

5.0 Alternatives Screening

The California Environmental Quality Act (CEQA), Section 15126.6, requires an Environmental Impact Report (EIR) to describe a reasonable range of alternatives to a Project or to the location of a Project which could feasibly attain its basic objectives but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. This section discusses a range of alternatives to the Proposed Project, including alternative sites and a “No Project Alternative.” Criteria used to evaluate the range of alternatives and remove certain alternatives from further consideration are addressed. The CEQA Guidelines, Section 15126.6, provide direction for the discussion of alternatives to the Proposed Project. This section requires:

- A description of “...a range of reasonable alternatives to the Project, or to the location of a 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” (15126.6(a)).
- A setting forth of alternatives that “...shall be limited to ones that would avoid or substantially lessen any of the significant effects of the Project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the Project” (15126.6(f)).
- A discussion of the “No Project” alternative, and “...If the environmentally superior alternative is the “No Project” alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives” (15126.6(e)(2)).
- A discussion and analysis of alternative locations “...that would substantially lessen any of the significant effects of the Project need to be considered for inclusion in the EIR” (15126.6(f)(2)(B)).

This EIR has used an alternatives screening analysis to define a reasonable range of alternatives to be evaluated in the EIR. In accordance with CEQA Guidelines Section 15126.6(c), this alternative screening analysis identifies the alternatives proposed during the scoping process and considered by staff, and explains why some of the proposed alternatives were rejected for further analysis. A detailed analysis and a comparison of the impacts of each of the alternatives that are selected for further evaluation and identification of the environmentally superior alternative is provided in section 6.0.

This screening methodology also uses the “*rule of reason*” approach to alternatives as discussed in State CEQA Guidelines (Section 15126.6(f)). The rule of reason approach has been defined to require that EIRs address a range of feasible alternatives that have the potential to diminish or avoid adverse environmental impacts. The State CEQA Guidelines state:

The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project (Section 15126.6(f)).

In defining feasibility of alternatives, the State CEQA Guidelines state:

Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (Section 15126.6(f)(1)).

If an alternative was found to be technically infeasible, then it was dropped from further consideration. This was the primary feasibility factor that was used to eliminate an alternative without further screening analysis. Feasible means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors (CEQA Guidelines §15362).

In addition, CEQA states that alternatives should “...attain most of the basic objectives of the project ...” (Section 15126.6(a)). If an alternative was found to not attain the basic objectives, then it was also eliminated.

The use of a screening analysis for the alternatives ensures that the full spectrum of environmental concerns is adequately considered, and that a reasonable choice of alternatives is selected for evaluation in the EIR.

Given the CEQA mandates listed above, the remainder of this section covers: (1) a brief description of a range of reasonable alternatives to the Proposed Project; (2) a screening analysis that summarizes and compares the significant environmental effects of each alternative; and (3) an environmental analysis of the alternatives that were selected for further consideration in the EIR, which are discussed in detail in Chapter 6.0.

A summary of the results of the screening analysis is presented in Table 5.1.

5.1 Description of Alternatives and Screening Analysis

A variety of alternatives for the Project was considered in a screening analysis to determine potential alternatives which might produce fewer significant impacts, or reduce the severity of those significant impacts, than the Proposed Project. The approach taken was to list a wide number of possible alternatives and then screen those to only the alternatives that would satisfy the following:

- The alternative is technically feasible;
- The alternative would lessen any of the significant Class I impacts of the Proposed Project; and
- The alternative would attain most of the basic Proposed Project objectives (see section 2.0, Project Description).

Alternatives considered included the No Project Alternative, those associated with different drilling and processing locations, the modifications to the Project timeline or footprint, different pipeline alignments and different maintenance yard locations or arrangements.

As shown in Table 5.1, the following alternatives were selected for further analysis in this EIR, and are analyzed in Section 6.0:

- No Project Alternative
- AES Site Alternative
- Reduced Wells Alternative
- Reduced Timeframe Alternative
- Existing Pipelines Alternative
- Phase 1 City Maintenance Yard Construction Alternative

Table 5.1 Summary Results of the Alternatives Screening Analysis

Alternative	Screening Result
<i>No Project Alternatives</i>	
No Project Alternative: no oil Project and no new maintenance yard	Retained for full analysis (as required by CEQA)
<i>Alternative Locations</i>	
AES Site	Retained for full analysis
Rosecrans Ave Site	Eliminated
Exxon/Mobil Oil Torrance Site	Eliminated
Hermosa Beach Locations	Eliminated
Greenbelt	Eliminated
Offshore/Offshore Completions	Eliminated
<i>Alternative Facility Arrangements</i>	
Reduced Equipment	Eliminated
Reduced Wells	Retained for full analysis
Reduced Timeframe	Retained for full analysis
<i>Alternative Pipeline/Transportation Routes</i>	
Existing Pipelines	Retained for full analysis
Greenbelt North	Eliminated
Greenbelt South	Eliminated
Trucking of Crude Oil	Eliminated
<i>Alternative Maintenance Yard Arrangements/Locations</i>	
Different Locations	Eliminated
Alternative temporary site	Eliminated
Split Location	Eliminated
Phase 1 Construction of Permanent Yard	Retained for full analysis

5.1.1 No Project Alternative

The CEQA requires that the specific alternative of the “No Project” be evaluated along with its impacts as part of the EIR (CEQA Guidelines Section 15126.6(e) (1)). For projects that are other

than a land use or regulatory plan, the No Project Alternative is the circumstances under which the Project does not proceed. If disapproval of the Project under consideration would result in predictable actions by others, such as the proposal for another Project, this No Project consequence should be discussed (CEQA Guidelines Section 15126.6(e)(3)(B)). The CEQA Guidelines go on to say that the Lead Agency should analyze the impacts of the No Project Alternative by projecting what would reasonably be expected to occur in the foreseeable future if the Proposed Project was not approved (Guidelines Section 15126.6(e)(3)(C)).

The Applicant's Proposed Project is construction and operation of drilling and production facilities for exploration and production of oil and gas resources. The construction of the City Maintenance Yard is also part of the Proposed Project.

With the No Project Alternative, the field would not be developed and the resources of the field would not be utilized. Under the No Project Alternative, no new activity would occur at the Project Site and the Maintenance Yard would not be relocated at this time.

Because CEQA requires the EIR to analyze the No Project Alternative, it has been retained for further analysis.

5.1.2 Alternative Drilling and Production Locations

This section describes alternative locations that could be used to install drilling and support equipment, which could access the oil reservoir from a location different than the Applicant's Proposed Project location. The selection criteria for alternative locations include the following:

- Distance must be within the reach limits of directional drilling technology and enable recovery of a sufficient percentage of the reserves;
- Sufficient distance from populations to minimize public health risks, air quality, aesthetics, noise, and vibration impacts; or
- Utilize historically disturbed areas and preferably within industrial areas to minimize biological and recreational impacts.

The delineation of the western Torrance Oil Field reservoir within the City of Hermosa Beach is well established by a history of wells drilled in the area. In general, the oil resides within the field to the west and north of the Project Site, ranging in depth from 2,600 feet in the south-west areas to 6,000 feet in the north (based upon Applicant submittals related to test well drilling targets).

This delineation of the reservoir determines the allowable locations from where wells could be drilled to access the reservoir. Directional drilling enables extraction of oil and gas from multiple layers with a single well, or from a single layer that runs diagonally or even horizontally, thereby allowing more efficient extraction of oil and gas.

The ability to extract oil and gas from a reservoir by directional drilling is a function of the depth of the oil- and gas-containing layers (targets) and the size and ability of the drilling rig. In general, the shallower the reservoir, the closer the drilling rig must be to the reservoir. The larger the drilling rig, the farther the drilling rig can be from the reservoir. The ratio of the

horizontal distance to the vertical distance is called the “throw ratio” or horizontal to vertical (H/V) ratio. For the Proposed Project test wells, throw ratios range up to 2.8 based on Applicant data. Most likely a throw ratio of 4.0 could be achieved, with a maximum horizontal distance depending on the depth of the portion of the reservoir targeted.

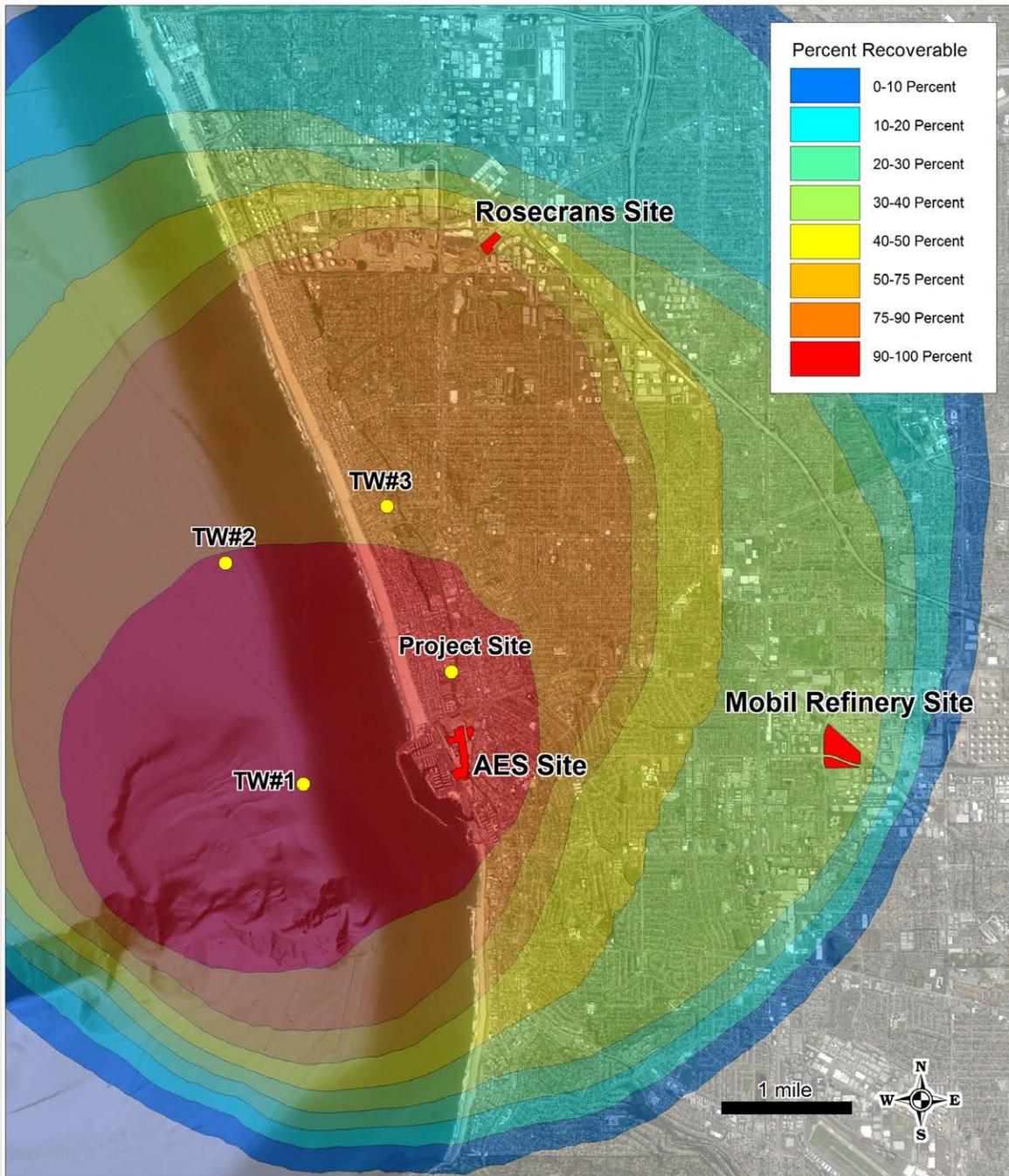
All of the targeted areas could be reached from areas located within Hermosa Beach or within the north-western portion of Redondo Beach. For locations farther away, less of the crude oil could be recovered as fewer portions of the crude oil containing reservoirs could be reached. Figure 5-1 shows the areas which were evaluated for alternative locations and the estimated crude oil recovery percentages based on a throw ratio of 4:1 from each of the test well locations and their associated depths to the target.

In general, alternative locations would need to be within 0.5-1.0 miles of the Proposed Project site to drill and extract 100% of the resources from the north, east and south ends of the delineated reservoir while not exceeding a horizontal to vertical ratio (throw ratio) of 4.0. Locations farther away would recover less of the reserves. Based on availability of vacant sites and appropriateness of potential oil development, offsite locations were considered at the following areas.

1. Near the corner of Rosecrans and Sepulveda/Hwy 1 within the City of El Segundo;
2. A site south of the Exxon/Mobil Oil Refinery in the City of Torrance;
3. On or near the AES property within the City of Redondo Beach;
4. Other Hermosa Beach locations

The locations were screened based on which impacts were likely to increase or decrease as a result of the alternative. Alternatives that were not perceived to have any benefit over the Proposed Project were discarded from further consideration.

Figure 5-1 Percent of Crude Recovery and Alternative Locations



Notes: Recoverable reserves based on a Horizontal/Vertical "Throw" ratio of 4.0. TW#1 represents the bottomhole target location for test well #1, etc.

5.1.2.1 Rosecrans Alternative Location

Under this alternative, oil drilling and processing would be located on a parcel (AIN 4138015007) within the southern portion of the City of El Segundo, to the east of the Chevron El Segundo Refinery and to the north-east of the corner of Rosecrans and Sepulveda Blvd/Hwy 1. A portion of this area is currently zoned light industrial by the City of El Segundo. The parcel is located between two railroad tracks. See Figure 5-2.

The parcels surrounding the parcel are currently empty space or commercial and are zoned commercial center (C-4) by the City of El Segundo. A shopping/eating area is located approximately 300-400 feet to the west and relatively new commercial buildings are located 300-400 feet to the east. The Air Products facility is located about 500 feet to the south. The parcel is 7.6 acres in size.

Connections to a pipeline system would be simple because Chevron Refinery is located within 1/2 mile. Existing pipelines could be utilized or a new pipeline constructed.

Under this alternative, production levels would decrease because some portions of the reservoir would not be accessible (such as zones to the south-west near the termination of test well #1). This location would limit the depth of areas accessible in the far south-western edge of the field to greater than 5,500 feet, with a throw ratio of 4.0. This would also limit the depth of accessible crude zones near the north-western and north-eastern portions of the reservoir to between 2,700 - 4,000 feet, which would enable some of the crude to be recovered. Given the number of zones and the varying depths, it is difficult to determine the exact reduction in the production levels with this alternative. However, based on the depth of target-producing zones projected for the test well cross sections made available by the Applicant, drilling from the Rosecrans Site could likely produce 50 to 75 percent of the Proposed Project levels.

Figure 5-2 Rosecrans Alternative Location Detail



Impacts that would be Less than the Proposed Project

Since facilities would be farther from residences than the Project Site, risk of upset and noise impacts would be reduced compared to the Proposed Project, particularly at night as the commercial areas around this alternative site would be less sensitive to nighttime drilling and operational noise. There would be a reduction in impacts for aesthetic resources since the facilities would be located in a less aesthetically sensitive area, which is already partially industrialized. Air quality impacts related to odor would be less since the facilities would be

farther from residences. Transportation impacts related to street construction of pipelines and construction of facilities could be less since vehicles would have easier access to the site (directly along Rosecrans Avenue) and in street pipeline construction would be minimized. In addition, as the City Maintenance Yard would not have to be relocated, construction impacts of the temporary and permanent City Maintenance Yard would also be eliminated.

Impacts that would be Greater than the Proposed Project

This alternative might require significant time-consuming modifications to zoning within the City of El Segundo to allow for the Project, which would create land use impacts. The Project would also be potentially incompatible with the surrounding commercial uses.

Due to the reduced recovery of oil and gas, which may render the Project infeasible from this location and potential impediments associated with land use this alternative was eliminated from further consideration.

5.1.2.2 Exxon/Mobil Oil Torrance Refinery Alternative Location

Under this alternative, oil drilling and processing would be located on a parcel near the Exxon/Mobil Torrance Refinery (AIN 7352015005 or 7352015005) to the east of the corner of Del Amo Blvd. and Prairie Ave. The Exxon/Mobil Torrance Refinery is located to the immediate north-east of this alternative location and the Torrance City Center is located to the south. This area is currently zoned heavy manufacturing by the City of Torrance. The north parcel currently contains what appear to be some horse stables. The parcels are 29 acres and 7.6 acres in size, respectively. See Figure 5-3.

The parcels surrounding the area are zoned heavy manufacturing by the City of Torrance. A Staybridge Suites hotel is located approximately 500 feet to the west across Prairie Avenue and some residential and recreational uses are located about 1,000 feet to the south-west.

Connections to a pipeline system would be simple because the Exxon/Mobil Torrance Refinery is located within 1/2 mile. Existing pipelines could be utilized or a new pipeline constructed.

Under this alternative, production levels would decrease because some of the zones would not be accessible (such as zones to the west near the termination of test well #1 or #2). This location would limit the depth of accessible crude zones in the far western edge of the field to greater than 5,500 feet, with a throw ratio of 4.0. This would also limit the depth of accessible crude zones near the north-western and north-eastern portions of the reservoir to between 5,400 - 6,500 feet deep, which would enable only the crude in the eastern, onshore portions of the field to be recovered (as per test well information provided by the Applicant). Given the number of zones and the varying depths, it is difficult to determine the exact reduction in the production levels with this alternative. However, based on the depth of target-producing zones projected for the test well cross sections made available by the Applicant, drilling from the Exxon/Mobil Refinery Site could likely produce 30 to 40 percent of the Proposed Project levels.

Figure 5-3 Exxon/Mobil Refinery Alternative Location Detail



Impacts that would be Less than the Proposed Project

Similar to the Rosecrans Alternative Site, since facilities would be farther from residences than the Project Site, risk of upset and noise impacts would be reduced compared to the Proposed Project. There would be a reduction in impacts for aesthetic resources since the facilities would be located in a less aesthetically sensitive area, which is already industrialized. Air quality impacts related to odor would be less since the facilities would be farther from residences. Transportation impacts related to street construction of pipelines and construction of facilities

could be less since vehicles would have easier access to the site (directly along West 190th and Prairie) and in street pipeline construction would be minimized. In addition, as the City Maintenance Yard would not have to be relocated, construction impacts of the temporary and permanent City Maintenance Yard would also be eliminated.

Impacts that would be Greater than the Proposed Project

Depending on the exact parcel selected, this alternative may not be available as it is currently owned by Exxon/Mobil Oil Corporation (as per Los Angeles County zoning records), and the suitable parcel located to the immediate south is owned by Exxon/Mobil California Exploration and Producing Asset Company. No discussions with these owners have taken place about the availability of the parcels.

Due to the reduced recovery of oil and gas and potential impediments associated with property ownership this alternative was eliminated from further consideration.

5.1.2.3 AES Power Generating Station Alternative Location

Under this alternative, oil drilling and processing would be located on a parcel (AIN 7503013015 on the AES site or AIN 7503014010, which is currently "The Dirt Yard" site) at or near the AES Power Generating Station located to the south-east of the intersection of Herondo Street and N. Harbor Drive in the City of Redondo Beach. King Harbor is located to the west of the alternative location, residences are located to the north across Herondo Street (within the City of Hermosa Beach) and a parking structure, offices and commercial activities are located to the east of the parcels. The AES parcel is currently zoned "Generating Plant" (P-GP) and the Dirt Yard parcel is zoned Industrial (I-2A) by the City of Redondo Beach. Portions of the AES parcel are currently empty containing the old berms where the generating station fuel oil tanks used to be located. Pads 4 and 5 are the most likely candidates for the alternative located on the AES site (parcel AIN 7503013015) which is 21 acres.

The other parcel currently contains the "Dirt Yard" commercial facility at the intersection of Gertruda & Francisca and is about 2 acres in size. See Figure 5-4.

The parcels surrounding the AES and Dirt Yard parcels are zoned commercial (C-5A) by the City of Redondo Beach, with the harbor area to the west zoned coastal commercial (CC-4) and a self storage area ("Mini Storage") located to the immediate east of the AES site zoned commercial (C-5A). An office complex and parking garage are also located to the immediate east of the southern portion of the AES parcel near pads 4 and 5.

The Dirt Yard is privately owned and has a U.S. Post Office located within 200 feet and a bank located within 500 feet to the immediate east.

Connections to a pipeline system would utilize the same pipeline arrangement as the Proposed Project.

Under this alternative, since the drilling location would be moved from the Proposed Project location, production levels might change because some of the zones might not be accessible.

However, as this location would be within a 1/2 mile of the Proposed Project location, drilling would be able to reach all areas of the reservoir. Given the number of zones and the varying depths, it is difficult to determine the exact production levels with this alternative. However, based on the depth of target-producing zones projected for the test well cross sections made available by the Applicant, drilling from the AES Site could likely produce 100 percent of the Proposed Project levels.

On November 20, 2012 AES Southland, LLC submitted an Application for Certification (AFC) to the California Energy Commission seeking permission to construct and operate a power generation facility, the Redondo Beach Energy Project (RBEP), located at the AES site (see Figure 5-4 for an outline of the RBEP exact location). The RBEP is a proposed natural-gas fired electrical generating facility with a gross generating capacity of 511 megawatt (MW), which would replace, and be constructed on the site of, the AES Redondo Beach Generating Station. Other equipment and facilities to be constructed would include natural gas compressors, water treatment facilities, emergency services, and administration and maintenance buildings. The existing Redondo Beach Generating Station Units 1 through 8 and auxiliary boiler No. 17 would be removed as part of the project. (Units 1, 2, 3, and 4 are currently retired. Units 5, 6, 7, and 8 are currently in use).

The RBEP Project is proposing to utilize the northern half of parcel 7503013015 for construction of the above-ground facilities. The existing AES Power Generating Plant (see Figure 5-4) would be demolished and removed. It is possible that the existing AES Power Generating Plant area, after the equipment has been demolished and removed, could also serve as a drilling and production site.

The power plant is a controversial project in Redondo Beach. In 2008 the City passed zoning changes that made any new power plant a “conditional use” subject to City Council approval and added parks as a permitted use of the AES property. These proposed changes were added to the Redondo zoning ordinances by a vote of the people in 2010. The zoning ordinance states that any new power plant or modification cannot have any adverse impact on surrounding land uses and neighborhoods. A ballot measure, Measure A, was placed on the ballot in March 2013 and called for rezoning the land under the plant to a mixture of up to 40 percent institutional and commercial uses, with the remaining land designated parkland and open space. Power generation would no longer be an allowable use. Measure A was defeated.

The RBEP Project is currently under review by the California Energy Commission. The Application for Certification was determined to be “Data Adequate” at the Commission Business Meeting August 27, 2013. A decision is anticipated by mid to late 2014 (docket number 12-AFC-03).

Impacts that would be Less than the Proposed Project

Similar to the other alternative locations, since facilities would be farther from residences than the Project Site, risk of upset and noise impacts would be reduced compared to the Proposed Project. There would be a reduction in impacts for aesthetic resources since the facilities would be located in an area which is already industrialized. Air quality impacts related to odor and health risk would be less since the facilities would be farther from residences. However, potential impacts to nearby commercial areas, such as the U.S. Post Office, would be a concern

depending on which parcel is utilized. Transportation impacts related to street construction of pipelines along Valley Drive would be eliminated. As vehicles would have easier access to the site (directly along Herondo Ave), traffic related safety impacts would be reduced. In addition, as the City Maintenance Yard would not have to be relocated, construction impacts of the temporary and permanent City Maintenance Yard would also be eliminated. This alternative would be located in an area that would be more consistent with the surrounding land uses and would have sensitive receptors farther away. Also, the location would result in fewer visual, noise and risk impacts even with the potential impediments associated with land use.

Figure 5-4 AES Site Location Detail



Note: Blue line designates the potential area for the RBEG project within the City of Redondo Beach.

Impacts that would be Greater than the Proposed Project

Depending on the parcel selected, this alternative may not be available as it is currently owned by AES or other private entities (as per Los Angeles County zoning records). No discussions with these owners have taken place about the availability of the parcels. The RBEP Project is currently very controversial and given the zoning history with the parcel, the placement of drilling activities on the site might not be acceptable to the current Redondo Beach City Council or the community of Redondo Beach. This could create land use incompatibility issues that would be similar to the Proposed Project since it would likely require a vote of the people and other zoning changes similar to the Proposed Project in the City of Hermosa Beach.

This location would have the ability to recover all of the oil and gas reserves, this alternative has been retained for further consideration.

5.1.2.4 Other Alternative Locations

In general, the prevalence of residential areas within an acceptable distance of the oil reservoir severely limits the potential options for drilling activities. No alternative locations were identified within the City of Hermosa Beach area that could provide advantages over the Proposed Project location in terms of reducing potentially significant impacts related to the proximity to residences (noise, air quality, odors, aesthetics, etc).

The alternative locations considered and eliminated from further consideration included the following:

Hermosa Beach - Civic Center/Proposed City Maintenance Yard: This alternative would involve placing an equipment arrangement and drilling facilities similar to the Proposed Project at the existing space next to Civic Center, currently occupied by the Hermosa Self Storage facility. The current City Yard site would remain under its current configuration. However, as the surrounding neighbors to this alternative location would be located closer than the Proposed Project, the impacts would most likely be the same, if not greater, than at the Project Site. Impacts that would likely be greater would include safety and aesthetics as the rig would be closer to residences than the Proposed Project; and noise, because of increased proximity to sensitive receptors. Recoverable reserves would be the same. Therefore, as no potentially significant impacts would be reduced or eliminated, this alternative location was eliminated from further consideration.

Hermosa Beach - Community Center: the Community Center parcel is located to the east of Civic Center and currently contains the tennis courts as well as the Community Center. The Community Center is located at 710 Pier Avenue directly across the street from City Hall. The western area containing parking and the tennis courts could be re-arranged to allow for a small drilling site, with the corresponding loss of parking and recreational activities. Residences are located immediately to the south of the Community Center. Because the surrounding neighbors would be located very close, the impacts would most likely be the same, if not greater, than the Project Site. Impacts that would likely be the same or greater would include safety, odors, noise and aesthetics as the rig would be closer to sensitive receptors than the Proposed Project. In addition, the resolution adopted by the City Council in 1976 transferring the property to the City

from the School District directs that the site shall be acquired for "public recreation and use purposes" (resolution 76-4092, 77-4099). Moreover, the conditions of the sale limited the uses of the property to "a park, recreational, open space, educational or other community purposes" (78-241040). Placing a drilling site on the Community Center site would be in conflict with the terms of the original sale of the property. Therefore, this alternative was eliminated from further consideration.

Other Hermosa Beach Areas: There are some other Hermosa Beach properties that are vacant or could be vacated, such as Valley Park, Clark Field, South Park, Nobel Park or Bi-centennial Park all of which are zoned open space. The area between 4th and 5th along Ardmore that is currently zoned light manufacturing was also considered. Other areas considered included beach areas or existing parking lot areas. However, as the surrounding neighbors to all of these alternative locations would be located very close, the impacts would most likely be the same as, if not greater than, the Project Site. Impacts that would likely be the same or greater would include safety, odors, noise and aesthetics as the rig would be closer to sensitive receptors than the Proposed Project. Areas closer to the beach could also introduce additional spill risks associated with spills impacting the marine environment. In addition, areas zoned open space could not change their zoning designation without a vote of the people as per Ordinance 86-844. Therefore, as no potentially significant impacts would be reduced or eliminated, these alternative locations were eliminated from further consideration.

Greenbelt: This alternative location would involve placing the Project in the Greenbelt immediately adjacent to the Project Site or within the greenbelt at any location within Hermosa Beach or Manhattan Beach (preferably to the south near Herondo St. to minimize pipeline distances). The equipment arrangement would be similar to the Proposed Project. Recoverable reserves would be the same. This would provide some minor improvement in separation distances from some commercial/light manufacturing uses, but diminish separation distances relative to other residential uses directly to the east and south. The roadway along the Greenbelt would provide some separation, but these locations could increase the impacts on residences as many residential areas are located along the Greenbelt and the facilities would be located closer to residences as opposed to the commercial/manufacturing land uses around the Project Site. Because the surrounding neighbors to this alternative location would still be located close by, the impacts would most likely be the same, if not greater, than the Project Site. Therefore, as no potentially significant impacts would be reduced or eliminated, this alternative location was eliminated from further consideration.

Offshore Platform: This alternative would involve installing a new platform 1-2 miles offshore with offshore oil and gas processing and connecting pipelines to onshore pipelines. Recoverable reserves would be the same. This alternative would have the advantage of increasing the separation distances from residences, thereby reducing impacts associated with risks, air quality, noise, etc. However, it would increase the impacts from risks of spills to the marine environment; introduce new impacts to aesthetics associated with the visibility of a new offshore platform, and introduce impacts associated with navigational risks from the platform and associated supply vessels. Barriers to permitting of an offshore Platform would also be substantial; offshore platforms have not been permitted in state waters since the 1960s. A ban on state offshore leases has been in place since 1969. Due to the added significant offshore impacts, this alternative location was eliminated from further consideration.

Offshore Completions: This alternative would involve installation offshore completions with corresponding pipelines connecting to a processing location onshore or directed offshore to area Platforms. Offshore Platform connections would most likely be to Platform Esther (or other Long Beach area facilities, about a 30 mile pipeline). Offshore completions are located entirely underwater and would not produce aesthetic impacts. Drilling of the wells and other well operations would require a temporary drilling barge/platform. A subsea completion refers to a system of pipes, connections and valves that reside on the ocean bottom and serve to gather hydrocarbons produced from individually completed wells and direct those hydrocarbons to a storage and offloading facility that might be either offshore or onshore. Offshore completions are common in the Gulf of Mexico, but not so much in California. This alternative location would require either coordination with another offshore platform for oil and gas processing, or the construction and operation of an onshore oil and gas processing facility, similar in arrangement to the Proposed Project facilities. Like the Offshore Platform Alternative location discussed above, this alternative would have the advantage of increasing the separation distances from residences, thereby reducing impacts associated with risks, air quality, noise, etc. However, it would increase the impacts from risks of spills to the marine environment (from facilities and pipelines) and impacts to aesthetics (while drilling only). Barriers to permitting of an offshore completion also would be substantial. Therefore, this alternative location was eliminated from further consideration.

5.1.3 Alternative Facility Equipment or Production Arrangements

This section describes alternative facility equipment or production arrangements that could be used. These include:

- A reduction in the size or number of tanks to allow for the installation of a gas metering station onsite (Reduced Equipment Alternative);
- A reduction in the number of wells drilled to allow for more separation and for the installation of a gas metering station onsite (Reduced Wells Alternative);
- Limits on the years that the facility could operate (Reduced Timeframe Alternative).

5.1.3.1 Reduced Equipment Alternative

The Proposed Project equipment arrangement would be very confined, because the maintenance yard has limited space to accommodate a drilling and processing operation. Due to the lack of space, the Applicant has proposed that the gas metering station be placed at least a 1/2 mile away from the facility near Herondo Street with two gas pipelines connecting to the metering station. A metering station generally requires about 2,000 ft² of space, and includes equipment such as meters, valves, piping, etc. Allowing the metering station to be placed within the Proposed Project Site instead of a more remote location would reduce the impacts associated with having two gas pipelines operating. Under the Proposed Project's configuration, the two pipelines are needed to ensure that gas that does not meet the Gas Company's specifications for carbon dioxide and hydrogen sulfide content can be returned to the E&B Facility for further processing. Having two pipelines increases the risk of a potential release for the transport of gas through the pipelines. Conversely, having the metering station onsite would allow for gauging the quality of

the gas onsite and not having to potentially have to transport it back for additional processing, thereby reducing potential risk impacts.

The Proposed Project equipment layout has two crude oil shipping tanks with a capacity 2,900 BBL each for a total capacity of 5,800 BBL. At full production levels of 8,000 bpd, the crude oil storage would provide about 17 hours of storage. By reducing this to a single tank, and reducing the storage capacity to about 8.5 hours, enough space could be available to fit in the gas metering station and eliminate the need for two pipelines.

This alternative would have advantages primarily by reducing the risk of upset impacts because less gas pipeline would be utilized in order to transport the gas to markets. However, this advantage would only be realized if the gas does not meet specifications and the second pipeline is utilized; therefore, the amount of time that multiple pipelines would be in service producing an increased risk would be minimal. Note that under normal operations, the second gas pipeline would be isolated from the first gas pipeline, so that only one gas pipeline is operating at a time. Therefore, as no potentially significant impacts would be reduced or eliminated, this alternative arrangement was eliminated from further consideration.

5.1.3.2 Reduced Wells Alternative

Under this alternative, a reduced number of wells would be drilled in order to 1) reduce the time of drilling from 2.5 years to about 1 year; 2) allow for additional space onsite to be used for increased separation distances from neighbors; and 3) allow for the placement of the gas metering station onsite.

Under this alternative, the Applicant would be allowed to drill for a period of only 1 year, which would enable only 12-14 wells to be drilled. With a shorter timeframe, most likely the Applicant would focus on the closest targets, thereby reducing the time of drilling per well and enable more than one well per month to be drilled.

This alternative would have the advantage of reducing the risk of an upset, because less time would be spent conducting the most risky activity at the site (drilling). Once wells are drilled, and reservoir pressures subside (as is expected shortly after the wells are completed), the risks of upset are substantially less than during drilling, when reservoir pressures may be higher and there is the risk that a blowout could occur.

Also, drilling would take place along only one well cellar, the drilling activities would be placed 20-40 feet farther from the neighbors, thereby potentially reducing the risks associated with releases.

This alternative would also have advantages related to aesthetics, because the drilling rig would be on site for less time, and noise would be reduced, because the 24-hour per day activities associated with drilling would be limited to 1 year (although 24-hour per day operations would continue). In addition, air quality and odors also may be reduced because drilling activities produce the highest probability of odor events this alternative would involve less drilling time; therefore, there would be potentially fewer odor events.

The disadvantage of this alternative is that less crude oil and gas would be produced, most likely less than 4,000 bpd crude oil and 1 mmscfd of gas, or about 50 percent of the Proposed Project.

However, because potentially significant impacts would be reduced, this alternative arrangement was retained for further analysis.

5.1.3.3 Reduced Timeframe Alternative

Under this alternative, the Applicant would have a reduced amount of time to drill and produce the wells (10 years) from that provided in the Proposed Project. After the reduced timeframe expires, the Applicant would be required to abandon the wells, and remove all of the equipment and restore the site. Based on estimated production curves from the Applicant through the year 2049, an estimated total of 35 million barrels of crude oil would be produced under the Proposed Project. Within the first 10 years of production, about 63% of this total would be produced, with the amount declining starting about 3.5 years after Phase 4 production begins. The last 10 years of production would account for less than 10% of the total amount of crude oil produced from the field.

Note that these production numbers are estimates, and could change substantially once well specific information is obtained during exploratory drilling.

Under this alternative, the Applicant would have 10 years to produce crude oil after the first crude oil starts flowing in Phase 4. This reduced timeframe would reduce impacts related to noise, as the Project would operate for a shorter period of time. It would also reduce the risks of upset over the life of the Project as the Project life would be shorter. However, it would not reduce the peak impacts of noise, aesthetics and risk, which would occur during drilling; it would only affect the duration of the impacts associated with operations. The operational impacts that would be reduced in severity would be aesthetics, noise and risks associated with drilling. Drilling of the wells would most likely remain the same as under the Proposed Project. Note that occasional re-drills may occur and the number of these would also be reduced under this alternative.

The disadvantage of this alternative is that less crude oil and gas would be produced, most likely limited to less than 63% of the total recoverable reserves.

However, as the duration of the exposure to potentially significant impacts would be reduced, this alternative arrangement was retained for further analysis.

5.1.4 Alternative Transportation Arrangements

This section describes alternative pipeline arrangements that could be used. These include:

- Use of existing pipelines;
- Trucking of Crude Oil;
- Use of the Greenbelt as a pipeline route to the north; and
- Use of the Greenbelt as a pipeline route to the south.

5.1.4.1 Use of Existing Pipelines

There are some existing pipeline networks in the area that could be utilized and would require shorter connections than those proposed by the Applicant. MacPherson in their original proposal in 1997, planned to utilize a Chevron pipeline that was originally constructed in 1925, although several segments have been replaced as recently as 1984. It was determined that the Chevron pipeline would have required too many repairs and was too old to be utilized. MacPherson instead proposed to connect their proposed crude oil pipeline into the Edison Pipeline and Terminal Company (EPTC) transportation system.

The EPTC (now owned by Plains All American) pipeline system formerly serviced the Redondo Beach Generating Station, which has historically used fuel oil as a fuel to power the generating equipment before the plant was converted to natural gas. The fuel oil distribution network owned by Southern California Edison distributed fuel oil from area refineries to the various Edison power plants. According to pipeline maps of the area, there is the potential for the existence of multiple pipelines to run along or near Herondo Street to the Redondo Beach Power Generating Plant. The use of these existing pipelines would eliminate the need to construct a crude oil pipeline from Valley Drive to the Exxon/Mobil Torrance Refinery (approximately 2.5 miles). Some modifications and upgrades most likely would be required to the existing pipelines. A pipeline would still need to be constructed from the Project Site to the Generating Plant along Valley Drive to connect to the existing pipelines.

The Applicant has indicated that they have explored this as a possibility and that it is feasible, although no agreements have been made. However, in order to present the worst case impacts in the EIR, the Applicant proposed construction of a crude oil pipeline all the way to the Exxon/Mobil Torrance Refinery.

Therefore, because this alternative would reduce the construction requirements associated with building a new pipeline and involves less construction than the Proposed Project, it has been retained for further analysis.

5.1.4.2 Trucking of Crude Oil

The transportation of crude oil by truck is proposed for the initial Phase 1 of the Project. Under this alternative, trucking of crude oil could continue throughout the remaining phases of the Project. This would have the advantage of eliminating the need to construct a crude oil pipeline, thereby eliminating some disturbance to area traffic and the generation of air emissions during construction activities. However, as a pipeline would still need to be installed for a portion of the pipeline route to install the gas pipeline, the additional traffic and air emissions would be associated with only the portion of the crude oil pipeline installed along 190th. The trucking of the crude oil would also introduce close to 50 trucks per day along the proposed truck routes to haul the crude oil for the life of the Project. This would introduce additional air emissions and potential traffic and safety implications associated with this number of trucks. These impacts would be greater than the reduction in impacts associated with the elimination of pipeline construction. Therefore, this transportation scenario has been eliminated from further consideration.

5.1.4.3 Greenbelt to the North Pipeline Route

The Veterans Parkway Hermosa Valley Greenbelt is located next to the Project Site and was formerly occupied by railroad tracks owned by Santa Fe Railway. The railway was converted to a wood-chip pathway and landscaped. The Greenbelt is a substantial recreational resource in the community and is heavily used by pedestrians, runners and dog walkers. The route travels north from Herondo Street to just south of the Chevron El Segundo Refinery. Installation of the pipeline within this pathway would allow for transportation of the crude oil to area refineries, specifically the Chevron El Segundo Refinery, without affecting area traffic during construction. However, impacts would occur to portions of the Greenbelt during installation of the pipeline.

The Greenbelt is generally about 100 feet wide, meaning that about 1/3 to 1/2 of the greenbelt would be disturbed during pipeline installation along a distance of about 500 feet each day. Re-landscaping of the area would also be required. The distance from the Project Site to the Chevron Refinery would be about 3.5 miles.

This alternative would cause disturbances to the heavily used recreational nature of the Greenbelt. During the construction period there would be substantial inconvenience to the Greenbelt users. Because the majority of the Proposed Project pipeline route would take place within the Southern California Edison (SCE) Right of Way (ROW) (for one of the proposed pipeline options) and would not cause traffic impacts, this alternative would reduce impacts related to the pipeline construction within the Valley Drive pipeline segment only. This alternative would also be in conflict with existing City standards and the CUP, which prohibit the use of the Greenbelt for anything other than recreation. Based on the amount of time required for construction within the Greenbelt and the impacts to recreation, this alternative has been eliminated from further consideration.

5.1.4.4 Greenbelt to the South Pipeline Route

The Proposed Project pipeline route would involve installation of the pipeline within Valley Drive for about 2,000 feet to the south until the SCE Right of Way (ROW) is reached. Thereafter, construction of the pipeline would occur within the SCE ROW and impacts to traffic would be minimal. This alternative would entail construction of the pipeline within the Greenbelt, thereby eliminating impacts to Valley Drive traffic. Construction within the Greenbelt would occur for a period of 10-15 days, with additional time needed to re-landscape the area. About 1/3 to 1/2 of the width of the Greenbelt would be taken up by the construction spread, with about 500 feet being impacted each day. Some traffic impacts would remain along Valley Drive or Ardmore Avenue as construction vehicles and equipment/materials would need to be delivered to the construction area.

This alternative would cause disturbances to the heavily used recreational nature of the Greenbelt. The distance that would be required to install a pipeline to the south, and therefore the amount of time causing inconvenience to the Greenbelt, would be limited. This alternative would be in conflict with existing City standards and the CUP, however, for the same reasons stated above in subsection 5.1.4.3, and has therefore been eliminated from further consideration.

5.1.5 Alternative City Maintenance Yard Arrangements/Locations

This section describes alternative City Maintenance Yard arrangements. These include:

- Other locations;
- Other Temporary locations;
- Split location; and
- Phase 1 Permanent Yard Construction

Each of these is discussed below.

5.1.5.1 Other Locations for the City Maintenance Yard Alternative

Locations that could be used for the City Maintenance Yard would need to have a relatively flat site, with security (fencing and night lighting), self-contained drainage compliant with the Hermosa Beach Storm Water Management and Discharge Control Ordinance requirements, utilities, and circulation to accommodate access by large vehicles. Because the City provides essential services and staging, it would be beneficial for the site to be located outside the flood and tsunami zone. The replacement site would need to be designated for industrial uses.

The City undertook an analysis and the Director of Public Works and the City Yard Superintendent conducted site visits to evaluate different sites for their suitability as relocation sites. Sites currently owned by the City offer the advantage of land use control. Below are the sites assessed.

1. The Dirt Yard, corner of Gertruda & Francisca (The same as the AES Site parcel AIN 7503-01-4010 assessed above for an alternative drilling and production site);
2. The AES site (parcel AIN 7503-01-3819) north side storage area;
3. SCE Power Line Easement;
4. Verizon surplus parking lot;
5. Industrial Alley (Seventh Street);
6. Community Center;
7. Industrial zoned area between 4th and 5th Streets across from Ardmore Park;
8. Merged maintenance operations with the City of Redondo Beach

Site 1 was considered as a potential location even though it is outside of the City of Hermosa Beach. The site is privately owned and is currently operated by "The Dirt Yard".

Site 2 was eliminated from further consideration because it is currently only zoned for a power plant or open space and it is intended to be used for a proposed power plant project.

Sites 1 and 2 may have difficulties obtaining long term leases due to the City of Redondo Beach Charter Article 27.

Site 3 was eliminated for a permanent facility because SCE's practices and policies would not allow the construction of buildings or structures within the SCE power line easement.

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Site 4 was considered to be too small to provide sufficient space for the maintenance yard functions.

Sites 5, 6 and 8 were considered to be potentially viable locations.

Site 7 was not assessed by the City staff, but it is zoned industrial with existing residences. However, because it is located immediately adjacent to residences and across from Ardmore Park, and is limited in size (less than 0.5 acres), it was eliminated from further consideration.

Additionally, the location next to the Civic Center was considered by City staff and identified as the Proposed Project.

Sites 1, 5, 6 and 8 are discussed below.

The Dirt Yard (Site 1)

This site totals more than 2 acres and was recently purchased by a private party. It is located in close proximity to the City of Hermosa Beach. It would require a level of construction equal to that required for the Proposed Project new maintenance yard, including grading, paving and building construction. But there is enough space for storage and operations. However, the long term availability of the site is not known as it is owned by a private party, and concerns related to the Redondo Beach Article 27 may render this site infeasible for a permanent location. This alternative has been eliminated from further analysis.

Industrial Alley Alternative (Site 5)

This site was determined by City staff to have the potential to provide well-organized, interior and exterior space in sufficient quantities to meet most or all of the yard's current programmatic needs. The major drawback to this alternative is that it would require purchase of the site and displacement of several long-term tenants. The site consists of several parcels which may be under multiple ownerships, and so would require purchase from these owners. In addition to displacing tenants, use of this site would require improvements to manage drainage and provide security onsite. However, this site does not provide any advantage over the Project Site in terms of reduction or avoidance of significant adverse impacts and, as the availability of the parcels is unknown, this alternative has been eliminated from further analysis.

Community Center (Site 6)

The Community Center parking and tennis courts could be re-built and re-arranged to allow for the maintenance yard on the ground floor of a parking structure. This would be a similar arrangement as the Proposed Project Maintenance Yard located next to the Civic Center. The disadvantage is that this area is not zoned industrial. The advantages are that, depending on the exact area proposed, residential areas are not located immediately next to the maintenance operations, thereby potentially reducing noise impacts.

Construction of the Maintenance Yard at the Community Center would have similar impacts as the Proposed Project and could cause some loss of recreational activities. In addition, the "public recreation and use purposes" requirement would most likely prevent the development of this site. Therefore, this alternative has been eliminated from further analysis.

Merge with Redondo Beach (Site 8)

The City of Redondo Beach maintenance facility is located at 545 Gertruda Avenue within the City of Redondo Beach approximately 2/3 of a mile from the existing Hermosa Beach maintenance yard. Merging of the two operations into one maintenance unit would enable some economies of scale benefits including sharing of equipment, etc. However, the Redondo Beach maintenance facility site is currently at capacity and the City of Redondo Beach Public Works Department indicates that a merged arrangement is feasible in the long term only if new facilities are constructed in a new location, which would generate construction impacts. There might be fewer impacts associated with a cooperation arrangement between the two Cities, although the advantages would primarily be fiscal. As the Redondo Maintenance Site would most likely be located farther away from Hermosa facilities, increased routine travel distances would render this long term permanent arrangement of merging with Redondo Beach not environmentally advantageous at this time. Therefore, this alternative has been eliminated from further analysis.

5.1.5.2 Alternative Locations for the Temporary Maintenance Yard

Under this alternative, the temporary City yard functions would be relocated to a site that is already or partially developed (for approximately 1.5-2 years), most likely outside of Hermosa Beach.

A short-term site could be more feasible than a long term site at "The Dirt Yard" location due to the Redondo Beach Article 27 (Municipal Code) pursuant to which the City of Redondo Beach could issue a temporary permit for up to 2 years. The site might also be more available for a short-term lease than for a permanent facility as the new site owner might not want to sell, but would be willing to lease the facility. However, the Dirt yard site is not developed and construction impacts would be the same for air emissions. Noise impacts would be less as the Proposed Project location as it is located farther from residential areas, but this location is located immediately next door to the Post Office, which would produce noise impacts.

Another site, located outside of Hermosa Beach, could also be acquired that may have established indoor space and storage space. Areas to lease would be more available if the location were located more inland, within Torrance for example, where space is not at such a premium. Potentially the site could require less construction, such as a used car dealership or a gas station, with buildings and paved areas already in place. However, a location farther from Hermosa would require more travel by City vehicles, and, as per discussion with City Public Works staff, less responsiveness to City conditions as response times would be longer. Therefore, this alternative has been eliminated from further analysis.

5.1.5.3 Split Location for the Maintenance Yard Alternative

Under this alternative, the City Yard functions would be split amongst two or more sites, with one site handling vehicle maintenance, another site handling materials storage and yet another site containing offices. This would allow for functions to utilize existing City properties that, individually, are not large enough to accommodate all City Maintenance Yard functions.

During the City staff review, the Public Works staff felt strongly that it is more efficient to have City Maintenance Yard operations centrally located (with both City staff and contract personnel working out of the same site), and that this efficiency would be lost if the yard's current functions were dispersed across multiple sites, an effect that would incur additional management costs. Staff indicated that the storage of materials at a separate site (or sites) is probably an exception to this rule.

As storage of gravel, sand and other materials could potentially consume a substantial amount of space, the placement of these functions at another "remote" location with all remaining functions at a single site might allow for efficient use of City property. The "remote" storage location would still need to be relatively accessible from main streets.

However, construction of a maintenance facility would still need to take place and this alternative would not substantially reduce or avoid any significant impacts over the Project Site. Therefore, this alternative has been eliminated from further analysis.

5.1.5.4 Phase 1 Construction of Permanent Yard

Temporary facilities would allow for the Proposed Oil Project testing phase, Phase 2, to be completed before the substantial investment in a new permanent maintenance facility is done. If the Phase 2 testing is unsuccessful, the Maintenance facilities could move back to the old maintenance site and construct new facilities at the old site instead of incurring the demolition impacts associated with preparing the proposed new maintenance yard site. However, the construction of temporary facilities, as defined in the Proposed Project, would incur additional costs and require additional construction and its associated impacts. This alternative would involve proceeding with the construction of the permanent facility prior to Phase 1 of the Proposed Oil Project, so that when the existing City Maintenance Yard is demolished during Phase 1, the permanent City Maintenance Yard would be completed. The advantages of this alternative are a reduction in the amount of construction and the elimination of a temporary City Maintenance Yard, which may introduce additional impacts, such as noise, to the area. This alternative has been retained for further analysis.

5.1.6 Project Objectives

CEQA states that the EIR need examine in detail only the alternatives that the lead agency determines could "...feasibly attain most of the basic objectives of the Project". The Project objectives are detailed in the beginning of section 2.0, Project Description. The ability of each of the alternatives that have been retained for further analysis to achieve these Project objectives is discussed below.

5.1.6.1 No Project Alternative and Project Objectives

The No Project Alternative would not achieve any of the Applicant's objectives of the Project as no oil and gas would be developed and no infrastructure would be installed.

The City's objectives would mostly be met as City facilities would continue as they currently are, would retain consolidated facilities, with no disruption to City functions, would remain compatible with existing surrounding land uses, and with no net loss of parking. Under the No Project Alternative, the existing facilities may not provide high-quality services in an integrated fashion indefinitely as the facilities are deteriorating.

5.1.6.2 AES Site Alternative and Project Objectives

The AES Site Alternative would achieve most of the Applicant's objectives in regards to maximizing oil and gas production, utilizing the latest technologies and technological advances, minimizing visual effects and providing safe vehicular ingress and egress. Because the 1993 CUP and the Settlement Agreement are both associated with the specific Project Site within the City of Hermosa Beach Maintenance Yard, this objective may not be specifically met. However, the EIR includes this alternative as it would meet all of the other objectives and would substantially reduce significant environmental impacts.

5.1.6.3 Oil Development with Reduced Wells and Project Objectives

The Reduced Wells Alternative would achieve the Applicant's objectives in regards to developing the project utilizing the latest technologies and technological advances, minimizing visual effects and providing safe vehicular ingress and egress. The objective of maximizing oil and gas production would be incrementally less successful in achieving this objective than would the Proposed Project due to the reduced amount of oil and gas that would be developed.

Under this alternative, all of the objectives for the Proposed City Maintenance Yard would be met.

5.1.6.4 Oil Development with Reduced Timeframe and Project Objectives

The Reduced Timeframe Alternative would achieve the Applicant's objectives in regards to developing the Project utilizing the latest technologies and technological advances, minimizing visual effects and providing safe vehicular ingress and egress. The objective to maximizing oil and gas production would be incrementally less successful in achieving this objective than would the Proposed Project due to the reduced amount of oil and gas that would be developed.

Under this alternative, all of the objectives for the Proposed City Maintenance Yard would be met.

5.1.6.5 Use of Existing Pipelines and Project Objectives

The Use of Existing Pipeline Alternative would achieve all of the objectives of the Applicant's Proposed Project as well as all of the objectives for the Proposed City Maintenance Yard.

5.1.6.6 Phase 1 Permanent Yard Construction and Project Objectives

The City's objectives would be met as City facilities would be built, would provide high-quality services in an integrated fashion, would comply with CEQA, would retain consolidated facilities, with no disruption to City functions, would remain compatible with existing surrounding land uses, and with no net loss of parking.

The Phase 1 Permanent Yard Construction Alternative would achieve all of the objectives of the Applicant's Proposed Project as well.

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