ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

draft MINIMUM REQUIREMENTS DECISION GUIDE WORKBOOK

"…except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act…"

-- The Wilderness Act of 1964

Project Title: Calnev Pipeline Cathodic Protection

MRDG Step 1: Determination

Determine if Administrative Action is Necessary

Description of the Situation

What is the situation that may prompt administrative action?

*Calnev Pipeline, Inc. needs to protect the integrity of two existing underground petroleum pipelines to reduce the potential for future releases of petroleum products within Soda Lake in Mojave National Preserve. One 8 5/8" pipeline and one 14" pipeline lie parallel to each other, and are collectively referred to as the **Calnev Pipeline**. Pipeline segments crossing Soda Lake are subject to a corrosive environment which has depleted the existing cathodic protection system, sacrificial magnesium anodes; as a result, the coating on the 8-inch pipeline is now deteriorating. To prevent further deterioration of the pipeline coating and potential subsequent petroleum releases, the spent cathodic protection system needs to be replaced.*

Options Outside of Wilderness

Can action be taken outside of wilderness that adequately addresses the situation?

☐ YES

☐ NO

Explain:

To address this issue outside of wilderness, Calnev Pipeline, Inc. would need to relocate both pipelines – one 8 5/8" and one 14" – outside of wilderness. Calnev Pipeline, Inc. submitted an application for a BLM right-of-way grant to install a 16" pipeline parallel to the 8 5/8" and 14" pipelines, with a diversion from Zzyzx Road to Halloran Summit where it would run north and west of Interstate highway 15 on BLM lands to avoid Mojave National Preserve. Calnev Pipeline, Inc. refused to consider this option due to associated costs (Allan Campbell, Kinder Morgan Energy Partners, 07/24/2012 meeting at Mojave National Preserve, Barstow, CA). The ROW grant for the 8 5/8" pipeline was issued for an indefinite period; therefore, Calnev Pipeline, Inc. will continue to operate the 8 5/8" pipeline where it is currently placed. In 2014, the BLM renewed the ROW grant for the 14" pipeline on BLM lands for a period of 20 years, and issued a separate

Criteria for Determining Necessity

Is action necessary to meet any of the criteria below?

A. Valid Existing Rights or Special Provisions of Wilderness Legislation

*Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that **requires** action? Cite law and section.*

☐ YES ☑ NO

Explain:

*There are no special provisions in the California Desert Protection Act of 1994 which designated the Mojave Wilderness, for the continued operation of the **Calnev Pipeline** in the Mojave Wilderness.*

B. Requirements of Other Legislation

Is action necessary to meet the requirements of other federal laws? Cite law and section.

☑ YES ☐ NO

Explain:

Calnev Pipeline, Inc. holds existing rights under the Mineral Leasing Act to operate its 8 5/8" and 14" pipelines in the Mojave Wilderness (Mineral Leasing Act, 30 USC 184 Sec 17(l)). The right-of-way grants issued by the Bureau of Land Management – BLM reference #s LA-0168855, LA-0168999, and CACA-053529-01 – allow Calnev Pipeline, Inc. to construct, maintain, and decommission for the 8 5/8" and 14" pipelines. The ROW grant for the 8 5/8" pipeline was issued for an indefinite period; in 2014, the BLM renewed the ROW grant for the 14" pipeline on BLM lands for a period of 20 years, and issued a separate ROW grant for the pipeline segment on NPS lands for a period of 10 years. The Department of Interior Solicitor determined the right-of-way grants for the initial construction of the 8 5/8" and 14" pipelines pre-exist the establishment of Mojave National Preserve, and continue to be valid (DOI Solicitor Opinion, Barbara Goodyear & Kevin Tanaka, 04/29/2013 via email).

The Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011 (Public Law 112–90) renewed pipeline safety programs established under previous renewals and amendments to the first Natural Gas Pipeline Safety Act of 1968. The Pipeline & Hazardous Materials Safety Administration (PHMSA), under the

C. Wilderness Character

Is action necessary to preserve one or more of the qualities of wilderness character including: Untrammeled, Undeveloped, Natural, Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation, or Other Features of Value?

UNTRAMMELED

☐ YES ☑ NO

Explain:

*The continued existence, operation, inspection, and maintenance of the **Calnev Pipeline** within the Mojave Wilderness compromises the untrammeled quality of wilderness character. The active operation, inspection, and maintenance of the **Calnev Pipeline** intrude on any potential of Soda Lake to be free from modern human control or manipulation. Installation of a cathodic protection system would not preserve the untrammeled quality of the Mojave Wilderness.*

UNDEVELOPED

☐ YES ☑ NO

Explain:

*The continued existence, operation, inspection, and maintenance of the **Calnev Pipeline** within the Mojave Wilderness compromises the undeveloped quality of wilderness character. While the pipelines are installed underground, they are indicated by a series of above-ground markers and are connected to 39 test stations, two solar impressed current stations, one fenced rectifier, one block valve and possible other ancillary facilities as yet not identified by Calnev Pipeline, Inc.. In addition to the **Calnev Pipeline**, within a vicinity of less than one mile to the **Calnev Pipeline** right-of-way lie two other linear right-of-way corridors – underground fiber-optic cables owned and operated by AT&T and by Sprint. All three ROWs are indicated by access roads and above-ground markers. Installation of a cathodic protection system would not preserve the undeveloped quality of the Mojave Wilderness.*

NATURAL

☑ YES ☐ NO

Explain:

*Soda Lake is a natural feature of Mojave National Preserve and the Mojave Wilderness. This playa overlies the underground terminus of the Mojave River, an inland-flowing watershed. The continued existence, operation, inspection, and maintenance of the **Calnev Pipeline** within the Mojave Wilderness compromises the natural quality of wilderness character. The installation of a cathodic protection system is necessary to prevent petroleum releases that would negatively affect the natural quality of the Mojave Wilderness.*

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

☐ YES ☑ NO

Explain:

*The continued existence, operation, inspection, and maintenance of the **Calnev Pipeline** within the Mojave Wilderness compromises the wilderness quality of solitude or primitive and unconfined recreation. In addition to underground pipes, the **Calnev Pipeline** includes numerous above-ground ancillary facilities: 39 test stations, two solar impressed current stations, one fenced rectifier, one block valve, and possible other facilities. Calnev Pipeline, Inc. personnel periodically monitor the **Calnev Pipeline**. ROW access is required for inspections and repairs. The presence of Calnev Pipeline, Inc. personnel intrudes on this wilderness quality. The installation of a cathodic protection system would require Calnev Pipeline, Inc. personnel, heavy equipment, and materials in wilderness for an extended period. This action is not necessary to protect the solitude or primitive & unconfined recreation quality of the Mojave Wilderness.*

OTHER FEATURES OF VALUE

☐ YES ☑ NO

Explain:

Step 1 Determination

Is administrative action necessary in wilderness?

Decision Criteria	Summary Responses
A. Existing Rights or Special Provisions	Action IS NOT necessary to meet this criterion.
B. Requirements of Other Legislation	Action IS necessary to meet this criterion.
C. Wilderness Character	
Untrammeled	Action IS NOT necessary to meet this criterion.
Undeveloped	Action IS NOT necessary to meet this criterion.
Natural	Action IS necessary to meet this criterion.
Outstanding Opportunities	Action IS NOT necessary to meet this criterion.
Other Features of Value	Action IS NOT necessary to meet this criterion.

Is administrative action necessary in wilderness?

☑ YES

EXPLAIN & PROCEED TO STEP 2 OF THE MRDG

☐ NO

Explain:

*The **Calnev Pipeline** needs a new cathodic protection system installed to protect the natural quality of the Mojave Wilderness in Soda Lake, in Mojave National Preserve. The segment of the **Calnev Pipeline** at risk lies in Soda Lake, whose soils present a highly corrosive environment. Cathodic protection would prevent two pipelines from corroding and, therefore, from releasing petroleum product into the Mojave Wilderness.*

Project Title: Calnev Pipeline Cathodic Protection

MRDG Step 2

Determine the Minimum Activity

Other Direction

*Is there "special provisions" language in legislation (or other Congressional direction) that explicitly **allows** consideration of a use otherwise prohibited by Section 4(c)?*

AND/OR

Has the issue been addressed in agency policy, management plans, species recovery plans, or agreements with other agencies or partners?

☑ YES

DESCRIBE OTHER DIRECTION BELOW

☐ NO

Describe Other Direction:

Pursuant to the Minerals Leasing Act and its amendments, which authorizes the Bureau of Land Management to issue right-of-way grants for oil and gas utilities, the BLM issued right-of-way grants to Calnev Pipeline for the construction, maintenance and decommissioning of an 8 5/8" petroleum transport pipeline (1963, reference nos. LA-168855 and LA-168999) and a 14" petroleum transport pipeline (1975, reference no. S-5597; 2014 renewal, reference no CACA-053529 and CACA-053529-01). Because both pipelines were originally authorized before establishment of the Mojave Wilderness in 1994, the Department of Interior Solicitor determined that Calnev Pipeline has the legal right to continue to operate both pipelines in Mojave National Preserve, in the Mojave Wilderness. This determination overrules the Minerals Leasing Act which prohibits the National Park Service from issuing oil or gas leases (30 USC §185(a) and (b)(1)), and the Wilderness Act Public Law 88-577 (16 U.S. C. 1131-1136, § 4(3)(d)(3)). NPS Management Policies 2006 allows for the continuation of valid existing private rights in wilderness including rights-of-way (§ 6.4.6).

Time Constraints

What, if any, are the time constraints that may affect the action?

Components of the Action

What are the discrete components or phases of the action?

Component X	*Example: Transportation of personnel to the project site*
Component 1	Transportation of Calnev Pipeline, Inc. personnel to project site
Component 2	Transportation of construction equipment and materials to project site
Component 3	Alterations to underground infrastructure of the Calnev Pipeline
Component 4	Alterations to above-ground ancillary facilities of the Calnev Pipeline
Component 5	On-site inspections and test station readings of the Calnev Pipeline
Component 6	Life cycle of cathodic protection system of the Calnev Pipeline and consequential threat of a petroleum release in wilderness
Component 7	
Component 8	
Component 9	

Proceed to the alternatives.

Refer to the **MRDG Instructions** regarding alternatives and the effects to each of the comparison criteria.

Project Title: Calnev Pipeline Cathodic Protection

MRDG Step 2: Alternatives

Alternative 1: (A) No Action

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Under the Alternative 1 (A), Calnev Pipeline, Inc. would continue to operate without any action taken to provide cathodic protection to the 8 5/8" and 14" pipelines, jointly referred to as the **Calnev Pipeline**. The pipelines would continue to be protected by solar impressed current provided at two localized sites in Soda Lake plus a larger solar impressed current system operating at the Calnev Baker Pump Station within Mojave National Preserve outside of wilderness. Calnev Pipeline, Inc. would conduct on-site inspections 12 times per year by motorized vehicle; common to all alternatives are two additional site visits by motorized vehicle per year, to perform maintenance and repairs to above-ground ancillary facilities from vandalism and severe weather events. Motorized vehicle access is necessary to transport the testing and repair equipment that cannot be otherwise transported on foot or horseback. The existing cathodic protection system is beginning to exhaust its life cycle; it is not expected to last as the coating on the 8 5/8" pipeline may be already starting to corrode; coating on the 14" pipeline would likely begin to corrode at a later point, as well. Further degradation of the pipelines could lead to releases of petroleum fuels; the **Calnev Pipeline** could be shut down before this occurs. Either outcome is dependent on actions taken outside of the scope of this project.

Component Activities

How will each of the components of the action be performed under this alternative?

Component of the Action		Activity for this Alternative
X	*Example: Transportation of personnel to the project site*	*Example: Personnel will travel by horseback*
1	Transportation of Calnev Pipeline, Inc. personnel to project site	Personnel will travel by motorized vehicle.
2	Transportation of construction equipment and materials to project site	No construction equipment or materials
3	Alterations to underground infrastructure of the Calnev Pipeline	No alteration to the underground pipelines
4	Alterations to above-ground ancillary facilities of the Calnev Pipeline	No alteration to the above-ground ancillary facilities
5	On-site inspections and test station readings of the Calnev Pipeline	12 on-site inspections plus two maintenance inspections per year, all via motorized vehicle.
6	Life cycle of cathodic protection system of the Calnev Pipeline and consequential threat of a petroleum release in wilderness	Existing sacrificial anode cathodic protection system has exhausted its life cycle; solar impressed current system is close to the end of its life cycle. High risk as pipelines
7		
8		
9		

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	Personnel will travel by motorized vehicle.	☐	☑	☐
2	No construction equipment or materials	☐	☐	☑
3	No alteration to the underground pipelines	☐	☐	☑
4	No alteration to the above-ground ancillary facilities	☐	☐	☑
5	12 on-site inspections plus two maintenance inspections per year, all via motorized vehicle.	☐	☑	☐
6	Existing sacrificial anode cathodic protection system has exhausted its life cycle; solar impresse	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	2	NE
Untrammeled Total Rating		**-2**		

Explain:

Existing infrastructure of **Calnev Pipeline** would not change; therefore, the untrammeled character of the Mojave Wilderness would not be altered.

Pipeline inspections would be conducted via motorized vehicle 12 times per year. Calnev Pipeline, Inc. personnel would use an existing access road to inspect the right-of-way. The Mojave Wilderness is already disturbed along the **Calnev Pipeline** right-of-way; site inspections by motorized vehicle would not increase the footprint or intensity of disturbance but would allow this footprint to persist. Their presence in wilderness for commercial purposes negatively affects the untrammeled quality of wilderness.

Because of Pipeline Safety Act regulations already in place, PHMSA might likely order the shutdown of the **Calnev Pipeline** before the 8 5/8” or 14” pipeline corrodes to the point of releasing petroleum product, but this possibility lies outside the scope of the project. The untrammeled character of wilderness would not be affected by a remotely located shutdown of the **Calnev Pipeline** system.

UNDEVELOPED

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	Personnel will travel by motorized vehicle.	☐	☑	☐
2	No construction equipment or materials	☐	☐	☑
3	No alteration to the underground pipelines	☐	☐	☑
4	No alteration to the above-ground ancillary facilities	☐	☐	☑
5	12 on-site inspections plus two maintenance inspections per year, all via motorized vehicle.	☐	☑	☐
6	Existing sacrificial anode cathodic protection system has exhausted its life cycle; solar impresse	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	2	NE
Undeveloped Total Rating		**-2**		

Explain:

Existing infrastructure of **Calnev Pipeline** would not change; therefore, the undeveloped character of the Mojave Wilderness would not be altered. The presence of pipeline inspectors traveling in motorized vehicles frequently throughout the calendar year maintains existing violations of the undeveloped character of wilderness.

There is a heightened risk of petroleum release resulting from No Action. This also increases the risk of emergency response in wilderness, and clean-up teams with associated equipment and materials.

NATURAL

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	Personnel will travel by motorized vehicle.	☐	☑	☐
2	No construction equipment or materials	☐	☐	☑
3	No alteration to the underground pipelines	☐	☐	☑
4	No alteration to the above-ground ancillary facilities	☐	☐	☑
5	12 on-site inspections plus two maintenance inspections per year, all via motorized vehicle.	☐	☑	☐
6	Existing sacrificial anode cathodic protection system has exhausted its life cycle; solar impresse	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	2	NE
Natural Total Rating		**-2**		

Explain:

Under No Action, the natural character of wilderness does not change. Nonetheless, the heightened risk of pipeline deterioration has associated greater risks of petroleum releases, which would negatively impact the natural quality of wilderness. The monthly presence of pipeline inspectors traveling in motorized vehicles through wilderness also violates the natural quality of wilderness. The vehicles repeatedly compact and trample the soils and vegetation of Soda Lake as they travel the length of the right-of-way.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	Personnel will travel by motorized vehicle.	☐	☑	☐
2	No construction equipment or materials	☐	☐	☑
3	No alteration to the underground pipelines	☐	☐	☑
4	No alteration to the above-ground ancillary facilities	☐	☐	☑
5	12 on-site inspections plus two maintenance inspections per year, all via motorized vehicle.	☐	☑	☐
6	Existing sacrificial anode cathodic protection system has exhausted its life cycle; solar impresse	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	2	NE
Solitude or Primitive & Unconfined Recreation Total Rating		**-2**		

Explain:

Most component activities of No Action would not impact the quality of solitude or unconfined recreation in the Mojave Wilderness. The negative effect would be from 14 on-site inspections conducted via motorized vehicle. The inspectors and vehicles alike disrupt the experience of solitude or unconfined recreation both by visual and acoustic intrusions.

OTHER FEATURES OF VALUE

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☐
1	Personnel will travel by motorized vehicle.	☐	☐	☐
2	No construction equipment or materials	☐	☐	☐
3	No alteration to the underground pipelines	☐	☐	☐
4	No alteration to the above-ground ancillary facilities	☐	☐	☐
5	12 on-site inspections plus two maintenance inspections per year, all via motorized vehicle.	☐	☐	☐
6	Existing sacrificial anode cathodic protection system has exhausted its life cycle; solar impresse	☐	☐	☐
7		☐	☐	☐
8		☐	☐	☐
9				
Totals		0	0	NE
Other Features of Value Total Rating			**0**	

Explain:

Traditional Skills

What is the effect of each component activity on traditional skills?

TRADITIONAL SKILLS

Component Activity for this Alternative		☑sitive	☐gative	☐ Effect
X	*Example: Personnel will travel by horseback*	☑	☐	☐
1	Personnel will travel by motorized vehicle.	☐	☑	☐
2	No construction equipment or materials	☐	☐	☑
3	No alteration to the underground pipelines	☐	☐	☑
4	No alteration to the above-ground ancillary facilities	☐	☐	☑
5	12 on-site inspections plus two maintenance inspections per year, all via motorized vehicle.	☐	☑	☐
6	Existing sacrificial anode cathodic protection system has exhausted its life cycle; solar impresse	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9				
Totals		1	2	NE
Traditional Skills Total Rating		**-1**		

Explain:

Under No Action, Calnev Pipeline, Inc. personnel would access the Calnev Pipeline 14 times per year by motorized vehicle instead of using traditional methods of access on foot or horseback. No component activities of No Action implement traditional skills.

Economics

What is estimated cost of each component activity?

COST

Component Activity for this Alternative		Estimated Cost
X	*Example: Personnel will travel by horseback*	*$1,900*
1	Personnel will travel by motorized vehicle.	$75,000
2	No construction equipment or materials	$0
3	No alteration to the underground pipelines	$0
4	No alteration to the above-ground ancillary facilities	$0
5	12 on-site inspections plus two maintenance inspections per year, all via motorized vehicle.	$30,000
6	Existing sacrificial anode cathodic protection system has exhausted its life cycle; solar impressed current sy	$3,000,000
7		
8		
9		
Total Estimated Cost		**$3,105,000**

Explain:

Under No Action, the Calnev Pipeline would need to be frequently inspected to monitor the level of cathodic protection. Once the CP system is completely exhausted, the pipeline will begin to rapidly corrode. The cost estimate of the existing CP system being exhausted and threat of petroleum release being heightened reflects the minimum possible cost of continuing petroleum transport to Las Vegas; $3, 000,000 is only estimated on one possible action that would, nonetheless, lie outside the scope of this project; other options could be at least as much as, and possibly higher than, this estimate.

Safety of Visitors & Workers

What is the risk of this alternative to the safety of visitors and workers? What mitigation measures will be taken?

RISK ASSESSMENT	Probability of Accident				
Severity of Accident	Frequent	Likely	Common	Unlikely	Rare
Catastrophic: Death or permanent disability	☐	☑	☐	☐	☐
Critical: Permanent partial disability or temporary total disability	☐	☐	☐	☑	☐
Marginal: Compensable injury or illness, treatment, lost work	☐	☐	☐	☑	☐
Negligible: Superficial injury or illness, first aid only, no lost work	☐	☐	☐	☑	☐
Risk Assessment	**Extremely High Risk**				

Explain:

If the No Action is implemented, the safety of visitors and workers would be at risk from potential petroleum releases.

Summary Ratings for Alternative 1

Wilderness Character	
Untrammeled	-2
Undeveloped	-2
Natural	-2
Solitude or Primitive & Unconfined Recreation	-2
Other Features of Value	0
Wilderness Character Summary Rating	**-8**

Traditional Skills	
Traditional Skills	-1

Economics	
Cost	$3,105,000

Safety of Visitors & Workers	
Risk Assessment	Extremely High Risk

Project Title: Calnev Pipeline Cathodic Protection

MRDG Step 2: Alternatives

Alternative 2: (B) Install Two Additional Solar Impressed Current CP Stations And Upgrade Two Existing Stations

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Under this alternative, Calnev Pipeline, Inc. would upgrade two existing solar impressed current CP stations with 4' x 6' solar grids, and install two additional solar impressed current CP stations of 8' x 10' dimension within Mojave Wilderness. Motorized vehicles and mechanized equipment would be required for construction. The two 4' x 6' solar panels would be installed within existing chain link fencing; the two 8' x 10' panels would not require chain link fencing. Twenty-nine of the existing 39 test stations would be removed. Long-term current readings would be done either by remote readings from satellites, or by access on foot. Long-term maintenance/repair activities would require motorized vehicles and mechanized equipment. The corrosion of the pipeline would be stopped; Calnev Pipeline, Inc. would be able to control the CP system in response to changes in the pipeline coating or site conditions. The system would have an operational life of 25 years. Construction would take up to 22 days.

The solar impressed current cathodic protection system would be inspected remotely via satellite six times per year. Calnev Pipeline, Inc. would conduct field inspections on foot if remote monitoring units are not working; in addition, they would perform two maintenance inspections per year, with access on foot. Common to all alternatives are two additional site visits by motorized vehicle per year, to perform maintenance and repairs to above-ground ancillary facilities from vandalism and severe weather events. Existing block valves and rectifiers will remain in place and unchanged.

Component Activities

How will each of the components of the action be performed under this alternative?

Component of the Action		Activity for this Alternative
X	*Example: Transportation of personnel to the project site*	*Example: Personnel will travel by horseback*
1	Transportation of Calnev Pipeline, Inc. personnel to project site	Transported by motor vehicle to each work site within the ROW on Soda Lake. 71 trips total.
2	Transportation of construction equipment and materials to project site	Transported by motor vehicle. Size and weight prohibits use of aerial transport for this project.
3	Alterations to underground infrastructure of the Calnev Pipeline	Trenching and excavation to remove 29 above-grade post-mounted test stations and buried wiring; and repair and re-coating both pipelines at each wire connection location.
4	Alterations to above-ground ancillary facilities of the Calnev Pipeline	Above-ground solar impressed current stations increase from two to four; test stations would decrease from 39 to 10. At each station, the ground would be graded and a concrete
5	On-site inspections and test station readings of the Calnev Pipeline	Two times per year on foot.
6	Life cycle of cathodic protection system of the Calnev Pipeline and consequential threat of a petroleum release in wilderness	25 years. Significantly reduced risk of release.
7		
8		
9		

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	Transported by motor vehicle to each work site within the ROW on Soda Lake. 71 trips total.	☐	☑	☐
2	Transported by motor vehicle. Size and weight prohibits use of aerial transport for this project.	☐	☑	☐
3	Trenching and excavation to remove 29 above-grade post-mounted test stations and buried wirin	☐	☑	☐
4	Above-ground solar impressed current stations increase from two to four; test stations would dec	☐	☑	☐
5	Two times per year on foot.	☐	☐	☑
6	25 years. Significantly reduced risk of release.	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	4	NE
Untrammeled Total Rating		**-4**		

Explain:

Use of heavy construction equipment and motorized vehicles would trammel the wilderness. Installation of four concrete pads for solar generation arrays would trammel wilderness. Upon completion of construction, the footprint of **Calnev Pipeline's** above-ground ancillary facilities would be reduced in total but the solar impressed current stations will double to four, and their size will be up to 400% larger than each of the two existing stations. The expected life cycle of solar impressed current cathodic protection far exceeds that of sacrificial anode (five years for magnesium; ten years for zinc oxide), reducing the frequency of replacement. Nonetheless, the untrammeled character of wilderness is already compromised by the presence of **Calnev Pipeline** on Soda Lake; these effects will not be any greater or less by the implementation of this alternative.

UNDEVELOPED

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	Transported by motor vehicle to each work site within the ROW on Soda Lake. 71 trips total.	☐	☑	☐
2	Transported by motor vehicle. Size and weight prohibits use of aerial transport for this project.	☐	☑	☐
3	Trenching and excavation to remove 29 above-grade post-mounted test stations and buried wirin	☐	☑	☐
4	Above-ground solar impressed current stations increase from two to four; test stations would dec	☐	☑	☐
5	Two times per year on foot.	☐	☐	☑
6	25 years. Significantly reduced risk of release.	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	4	NE
Undeveloped Total Rating		**-4**		

Explain:

The operation, maintenance, and repair of a petroleum pipeline transport system continues the presence of development in wilderness. The undeveloped character of wilderness is already compromised by the presence of **Calnev Pipeline** on Soda Lake; these effects will not be any greater or less by the implementation of this alternative. No component activities of Alternative 2 contribute to the undeveloped character of the Mojave Wilderness at Soda Lake.

NATURAL

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	Transported by motor vehicle to each work site within the ROW on Soda Lake. 71 trips total.	☐	☑	☐
2	Transported by motor vehicle. Size and weight prohibits use of aerial transport for this project.	☐	☑	☐
3	Trenching and excavation to remove 29 above-grade post-mounted test stations and buried wirin	☐	☑	☐
4	Above-ground solar impressed current stations increase from two to four; test stations would dec	☐	☑	☐
5	Two times per year on foot.	☐	☐	☑
6	25 years. Significantly reduced risk of release.	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	4	NE
Natural Total Rating		**-4**		

Explain:

Four component activities of Alternative 2 contradict the natural quality of the Mojave Wilderness at Soda Lake. Heavy equipment will be transported by motor vehicle to the project site, remaining onsite until the completion of construction: back hoe with front loader bucket, mounted with low-impact, soft, wide rubber tires; 2.5-ton flatbed truck with boom hoist; skid-steer mounted auger drilling rig; water truck; service trailer; and a cement truck to pour two concrete pads. Three pick-up trucks will make two trips per day to transport personnel to and from the work site, 71 trips total over 22 days of construction. The aboveground facilities left in place under this alternative include two 6' x 8' solar arrays replacing two 2' x 3' arrays, plus two 8' x 10' solar arrays, the four units evenly spaced within a 4.5-mile span of the pipeline as it crosses Soda Lake. Calnev Pipeline, Inc. would remove 75% of the existing test station markers, leaving in place 10 test stations connected to the solar impressed current system. The four solar array panels would not be camouflaged but the sides and back of each cage would be painted in desert colors. Each panel would lie on the ground surface, protruding up from the flat playa. Assuming uninterrupted function and site inspections on foot, Calnev Pipeline, Inc. estimates this system to protect the pipeline for 25 years, preventing petroleum releases over the same period of time. Two component activities neither damage nor contribute to the natural quality of the wilderness. Accessing the right-of-way on foot (or other means of non-motorized, non-mechanized transportation) is equivalent to park visitors' access to the wilderness and does not impact, either

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	Transported by motor vehicle to each work site within the ROW on Soda Lake. 71 trips total.	☐	☑	☐
2	Transported by motor vehicle. Size and weight prohibits use of aerial transport for this project.	☐	☑	☐
3	Trenching and excavation to remove 29 above-grade post-mounted test stations and buried wirin	☑	☐	☐
4	Above-ground solar impressed current stations increase from two to four; test stations would dec	☐	☐	☑
5	Two times per year on foot.	☐	☐	☑
6	25 years. Significantly reduced risk of release.	☐	☐	☐
7		☐	☐	☐
8		☐	☐	☐
9				
Totals		1	3	NE
Solitude or Primitive & Unconfined Recreation Total Rating		**-2**		

Explain:

The construction phase includes work crews, heavy duty construction equipment, trenching and excavation, installation of four above-ground solar impressed current stations and removal of 29 test stations. Component activities associated with construction (1-3) will intrude upon the wilderness character of solitude, primitive and unconfined recreation. The aboveground facilities left in place at the end of construction will be greatly reduced in number and in proximity; rather than 39 test station poles, 4 feet high, 300 feet apart across Soda Lake, there will be four large solar impressed current stations across the same distance, approximately 2,900 feet apart. In relative terms, component activity 4 will improve this wilderness character over the existing condition of Solitude or Primitive and Unconfined Recreation, by reducing the number and frequency of above-ground ancillary facilities. In contrast, the facilities that remain would be of significantly greater scale (200% to 300% increase in size) Current readings and life cycle of the solar impressed current system will not positively or negatively affect the quality of solitude or primitive and unconfined recreation.

OTHER FEATURES OF VALUE

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☐
1	Transported by motor vehicle to each work site within the ROW on Soda Lake. 71 trips total.	☐	☐	☐
2	Transported by motor vehicle. Size and weight prohibits use of aerial transport for this project.	☐	☐	☐
3	Trenching and excavation to remove 29 above-grade post-mounted test stations and buried wirin	☐	☐	☐
4	Above-ground solar impressed current stations increase from two to four; test stations would dec	☐	☐	☐
5	Two times per year on foot.	☐	☐	☐
6	25 years. Significantly reduced risk of release.	☐	☐	☐
7		☐	☐	☐
8		☐	☐	☐
9				
Totals		0	0	NE
Other Features of Value Total Rating		**0**		

Explain:

Traditional Skills

What is the effect of each component activity on traditional skills?

TRADITIONAL SKILLS

Component Activity for this Alternative		☑ositive	☐gative	☐ Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	Transported by motor vehicle to each work site within the ROW on Soda Lake. 71 trips total.	☐	☑	☐
2	Transported by motor vehicle. Size and weight prohibits use of aerial transport for this project.	☐	☑	☐
3	Trenching and excavation to remove 29 above-grade post-mounted test stations and buried wirin	☐	☑	☐
4	Above-ground solar impressed current stations increase from two to four; test stations would dec	☐	☑	☐
5	Two times per year on foot.	☑	☐	☐
6	25 years. Significantly reduced risk of release.	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9				
Totals		1	4	NE
Traditional Skills Total Rating		**-3**		

Explain:

None of the component activities employ or promote traditional skills or methods. Transport by foot or horseback is unfeasible for the heavy construction equipment needed for trenching and excavation, and for pouring concrete. Work crews will be transporting materials and supplies to the work sites. Calnev Pipeline, Inc., has not proposed to use traditional skills to carry out its proposed work. Field monitoring (#5) may be partially carried out using the traditional method of walking or riding horseback.

Economics

What is estimated cost of each component activity?

COST

Component Activity for this Alternative		Estimated Cost
X	*Example: Personnel will travel by horseback*	*$1,900*
1	Transported by motor vehicle to each work site within the ROW on Soda Lake. 71 trips total.	$5,000
2	Transported by motor vehicle. Size and weight prohibits use of aerial transport for this project.	$75,000
3	Trenching and excavation to remove 29 above-grade post-mounted test stations and buried wiring; and repai	$165,000
4	Above-ground solar impressed current stations increase from two to four; test stations would decrease from 3	$115,000
5	Two times per year on foot.	$30,000
6	25 years. Significantly reduced risk of release.	$0
7		
8		
9		
Total Estimated Cost		**$390,000**

Explain:

Contractors already have motor vehicles, so transportation costs would be minimal.

Heavy duty construction equipment would be rented for this project in order to perform the trenching and carry the materials.

Trenching and excavation requires several laborers, inspectors, and supervisors.

$115,000 includes the cost of the new solar rectifiers as well as the upgraded solar panels for the two existing solar rectifiers.

Field inspections would significantly decrease due to improved accessibility via satellite to CP data.

Safety of Visitors & Workers

What is the risk of this alternative to the safety of visitors and workers? What mitigation measures will be taken?

RISK ASSESSMENT	Probability of Accident				
Severity of Accident	Frequent	Likely	Common	Unlikely	Rare
Catastrophic: Death or permanent disability	☐	☐	☐	☐	☑
Critical: Permanent partial disability or temporary total disability	☐	☐	☐	☐	☑
Marginal: Compensable injury or illness, treatment, lost work	☐	☐	☐	☐	☑
Negligible: Superficial injury or illness, first aid only, no lost work	☐	☐	☐	☐	☑
Risk Assessment	**Moderate Risk**				

Explain:

Calnev Pipeline, Inc. has proposed this and the other action alternatives to prevent the risks to health and human safety from a petroleum release. They are held to regulations under the Pipeline Safety Act and Occupational Health and Safety Act (OSHA) in designing and implementing all work on the **Calnev Pipeline**.

Summary Ratings for Alternative 2

Wilderness Character	
Untrammeled	-4
Undeveloped	-4
Natural	-4
Solitude or Primitive & Unconfined Recreation	-2
Other Features of Value	0
Wilderness Character Summary Rating	**-14**

Traditional Skills	
Traditional Skills	-3

Economics	
Cost	$390,000

Safety of Visitors & Workers	
Risk Assessment	Moderate Risk

Project Title: Calnev Pipeline Cathodic Protection

MRDG Step 2: Alternatives

Alternative 3: (C) Install 60 New Zinc Anode Stations

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Under Alternative 3 (C), Calnev Pipeline, Inc. would install 60 new sacrificial zinc anode stations within the Soda Dry Lake Bed. The stations would be spaced 200 feet apart across a distance of 12,000 feet. At each station, Calnev Pipeline, Inc. would install three anodes, reference electrodes, test station, and connecting wires to the two pipelines. Twenty existing stations would be re-used, 19 decommissioned, and 40 new stations would be installed. Thirteen decommissioned stations would be removed, six would be re-purposed for permanent reference electrodes. The end result would be 66 above-ground pole markers: 60 for test stations mounted to the poles, six for buried permanent reference electrodes. Construction would be completed within 33 days.

Calnev Pipeline, Inc. personnel would access the right-of-way by motorized vehicle 10 times per year to test the cathodic protection system. Twice a year, personnel would test the system once a week over a four-week period to take readings at each test station, install current interrupters, take a second set of readings, then disconnect and remove current disrupters. This system has an estimated life cycle of 25 years. Common to all alternatives are two additional site visits by motorized vehicle per year, to perform maintenance and repairs to above-ground ancillary facilities from vandalism and severe weather events. Existing block valves, rectifiers, and two 2' x 3' solar impressed current stations surrounded by chain link fence would remain in place and unchanged.

Component Activities

How will each of the components of the action be performed under this alternative?

Component of the Action		Activity for this Alternative
X	*Example: Transportation of personnel to the project site*	*Example: Personnel will travel by horseback*
1	Transportation of Calnev Pipeline, Inc. personnel to project site	For 33-day construction phase, transportation by motor vehicle to each work site within the ROW on Soda Lake. Four maintenance inspections per year on foot.
2	Transportation of construction equipment and materials to project site	For 33-day construction phase, transportation by motor vehicle. Size and weight prohibits use of aerial transport for this project.
3	Alterations to underground infrastructure of the Calnev Pipeline	Trenching and excavation to install 40 new stations, re-use 20 existing stations, remove 13 decommissioned stations, and re-purpose 6 decommissioned stations.
4	Alterations to above-ground ancillary facilities of the Calnev Pipeline	Total above-ground stations include: 40 new stations, 20 re-used existing stations, and 6 re-used decommissioned stations. Other ancillary facilities would remain (block valve.
5	On-site inspections and test station readings of the Calnev Pipeline	Up to 10 visits for on-site system testing (eight) and inspections (two); plus two maintenance inspections per year. All site visits by motorized vehicle.
6	Life cycle of cathodic protection system of the Calnev Pipeline and consequential threat of a petroleum release in wilderness	25 years or less. Significantly reduced risk of release.
7		
8		
9		

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

	Component Activity for this Alternative	Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	For 33-day construction phase, transportation by motor vehicle to each work site within the ROW	☐	☑	☐
2	For 33-day construction phase, transportation by motor vehicle. Size and weight prohibits use of	☐	☑	☐
3	Trenching and excavation to install 40 new stations, re-use 20 existing stations, remove 13 decor	☐	☑	☐
4	Total above-ground stations include: 40 new stations, 20 re-used existing stations, and 6 re-used	☐	☑	☐
5	Up to 10 visits for on-site system testing (eight) and inspections (two); plus two maintenance insp	☐	☑	☐
6	25 years or less. Significantly reduced risk of release.	☐	☐	☑
7		☐	☐	☑
8		☐	☐	☐
9		☐	☐	☐
Totals		0	5	NE
Untrammeled Total Rating		**-5**		

Explain:

Use of heavy construction equipment and motorized vehicles would trammel the wilderness. Installation of 40 new zinc anode stations would trammel wilderness. Upon completion of construction, the footprint of Calnev Pipeline's above-ground ancillary facilities would increase to 66 in total, increasing the intrusion of commercial development on Soda Dry Lake playa. The expected life of a 60 Zinc Anode cathodic protection system is 25 years, similar to that of a solar impressed current cathodic protection system. The untrammeled quality of wilderness would be further compromised by Alternative 3 (C) than it currently is under the status quo, Alternative 1 (A).

UNDEVELOPED

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	For 33-day construction phase, transportation by motor vehicle to each work site within the ROW	☐	☑	☐
2	For 33-day construction phase, transportation by motor vehicle. Size and weight prohibits use of	☐	☑	☐
3	Trenching and excavation to install 40 new stations, re-use 20 existing stations, remove 13 decor	☐	☑	☐
4	Total above-ground stations include: 40 new stations, 20 re-used existing stations, and 6 re-used	☐	☑	☐
5	Up to 10 visits for on-site system testing (eight) and inspections (two); plus two maintenance insp	☐	☑	☐
6	25 years or less. Significantly reduced risk of release.	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	5	NE
Undeveloped Total Rating		**-5**		

Explain:

The operation, maintenance, and repair of a petroleum pipeline transport system, including access via motorized vehicle, continues the presence of development in wilderness. No component activities of Alternative 3 (C) contribute to the undeveloped quality of the Mojave Wilderness at Soda Lake.

NATURAL

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	For 33-day construction phase, transportation by motor vehicle to each work site within the ROW	☐	☑	☐
2	For 33-day construction phase, transportation by motor vehicle. Size and weight prohibits use of	☐	☑	☐
3	Trenching and excavation to install 40 new stations, re-use 20 existing stations, remove 13 decor	☐	☑	☐
4	Total above-ground stations include: 40 new stations, 20 re-used existing stations, and 6 re-used	☐	☑	☐
5	Up to 10 visits for on-site system testing (eight) and inspections (two); plus two maintenance insp	☐	☑	☐
6	25 years or less. Significantly reduced risk of release.	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	5	NE
Natural Total Rating		**-5**		

Explain:

Five component activities of Alternative 3 are detrimental to the natural quality of the Mojave Wilderness at Soda Lake; one has no effect. Heavy equipment will be transported by motor vehicle to the project site, remaining onsite until the completion of construction: back hoe with front loader bucket, mounted with low-impact, soft, wide rubber tires; 2.5-ton flatbed truck with boom hoist; skid-steer mounted auger drilling rig; water truck; and service trailer. Personnel will be transported to the site each day by three pick-up trucks; over a 33-day construction period, the total number of vehicle trips equals at least 198. Every 200 feet along the pipeline, crews will install three anodes perpendicular to, between and eight feet to either side of the two pipelines. Each anode will be installed in a hole 12" in diameter, 25' in depth. six permanent reference anodes will be installed two feet deep, the same depth as the pipelines. Twenty test stations would be reused, 40 new test stations installed, 13 test stations removed, and six test stations repurposed for six permanent reference electrodes. At each site where 19 test stations are removed or repurposed, trenches will be dug so that both pipelines can be repaired and recoated. At the completion of construction, 66 test station markers and two 2' x 3' solar impressed current stations enclosed by chainlink fencing will remain aboveground along the flat playa. This alternative has an estimated life cycle of 25 years, the same as the solar impressed current alternative. The life cycle component activity neither further damages nor contributes to the natural quality of the wilderness.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	For 33-day construction phase, transportation by motor vehicle to each work site within the ROW	☐	☑	☐
2	For 33-day construction phase, transportation by motor vehicle. Size and weight prohibits use of	☐	☑	☐
3	Trenching and excavation to install 40 new stations, re-use 20 existing stations, remove 13 decor	☐	☑	☐
4	Total above-ground stations include: 40 new stations, 20 re-used existing stations, and 6 re-used	☐	☑	☐
5	Up to 10 visits for on-site system testing (eight) and inspections (two); plus two maintenance insp	☐	☐	☑
6	25 years or less. Significantly reduced risk of release.	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9				
Totals		0	5	NE
Solitude or Primitive & Unconfined Recreation Total Rating		**-5**		

Explain:

The construction phase includes work crews, heavy duty construction equipment, trenching and excavation, installation of 60 above-ground test stations at each zinc anode station, plus an additional six test station poles for permanent reference electrodes. All of these component activities will intrude upon the wilderness' opportunity for solitude, primitive and unconfined recreation more than the existing system of 39 above-ground test station poles. Current readings and life cycle of the solar impressed current system will not positively or negatively affect the quality of solitude or primitive and unconfined recreation.

OTHER FEATURES OF VALUE

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☐
1	For 33-day construction phase, transportation by motor vehicle to each work site within the ROW	☐	☐	☐
2	For 33-day construction phase, transportation by motor vehicle. Size and weight prohibits use of	☐	☐	☐
3	Trenching and excavation to install 40 new stations, re-use 20 existing stations, remove 13 decor	☐	☐	☐
4	Total above-ground stations include: 40 new stations, 20 re-used existing stations, and 6 re-used	☐	☐	☐
5	Up to 10 visits for on-site system testing (eight) and inspections (two); plus two maintenance insp	☐	☐	☐
6	25 years or less. Significantly reduced risk of release.	☐	☐	☐
7		☐	☐	☐
8		☐	☐	☐
9				
Totals		0	0	NE
Other Features of Value Total Rating		**0**		

Explain:

Traditional Skills

What is the effect of each component activity on traditional skills?

TRADITIONAL SKILLS

Component Activity for this Alternative		☑ositive	☐gative	☐ Effect
X	*Example: Personnel will travel by horseback*	☐	☑	☐
1	For 33-day construction phase, transportation by motor vehicle to each work site within the ROW	☐	☑	☐
2	For 33-day construction phase, transportation by motor vehicle. Size and weight prohibits use of	☐	☑	☐
3	Trenching and excavation to install 40 new stations, re-use 20 existing stations, remove 13 decor	☐	☑	☐
4	Total above-ground stations include: 40 new stations, 20 re-used existing stations, and 6 re-used	☐	☑	☐
5	Up to 10 visits for on-site system testing (eight) and inspections (two); plus two maintenance insp	☑	☑	☐
6	25 years or less. Significantly reduced risk of release.	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9				
Totals		1	6	NE
Traditional Skills Total Rating		**-5**		

Explain:

Component activities 1-4 do not employ or promote traditional skills or methods. Transport by foot or horseback would be unfeasible for the heavy construction equipment needed for trenching and excavation, and for pouring concrete. Work crews would be transporting materials and supplies to the work sites. Travel by foot and by motorized vehicle would be used to conduct on-site monitoring and inspections.

Economics

What is estimated cost of each component activity?

COST

Component Activity for this Alternative		Estimated Cost
X	*Example: Personnel will travel by horseback*	*$1,900*
1	For 33-day construction phase, transportation by motor vehicle to each work site within the ROW on Soda La	$8,000
2	For 33-day construction phase, transportation by motor vehicle. Size and weight prohibits use of aerial transp	$115,000
3	Trenching and excavation to install 40 new stations, re-use 20 existing stations, remove 13 decommissioned	$285,000
4	Total above-ground stations include: 40 new stations, 20 re-used existing stations, and 6 re-used decommiss	$35,000
5	Up to 10 visits for on-site system testing (eight) and inspections (two); plus two maintenance inspections per y	$45,000
6	25 years or less. Significantly reduced risk of release.	$0
7		
8		
9		
Total Estimated Cost		**$488,000**

Explain:

Alternative 3 has decreased material costs because no new solar rectifiers are required, however labor costs significantly increase due to the time and effort required to complete all of the trenching. Manual readings of all test stations would also be required as part of the routine surveys.

Safety of Visitors & Workers

What is the risk of this alternative to the safety of visitors and workers? What mitigation measures will be taken?

RISK ASSESSMENT	Probability of Accident				
Severity of Accident	Frequent	Likely	Common	Unlikely	Rare
Catastrophic: Death or permanent disability	☐	☐	☐	☐	☑
Critical: Permanent partial disability or temporary total disability	☐	☐	☐	☐	☑
Marginal: Compensable injury or illness, treatment, lost work	☐	☐	☐	☐	☑
Negligible: Superficial injury or illness, first aid only, no lost work	☐	☐	☐	☐	☑
Risk Assessment	**Moderate Risk**				

Explain:

Calnev Pipeline, Inc. has proposed this and the other action alternatives to prevent the risks to health and human safety from a petroleum release. They are held to regulations under the Pipeline Safety Act and Occupational Health and Safety Act (OSHA) in designing and implementing all work on the Calnev Pipeline.

Summary Ratings for Alternative 3

Wilderness Character	
Untrammeled	-5
Undeveloped	-5
Natural	-5
Solitude or Primitive & Unconfined Recreation	-5
Other Features of Value	0
Wilderness Character Summary Rating	**-20**

Traditional Skills	
Traditional Skills	-5

Economics	
Cost	$488,000

Safety of Visitors & Workers	
Risk Assessment	Moderate Risk

Project Title: Calnev Pipeline Cathodic Protection

MRDG Step 2: Alternatives

Alternative 4: (D) Install 39 Zinc Anode Stations

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Under Alternative 4,(D) Calnev Pipeline, Inc. would replace 39 existing magnesium anode stations with 39 zinc anode stations in the same locations. Replacement anodes would be composed of zinc rather than magnesium, to provide cathodic protection over a longer performance life. Six permanent reference electrodes would also be installed underground, attached to above-ground test station poles. This would leave a total of 45 above-ground pole markers across wilderness upon completion of construction. Installation of new zinc anodes and wiring would require new boreholes, trenches, and excavations within the footprint of the Calnev Pipeline right-of-way corridor. Construction would require mechanized heavy equipment (drill rig, flat-bed truck with lift hoist, and backhoe) and would last 26 days.

Inspection and maintenance requirements are the same as for Alternative 3 (C), with a total of 10 field visits via motorized vehicle per year. Estimated performance life cycle of a 39 zinc anode system is 10 years. Common to all alternatives are two additional site visits by motorized vehicle per year, to perform maintenance and repairs to above-ground ancillary facilities from vandalism and severe weather events. Existing block valves, rectifiers, and two 2' x 3' solar impressed current systems surrounded by chain link fence will remain in place and unchanged.

Component Activities

How will each of the components of the action be performed under this alternative?

Component of the Action		Activity for this Alternative
X	*Example: Transportation of personnel to the project site*	*Example: Personnel will travel by horseback*
1	Transportation of Calnev Pipeline, Inc. personnel to project site	For 26-day construction phase, transportation by motor vehicle. Four maintenance inspections per year on foot.
2	Transportation of construction equipment and materials to project site	For 26-day construction phase, transportation by motor vehicle. Size and weight prohibits use of aerial transport for this project.
3	Alterations to underground infrastructure of the Calnev Pipeline	39 underground connections to the two pipelines remain unchanged from the status quo; new boreholes will be drilled for the zinc anodes.
4	Alterations to above-ground ancillary facilities of the Calnev Pipeline	39 above-ground test stations plus 6 markers for reference electrodes remain unchanged from the status quo.
5	On-site inspections and test station readings of the Calnev Pipeline	Up to 10 visits per year (8 for system testing, 2 maintenance inspections) by motorized vehicle.
6	Life cycle of cathodic protection system of the Calnev Pipeline and consequential threat of a petroleum release in wilderness	10 years. Significantly reduced risk of release.
7		
8		
9		

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

	Component Activity for this Alternative	Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	For 26-day construction phase, transportation by motor vehicle. Four maintenance inspections p	☐	☑	☐
2	For 26-day construction phase, transportation by motor vehicle. Size and weight prohibits use of	☐	☑	☐
3	39 underground connections to the two pipelines remain unchanged from the status quo; new bo	☐	☑	☐
4	39 above-ground test stations plus 6 markers for reference electrodes remain unchanged from th	☐	☐	☑
5	Up to 10 visits per year (8 for system testing, 2 maintenance inspections) by motorized vehicle.	☑	☑	☐
6	10 years. Significantly reduced risk of release.	☐	☑	☐
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		1	5	NE
Untrammeled Total Rating		**-4**		

Explain:

Use of heavy construction equipment and motorized vehicles would trammel the wilderness. Installation of 39 zinc anode stations would trammel wilderness. Upon completion of construction, the footprint of Calnev Pipeline's above-ground ancillary facilities would remain as it currently exists, with no increase in above-ground facilities; because new boreholes would be drilled, the footprint of disturbed soils would increase even within the right-of-way corridor. The life cycle of a 39 zinc anode system is 10 years. Compared with Alternatives 2 (B) and 3 (C) -- both of whose expected life cycle is 25 years -- Alternative 4 (D) would need to be repeated twice within the same period. The untrammeled character of wilderness will be further compromised by Alternative 4 (D) than it currently is under the status quo, Alternative 1 (A).

UNDEVELOPED

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	For 26-day construction phase, transportation by motor vehicle. Four maintenance inspections p	☐	☑	☐
2	For 26-day construction phase, transportation by motor vehicle. Size and weight prohibits use of	☐	☑	☐
3	39 underground connections to the two pipelines remain unchanged from the status quo; new bo	☐	☑	☐
4	39 above-ground test stations plus 6 markers for reference electrodes remain unchanged from th	☐	☐	☑
5	Up to 10 visits per year (8 for system testing, 2 maintenance inspections) by motorized vehicle.	☐	☑	☐
6	10 years. Significantly reduced risk of release.	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	4	NE
Undeveloped Total Rating		**-4**		

Explain:

The operation, maintenance, and repair of a petroleum pipeline transport system continues the presence of development in wilderness. No component activities of Alternative 4 contribute to the undeveloped character of the Mojave Wilderness at Soda Lake. Site inspections carried out by motorized vehicle would diminish the undeveloped quality of wilderness.

NATURAL

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	For 26-day construction phase, transportation by motor vehicle. Four maintenance inspections p	☐	☑	☐
2	For 26-day construction phase, transportation by motor vehicle. Size and weight prohibits use of	☐	☑	☐
3	39 underground connections to the two pipelines remain unchanged from the status quo; new bo	☐	☑	☐
4	39 above-ground test stations plus 6 markers for reference electrodes remain unchanged from th	☐	☐	☑
5	Up to 10 visits per year (8 for system testing, 2 maintenance inspections) by motorized vehicle.	☐	☑	☐
6	10 years. Significantly reduced risk of release.	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	4	NE
Natural Total Rating		**-4**		

Explain:

Four component activities of Alternative 4 (D) diminish the natural quality of the Mojave Wilderness at Soda Lake. The construction phase to install a 39 zinc anode cathodic protection system would involve intensive use of heavy equipment, as previously described for Alternative 3 (C). The drilling of 39 new boreholes would increase ground disturbance. Site inspections and testing would require access by motorized vehicle. Two component activities would not change the natural quality of wilderness in either direction. Alternative 4 (D) would provide the same level of protection to the Calnev Pipeline as the other action alternatives, albeit with a shorter performance life cycle. Compared to Alternatives 2 (B) and 3 (C) -- both of whose life cycle is 25 years -- Alternative 4 (D) would require triple the amount of construction in the same period of time. Comparing each cathodic protection option, Alternatives 2 (B), 3 (C), and 4 (D) all involve intensive use of heavy equipment during construction and repeated access to the right-of-way by motorized vehicle, diminishing the natural quality of wilderness at Soda Lake. The quantity and dimension of above-ground ancillary facilities would remain unchanged from the status quo, neither contributing to nor detracting from the natural quality of wilderness at Soda Lake.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	For 26-day construction phase, transportation by motor vehicle. Four maintenance inspections p	☐	☑	☐
2	For 26-day construction phase, transportation by motor vehicle. Size and weight prohibits use of	☐	☑	☐
3	39 underground connections to the two pipelines remain unchanged from the status quo; new bo	☐	☐	☑
4	39 above-ground test stations plus 6 markers for reference electrodes remain unchanged from th	☐	☑	☐
5	Up to 10 visits per year (8 for system testing, 2 maintenance inspections) by motorized vehicle.	☐	☐	☑
6	10 years. Significantly reduced risk of release.	☐	☐	☐
7		☐	☐	☐
8		☐	☐	☐
9				
Totals		0	4	NE
Solitude or Primitive & Unconfined Recreation Total Rating		**-4**		

Explain:

The construction phase includes work crews, heavy duty construction equipment, trenching and excavation, installation of 39 above-ground test stations at each zinc anode station. Component activities 1-3 and 5 would intrude upon the wilderness character of solitude, primitive and unconfined recreation. Component activities 4 and 6 would not change the existing condition of this wilderness quality. Current readings and life expectancy of the solar impressed current system would not positively or negatively affect the quality of solitude or primitive and unconfined recreation.

OTHER FEATURES OF VALUE

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☐
1	For 26-day construction phase, transportation by motor vehicle. Four maintenance inspections p	☐	☐	☐
2	For 26-day construction phase, transportation by motor vehicle. Size and weight prohibits use of	☐	☐	☐
3	39 underground connections to the two pipelines remain unchanged from the status quo; new bo	☐	☐	☐
4	39 above-ground test stations plus 6 markers for reference electrodes remain unchanged from th	☐	☐	☐
5	Up to 10 visits per year (8 for system testing, 2 maintenance inspections) by motorized vehicle.	☐	☐	☐
6	10 years. Significantly reduced risk of release.	☐	☐	☐
7		☐	☐	☐
8		☐	☐	☐
9				
Totals		0	0	NE
Other Features of Value Total Rating		**0**		

Explain:

Traditional Skills

What is the effect of each component activity on traditional skills?

TRADITIONAL SKILLS

Component Activity for this Alternative		☑ositive	☐gative	☐ Effect
X	*Example: Personnel will travel by horseback*	☐	☑	☐
1	For 26-day construction phase, transportation by motor vehicle. Four maintenance inspections p	☐	☑	☐
2	For 26-day construction phase, transportation by motor vehicle. Size and weight prohibits use of	☐	☑	☐
3	39 underground connections to the two pipelines remain unchanged from the status quo; new bo	☐	☑	☐
4	39 above-ground test stations plus 6 markers for reference electrodes remain unchanged from th	☐	☐	☑
5	Up to 10 visits per year (8 for system testing, 2 maintenance inspections) by motorized vehicle.	☐	☑	☐
6	10 years. Significantly reduced risk of release.	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9				
Totals		0	5	NE
Traditional Skills Total Rating		**-5**		

Explain:

Component activities 1-3 and 5 would not employ or promote traditional skills or methods. Transport by foot or horseback is unfeasible for the heavy construction equipment needed for trenching and excavation, and for pouring concrete. Work crews would transport materials and supplies to the work sites by motorized vehicle. Monitoring and inspections would be carried out via motorized vehicle. Component activities 4 and 6 would not utilize or diminish the use of traditional skills.

Economics

What is estimated cost of each component activity?

COST

Component Activity for this Alternative		Estimated Cost
X	*Example: Personnel will travel by horseback*	*$1,900*
1	For 26-day construction phase, transportation by motor vehicle. Four maintenance inspections per year on fo	$6,500
2	For 26-day construction phase, transportation by motor vehicle. Size and weight prohibits use of aerial transp	$95,000
3	39 underground connections to the two pipelines remain unchanged from the status quo; new boreholes will b	$200,000
4	39 above-ground test stations plus 6 markers for reference electrodes remain unchanged from the status quo	$10,000
5	Up to 10 visits per year (8 for system testing, 2 maintenance inspections) by motorized vehicle.	$45,000
6	10 years. Significantly reduced risk of release.	$713,000
7		
8		
9		
Total Estimated Cost		**$1,069,500**

Explain:

Replacing the existing magnesium anodes that have been depleted would require purchasing new anodes and new boring and trenching to attach to the pipelines. Because this option would provide CP for 10 years, it would need to be completed three times in a 25-year period compared with the other action alternatives -- 2 (B) or 3 (C).

Safety of Visitors & Workers

What is the risk of this alternative to the safety of visitors and workers? What mitigation measures will be taken?

RISK ASSESSMENT	Probability of Accident				
Severity of Accident	Frequent	Likely	Common	Unlikely	Rare
Catastrophic: Death or permanent disability	☐	☐	☐	☐	☑
Critical: Permanent partial disability or temporary total disability	☐	☐	☐	☐	☑
Marginal: Compensable injury or illness, treatment, lost work	☐	☐	☐	☐	☑
Negligible: Superficial injury or illness, first aid only, no lost work	☐	☐	☐	☐	☑
Risk Assessment	**Moderate Risk**				

Explain:

Calnev Pipeline, Inc. has proposed this and the other action alternatives to prevent the risks to health and human safety from a petroleum release. They are held to regulations under the Pipeline Safety Act and Occupational Health and Safety Act (OSHA) in designing and implementing all work on the Calnev Pipeline.

Summary Ratings for Alternative 4

Wilderness Character	
Untrammeled	-4
Undeveloped	-4
Natural	-4
Solitude or Primitive & Unconfined Recreation	-4
Other Features of Value	0
Wilderness Character Summary Rating	**-16**

Traditional Skills	
Traditional Skills	-5

Economics	
Cost	$1,069,500

Safety of Visitors & Workers	
Risk Assessment	Moderate Risk

Project Title: Calnev Pipeline Cathodic Protection

MRDG Step 2: Alternatives Not Analyzed

Alternatives Not Analyzed

What alternatives were considered but not analyzed? Why were they not analyzed?

Replacement of Current Magnesium Anodes with New Magnesium Anodes: This alternative, to install the same CP system as is currently in place, would have a life cycle of five years, half that of replacement with zinc anodes (Alternative 4). With new developments in CP technology available, this alternative was dismissed from further analysis.

Reduce Scale of Calnev Proposal: This option would reduce the number of sacrificial anodes and above-ground test stations. It would shorten the life cycle of an CP system, requiring more frequent replacements than Alternatives 2, 3 or 4 (B, C or D) -- i.e., more frequent intrusions into wilderness and disturbances to Soda Lake.

Recoat the 8 5/8" Pipeline Across Soda Lake: Recoating requires complete excavation of the pipeline to two feet below and to each side of the pipe. It also requires upgrading the two existing solar impressed current stations. This alternative was not further considered due to its significantly greater level of disturbance.

Install Lineal Mixed Metal Oxide Anode Along Pipeline: This technology requires a plow-in method of access pits at 1,000-foot intervals with a ribbon-type anode plowed into the ground, plus and additional eight solar powered CP units. The substantially greater ground disturbance and 500% increase in solar impressed current stations installed makes this alternative less appealing. It was eliminated from further analysis in lieu of the action alternatives 2, 3, and 4 (B, C, and D).

Project Title: Calnev Pipeline Cathodic Protection

MRDG Step 2: Alternative Comparison

Alternative 1: (A) No Action

Alternative 2: (B) Install Two Additional Solar Impressed Current CP Stations And Upgrade Two Existing Stations

Alternative 3: (C) Install 60 New Zinc Anode Stations

Alternative 4: (D) Install 39 Zinc Anode Stations

Wilderness Character	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Untrammeled	0	2	0	4	0	5	1	5
Undeveloped	0	2	0	4	0	5	0	4
Natural	0	2	0	4	0	5	0	4
Solitude/Primitive/Unconfined	0	2	1	3	0	5	0	4
Other Features of Value	0	0	0	0	0	0	0	0
Totals	0	8	1	15	0	20	1	17
Wilderness Character Rating	**-8**		**-14**		**-20**		**-16**	

Traditional Skills	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Traditional Skills	1	2	1	4	1	6	0	5
Traditional Skills Rating	**-1**		**-3**		**-5**		**-5**	

Economics	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Cost	$3,105,000	$390,000	$488,000	$1,069,500

Safety of Visitors & Workers	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Risk Assessment	Extremely High Risk	Moderate Risk	Moderate Risk	Moderate Risk

Alternative 5: _____

Alternative 6: _____

Alternative 7: _____

Alternative 8: _____

Wilderness Character	Alternative 5		Alternative 6		Alternative 7		Alternative 8	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Untrammeled	0	0	0	0	0	0	0	0
Undeveloped	0	0	0	0	0	0	0	0
Natural	0	0	0	0	0	0	0	0
Solitude or Primitive & Unconfined Rec.	0	0	0	0	0	0	0	0
Other Features of Value	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0
Wilderness Character Rating	**0**		**0**		**0**		**0**	

Traditional Skills	Alternative 5		Alternative 6		Alternative 7		Alternative 8	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Traditional Skills	0	0	0	0	0	0	0	0
Traditional Skills Rating	**0**		**0**		**0**		**0**	

Economics	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Cost	$0	$0	$0	$0

Safety of Visitors & Workers	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Risk Assessment				

Project Title: Calnev Pipeline Cathodic Protection

MRDG Step 2: Determination

Refer to the **MRDG Instructions** before identifying the selected alternative and explaining the rationale for the selection.

Selected Alternative

- ☐ Alternative 1: (A) No Action
- ☑ Alternative 2: (B) Install Two Additional Solar Impressed Current CP Stations And Upgrade Two
- ☑ Alternative 3: (C) Install 60 New Zinc Anode Stations
- ☑ Alternative 4: (D) Install 39 Zinc Anode Stations
- ☐ Alternative 5:
- ☐ Alternative 6:
- ☐ Alternative 7:
- ☐ Alternative 8:

Explain Rationale for Selection:

All three action alternatives result in significant negative wilderness character ratings and traditional skills ratings. The negative impacts to wilderness character across all three action alternatives are significant -- at -14, -20, and -16. A similar comparison resulted for impacts to traditional skills -- at -3, -5 and -5. The action alternatives vary most distinctly by intensity and frequency of impact. Alternatives 2 (B) and 3 (C) would require construction every 25 years, compared with Alternative 4 (D) every 10 years. 3 (C) leaves 66 test station posts above-ground upon completion of construction; 4 (D) leaves 45 posts; comparatively, 2 (B) leave two 4' x 6' and two 8' x 10' solar panels in place.

The end result is the same: cathodic protection to deter corrosion of the Calnev Pipeline. Comparing alternatives 2, 3 and 4 results in a minimum tool common to all -- large, heavy construction equipment and work crews transported to the project area by motorized vehicle and/or mechanized transport, extensive construction windows from 22 to 33 days in duration, and a significant long-term continuation of commercial activity in wilderness.

If more space is needed, continue on the next page…

Explain Rationale for Selection, Continued:

Describe Monitoring & Reporting Requirements:

Approvals

Which of the prohibited uses found in Section 4(c) of the Wilderness Act are approved in the selected alternative and for what quantity?

Prohibited Use		Quantity
☐	Mechanical Transport:	
☐	Motorized Equipment:	
☐	Motor Vehicles:	
☐	Motorboats:	
☐	Landing of Aircraft:	
☐	Temporary Roads:	
☐	Structures:	
☐	Installations:	

Record and report any authorizations of Wilderness Act Section 4(c) prohibited uses according to agency policies or guidance.

Refer to agency policies for the following review and decision authorities:

Prepared	Name	Position	
	Signature		Date
Recommended	Name	Position	
	Signature		Date
Recommended	Name	Position	
	Signature		Date
Approved	Name	Position	
	Signature		Date