 12/9/97; Withheld by FOIA

Titles and Document Identifier for the 14 Intermodal Transfer Facility Drawings as follows:

Title Sheet, Legend, General Notes & Abbreviations	BCBI00000-01717-2700-82022-00
RIS: MOL.19981120.0205	
General Site Plan	BCBI00000-01717-2700-82023-00
RIS: MOL.19981120.0206	
Rail Yard Plan & Profile	BCBI00000-01717-2700-82024-00
RIS: MOL.19981120.0207	
Dedicated Train Plan & General Freight Plan	BCBI00000-01717-2700-82025-00
RIS: MOL.19981120.0208	
Rail Yard Sections & Details	BCBI00000-01717-2700-82026-00
RIS: MOL.19981120.0209	
Pavement Plan	BCBI00000-01717-2700-82027-00
RIS: MOL.19981120.0210	
Utility Plan ..	BCBI00000-01717-2700-82028-00
RIS: MOL.19981120.0211	
Pavement & Utility Sections & Details	BCBI00000-01717-2700-82029-00
RIS: MOL.19981120.0212	
Office Building Plan & Elevations	BCBI00000-01717-2700-82030-00
RIS: MOL.19981120.0213	
Maintenance Building & Security Sta. Plan & Elevations	BCBI00000-01717-2700-82031-00
RIS: MOL.19981120.0214	
Loading/Unloading Area Plan	BCBI00000-01717-2700-82034-00
RIS: MOL.19981120.0215	
Scale Plan & Section	BCBI00000-01717-2700-82035-00
RIS: MOL.19981120.0216	
Office Parking Lot Layout & Access Road	BCBI00000-01717-2700-82036-00
RIS: MOL.19981120.0217	
Generic IMT Footprint Located at Caliente Site	BCBI00000-01717-2700-82037-00
RIS: MOL.19981120.0218	

Titles and Document Identifier for the 4 Intermodal Transfer Site Drawings as follows:

Caliente Siting Area Map	BCBI00000-01717-2700-82038-00
RIS: MOL.19980126.0401	
Apex/Dry Lake Siting Area Map	BCBI00000-01717-2700-82039-00
RIS: MOL.19980126.0409	
Sloan Siting Area Map	BCBI00000-01717-2700-82040-00
RIS: MOL.19980126.0417	
Jean Siting Area Map	BCBI00000-01717-2700-82041-00
RIS: MOL.19980126.0425	

12. (8/97) **Yucca Mountain Potential Nuclear Waste Repository Supplemental Transportation Analysis Prepared by Parsons Transportation Group**—Contains an analysis of physical restrictions to heavy haul trucks turning along the route and potential bypass route of the US 95 curve in Beatty, Nevada; examines the frost restriction conditions along the route; analyzes the current heavy haul permitting practices now used by NDOT and determines mitigation measures that may be required by NDOT before issuing a heavy haul permit; presents a breakpoint analysis of various vehicle configurations and determines potential road improvements required for each vehicle configuration.

13. **(6/18/97) Draft IMT Facility Design Requirements**—Defines the functions to be performed, and requirements for the conceptual design of an intermodal transfer facility.

~~13.~~ **14. (1991) Nevada Highways: Physical Conditions and Safety Experience (YMP-91-18)**

RIS: NNA.19910926.0046—Report compares the physical and operating characteristics of Nevada's highway system to the rest of the country; describes combination truck accidents, locations and accident concentrations in Nevada; and characterizes accident patterns on major highways in Nevada.

15. **(4/89) Nevada Highway Routing Study (DOE/NV-10576-7) RIS: NNA.19890413.0172**—Study identifies potential Nevada points of entry, shipment routes, and shipping rates for highway shipments of radioactive waste based on DOT regulation, and identifies additional routes that may be beneficial to the State of Nevada.

**BOTTOM DRAWER
BOTH HEAVY HAUL & RAIL**

1. Transportation Data Needs Log in Support of the EIS

- NTEF Request #001, dated 1/23/98 by Jason Tech.....Drawings provided for land disturbance during construction & operation within the corridors (width & total acreage).
- NTEF Request #002, dated 1/23/98 by Jason Tech.....Provided summary on process of pedigree on land disturbance during construction.
- NTEF Request #003, dated 1/23/98 by Jason Tech.....Data derived from Rail Cost Estimates for total material usage for rail line construction within each corridor.
- NTEF Request #004, dated 1/23/98 by Jason Tech.....Amount of water usage & corresponding number of wells along the route. Additional routes & justification for water usage needed.
- NTEF Request #004, Rev. 01, 8/18/98 by Jason Tech..Update NTEF Request #004; provided number of 5,000 gallon trucks for rail construction for each of the 5 routes.
- NTEF Request #005, dated 2/9/98, by Jason Tech.....Provided estimated number of location workers involved with rail line operations for all five routes.
- NTEF Request #006, dated 2/9/98, by Jason Tech.....Cost methodology summary needed.
- NTEF Request #007, dated 2/9/98, by Jason Tech.....Need info on land use on IMT (pedigree).
- NTEF Request #008, dated 1/23/98, by Jason Tech.....Conceptual Design for IMT Station - staffing requirements, waste streams & quantities, air & water emission, total land disturbance, material usage, & discussion of operations. Type of equipment requested & how long it will operate & frequency.
- NTEF Request #009, dated 1/23/98, by Jason Tech.....Road upgrade requirements & the bases for these upgrades.
- NTEF Request #010, dated 1/23/98, by Jason Tech.....Need heavy haul vehicle horsepower, speed, & operating envelope. They need to know the type of escort vehicle.
- NTEF Request #011, dated 1/23/98, by Jason Tech.....O&M costs on heavy haul (including IMT)
- NTEF Request #012, dated 2/9/98, by Jason Tech.....Justify why we aren't taking northern heavy haul routes from Carlin, why we dismissed Hwy 160, & why California hwy. 127 wasn't considered.
- NTEF Request #013, dated 2/9/98, by Jason Tech.....Cask recovery for an in-transit incident/accident between IMT & repository or between main rail line & repository. Define operational arrangements & costs.
- NTEF Request #014, dated 10/24/97, by Lee Morton...Provided Rail map (5 routes), Heavy Haul map (5 routes) and Legal Weight Truck map.
- NTEF Request #015, dated 8/14/97, by B. Fogdall.....Prepare summary table/matrix showing rail, heavy haul & legal weight truck routes currently being considered, those rejected, description of route, & any pertinent information about unique features.

- NTEF Request #016, dated 9/25/97, by Lee Morton.....Prepare a white paper discussing BLM existing & planned corridors & how they were utilized with rail routing.
- NTEF Request #017, dated 10/9/97, by David Lechel...Prepare a point of origin white paper to address S. Lichtman (HQ EH) concerns: why routes & alignments are selected.
- NTEF Request #018, dated 10/3/97, by David Lechel...Prepare a white paper discussing decision for selection of the width for alignment for the EIS (quarter mile total width vs. quarter mile from centerline).
- NTEF Request #019, dated 10/3/97, by David Lechel...Discuss from an engineering viewpoint why 1/4 mile alignments are satisfactory.
- NTEF Request #020, dated 10/22/97, by Lee Morton...Provided the Preliminary Draft of Road Upgrades for Heavy Haul Truck Roads containing analysis & maps.
- NTEF Request #021, dated 10/22/97, by Lee Morton...Asked to develop a plan to obtain the appropriate level of environmental baseline info for potentially impacted roads. (This request was wrongfully assigned to Phil Gehner; reassigned to L. Swartz & D. Wilcox)
- NTEF Request #022, dated 10/16/97, by Lee Morton...Justify dismissal of IMT facility within California with associated heavy haul utilizing CA 127.
- NTEF Request #023, dated 10/22/97, by Lee Morton...Justify dismissal of the Spaghetti Bowl as a heavy haul route.
- NTEF Request #024, dated 10/21/97, by Lee Morton...Justify dismissal of SR 160 as a heavy haul route.
- NTEF Request #025, dated 10/16/97, by Lee Morton...Prepare a pro vs. con issue paper for a DOE built Las Vegas Northern Beltway.
- NTEF Request #026, dated 10/22/97, by Lee Morton...Include Spaghetti Bowl "breakpoint" (wt./length) for Heavy Haul in NDOT.
- NTEF Request #027, dated 3/11/98, by Jason Tech.....How are waste package components expected to be delivered to Nevada, rail and/or truck? If both rail & truck would be used, what would the mix be and what components would be shipped on each?
- NTEF Request #028, dated 3/11/98, by Jason Tech.....Where might the waste package shipments originate?
- NTEF Request #029, dated 3/11/98, by Jason Tech.....What are the characteristics of special transportation packaging, if any (e.g., intermodal transport container) that would be used to protect waste package components during transport to Yucca Mountain? What would be the weight & size of this packaging?
- NTEF Request #030, dated 3/11/98, by Jason Tech.....Where in Nevada (e.g., Caliente intermodal station or siding, Jean intermodal station or siding, Apex intermodal station or siding, UP Las Vegas terminal) would initial deliveries likely be made assuming: 1) Rail line from UP mainline to Yucca Mtn.; 2) no rail line from UP mainline to Yucca Mtn. & mostly legal wt. Truck transportation of SNF & HLW; 3) heavy haul truck transportation option for SNF and HLW to Yucca Mtn.

NTEF Request #031, 3/11/98, by Jason TechIf rail line is not constructed or its construction were to be delayed, waste package components would be delivered from their point of initial delivery in Nevada to Yucca Mtn. Via truck. What would the truck configuration be, & the operations mode (e.g., legal wt., overweight up to 129,000 lbs., & or heavy haul)? How many shipments would be by LWT? What would the GVW be? How many by overweight truck? What would the weight & configuration be of overweight truck shipments?, etc.

NTEF Request #032, dated 3/19/98, Jason Tech.....Current dollar costs to construct/acquire transportation equipment and facilities. Included should be costs for transportation casks, vehicles, and (if not addressed elsewhere, e.g., surface facilities) facilities such as cask maintenance facilities and intermodal transfer stations. Also included should be costs for associated documentation and other software and for procurement and acceptance. Current dollar costs to implement transportation operations including staffing, training, developing operating policies and procedures, establishing an organizational structure, and startup operations. Current dollar costs by year to operate the transportation system including payments to carriers; payments for in-transit security & vehicle location monitoring; cask fleet maintenance costs; recurring training & other administrative costs; system management costs including costs of quality assurance activities; dispatch operations, fleet use management, and expediting costs; transportation facilities operations and maintenance costs; costs of field services activities; and other costs that may be incurred during operations. Current dollar costs by year to acquire replacement equipment if not included in operation costs. Current dollar costs in the year assumed to be incurred to decontaminate and dispose of transportation equipment that has reached its useful life. In addition, they have requested the bases for the data provided.

NTEF Request #033, dated 3/19/98, by W. Dixon.....Review Heavy Haul permitting conditions in Nevada.

NTEF Request #034, dated 11/13/97, by W. Dixon.....Research the number & conditions imposed on previous non-rad heavy haul shipments in Nevada.

NTEF Request #035, dated 3/24/98, by Jessen.....Determine boundaries for the IMT station; ie., how far from the cask handling operations would the boundary fence be located? Is attachment 3 of the IMT station design report available and is there a schematic for this attachment?

NTEF Request #036, dated 3/14/98, by Jessen.....Horsepower estimates for IMT station yard locomotive, heavy haul trucks, & legal wt. Trucks.

NTEF Request #037, dated 4/3/98, by Jessen.....Verify that the following numbers are the latest life cycle cost estimates for the primary rail corridors:
Carlin: 813 million Jean: 469 million
Caliente: 873 million Valley Modified: 274 mil.
Caliente-Chalk: 667 million

- NTEF Request #038, dated 4/16/98, by Jason Tech.....Answer following questions:
 How much diesel fuel & gasoline would they use to build the road upgrades? How much steel would be used in the rail construction? How much concrete would be used in the rail construction? How much electricity will the IMT use in operation? Provide asphalt and aggregate quantities for the road upgrades.
- NTEF Request #039, dated 4/7/98, by S. GillespieAny new data on Nevada rail costs for the TSLCC? Also, the costs you sent last week were capital costs. Do you have any estimates for Operations costs (such as track/equipment maintenance)?
- NTEF Request #040, dated 4/17/98, by Lee Morton.....What is considered to be "normal" inspection for rail shipments?
- NTEF Request #041, dated 4/28/98, by Ralph BestNeed info on the ORNL Cask Maintenance Facility study.
- NTEF Request #042, dated 4/29/98, by B. Fogdall.....Provide any info (including dates of interactions with Lake Barrett) as well as info presented (ie., Moler Briefing of 8/97 & 12/97 EIS Briefing).
- NTEF Request #043, dated 6/1/98, by Ralph BestNeed info on current & projected traffic in Nevada. Of particular interest will be projections of traffic for the Las Vegas Beltway & the intersection of the Beltway with U.S. 95.
- NTEF Request #044, dated 7/13/98, by Jason Tech.....IMT cost estimate numbers to determine the number of construction & management people required for the IMT construction.
- NTEF Request #044, Rev. 01, 12/15/98, Jason Tech....Revised to correct typographical error within data provided, and clarified information.
- NTEF Request #045, dated 8/17/98, by Jason Tech.....Provide the amount of water for dust compaction for each of the five heavy haul truck routes. What is the amount of disturbed land for the Caliente Heavy Haul Route (Beatty Bypass)?
- NTEF Request #046, dated 8/25/98, by Jason Tech.....Send a copy of the NDOT reference that identifies Nevada highways that are approved for heavy haul truck operations; add'l. information on 1997 Nevada Base Highway map provided.
- NTEF Request #047, dated 8/25/98, by Jason Tech.....How many acres of land would be needed for the mid-route stopover along the Caliente route? Is this info in the Morrison-Knudsen report?
- NTEF Request #048, dated 8/25/98, by Jason Tech.....How much of the land for the Beatty alternate truck route is publicly & privately owned?
- NTEF Request #049, dated 8/13/98, by Jason Tech.....Provided number of people required to support the heavy haul operations per route.
- NTEF Request #050, dated 9/4/98, by Guy Regan.....Prepared a Comparison of Annual Costs between Rail Routes Carlin-Big Smoky Valley, Caliente-Chalk Mountain, and Valley Modified; and Comparison of

Annual Costs between Caliente-Heavy Haul Truck
Route and the Caliente and Jean-Wilson Pass Routes.

NTEF Request #051, dated 1/27/99, by Jason Tech.....Provided land use information for the five rail corridors, utilizing the design analysis primary alignment and all options.

NTEF Request #051, Rev. 01, 2/1/99, by Jason Tech...Revision to NTEF Request #051 to make editorial changes in the Rail corridor land use file that was provided.

NTEF Request #052, dated 2/18/99, by Jason Tech.....Provided construction man-hour estimates for each rail route, including each option.

2. **(1996) Nevada Potential Repository Preliminary Transportation Strategy Study 2, Volumes 1&2 (B00000000-01717-4600-00050 REV 01, 1996) RIS: MOL.19960724.0199(vol. I), RIS: MOL.19960724.0200 (vol. II)**—The second systems study that provides additional information for rail and heavy haul truck options. The study incorporates expertise from the Desert Research Institute (DRI) for archaeological information; Environmental group for land use information; Institutional group regarding future planning near and within identified rail corridors; Engineering for costing, rail corridor analysis; Socioeconomic group provided information on population data and future planning; CRWMS Transportation group provided rail analysis using INTERLINE routing code; coordination and analysis by the systems analysis and modeling group; and the Geographic Information System (GIS) maps were compiled by the GIS group.
3. **(1995) - Nevada Potential Repository Preliminary Transportation Strategy Study 1 (B00000000-01717-4600-00023 REV 01, 1995) RIS: MOL.19950810.0059**—The first study of two systems studies that identifies reasonable alternatives for waste transport to a potential repository - rail, heavy haul truck, and legal weight truck. The study incorporated expertise from the Environmental group-permitting; environmental group - land use; Engineering; Geographic Information System (GIS) mapping; Institutional support, coordination and analysis by the systems analysis group; and additional information provided by the CRWMS Transportation group regarding legal weight truck and heavy haul truck transport. This study provides cost estimates, at a high level, for heavy haul truck and rail options.
4. **(9/91) Nevada Commercial Spent Nuclear Fuel Transportation Experience (YMP-91-17) RIS: NNA.19910926.0047**—The report presents a historic overview of commercial reactor spent nuclear fuel shipments that occurred in the State of Nevada, and a review of the accident and incident data for these shipments.
5. **(7/90) Preliminary Nevada Transportation Accident Characterization Study (YMP-90-42, July 1990) RIS: NNA.19901003.0051**—Study characterizes and documents highway and rail accidents in the State of Nevada.
6. **(2/95) UNLV Study - Transportation Impact Assessment System Design**—This identifies the data needs for a monitoring database to support the White Pine County transportation impact assessment dealing with both rail and heavy haul scenarios.
7. **(5/31/91) UNLV Study - Mountain Transportation Routes: Preliminary Characterization and Risk Analysis** - This report was made by the UNLV Transportation Research Center for the State of Nevada. The report provides an accident analysis along both rail and highway potential transportation corridors. Relative and absolute impact measures are provided to support comparisons of routes based on selected characteristics. A worst-case scenario is also included to identify potential critical and most probable places for accidents and/or incidents to occur.

**BOTTOM DRAWER
REGULATIONS**

1. **(NO DATE) All Transportation Modes** - Chart outlining the following: governing region, permit, function, requirements, issuing and authorizing agency, timeframe, and adopted regulations.
2. **(12/9/97) Borrow Areas & Excavation Waste Disposal Areas** - Areal Requirements Estimate
3. **(11/11/97) Local Transportation Regulations** - Bryan Wilson Lotus Notes to Melanie Scott/Ella Johnson.

Attachment 1
Summary PDEIS Data Table and
Spreadsheets for Rail Implementing Alternatives

PDEIS Summary Data
Rail corridor utilities, energy, and materials.

Corridor	Length (kilometers ^a)	Diesel fuel use (million liters ^b)	Gasoline use (thousand liters)	Steel (thousands of metric tons ^c)	Concrete (thousands of metric tons)
Construction					
Caliente	513	42	870	71	420
Carlin	520	39	800	72	400
Caliente-Chalk Mountain	345	33	630	48	280
Jean	181	26	500	26	150
Valley Modified	159	13	270	22	130

Rail Utilities, Energy and Materials Data

Commidity	Units	Caliente	Carlin	Chalk Mtn	Jean	Valley Mod	Reference
Fossil Fuel							
Diesel	gallon	11,145,000	10,380,000	8,710,000	6,945,000	3,534,000	1-1
	liter	42,187,503	39,291,725	32,970,224	26,289,117	13,377,356	
Gasoline	gallon	230,000	211,000	166,000	133,000	72,000	1-1
	liter	870,626	798,705	628,365	503,449	272,544	
Total Fossil Fuel	million l	43.1	40.1	33.6	26.8	13.6	

Reference:

1-1 Nevada Transportation Engineering File, Top Drawer, Rail, Item 1, Nevada Transportation Study Construction Cost Estimate, March 1998, "Comparison of Construction Equip. Hours".

Rail Utilities, Energy and Materials Data

Commodity		Units	Caliente	Carlin	Chalk Mtn	Jean	Valley Mod	Reference
Steel	Reinforcing	mt	6,358.0	5,367.0	4,170.0	2,306.0	1,773.0	1-2
	Structural-Bridges	mt	1,360.0	1,360.0	333.0	333.0	333.0	1-2
	Piling-bridges	mt	1,706.0	1,435.0	1,237.0	526.0	541.0	1-2
	Misc-bridges	mt	113.3	110.6	63.6	371.1	33.1	1-2
	Subtotal	mt	9,537.3	8,272.6	5,803.6	3,536.1	2,680.1	
	Rail--115#	mt	61,567.0	63,766.0	41,860.0	22,139.0	19,374.0	1-3
	Total	1,000 mt	71.1	72.0	47.7	25.7	22.1	

Reference:

- 1-2 Nevada Transportation Engineering File, Top Drawer, Rail, Item 1, Nevada Transportation Study Construction Cost Estimate, March 1998, "Summary Structures Detail".
- 1-3 Nevada Transportation Engineering File, Top Drawer, Rail, Item 1, Nevada Transportation Study Construction Cost Estimate, March 1998, "Morrison Knudsen Corp, Number: 3969 H7834, Sorted by Work Zone; Partial on: Work Area".

Rail Utilities, Energy and Materials Data

Commidity		Units	Caliente	Carlin	Chalk Mtn	Jean	Valley Mod	Reference
Concrete	Prestressed Components	mt	29,664	23,252	21,641	8,581	8,126	1-2
	Concrete Ties	ea	889,707	921,481	604,923	319,925	279,980	1-3
		cm	119,132	123,386	80,999	42,838	37,489	Note 1-1
		mt	274,003	283,789	186,298	98,527	86,225	Note 1-2
	Subtotal	mt	303,667	307,041	207,939	107,108	94,351	
	Ready Mix--4,000 psi	cm	50,552	42,022	32,083	18,521	14,392	1-2
		mt	116,270	96,651	73,791	42,598	33,102	Note 2
	Total	1,000 mt	419.9	403.7	281.7	149.7	127.5	
	% Ready Mix	%	28	24	26	28	26	

Note 1-1 Average tie size assumed to be 8 inches high by 10 inches wide by 8 feet 6 inches long = .1749 cubic yards per tie = .1339 cubic meters per tie. 1-4

Note 1-2 Concrete density assumed to be 2,300 kg/cm. 1-5

Reference:

1-4 E-mail from Jeff Pullen to Kingsley House, April 4, 1999, 9:28 AM.

1-5 Fax from Kathryn Knapp to Kingsley House, 1/21/99.

Reference Data for

Attachment 1

PREDECISIONAL WORKING

Reference 1-1

Pg 1-1-1 of 2

DRAFT

Civilian Radioactive Waste Management System
Management & Operating Contractor

NEVADA TRANSPORTATION STUDY
CONSTRUCTION COST ESTIMATE

March 1998

Prepared by

Morrison Knudsen Corporation
720 Park Blvd.
Boise, ID 83712

EIS RELATED INFORMATION

Comparison of Construction Equip. Hours

Direct Construction Equipment Description	Calliente Eccles	Carlin Old Smoky	Carlin Monitor V	Valley Modified	Jean Route	Eccles O. Blossom	Eccles Topopah
Route Length Km.	512.9	520.4	532.6	158.5	180.5	344.9	335.7
Pick Up Truck 4WD .75T	184000	171000	197000	59000	112000	135000	137000
Highway End Dump 10 cy	19000	19000	19000	6000	7000	14000	15000
Flatbed Truck 1.5- 2.0 T	26000	23000	26000	8000	10000	18000	17000
Flatbed Truck 10 T	21000	18000	21000	6000	8000	14000	14000
Water Truck 3300 Gal	56000	54000	60000	20000	41000	43000	46000
Lowboy 30-50 T W/Tractor	17000	14000	13000	6000	5000	13000	13000
Mechanic Truck	30000	28000	35000	7000	20000	22000	20000
End Dump Cat 773 -50T	105000	96000	114000	41000	81000	70000	72000
End Dump Articulate -30T	41000	43000	44000	13000	29000	29000	29000
Water Wagon 10,000 Gal	32000	31000	31000	15000	19000	22000	26000
Compressor -Port 175-450 CFM	47000	40000	45000	14000	17000	32000	31000
Concrete Pump Truck Mt. W/Boom	2000	2000	2000	1000	1000	2000	2000
Hydraulic Drill	102000	82000	129000	17000	101000	76000	72000
Backhoe Cat 225 - 1cy	4000	4000	4000	1000	2000	3000	3000
Backhoe Cat 235 - 2cy	42000	44000	46000	14000	15000	31000	31000
Crawler Crane 100-150 T	11000	9000	9000	3000	3000	8000	8000
Utility Crane 15 T Hyd	27000	36000	28000	12000	13000	45000	28000
Generator Small 20-50 KW	1300	1300	1300	1000	1300	1000	1000
Generator Large 250 Kw	105000	105000	110000	35000	62000	105000	105000
Grader Cat 14 - 16	69000	65000	69000	27000	43000	53000	57000
Light Plants 6-10 Kw	94000	88000	96000	27000	35000	65000	64000
Forklift Rough Terrain 15,000 Lb	6000	5000	5000	2000	2000	4000	4000
Loader Cat 950-966	5000	5000	5000	2000	2000	4000	4000
Loader Cat 988b	4000	4000	5000	2000	2000	3000	3000
Loader Cat 992c	28000	27000	30000	13000	21000	18000	20000
Loader-Hoe Case 580	14000	14000	14000	9000	5000	82000	10000
Belt Loader W/Grizzly	5000	5000	5000	2000	2000	3000	3000
Pile Hammer	2000	2000	2000	1000	1000	2000	1000
Compactor Small	43000	43000	46000	14000	14000	32000	31000
Compactor Large	65000	62000	61000	29000	35000	45000	51000
Scraper 20-24 cy	37000	36000	37000	11000	14000	27000	28000
Scraper 32-44 cy	100000	90000	102000	38000	73000	99000	109000
Tractors D6-D7	13000	13000	13000	4000	12000	9000	10000
Tractors D8	106000	91000	119000	22000	67000	93000	93000
Tractors D9	41000	33000	51000	7000	33000	31000	29000
Welders 300 amp Diesel	34000	29000	32000	8000	12000	23000	22000
Track Equipment	15000	16000	17000	5000	6000	11000	11000
Total Equip. Hrs.	1553300	1446300	1643300	502000	926300	1287000	1220000
Est. Diesel Requirements Gallons	11,145,000	10,380,000	12,030,000	3,534,000	6,945,000	8,710,000	8,945,000
Est. Gasoline Requirements Gallons	230,000	211,000	241,000	72,000	133,000	166,000	167,000

P-1-1-2

Refrence 1-2
Pg 1-2 - 1 of 2

PREDECISIONAL WORKING

DRAFT

Civilian Radioactive Waste Management System
Management & Operating Contractor

NEVADA TRANSPORTATION STUDY
CONSTRUCTION COST ESTIMATE

March 1998

Prepared by

Morrison Knudsen Corporation
720 Park Blvd.
Boise, ID 83712

EIS RELATED INFORMATION

Summary Structures Detail

Carlin

Chalk/MT

				<i>Carlin Bfg/</i>	<i>Carlin Mont</i>	<i>Caliente</i>	<i>Chalk/Eccl</i>	<i>Orange/Ec</i>	<i>Jean/Wils</i>	<i>Valley Mod</i>
Bent Cap	Prestressed Int. Cap Conc.	Mt	7.5	484.05	345.6	649.35	429.975	408.975	180.3	150
Bent Cap	Prestressed End Cap Conc.	Mt	10	489.6	376.7	576.9	486.7	458.7	178.2	200
Box Girder	Prestressed 15 M Girder	Mt	32	6265.6	4822.4	7385.6	6230.4	5872	2281.6	2560
Box Girder	Prestressed 20 M Girder	Mt	52	8335.6	6604	12006.8	6864	7508.8	3146	2080
Box Girder	Prestressed 30 M Girder	Mt	83	0	1328	0	0	0	0	0
Panel/Plan	Prestressed Planks & Panel	Mt	19.6	7677.32	5905.48	9045.4	7630.28	7191.24	2794.96	3136
Sub total Prestressed concrete				23252	19382	29664	21641	21440	8581	8126
C.I.P. Conc	Ready Mix Delivered	Cm		42022	50018	50552	32083	33647	18521	14392
C.I.P. Conc	Reinforcing Steel	Mt		5367	6305	6358	4170	4365	2306	1773
Str. Steel	Trestle Steel Bridges	Mt		1360	1360	1360	333	333	333	333
H Piling	All Bridges	Mt		1435	1416	1706	1237	1282	526	541
Misc. Metal	All Bridges	Mt		110.6	156.3	113.3	63.6	38.4	** 371.1	33.1
** Includes Tunnel Steel										
Total Steel				8272.6	9637.3	9637.3	5803.6	5803.6	3536.1	2680.1

This page is 1.09.89 in Jason Library

2-1-2-2

Reference 1-3
Pg 13-1 of 6

PREDECISIONAL WORKING

DRAFT

Civilian Radioactive Waste Management System
Management & Operating Contractor

NEVADA TRANSPORTATION STUDY
CONSTRUCTION COST ESTIMATE

March 1998

Prepared by

Morrison Knudsen Corporation
720 Park Blvd.
Boise, ID 83712

EIS RELATED INFORMATION

Morrison Knudsen Corp.
 Number: 3969 117834
 Project: Yucca Mountain R.R. Proposal

Callente to Repository Other Sum.
 Sorted By: Work Zone, Resource Groups, Re
 (Partial Summary; Composite/Crew Resources ARE Expanded)

09/18/97
 9:59 am
 Page: 3

Resource Rate	Description	Quantity	Manhours	Labor	Perm. Mat'l's	Equip.	Supplies	Sub-Contracts	Property	Total Cost
Work Zone 06: Sub Ballast										
Resource Group MAT: Material Costs										
Subtotal, Sub Ballast		5,939,500 SM			8,166,813		96,037	407,693		8,670,543

Work Zone 07: Trackwork 115# Rail										
Resource Group ADD: Add-on Percentage										
ST&S 15%	SMALL TOOLS & SUPPLIES 15%						934,203			934,203

Resource Group MAT: Material Costs										
BALLAST	Delivered ballast in rail cars at sidin	1,128,318 MTON			11,283,181		13,539,818			24,822,999
R.R.XSING	Standard Railroad Crossing Sign	232 EA			116,000					116,000
RAIL	The rail proposed is 115 # standard rail	61,567 MTON			39,710,836		7,080,227			46,791,063
RAIL ANCH.	Furnish Rail Anchors	1,779,436 EA			1,779,436		266,915			2,046,351
TIES/CLIP	Delivery price for concrete ties	889,707 EA			50,490,867		4,670,961			55,161,828
TURNOUTS	Complete No 10 Turnout	40 EA			1,920,000					1,920,000
WELD KITS	Purchase field weld kits delivered to	2,968 EA			195,863					195,863
WOOD PLANK	Planks/Wood ties/Spikes/bolts	116 EA			142,680					142,680
Subtotal, Material Costs		1,189,885 MTON			105,638,863		25,557,921			131,196,784

Resource Group SUB: Subcontracted work										
LAY/CLIP	Subcontractor Plug price for lay ties &	536,945 METER						22,900,704		22,900,704

Resource Group SUP: Supplies										
STRINGING	Special Built stringing trailer	258,463 METER					320,494			320,494
WORK TRAIN	Proposed Lease agreement for two	15,412 HOUR	46,235	1,849,380		2,157,610	1,232,920	1,078,805		6,318,715
Subtotal, Supplies		258,463 METER	46,235	1,849,380		2,157,610	1,553,414	1,078,805		6,639,209
Subtotal, Trackwork 115# Rail		1,189,885 MTON	46,235	1,849,380	105,638,863	2,157,610	28,045,538	23,979,509		161,670,900

Work Zone 08: Structures										
Resource Group ADD: Add-on Percentage										
ST&S 15%	SMALL TOOLS & SUPPLIES 15%						3,633,451			3,633,451
STS	SMALL TOOLS AND SUPPLIES						46,937			46,937
Subtotal, Add-on Percentage							3,680,388			3,680,388

Resource Group MAT: Material Costs										
14	Trevertia #1125 Geotextile Fabric	153,762 SM			211,423					211,423
15	Granular Bedding/Drain Material	51,673 LCM			1,141,973					1,141,973
16	3"-14" Rip-Rap	5,705 LCM			105,836					105,836
36	900mm X 2.77 mm Thickness CMP	12,360 METER	13,843	456,826	973,226	73,048	50,305			1,553,405
36A	900mm FLARED END SECTION	412 EACH			113,300					113,300
48	1200mm X 2.77mm Thickness CMP	12,360 METER	17,428	575,111	1,500,380	92,020	63,258			2,230,769
48A	1200 mm FES	412 EACH			236,933					236,933
60	1500mm X 2.77mm Thickness CMP	6,180 METER	10,939	360,974	811,001	57,758	39,707			1,269,440
60A	1500mm FES	206 EACH			180,250					180,250
72	1800mm X 2.77mm Thickness CMP	4,920 METER	9,692	319,849	920,040	51,178	35,183			1,326,250
72A	1800 mm FLARED END SECTION	117 EACH			163,800					163,800

DT
 1-3-2

Morrison Knudsen Corp.
 Number: 3969 H7834
 Project: Yucca Mountain R.R. Proposal

Carlin Big Valley Other Sum.
 Sorted By: Work Zone, Resource Groups, Re
 (Partial Summary; Composite/Crew Resources ARE Expanded)

09/18/97
 8:28 am
 Page: 3

Resource Rate	Description	Quantity	Manhours	Labor	Perm. Mat'ls	Equip.	Supplies	Sub-Contracts	Property	Total Cost
Work Zone 06: Sub Ballast										
Resource Group MAT: Material Costs										
Subtotal, Sub Ballast		6,245,100 SM			8,587,013		100,985	428,716		9,116,714

Work Zone 07: Trackwork 115# Rail										
Resource Group ADD: Add-on Percentage										
ST&S 15%	SMALL TOOLS & SUPPLIES 15%						969,498			969,498

Resource Group MAT: Material Costs										
BALLAST	Delivered ballast in rail cars at sidin	1,168,614 MTON			11,686,139		14,023,367			25,709,506
R.R.XSING	Standard Railroad Crossing Sign	328 EA			164,000					164,000
RAIL	The rail proposed is 115 # standard rail	63,766 MTON			41,129,035		7,333,084			48,462,119
RAIL ANCH.	Furnish Rail Anchors	1,842,984 EA			1,842,984		276,448			2,119,432
TIES/CLIP	Delivery price for concrete ties	921,481 EA			52,294,055		4,837,776			57,131,831
TURNOUTS	Complete No 10 Turnout	34 EA			1,632,000					1,632,000
WELD KITS	Purchase field weld kits delivered to	3,047 EA			201,094					201,094
WOOD PLANK	Planks/Wood ties/Spikes/bolts	164 EA			201,720					201,720
Subtotal, Material Costs		1,232,380 MTON			109,151,027		26,470,675			135,621,702

Resource Group SUB: Subcontracted work										
LAY/CLIP	Subcontractor Plug price for lay ties &	556,121 METER						23,718,561		23,718,561

Resource Group SUP: Supplies										
STRINGING	Special built stringing trailer	267,694 METER					331,940			331,940
WORK TRAIN	Proposed Lease agreement for two	15,962 HOUR	47,886	1,915,428		2,234,665	1,276,952	1,117,333		6,544,378
Subtotal, Supplies		267,694 METER	47,886	1,915,428		2,234,665	1,608,892	1,117,333		6,876,318
Subtotal, Trackwork 115# Rail		1,232,380 MTON	47,886	1,915,428	109,151,027	2,234,665	29,049,065	24,835,894		167,186,079

Work Zone 08: Structures										
Resource Group ADD: Add-on Percentage										
ST&S 15%	SMALL TOOLS & SUPPLIES 15%						3,174,704			3,174,704
STS	SMALL TOOLS AND SUPPLIES						46,937			46,937
Subtotal, Add-on Percentage							3,221,641			3,221,641

Resource Group MAT: Material Costs										
14	Treveria #1125 Geotextile Fabric	175,895 SM			241,856					241,856
15	Granular Bedding/Drain Material	60,327 LCM			1,333,234					1,333,234
16	3"-14" Rip-Rap	5,293 LCM			98,180					98,180
36	900mm X 2.77 mm Thickness CMP	14,607 METER	16,360	539,877	1,150,160	86,328	59,451			1,835,816
36A	900mm FLARED END SECTION	486.9 EACH			133,898					133,898
48	1200mm X 2.77mm Thickness CMP	14,607 METER	20,596	679,666	1,773,151	108,750	74,759			2,636,326
48A	1200 mm FES	486.9 EACH			280,008					280,008
60	1500mm X 2.77mm Thickness CMP	7,304 METER	12,927	426,599	958,442	68,259	46,925			1,500,225
60A	1500mm FES	243.5 EACH			213,020					213,020
72	1800mm X 2.77mm Thickness CMP	5,481 METER	10,797	356,299	1,024,886	57,010	39,192			1,477,387
72A	1800 mm FLARED END SECTION	124.4 EACH			174,102					174,102

21-3-2

Morrison Knudsen Corp.
 Number: 3969 117834
 Project: Yucca Mountain R.R.Proposal

Valley Modified Route Other Sum.
 Sorted By: Work Zone, Resource Groups, Re
 (Partial Summary; Composite/Crew Resources ARE Expanded)

09/18/97
 10:47 am
 Page: 3

Resource Rate	Description	Quantity	Manhours	Labor	Perm. Mat'ls	Equip.	Supplies	Sub-Contracts	Property	Total Cost
Work Zone 07: Trackwork 115# Rail										
Resource Group ADD: Add-on Percentage										
Resource Group MAT: Material Costs										
BALLAST	Delivered ballast in rail cars at siding	355,068 MTON			3,550,678		4,260,814			7,811,492
R.R.XSING	Standard Railroad Crossing Sign	80 EA			40,000					40,000
RAIL	The rail proposed is 115 # standard rail	19,374 MTON			12,496,513		2,228,060			14,724,573
RAIL ANCH.	Furnish Rail Anchors	559,967 EA			559,967		83,995			643,962
TIES/CLIP	Delivery price for concrete ties	279,980 EA			15,888,856		1,469,894			17,358,750
TURNOUTS	Complete No 10 Turnout	10 EA			480,000					480,000
WELD KITS	Purchase field weld kits delivered to	918.7 EA			60,631					60,631
WOOD PLANK	Planks/Wood ties/Spikes/bolts	40 EA			49,200					49,200
Subtotal, Material Costs		374,442 MTON			33,125,845		8,042,763			41,168,608
Resource Group SUB: Subcontracted work										
LAY/CLIP	Subcontractor Plug price for lay ties &	168,970 METER						7,206,571		7,206,571
Resource Group SUP: Supplies										
STRINGING	Special Built stringing trailer	81,335 METER					100,856			100,856
WORK TRAIN	Proposed Lease agreement for two	4,850 HOUR	14,549	581,977		678,973	387,985	339,487		1,988,422
Subtotal, Supplies		81,335 METER	14,549	581,977		678,973	488,841	339,487		2,089,278
Subtotal, Trackwork 115# Rail		374,442 MTON	14,549	581,977	33,125,845	678,973	8,822,345	7,546,058		50,755,198
Work Zone 08: Structures										
Resource Group ADD: Add-on Percentage										
STS 15%	SMALL TOOLS & SUPPLIES 15%						571,841			571,841
STS	SMALL TOOLS AND SUPPLIES						12,651			12,651
Subtotal, Add-on Percentage							584,492			584,492
Resource Group MAT: Material Costs										
14	Trevera #1125 Geotextile Fabric	46,620 SM			64,103					64,103
15	Granular Bedding/Drain Material	19,852 LCM			438,729					438,729
16	3"-14" Rip-Rap	1,664 LCM			30,867					30,867
36	900mm X 2.77 mm Thickness CMP	2,880 METER	3,226	106,445	226,771	17,021	11,722			361,959
36A	900mm FLARED END SECTION	96 EACH			26,400					26,400
48	1200mm X 2.77mm Thickness CMP	2,880 METER	4,061	134,006	349,603	21,442	14,740			519,791
48A	1200 mm FES	96 EACH			55,208					55,208
60	1500mm X 2.77mm Thickness CMP	1,440 METER	2,549	84,110	188,971	13,458	9,252			295,791
60A	1500mm FES	48 EACH			42,000					42,000
72	1800mm X 2.77mm Thickness CMP	2,040 METER	4,019	132,620	381,480	21,220	14,588			549,908
72A	1800 mm FLARED END SECTION	34 EACH			47,600					47,600
84	2100 mm X 2.77mm Thickness CMP	2,040 METER	8,364	276,012	454,920	44,162	30,361			805,455
84A	2100 mm Flared End Section	34 EACH			61,200					61,200
BENT CAPS	Purchase Intermediate Bent Caps	20 EA			80,000					80,000
CONC.WASTE	Allowance for waste conc.	302.2 CM					27,200			27,200
EFCO FORM	Steel Forms Culverts Leased	36,020 SM					450,250			450,250
END BENTS	Purchase End Bents	20 EA			130,000					130,000

27-1-3-4

Resource Rate	Description	Quantity	Manhours	Labor	Perm. Mat'ls	Equip.	Supplies	Sub-Contracts	Property	Total Cost
Work Zone 07: Trackwork 115# Rail										
Resource Group ADD: Add-on Percentage										
Resource Group MAT: Material Costs										
BALLAST	Delivered ballast in rail cars at siding	405,726 MTON			4,057,255		4,868,706			8,925,961
R.R.XSING	Standard Railroad Crossing Sign	96 EA			48,000					48,000
RAIL	The rail proposed is 115 # standard rail	22,139 MTON			14,279,394		2,545,938			16,825,332
RAIL ANCH.	Furnish Rail Anchors	639,857 EA			639,857		95,979			735,836
TIES/CLIP	Delivery price for concrete ties	319,925 EA			18,155,724		1,679,604			19,835,328
TURNOUTS	Complete No 10 Turnout	12 EA			576,000					576,000
WELD KITS	Purchase field weld kits delivered to	1,057 EA			69,784					69,784
WOOD PLANK	Planks/Wood ties/Spikes/bolts	48 EA			59,040					59,040
Subtotal, Material Costs		427,864 MTON			37,885,054		9,190,227			47,075,281
Resource Group SUB: Subcontracted work										
LAY/CLIP	Subcontractor Plug price for lay ties &	193,077 METER						8,234,734		8,234,734
Resource Group SUP: Supplies										
STRINGING	Special built stringing trailer	92,939 METER					115,245			115,245
WORK TRAIN	Proposed Lease agreement for two	5,542 HOUR	16,625	665,008		775,843	443,339	387,921		2,272,111
Subtotal, Supplies		92,939 METER	16,625	665,008		775,843	558,584	387,921		2,387,356
Subtotal, Trackwork 115# Rail		427,864 MTON	16,625	665,008	37,885,054	775,843	10,082,870	8,622,655		58,031,430
Work Zone 08: Structures										
Resource Group ADD: Add-on Percentage										
OHP	SUBCONTRACTOR OVERHEAD & PROFIT							4,917,125		4,917,125
SHIFT	SHIFT PREMIUM			563,849						563,849
ST&S 15%	SMALL TOOLS & SUPPLIES 15%						2,220,639			2,220,639
STS	SMALL TOOLS AND SUPPLIES						12,651			12,651
Subtotal, Add-on Percentage				563,849			2,233,290	4,917,125		7,714,264
Resource Group MAT: Material Costs										
14	Treveria #1125 Geotextile Fabric	47,340 SM			65,093					65,093
15	Granular Bedding/Drain Material	17,594 LCM			388,827					388,827
16	3"-14" Rip-Rap	1,529 LCM			28,365					28,365
36	900mm X 2.77 mm thickness CMP	3,600 METER	4,032	133,056	283,464	21,276	14,652			452,448
36A	900mm FLARED END SECTION	120 EACH			33,000					33,000
48	1200mm X 2.77mm Thickness CMP	3,600 METER	5,076	167,508	437,004	26,802	18,425			649,739
48A	1200 mm FES	120 EACH			69,010					69,010
60	1500mm X 2.77mm Thickness CMP	1,800 METER	3,186	105,138	236,214	16,823	11,565			369,740
60A	1500mm FES	60 EACH			52,500					52,500
72	1800mm X 2.77mm Thickness CMP	1,560 METER	3,073	101,416	291,720	16,227	11,156			420,519
72A	1800 mm FLARED END SECTION	26 EACH			36,400					36,400
84	2100 mm X 2.77mm Thickness CMP	1,200 METER	4,920	162,360	267,600	25,978	17,860			473,798
84A	2100 mm Flared End Section	20 EACH			36,000					36,000
AIR DUCT	36" tunnel air duct light metal	3,000 METER					255,000			255,000
BENT CAPS	Purchase Intermediate Bent Caps	24.04 EA			96,178					96,178

P813-5

Morrison Krudsen Corp.
 Number: 3969 H7834
 Project: Yucca Mountain R.R.Proposal

Topopah Chalk Mt/Eccles Other Sum.
 Sorted By: Work Zone, Resource Groups, Re
 (Partial Summary; Composite/Crew Resources ARE Expanded)

09/18/97
 10:12 am
 Page: 3

Resource Rate	Description	Quantity	Manhours	Labor	Permi. Mat'ls	Equip.	Supplies	Sub- Contracts	Property	Total Cost
Work Zone 06: Sub Ballast										
Resource Group MAT: Material Costs										
Subtotal, Sub Ballast		4,028,300 SM			5,538,913		65,132	276,489		5,880,534
Work Zone 07: Trackwork 115# Rail										
Resource Group ADD: Add-on Percentage										
ST&S 15%	SMALL TOOLS & SUPPLIES 15%						643,166			643,166
Resource Group MAT: Material Costs										
BALLAST	Delivered ballast in rail cars at siding	767,158 MTON			7,671,584		9,205,901			16,877,485
R.R.XSING	Standard Railroad Crossing Sign	200 EA			100,000					100,000
RAIL	The rail proposed is 115 # standard rail	41,860 MTON			26,999,922		4,813,940			31,813,862
RAIL ANCH.	furnish Rail Anchors	1,182,020 EA			1,182,020		177,303			1,359,323
TIES/CLIP	Delivery price for concrete ties	604,923 EA			34,329,408		3,175,848			37,505,256
TURNOUTS	Complete No 10 Turnout	28 EA			1,344,000					1,344,000
WELD KITS	Purchase field weld kits delivered to	2,023 EA			133,512					133,512
WOOD PLANK	Planks/Wood ties/Spikes/bolts	100 EA			123,000					123,000
Subtotal, Material Costs		809,019 MTON			71,883,446		17,372,992			89,256,438
Resource Group SUB: Subcontracted work										
LAY/CLIP	Subcontractor Plug price for lay ties &	365,076 METER						15,570,491		15,570,491
Resource Group SUP: Supplies										
STRINGING	Special Built stringing trailer	175,733 METER					217,908			217,908
WORK TRAIN	Proposed Lease agreement for two	10,478 HOUR	31,435	1,257,418		1,466,988	838,279	733,494		4,296,179
Subtotal, Supplies		175,733 METER	31,435	1,257,418		1,466,988	1,056,187	733,494		4,514,087
Subtotal, Trackwork 115# Rail		809,019 MTON	31,435	1,257,418	71,883,446	1,466,988	19,072,345	16,303,985		109,984,182
Work Zone 08: Structures										
Resource Group ADD: Add-on Percentage										
OHIP	SUBCONTRACTOR OVERHEAD & PROFIT							376,980		376,980
SHIFT	SHIFT PREMIUM			43,228						43,228
ST&S 15%	SMALL TOOLS & SUPPLIES 15%						3,213,551			3,213,551
STS	SMALL TOOLS AND SUPPLIES						12,651			12,651
Subtotal, Add-on Percentage				43,228			3,226,202	376,980		3,646,410
Resource Group MAT: Material Costs										
14	Trevera #1125 Geotextile Fabric	117,467 SM			161,517					161,517
15	Granular Bedding/Drain Material	40,775 LCM			901,128					901,128
16	3"-14" Rip-Rap	4,514 LCM			83,741					83,741
36	900mm X 2.77 mm Thickness CMP	9,540 METER	10,685	352,598	751,180	56,381	38,828			1,198,987
36A	900mm FLARED END SECTION	303 EACH			83,325					83,325
48	1200mm X 2.77mm Thickness CMP	9,540 METER	13,451	443,896	1,158,061	71,025	48,826			1,721,808
48A	1200 mm FES	303 EACH			174,249					174,249
60	1500mm X 2.77mm Thickness CMP	4,830 METER	8,549	282,120	633,841	45,141	31,033			992,135
60A	1500mm FES	152 EACH			133,000					133,000

PT
 21-2-6

Jeff Pullen
04/09/99 08:28 AM

To: Kingsley House/YD/RWDOE@CRWMS
cc: Phil Gehner/YM/RWDOE@CRWMS, Ralph Best/YD/RWDOE@CRWMS
Subject: Rail Ties

The rail ties have not yet been designed. The design will be a combination of the tie size, rail type, tie spacing, ground conditions, ballast type, and loading. However, to estimate the quantity of concrete to be used in fabricating the ties, an average value for tie size can be used. Per AREA guidance, the concrete ties should not be less than 6" thick, nor more than 10" thick, and should not be less than 8" wide, nor more than 13" wide. AREA also recommends that the ties not be less than 7'-9" long, nor more than 9'-0" long. Using these ranges, a decent average tie sizing would be 8" thick, 10" wide, and 8'-6" long.

Reference 1-4
28-1-4-1-81

Reference 1-5
Pg 1-5-1 of 1

Civilian Radioactive Waste
Management Systems

M&O**FACSIMILE MESSAGE****From:** Kathryn Knapp**Phone:** 295 4724**Fax #:** (702) 295-4438**TO:** King House**FAX:** 365-6162**DATE:** 1-21-99**Number of Pages including this Page:** $\frac{10K}{2} 3$ **Message:** Here's the sketch of the

Support assembly. Hopefully it will

Satisfy your needs:

Concrete density = 2300 kg/m³

**Attachment 2
PDEIS Summary Data and
Spreadsheet for Intermodal Transfer Stations
To support
Heavy-Haul Truck Implementing Alternatives**

**PDEIS Summary Data
Intermodal transfer station utilities, energy, and materials.**

Station	Electrical demand (kilowatts)	Fossil fuel (liters) ^a	Concrete (thousand metric tons) ^b	Asphalt (thousand metric tons) ^c	Steel (thousand metric tons)
Construction					
Caliente		Minimal	7.9	18	1.4
Sloan/Jean		Minimal	7.9	18	1.4
Apex/Dry Lake		Minimal	7.9	18	1.4
Operations					
Caliente	165	Minimal			
Sloan/Jean	165	Minimal			
Apex/Dry Lake	165	Minimal			

IMT Utilities, Energy and Materials

Commodity		Units	Caliente	Sloan Jean	Apex Dry Lake	Reference
Asphalt	Asphalt 2" thick	t	165	165	165	2-1
	Asphalt 4" thick	t	4,300	4,300	4,300	2-1
	Asphalt 8" thick	t	10,650	10,650	10,650	2-1
	Parking Area	t	125	125	125	2-1
	Roadways	t	2,225	2,225	2,225	2-1
	Total	t	17,465	17,465	17,465	
		1,000 mt	17.5	17.5	17.5	
Concrete						
Ready Mix						
	Unloading Area	cu yd	900	900	900	2-1
	Trenches and Grates	cu yd	120	120	120	2-1
	Building Fnds	cu yd	180	180	180	2-1
	Crane Rail Fnd	cu yd	700	700	700	2-1
	SubTotal	cu yd	1900	1900	1900	
		1,000 cu m	1.5	1.5	1.5	
		1,000 mt	3.3	3.3	3.3	
Precast						
	Rail Ties	ea	14,830	14,830	14,830	2-1
		cm	1,986	1,986	1,986	Note 2-1
		1,000 mt	4.6	4.6	4.6	Note 2-2
	Total Concrete	1,000 mt	7.9	7.9	7.9	

Note 2-1 Average tie size assumed to be 8 inches high by 10 inches wide by 8 feet 1-4

6 inches long = .1749 cubic yards per tie = .1339 cubic meters per tie.

Note 2-2 Concrete density assumed to be 2,300 kg/cm. 1-5

IMT Utilities, Energy and Materials

Steel	Rail-133#	t	1,580	1,580	1,580	2-2
		1,000 mt	1.4	1.4	1.4	32.8

Reference:

- 2-1 Nevada Transportation Engineering File, Bottom Drawer, Heavy Haul, Item 11, Intermodal Transfer Station Preliminary (BCB1000000-01717-0200-00007, Rev.00), Dec 9, "Cost Estimate by Summary by Activity".
- 1-4 E-mail from Jeff Pullen to Kingsley House, April 4, 1999, 9:28 AM.
- 1-5 Fax from Kathryn Knapp to Kingsley House, 1/21/99.
- 2-2 Nevada Transportation Engineering File, Bottom Drawer, Heavy Haul, Item 11, Intermodal Transfer Station Preliminary (BCB1000000-01717-0200-00007, Rev.00), Dec 9, "Sheet No. A035, Pg. 1, Rail Yard Materials Delivered to Site".

Reference Data for

Attachment 2

**PREDECISIONAL
DRAFT**

**YUCCA MOUNTAIN
SITE CHARACTERIZATION PROJECT
INTERMODAL TRANSFER FACILITY**

**Cost Estimate
Summary by Activity**

**EIS-RELATED
INFORMATION**

Sheet No.	Description	Quantity	Manhours	Labor	Perm. Mat'ls	Equip.	Supplies	Sub-Contracts	Misc.	Total Cost
Activity AA: Site Preparation										
A001	Mobilization & Demob.	18,302,000 \$						183,020		183,020
A002	Construction Survey	1 LS	2,554	92,067		1,496	16,878	23,193		133,634
A003	Intermodal Property Purchase	60 ACRES						300,000		300,000
A004	Construction Field Office	1 LS					299,600	62,916		362,516
A005	Build Access Road to Site	5,280 LF	889	32,509		6,547	15,902	11,541		66,499
A006	Erosion & Pollution Control	1 LS	561	18,000		1,053	5,651	5,188		29,892
A007	Clearing Site	50 ACRES	2,168	76,549		23,120	35,094	28,300		163,064
Subtotal, Site Preparation			6,171	219,125		32,216	373,126	614,158		1,238,625
Activity AB: General Site Grading										
A008	Unclassified Excavation	50,000 CY	1,665	63,775		35,164	33,163	27,741		159,843
A009	Borrow Materials	5,000 CY	555	19,309		5,886	9,598	7,307		42,100
A010	Detention Basin & Discharge	1 LS	858	29,396	9,450	1,920	8,368	10,318		59,453
Subtotal, General Site Grading			3,077	112,481	9,450	42,970	51,129	45,366		261,396
Activity AC: Agg Base & Paving Site & Fencing										
A011	Build Chain Link Fence	16,000 LF						240,000		240,000
A012	F&I Double Swing Gates	5 EA						6,250		6,250
A013	F&I Single Personel Gates	2 EA						1,700		1,700
A014	Aggregate Base Course	14,500 CY	2,085	76,574	234,175	18,479	27,354	74,882		431,464
A015	Asphalt Conc 2" Thick	165 TON	87	3,166	4,973	1,001	1,438	2,221		12,798
A016	Asphalt Conc 4" Thick	4,300 TON	1,289	47,000	113,474	19,315	24,730	42,949		247,468
A017	Asphalt Conc 8" Thick	10,650 TON	3,281	119,767	250,567	48,663	63,300	101,283		583,580
A018	Asphalt Surfacing Parking Area	125 TON	80	2,934	3,346	860	1,282	1,769		10,191
A019	Asphalt Surfacing Roadways	2,225 TON	656	23,934	66,915	9,921	12,658	23,820		137,249
A020	Precast Concrete Wheel Stops	35 EA	21	641	2,622	29	151	723		4,165
A021	Paving Lines and Markers	5,500 SF						16,650		16,650
Subtotal, Agg Base & Paving Site & Fencing			7,499	274,016	676,072	98,268	130,913	512,247		1,691,516
Activity AD: Reinforced Concrete Foundations										
A022	Unloading Area Reinf Concrete	900 CY	1,649	60,295	91,485	2,789	11,718	34,920		201,207
A023	Reinf Concrete Trenches/Grates	120 CY	1,915	66,165	55,961	2,393	18,700	30,076		173,294
A024	Reinf Concrete Building Frnds	180 CY	1,473	51,329	18,297	2,427	13,764	18,022		103,839
A025	Reinf Concrete Crane Rail Frnd	700 CY	3,571	126,925	78,378	7,279	30,183	50,981		293,745
A026	Precast Track Panels	870 LF	1,958	64,955	142,720	6,032	22,601	49,625		285,933
Subtotal, Reinforced Concrete Foundations			10,566	369,669	386,840	20,920	96,966	183,623		1,058,018
Activity AE: Drainage & Fabric										
A027	Storm Sewer Pipe & Accessories	1 LS	609	19,752	32,582	1,398	2,255	11,757		67,745
A028	Perforated HDPE Pipe 6" Dia	1,320 LF	97	2,937	7,062	11	233	2,151		12,394
A029	Perforated Drain Pipe 8" Dia	7,500 LF	489	16,703	68,213	1,646	2,478	18,698		107,738
A030	Filter Fabric	160,000 SY	678	26,479	299,600	1,485	3,799	69,586		400,949
A051	Intermodal Firewater System	1 LS	1,749	68,248	61,279	3,051	13,414	30,658		176,650

P&E 2-1-2

Morrison Knudsen Corp.
 Number: 391A
 Project: Yucca Intermodal Proposal

Summary by Activity, Det (w/o UC)
 Sorted By: Activity

12/09/97
 3:02 pm
 Page: 2

Sheet No.	Description	Quantity	Manhours	Labor	Perm. Mat'ls	Equip.	Supplies	Sub-Contracts	Misc.	Total Cost
Activity AE: Drainage & Fabric										
A052	Intermodal Utilities	1 LS	1,011	39,238	76,987	1,814	7,774	166,001		291,813
Subtotal, Drainage & Fabric			4,633	173,357	545,721	9,406	29,953	298,852		1,057,289
Activity AF: Rail Track Installation										
A031	Subgrade Soil Stabilization	130,000 SY	7,832	279,259	103,362	48,950	54,911	102,161		588,644
A035	Rail Yard Materials Delivered to Site	28,990 TF			2,255,822		655,908	611,463		3,523,193
A037	Rail Track Sub-Ballast	30,100 CY	708	25,707	416,765	16,264	16,342	99,766		574,843
A038	Rail Track Ballast	20,500 CY	3,523	120,362		35,715	46,056	42,448		244,581
A039	Rail Track Ties	14,830 EA						376,870		376,870
A040	Rails String out	28,990 TF	1,710	53,863		10,060	187,688	52,838		304,450
A041	Rail Joints Thermite & Bolted	200 EA	786	24,155	14,124	938	5,519	9,395		54,131
A042	Rail Track Turn Outs #9-10	29 EA	9,512	297,816	1,489,440	13,594	77,036	394,356		2,272,242
A043	Rail Turn Outs #20	2 EA	984	30,809	145,520	1,406	7,969	38,998		224,702
Subtotal, Rail Track Installation			25,056	831,972	4,425,033	126,926	1,051,429	1,728,296		8,163,656
Activity AG: Intermodal Facilities										
A032	Gantry Crane & Rails	1 LS	3,623	145,024	1,937,556	11,638	31,219	41,882		2,167,318
A033	Mobile Crane 200 Ton DEMAG	1 EA			1,177,000					1,177,000
A044	Intermodal Elec Lighting System	1 LS	4,650	200,000	160,500	30,000	19,260	182,850		592,610
A045	Intermodal Radio Control System	1 LS			267,500			56,175		323,675
A046	Intermodal Gravel Roads	1,750 CY	251	8,991	18,725	1,029	1,897	6,435		37,077
A047	Intermodal Truck Scales	1 LS	123	4,277	39,081	202	1,227	9,406		54,194
A048	Intermodal Guard Station	1 LS	81	3,176	4,289	217	516	1,722		9,920
A049	Intermodal Maint Security Bld	3,891 SF						394,002		394,002
A050	Intermodal Office Bld	3,217 SF						228,283		228,283
A054	Intermodal Emergency Generator	1 LS						100,000		100,000
A055	Intermodal Landscaping	1 LS						25,000		25,000
Subtotal, Intermodal Facilities			8,727	361,468	3,604,651	43,086	54,119	1,045,753		5,109,077
Activity AH: Construction Mgmt/Design Engrg										
A900	Engineering	20,753,050 \$							1,452,714	1,452,714
A901	Construction Management	20,753,050 \$							1,660,244	1,660,244
Subtotal, Construction Mgmt/Design Engrg									3,112,958	3,112,958
Activity AI: Contingency										
A902	Contingency	1 LS							2,173,473	2,173,473

2-1-3

**PREDECISIONAL
DRAFT**

**YUCCA MOUNTAIN
SITE CHARACTERIZATION PROJECT
INTERMODAL TRANSFER FACILITY**

**Cost Estimate
Summary by Activity**

**EIS-RELATED
INFORMATION**

Sheet No: A035
 Operation: Rail Yard Materials Delivered to Site
 Quantity: 28990.0000 TF
 Sheet Type: Standard
 Estimator: MLA
 Date: 11/06/97
 Revision:

----- Estimate Code -----
 1.0 Activity AF Rail Track Installation
 2.0 Bid Items 35 Railyard Materials Delivered to Site

Line-Type	Group/Code	Description	Quantity	Manhours	Labor	Perm. Mat'ls	Equip.	Supplies	Sub-Contracts	Misc.	Total Cost
1.00	MAT /RAIL	Rail-133 # Standard Rail (incl turn outs)	1580.00 TON			600.000		100.000			700.000
		Extension:				948,000		158,000			1,106,000
2.00	MAT /TIES/CLIP	Delivery Price Concrete Ties w/Clips/Pads	14500.00 EA			57.000		8.000			65.000
		Extension:				826,500		116,000			942,500
3.00	MAT /BALLAST	Delivered Ballast in Rail Cars at Siding	28000.00 TON			10.000		12.000			22.000
		Extension:				280,000		336,000			616,000
4.00	MAT /RAIL ANCH.	Furnish Rail Anchors	1320.00 EA			1.000		0.150			1.150
		Extension:				1,320		198			1,518
5.00	MAT /01	Hardwood Ties 10' Long w/Tie Plates	330.00 EA			65.000					65.000
		Extension:				21,450					21,450
6.00	MAT /JOINT BARS	Bolted Joints in Pairs of Plates	350.00 PR			75.000		5.000			80.000
		Extension:				26,250		1,750			28,000
7.00	MAT /TK BOLTS	Track Bolts	2100.00 EA			2.250		0.500			2.750
		Extension:				4,725		1,050			5,775
8.00		Subtotal				2,108,245		612,998			2,721,243
9.00	TAX /1	State Sales & Use Tax @ 7%	7.00 %			147,577		42,910			190,487
10.00		Subtotal				2,255,822		655,908			2,911,730
11.00	01 /01	Subcontractor's Overhead	10.00 %						291,173		291,173
12.00		Subtotal				2,255,822		655,908	291,173		3,202,903
13.00	01 /02	Subcontractor's Profit	10.00 %						320,290		320,290

2-2-2

Attachment 3
PDEIS Summary Data and
Spreadsheet for Heavy-Haul Truck Routes

PDEIS Summary Data
Heavy-haul upgrades.

Route	Length (km)	Diesel Fuel (Million liters)	Gasoline (Thousand liters)	Asphalt (Million metric tons)	Concrete (thousand metric tons)	Steel ^a (Metric tons)
Construction						
Caliente-Tonopah	533	13.2	220	1.42	1.8	49.3
Caliente-Chalk Mountain	282	4.7	77	0.41	.5	14.1
Caliente-Las Vegas	377	5.5	110	0.55	.8	21.1
Jean-Sloan	188	1.7	29	0.24	.1	2.3
Apex-Dry Lake	182	1.6	28	0.23	.1	2.3

a. Steel includes rebar only.

Heavy Haul Route Upgrades Utilities, Energy and Materials

Commodity	Units	Caliente	Caliente Chaulk Mtn	Caliente Las Vegas	Sloan Jean	Apex Dry Lake	Reference
Fossil Fuel							
Diesel	gallon	3,484,336	1,249,249	1,454,635	452,226	435,612	3-1
	liter	13,189,362	4,728,820	5,506,274	1,711,825	1,648,935	
Gasoline	gallon	58,287	20,294	28,956	7,609	7,258	3-1
	liter	220,636	76,819	109,608	28,803	27,474	
Total Fossil Fuel	million l	13.4	4.8	5.6	1.7	1.7	

Reference:

3-1 Nevada Transportation Engineering File, Bottom Drawer, Heavy Haul, Item 5, Cost Estimate for Heavy Haul Truck Transport Design, May 6, 1999, "OCRWM Heavy Haul Upgrade Cost Estimate-/RESSUM.WK4".

Asphalt	t	1,560,252	451,965	601,967	263,095	250,411	3-2
	1,000 mt	1,415	410	546	239	227	

Reference:

3-2 Nevada Transportation Engineering File, Bottom Drawer, Heavy Haul, Item 5, Cost Estimate for Heavy Haul Truck Transport Design, May 6, 1999, "OCRWM Heavy Haul Route-A.C. Quantity Totals".

Concrete	Ready mix	cu yd	1,008	288	432	48	48	3-3
		cm	771	220	330	37	37	
		mt	1,773	506	760	84	84	
		1,000 mt	1.77	0.51	0.76	0.08	0.08	

Note 3-1 Concrete density assumed to be 2,300 kg/cm.

1-5

Reference:

3-3 Nevada Transportation Engineering File, Bottom Drawer, Heavy Haul, Item 5, Cost Estimate for Heavy Haul Truck Transport Design, May 6, 1999, "Other Resource Summary by Route, Number: 391N627A".

1-5 Fax from Kathryn Knapp to Kingsley House, 1/21/99.

Heavy Haul Route Upgrades Utilities, Energy and Materials

Commidity		Units	Caliente	Caliente Chaulk Mtn	Caliente Las Vegas	Sloan Jean	Apex Dry Lake	Reference
Steel	Reinforcing	lb	108,703	31,058	46,587	5,176	5,176	3-3
		mt	49.3	14.1	21.1	2.3	2.3	

Reference Data for

Attachment 3

Reference 3-1
Pg 3-1-1 of 2

COST ESTIMATE FOR THE HEAVY HAUL TRUCK TRANSPORT DESIGN

INCLUDING:

THE DETAILED COST ESTIMATE FOR INITIAL PUBLIC
ROAD UPGRADES AND UPGRADE OF THE NAFR VALLEY
ROAD

AND

THE ESTIMATED TOTAL LIFE CYCLE COST FOR HEAVY
HAUL TRANSPORT CONSISTING OF PUBLIC AND NAFR
INITIAL UPGRADES, NTS INITIAL UPGRADES, IMT
DESIGN AND CONSTRUCTION, AND ANNUAL
OPERATING AND MAINTENANCE COSTS FOR ALL
SYSTEMS

REVISED: MAY 6, 1998

2080

Pg 3-1-2

OCRWM Heavy Haul Road Upgrade Cost Estimate

Route	Total Manhours (Hours)	Total Equipment Hours (Hours)	Total Diesel Fuel (Gal)	Total Gasoline (Gal)	Construct Time
Caliente	653,466	447,455	3,484,336	58,287	2 3 yrs
Caliente Chalk Mtn.	240,638	163,784	1,249,249	20,294	2.25
Caliente Las Vegas	293,104	196,093	1,454,635	28,956	2.25
Dry Lake Apex	82,116	54,636	435,612	7,258	.6 (7 wks)
Sloan Jean	85,763	56,721	452,226	7,609	.6 (7 wks)

$$\text{Caliente} = \frac{653,466 \text{ hr}}{\left(\frac{2000 \text{ hrs}}{\text{yr}} \times 3 \text{ yrs}\right)} = 110 \text{ weeks}$$

$$\text{Caliente - Chalk} = \frac{240,638 \text{ hr}}{\left(\frac{2000 \text{ hrs}}{\text{yr}} \times 2.25 \text{ yrs}\right)} = 55 \text{ weeks}$$

$$\text{Caliente - Las Vegas} = \frac{293,104 \text{ hr}}{\left(\frac{2000 \text{ hrs}}{\text{yr}} \times 2.25 \text{ yrs}\right)} = 65 \text{ weeks}$$

$$\text{Dry Lake/Apex} = \frac{82,116}{\left(\frac{2000 \text{ hrs}}{\text{yr}} \times .6 \text{ yrs}\right)} = 68 \text{ weeks}$$

$$\text{Sloan/Sloan} = \frac{85,763}{\left(\frac{2000 \text{ hrs}}{\text{yr}} \times .6 \text{ yrs}\right)} = 71 \text{ weeks}$$

Reference 3-2

Pg 3-2-1 of 2

COST ESTIMATE FOR THE HEAVY HAUL TRUCK TRANSPORT DESIGN

INCLUDING:

THE DETAILED COST ESTIMATE FOR INITIAL PUBLIC
ROAD UPGRADES AND UPGRADE OF THE NAFR VALLEY
ROAD

AND

THE ESTIMATED TOTAL LIFE CYCLE COST FOR HEAVY
HAUL TRANSPORT CONSISTING OF PUBLIC AND NAFR
INITIAL UPGRADES, NTS INITIAL UPGRADES, IMT
DESIGN AND CONSTRUCTION, AND ANNUAL
OPERATING AND MAINTENANCE COSTS FOR ALL
SYSTEMS

REVISED: MAY 6, 1998

OORWM Heavy Haul Route Study-A.C. Quantity Totals

Construction Operation	Total (tons)	Calliente Route	Calliente / Chalk Mt. Route	Calliente / Las Vegas Route	Dry Lake / Apex Route	Sloan / Jean Route
Paving						
A.C. pave surface course (2")- 12 ft wide	649,831			202488	202488	244855
A.C. pave surface course (2")- 14 ft wide	75,236	42559	19102	13513	26	36
A.C. pave surface course (2")- 16 ft wide	910,393	421344	198844	263467	18079	8659
A.C. pave surface course (2")- 18 ft wide	283,198	283198				
A.C. pave surface course (2") Total	1,918,658	747,101	217,946	479,468	220,593	253,550
A.C. pave base course Total- 4 ft wide	311,583	154388	62281	93657		1257
A.C. pave base course Total- 14 ft wide	889,079	655,973	168,948	26,052	29,818	8,288
A.C. pave base course (3")-14 ft wide	8,370	2,790	2,790	2,790	-	-
A.C. pave base course -14 ft wide Total	897,449	658,763	171,738	28,842	29,818	8,288
A.C. pave base course Total	1,209,032	813,151	234,019	122,499	29,818	9,545
Total Paving	3,127,690	1,560,252	451,965	601,967	250,411	263,095
AC30 oil at 4.75% of dry aggregate	148,565	74,112	21,468	28,593	11,895	12,497
per year over 4 years	37,141	18,528	5,367	7,148	2,974	3,124
Add 2% waste	37,884	18,899	5,474	7,291	3,033	3,187
Line at 1.5% or dry aggregate	46,915	23,404	6,779	9,030	3,756	3,946
per year over 4 years	11,729	5,851	1,695	2,257	939	987
Add 2% waste	11,963	5,968	1,729	2,303	958	1,006
Prime & Tack Coat						
Prime Coat (sy)	4,987,721	3,723,073	1,005,499	46,899	164,395	47,855
Prime Coat (gal) @ 0.35 gal/sy	1,745,702	1,303,076	351,925	16,415	57,538	16,749
Prime Coat (ton) @ 256 gal/ton	6,819	5,090	1,375	64	225	65
Tack Coat (sy)	12,534,026	3,033,656	952,529	4,474,728	1,829,256	2,243,857
Tack Coat (gal) @ 0.10 gal/sy	1,253,403	303,366	95,253	447,473	182,926	224,386
Tack Coat (ton) @ 256 gal/ton	4,896	1,185	372	1,748	715	877

tons

2023-2-2

Reference 3-3

Pg 3-3-1 of 6

COST ESTIMATE FOR THE HEAVY HAUL TRUCK TRANSPORT DESIGN

INCLUDING:

THE DETAILED COST ESTIMATE FOR INITIAL PUBLIC
ROAD UPGRADES AND UPGRADE OF THE NAFR VALLEY
ROAD

AND

THE ESTIMATED TOTAL LIFE CYCLE COST FOR HEAVY
HAUL TRANSPORT CONSISTING OF PUBLIC AND NAFR
INITIAL UPGRADES, NTS INITIAL UPGRADES, IMT
DESIGN AND CONSTRUCTION, AND ANNUAL
OPERATING AND MAINTENANCE COSTS FOR ALL
SYSTEMS

REVISED: MAY 6, 1998

Harrison Knudsen Corp.
 Number: 391N627A
 Project: OCRMM Heavy Haul Road Upgrades

Other Resource Summary By Route
 Sorted By: Route, Resource Groups, Resour
 (Composite/Crew Resources ARE Expanded)

04/23/98
 8:25 am
 Page: 1

Resource Rate	Description	Quantity	Manhours	Labor	Perm. Mat'ls	Equip.	Supplies	Sub-Contracts	Misc	Total Cost
Route 1: Callente Route										
Resource Group ADD: Contractor Overhead & Fee										
PRMFEE	Contractor Fee @ 10%								7,264,872	7,264,872
PRMOH	Contractor Overhead @ 10%								6,842,671	6,842,671
SUBOHF	Subcontractor Overhead & Fee							97,839		97,839
Subtotal, Contractor Overhead & Fee								97,839	14,107,543	14,205,382
Resource Group CONT: Contingency										
01	Contingency on Direct Cost @ 25%	825,342 \$100							20,633,550	20,633,550
02	Contingency on Engineering & CM @ 15%	124,684 \$100							1,870,260	1,870,260
Subtotal, Contingency									22,503,810	22,503,810
Resource Group DWA: DWA Material Prices										
01	AC 30 Oil	75,594 TON			15,118,842					15,118,842
02	Lime	23,872 TON			2,387,186					2,387,186
03	Tack Coat Oil	2,871 TON			574,260					574,260
04	Prime Coat Oil	5,539 TON			1,107,720					1,107,720
Subtotal, DWA Material Prices									19,188,008	19,188,008
Resource Group ENG: Engineering, Construction Management										
CM	Construction Mgt on Directs +	890,602 \$100							5,343,612	5,343,612
ENGRG	Engineering & Survey on Directs +	890,602 \$100							7,124,816	7,124,816
Subtotal, Engineering, Construction Ma									12,468,428	12,468,428
Resource Group MAT: Material										
300	48" CMP	2,920 LF			182,500					182,500
304	Reinforcing Steel-Gr 60	108,703 LB			32,611					32,611
305	Ready Mix Concrete	1,008 CY			75,600					75,600
306	30" x 30" High Intensity Road Sign	40 EA			2,440					2,440
307	Steel Posts, Galv 10'	422 EA			11,183					11,183
308	Roadway Delineators (Including posts)	3,820 EA			41,638					41,638
309	6' Chain Link Fence w/3 Strands Barb	3,600 LF			23,220					23,220
310	14' Wide Double Swing Gate	4 EA			1,772					1,772
311	Wood Poles 20'	16 EA			6,320					6,320
312	Metal Halide Lights-400 Watt	16 EA			6,560					6,560
313	Conductor/Conduit Allowance	16 EA			1,920					1,920
314	Security Trailer 12x50	2 EA			31,600					31,600
315	Generator 10kW	2 EA			16,400					16,400
316	Steel Fuel Tank 500 gal	2 EA			1,600					1,600
317	Sewage Holding Tank	2 EA			1,300					1,300
318	Cellular Phone	2 EA			500					500
319	Guard Rail, Corrugated, Galv, w/steel	23,444 LF			221,546					221,546
Subtotal, Material									658,710	658,710
Resource Group SIS: Small Tools & Supplies										
05	Small Tools & Supplies @ 5%						1,258,648			1,258,648

25-3-1

Morrison Knudsen Corp.
 Number: 391N627A
 Project: OCRWM Heavy Haul Road Upgrades

Other Resource Summary By Route
 Sorted By: Route, Resource Groups, Resour
 (Composite/Crew Resources ARE Expanded)

04/23/98
 8:25 am
 Page: 3

Resource Rate	Description	Quantity	Manhours	Labor	Perm. Mat'ls	Equip.	Supplies	Sub-Contracts	Misc	Total Cost
Route 2: Caliente Chalk Mt. Route										
Resource Group ENG: Engineering, Construction Management										
Subtotal, Engineering, Construction Ma		943,088	\$100						6,601,616	6,601,616
Resource Group MAT: Material										
300	48" CMP	800	LF		50,000					50,000
304	Reinforcing Steel-Gr 60	31,058	LB		9,317					9,317
305	Ready Mix Concrete	288	CY		21,600					21,600
307	Steel Posts, Galv 10'	182	EA		4,823					4,823
308	Roadway Delineators (including posts)	1,824	EA		19,882					19,882
309	6' Chain Link Fence w/3 Strands Barb	3,600	LF		23,220					23,220
310	14' Wide Double Swing Gate	4	EA		1,772					1,772
311	Wood Poles 20'	16	EA		6,320					6,320
312	Metal Halide Lights-400 Watt	16	EA		6,560					6,560
313	Conductor/Conduit Allowance	16	EA		1,920					1,920
314	Security Trailer 12x50	2	EA		31,600					31,600
315	Generator 10kW	2	EA		16,400					16,400
316	Steel Fuel Tank 500 gal	2	EA		1,600					1,600
317	Sewage Holding Tank	2	EA		1,300					1,300
318	Cellular Phone	2	EA		500					500
319	Guard Rail, Corrugated, Galv, w/steel	13,326	LF		125,931					125,931
Subtotal, Material		17,726	LF		322,745					322,745
Resource Group SIS: Small Tools & Supplies										
05	Small Tools & Supplies @ 5%						465,013			465,013
Resource Group SUB: Subcontracts										
301	Road Striping-Permanent Paint	306.1	MILES					168,355		168,355
302	Traffic Signal Allowance (2 red/yellow	1	PR					33,000		33,000
303	Drill & Develop Water Well	5	EA					375,000		375,000
Subtotal, Subcontracts		306.1	MILES					576,355		576,355
Resource Group SUP: Supplies										
302	Form Supplies	6,411	SF				9,616			9,616
303	Barrels w/flashers 36"x18"	578	EA				47,569			47,569
304	Traffic Warning Signs w/posts	58	EA				2,958			2,958
305	Portable Delineator Posts	20	EA				572			572
306	Paint	364.8	GAL				12,768			12,768
307	Temporary Striping Tape	12,038	LF				6,019			6,019
Subtotal, Supplies		6,411	SF				79,502			79,502
Resource Group TAX: Tax										
SIAX	Sales tax @ 7%				410,167		250,261			660,428

23-2-3

Morrison Knudsen Corp.
 Number: 391N627A
 Project: OCRMM Heavy Haul Road Upgrades

Other Resource Summary By Route
 Sorted By: Route, Resource Groups, Resour
 (Composite/Crew Resources ARE Expanded)

04/23/98
 8:25 am
 Page: 4

Resource Rate	Description	Quantity	Manhours	Labor	Perm. Mat'ls	Equip.	Supplies	Sub-Contracts	Misc	Total Cost
Route 2: Caliente Chalk Mt. Route										
Resource Group TAX: Tax										
Subtotal, Caliente Chalk Mt. Route		1,425,121 \$100			6,269,691		794,776	13,840,281	22,840,044	43,744,792
Route 3: Caliente Las Vegas Route										
Resource Group ADD: Contractor Overhead & Fee										
PRMFEE	Contractor Fee @ 10%								3,041,257	3,041,257
PRMOH	Contractor Overhead @ 10%								2,902,790	2,902,790
SUBOHF	Subcontractor Overhead & Fee							84,033		84,033
Subtotal, Contractor Overhead & Fee								84,033	5,944,047	6,028,080
Resource Group CONT: Contingency										
01	Contingency on Direct Cost @ 25%	349,720 \$100							8,743,000	8,743,000
02	Contingency on Engineering & CM @ 15%	52,879 \$100							793,185	793,185
Subtotal, Contingency		402,599 \$100							9,536,185	9,536,185
Resource Group DWA: DWA Material Prices										
01	AC 30 Oil	29,165 TON			5,833,060					5,833,060
02	Lime	9,210 TON			921,010					921,010
03	Tack Coat Oil	1,922 TON			384,336					384,336
04	Prime Coat Oil	69.36 TON			13,872					13,872
Subtotal, DWA Material Prices		40,366 TON			7,152,278					7,152,278
Resource Group ENG: Engineering, Construction Management										
CM	Construction Mgt on Directs +	377,710 \$100							2,266,260	2,266,260
ENGRG	Engineering & Survey on Directs +	377,710 \$100							3,021,680	3,021,680
Subtotal, Engineering, Construction Ma		755,420 \$100							5,287,940	5,287,940
Resource Group MAT: Material										
300	48" CMP	1,270 LF			79,375					79,375
301	18" RCP	150 LF			1,710					1,710
302	Precast Curb Inlet Box, Grate & Frame	1.837 EA			661					661
303	Pipe Bedding	101.0 TON			1,010					1,010
304	Reinforcing Steel-Gr 60	46,587 LB			13,976					13,976
305	Ready Mix Concrete	432 CY			32,400					32,400
307	Steel Posts, Galv 10'	256 EA			6,784					6,784
308	Roadway Delineators (including posts)	2,554 EA			27,839					27,839
309	6' Chain Link Fence w/3 Strands Barb	3,600 LF			23,220					23,220
310	14' Wide Double Swing Gate	4 EA			1,772					1,772
311	Wood Poles 20'	16 EA			6,320					6,320
312	Metal Halide Lights-400 Watt	16 EA			6,560					6,560
313	Conductor/Conduit Allowance	16 EA			1,920					1,920
314	Security Trailer 12x50	2 EA			31,600					31,600
315	Generator 10kW	2 EA			16,400					16,400
316	Steel Fuel Tank 500 gal	2 EA			1,600					1,600
317	Sewage Holding Tank	2 EA			1,300					1,300

AT
 C-2
 A

Morrison Knudsen Corp.
 Number: 391N627A
 Project: OCRWM Heavy Haul Road Upgrades

Other Resource Summary By Route
 Sorted By: Route, Resource Groups, Resour
 (Composite/Crew Resources ARE Expanded)

04/23/98
 8:25 am
 Page: 6

Resource Rate	Description	Quantity	Manhours	Labor	Perm. Mat'ls	Equip.	Supplies	Sub- Contracts	Misc	Total Cost
Route 4: Dry Lake Apex Route										
Resource Group DWA: DWA Material Prices										
Subtotal, DWA Material Prices		17,056 TON			3,028,096					3,028,096
Resource Group ENG: Engineering, Construction Management										
CM	Construction Mgt on Directs +	119,758 \$100							718,548	718,548
ENGRG	Engineering & Survey on Directs +	119,758 \$100							958,064	958,064
Subtotal, Engineering, Construction Ma		239,516 \$100							1,676,612	1,676,612
Resource Group MAT: Material										
300	48" CMP	20 LF			1,250					1,250
301	18" RCP	150 LF			1,710					1,710
302	Precast Curb Inlet Box, Grate & Frame	1,837 EA			661					661
303	Pipe Bedding	101.0 TON			1,010					1,010
304	Reinforcing Steel-Gr 60	5,176 LB			1,553					1,553
305	Ready Mix Concrete	48 CY			3,600					3,600
307	Steel Posts, Galv 10'	6 EA			159					159
308	Roadway Delineators (including posts)	48 EA			523					523
Subtotal, Material		170 LF			10,466					10,466
Resource Group STS: Small Tools & Supplies										
05	Small Tools & Supplies @ 5%						156,985			156,985
Resource Group SUB: Subcontracts										
301	Road Striping-Permanent Paint	420.5 MILES						231,275		231,275
302	Traffic Signal Allowance (2 red/yellow)	1 PR						33,000		33,000
Subtotal, Subcontracts		420.5 MILES						264,275		264,275
Resource Group SUP: Supplies										
301	Landfill Disposal Fee	198.8 LCY					497			497
302	Form Supplies	1,068 SF					1,603			1,603
303	Barrels w/flashers 36"x18"	567 EA					46,664			46,664
304	Traffic Warning Signs w/posts	19 EA					969			969
305	Portable Delineator Posts	57 EA					1,630			1,630
306	Paint	820.4 GAL					28,714			28,714
307	Temporary Striping Tape	27,073 LF					13,537			13,537
Subtotal, Supplies		198.8 LCY					93,614			93,614
Resource Group TAX: Tax										
STAX	Sales Tax @ 7%				212,699		86,074			298,773

28
 3-3-5

Morrison Knudsen Corp.
 Number: 391N627A
 Project: OCRWM Heavy Haul Road Upgrades

Other Resource Summary By Route
 Sorted By: Route, Resource Groups, Resour
 (Composite/Crew Resources ARE Expanded)

04/23/98
 8:25 am
 Page: 7

Resource Rate	Description	Quantity	Manhours	Labor	Perm. Mat'ls	Equip.	Supplies	Sub-Contracts	Misc	Total Cost
Route 4: Dry Lake Apex Route										
Resource Group TAX: Tax										
Subtotal, Dry Lake Apex Route		367,312			3,251,261		336,673	264,275	6,606,800	10,459,009
Route 5: Sloan Jean Route										
Resource Group ADD: Contractor Overhead & Fee										
PRMFEE	Contractor Fee @ 10%								1,024,403	1,024,403
PRMOH	Contractor Overhead @ 10%								957,912	957,912
Subtotal, Contractor Overhead & Fee									1,982,315	1,982,315
Resource Group CONT: Contingency										
01	Contingency on Direct Cost @ 25%	115,814	\$100						2,890,350	2,890,350
02	Contingency on Engineering & CM @ 15%	17,457	\$100						261,855	261,855
Subtotal, Contingency		133,071	\$100						3,152,205	3,152,205
Resource Group DWA: DWA Material Prices										
01	AC 30 Oil	12,747	TON		2,549,391					2,549,391
02	Lime	4,025	TON		402,535					402,535
03	Tack Coat Oil	974.1	TON		194,820					194,820
04	Prime Coat Oil	70.38	TON		14,076					14,076
Subtotal, DWA Material Prices		17,817	TON		3,160,822					3,160,822
Resource Group ENG: Engineering, Construction Management										
CH	Construction Mgt on Directs +	124,694	\$100						748,164	748,164
ENGRG	Engineering & Survey on Directs +	124,694	\$100						997,552	997,552
Subtotal, Engineering, Construction Ma		249,388	\$100						1,745,716	1,745,716
Resource Group MAT: Material										
300	48" CMP	20	LF		1,250					1,250
301	18" RCP	190	LF		2,166					2,166
302	Precast Curb Inlet Box, Grate & Frame	2,327	EA		838					838
303	Pipe Bedding	1,280	TON		1,280					1,280
304	Reinforcing Steel-Gr 60	5,176	LB		1,553					1,553
305	Ready Mix Concrete	48	CY		3,600					3,600
306	30" x 30" High Intensity Road Sign	3	EA		183					183
307	Steel Posts, Galv 10'	9	EA		239					239
308	Roadway Delineators (including posts)	48	EA		523					523
Subtotal, Material		210	LF		11,632					11,632
Resource Group SIS: Small Tools & Supplies										
05	Small Tools & Supplies @ 5%						163,782			163,782

22
 3-3-98