C. ALTERNATIVES

This section is organized as follows: Section C.1 is an overview of the alternatives development and screening process, Section C.2 describes the methodology used for the alternatives evaluation, Section C.3 summarizes which alternatives have been selected for full EIR analysis and which have been eliminated based on CEQA criteria, Section C.4 describes the alternatives that have been retained for full Environmental Impact Report (EIR) analysis in Section D, Section C.5 describes the alternatives eliminated from full EIR analysis and rationale for elimination, and Section C.6 provides a description of the No Project Alternative. Section E, Comparison of Alternatives, compares the environmental advantages and disadvantages of the Proposed Project and the alternatives carried forward for further evaluation. Section D provides a discussion of the alternatives carried forward in each issue area as it relates to that topic.

C.1 Alternatives Development and Screening Process

One of the most important aspects of the environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a Proposed Project. In addition to mandating consideration of the No Project Alternative, the California Environmental Quality Act (CEQA) Statutes and Guidelines, State CEQA Guidelines (Section 15126.6(d)) emphasize the selection of a reasonable range of potentially feasible alternatives and adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision makers. The State CEQA Guidelines state that the discussion of alternatives shall focus on alternatives capable of eliminating or reducing significant adverse environmental effects of a Proposed Project, even if these alternatives would impede to some degree the attainment of the project objectives or would be more costly. However, the State CEQA Guidelines also declare that an EIR need not consider an alternative that fails to meet most of the basic project objectives, or whose effects cannot be reasonably ascertained, or whose implementation is remote or speculative.

The Proposed Project is described in detail in Section B of this EIR. Alternatives to the Proposed Project were suggested during the scoping period (November through December 2007) by the general public and local agencies in response to the Notice of Preparation (NOP). Other alternatives were developed by EIR preparers or presented by Sacramento Natural Gas Storage (SNGS), LLC.

In total, 18 alternatives in addition to the No Project Alternative (discussed in Section C.6) were considered in the screening process. Alternatives considered included six alternative storage site locations within Sacramento County and in close proximity to SMUD's service area (see in Figure C-1); possible combination of these alternative gas storage sites; alternative storage sites outside the Sacramento area; seven project design alternatives as identified by SNGS, LLC for

the proposed Florin Gas Field Project; as well as three alternatives to natural gas storage. Alternatives to natural gas storage include methods of meeting project objectives that do not require development of a new underground natural gas storage facility (e.g., additional natural gas supply, energy conservation, and/or alternative fuels).

C.2 Alternatives Screening Methodology

The evaluation of alternatives to the proposed SNGS Facility was completed using a screening process that consisted of three steps:

Step 1: Clarify the description of each alternative to allow comparative evaluation.

Step 2: Evaluate each alternative using CEQA criteria (defined below).

Step 3: Determine the suitability of each alternative for full analysis in the EIR. If the alternative is unsuitable, eliminate it from further consideration. Infeasible alternatives and alternatives that clearly offered no potential for overall environmental advantage were removed from further analysis.

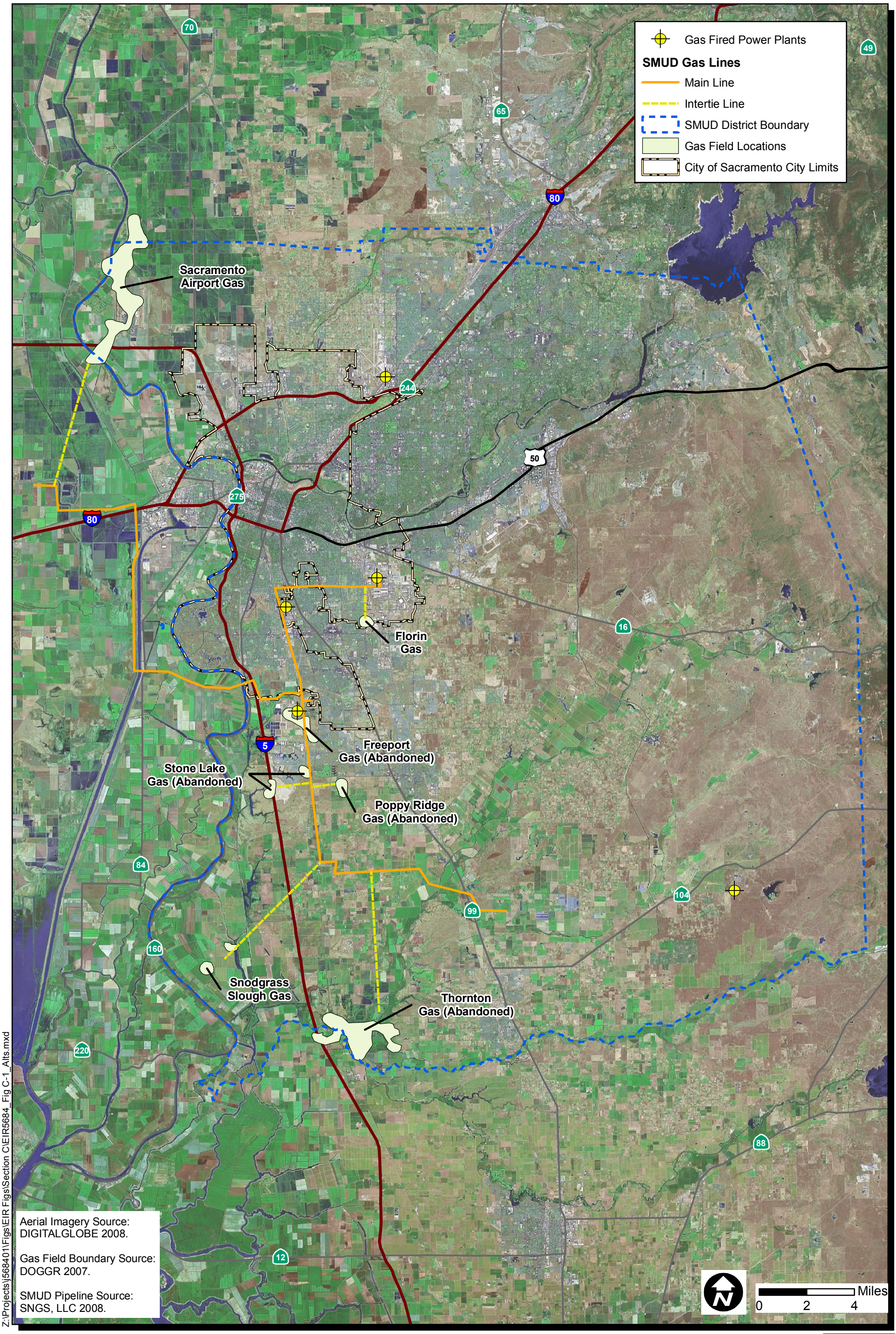
Following the three-step screening process, the advantages and disadvantages of the remaining alternatives were carefully weighed with respect to CEQA's criteria for consideration of alternatives.

State CEQA Guidelines (Section 15126.6(a)) state that:

> An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives.

In order to comply with CEQA's requirements, each alternative that has been suggested or developed for the Proposed Project has been evaluated in three ways:

- Does the alternative meet most basic project objectives?
- Is the alternative feasible (i.e., legal, regulatory, technical)?
- Does the alternative avoid or substantially lessen any significant environmental effects of the Proposed Project (including consideration of whether the alternative itself could create significant environmental effects potentially greater than those of the Proposed Project)?



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Sacramento Natural Gas Storage Project - EIR

Alternative Natural Gas Storage Sites

FIGURE
C-1

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C.2.1 Consistency with Project Objectives

State CEQA Guidelines (Section 15126.6(b)) require the consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives." Therefore, it is not required that each alternative meet all of SNGS, LLC's objectives. However, each alternative must be able to "feasibly" accomplish most of the basic objectives of the project. Moreover, a project may not so limit the objectives of a project in such a way as to artificially confine the range of feasible alternatives that are available.

The objectives of the Proposed Project as defined by SNGS, LLC would meet the following:

1. Provide strategically located natural gas in California.
2. Provide a secure and reliable gas supply for the Sacramento Metropolitan area in the event of a disruption of service on the main supply pipeline that services the area.
3. Satisfy the Sacramento Municipal Utility District's (SMUD's) natural gas storage needs to specifically provide a fuel supply to power their electrical generating plants. The total volumetric capacity available to SMUD under its storage service agreement with SNGS, LLC is 4.0 billion cubic feet (bcf), which yields approximately a 30-day supply.[1]

The CPUC's Certificate of Public Convenience and Necessity (CPCN) proceedings may separately and specifically evaluate the need for the project.

C.2.2 Feasibility

State CEQA Guidelines Section 15364 define feasibility as:

> …capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

In addition, Section 15126.6(f)) of the State CEQA Guidelines requires that the lead agency consider site suitability, economic viability, availability of infrastructure, general plan consistency, other regulatory limitations, jurisdictional boundaries, and the proponent's control

[1] SMUD's RFP No. 91-2, dated June 5, 1992, identified a minimum storage capacity of 3 bcf of working gas for approximately 45 days of projected supply. Since 1992, SMUD has added gas-fired electric generating facilities within their service area. SMUD currently has 5 plants that are fired by natural gas. Therefore, demand for stored natural gas has increased from 1992 to 2009.

over alternative sites in determining the range of alternatives to be evaluated in the EIR. Feasibility can include several components:

- Technical Feasibility: Is the alternative feasible from a technological perspective, considering the construction, operation, and maintenance?
- Legal and Regulatory Feasibility: Does the alternative involve lands that have legal protections or regulatory restrictions that may prohibit or substantially limit the feasibility of permitting a new natural gas storage reservoir and associated facilities?

For the screening analysis, the legal, regulatory, and technical feasibility of potential alternatives was assessed. The assessment was directed toward reverse reason, that is, a determination was made as to whether there was anything about the alternative that would be infeasible on technical, legal, or regulatory grounds.

The screening analysis did not focus on relative economic factors or costs of the alternatives since the State CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives or would be more costly" (Section 15126.6(b) of the State CEQA Guidelines). The CPUC's CPCN proceedings may separately and specifically consider cost issues as they pertain to economic feasibility.

C.2.3 Potential to Eliminate Significant Environmental Effects

CEQA requires that to be fully considered in an EIR, an alternative must have the potential to "avoid or substantially lessen any of the significant effects of the project" (Section 15126.6(a) of the CEQA Guidelines). If an alternative was identified that clearly does not provide potential overall environmental advantage as compared to the Proposed Project, it was eliminated from further consideration. At the screening stage, it is not possible to evaluate all of the impacts of the alternatives in comparison to the Proposed Project with absolute certainty, nor is it possible to quantify impacts. However, it is possible to identify elements of an alternative that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area.

C.3 Summary of Screening Results

Table C-1 provides a composite list of the alternatives considered and the results of the screening analysis with respect to the criteria findings for consistency with project objectives, feasibility, and environmental effectiveness. Alternatives carried forward for full EIR analysis are listed below in Section C.3.1. Alternatives eliminated from further consideration follow in Section C.3.2.

C.3.1 Alternatives Analyzed in the EIR

The alternatives listed below are those that have been selected through the alternative screening process for detailed EIR analysis. Each of these alternatives meets most or all project objectives, is feasible, and potentially avoids or reduces environmental effects of the Proposed Project. The alternatives are briefly described in Table C-1 and Section C.4.

Alternative gas field locations

- Freeport Gas Field
- Snodgrass Slough Gas Field
- Thornton Gas Field.

Project design alternatives

- Three alternative pipeline routes between the proposed wellhead site and proposed compressor station as identified by SNGS, LLC for the proposed Florin Gas Storage Project.

C.3.2 Alternatives Eliminated from EIR Consideration

The alternatives that have been eliminated through the alternative screening process from EIR analysis are listed below. As summarized in Table C-1, these alternatives have been eliminated due to project objective and feasibility concerns, and because several would not have the potential to avoid or substantially lessen environmental impacts. The rationale for elimination of each alternative is summarized in Table C-1 and Section C.5.

Gas field alternatives

- Stone Lake
- Poppy Ridge
- Sacramento Airport
- Combined Gas Field Alternative
- Outside Sacramento area
- Storage of natural gas in aboveground or partially buried tanks.

Table C-1
SNGS Proposed Project—Summary of Alternatives Screening Analysis

Alternative	Project Objectives Criteria*	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR for Further Analysis
Gas Field Alternatives				
Freeport	Partially meets project objectives due to limited storage capacity. Would have a working gas storage capacity of +1 bcf. Project objective 3 requires 4 bcf.	Meets technical feasibility criteria. Would require construction of approximately 1 mile of interconnect pipeline.	Potentially meets environmental criteria as field is located in suburban fringe and may reduce potential public safety risks.	Yes
Snodgrass Slough Gas Field	Partially meets project objectives due to limited storage capacity. Would have a working gas storage capacity of at least +2 bcf. Project objective 3 requires 4 bcf.	May be technically feasible but would require approximately 5 miles of interconnect pipeline.	Meets environmental criteria as it would provide a natural gas storage field outside of an urban area, thereby reducing potential public safety risks.	Yes
Stone Lake	Does not meet project objectives due to limited storage capacity. Would have a working gas storage capacity of 0.75 bcf. Project objective 3 requires 4 bcf.	Does not meet feasibility criteria due to faults.	Located in Stone Lake Refuge. May not meet environmental criteria as it is located in an environmentally sensitive area (Stone Lake Refuge).	No
Poppy Ridge	Does not meet project objectives due to limited storage capacity. Would have a working gas storage capacity of 0.12 bcf. Project objective 3 requires 4 bcf.	Meets technical feasibility criteria.	Does not meet environmental criteria as it would be located in the community of Elk Grove and therefore would not substantially reduce public safety risks.	No

Table C-1 (Continued)

Alternative	Project Objectives Criteria*	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR for Further Analysis
Sacramento Airport	Meets project objectives. Would have a working gas storage capacity of 7.5 bcf. Project objective 3 requires 4 bcf.	Does not meet feasibility criteria due to geologic formation.	May not meet environmental criteria due to potential siting conflicts with airport and additional environmental impacts associated with the 5- to 10-mile connecting pipeline.	No
Thornton	Meets project objectives. Would have a working gas storage capacity of +7.5 bcf. Project objective 3 requires 4 bcf.	Meets technical feasibility criteria. Would require construction of approximately 7 miles of pipeline.	May meet environmental criteria as it would provide natural gas storage outside of an urban area, thereby reducing potential public safety issues. However, this alternative is in the Cosumnes River Preserve and would require approximately 7 miles of connecting pipeline.	Yes
Combined Gas Field (Poppy Ridge and Stone Lake)	Does not meet project objectives due to limited storage capacity. Would have a working gas storage capacity of 0.87 bcf. Project objective 3 requires 4 bcf.	While the use of Poppy Ridge would meet technical feasibility, in combination with Stone Lake would not meet technical feasibility criteria due to faults.	Does not meet environmental criteria. The facilities required under this alternative would be located in the Stone Lake Refuge and in the community of Elk Grove. Therefore, would not substantially reduce public safety risks and would increase biological resource impacts associated within the Stone Lake Refuge.	No
Outside Sacramento Area	Does not meet project objectives because it does not provide local storage in the Sacramento area.	May be feasible depending upon location.	May meet environmental criteria depending on location.	No
Storage of natural gas in aboveground or partially buried tanks	Would store less than .05 bcf per tank. Could meet project objectives assuming 80 tanks developed.	May be feasible depending upon location.	Would not meet environmental criteria. Depending on location, the development of 80 tanks would create aesthetic impacts, land use impacts, and safety issues.	No

Table C-1 (Continued)

Alternative	Project Objectives Criteria*	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR for Further Analysis
Project Design Alternatives as Identified by SNGS, LLC for the Proposed Florin Gas Field Storage Project				
Alternative Compressor Station Site 1 - Located next to drill site	Meets project objectives.	Meets feasibility criteria.	Does not meet environmental criteria. Would require relocation of current businesses and would be closer to residences.	No
Alternative Compressor Station Site 2 - Located near Fruitridge Road	Meets project objectives.	Meets feasibility criteria.	Does not meet environmental criteria. Closer to businesses and residences than the Proposed Project.	No
Alternative Wellhead Site to Compressor Station Pipeline Route 1	Meets project objectives.	Meets feasibility criteria.	Meets environmental criteria. Although this pipeline alignment is 450 feet longer, it avoids impacts to Power Inn Road. ~~and may have slightly less public safety issues because it is further away from residences.~~	Yes
Alternative Wellhead Site to Compressor Station Pipeline Route 2	Meets project objectives.	Meets feasibility criteria.	Meets environmental criteria. Although this pipeline alignment is 350 feet longer, it avoids impacts to Power Inn Road. ~~and may have slightly less safety issues because it is further away from residences.~~	Yes
Alternative Wellhead Site to Compressor Station Pipeline Route 3	Meets project objectives.	Meets feasibility criteria.	Meets environmental criteria. This alternative follows Power Inn Road and is the shortest alignment.	Yes
Alternative Well Site at Compressor Station Site.	Does not meet project objectives as not technically feasible.	Does not meet feasibility criteria because it is not near center of gas field.	Meets environmental criteria. Further away from residential areas and shorter pipeline.	No

Table C-1 (Continued)

Alternative	Project Objectives Criteria*	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR for Further Analysis
Alternatives to Natural Gas Storage				
Construction of additional pipelines to increase natural gas supply to Sacramento area.	Does not meet project objectives. Would not provide additional storage in area and would be subject to transport curtailment.	Unknown feasibility. Unlikely that additional gas supply is available to support an additional pipeline.	May not meet environmental criteria. Depending on location, would create construction impacts and system safety impacts associated with pipeline construction.	No
Alternative fuels supplies (such as biofuels, wind, solar, geothermal, landfill gas, hydroelectric and anaerobic digestion).	Does not meet project objectives. Would not provide additional natural gas storage in Sacramento area.	Would not meet project need for natural gas storage; therefore, not considered feasible.	~~Does not~~Would meet environmental criteria. Use of alternative fuels ~~such as oil~~ would potentially decrease ~~increase~~ air pollutants. ~~and would violate air quality standards.~~	No
Energy conservation/demand-side management	Does not meet project objectives. Will not replace enough energy to substantially reduce the necessity for storage.	Would not meet feasibility criteria as these options are not feasible on a scale that would be suitable to replace the Proposed Project.	Would meet environmental criteria, since impacts of the project would be avoided and no new significant environmental impacts would be created.	No

* Any storage over 1 bcf = partially meets project objectives

Project design alternatives

- Alternative Compressor Station Site 1 as identified by SNGS, LLC for the proposed Florin Gas Storage Project
- Alternative Compressor Station Site 2 as identified by SNGS, LLC for the proposed Florin Gas Storage Project
- Alternative well site at compressor station site as identified by SNGS, LLC for the proposed Florin Gas Storage Project.

Alternatives to natural gas storage

- Construction of additional pipelines to increase natural gas supply to Sacramento area
- Energy conservation/demand-side management
- Alternative fuel supply.

C.4 Alternatives Evaluated in this EIR

As discussed in Section C.2, alternatives were assessed for their technical, legal, and regulatory feasibility, their ability to reasonably achieve the project objectives, and their potential for reducing the significant environmental impacts of the Proposed Project. Based on these screening criteria, the following alternatives were selected for detailed analysis within this EIR.

C.4.1 Gas Field Alternatives

C.4.1.1 Freeport Gas Field

Description

The Freeport Gas Field Alternative is shown in Figures C-1 and C-2 and was evaluated by SNGS, LLC. The Freeport Gas Field is located on a suburban fringe site and is partially located under the Sacramento Regional Wastewater Treatment Plant (SRWTP), which is a 900-acre area. The wastewater district also purchased 2,650 acres surrounding the treatment plant to serve as a buffer between the SRWTP operations and the surrounding existing and planned residential communities. This land is known as the Bufferlands, which provides an area for environmental mitigation, farming and grazing, habitat for wildlife, and environmental education opportunities. This property is managed by Bufferlands staff.

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Sacramento Natural Gas Storage Project - EIR

Freeport Gas Field Alternative

FIGURE
C-2

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The field is surrounded to the north, west, and south by Elk Grove, population 59,984 (U.S. Census 2000), neighborhood of Laguna Creek, which is a suburb of Sacramento. The Interstate 5 (I-5) freeway crosses the western boundary of the site. Working gas storage capacity in this field is estimated to be over 1 bcf. Development of this field would involve constructing facilities similar to those required for the Proposed Project, including injection/withdrawal wells, compressor station, and connecting pipeline(s) between the wells and compressor station, as well as an interconnecting pipeline from the gas field to SMUD's natural gas pipeline system. As shown in Figure C-1, connection to the SMUD system under this alternative would require the construction of a 16-inch interconnect pipeline for approximately 1 mile through rural areas.

Rationale for Full Analysis

Development of the Freeport Gas Field is technically feasible and would provide a natural gas storage field in a suburban fringe site, which may reduce the potential public safety impacts associated with the Proposed Project. This alternative would meet project objectives 1 and 2. Due to this alternative's limited ability to store natural gas it would only partially meet project objective 3. This alternative has been recommended to be carried forward for further analysis in the EIR as it would partially meet project objectives, is technically feasible, and has the potential to reduce project impacts.

C.4.1.2 Snodgrass Slough Gas Field

Description

The Snodgrass Slough Gas Field Alternative is shown in Figures C-1 and C-3 and was evaluated by SNGS, LLC. The Snodgrass Slough Gas Field is located in an agricultural area. To the east and adjacent of the field is the Reclamation District 551 Borrow Canal. The Sacramento River and California State Highway 160 are located approximately 3 miles to the west of the site. Walnut Grove, located approximately 4 miles to the south of the site, is the nearest population center with a population of 669 people (U.S. Census 2000). Working gas storage capacity in this field is estimated to be greater than 2 bcf. Development of this field would involve constructing facilities similar to those required for the Proposed Project, including injection/withdrawal wells, compressor station, and connecting pipeline(s) between the wells and compressor station, as well as an interconnecting pipeline from the gas field to SMUD's natural gas pipeline system. As shown in Figure C-1, connection to the SMUD system under this alternative would require the construction of an approximately 16-inch interconnect pipeline for approximately 5 miles. Construction of this interconnect pipeline would require horizontal directional drilling (HDD) across the slough, I-5, and the Union Pacific Railroad (UPRR).

Rationale for Full Analysis

Development of the Snodgrass Slough Gas Field would provide a natural gas storage field outside of an urban area, thereby reducing the potential public safety impacts associated with the Proposed Project while partially meeting project objectives 1, 2, and 3. While this field has produced natural gas between 1993 and 1998, the geologic structure has not been studied in detail and therefore the technical feasibility may be limited and require further geologic evaluation and special engineering. While careful consideration needs to be given to the potential technical limitations of this alternative, it is considered to be potentially feasible. Therefore, it has been recommended to be carried forward for further analysis in the EIR, as it would partially meet project objectives, is potentially technically feasible, and has the ability to reduce project impacts.

C.4.1.3 Thornton Gas Field

Description

The Thornton Gas Field Alternative is shown in Figures C-1 and C-4 and was evaluated by SNGS, LLC. The Thornton Gas Field is located in a predominantly agricultural area. The field is located less than a mile east of Franklin Boulevard and approximately 1.5 miles east of the I-5 freeway. The Cosumnes River Preserve is adjacent to the field to the north. The nearest population center is Thornton, which is located approximately 1 mile to the south of the site and has a population of 4,650 people (U.S. Census 2000). The Thornton Gas Field is large with a working gas storage capacity of greater than 7.5 bcf. Development of this field would involve constructing facilities similar to those required for the Proposed Project, including injection/withdrawal wells, compressor station, and connecting pipeline(s) between the wells and compressor station, as well as an interconnecting pipeline from the gas field to SMUD's natural gas pipeline system. As shown in Figure C-1, connection to the SMUD system under this alternative would require the construction of a 7-mile, 16-inch-diameter interconnect pipeline through primarily rural areas.

Rationale for Full Analysis

Development of the Thornton Gas Field is technically feasible and would provide a natural gas storage field outside of an urban area, thereby reducing potential health and safety impacts associated with the Proposed Project while meeting project objectives. While this alternative may create additional impacts associated with construction and operation of proposed facilities adjacent to the Cosumnes River Preserve, it has been recommended to be carried forward for further analysis in the EIR as it would meet project objectives, is technically feasible, and has the ability to reduce project impacts assuming facilities would be located outside the Cosumnes River Preserve.

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Sacramento Natural Gas Storage Project - EIR

Snodgrass Slough Gas Field Alternative

FIGURE
C-3

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Sacramento Natural Gas Storage Project - EIR

Thornton Gas Field Alternative

FIGURE
C-4

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C.4.2 Project Design Alternatives as Identified by SNGS, LLC for the Proposed Florin Gas Field Storage Project

C.4.2.1 Alternative Wellhead Site to Compressor Station Pipeline Route 1

Description

Project facilities under the Alternative Pipeline Route 1 are the same as the Proposed Florin Gas Field Storage Project, except for the route which the 16-inch-diameter underground natural gas pipeline would run from the wellhead site to the compressor station. As shown in Figure C-5, from the northwest corner of the wellhead site, under this alternative the gas pipeline from the wellhead to the compressor station would head due east to the UPRR tracks. This alternative would parallel Junipero Street and cross an active industrial-use yard. It would then parallel the UPRR tracks, north to Elder Creek Road. At this point, the alignment continues north to Lemon Hill Avenue before entering the compressor station. This route would be approximately 7,800 feet long, approximately 450 feet longer than the Proposed Project.

Rationale for Full Analysis

Alternative Pipeline Route 1 would reduce traffic impacts on Power Inn Road ~~and may reduce safety impacts because it is further away from residences~~ while meeting project objectives 1, 2, and 3. Because this alternative has the potential to reduce project impacts, it has been recommended to be carried forward for full EIR analysis.

C.4.2.2 Alternative Wellhead Site to Compressor Station Pipeline Route 2

Description

Project facilities under the Alternative Pipeline Route 2 are the same as the Proposed Florin Gas Field Storage Project, except for the route which the 16-inch-diameter underground natural gas pipeline would run from the wellhead site to the compressor station. As shown in Figure C-5, from the northwest corner of the wellhead site, under this alternative the gas pipeline from the wellhead to the compressor station would run approximately 600 feet north within the utility alignment to Berry Avenue, and then parallel the UPRR tracks north to Elder Creek Road. At this point, the alignment continues north to Lemon Hill Avenue before entering the compressor station. This route would be approximately 7,700 feet long, approximately 350 feet longer than the Proposed Project.

Rationale for Full Analysis

Alternative Pipeline Route 2 would reduce traffic impacts on Power Inn Road ~~and may reduce safety impacts because it is further away from residences~~ while meeting project objectives 1, 2,

and 3. Because this alternative would meet project objectives, is feasible, and has the potential to reduce project impacts it has been recommended to be carried forward for full EIR analysis.

C.4.2.3 Alternative Wellhead Site to Compressor Station Pipeline Route 3

Description

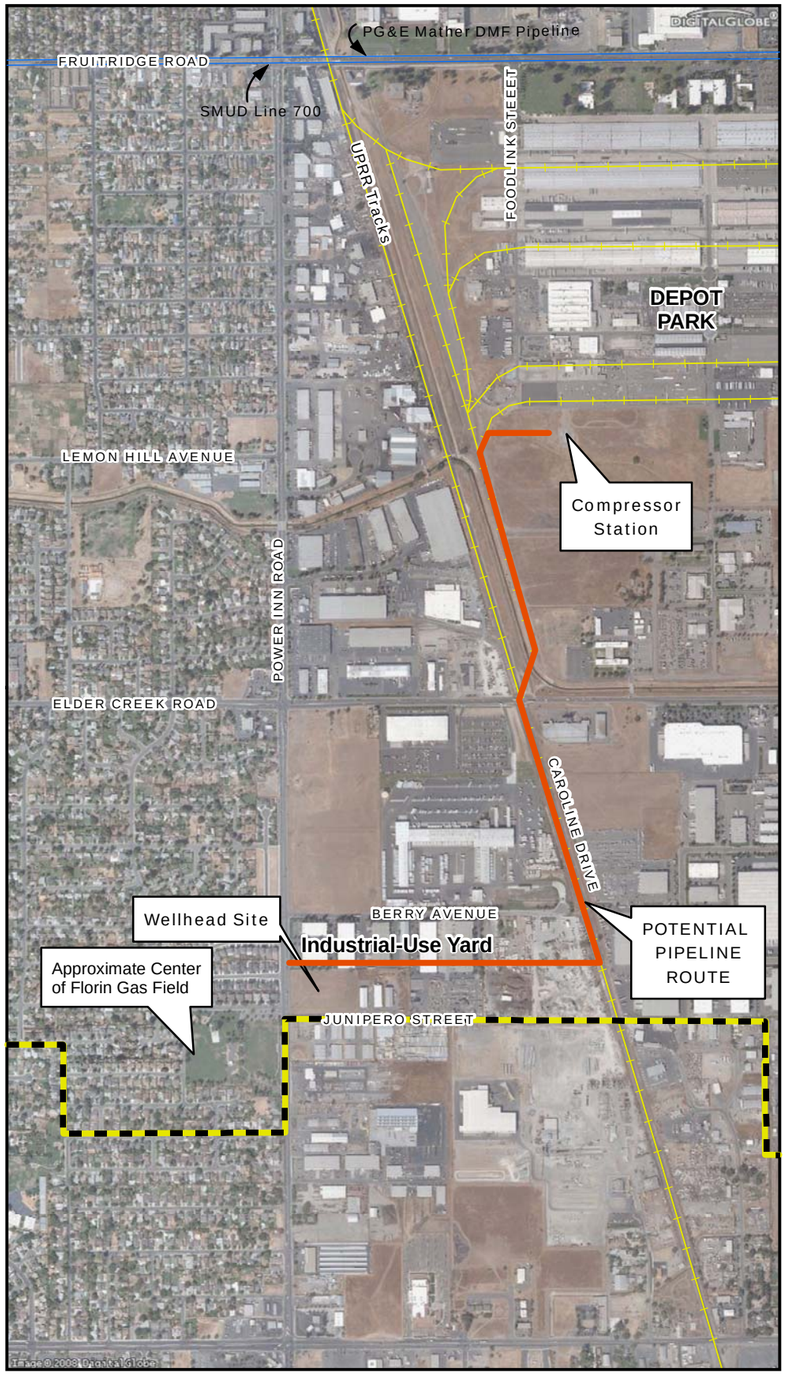
Project facilities under the Alternative Pipeline Route 3 are the same as the Proposed Florin Gas Field Storage Project, except for the route which the 16-inch-diameter underground natural gas pipeline would run from the wellhead site to the compressor station. As shown in Figure C-5, from the northwest corner of the wellhead site, under this alternative the gas pipeline from the wellhead to the compressor station would run north approximately 1,650 feet within an existing utility alignment, and then approximately 650 feet north along Power Inn Road to Elder Creek Road. From that intersection, the pipeline would be installed within Elder Creek Road, for approximately 1,800 feet, to the intersection with the UPRR tracks. At this point, the alignment continues north to Lemon Hill Avenue before entering the compressor station. This route would be approximately 7,100 feet long total, approximately 250 feet shorter in length than the Proposed Project.

Rationale for Full Analysis

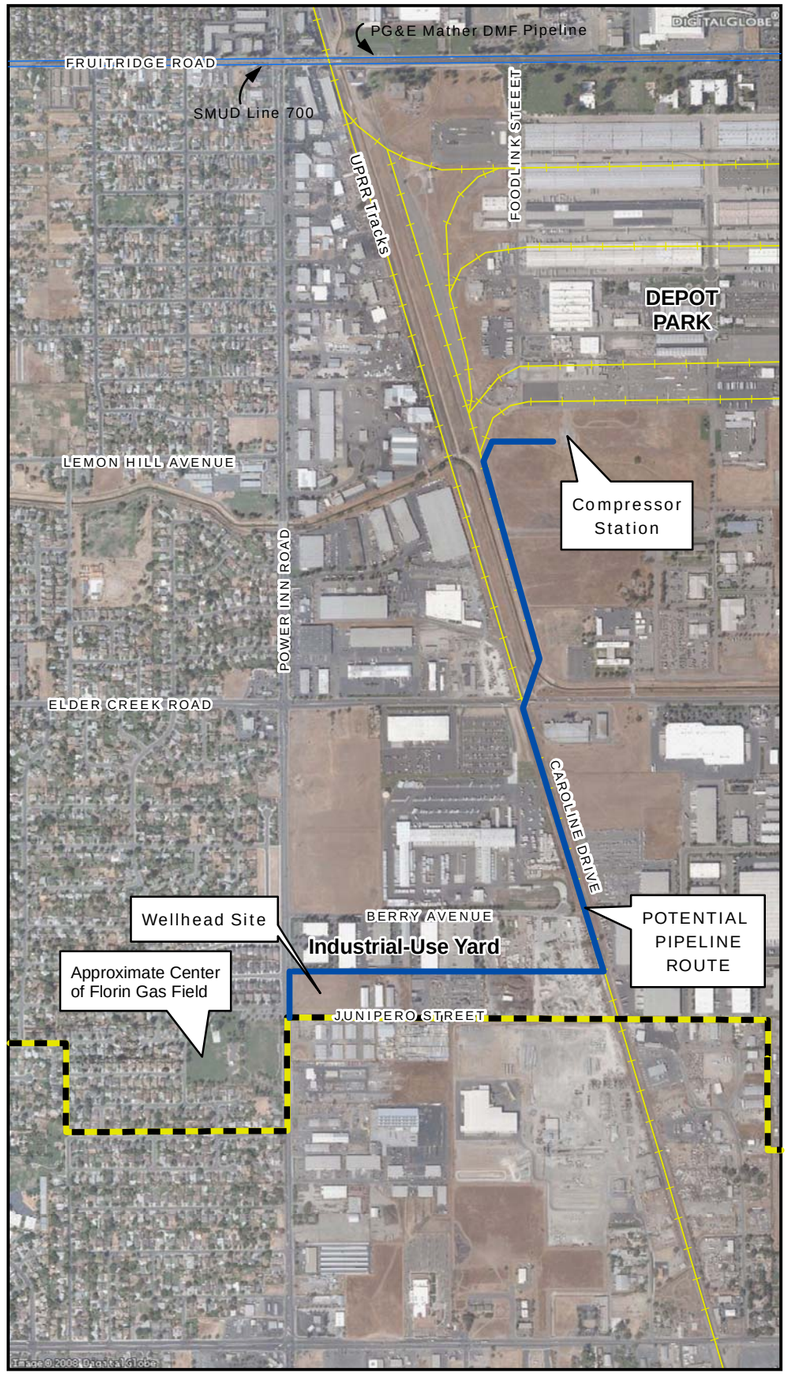
Alternative Pipeline Route 3 is the shortest alignment and would reduce construction-related impacts while meeting project objectives 1, 2, and 3. Because this alternative would meet project objectives, is feasible, and has the potential to reduce project impacts it has been recommended to be carried forward for full EIR analysis.

C.5 Alternatives Eliminated from Full EIR Evaluation

As discussed in Section C.1, alternatives were assessed for their ability to reasonably achieve the project objectives and reduce the significant environmental impacts of the Proposed Project. Also, their technical, legal, and regulatory feasibility was evaluated. Based on these screening criteria, the alternatives eliminated from EIR consideration are listed above in Section C.3.2. The rationale for elimination of each alternative is summarized below.



ROUTE 1



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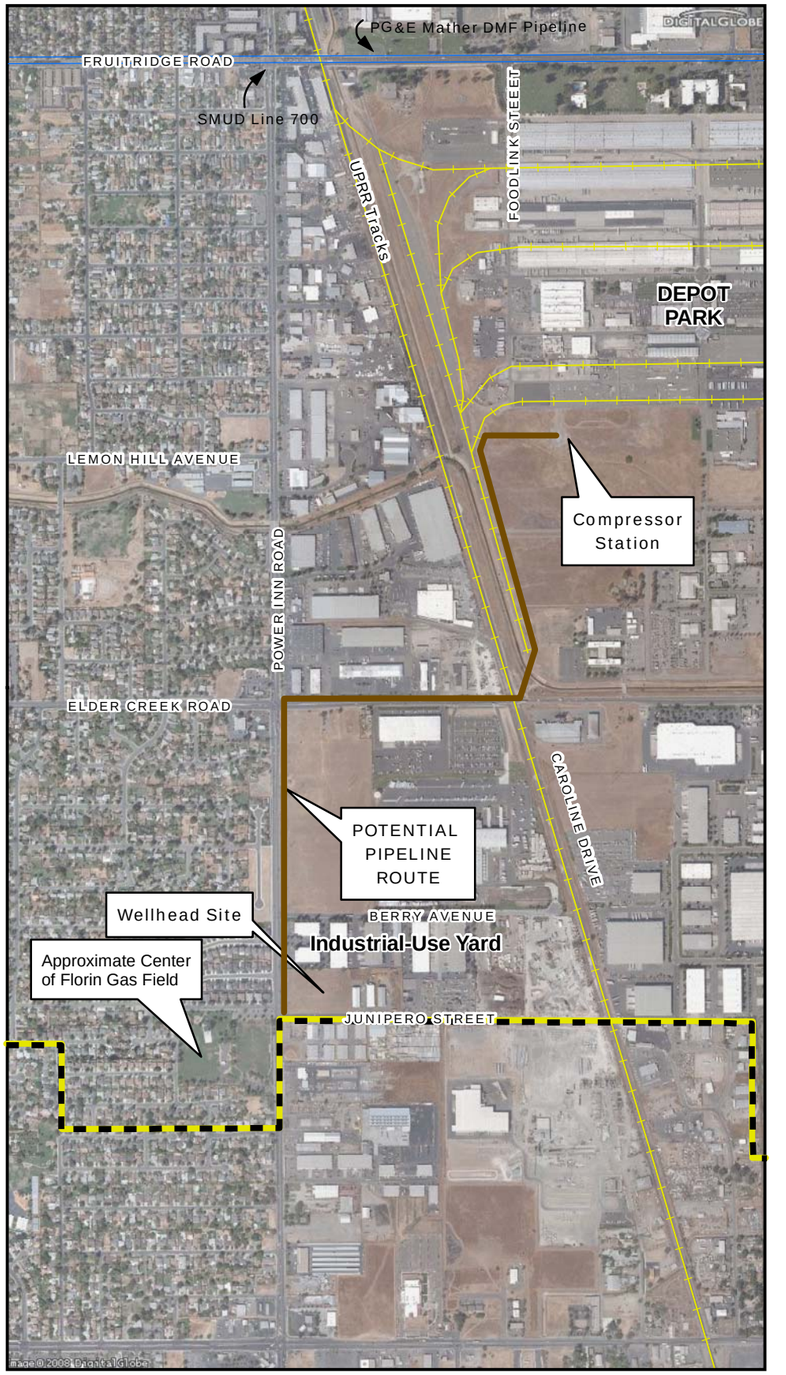

ROUTE 3

SOURCE: SNGS, LLC 2007.

Sacramento Natural Gas Storage Project - EIR

Alternative Connecting Pipelines

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C.5.1 Alternative Gas Fields

C.5.1.1 Stone Lake Gas Field

Description

The Stone Lake Gas Field consists of two small fields located to the south of the Freeport Gas Field near the Elk Grove and Laguna neighborhoods. The fields are located in a residential area on the southern urban fringe of the Sacramento Metro area. The western field is located beneath the I-5 freeway and immediately to the south of Elk Grove Boulevard. The eastern field is east of I-5 freeway and adjacent and to the north of Elk Grove Boulevard. The Stone Lake Gas Field Alternative is shown in Figure C-1 and was evaluated by SNGS, LLC. The field is located in the Stone Lake Refuge. Working gas storage capacity in this field is estimated to be approximately 0.75 bcf. Development of this field would involve constructing facilities similar to those required for the Proposed Project, including injection/withdrawal wells, compressor station, and connecting pipeline(s) between the wells and compressor station, as well as an interconnecting pipeline from the gas field to SMUD's natural gas pipeline system. As shown in Figure C-1, connection to the SMUD system under this alternative would require the construction of an approximately 2-mile, 16-inch-diameter interconnect pipeline through a partially urbanized area.

Rationale for Elimination

The Stone Lake Gas Field would provide a natural gas storage field outside of an urban area, thereby reducing the potential health and safety impacts associated with the Proposed Project. However, other environmental impacts to biological resources may be greater than those associated with the Proposed Project due to construction and operation activities within the Stone Lake Refuge and additional connection pipeline required for this alternative; therefore, this alternative may not meet environmental screening criteria. This alternative would not meet the CEQA screening criteria for project objectives or feasibility. This alternative would meet project objective 1. However, due to its limited ability to store natural gas, it would not meet project objectives 2 and 3. In addition, three faults occur within the Stone Lake Gas Field, which may create pathways for leakage; therefore, due to geologic conditions, the field may not meet the technical feasibility criteria. The Stone Lake Gas Field Alternative would not meet project objectives criteria or technical feasibility criteria and therefore was not carried forward for full EIR analysis.

C.5.1.2 Poppy Ridge Gas Field

Description

The Poppy Ridge Gas Field is a small gas field located to the east of the eastern-most Stone Lake Gas Field. It is also beneath a residential area on the urban fringe of the Sacramento Metro area.

It is located to the south of Elk Grove Boulevard and 1 mile east of Franklin Boulevard. Poppy Ridge, like the Freeport and Stone Lake gas fields, is located in the Laguna neighborhood of Elk Grove. The Poppy Ridge Gas Field Alternative is shown in Figure C-1 and was evaluated by SNGS, LLC. Working gas storage capacity in this field is estimated to be approximately 0.12 bcf. Development of this field would involve constructing facilities similar to those required for the Proposed Project, including injection/withdrawal wells, compressor station, and connecting pipeline(s) between the wells and compressor station, as well as an interconnecting pipeline from the gas field to SMUD's natural gas pipeline system. As shown in Figure C-1, connection the SMUD system under this alternative would require the construction of an approximately 2-mile, 16-inch-diameter interconnect pipeline through an urban area.

Rationale for Elimination

This alternative appears to be technically feasible. However, the Poppy Ridge Gas Field is located in an urban area and therefore would not substantially reduce potential health and safety impacts associated with the Proposed Project and therefore would not meet the CEQA screening criteria for environmental criteria. This alternative would meet project objective 1. However, due to its limited ability to store natural gas, it would not meet project objectives 2 and 3 and therefore would not meet project objectives criteria. Because the Poppy Ridge Gas Field Alternative would not meet project objectives or environmental criteria, it was not carried forward for full EIR analysis.

C.5.1.3 Sacramento Airport Gas Field

Description

The Sacramento Airport Gas Field is located, as the name suggests, beneath the Sacramento Airport. It is comparatively larger in area than the other alternatives considered and is approximately 6 miles long (north to south) and is 1.5 miles at its widest point across (west to east). At its northern-most point the Sacramento Airport Gas Field touches West Riego Road. The western boundary of the field is the Sacramento River, the southern boundary is the State Highway-22, and the eastern boundary is Power Line Road. Other than the airport, the gas field is located beneath agricultural fields. The Sacramento Airport Gas Field Alternative is shown in Figure C-1 and was evaluated by SNGS, LLC. The field covers 11 square miles and the storage capacity in this field is 7.5 bcf, similar to that of the Proposed Project. Development of this field would involve constructing facilities similar to those required for the Proposed Project, including injection/withdrawal wells, compressor station, and connecting pipeline(s) between the wells and compressor station, as well as an interconnecting pipeline from the gas field to SMUD's natural gas pipeline system. As shown in Figure C-1, connection to the SMUD system under this

alternative would require the construction of and approximately 5- to 10-mile, 16-inch-diameter interconnect pipeline.

Rationale for Elimination

While the Sacramento Airport Gas Field would meet project objectives and provide a natural gas storage field outside of residential areas, thereby reducing the potential health and safety impacts associated with the Proposed Project, it would not meet the technical feasibility screening criteria. The geologic formation of the reservoir, which includes faults, discontinuous sand lenses, and massive discontinuity in the production zones throughout the field, precludes this alternative due to feasibility and therefore, this alternative was not carried forward for full EIR analysis. Furthermore, this alternative could create potential siting conflicts with the airport as well as additional environmental impacts associated with the need to construct an approximately 5- to 10-mile interconnect pipeline.

C.5.1.4 Combined Gas Field Alternative

Six alternative gas storage sites within Sacramento County and in close proximity to SMUD's service area were considered in the alternatives screening process. As summarized in Table C-1 and discussed in Section C.4, the Freeport, Snodgrass Slough, and Thornton Gas Fields have been selected through the alternatives screening process for detailed EIR analysis.

Combinations of the Freeport, Snodgrass Slough and Thornton Gas Fields were not considered for several reasons. First, combining any of these three off-site gas field alternatives would require duplication of construction and operation of project facilities at each gas field including injection/withdrawal wells, compressor station, and connecting pipelines from the wells to the compressor station and also to interconnect into the SMUD system. Second, construction and operation of duplicated facilities would not have the ability to further avoid or substantially lessen significant environmental effects beyond those environmental impacts associated with each individual alternative gas field site.

As summarized in Table C-1 and discussed in Section C.5, the Sacramento Airport, Stone Lake and Poppy Ridge alternative gas fields were not carried forward for EIR analysis. However, the Sacramento Airport, Stone Lake, and Poppy Ridge gas fields were also not considered in combinations for several reasons. First, the Sacramento Airport Gas Field Alternative would meet project objectives, and it would not meet technical feasibility screening criteria due to geologic concerns. Moreover, even if combining the Sacramento Airport Gas Field was combined with another alternative gas field, the Sacramento Airport Gas Field would not become technically feasible.

As summarized in Table C-1 and discussed in Section C.5, both the Poppy Ridge and the Stone Lake gas field alternatives were too small to meet project objectives screening criteria. Moreover, the Stone Lake Alternative does not meet feasibility criteria due to faults (see Table C-1). However, an alternative combining these two alternative gas fields was considered, but eliminated as explained below.

As discussed in Sections C.5.1.1 and C.5.1.2 and shown in Figure C-1, the Stone Lake and Poppy Ridge Gas Fields are located on the urban fringe of the Sacramento Metro area. The Stone Lake Gas Field is located in the Stone Lake Refuge near the community of Elk Grove. The Poppy Ridge Gas Field is located two to three miles east of the Stone Lake Gas Field, underneath a residential area of Elk Grove. Development of both fields together would involve constructing and operating duplicate facilities similar to those required for the Proposed Project at each gas field site, including injection/ withdrawal wells at each field, compressor stations at each field, and connecting pipelines from the wells to the compressor station at each field as well as interconnecting pipelines into the SMUD system. Connection to the SMUD system under this combined alternative would require construction of an approximately 2-mile 16-inch diameter pipeline through a partially urbanized area to connect the Stone Lake Gas Field to the SMUD system as well as an approximately 2-mile 16-inch diameter pipeline through an urbanized area to connect the Poppy Ridge Gas Field to the SMUD system. Working gas storage capacity under this combined gas field alternative is estimated to be approximately 0.87 bcf (0.75 bcf Stone Lake plus 0.12 bcf Poppy Ridge).

Rational for Elimination

Combining the Stone Lake and Poppy Ridge Gas Fields would meet project objective 1; however, due to its limited working capacity to store natural gas, this combined gas field alternative would not meet project objectives 2 and 3, and therefore would not meet CEQA screening criteria for project objectives. This combined gas field alternative would not meet CEQA screening criteria for technical feasibility as three faults occur within the Stone Lake Gas Field, which may create pathways for leakage. Finally, while the Stone Lake Gas Field would provide a natural gas field outside of an urban area, thereby reducing potential health and safety impacts associated with the Proposed Project, in combination with the Poppy Ridge Gas Field, health and safety impacts would not be substantially reduced as the Poppy Ridge Gas Field is located in an urban area. Furthermore, operating two gas storage facilities with separate wells, compressor stations, and pipelines may increase the potential for accidents including fire and explosions than would be associated with the operation of a single facility. The greater length of the two pipeline systems will increase the probability of fire and explosion from a pipeline rupture. Cycling the pressures of two natural gas storage reservoirs may also increase the potential for gas migration to the groundwater aquifer and to the ground surface. This could result in the contamination of the aquifer and the increased potential for fire and explosions.

Additionally, combining the Stone Lake and Poppy Ridge Gas Fields would have greater impacts to biological resources as the Stone Lake Gas Field is located in the Stone Lake Refuge. Therefore, ~~combing~~ combining the Stone Lake and Poppy Ridge gas fields would not meet the CEQA screening criteria for environmental effects as it would not avoid or substantially reduce environmental impacts of the Proposed Project. Combining the Stone Lake and Poppy Ridge gas fields as an alternative to the Proposed Project would not meet project objectives criteria, technical feasibility criteria, or environmental screening criteria and therefore was not carried forward for full EIR analysis.

C.5.1.5 Gas Fields Outside Sacramento County

Description

Gas fields outside of the Sacramento area were considered, including Wild Goose in Colusa County, and a number of other depleted or partially depleted gas or oil fields in the region, including the Princeton Gas Field in Colusa County. Development of these field(s) would involve constructing facilities similar to those required for the Proposed Project, including injection/withdrawal wells, compressor station, and connecting pipeline(s) between the wells and compressor station, as well as an interconnecting pipeline from the gas field to SMUD's natural gas pipeline system.

Rationale for Elimination

Development of a gas storage field outside the Sacramento area may potentially be feasible and depending on the location, may reduce the potential public health and safety impacts associated with the Proposed Project by developing natural gas storage outside the metropolitan area. However, this alternative would not meet the CEQA screening criteria for project objectives. While this alternative would meet project objective 1, it would not meet project objectives 2 and 3. Natural gas storage under this alternative would be located over 13 miles from the Sacramento Metropolitan and SMUD service area. The reliability of storage of natural gas to SMUD and the Sacramento Metropolitan area during a disruption tends to decrease with pipeline distance to a point where natural gas storage facilities outside the Sacramento area would not meet project objectives 2 and 3, which specifically require that the gas storage provide secure and reliable gas supply to the Sacramento metropolitan area in the event of a disruption of service and to provide storage needed to specifically supply SMUD natural gas storage needs to power their electrical generating plants. Therefore this alternative was not carried forward for further analysis in the EIR.

C.5.1.6 Use of Natural Gas Storage Tanks

Description

This alternative would involve the use of above ground or partially buried storage tanks that would store natural gas in the Sacramento Area. The storage capacity of each tank is expected to be 0.05 bcf of natural gas. This would mean that approximately 80 such tanks would be necessary to meet the 4.0 bcf storage requirements. Even partially buried, these tanks could be over 100 feet in diameter and 75 to 100 feet high. No specific locations have been identified. For purposes of the analysis provided in this EIR it is assured that natural gas storage tanks under this alternative would be placed in locations near existing SMUD pipelines (see Figure C-1).

Rationale for Elimination

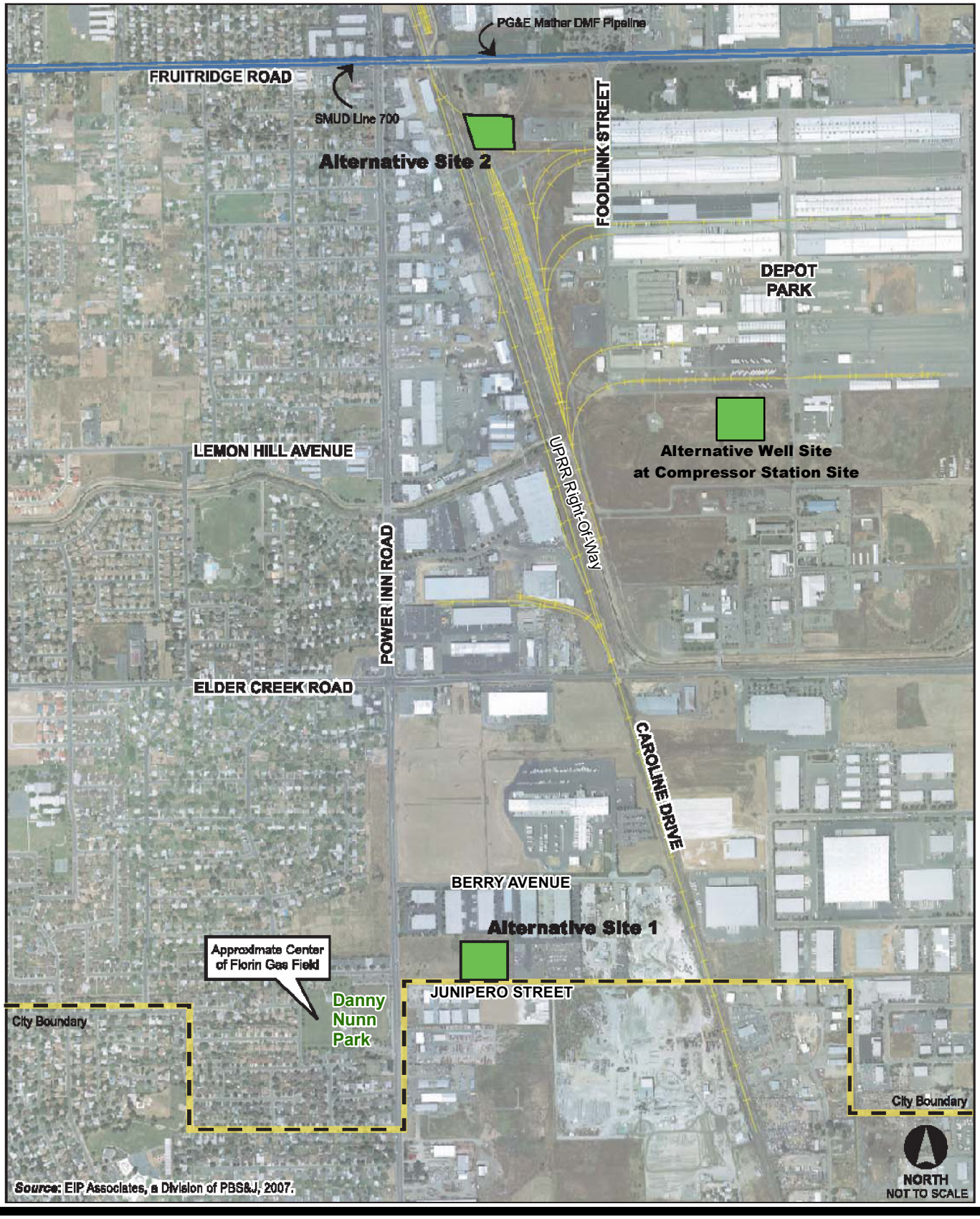
The development of approximately 80 natural gas storage tanks located in or near SMUD natural gas lines could result in substantial risk to fire or explosion both from the tanks themselves, and from the connecting pipelines. Additionally, development of 80 of these large tanks would result in substantial aesthetic impacts and land use impacts. Although this alternative could meet most project objectives and is considered technically feasible, it would not meet environmental screening criteria due to the substantial safety, land use, and aesthetics impacts and therefore was not carried forward for full EIR analysis.

C.5.2 Project Design Alternatives as Identified by SNGS, LLC for the Proposed Florin Gas Field Storage Project

C.5.2.1 Alternative Compressor Station Location 1

Description

Project facilities under the alternative compressor station location 1 are the same as the Proposed Florin Gas Field Storage Project except for the location of the compressor station. As shown in Figure C-6, under this alternative the compressor station would be immediately adjacent and to the east of the wellhead site, located on the northeast quadrant of Power Inn Road and Junipero Street. At least one or two additional parcels of land, currently occupied by active businesses, would have to be acquired. The compressor station would be approximately 500 feet from residences under this alternative.



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Alternative Compressor Station Sites and Well Site

FIGURE C-6

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Rationale for Elimination

Although this alternative would meet project objectives and would be feasible, it would not reduce environmental impacts of the Proposed Project. This alternative would require relocation of current businesses and would be closer to residences; therefore, it was not carried forward for further analysis in the EIR.

C.5.2.2 Alternative Compressor Station Location 2

Description

Project facilities under the alternative compressor station location 2 are the same as the Proposed Florin Gas Field Storage Project except for the location of the compressor station. As shown in Figure C-6, under this alternative the compressor station would be near Fruitridge Road, adjacent to the west of the UPRR right of way, on the Depot Park property.

Rationale for Elimination

Although this alternative would meet project objectives and would be feasible, it would not reduce environmental impacts of the Proposed Project. This alternative would be closer to residences and businesses and, therefore, was not carried forward for further analysis in the EIR.

C.5.2.3 Alternative Well Site at Compressor Station Site

Description

Project facilities under the alternative wellhead site location are the same as the Proposed Florin Gas Field Storage Project except for the location of the wellhead site. Under this alternative the wellhead site would be constructed adjacent to the compressor station on the Depot Park site. This alternative would move this project component away from the adjacent residences and Danny Nunn Park on Power Inn Road.

Rationale for Elimination

For the wellhead site to operate correctly it needs to be located near the center of the natural gas field. However, this alternative would move the wellhead site approximately 1 mile away from the natural gas field boundary. Therefore, this alternative does not meet the feasibility criteria for the project and was not carried forward for full EIR analysis.

C.5.3 Alternatives to Natural Gas Storage

C.5.3.1 New Natural Gas Supply Pipeline

Description

This alternative would construct another natural gas supply line to the Sacramento area, potentially from Canada or other western states. This would provide an alternative supply of gas to the region but would not accomplish more storage.

Rationale for Elimination

Although this alternative would eliminate the proposed storage facilities, it may not be feasible and/or meet project objectives because it would not provide further storage and the availability of a new gas supply for the pipeline is not known. Furthermore, this alternative would create additional environmental impacts and risks associated with construction of a new natural gas supply pipeline. For these reasons, this alternative was not carried forward for further analysis in the EIR.

C.5.3.2 Energy Conservation and Demand-Side Management

Description

Energy conservation and demand-side management programs are designed to reduce customer energy consumption. PG&E and SMUD offer a number of energy conservation programs for customers, including financial incentives for installing specific energy-efficient appliances or taking other measures to conserve energy. PG&E and SMUD also provide programs to raise awareness among customers regarding their energy usage and ways to conserve, as well as a variety of free brochures on improving energy efficiency.

Rationale for Elimination

Reductions in demand through related energy conservation programs are an important part of PG&E's and SMUD's future operations and are incorporated into long-term energy need forecasts. As separate and stand-alone programs, however, these programs do not provide either the capacity or reliability needs of providing natural gas storage to the Sacramento metropolitan area. Energy conservation and demand-side management would not occur at a scale that would eliminate the need for natural gas storage in the Sacramento metropolitan area as described in Section A.2 of this EIR, Project Purpose and Need. While this alternative would avoid environmental impacts of the Proposed Project, this alternative was not carried forward for further analysis in the EIR because it would not meet project objectives and feasibility criteria.

C.6 No Project Alternative

CEQA requires an evaluation of the No Project Alternative so that decision makers can compare the impacts of approving the project with the impacts of not approving the project. According to State CEQA Guidelines section 15126.6(e), the No Project Alternative must include the assumption that conditions at the time of the NOP (i.e., baseline environmental conditions) would not be changed since the Proposed Project would not be installed, and the events or actions that would be reasonably expected to occur in the foreseeable future if the project were not approved. The first condition is described in the EIR for each environmental discipline as the "environmental baseline," since no impacts of the Proposed Project would be created. This section defines the second condition of reasonably foreseeable actions or events. The impacts of these actions are evaluated in each issue area's analysis in Section D.

Under the No Project Alternative, the SNGS Facility would not be built, thereby not developing natural gas storage for the Sacramento metropolitan area. In the event of disruption of the gas PG&E Lines 400/401, an adverse condition in the Sacramento area would occur as natural gas is used to generate approximately 30% of the electricity in the Sacramento area. SMUD has identified a need for at least a 30-day backup supply of natural gas in the event of an outage of the PG&E natural gas distribution system. Under the No Project Alternative, the proposed SNGS Facility would not be built. The primary objective of the Proposed Project to increase storage in the event of an interruption of the importation system would not be met, thereby requiring SMUD and PG&E to implement cutbacks on non-essential uses of energy, and depending on the length of interruption, would run out of natural gas at some locations.

C.7 References

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