November 13, 2003

Conceptual Design Analysis

Construction and Operation issues associated with
the co-location of rail sidings to serve the
Department of Energy's potential Yucca Mountain related
Inter-Modal Transfer Facility and the rail sidings to serve
Meadow Valley Industrial Park

prepared for

Board of Lincoln County Commissioners

&

City of Caliente

AWMiller Consulting, Inc.

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1.0 INTRODUCTION

1.1 Purpose of Report

This concept design analysis provides information on alternatives for a single pair of rail sidings supporting the Meadow Valley Industrial Park (MVIP) and how co-location of the potential Department of Energy (DOE) Inter-Modal Transfer Facility might compliment or conflict with alternatives for rail sidings required to support the MVIP. In support of this analysis, this report provides conceptual track layouts and estimated construction cost for design and construction of the rail sidings that support the MVIP, as well as a conceptual track layout based on the layout depicted on Figure 8.6 of the Yucca Mountain Environmental Impact Study (EIS) with any additional estimated construction costs that may be directed to the City of Caliente, owing to the co-location of the potential DOE Facility.

1.2 Project Location and Description

The proposed site is located in Lincoln County, Nevada, approximately 1.5 miles south of the City of Caliente and along the Union Pacific Railroad (UPRR) main line for approximately one mile. The west Right-of-Way line for the UPRR main line track is the east boundary of the proposed site. The UPRR west Right-of-Way line is 100 ft. from the centerline of the main line track. Just to the east of the Right-of-Way line is the Lincoln County Power Line (2.2kv), which runs parallel to the main line track. A dirt access road is located just west of the westerly UPRR Right-of-Way and parallel to the power line. This road provides access to the wastewater treatment plant for the City of Caliente. The sanitary sewer main line to the treatment plant is located within the dirt access road limits. The MVIP property adjoins the proposed site to the north.

Figure 1.1, of this report, shows the project site in a statewide context. It's location within Lincoln County is illustrated in Figure 1.2, of this report. Figure 1.3, of this report, provides a more precise location in the immediate vicinity of the City of Caliente.

From the topographic representation depicted in Figure 1.3, of this report, the proposed site sheet drains from the mountains on the west side to the southeast. A small portion of the storm water collects in the drainage channel on the west side of the UPRR main line and located within the UPRR Right-of-Way. This storm water flows to the south to a bridge culvert turns and flows to the east under the main line track. The majority of the storm water from the proposed site collects at the south end of the site and ponds at the base of the mountains.

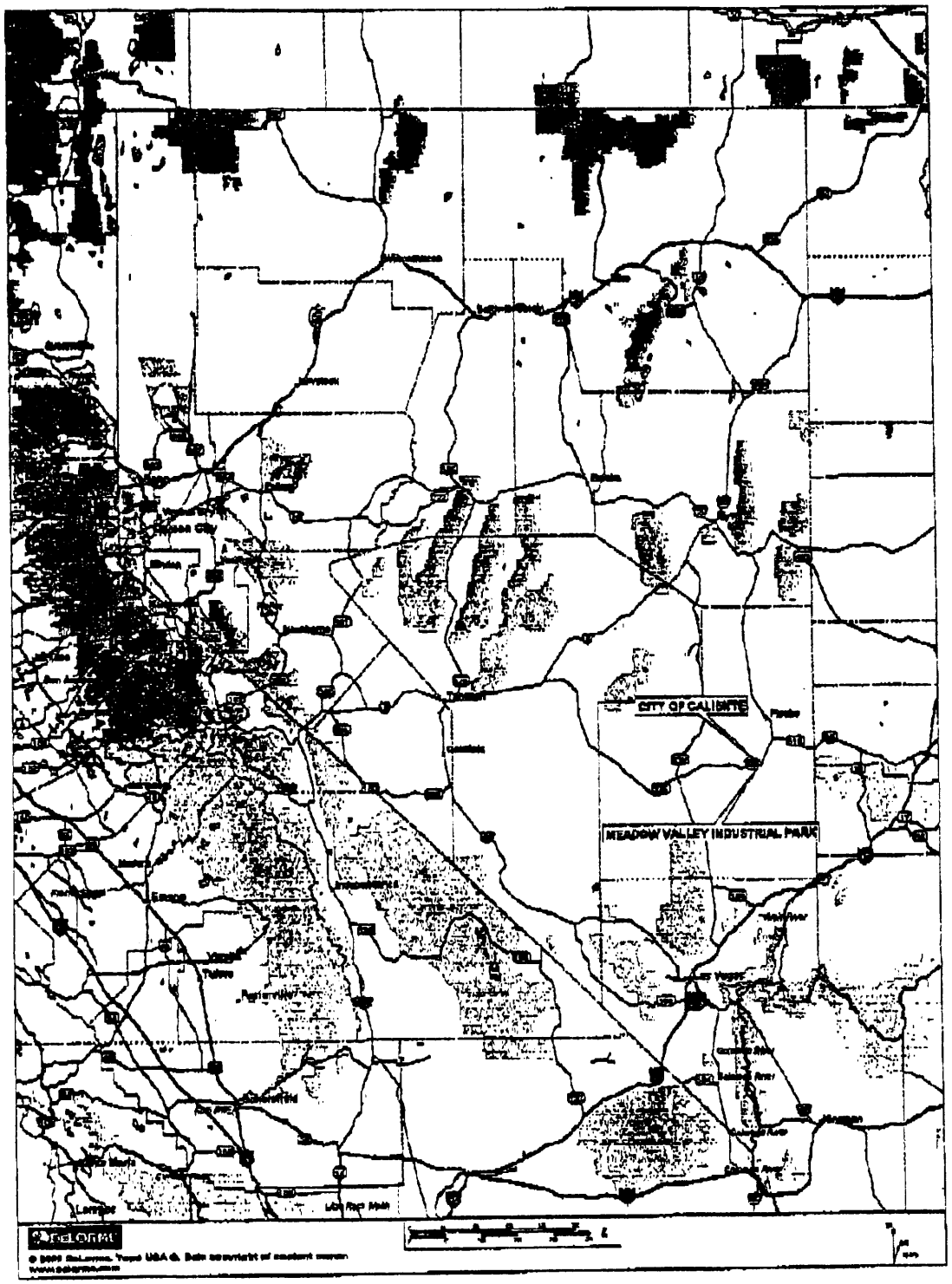

Figure 1.1

State Wide Project Location

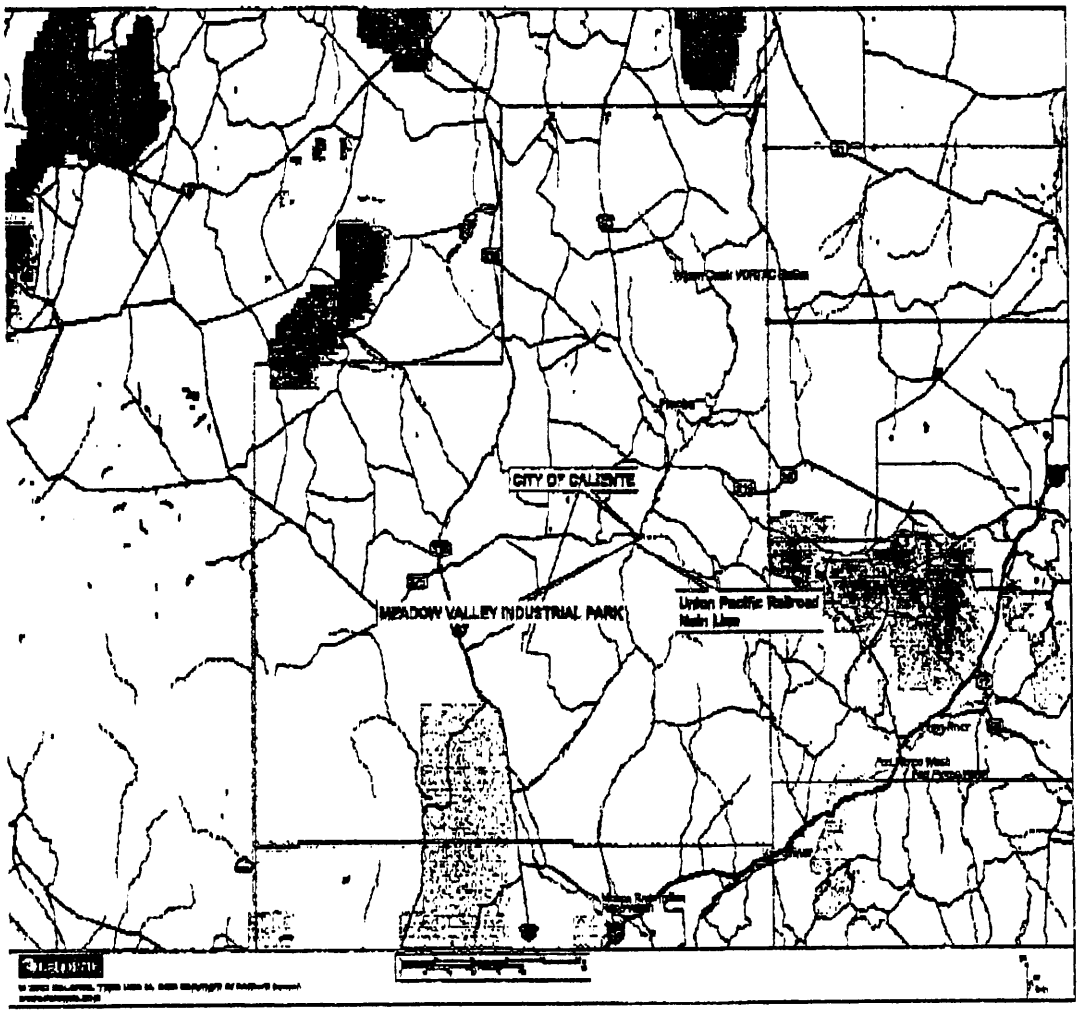

Figure 1.2

Project Location within Lincoln County

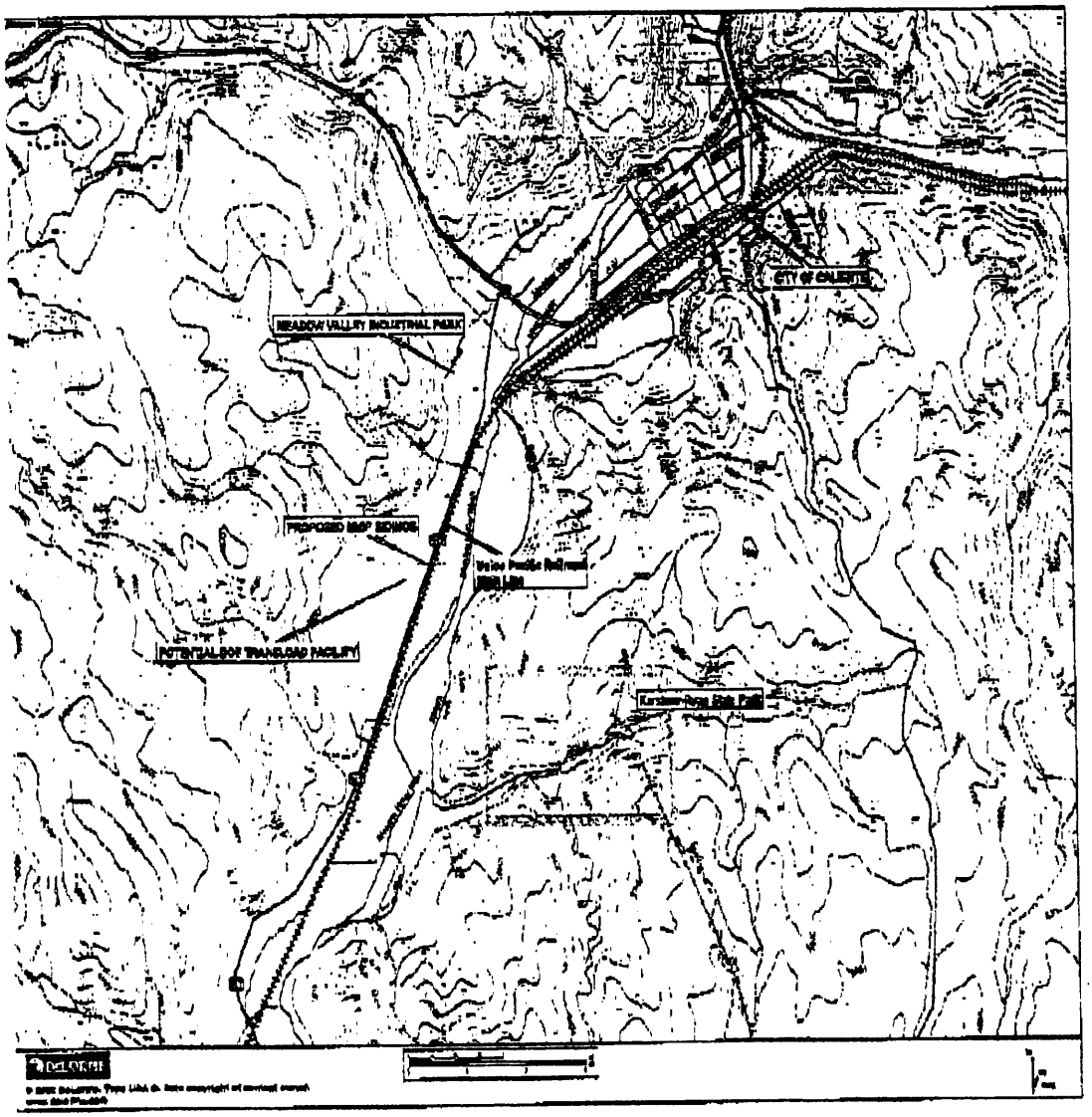

Figure 1.3

MVIP Vicinity Map

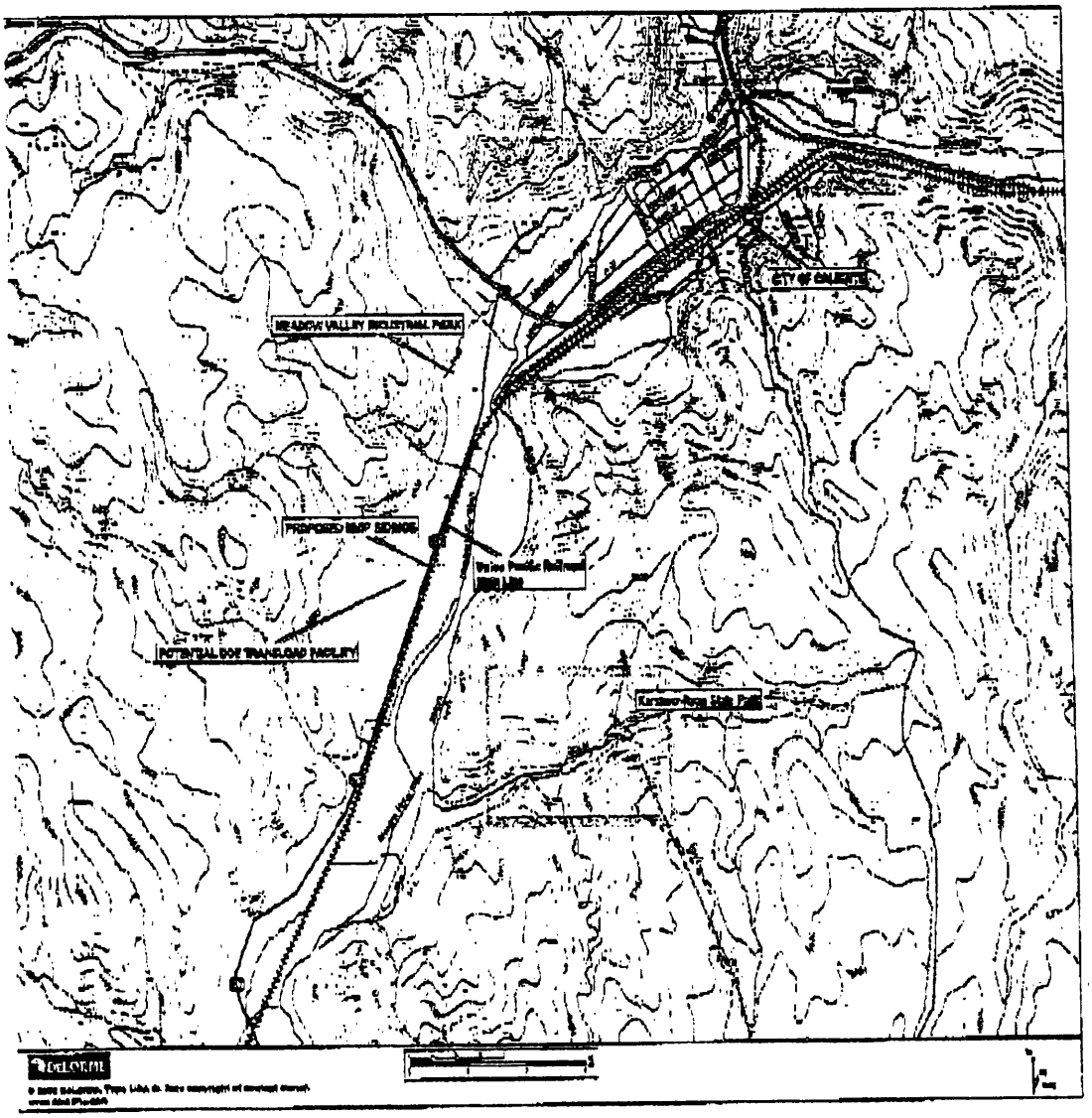

Figure 1.3

MVIP Vicinity Map

1.3 Project Background

The City of Caliente is in the process of developing the Meadow Valley Industrial Park, which will be rail served. For the UPRR to serve the MVIP, two 2,000 ft. long rail sidings located parallel to the main line tracks is being required by the UPRR. The location, as suggested by the UPRR, is just south of the MVIP. This particular location appears to be the only viable location due to the existing topography and the existing alignment of the UPRR main line track. The length of the sidings was determined by the UPRR based on the anticipated maximum number of rail cars the MVIP may require.

The Department of Energy (DOE) has also designated this site for a Potential Inter-Modal Transfer Facility, which is to be rail served, for spent nuclear fuel and high-level radioactive waste destined for a possible repository at Yucca Mountain. Reference the Environmental Impact Study (EIS) Chapter 8 – Figure 8.8 (included in this report as Figure A).

In recognition of the need for the rail sidings to serve the MVIP, the City of Caliente has retained the firm of AWMiller Consulting, Inc. to analyze, identify and evaluate the design considerations regarding mitigation of co-location issues between the MVIP Rail Siding Project and the proposed DOE Inter-Modal Transfer Facility along with the associated estimated construction costs.

1.4 Project Need

The MVIP Rail Siding Project is essential to support the rail served industries that locate within the Park. The City of Caliente is concerned that the potential DOE Inter-Modal Transfer Facility may preempt the ability of the City to develop rail sidings needed to serve the MVIP. If co-location conflicts are mitigated, development of rail infrastructure required by DOE to serve the potential DOE Inter-Modal Transfer Facility could reduce the costs of the MVIP rail sidings.

2.0 MEADOW VALLEY INDUSTRIAL PARK (MVIP)

As a result of a preliminary review of the conceptual track layout, as presented in figure 2.1, of this report, by the UPRR, the following conditions set forth by the UPRR to effectively service the MVIP were verified:

- Two double ended tracks running parallel to the UPRR main line having a minimum of 2,000 track feet of storage area.
- UPRR will only do direct set outs and/or pick ups from the sidings.
- The MVIP would need to contract with an independent switching company to serve the industries located within the MVIP.

2.1 DESCRIPTION (Figure 2.1)

The two MVIP sidings, as required by the UPRR, will locate adjacent and parallel to the UPRR main line and west of the UPRR maintenance road within the 100 ft. wide UPRR Right-of-Way. The MVIP Sidings would tie into the UPRR main line on the north end using a No.11 Turnout, with the required UPRR leaving signal. The point of switch would be located approximately 350 ft. south of the existing UPRR point of switch for the No.1 and No.2 main line turnout. A No.11 Turnout, with the required UPRR leaving signal, would be used for the south main line tie-in. The point of switch would be located approximately 510 ft. north of the existing bridge culvert. Re-alignment of the existing UPRR maintenance road and timber crossings would be required, as well as a Derail at both ends of the MVIP sidings. The MVIP Lead Track, connecting the MVIP sidings with the MVIP site, would be a continuation of Track M-2 to the north to include a timber crossing at the existing UPRR maintenance road while continuing to the north to tie into the MVIP lead track, as designed by AMEC Infrastructure, Inc.

2.2 SWITCHING OPERATIONS

2.2.1 Union Pacific Railroad

The UPRR does not currently have a local switching operation for the Caliente, Nevada area. Therefore, the UPRR will only set out the required rail cars for the MVIP on Track M-1 and pick-up rail cars on the parallel Track M-2 on an as needed basis.

2.2.2 Independent Switching Company

An Independent Switching Company will be needed to switch the rail cars set out by the UPRR on Track M-1 and deliver them to the appropriate industrial facilities located in the MVIP. The Switching Company will also be required to pick up the rail cars from the facilities located in the MVIP and spot them on Track M-2 for UPRR pick up.

2.3 RAIL CAR CAPACITY

The capacity of the two 2,000 foot sidings will be set at 30 rail cars on each track (based on 65' long rail cars). This rail car capacity was established by the UPRR as a minimum requirement for the MVIP.

2.4 CONCLUSION

Based on the existing UPRR main line track alignment, this scenario, as presented in figure 2.1, of this report, is the only logical location for the sidings supporting the MVIP. The north turnout is located as far north as possible on the UPRR main line so as to minimize the length of the MVIP lead track and to clear the existing UPRR signalization for the No.1 & No.2 main line turnout located at sta. 65+50.2. Other alternatives would be to slide the MVIP sidings to the south along the alignment of the UPRR main line, maintaining the same track layout. This would only lengthen the MVIP lead track as well as increase the cost of the project.

CONCEPTUAL TRACK LAYOUT
MEADOW VALLEY INDUSTRIAL PARK SIDINGS
NEVADA
FIGURE 2.1
MEADOW VALLEY INDUSTRIAL PARK
LIMITS OF PROJECT SITE
LIMITS OF PROJECT SITE
LEGEND

3.0 ALTERNATIVES – POTENTIAL DOE FACILITY INTERFACE

The following scenarios are presented in two parts.

- **Scenario A1** assumes the MVIP Sidings are in place prior to the potential DOE Facility track.
- **Scenario A2** assumes the DOE Facility track is in place prior to the MVIP Sidings.

As a result of a preliminary review by the UPRR, the following has been recommended for this report:

- Minimize the number of turnouts from the UPRR main line track.
- The potential DOE Inter-Modal Transfer Facility can be served, by the UPRR, with a single-ended lead track.

The DOE Yucca Mountain Repository Development Office has not compiled a working scenario for the potential Caliente Inter-Modal Transfer Facility at the writing of this report. However, the track layout, as depicted in Figure A, of this report (EIS Figure 8.6), was used to compile the conceptual track layouts for the Potential DOE Facility. This conceptual track layout is merely used to consider possible conflicts with the MVIP Sidings layout and the possible tie-ins to the UPRR main line.

The existing Caliente wastewater treatment plant will remain in place for purposes of this report.

3.1 SCENARIO A1 - Description (Figure 3.1)

With the MVIP sidings in place, as described in Section 2.0 of this report, the DOE lead track could to tie into the UPRR main line track at sta. 106+46.3, using a No.15 power operated turnout, as indicated in Figure 3.1 of this report. The DOE lead track alignment would continue to the north within the UPRR right-of-way, clearing the entrance to the existing wastewater treatment plant and crossing the existing drainage channel. Upon leaving the UPRR right-of-way, the DOE lead track will cross under the existing overhead power line, over the existing sanitary sewer main line and across the existing dirt access road prior to entering into the actual site for the potential DOE Inter-Modal Transfer Facility.

3.1.1 SUMMARY

It would be the responsibility of the DOE Caliente Inter-Modal Transfer Facility Project to modify the crossings described above, to meet with all requirements imposed by the governing agencies and/or owning utility companies.

3.2 SCENARIO A2 - Description (figure 3.2)

With the Potential DOE Inter-modal Transfer Facility track project in place, the MVIP sidings would be constructed as indicated in section 2.0, of this report. However, it is anticipated that the UPRR will require the south end of the MVIP sidings to tie into the DOE lead track, shown in figure 3.2, of this report, as a measure to reduce the number of turnouts in their main line. This could be accomplished by removing a portion of the DOE lead track and installing a No.9 turnout that would align with the MVIP sidings as described in section 2.0.

3.2.1 SUMMARY

It would be beneficial for the City of Caliente to coordinate with the Potential DOE Inter-modal Transfer Facility project engineers regarding the design of the alignment of the DOE lead track to accommodate the MVIP siding tie in. This Scenario would require the approval by the Potential DOE Facility as well as the UPRR Operations.

CONCEPTUAL TRACK LAYOUT - SCENARIO A1
UPRR - LVVP - DOE INTERFACE
NEVADA

FIGURE 3.1

CONCEPTUAL TRACK LAYOUT - SCENARIO A2
UPRR - IWP - DOE INTERFACE
EMERTE NEVADA

FIGURE 3.2

LEGEND

MEADOW VALLEY INDUSTRIAL PARK

LIMITS OF PROJECT SITE

LIMITS OF PROJECT SITE

3.3 SCENARIO B1 - Description (Figure 3.3)

With the MVIP sidings in place, as described in section 2.0 of this report, the DOE track could to tie into the UPRR main line track at sta. 115+02.6, as indicated in figure 3.3 of this report. The DOE lead track alignment would continue to the north and within the UPRR right-of-way. Upon leaving the UPRR right-of-way, the DOE lead track will cross under the existing overhead power line, and across the existing access road prior to entering into the Potential DOE Inter-Modal Transfer Facility.

3.3.1 SUMMARY

It will be the responsibility of the DOE Caliente Inter-Modal Transfer Facility Project to modify the crossings described above, to meet all requirements imposed by the governing agencies and/or owning utility companies.

3.4 SCENARIO B2 – Description (Figure 3.4)

With the DOE track project in place, the MVIP sidings would be constructed as indicated in section 2.0, of this report.

3.4.1 SUMMARY

The DOE Caliente Inter-Modal Transfer Facility Project will have no impact on the MVIP sidings project.

CONCEPTUAL TRACK LAYOUT - SCENARIO 3
UPRR - MVIP - DOE NTTSF/ACE
CALIENTE NEVADA

FIGURE 3.3

CONCEPTUAL TRACK LAYOUT - SCENARIO C
UPRR - MVP - DOE INTERFACE
CALIENTE NEVADA

FIGURE 3.4

3.5 SCENARIO C1 – Description

With the MVIP sidings in place, as described in section 2.0 of this report, the DOE track is anticipated to tie into the UPRR main line track at two points using No.15 power operated turnouts forming a wye track, as indicated in figure 3.3, of this report. The south tie in point is would be at sta. 115+02.6. The north tie in of the wye track would be required to tie in at sta. 101+37.8. Due to the restrictive nature of a wye track, this would require the Potential DOE track project to remove a portion of the MVIP sidings as well as to relocate the turnout to sta. 97+87.8 to clear the DOE turnout and signalization.

3.5.1 SUMMARY

This scenario, as presented, would enhance the DOE track project from the stand point of UPRR switching operations. However, this Scenario will greatly reduce the capacity of the MVIP sidings, which will limit the development on the Industrial Park as planned by the City of Caliente. Also, this Scenario presents four turnouts in the UPRR main line, which may be rejected by the UPRR. Therefore, this scenario, as presented, would present undo limitations to the development of the MVIP by the City of Caliente as well as face possible rejection by the UPRR.

4.0 ESTIMATED COSTS

4.1 CONSTRUCTION COST

The estimated construction cost for all the conceptual layouts are based on current (2003) dollars with no allowance for inflation. The major construction items are identified for each conceptual layout. The estimated unit prices for each identified major construction item were extracted from examination of bid documents of previous projects. Also from the examination of bid documents of previous projects, the costs of the remaining unidentified construction items generally totaled at about 16% of the sum of the costs for the identified major items. An amount of 10% was selected for this project.

The costs for design engineering, construction administration and contingencies were estimated at 7%, 15%, and 3% respectively for a sum of 25% of estimated construction costs. Figure 4.1, of this report, provides a summary of the construction cost estimates for each conceptual scenario.

MEADOW VALLEY INDUSTRIAL PARK
RAIL SIDINGS
CONSTRUCTION COST ESTIMATES

				SCENARIO A1		SCENARIO A2		SCENARIO B		SCENARIO C	
ITEM	DESCRIPTION	UNIT	UNIT COST ($)	QUANTITY	AMOUNT ($)	QUANTITY	AMOUNT ($)	QUANTITY	AMOUNT ($)	QUANTITY	AMOUNT ($)
1	GRADING	CY	15.00	8,000	120,000.00	8,000	120,000.00	8,000	120,000.00	5,800	87,000.00
2	TRACK	TRK FT	100.00	6,070	607,000.00	5,880	588,000.00	6,070	607,000.00	4,400	440,000.00
3	No. 9 TURNOUT	EA	30,000.00	5	150,000.00	5	150,000.00	5	150,000.00	5	150,000.00
4	D.P.S.S. DERAIL	EA	11,500.00	2	23,000.00	2	23,000.00	2	23,000.00	2	23,000.00
5	TIMBER CROSSING	LF	165.00	60	9,900.00	40	6,600.00	60	9,900.00	60	9,900.00
6 [1]	No.11 TURNOUT W/LEAVING SIGNAL	EA	350,000.00	2	700,000.00	1	350,000.00	2	700,000.00	2	700,000.00
7	BALLAST	TON	20.00	5,550	111,000.00	5,350	107,000.00	5,550	111,000.00	4,000	80,000.00
8 [2]	GRADING RE-ALIGNMENT	CY	15.00			750	11,250.00				
9 [2]	TRACK RE-ALIGNMENT	TRK FT	20.00			600	12,000.00				
10 [3]	No. 9 TURNOUT AT DOE LEAD TRACK	LS				1	37,500.00				
11											
12											
13	SUBTOTAL - IDENTIFIED ITEMS				1,720,900.00		1,403,350.00		1,720,900.00		1,489,900.00
14	MOBILIZATION	LS	6,500.00	1	6,500.00	1	6,500.00	1	6,500.00	1	6,500.00
15	UNIDENTIFIED ITEMS - 10%	LS		1	172,090.00	1	140,335.00	1	172,090.00	1	148,990.00
16											
17											
18	TOTAL - CONSTRUCTION				1,899,490.00		1,550,185.00		1,899,490.00		1,645,390.00
19	ENGR. - CM - CON. - 25%	LS		1	474,872.50	1	387,546.25	1	474,872.50	1	411,347.50
20	TOTAL - PROJECT				2,374,362.50		1,937,731.25		2,374,362.50		2,056,737.50

1 CONSTRUCTION BY UPRR FORCES AT OWNERS EXPENSE
2 IF COORDINATION IS NOT ACCOMPLISHED WITH THE POTENTIAL DOE FACILITY AND PENDING APPROVAL BY THE POTENTIAL DOE FACILITY
3 PENDING APPROVAL FROM THE POTENTIAL DOE FACILITY

Figure 4.1

5.0 CONCLUSIONS & RECOMMENDATIONS

5.1 SCENARIO A1 (Section 3.1 – Figure 3.1)

In the case where the MVIP sidings are constructed first, the track geometry of both projects, as presented in Figure 3.1, of this report, indicate that the MVIP sidings could co-exist with the Potential DOE Inter-Modal Transfer Facility without any additional construction costs directed to the City of Caliente. There would be no impact on the MVIP siding project, other than a close proximity during the construction phase.

Potential security issues imposed by this potential DOE Facility may prohibit this scenario, due to the close proximity of the tracks at the south end of the MVIP siding project.

5.2 SCENARIO A2 (Section 3.2 – Figure 3.2)

Should the DOE Inter-Modal Transfer Facility be constructed first, the track geometry of both projects, as presented in Figure 3.2, of this report, indicate that the MVIP sidings could co-exist with the Potential DOE Inter-Modal Transfer Facility, however, there could be additional cost directed to the City of Caliente. These costs could be as much as $436,630.00 (reference Figure 4.1 – Items 6, 8, 9 & 10), which could be one-half of the cost to construct the portion of lead track to be used by both projects. In addition maintenance fees for the co-use of track could be incurred.

Potential security issues imposed by this Potential Doe Facility may prohibit this scenario, due to the co-use of the potential DOE Facility track at the south end of the MVIP siding project.

5.3 SCENARIO B1 & B2 (Section 3.3 & 3.4 – Figure 3.3)

Under the alternative conceptual layouts for each of these scenarios, the track geometry of both projects, as presented in Figure 3.3, of this report, indicate that the MVIP sidings could co-exist with the Potential DOE Inter-Modal Transfer Facility without any additional construction costs directed to the City of Caliente. There would be no impact on the MVIP siding project.

It appears that any security issues imposed by this Potential DOE Facility would not affect the MVIP siding project.

5.4 Scenario C1 (Section 3.5 – Figure 3.4)

With the MVIP sidings constructed first under this alternative layout, the track geometry of both projects, as presented in Figure 3.3, of this report, indicate that the MVIP sidings could co-exist with the Potential DOE Inter-Modal Transfer Facility without any additional construction costs directed to the City of Caliente. However, there would be a substantial impact to the MVIP siding project. The rail car capacity would be reduced to 17 cars from the UPRR recommended capacity of 30 cars. This scenario would permanently limit the UPRR to a maximum delivery of 17 cars per day to the MVIP, and in turn, limit the potential development of the rail served industries within the MVIP. Furthermore, this scenario provides for four turnouts on the UPRR main line, which may be unacceptable to the UPRR. Therefore, this alternative is considered as a no-build scenario.

6.0 EXISTING IMPROVEMENTS

6.1 Modification of Existing Improvements

The following is a list of the existing improvements that would require modification by the City of Caliente and/or the DOE for the MVIP siding project and/or DOE Inter-Modal Transfer Facility siding project, with a brief description.

- **Drainage Channel**
  Narrow the channel to accommodate the new siding tracks and roadbed, and maintaining the current flows

- **UPRR Maintenance Road**
  Re-align to accommodate the track tie-ins on the UPRR main line at both the north and south ends of the project.

- **Access Road**
  Re-align to meet the alignment of the Access Road at the north end of the project, as designed by AMEC Infrastructure, Inc.

- **Sanitary Sewer Line**
  A portion of the sewer line may need to be re-aligned or steel encased to accommodate the alignment of the MVIP lead track. A more accurate location of the sewer line will have to be made to verify this modification.

- **Lincoln County Power Line (2.2kv)**
  Possible removal/relocation of one or two power poles, due to alignment of the Access Road at the north end of the project.

- **Fencing**
  Re-alignment/relocation and/or installation of gates at the UPRR maintenance road at the north end of the project.

- **Fiber Optic Cables**
  Re-alignment/relocation.

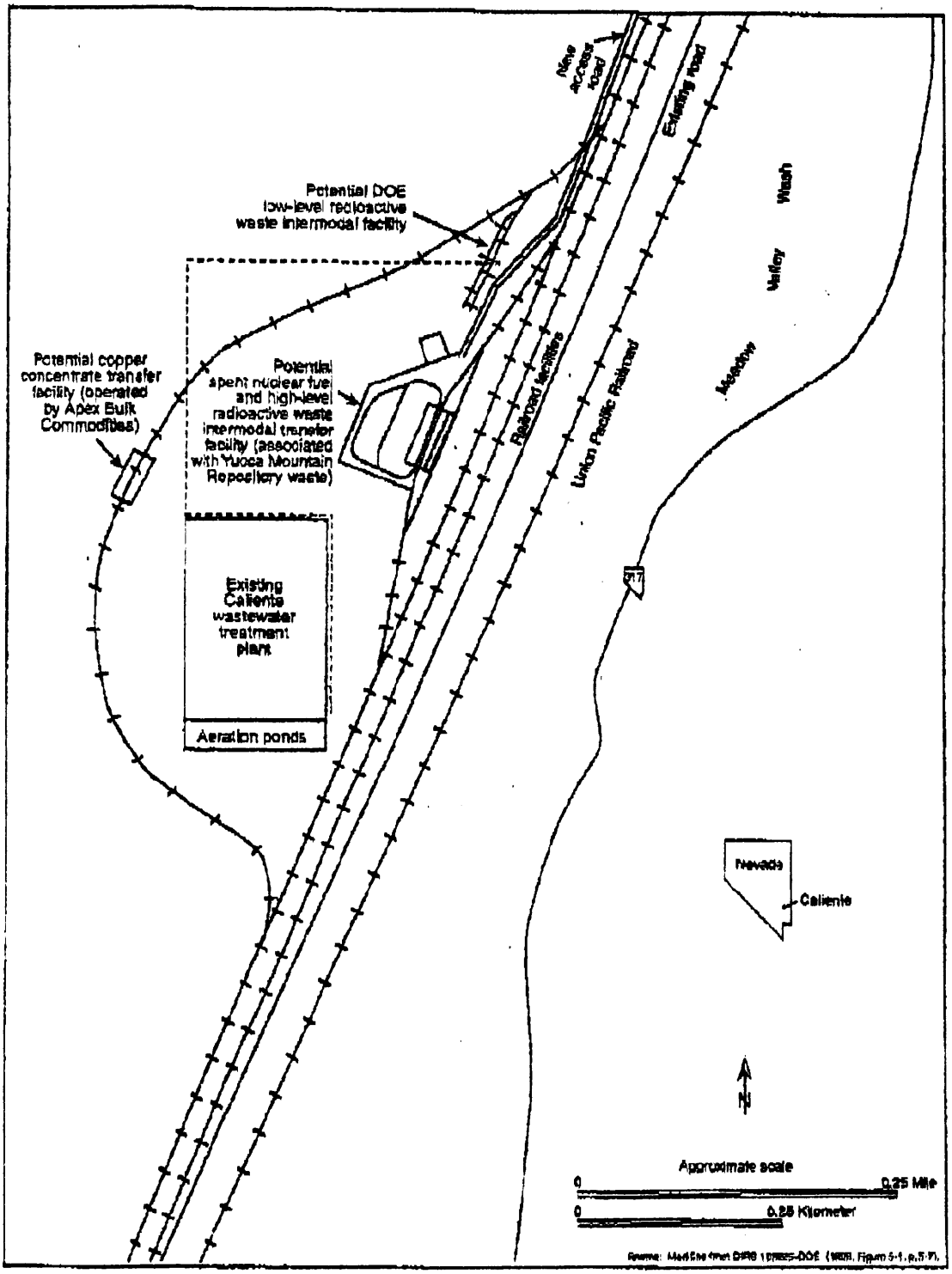

Figure 8-6. Potential locations of intermodal transfer stations at Caliente.

Figure A