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April 8, 2019

VIA ELECTRONIC MAIL

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Re: Comment Letter re April 9, 2019 Agenda Item 46: Recommendation for 1) Interim Urgency Ordinance Prohibiting Drilling of Wells, and 2) Amending Zoning Ordinances to Require Discretionary Approval of New Oil/Gas Development under Approved CUPs.

Honorable Members of the Board:

This office is counsel to PEAK OPERATOR, LLC, PEAK OIL VENTURES LLC, PEAK OIL LLC, and PEAK OIL HOLDINGS LLC (collectively, "Peak"), which operates on the HBH and Hunsucker leases in unincorporated Ventura County ("Property")¹. We are writing in response to the "Recommendation of Supervisor Bennet To Direct the Planning Division to Promptly Return to the Board with a Proposed Interim Ordinance Pursuant to Government Code Section 65858 to Temporarily Prohibit the County's Approval of New Oil and Gas Wells, and Re-Drilling of Existing Oil and Gas Wells, for Oil Production that will Utilize Steam Injection in the Vicinity of Potable Groundwater Aquifers while the County Studies Potential Regulations for this Land Use;

¹ See Exhibit 1, Figure 2 (p. 5 of 89) for Project Location Map.

and Direct the Planning Division to Also Study Potential Amendments to the County's Zoning Ordinances to Require Discretionary Approval of New Development Under Antiquated Oil and Gas Permits; All Supervisorial Districts." ("Proposal").

Peak urges the Board to either remove this item from the agenda entirely, or to vote against the recommended actions suggested within the Proposal.

Regarding the proposed urgency ordinance to temporarily prohibit new oil and gas wells ("Proposed Urgency Ordinance"), the entire Proposal lacks foundation, as the United States Geological Survey ("USGS") report cited therein is misquoted and improperly relied upon. The Proposed Urgency Ordinance also completely ignores the robust state regulatory scheme in place to ensure that water quality is protected and safe. There are also factual inaccuracies throughout the Proposal. For example, the Proposal falsely states that "the permitted activities and their environmental impacts have never been analyzed under CEQA." (Proposal, at p. 3.) This is incorrect, as the Property where Peak operates is subject to a comprehensive Environmental Impact Report ("EIR") that was conducted in 1979 which addressed the environmental impacts of 120 wells, and the site currently contains (and even with Peak's proposed future expansion, is proposed to contain) fewer than 120 wells. (Exhibit 1.) For a multitude of reasons, the Proposed Urgency Ordinance does not meet the legal standard required under Government Code Section 65858.

Furthermore, with respect to the study of amendments to require discretionary approval of new oil and gas development under approved CUP's ("Discretionary Approval Amendments"), these are also legally without merit, and similarly ignore the robust state regulatory scheme in place relating to all oil and gas drilling. The California Division of Oil, Gas, and Geothermal Resources ("DOGGR") is the regulatory body with the appropriate expertise to study, analyze, and opine on oil and gas projects. The County has no such expertise, no such legal authority, and cannot and should not delve into this highly technical area without the appropriate proficiency, capacity, or capability.

This comment letter sets forth the real evidence (with references to relevant exhibits and links) relating to the issues before the Board of Supervisors. Peak is hopeful that with the appropriate and accurate information in hand, the Board will make the right decision, and will not impose the Proposed Urgency Ordinance, and will allow the appropriate state regulatory authorities to regulate oil and gas development without unnecessary local discretionary action.

I. The Property that is the Site of Peak's Operations is Subject to a Thorough 1979 Environmental Impact Report

The Oxnard Oil Field Vaca Tar development is not new. The reservoir was discovered in 1937 and has been developed by multiple companies since that time.

The California Environmental Quality Act ("CEQA") was adopted in 1970, and development occurring thereafter (including on the Property) would be subject to its terms. Peak's

development on the Property is governed by a 1979 EIR (attached hereto as Exhibit 1). Therefore, the Proposal's claim that "the permitted activities and their environmental impacts have never been analyzed under CEQA" is simply factually inaccurate. (Proposal, at p. 3.)

The EIR analyzed the environmental impacts of 120 wells and 45 surface acres of development. The EIR is still valid and applicable as to the Property, and as to Peak's operations on the Property. Prior operators at the Property drilled several wells over the years. Of these wells drilled by those operators, 8 (that were drilled in the 2007-09 timeframe) still exist on the Property today. Other wells were drilled and abandoned in the 1980's.

Peak purchased the minerals lease for the Property in 2012, and was approved for a Zoning Clearance to drill 24 wells and to construct related facilities, shortly thereafter. (ZC12-1052, "ZC 2012".) Peak commenced the work under ZC 2012 in January of 2013 and began drilling 9 wells and the installation of supporting facilities in March of 2013. In coordination with the County Planning Division, Peak has since drilled 6 additional wells, for a total of 15 wells on the Property.² Thus, there are a total of 23 active wells on the Property today (15 drilled by Peak, and 8 drilled by a prior operator).

Peak does intend to drill approximately 60-70 additional wells on the Property, and has a pending Zoning Clearance application for same. Importantly, even so, Peak proposes to drill fewer wells (approximately 80 total wells vs. the 120 analyzed in the EIR) and use a smaller surface footprint (approximate 20 surface acres vs. the 45 acres analyzed in the EIR) than was contemplated in the 1979 EIR.

The notion that oil and gas operators such as Peak are able to freely operate with no environmental or regulatory oversight is pure fiction – fiction that is perpetuated by the Proposal before the Board. Not only is there a valid governing EIR for the Property, but there are additional, specific regulatory schemes in place that are even more relevant to the precise aquifer-related concerns raised in the Proposal, addressed below.

II. DOGGER Regulations and Aquifer Exemption Procedures

The Division of Oil, Gas, and Geothermal Resources ("DOGGR") prioritizes protecting the public and the environment in its oversight of the oil, natural gas, and geothermal industries in California. To do that, DOGGR uses science and sound engineering practices to regulate the drilling, operation, and permanent closure of energy resource wells. DOGGR also regulates certain pipelines and facilities associated with production and injection.
(<https://www.conservation.ca.gov/dog>.)

² Peak was approved, through ZC 2012, to drill a total of 24 wells. Because Peak has only drilled 15 wells to date, there are 9 additional wells that have been fully approved, and that have yet to be drilled by Peak.

Specifically, in connection with underground injections, new underground injection control regulations ("UIC") took effect April 1, 2019. The DOGGR website is replete with specific regulations relating to UIC where links can be found to the final text of UIC regulations.³ The regulations impact about 55,000 UIC wells in California, and two types of wells: 1) those that inject water or steam for enhanced oil recovery, and 2) those that return the briny groundwater that comes up from oil formations during production – typically unusable for drinking or agriculture – back into the underground source from which it came.

Key elements in the UIC regulations include:

- Stronger testing requirements designed to identify potential leaks.
- Increased data requirements to ensure proposed projects are fully evaluated.
- Continuous well pressure monitoring.
- Requirements to automatically cease injection when there is a risk to safety or the environment.
- Monitoring for seismic activity.
- Requirements to disclose chemical additives.

More specifically, in its oversight of injection well operations, DOGGR's "**highest priority**" is to protect aquifers clean enough to supply water for drinking or agricultural use. DOGGR, the U.S. Environmental Protection Agency ("EPA"), and the State Water Resources Control Board ("SWRCB") have jointly developed a process to ensure that protection.

(https://www.conservation.ca.gov/dog/Pages/Aquifer_Exemptions.aspx) However, an exemption that allows injection may be granted if an aquifer is not a current or future source of drinking water because it naturally contains petroleum or harmful levels of minerals such as arsenic or boron.

The process for an exemption begins with DOGGR and SWRCB concurring that an aquifer meets certain criteria. The request for the exemption from the federal Safe Drinking Water Act ("SWDA") is sent to the EPA, which makes the final determination.

Importantly, Peak is in the process of obtaining an Aquifer Exemption now. On December 7, 2018, the SWRCB issued its "Preliminary Concurrence on the Aquifer Exemption Proposal, Vaca Tar Sands, Oxnard Oil Field, Ventura County." (See Exhibit 2.) The concurrence letter comes after significant technical and geologic reviews and inquiries.

This application is expected to be approved by the EPA very soon, and will serve to extend identified hydrocarbon limits and the resultant allowable injection area in the Oxnard Oil Field. The USGS and the SWRCB also conducted a comprehensive study on groundwater quality in the 8 Ventura County groundwater basins. The study did not identify oil and gas

3

[https://www.conservation.ca.gov/dog/general_information/Pages/UndergroundInjectionControl\(UIC\).aspx](https://www.conservation.ca.gov/dog/general_information/Pages/UndergroundInjectionControl(UIC).aspx)

production as a contamination source, despite nearly 100 years of oil and gas development and thousands of existing wells in the county. (See more detailed discussion in the section below).

Peak has constructed state of the art drill wells with pipe and cement specific to the steam injection application: N80 and L80 grade new and inspected casing and high strength thermal cement provided by Schlumberger. Peak also has installed 2 casing strings fully cemented to surface with thermal cement through the aquifers per DOGGR requirements.

In other words, Peak has taken, and will continue take, every precaution to ensure that aquifers are not contaminated through its operations. Furthermore, entities like DOGGR, SWRCB, and the EPA, who have the appropriate expertise to oversee and regulate these types of operations, will ensure that Peaks efforts are properly implemented.

III. The Real Facts Regarding Potential Impacts to Aquifers: No Public Drinking Water Supplies Have Been Impacted by Oil and Gas Production

The USGS aquifer study cited in the Proposal did not conclude that "petroleum-related gases are migrating into the drinking water aquifers of the Fox Canyon aquifer system." (Proposal at p. 2.) This is yet another important factual inaccuracy that is at the heart of the Proposal.

The cited USGS report states that the results of their sampling found no evidence or no detections of petroleum hydrocarbons, inorganic constituents, or isotopes that indicate oil field water mixing with the groundwater overlying the oil field. The USGS study did report that thermogenic gases had been detected in deep water wells. However, their study did not conclude that oil field activity was the cause. The author explained that detections of naturally-occurring thermogenic gases in deep groundwater could have resulted from natural vertical migration through the geologic formation, or through the water wells. Further, the low level of dissolved gases found in groundwater samples is below CA drinking water regulatory standards.⁴

A third party scientific study was conducted in 2018 to assess potential impacts to drinking water from oil and gas well drilling and production activities in Ventura County. The study was prepared by Thomas Johnson Associates, Substrata LLC and CW Consulting (firms that specialize in water and environmental issues). The key findings were that:

1. Groundwater quality in Ventura County primarily reflects interaction of the water with surrounding soil and rock, and the quality of the water sources that recharge groundwater.
2. Primary impacts to groundwater quality in Ventura County are contaminants from natural sediments, Ag sources, urban development, septic systems, wastewater treatment, seawater intrusion, and commercial activities.

⁴ Abstract of study can be found at: <https://ca.water.usgs.gov/projects/oil-gas-groundwater/products/>

3. NO public drinking water supplies have been impacted by oil and gas production. There is no evidence to support claims that oil and gas production activities have impacted any drinking water supplies or water resources.
4. All surface and groundwater monitoring programs conducted by water districts, Ventura County, water purveyors, the USGS and SWRCB have not identified oil/gas production as a contamination source.
5. Oil producing and water disposal formations in VC oilfields are isolated from public water supplies and regional aquifers.
6. Salts, metals and petroleum naturally occur in geologic formations, sediments, surface water and groundwater in Ventura County.
7. Petroleum impacts on groundwater quality in Ventura County, where evident at all, are localized, generally unrelated to oil and gas exploration and production, and much less frequent and significant than other sources of natural, agricultural and urban water-quality degradation.
8. Scientific studies and monitoring data indicate that current oil field operations do not pose a threat to public water supplies, consistent with industry practices and strict regulations designed to protect groundwater.

Further information regarding this study can be found at the following sources:

<https://www.energyindependenceca.com/wp-content/uploads/2019/01/Ventura-GW-Quality-OG-Production-Exec-Summary-Final-9-16-181.pdf> : Executive Summary.

<https://www.energyindependenceca.com/wp-content/uploads/2018/09/Ventura-GW-Quality-OG-Production-Final-9-7-18.pdf> : Full Report.

<https://www.extractingfact.com/article/cfrog-blatantly-misrepresents-usgs-findings-in-oxnardactivists> : Evidence of Environmental lobbying groups misrepresenting USGS report's findings.

Therefore, there is no factual or evidentiary basis upon which to conclude that oil and gas operations have any effect on Ventura County aquifers. Before any action is taken relating to the Proposed Urgency Ordinance, the County should closely review the USGS study, and make decisions based on the real facts discussed therein, and not based on misrepresentations of its contents.

IV. The Proposal Does Not Meet the Legal Standard under Government Code Section 65858 for an Urgency Ordinance, Because There is No "Current and Immediate Threat to the Public Health, Safety, or Welfare"

The Proposal claims that: "Under Government Code section 65858, a county may adopt an interim ordinance to temporarily prohibit certain land uses that may conflict with contemplated land use regulatory changes. The purpose of an urgency ordinance is to give the jurisdiction time to study the potential impacts of activities and figure out whether and how these activities should be

regulated differently." This statement misstates the legal standard under Government Code section 65858, which requires that there be a "**current and immediate threat to the public health, safety, or welfare**" before any urgency ordinance can be adopted.

The relevant portions of the Government Code are set forth below (emphasis supplied):

65858. (a) Without following the procedures otherwise required prior to the adoption of a zoning ordinance, the legislative body of a county, city, including a charter city, or city and county, **to protect the public safety, health, and welfare, may adopt as an urgency measure an interim ordinance** prohibiting any uses that may be in conflict with a contemplated general plan, specific plan, or zoning proposal that the legislative body, planning commission or the planning department is considering or studying or intends to study within a reasonable time. That urgency measure shall require a four-fifths vote of the legislative body for adoption. The interim ordinance shall be of no further force and effect 45 days from its date of adoption. After notice pursuant to Section 65090 and public hearing, the legislative body may extend the interim ordinance for 10 months and 15 days and subsequently extend the interim ordinance for one year. Any extension shall also require a four-fifths vote for adoption. Not more than two extensions may be adopted.

...

(c) **The legislative body shall not adopt or extend any interim ordinance pursuant to this section unless the ordinance contains legislative findings that there is a current and immediate threat to the public health, safety, or welfare, and that the approval of additional subdivisions, use permits, variances, building permits, or any other applicable entitlement for use which is required in order to comply with a zoning ordinance would result in that threat to public health, safety, or welfare.**

Here, there is no way that the County can credibly make a finding that "that there is a current and immediate threat to the public health, safety, or welfare" OR "that the approval of additional subdivisions, use permits, variances, building permits, or any other applicable entitlement for use which is required in order to comply with a zoning ordinance would result in that threat to public health, safety, or welfare." This is true for several reasons.

First, given the actual science and studies on the subject of aquifers, there is no contamination due to oil/gas. Second, due to the extensive and robust regulatory scheme in place relating to protection of aquifers, there is little risk that Peak (or any other oil operator, for that matter) would disrupt any aquifers. Third, the Kern County example cited in the Proposal is completely distinguishable from the situation on the Property (and throughout Ventura County), and there is no similar risk

here, due to the composition of the earth, and the lack of subsidence.⁵ Fourth, despite the Proposal's claims to the contrary, the Property is subject to an EIR which has already analyzed the environmental impacts for up to 120 wells, and Peak's operations have a much smaller footprint than what was already analyzed and approved therein.

V. Vested CUPs Cannot and Should not Be Subject to Further Discretionary Action by the County

County Counsel has reviewed and opined on whether or not the County can subject oil operators with valid CUPs to additional discretionary entitlements. The conclusion of that analysis is as follows: "The County of Ventura's ("County") ability to impose new conditions on antiquated oilfield permits is very limited. Because of the vested rights doctrine and constitutional protections afforded these permits, the County can impose new, narrowly tailored conditions on these permits only when a compelling public necessity, such as danger, harm or public nuisance, or significant violations exist, and not through an ordinary exercise of the police power for the general welfare." (See Exhibit 3, containing the undated County Counsel Opinion.)

The legal authority and citations contained throughout that 8-page legal analysis will not be repeated here, but the County Counsel's legal opinion does provide a relatively thorough review of vested rights and some of the constitutional protections enjoyed by landowners and operators with legally valid and vested entitlements. Any action by the County that jeopardizes these fundamental rights will be subject to challenge in the Courts by effected parties, including Peak.

Furthermore, it should be noted that the County has been treating the ministerial zoning clearance applications for additional wells with significant scrutiny, and has actually been treating them more like discretionary entitlements than ministerial applications.⁶

Beyond the County's legal inability to take this action, there is an arguably even more important reason why the County should avoid discretionary review of new development under oil/gas CUPs. There are a number of other qualified regulatory authorities with the actual and technical expertise to review, analyze, and opine on oil and gas operations. The County simply lacks this expertise. The DOGGR website specifies the permits needed to drill a well in California

⁵ The cited Kern County incident was a very shallow heavy oil reservoir (completely different than what is present at the Property where Peak's operations are located) and a very aberrant historical, and tragic, event. By contrast, the Peak project is very deep by steam injection standards at approx. 2000.' The 1979 EIR forecast minimal subsidence (1 foot over a 22 year period of development). In fact, per DOGGR mapping (found on their website), no subsidence has occurred on the Property at all. Indeed, survey data on old wells and new wells in 2014 (confirmed with elevation data on record with DOGGR) show zero subsidence, even after 40 years of thermal stimulation at the Property.

⁶ Note that this is another area in which the County's actions in this regard are subject to potential litigation.

(emphasis supplied): "Usually, two permits are needed to drill a well in California. You need a **use permit from the local agency** such as the city or county, and you need a drilling permit from DOGGR. In many counties, most wells drilled in existing oil or gas fields do not need a local-agency permit, so only a DOGGR permit is required. In other counties, use permits are required and can be obtained from the planning department."⁷

The "local use permits" in question are these same "antiquated" CUPs that the County is so concerned about. The County's focus on these local use permits totally misses the point. As a general rule of land use law, use permits such as CUPs specify the uses that are allowed on a particular property, and contain general and specific conditions governing that specific use. However, when it comes to specific development pursuant to that use permit, it is usually a different department with the relevant professional and technical expertise that will actually review, analyze, and approve the building/development itself.

In the context of a building, for example, a CUP would state what type of building is allowed on a Property, and would delineate certain conditions for the use. However, the Building and Safety department would actually review the building plans, and ensure that everything is engineered and constructed in compliance with the relevant codes, and to protect the public safety and welfare.

Similarly, in the oil and gas context, the CUPs in question have approved the oil/gas use on the relevant properties, and have conditioned that use accordingly. It is up to DOGGER, the EPA, SWRCB, the Air Pollution Control District, and other regulatory agencies with the appropriate technical expertise, to ensure that the actual wells are drilled properly, and in compliance with all relevant regulations.

In other words, the Proposal's premise is legally incorrect. Once a CUP is in place, the remaining specifics of how wells are drilled is beyond the purview of the Board of Supervisors, and rather, within the domain of the relevant regulatory entities that are technically equipped to handle these matters. Any decision to the contrary will be legally challenged in the courts, and ultimately, will be reversed.

VI. CONCLUSION

Peak requests that the entire Proposal be removed from the agenda for the April 9, 2019 meeting, because the factual premises upon which the Proposal relies are flawed, factually incorrect, and not supported by evidence.

To the extent that the matter is not removed from the agenda, the Board should act as follows:

⁷ <https://www.conservation.ca.gov/dog/faqs>

As to Item 1: The Proposed Urgency Ordinance is a drastic remedy meant to address a "current and immediate threat to the public health, safety, or welfare." No such current or immediate threat exists here. Also, as described in detail above, there is no evidence to support the claims in the Proposal. Until there are actual facts and evidence that can support a real threat to the public welfare, this measure cannot be taken.

As to Item 2: The County cannot and should not consider converting ministerial zoning clearance applications into discretionary entitlements. The County is both legally barred from doing so, and it would be overreaching into an area where it lacks expertise. Beyond the discretionary entitlements that operators like Peak have already obtained, any further approvals are within the domain of the regulatory agencies that work to ensure the oil/gas operations are conducted safely and properly.

Very truly yours,

A handwritten signature in black ink, consisting of a stylized 'S' followed by a horizontal line and a small dot.

SEENA M. SAMIMI of
Jeffer Mangels Butler & Mitchell LLP

cc: Kim Prillhart (via e-mail; kim.prillhart@ventura.org)

Exhibits:

Exhibit 1: 1979 EIR

Exhibit 2: Aquifer Exemption Preliminary Concurrence

Exhibit 3: County Counsel Legal Opinion

EXHIBIT 1

VENTURA COUNTY ENVIRONMENTAL RESOURCE AGENCY


FINAL
ENVIRONMENTAL IMPACT REPORT

FOR

CONDITIONAL USE PERMIT NO. CUP-3566
CHANSIOR WESTERN OIL AND DEVELOPMENT COMPANY (CWOD)

THIS REPORT HAS BEEN PREPARED PURSUANT TO DIVISION 13 OF THE
PUBLIC RESOURCE CODE.

APPROVED BY:


M. L. KOESTER, DIRECTOR
ENVIRONMENTAL RESOURCE AGENCY

DATE: 3/19/79

pEIR2a

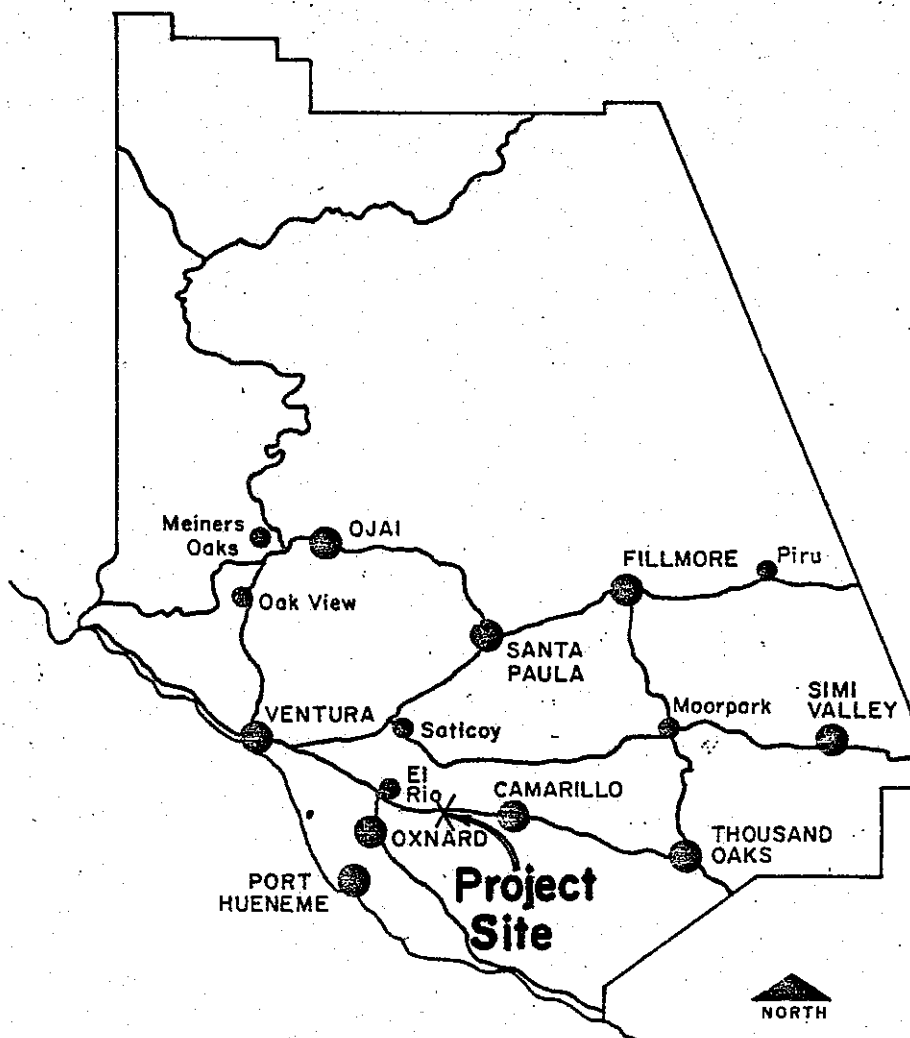
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SECTION I

INTRODUCTION

The Ventura County Environmental Assessment Committee (EAC) reviewed the Initial Study prepared for this proposed project and determined that the project could have a significant effect on the environment. Accordingly, EAC required that an Environmental Impact Report (EIR) be prepared in accordance with the provisions of the California Environmental Quality Act. In order to obtain greater technical knowledge of the potential impacts discussed in the Initial Study, the Environmental Resource Agency, acting with the Board of Supervisors' approval, contracted with the California State Division of Oil and Gas to prepare the Oxnard Oil Field Subsidence Study. This report evaluated many of the technical aspects of the project and identified mitigation measures in those areas where environmental effects were determined. This report, along with county expertise, serve as the technical basis for the preparation of this environmental document. The areas of focus for site specific analysis include: land use, geology and subsidence, flooding and drainage, groundwater, seismicity, air quality, archaeology, flora and fauna, fire protection, visual effect, public facilities, traffic, and energy. In addition, a cumulative assessment has been prepared for groundwater, air, traffic and subsidence in response to public comments on the draft EIR (see Appendix F).



COUNTY OF VENTURA

Ventura County
Environmental
Resource
Agency

CUP-3566
REGIONAL LOCATION MAP Figure 1
01

SECTION II

PROJECT DESCRIPTION

A. APPLICANT

Chanslor Western Oil and Development Company
10737 Shoemaker Avenue
Santa Fe Springs, CA 90670

B. PROJECT LOCATION AND LEGAL DESCRIPTION

The 358.35 acre project site is adjacent to the City Limits of Camarillo and shares common boundaries to the north with the Camarillo Airport, to the east with Wood Road, to the southeast with Pleasant Valley Road, and to the south with Sturgis Road. (See Figures 2 and 3). The subject parcel is designated as Assessor's Parcel Nos. 216-051-04, -08 and -09.

C. PROJECT OBJECTIVES

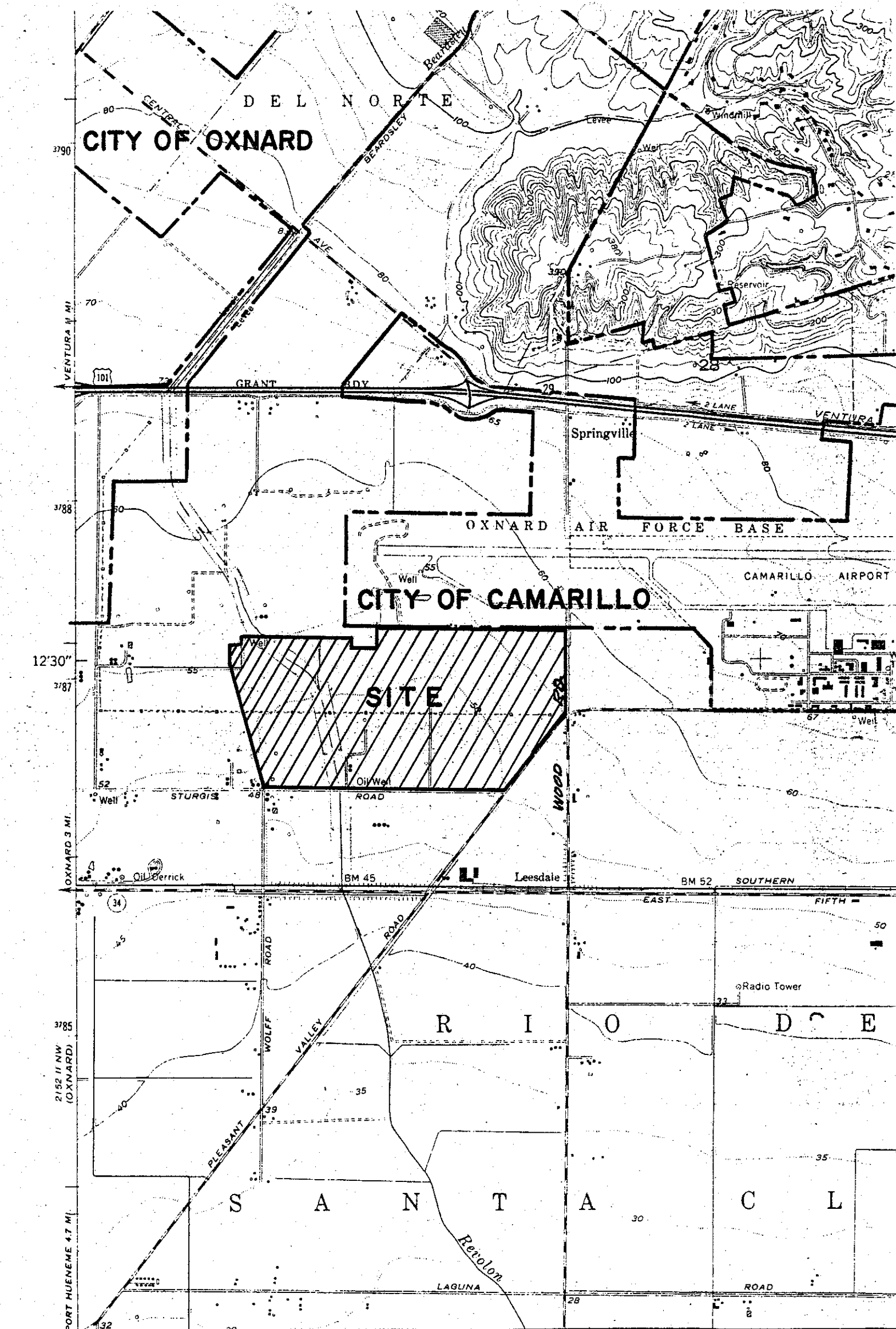
The proposed project involves the implementation of a two-phased thermal oil recovery program in the Vaca tar sand deposit. The pilot portion of the program (Phase I) would entail the drilling and steam injection operations of up to 20 wells in the Oxnard Oil Field over a 30-month testing period. If this pilot phase proves successful, then the production phase (Phase II) would commence with the development of an additional 100 wells, resulting in a total of 120 wells. Ultimately, 45 acres of the 358.35 acre project site would be used for the drilling and siting of various types of pumping, tankage and steam generation equipment over a 20 or 22 year period (DOG study). It is estimated that approximately 25% of the oil resources in the Vaca tar deposit (100,533,750 barrels) could be recovered during the life of the project. This resource would be used for conversion into asphalt products, bunker fuels, and other petroleum based products.

D. PROJECT CHARACTERISTICS

The pilot phase of the proposed project includes the testing evaluation of two related methods of thermal oil recovery. One method is called the "cyclic steam" technique and the other is the "steam flood" technique. The "cyclic steam" method involves the drilling of a well into the underlying tar bearing sands and the injection of superheated steam. The superheated steam then heats the high viscosity oil (5.1 American Petroleum Institute) and causes it to flow from the tar bearing sands. As this occurs, the steaming operation is shut down so that the hot oil can be pumped to the surface for processing. As needed, this process is repeated until all available oil in the vicinity of the well is recovered.

The second method to be evaluated is the steam flood technique. This method involves the drilling of a well which would be specifically used for steam injection purposes. Pressurized steam, heated to 600° Fahrenheit, will be injected into the well on a continuous basis. Other production wells would then pump the heated oil as it flowed from the tar bearing sands to the ground surface.

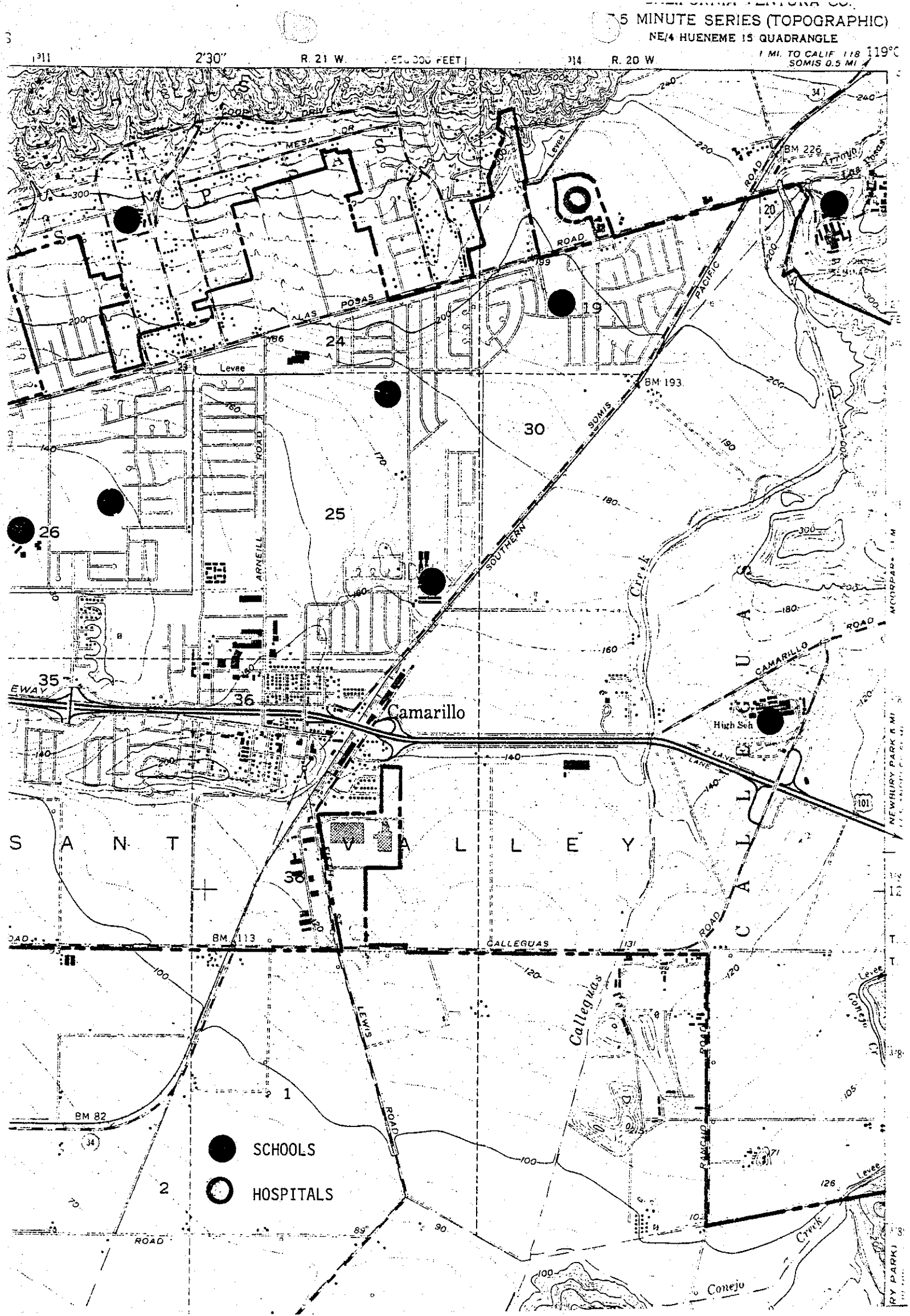
Presently, there is an existing thermal oil recovery operation located immediately east of the project site operating under Conditional Use Permit No. CUP-2136 (Chase Production). Presently, this permit encompasses both the Vacca Transamerica No. 203, completed on November 23, 1964, and Transamerica No. 702, completed June 20, 1965, and other wells that use the cyclic steam technique for oil recovery for a total of seven wells.



Ventura County
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CUP-3566
PROJECT LOCATION MAP
Figure 2

1" = 2000'

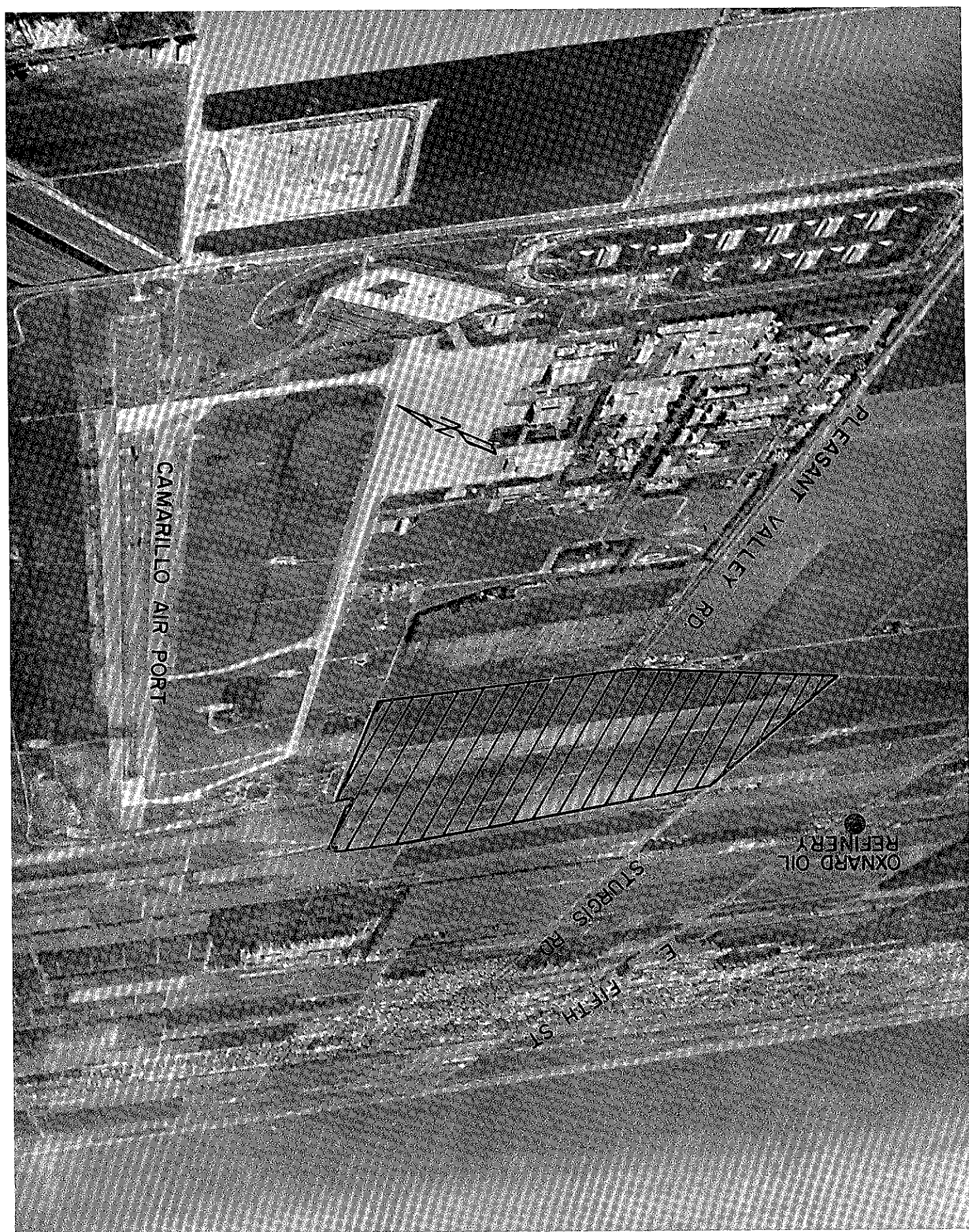


Ventura County
Environmental
Resource
Agency

CUP-3566
PROJECT LOCATION MAP
Figure 2 A

1" = 2000'

CUP-3566
Figure 4



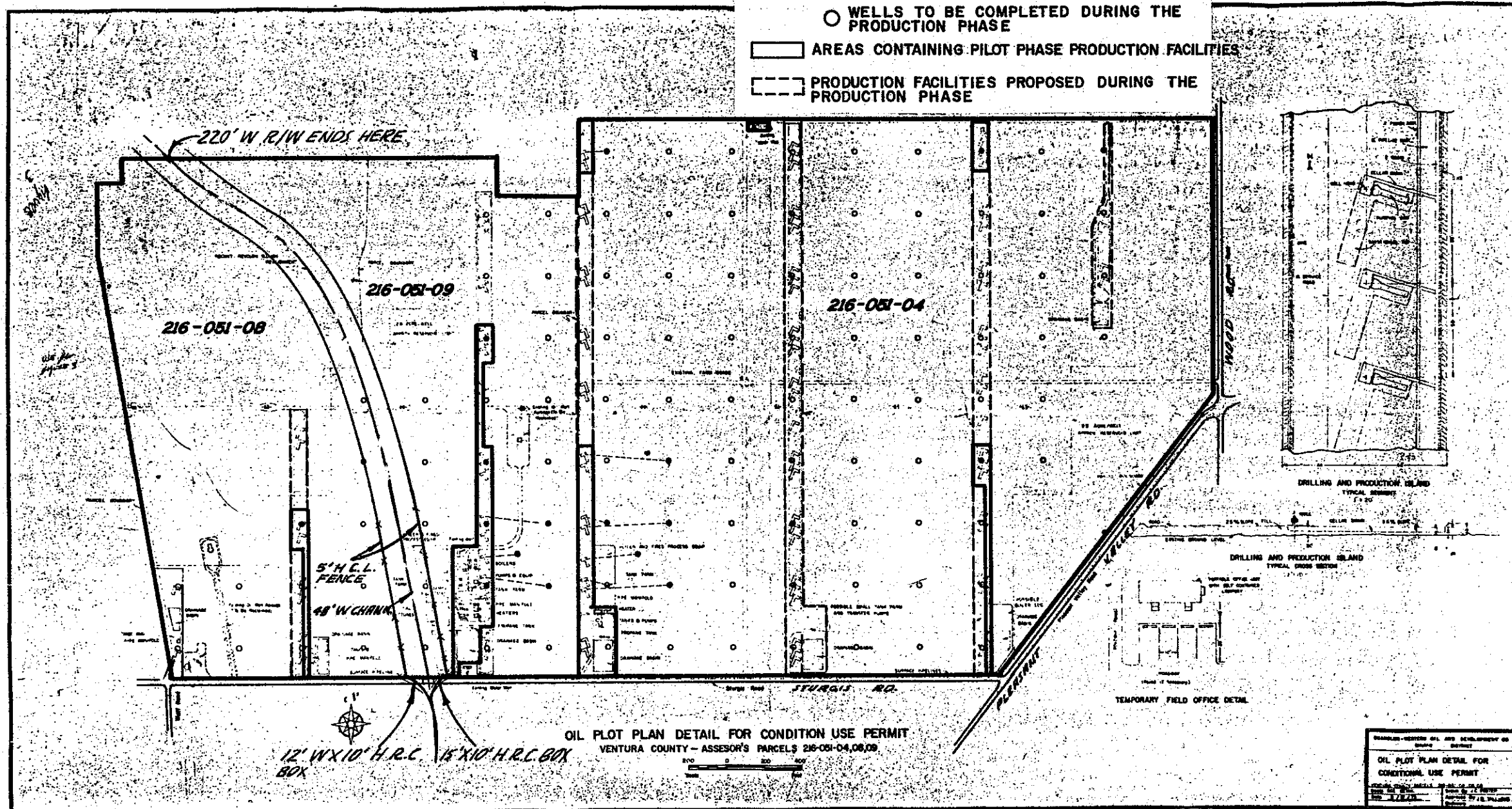
POSSIBLE LOCATION OF DIRECTIONALLY DRILLED
WELLS FROM PRODUCTION ISLANDS

- WELLS TO BE COMPLETED DURING THE
PILOT PHASE (30 MONTHS)

- WELLS TO BE COMPLETED DURING THE
PRODUCTION PHASE

▭ AREAS CONTAINING PILOT PHASE PRODUCTION FACILITIES

▭ PRODUCTION FACILITIES PROPOSED DURING THE
PRODUCTION PHASE



CUP-3566

PROJECT PLOT PLAN

Figure 3

SECTION III

SUMMARY

A. PROJECT IMPACTS

1. Land Use

The ultimate development of 120 wells would require the conversion of 45 acres of agricultural land to oil production. Accordingly, an annual financial loss of up to \$661,500 of income to the community could result. The remaining 313 acres would remain in agricultural production but could be subject to an undetermined amount of crop damage from the large amounts of sulphur oxides generated by the project as well as dust from oil field service roads. Mitigation measures should include utilization of the best available air pollution control technology and dust control measures to partially mitigate the project impacts on adjacent land uses (see Section V-A).

2. Geology and Seismic Assessment

The project site is located in an area that is subject to severe earthquake/ground shaking. In the event of a strong earthquake, surface facilities could be damaged and storage tanks could rupture. Although some buckled casing and kinked tubing may result, neither blowouts nor damage to either the oil zone or local aquifers is anticipated. To mitigate against the possibility of oil from ruptured tankage flowing onto adjacent agricultural lands and waterways, berms around each drilling island could be required (see Section V-B).

3. Flooding and Drainage

The project site is subject to flooding from the Revolon Slough, the Camarillo Hills Drain, Pleasant Valley Drain, and local sheet flow. Although flood control improvements are proposed for the Revolon Slough and the Camarillo Hill Drain, continued flooding is expected from other sources. The combination of berms and raised pads could protect the drilling islands in such a way as to prevent the contamination of flood waters with hydrocarbons and oil field wastes. Automatic pipe shut-offs could also be provided to protect against the breakage of oil field pipelines (see Section V-C).

4. Groundwater

The project could use up to 1,493,000 barrels of water from the Oxnard aquifer zone during the first thirty months. This zone is presently being overdrawn, allowing that seawater to intrude into the aquifer. The amount of water usage in Phase I is relatively small (1,493,000 barrels), but further dependance on the aquifer for Phase II could contribute to significant additional seawater intrusion. Therefore, water from another source (i.e., Calleguas Municipal Water District), should be used during Phase II instead of the native groundwater to prevent any further significant overdraft of the Oxnard aquifer (see Section V-D).

5. Subsidence

The project site and the immediately surrounding area has subsided two feet since 1920 and is expected to subside another foot over the next 22 years. If reservoir pressures in the oil zone are reduced by 400 psi or more, 1.34 feet of additional subsidence and one foot of horizontal displacement or more is anticipated. Subsidence could result in localized ponding of drainage flows and could reduce the effectiveness of flood control measures currently being constructed in the area. Mitigation measures include a repressurization program and subsidence monitoring to ensure that further subsidence does not result from the project (see Section V-E).

6. Air Quality

Due to prevailing meteorology in Ventura County, air pollutant emissions generated in the Oxnard Plain area are carried inland, affecting the air quality of the Camarillo, Moorpark-Simi Valley area, the Fillmore-Piru area and the Thousand Oaks area, as well as the Oxnard Plain. At present, the National standard for ozone is not being attained in these areas.

The proposed project, located on the Oxnard Plain, will produce significant amounts of RHC and NO_x (precursors to ozone), as well as TSP and SO_x, exacerbating the air quality problems in these areas. Mitigation measures include vapor controls, proper maintenance of wellhead equipment, fuel with lower sulfur content, and pipeline transfer of production (see Section V-F).

7. Archaeology

The project site is located in a sensitive archaeological zone, but a general surface reconnaissance conducted by the County's staff archaeologist identified no cultural resources. Nevertheless, there is a possibility of uncovering deeply buried materials during grading, in which case the County archaeologist should be contacted to ensure the proper disposition and/or salvage of any cultural resources (see Section V-G).

8. Flora and Fauna

The project site has been used entirely for the production of food and oil and is devoid of adequate habitat to support any significant numbers and types of either native wildlife or any rare or endangered species. Hydrocarbon spills, however, could enter adjacent waterways and be conveyed downstream into the Mugu Lagoon. If the pollutants were to reach the lagoon's natural environment, established breeding areas and food sources could be adversely affected. Accordingly, properly compacted berms to confine accidental spills of hydrocarbon materials could be required to ensure that nearby waterways are not contaminated (see Section V-H).

9. Fire Protection

Although the project site is located in an area having a low susceptibility to fire, the presence of oil recovery facilities increases the risk of fire. However, such risks are within the bounds of normal fire department capabilities as long as the existing provisions of the adherence to fire code and adequate supplies of water for fire fighting purposes are available (see Section V-I).

10. Aesthetics

The project site's location in the Oxnard Plain would make all oil recovery operations highly visible from adjacent roads. Flaring, if used, along with lighted drilling rigs would be visible during the night. During the daytime, significant amounts of tankage, oil drilling equipment, pumping devices, and parked vehicles would be visible to passersby; thereby changing the rural-agricultural character of the area to a more intensive industrial usage. Although little can be done to alleviate the visual impact of this facility, adequate landscaping could soften the impact (See Section V-J).

11. Public Facility Assessment

The project area has received severe flooding during major storms. This problem, however, is in the process of being partially mitigated through the installation of area-wide flood control improvements, including the channelization of the Revolun Slough and improvement of the Camarillo Hills Drain for the protection of agriculture. These channels are designed and constructed with very flat slopes (0.2 percent) due to the topographical constraints associated with the Oxnard Plain. Accordingly, these channels are particularly sensitive to topographical changes in excess of the existing rate of subsidence which has been compensated for in the project's design. Further

subsidence, as a result of oil withdrawal activities could reduce the carrying capacity of these channels and thus result in a reduced level of flood protection, thereby lessening the effectiveness of the flood control improvements. Mitigation measures proposed to preclude oil withdrawal subsidence include oil zone repressurization and subsidence monitoring programs (see Section V-K).

12. Traffic and Circulation

The most likely access route to the project site is the Ventura Freeway via Rice Avenue to Sturgis Road. According to the Public Works Agency, Rice Avenue, which in part has been widened, is capable of handling the small increase in traffic. Sturgis Road, on the other hand, is very narrow and is subject to flooding so that access to the site may be restricted during the rainy season. Accordingly, the use of alternative access routes may be necessary during inclement weather. No mitigation measures have been proposed for year-round access to the site (see Section V-L).

13. Energy

The proposed project would be a heavy user of diesel fuel during both Phase I and Phase II. Fuel usage is expected to reach 99,115 barrels during the first 30 months of testing and 6,762,940 barrels in the 20 years of production expected in Phase II. None of this fuel would be replaced by this project since the recovered oil's only usage would be for the conversion into asphalt products. The employment of other processes to convert the heavy crude into lighter weight by-products could be a future consideration, but the applicant's plans do not suggest the use of such methods (see Section V-M).

14. Agriculture

The project site is presently used for intensive agricultural purposes and an underdrainage system to reduce the area's high groundwater table and alkali buildup problems has recently been developed. It is possible that the proposed project could affect the operating efficiency of this underdrain system through a reduction of the system's gently sloping grade caused by the weight of the compacted soil serving as the base of the oil production islands. If this were to occur, the uniform rate of drainage flows could be reduced allowing for siltation buildups and increased maintenance costs to the farm operator. Also, the proposed production islands would separate the land in such a way that when it was farmed on its east-west axis, additional tillable land would be lost through conversion into tractor and farm equipment turnaround areas. Loss of additional crop lands does not occur when the farm operator tills the land on its north-south axis since farm roads are existing (see Section V-N).

B. GROWTH INDUCING IMPACTS

The Vaca Tar Sand deposit encompasses approximately 1,774 acres of land of which 358.35 acres is being proposed for development. Presently, it is estimated that there are about 402,135,000 barrels of oil in this deposit, of which 25 percent (100,533,750 barrels) could be recovered. The recovery of all the estimated reserves would take the total development of 520 wells or 400 more wells in addition to those now being proposed. Accordingly, further oil development could result with an increase in air quality degradation, visual impacts, and loss of prime agricultural lands. These impacts could, in part, be mitigated through the "unitization" of the oil field. Moreover, successful oil operations in the Vaca Tar could provide the impetus for oil exploration in the Lower Tar Sand, an area having about 50 million barrels of recoverable oil. At this time, no significant drilling in this oil zone has occurred due to unfavorable economics. However, new production techniques and higher oil prices may make the development of this deposit more attractive in the future.

C. ALTERNATIVES TO THE PROPOSED PROJECT

Three alternatives to the proposed project were identified and evaluated; the "no project", alternative project location, and alternative project size.

1. "No Project" Alternative

The "no project" alternative would maintain the existing environment and would preclude the possibility of project induced adverse impacts.

However, no utilization of the oil reserves would occur.

2. Alternative Project Locations

The areal limits of the Vaca Tar Sand deposit encompasses approximately 1,774 acres of land. There could be up to four other areas within this deposit where such a project could be placed. Although many of the identified environmental impacts would be much the same, there is a possibility that another location could avoid the flooding impacts associated with the proposed site.

3. Alternative Project Size

The ultimate placement of 120 wells, most of which would be used for production purposes, could be halved to approximately 60 wells; thereby reducing project related impacts on agricultural land, project visibility, and air pollution. Accordingly, the production period would be lengthened from 20 years to 40 years.

SECTION IV

ENVIRONMENTAL SETTING

A. HISTORY OF OIL RECOVERY ACTIVITIES

The Vaca Tar Sand was discovered in January, 1937, by Vaca Oil Exploration Company's Well No. 1, located in the southwest corner of what is now American Petrofina's Vacca Transamerica lease map. The well had a production rate of 50. barrels per day, but was abandoned because production could not be maintained due to sand influx.

In May, 1937, a second well in the area discovered low-gravity oil in a fractured shale reservoir 500 feet below the base of the Vaca Tar Sand. Subsequent drilling reached the low-gravity oil in the fractured shale, but the Vaca Tar Sand was undeveloped. Attempts were later made to drill three wells in the Vaca Tar Sand as salvage projects but were abandoned. The Vaca Tar zone was gun perforated, but sand influx resulted.

In 1953, oil was discovered in the Sespe zone at 6,000 feet and wells drilled to this formation provided additional geologic knowledge of the Vaca Tar Sand. The Vaca Tar Sand remained unexploited until December, 1964, when American Petrofina initiated a thermal recovery project by drilling and steaming Vaca Transamerica Well No. 203.

In February, 1965, three core holes were drilled on the Hunsucker tract, a northeast offset to the Vaca Transamerica lease, to gain more reservoir data.

In May, 1965, Well No. 203 was shut down due to mechanical problems which have since been corrected.

Vaca Transamerica Well No. 702 was completed in June, 1965, and has been utilizing "cyclic steam" injection since that time. The tar oil pumped from these wells is presently converted to asphalt products in the Oxnard Oil Refinery, which is located nearby.

B. LAND USE AND ZONING

The proposed project site is located in a highly productive agricultural area and has been planted with a variety of crops, including celery and flowers. In addition, three existing oil wells are located on the site, but these produce oil from zones that are much deeper than those of the Vaca Tar Sands.

Surrounding land uses consist of other agricultural operations and oil wells to the east, west, and south. The Camarillo Airport is located to the north.

The site is presently zoned "A-E" (Agricultural Exclusive, Forty Acre Minimum Lot Size) and is under Land Conservation Act contracts 48-1.3, 56-16.1, and 56-16.2. Surrounding zoning includes "R-A" (Rural Agricultural, One Acre Minimum Lot Size) to the north, west, and east, with "A-E" to the south.

C. APPLICABLE GENERAL PLANS

The Open Space Element of the Ventura County General Plan designates most of the project site as "Open Space" with about eighty acres in the northeasterly quarter of the project site as "Urban."

The Agricultural Element of the County General Plan designates the project site as "Prime Agricultural Land."

D. MAJOR ACCESS ROADS

Access to the project site can be attained from Sturgis Road via either Pleasant Valley or Rice Roads from interchanges along the Ventura Freeway. Of these two routes Pleasant Valley would provide the most difficult access due to poor road alignment at the intersection of Pleasant Valley and Wood Roads. Rice Road would provide better access since a

portion of it has been recently widened and offers a more direct route to the site. Sturgis Road, however, is narrow and commonly floods during the rainy season making portions of the site inaccessible until flood waters have receded. The traffic on Sturgis Road is approximately 780 ADT and traffic is basically local in origin. As a consequence, vehicular useage of this road is very low.

E. FLOODING AND DRAINAGE

The project site is subject to severe flooding from local sheet flow and overland flow from the Revolon Slough, Camarillo Hills Drain, and the Pleasant Valley Drain. Flood control projects are currently under way to reduce this problem. However, complete areawide protection is not expected even after the installation of these improvements. Previous instances of flooding have resulted in crop damage and road closure due to accumulations of mud.

F. GEOLOGY AND SEISMICITY

The Oxnard Plain is covered with a thin veneer of recent age alluvium comprised of sands, gravels and clays. Underlying these deposits are large freshwater aquifers and oil and gas deposits.

The project area is located within the Circum-Pacific seismic and volcanic belt, which has been active during much of Cenozoic time. The major fault systems in the vicinity of the Oxnard area include the San Andreas Fault Zone, the Big Pine Fault, and the San Gabriel Fault. An active but relatively minor fault system runs parallel to the Santa Monica Coastal Mountains from Santa Monica through Point Mugu, extending into the Channel Islands area.

G. SUBSIDENCE

The entire Oxnard Plain has a history of subsidence. Since 1920, approximately two feet of subsidence has been noted. This subsidence has been from a combination of natural causes, such as peat oxidation, natural hydrocompaction, and settling due to groundshaking due to earthquakes and also from man's activities, including groundwater withdrawals, agricultural hydrocompaction, and, possibly to a lesser extent, oil field fluid withdrawals. Over the next 22 years, one additional foot of subsidence is expected in the plain from natural causes.

H. GROUNDWATER

The project site is partly underlain by the Oxnard Pressure Basin which is composed of three different aquifer systems. The uppermost of these systems contains perched or semi perched water of poor quality. The next aquifer is the confined aquifer of the Oxnard and Mugu Aquifer Zones which yields about 75 percent of the groundwater produced in the Oxnard Plain. However, seawater is intruding into the Oxnard Aquifer Zone due to high water withdrawal rates. Beneath these zones are the Fox Canyon and Grimes Canyon aquifer zones which are also important groundwater resources.

I. AIR QUALITY

Ventura County, as other counties in coastal Southern California, has a serious air pollution problem. Smog formation and accumulation in areas of the County's south half is the major concern. Smog consists principally of a group of oxidant gases produced in the atmosphere by a series of chemical and physical processes occurring in sunlight. These processes involve reactive hydrocarbon (RHC) gases and nitrogen oxide (NOx) gases that are emitted principally by industrial activities and by the operation of motor vehicles. RHC is emitted to a great extent by motor vehicle operation; petroleum operations including evaporation of crude oil and gasoline during transfer and storage; evaporation of solvents from degreasers and surface coatings; and from agricultural spraying of RHC-containing pesticides. Emissions of NOx derived from activities requiring combustion, such as operation of motor vehicles, power plants and industrial boilers.

J. AGRICULTURE

A unique combination of both climatic and soil conditions make the Oxnard Plain a very productive agricultural region in which double and even triple cropping of lands not subject to flooding occurs.

SECTION V

ENVIRONMENTAL ASSESSMENTS AND MITIGATION MEASURES

A. LAND USE

1. Setting

The Oxnard Plain has been used primarily for the production of citrus fruits and field crops. The growing of citrus fruits, especially lemons, has not been successful on a large part of this area, because the trees will not tolerate alkali and require a deep, well drained soil for their best development. Sugar beets used to be a major crop in this area but have been replaced by truck crops, cut flowers and flower seed. The long growing season in this area permits two to three crops per year on lands not subject to frequent flooding. The project site possesses alluvial soils as does about 90 percent of Oxnard Plain. In this area these soils tend to have a high water table and to carry injurious quantities of alkali. This requires subdrainage systems in large parts of this area to obtain most effective use of these lands. These fertile soils are of extremely high value for agricultural purposes. (See Figure 4 on page 5.)

2. Impact

Phase I of the proposed project would occupy approximately 13 acres of the 358.35 acre site while Phase II would utilize an additional 32 acres of land. Ultimately, a total of 45 acres of land would be taken out of agricultural production. Agricultural lands now proposed for oil production could have been capable of producing three crops per year, but for the purposes of the following analysis only two crops were considered. Since celery and flowers have been planted on the site, the return from 13 acres could be \$54,600 and if 45 acres were planted, a \$190,000 loss per year could be anticipated. Accordingly, the loss to the community in jobs, sales, and income assuming a 3.5 local agricultural multiplier would range respectively, between \$189,000 to \$661,500 yearly depending on type of crops, number of croppings, weather and market conditions. This loss, however, could be reduced or offset by additional oil related employment (13 employees estimated by CWOD) and taxes. A cost-benefit study would be required to define the exact financial loss to the community. In addition to the financial loss to the community, the farmers' ability to efficiently cultivate the remaining acreage would be hampered since access to the fields would be complicated by the presence of drilling islands and service roads.

As noted in the Air Quality section of this report, the proposed project would produce sulphur oxides during Phase I and Phase II. If left unmitigated, sulphur oxides could result in an undeterminable amount of crop damage. In addition, dust generations from vehicular traffic on the service roads could result in an undeterminable amount of crop damage, especially for those crops located adjacent to the roads.

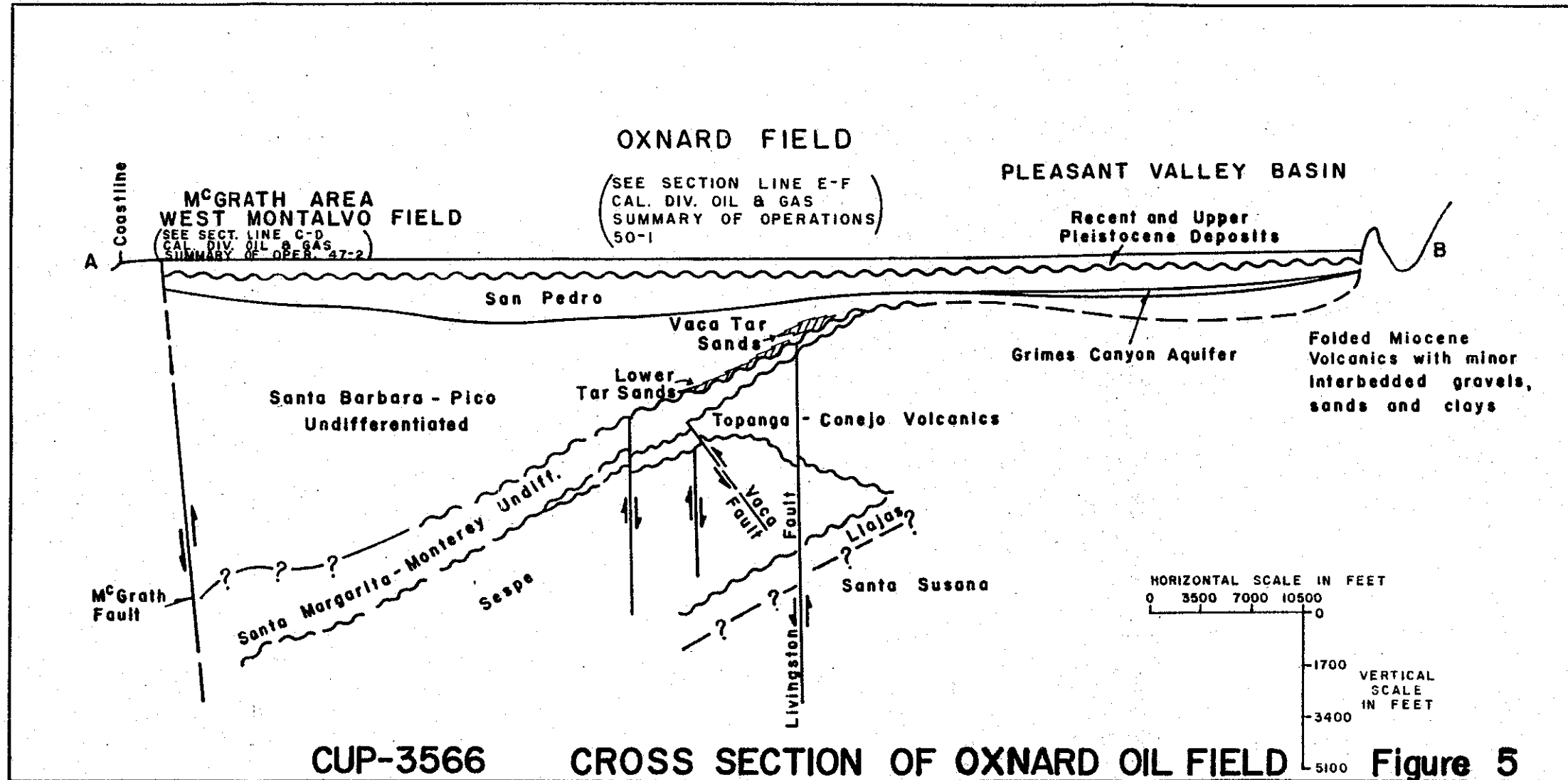
3. Mitigation Measures

There are no mitigation measures for the loss of agricultural land. Please refer to the mitigation measures presented in the Air Quality section of this report on page 33.

B. GEOLOGY AND SEISMIC¹

1. Setting

The project site is located in the Oxnard Plain which is included in one of the major tectonic belts (areas in which structural changes in the earth's crust occur) in California. Tectonic forces are the result of the southern end of the northwest-southeast trending Coast Mountain Range buttressing against the west-east trending Transverse Range. The Oxnard Plain covers an area of about 125 square miles and consists of surface alluvium generally not more than 70 feet in thickness which is underlain by large freshwater aquifers and oil and gas deposits.



The surface of the Oxnard Plain is covered with Recent alluvium, 200 to 300 feet thick, comprised of sands, gravels, and clays. The basal parts make up the Oxnard aquifer zone which is the principal fresh water aquifer in the Oxnard Plain. These deposits overlie approximately 300 feet of Upper Pleistocene (500,000 years ago) alluvium which consists of interbedded blue clay, silt, stream deposited sands, and gravels. The Mugu aquifer occurs near the base of these deposits (see figure 5).

The San Pedro formation underlies the alluvium, with a slight angular discordance of about four degrees to the west. It thickens from about 600 feet in the southeastern part of the field to about 1,500 feet in the northwestern portion and is composed of unconsolidated flood plain and channel deposits of sand, gravel, and interbedded clay. The base of the formation in this area consists of about 300 feet of sand and gravel designated as the Fox Canyon aquifer. This freshwater aquifer conformably overlies the Santa Barbara formation.

The Santa Barbara formation in this locality is a massive gray siltstone. The fossils and lithology indicate it was deposited in a fairly deep-water marine environment. In this area the contact between the Santa Barbara and the underlying Pico formation cannot be determined because of the gradational nature of the sediments.

The lithology of the Pico formation consists of marine, gray sandstones, shales, sands, and conglomerates. These sediments dip about five degrees to the west; they unconformably overlie the Topanga-Conejo Volcanics in the extreme southeastern part of the field, and the Monterey shale over the remainder of the field.

Tar sands are found at, or near, the base of the Pico formation over a good portion of the field. In a few localities, the sands do not lie directly upon the Miocene unconformity, but are separated from it by grey sandstones, shales, "mudstones" and conglomerates. The tar sands in the eastern part of the field are known as the Vaca Tar sands, and the stratigraphically lower tar sands in the western part of the field are called the Lower Tar sands.

The Vaca Tar sands are subangular, fine to medium grained, with scattered coarse to very coarse grains and pebbles; and at some locations they are interbedded with asphaltic shales and well cemented sandstones. Usually the sands are clean and extremely friable - the grains being held together by heavy, viscous tar; they contain fragments of megafossils, some foraminifera, mica, biotite, and volcanic and shale pebbles up to one inch in diameter. The fossils and lithology indicate that the sands were deposited in a shallow, marine environment by transgressive seas.

The Lower Tar sands occur immediately above the Miocene shales, and extend through the center of the field. They lense-in progressively lower on the Miocene unconformity, but do not extend far downdip.

The Monterey formation is composed of light brown to gray, punky, diatomaceous shales, dipping about 15 degrees to the west over most of the field; although in the southerastern area, the dip may be as much as 40 to 50 degrees. The thickness of the shale ranges from zero in the extreme southeastern part of the field to about 1,200 feet in the northwestern portion. The Monterey shales unconformably overlie the Topanga-Conejo Volcanics over most of the field; but in the southeastern part the shales may, in places, be interbedded with the volcanics.

In the southeastern part of the field the Monterey shales are very hard, being limey and cherty, and on the electric logs they have almost as high a resistivity as the volcanics; without core data it is difficult to differentiate between the two. Therefore, there is some doubt as to whether or not volcanics were even penetrated in some wells in this area.

Erratic tar sands occur in the Monterey formation throughout the field. There are very little reservoir data on them, however a few have been sidewall sampled. Production is obtained from these sands in the southeastern part of the field but no attempt has been made to produce from them in any other area of the field.

Earthquakes are generally associated with major fault systems. In the general vicinity of the Oxnard Plain, the major fault systems include the San Andreas Fault Zone, the Big Pine Fault and the San Gabriel Fault. An active but relatively minor fault system runs parallel to the Santa Monica coastal mountains from Santa Monica through Point Mugu, extending into the Channel Islands area.

The extent of groundshaking of a given epicentral ground acceleration level depends on the distance from the causative fault, the extent of faulting associated with the event and the nature of the near-surface geologic materials. Groundshaking is normally most intense in the vicinity of the fault causing the earthquake and the intensity generally disappates with distance from the fault. The seismicity of an area can be defined as the relationship between the frequency of occurrence of earthquakes and the magnitude of the events. Although the Oxnard area is not known to have been the site of a "great" (magnitude 8.0 Richter or larger) earthquake, the historic record shows that it has experienced several severe shocks. In addition, the geologic record indicates a recent high level of tectonic activity.

Generally, the history of small earthquakes in an area provides a fairly good estimate of the rate of occurrence of larger events. Data has been published giving the number of occurrences, location and ground accelerations of earthquakes for an average southern California site. Using this approach, it has been shown that on the average an earthquake of magnitude 6.1 should occur every year in the southern California region and a magnitude 8.0 earthquake should occur once in every 52 years. In June, July, and August of 1968, a series of 63 repetitive earthquakes of magnitude 2.8 or larger occurred in the vicinity of this marine fault system. The epicenter of an earthquake with a magnitude of 4.7 was located near Anacapa Island in August of 1973. The shock was felt from Point Mugu to Santa Barbara and caused landslides on Anacapa Island.

2. Impact ²

According to the Division of Oil and Gas, ground shaking caused by shock waves generated by movement along faults in the Oxnard Plain would not be of sufficient magnitude to shear well casings. In the event of a strong earthquake, surface facilities may be damaged, storage tanks may rupture, but damage to oil wells is expected to be minimal. In the Oxnard oil field, all of the faults terminate in an unconformity beneath the Vaca Tar sand but are not believed to be active. Slippage along these faults, if it were to occur, would probably not damage wells completed in the Vaca Tar Sand. On the other hand, severe groundshaking caused by nearby large magnitude earthquakes may damage well casings and tubing, in the form of buckled casing and kinked tubing, because of surface subsidence due to compaction of the shallow, relatively unconsolidated sediments.

During the late 1940's and 1950's, several events occurred in the Wilmington oil field that resulted in the shearing of well casings. In those instances, after a considerable amount of subsidence had been noted in the subsidence area (7-10 feet and more), subsurface slumping occurred wherein large volumes of ground moved both vertically and horizontally down towards the center of the subsidence bowl. The primary movement was along sloping bedding planes about 1,500-1,700 feet deep and had up to several inches of slippage. Those wells that crossed the slippage plane were distorted, bent, offset, or sheared at the depth of the slippage plane. The affected wells were all pumping wells and at the time of damage production ceased. There were no blowouts and no damage occurred to either the oil zone, the local aquifers, or surface facilities.

This problem was later alleviated by drilling a large diameter hole in the slippage plane interval and filling the space between the casing and the wall of the hole with a special packing material of emulsion type, extremely high gel strength mud.

3. Mitigation Measures

Rules and regulations of the State Division of Oil and Gas govern the operation of wells to ensure that proper sealing is maintained and that repairs are immediately made in case of earthquake damage.

C. FLOODING AND DRAINAGE

1. Setting³

The project site is located in the Revolon watershed which is the lower reach of a larger drainage area encompassing both the Beardsley Wash and Revolon Slough watersheds (see Figure 6).

The area within the Revolon watershed is about 17,700 acres or 27.7 square miles. The additional area in the Beardsley Wash drainage area north of Highway 101, which contributes to the flood flows in the Revolon Slough is about 20,500 acres or 32.0 square miles.

About 90 percent of the Revolon watershed is comprised of valley floor area. This area, about nine miles long and from one to six miles in width, has ground surface elevations ranging from sea level at the southern end to about three hundred feet at the base of the Camarillo Hills. The maximum elevation is about 900 feet.

During periods of flooding, flood flows enter the Revolon watershed from the Beardsley watershed through the Beardsley Wash channel and through the series of shallow culverts crossing Highway 101. Because of inadequate flood control measures in the Beardsley watershed, large areas are flooded. This upstream flooding provides a retarding effect and reduces the flood peaks that would otherwise be discharged onto the Revolon watershed downstream.

It is estimated that about 6,000 acres in the Revolon watershed are inundated by floodwaters once every 100 years on a long-term average. Smaller acreages are flooded at more frequent intervals.

Some flooding occurs two years out of every three and the greatest portion of the average annual damages is caused by flooding at an intensity that occurs at least once in ten years. The months during which flooding is most likely to occur are January, February, March and April. During the past fifty years more than ten storms have caused serious flooding. Major flooding occurred in 1938, 1941, 1943, 1944, 1946, 1952, 1958, 1962, 1969, and 1978.

In February of 1962, during a period of five days there were about twelve inches of precipitation that resulted in about 4,000 acres to become inundated in the Beardsley and Revolon watersheds with about 2,700 acres in the Revolon watershed. Large areas of truck crops were badly damaged or destroyed. The flood levels remained intermittently over a period of about a week. Homes, farm equipment, roads and bridges were damaged. Many people in Nyland Acres located within the Beardsley watershed were forced to leave their homes until the floodwaters receded. The flooding of septic tanks in this area not only caused damage but also created a temporary health hazard. Similar flooding occurred in 1969 and 1978.

Additional damage was done to public transportation facilities including roads, railroads, and farm buildings, machinery, and irrigation drainage systems. Interruption of communication and public utility services and the general disruption of the area's economy were less tangible damages.

2. Impact

The project site is located in a flood-prone area which consistently receives overland flows from the Revolon Slough, the Camarillo Hills Drain, and other local sources. Presently, most of the area's existing drainage facilities are inadequate in their flood flow carrying capacity and their ability to control scouring. The combination of these two adverse factors has resulted in flooding and the deposition of mud onto adjacent lands that has caused damage to crops and mud accumulations on Sturgis Road. Past flooding has required the releveling of land and the replanting of crops. Road cleanup, including the removal of sedimentation, from drains and culverts has also been required.

To control flooding in the Revolon watershed and in the project area specifically, the Ventura County Flood Control District is implementing the Watershed Work Plan for the Revolon and Beardsley watersheds.

As of this date, channel improvements have been installed or are under construction from Calleguas Creek north to the confluence with Camarillo Hills Drain. The scheduled completion of this flood control program through the project site is by the summer of 1979. The District's plans also include the improvement of the Camarillo Hills Drain from the airport to the Revolon Slough if local funding is available. However, even with the implementation of the flood control program that has been devised for the Revolon watershed and the project area, the project site would still remain subject to flooding from such sources as Pleasant Valley Road Drain and sheet flows from adjacent lands for which no flood prevention measures have yet been proposed. Accordingly, on-site flooding will continue to be a problem to the extent that flood flows could become contaminated with hydrocarbons and wastes which could then be transported downstream affecting downstream agricultural lands and possibly the Mugu Lagoon depending on the extent of contamination (see Sections V-E and V-K for additional information on subsidence and its impact on flooding).

3. Mitigation Measures

Drilling sites should be protected from flooding by the provision of either berms or raised pads so that flood waters cannot be contaminated with either hydrocarbons or wastes. Moreover, cutoff valves should be installed to preclude the potential for flood damage to either pipelines, pumps, or other facilities.

D. GROUNDWATER⁴

1. Setting

Some of the largest and most productive groundwater basins in California are located in the Southern half of Ventura County. The geology controlling the location and extent of the aquifers is extremely complex. Regional compressional forces over millions of years have caused the important aquifer systems to be severely folded and faulted. As a result, aquifer thickness can vary hundreds or even thousands of feet within a single hydrologic unit and other geologic formations change character within very short distances.

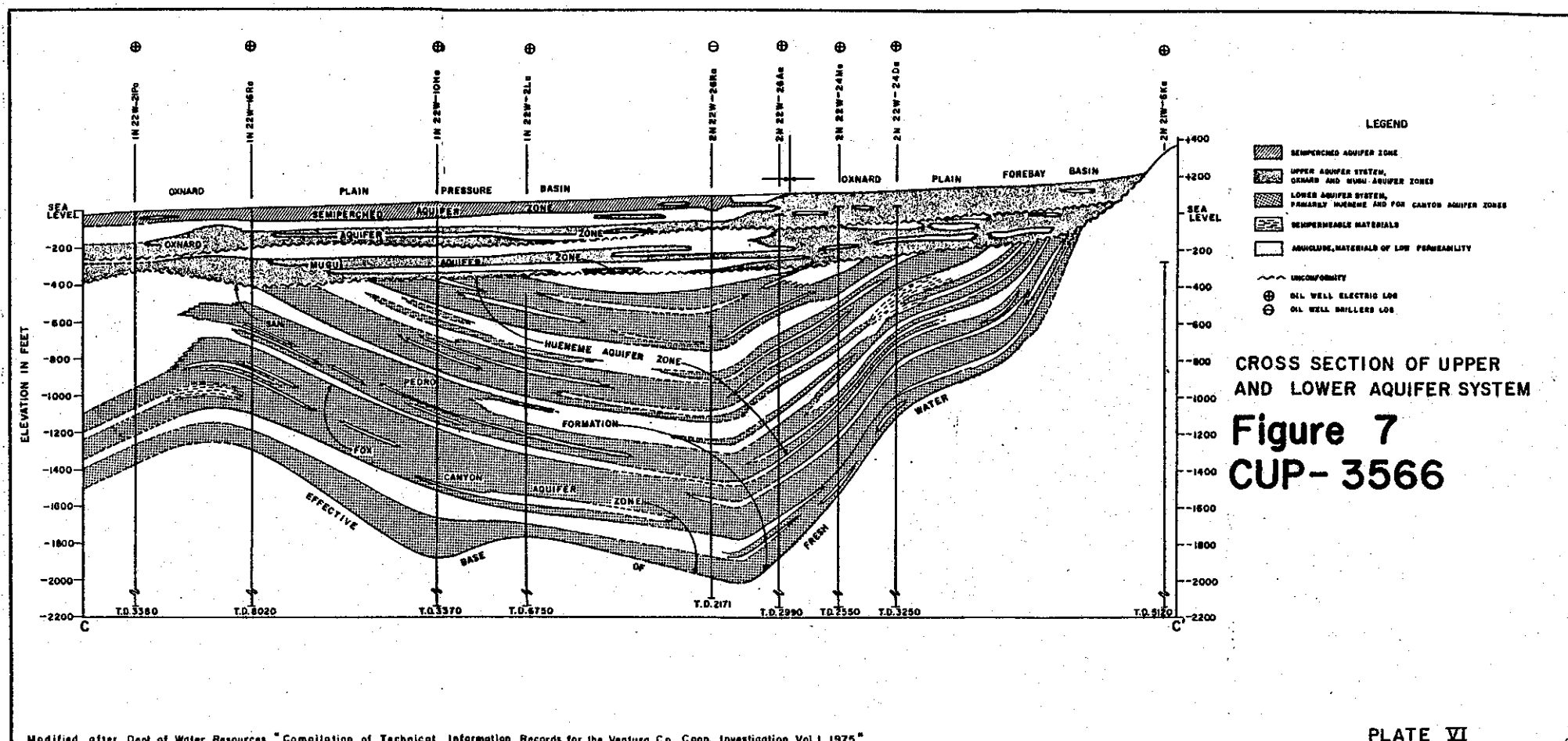
A groundwater basin is defined as an area underlain by sediments which are capable of storing groundwater supplies, and is distinguished from adjacent groundwater basins by its unique hydrologic and geologic features. According to the County Flood Control District, southern Ventura County has 17 major groundwater basins which can be divided into two hydrologic units: Ventura River and the Santa Clara-Calleguas.

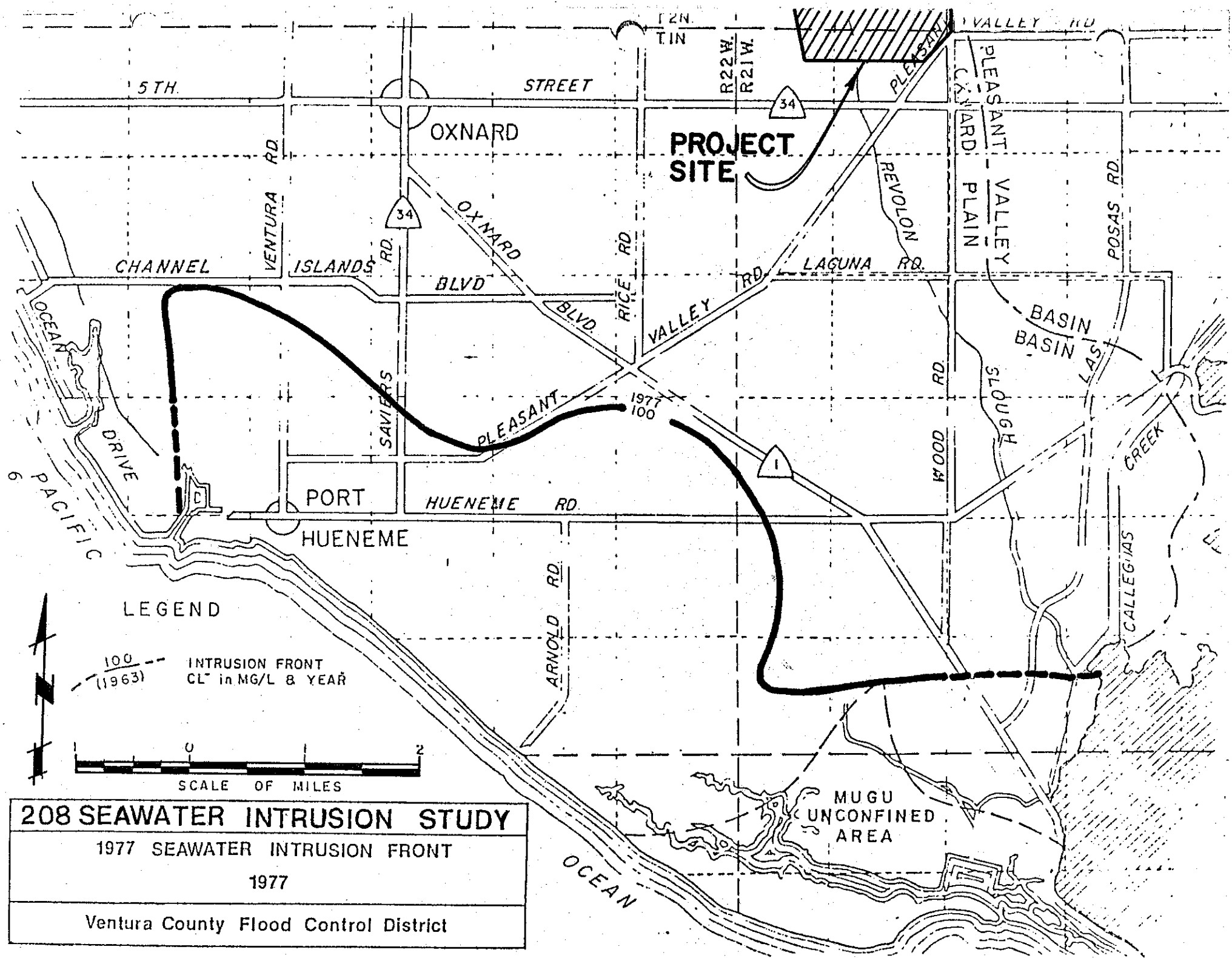
Specifically, the project site is underlain by Oxnard Plain Pressure Basin which is part of the Santa Clara-Calleguas Hydrologic Unit. The Oxnard Plain Pressure Basin is the most important groundwater basin in the County, due to its size, production and storage of groundwater, and proximity to agriculture which is the primary user of the groundwater.

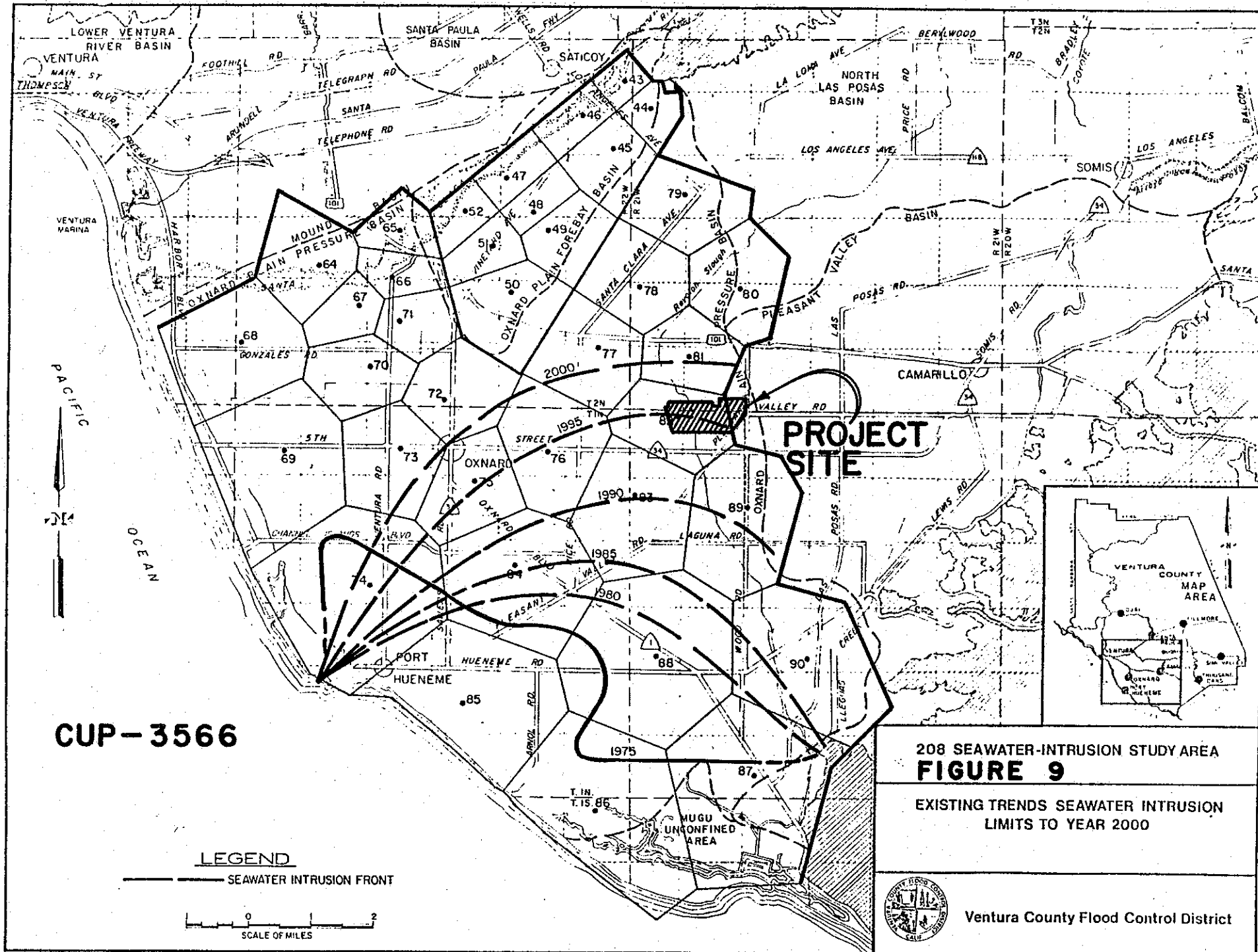
The Oxnard Plain Pressure Basin is composed of three aquifer systems each of which have differing water levels beneath the Oxnard Plain. The perched and semi perched aquifers comprise the initial (uppermost) aquifer system on the Oxnard Plain. These zones generally contain water of unacceptable quality for most beneficial uses. Beneath these zones lies the confined, upper aquifer system consisting of the Mugu and Oxnard aquifer zones, which yield about 75 percent of the groundwater production on the Oxnard Plain. Portions of this system are in hydraulic continuity with the ocean. The Fox Canyon and Grimes Canyon aquifer zones comprise the Lower Aquifer System which is also an important source of groundwater on the Oxnard Plain (see Figure 7).

The Oxnard Forebay Basin is the principal area of groundwater recharge to the Oxnard Plain. Its unconfined condition allows artificial and natural recharge to important aquifer systems. The Lower Aquifer System is the major source of groundwater supply in the Pleasant Valley Basin. These supplies are used extensively for agricultural and domestic purposes.

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Along most of Ventura County's coastal plain, water bearing materials of the Oxnard Aquifer Zone are in hydraulic continuity with the ocean, and, therefore, are subject to seawater intrusion under circumstances that cause the pressure of seawater to exceed that of the fresh groundwater. Prolonged overdraft of the groundwater has caused these conditions. Groundwater overdraft, principally in the Oxnard Plain, Pleasant Valley and Las Posas Basins, is estimated to be in the range of 60,000 to 65,000 acre-feet/year. Seawater intrusion was first evidenced in the Oxnard Aquifer Zone at Port Hueneme in the early 1950's and has progressed ever since, advancing inland within the Oxnard aquifer zone from Port Hueneme to Point Mugu (see Figures 8 and 9). Seawater has currently intruded an area of approximately 20 square miles, seriously degrading water quality in this area. No evidence of seawater intrusion has yet been detected within aquifers of the Lower Aquifer System; however, if hydraulic continuity exists, intrusion will occur since water levels within this zone are below sea level in many areas.

2. Impact

The operator has stated that a total of 35,000,000 barrels of water (4,511 acre-feet) would be needed for both the initial phase and the proposed 20-year-development phase of the project. Water required during the initial phase would be obtained from existing wells producing from the Oxnard Aquifer Zone system within the project area. The amount required during the initial 30-month period would be approximately 1,493,000 barrels (192 acre-feet). The remaining 33,507,000 barrels would be obtained over a 20-year period from the Calleguas Municipal Water District from sources outside the project area.

The volume of water to be produced from the project area is as follows:

1st year - 49,000 barrels or 6.31 acre-feet

2nd year - 388,000 barrels or 50.00 acre-feet

3rd year - 1,056,000 barrels or 136.11 acre-feet

Subsidence of the land surface could occur due to extraction of groundwater as a result of compaction of the fine-grained clayey beds as well as the unconsolidated or semi-consolidated sediments that commonly occur in this portion of the Ventura Basin. Compaction as a result of excessive fluid withdrawal from an aquifer is not uncommon, especially when the aquifer is "dewatered" or fluid is pumped to a depth below the top of the aquifer. However, the Oxnard Aquifer System is in hydraulic continuity with the sea and as a consequence, this aquifer will either be recharged from normal onshore sources or from the sea in the event that water levels remain below sea level. Therefore, complete and permanent dewatering of the Upper Aquifer System would not occur, and additional seawater intrusion into the Oxnard Aquifer System could be experienced.

3. Mitigation Measures

To preclude any worsening of the seawater intrusion problems in the Oxnard Aquifer System, all water used during the initial 30-month period should come from the Lower Aquifer. The production phase (Phase II) water requirements should be met with imported water. Such a supply is available from the Calleguas Municipal Water District.

The County of Ventura is currently in the process of preparing an implementation program as part of the Water Quality Management Plan (208), which when adopted could include solutions to the area's seawater intrusion problem.

E. SUBSIDENCE⁵

1. Setting

Historically, the Oxnard Plain has been experiencing a condition known as subsidence; a sinking of the land surface. This condition can be the result of either natural causes or human activities. Since 1920, approximately two feet of subsidence has been noted in the Oxnard Plain and another foot is expected during the next 22 years (see Figure 10).

In California four types of subsidence caused by human activity have been identified in addition to those forms of the hazard which occur naturally. Named according to the action which causes the subsidence, these four are: Groundwater Withdrawal Subsidence, Oil or Gas Withdrawal Subsidence, Hydrocompaction Subsidence, and Peat Oxidation Subsidence. Of all of these types, Groundwater Withdrawal Subsidence which generally occurs in valley areas underlain by alluvium, is the most extensive and the impacts of which are most costly.

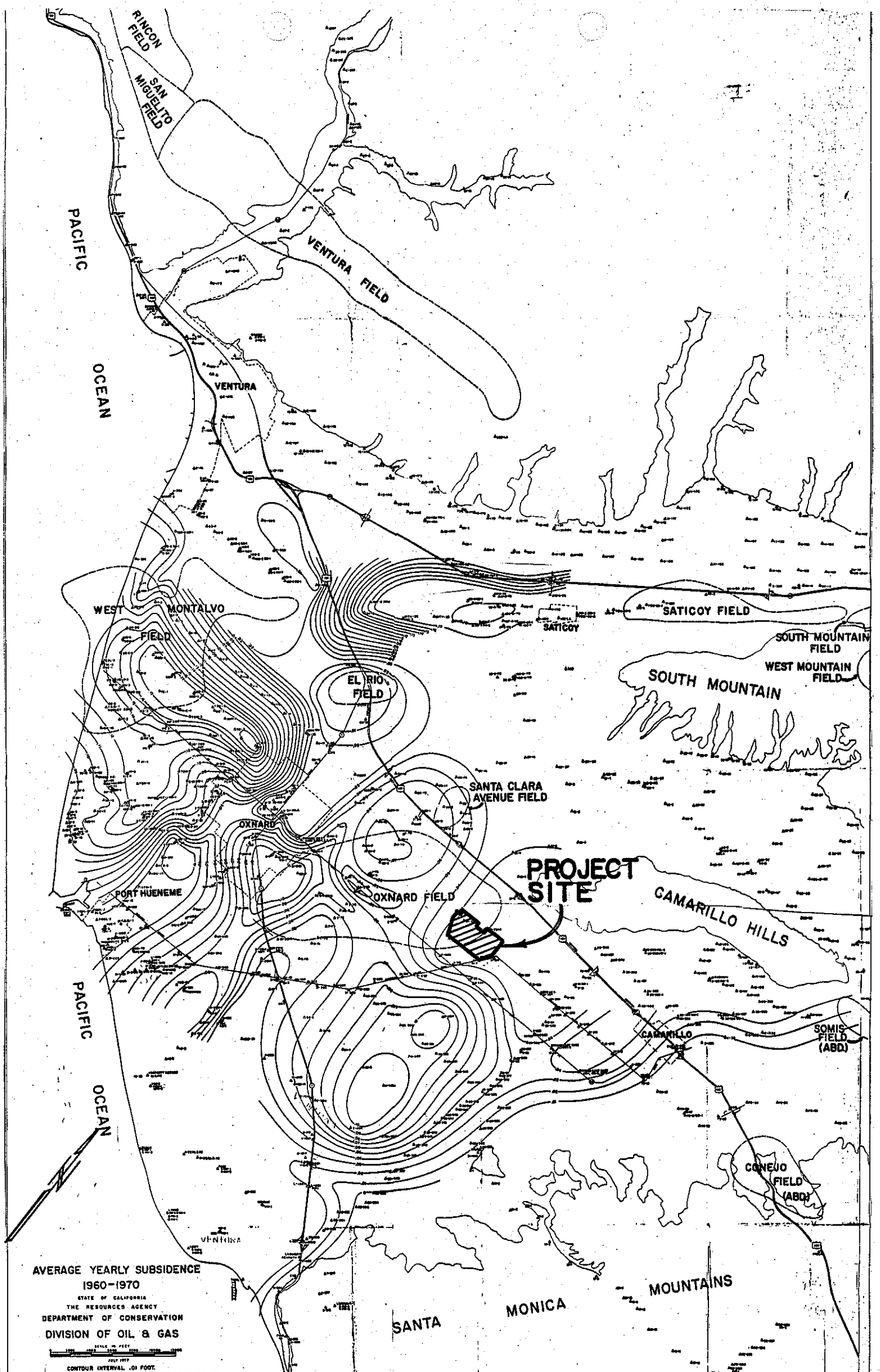
Basically, the process by which this first and most important type of subsidence occurs involves the extraction of a large quantity of water from an unconsolidated artesian aquifer. As this water is removed from the aquifer, the total weight of the overburden which the water used to help support, is placed on the subsurface materials. If fine-grained silts and clays make up portions of the aquifer, the additional load can squeeze the water out of these layers and into the coarser grained portions of the aquifer. All of this compaction produces a net loss in volume and hence a depression in the land surface. A very similar sequence of events leads to subsidence with oil and gas withdrawals.

Current studies of this problem in California focus on the determination of six factors. These are: degrees of groundwater confinement, thickness of aquifer systems, individual and total thickness of fine-grained beds, compressibility of the fine-grained layers, probable future depth of wells, and probable future decline in groundwater levels. All of these have a direct bearing on the potential occurrence and severity of groundwater withdrawal subsidence, but the primary causes are substantial or initial (first time) reductions in the water level of a valley fill alluvium.

Significant subsidence can also be caused by oil and gas withdrawal in oil and gas fields but it is rare. However, a few examples have been widely noted, such as the Goose Creek Field in Harris County, Texas; the eastern shore of Lake Maracaibo, Venezuela; and the Wilmington Field, California. Although subsidence above a producing oil and gas field is rare, each case must be investigated and evaluated to determine whether the cause is geological ("natural") subsidence, induced subsidence caused by man's activities, or both. Land subsidence induced by oil and gas withdrawal is caused by the compaction and consolidation of the reservoir rock. The mechanics of surface subsidence due to depletion of oil and gas zones are the same as those for subsidence caused by groundwater depletion. In effect, the underlying earth materials would be made to bear a greater load due to the loss of fluid pressure, causing the intergranular stresses to increase and thus, result in the compaction of the underlying deposits.

Though the focus of this discussion has been on that subsidence which is caused by human activities, it is important to understand that subsidence can and does occur as a natural process. Surface deformation can be the result of the natural compaction of loosely consolidated alluvium or tectonics. Subsidence has been traced to the settling of geologically new sediments and to downwarping which accompanies crustal folding.

Perhaps the most hazardous natural form of subsidence for Ventura County is that which might be caused by seismic shaking in the area of the Oxnard Plain. This area is known to be subsiding, thus exhibiting an intrinsic instability. The addition of strong ground motion from an earthquake could result in the liquefaction of fine-grained materials. This would cause a loss of ground support and the land surface could settle. Unlike other forms of subsidence, this one could occur in a short period of time.



Ventura County
Environmental
Resource
Agency

**AVERAGE RATE OF YEARLY SUBSIDENCE
1960-1970 IN PROJECT AREA
CUP- 3566 Figure 10**

2. Impact

According to the Division of Oil and Gas (DOG) the entire Oxnard Plain has a history of subsidence since the first elevation benchmarks were set in 1920. The maximum amount of surface subsidence that has been observed since 1920 is about two feet. This subsidence has been from a combination of natural causes, such as peat oxidation, natural hydrocompaction, and settling due to ground shaking associated with earthquakes and also from man's operations, such as groundwater withdrawal, agricultural compaction, and possibly to a lesser extent oil field fluid withdrawals. It appears, however, that the area has been subsiding from natural causes for thousands of years, even prior to human habitation in the area. DOG studies of past subsidence indicate that without the proposed development of the Vaca Tar sand, the maximum amount of subsidence which would occur during the 22-year development period would be approximately one foot.

If the Vaca Tar sand is produced as proposed, an additional 1.34 feet of vertical subsidence may be expected with a 400 psi reservoir pressure decline.

According to the D.O.C. horizontal movement associated with the present subsidence rate does not appear to be a significant factor anywhere in the Oxnard Plain. However, in the event of an additional 1.34 feet of vertical subsidence during the 22-year period of the project, there could be one foot of horizontal displacement 1,300 feet as measured from the center of the hypothetical subsidence bowl.

These predictions were based upon two methods: the comparison of various oil field characteristics and the analytical-mathematical approach assuming that the reservoir pressure decline would not exceed 400 psi (as estimated by CWOD in its development of the project area). However, further subsidence and horizontal movement could be expected if reservoir pressures were allowed to drop below 400 psi. Table 1 notes such pressure reductions and the corresponding subsidence prediction, taking into account the area's existing subsidence rate.

Table 1

Potential Subsidence From Oil Recovery Operations
In the Vaca Tar Sands Resulting From Reservoir Pressure Reductions

<u>Reservoir Pressure Reduction (Expressed in psi)</u>	<u>Oil Withdrawal Induced Subsidence (In Feet)</u>	<u>Existing Subsidence Plus Oil Withdrawal Induced Subsidence (In Feet)</u>
200	0	1
400	1.34	2.34
600	2.16	3.16
900*	2.55	3.55
1,160	2.82	3.82

*Current reservoir pressure is 930psi

Subsidence greater than the present rate could result in land form changes that would cause ponding of drainage flows in areas experiencing this subsidence. Moreover, subsidence could reduce the effectiveness of flood control improvements that are currently under construction in the area (see Public Facility Assessment). Depending on the size of the area of subsidence, crop damage and limitations to farming operations are possible.

3. Mitigation Measures

According to the Division of Oil and Gas, the best method to prevent surface subsidence caused by oilfield withdrawals would be to

institute a program of pressure maintenance at the very beginning of oil production operations so that zone pressures can best be maintained closest to their original values. To do this requires an injection program which replaces all of the fluid withdrawn with a replacement fluid, usually water. Injection water could be either fresh water, produced water, or a combination of the three. The use of injection water from sources other than groundwater (except the perched zone aquifer) should be encouraged due to local overdrafts.

In the event that significant surface subsidence is detected that can be attributed to the oilfield operations two measures can be instituted to alleviate this subsidence. Production can be curtailed or halted and water injection can be increased. However, caution should be exercised so that zone pressures do not exceed hydrostatic pressure to preclude damage to the overlying fresh water aquifers, leakage at the surface through well bore holes, or through other zones of weakness.

In order to properly monitor this project for surface subsidence, the following actions are recommended by the D.O.G.:

- A network of elevation benchmarks and extensometers should be set up around the potentially productive area at one-half mile spacing, depending upon road availability. This network should be surveyed semiannually from the start of the project and the results sent to the County and the Division of Oil and Gas (DOG) for analysis.
- Reservoir pressure surveys of Vaca zone wells should be required semiannually. Pressure maps from this data should be constructed by the operator and reviewed with the County and DOG.
- Surveillance meetings (semiannual) between the operator, County and DOG should be scheduled to review oil operations.
- Extensometers should be installed in key locations and compared with hydrographs in order to monitor any possible compaction within the fresh water aquifers.
- During the pilot phase of the project, additional core samples of the Vaca Tar sands should be obtained and compaction-compression tests performed for comparison with the Chase "El Rio" 1-XA well data.

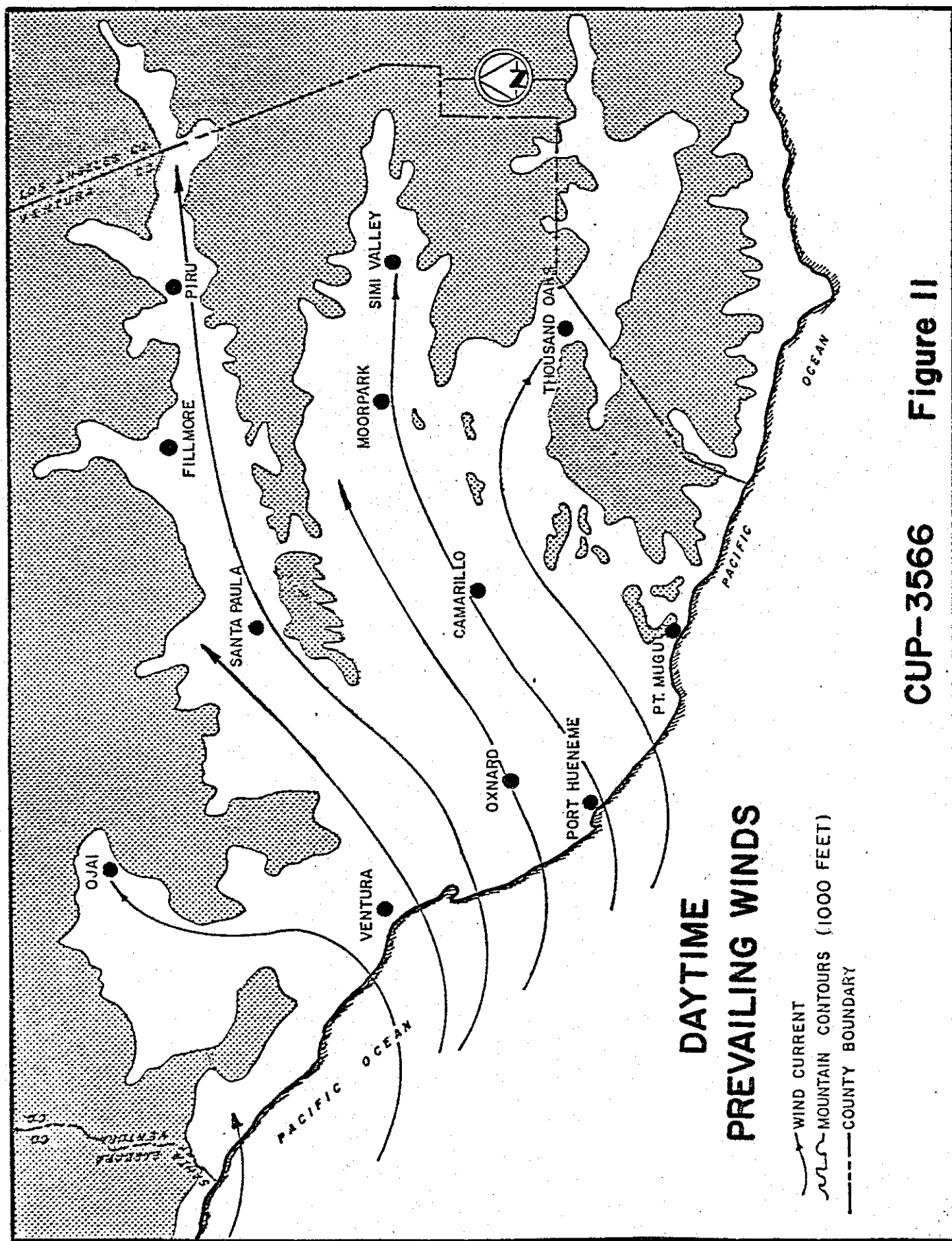
In order to ensure proper reservoir pressure control, full development of the Oxnard field should be under an approved unit or cooperative agreement among all Vaca Tar sand operators.

F. AIR QUALITY⁶

1. Setting

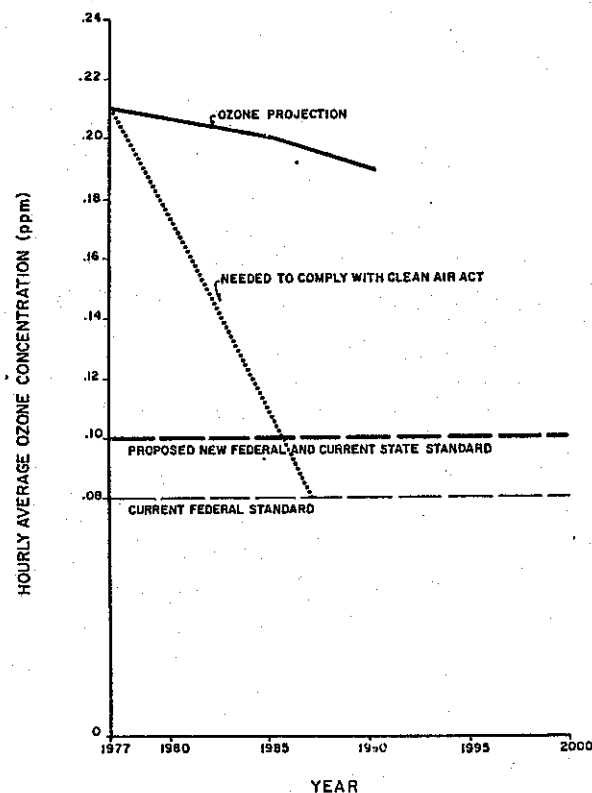
The project site is located in an area of flat, low-lying terrain. The prevailing wind is from the west during the day, with a less developed easterly wind occurring at night. During the day, as oxidant levels increase, this wind pattern causes oxidants and oxidant forming materials from the Oxnard Plain to travel inland through Moorpark to the Simi Valley, through Santa Paula to the Fillmore-Piru area, and through the Conejo Pass to Thousand Oaks. A significant air quality problem exists in these areas, especially during the smog season. Under other meteorological conditions, pollutants from the Oxnard Plain may be transported to the Ojai area or to areas outside of Ventura County (see Figure 11).

Ozone (oxidant) levels recorded at the Ventura County APCD's air monitoring station in Camarillo are considered representative of levels throughout the inland portion of the Oxnard Plain. Over the past seven years, the ozone levels recorded at the Camarillo station during the peak smog months of July, August, and September have exceeded the air quality standards 5 to 55 percent of the days. In those areas most significantly impacted by emissions generated in the Oxnard Plain, Moorpark-Simi Valley, Fillmore-Piru, and Thousand Oaks, the



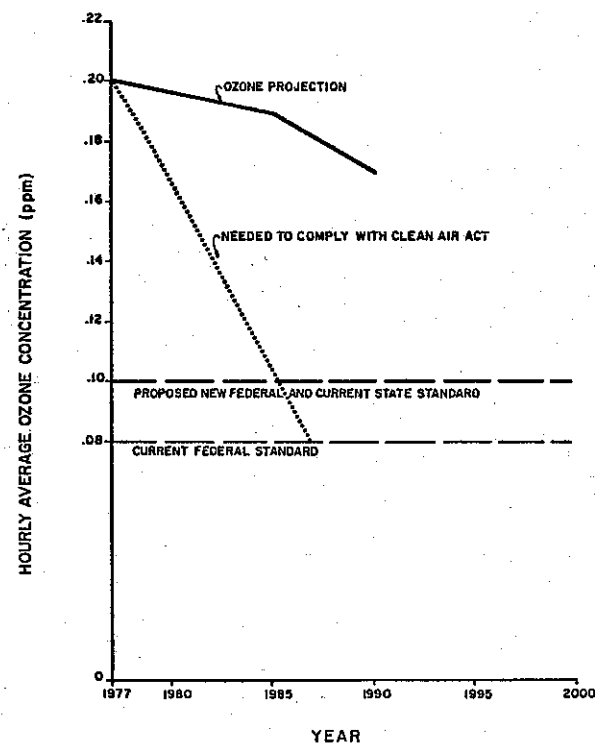
CUP-3566 Figure II

OZONE PROJECTION* FOR SIMI VALLEY (RSA-4)



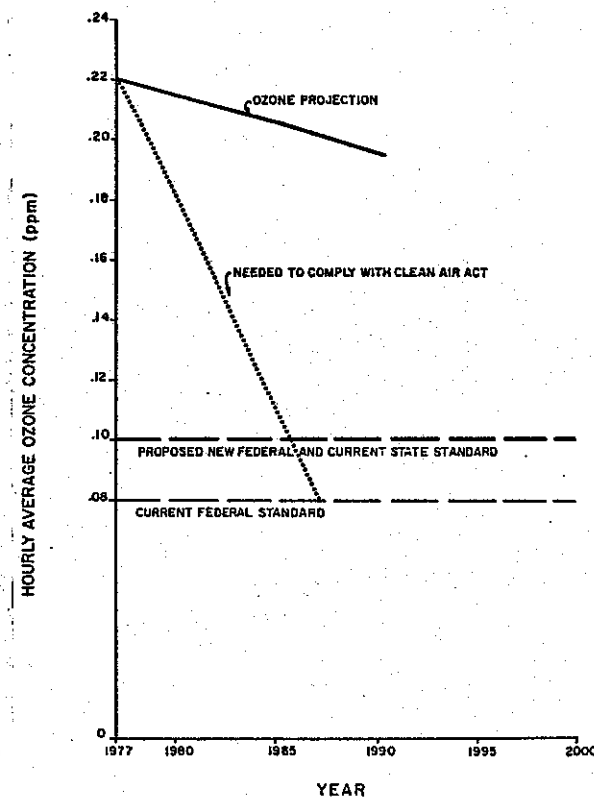
* BASED ON STRATEGIES IN EFFECT ON JANUARY 1, 1978 AND ASSUMING AREAS ADJACENT TO VENTURA COUNTY ARE MEETING NAAQS BY 1987.

OZONE PROJECTION* FOR FILLMORE - PIRU (RSA 6)



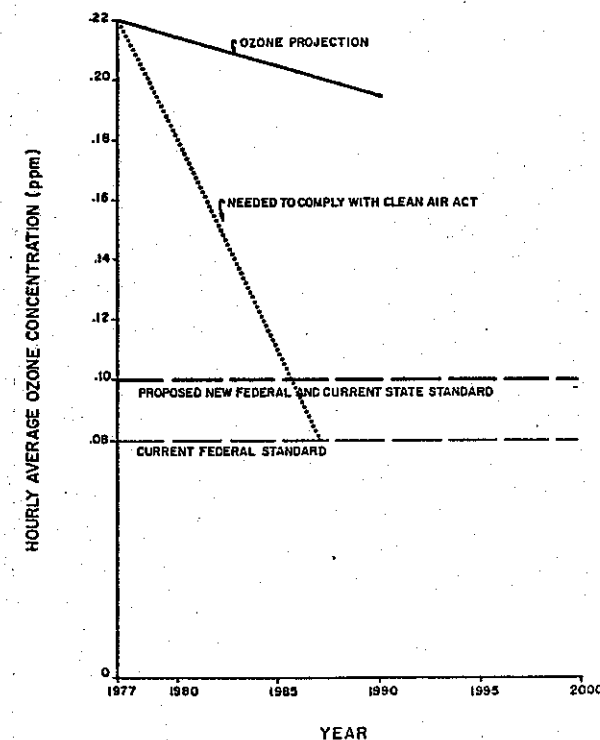
* BASED ON STRATEGIES IN EFFECT ON JANUARY 1, 1978 AND ASSUMING AREAS ADJACENT TO VENTURA COUNTY ARE MEETING NAAQS BY 1987.

OZONE PROJECTION* FOR OXNARD/PORT HUENEME-CAMARILLO (RSA 3)



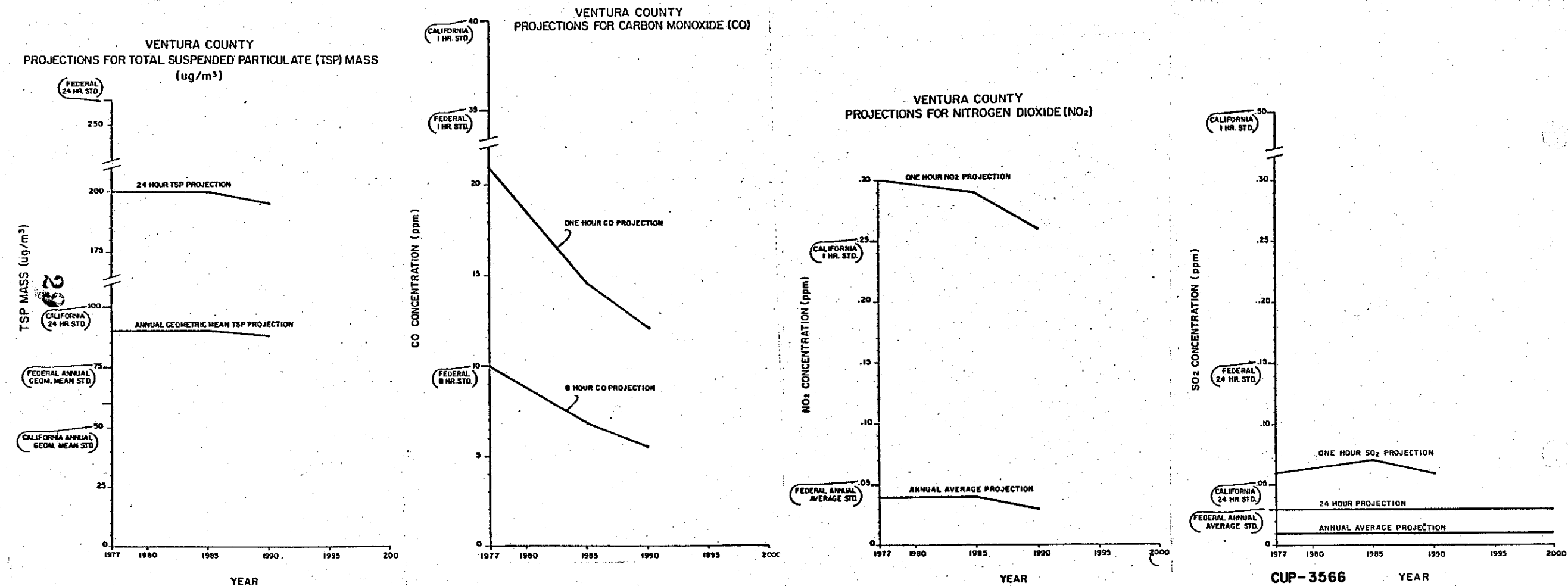
* BASED ON STRATEGIES IN EFFECT ON JANUARY 1, 1978 AND ASSUMING AREAS ADJACENT TO VENTURA COUNTY ARE MEETING NAAQS BY 1987.

OZONE PROJECTION* FOR THOUSAND OAKS (RSA 5)



* BASED ON STRATEGIES IN EFFECT ON JANUARY 1, 1978 AND ASSUMING AREAS ADJACENT TO VENTURA COUNTY ARE MEETING NAAQS BY 1987.

OZONE PROJECTIONS FOR AREAS IMPACTED BY THE PROJECT Figure 12



CUP-3566

YEAR

SULFUR DIOXIDE PROJECTIONS FOR VENTURA COUNTY Figure 13

PROJECTIONS FOR CARBON MONOXIDE (CO),
NITROGEN DIOXIDE (NO_2), SULFUR DIOXIDE (SO_2)
AND FOR TOTAL SUSPENDED PARTICULATE (TSP)
MASS ($\mu\text{g}/\text{m}^3$)

air quality standards for oxidants are exceeded a high percentage of the time during the peak smog months. In the Moorpark-Simi Valley area, the air quality standards for oxidants were exceeded from 65 to 95 percent of the days during the peak smog months of the past four years. In the Thousand Oaks area the oxidant standards were exceeded from 43 to 60 percent of the days during the peak smog months (see Appendix D).

Assuming that only currently instituted control measures are in effect, projection of the annual peak ambient ozone concentrations for the Oxnard Plain, the Moorpark-Simi Valley area, the Fillmore-Piru area and the Thousand Oaks area have been made. The projections are based on various population/land use alternatives developed by the Regional Land Use Program (RLUP). Figure 12 shows projections of future ozone projections in the Oxnard Plain and those areas most significantly impacted by emissions generated in the Oxnard Plain. Further details concerning the projection methodology are presented in the Ventura County Draft Air Quality Management Plan. Figure 12 illustrates that, assuming no further control measures are instituted, the air quality standard for oxidant will not be attained through the year 1990, and that ambient ozone levels will show little change over that time period.

Total suspended particulate (TSP) is the only pollutant other than oxidant to exceed the air quality standards in the Oxnard Plain area. Table II and III presents the countywide TSP monitoring data for the 24-hour TSP standard. Approximately 12 to 33 percent of the sampling days, have continuously exceeded the annual TSP standard for the past five years. (See Appendix D.) Countywide projections to the year 2000, assuming current control programs only, show little improvement compared to current values (see Figure 13).

Ambient levels of other pollutants monitored by the Ventura County Air Pollution Control District - nitrogen dioxide (NO_2), carbon monoxide (CO), and sulphur dioxide (SO_2) - are consistently below State and National standards and are projected to remain so (see Figure 13).

2. Impact

The project would be developed in two distinct phases. The pilot phase (Phase I), would consist of the drilling of ten exploratory wells to determine the extent of the tar sand deposit and the best method of production by thermal stimulation techniques. Within two years of the project start-up an additional ten wells will be drilled to further test the most effective steam drive technique and the economic productivity of the project. During this phase, production would be transferred via tank trucks to one of several possible refineries. All storage and transfer operations are planned to be equipped with vapor recovery controls, with the exception of a single, isolated gauge tank (500 barrel capacity). Estimated production during Phase I is approximately 1,300 barrels per day.

Within 30 months from project start-up the decision would be made to proceed with full scale production (Phase II) or to abandon the project based on the economic attractiveness of the investment. Full-scale production would involve the drilling of 100 additional wells and installation of additional steam generators, heaters, and storage tanks. During this phase, produced oil would be transferred by one of three possible alternatives; shipped by pipeline to existing tanker terminals in Ventura, shipped by pipeline directly to a refinery, or shipped by rail cars. All storage tanks would be equipped with vapor recovery controls, as would the rail car transfer operation. Estimated production during Phase II is approximately 5,000 barrels per day.

Estimated emissions for the various operations comprising Phase I and II of the proposed project are presented in Tables 2 and 3, respectively. Emissions were estimated on a maximum lbs/hr and tons/year basis and were developed as a "worst case." For example, where a choice of equipment was proposed, that equipment with the greatest emission impact was assumed to be in use, also, sulfur content of the fuel used was assumed at the maximum allowed by APCD regulation (0.5 percent by weight). It should also be noted

Table 2

WORST CASE EMISSION SUMMARYPhase I (Maximum Lbs/Hour)

<u>Activity</u>	<u>RHC</u>	<u>NOx</u>	<u>PM</u>	<u>CO</u>	<u>SOx</u>
Drilling	2.3	39.0	2.8	8.4	2.6
Steam Generators	1.0	18.8	4.8	1.2	22.2
Heaters	0.01	0.6	0.1	0.1	0.003
Storage Tanks	5.7	0.0	0.0	0.0	0.0
Fugitive Sources	1.9	0.0	0.0	0.0	0.0
Vehicle Traffic	0.7	5.3	0.4	2.7	0.5
Product Transfer	12.1	0.0	0.0	0.0	0.0

Phase I (Tons Per Year)

Drilling	2.5	42.1	3.0	9.1	2.8
Steam Generators	4.2	79.0	20.2	5.0	93.2
Heaters	.03	2.5	0.2	0.4	0.01
Storage Tanks	10.5	0.0	0.0	0.0	0.0
Fugitive Sources	3.5	0.0	0.0	0.0	0.0
Vehicle Traffic	1.0	7.7	0.4	4.1	0.8
Product Transfer	7.5	0.0	0.0	0.0	0.0

Table 3

WORST CASE EMISSION SUMMARYPhase II (Maximum Lbs/Hour)

<u>Activity</u>	<u>RHC</u>	<u>NOx</u>	<u>PM</u>	<u>CO</u>	<u>SOx</u>
Drilling	4.7	77.8	5.5	16.8	5.2
Production Hoist	0.5	9.0	0.6	1.9	0.6
Steam Generators	4.1	83.1	20.9	5.5	98.2
Heaters	0.2	3.8	0.3	0.9	24.4
Storage Tanks	6.3	0.0	0.0	0.0	0.0
Fugitive Sources	12.4	0.0	0.0	0.0	0.0
Vehicle Traffic	0.2	0.2	0.03	1.8	0.01
Pipeline Transport ⁽¹⁾	Neg.	Neg.	Neg.	Neg.	Neg.
Tanker Transport ⁽¹⁾	237.6	0.0	0.0	0.0	0.0
Rail Car Transport ⁽¹⁾	15.8	0.0	0.0	0.0	0.0

(1) Mutually Exclusive Alternatives

Phase II (Tons Per Year)

Drilling	20.3	335.9	23.9	72.6	22.4
Production Hoist	1.2	19.4	1.4	4.2	1.3
Steam Generators	17.1	349.0	87.7	23.0	412.6
Heaters	0.7	15.9	1.4	3.6	102.5
Storage Tanks	10.4	0.0	0.0	0.0	0.0
Fugitive Sources	22.6	0.0	0.0	0.0	0.0
Vehicle Traffic	0.3	0.2	0.04	2.7	0.01
Pipeline Transport ⁽¹⁾	Neg.	Neg.	Neg.	Neg.	Neg.
Tanker Transport ⁽¹⁾	21.7	0.0	0.0	0.0	0.0
Rail Car Transport ⁽¹⁾	28.9	0.0	0.0	0.0	0.0

(1) Mutually Exclusive Alternatives

that all the various operations would not be occurring simultaneously. For example, emissions resulting from drilling operations would largely occur prior to emissions associated with production. The assumptions and references utilized in calculating the emission estimates are presented in Appendix E.

According to the Air Pollution Control District, the proposed project could emit up to 23.7 lbs/hour of reactive hydrocarbons (RHC), 63.7 lbs/hour of nitrous oxides (NOx), 10.4 lbs/hour of particulate matter (PM), and 25.3 lbs/hour of sulphur oxides (SOx) during Phase I. The emission of these stated amounts of pollutants would have a significant impact on the area's air quality on a "worst case" basis. Phase II would have an even greater impact on the area's air quality since on a "worst case" basis (assumes tanker transport of crude oil) project emissions could result in 266.0 lbs/hour of RHC, 173.9 lbs/hour of NOx, 27.3 lbs/hour of PM and 128.4 lbs/hour of SOx. Alternative crude oil transportation modes, if used, could result in reduced emissions of RHC. For example, a pipeline transport mode enables emissions to be restricted to 28.7 lbs/hour of RHC, while rail transport increases RHC emissions to 44.5 lbs/hour. Other emissions as noted in Tables 2 and 3 would remain the same no matter which transportation mode was ultimately used.

APCD further notes that total suspended particulates (TSP) in the Camarillo and Oxnard areas presently exceed federal and state standards (60 ug/m^3) by 17 ug/m^3 . Hence, additional releases of particulate matter by the proposed project would make the attainment of state and federal standards for this pollutant even more difficult to achieve.

Odor problems presently exist in the project area, resulting from oil field and refining operations in the area. Odor and safety problems associated with the project could result from fugitive sources, such as emissions of hydrogen sulfide (H_2S) and mercaptans from wellhead casings and tanks during the production and handling of crude. (Core samples that have been taken indicate no H_2S content at the site, however.) Mitigation measures are covered in the following section.

3. Mitigation Measures

Project applicant proposes to install a vacuum vapor recovery system on all wellheads and tanks. Vapors, including H_2S , will be recovered and incinerated as fuel gases in a diesel steam generator, with a standby flare. Fugitive emissions are expected to be reduced by greater than 95 percent. APCD Rule 64 limits the sulfur content of fuel. As mentioned before, core samples have shown no H_2S ; however, if concentrations of H_2S are greater than that allowed under Rule 64, the system will have to be modified.

The Emissions estimates in the impact analysis section for fugitive pollutant sources are based on measured wellhead losses from older equipment operating in Ventura County. Emissions from new wellhead apparatus would be expected to be less than emissions from older equipment, and proper maintenance thereafter would mitigate fugitive pollutant emissions.

Applicant has indicated that diesel fuel, 0.28% sulfur by weight, will be used rather than 0.5% fuel oil as assumed in the impact analysis section. Emissions of sulfur oxides would be mitigated by this measure.

APCD Rules and Regulations require good maintenance practices, enforced by periodic inspections. Hot crude oil spills and other maintenance problems will be mitigated by such practices.

It should be noted that if an ambient air standard is exceeded, the proposed project must comply with the provisions of Ventura County Air Pollution Control District Rule 26 (New Source Review Rule). The New Source Review Rule requires that significant new sources, with the potential to emit greater than 10 pounds per hour of any subject air pollutant (except carbon monoxide for which the limit is 50 pounds per hour), obtain emission "tradeoffs" to offset the proposed increase in emissions.

The proposed project must also address the Prevention of Significant Deterioration and/or the Non-Attainment Area provisions of the Federal Clean Air Act as amended in 1977. These provisions may require additional air quality monitoring and analysis before the project can obtain the necessary air quality permits.

The implementation of dust control measures through the use of either watering or oiling of service roads could be beneficial in reducing projects related dust generations.

G. ARCHAEOLOGY⁷

1. Setting

Various ethno-historical and archaeological sources have noted that the project site is located in a sensitive archaeological zone. The most significant of this area's historical and prehistoric sites are the Chumash villages of Wenemu (sleeping place), Kasunalmu (sending place) and Ishwa (ashes). Unfortunately these particular sites have never been recorded and may be presently buried under flood related alluvial deposits.

2. Impacts

Due to the archaeological sensitivity of the area, a general surface reconnaissance was conducted on the project site by the County's staff archaeologist. This investigation entailed an intensive surface examination of all areas capable of containing cultural resources and an intuitive sampling of all other areas not particularly amenable to direct examination (i.e., brush covered areas and partially flooded areas). This survey, however, identified no cultural resources. The reason for this may have been that the site was never used by aboriginal man or it may have been that past siltation from flooding has obscured any traces of man's activities at the site. However, future grading activities could reveal deeply buried materials.

3. Mitigation Measures

In the event that subsurface materials of an archaeological nature are uncovered during project development, the developer should contact a County archaeologist to ensure the proper disposition and/or salvage of these resources.

H. FLORA AND FAUNA⁸

1. Setting

The project site is almost entirely used for agricultural purposes with the portion of the site east of the Revolon Slough having been planted in celery and the portion west of the slough having been planted in flowers (stock). Peripheral vegetation is limited to disturbance weeds. Vegetation resources along the banks of the Revolon Slough is also very limited and sparse. Accordingly, the project site provides a very poor wildlife habitat. The project site, although not significant, is suitable habitat for a number of other bird and small mammal species which are common to agricultural areas. Agricultural operations appear to have severely depleted amphibian, reptile, and invertebrate populations.

The land to the east, west and south of the project site is also utilized for agricultural purposes but the only significant wildlife habitat is located directly north in the Camarillo Airport. In this area, poor drainage has produced ponding that has led to the establishment of a relatively significant riparian habitat which provides a rest stop for a number of migratory birds.

The site drains into Revolon Slough which in turn drains into Mugu Lagoon. Mugu Lagoon is a critical coastal wetland containing a wide variety of flora and fauna. The lagoon is habitat for a number of rare and endangered wildlife species, including the California Brown Pelican, the Belding Savannah Sparrow and the California Least Tern, among others.

2. Impact

According to the Public Works Agency, the project site does not constitute a significant wildlife habitat and as such would not be severely impacted by future oil recovery operations. Moreover, there would be no effect on any rare or endangered species since the project site neither provides suitable habitat, nor food for the continuation of these species.

The proposed project, however, could effect wildlife in the Point Mugu Lagoon if hydrocarbon pollutants carried by drainage runoff were to enter the Revolon Slough and be transported downstream. These pollutants could degrade the Mugu Lagoon's waters whereby causing the contamination of breeding areas and food sources.

3. Mitigation Measures

The establishment of berms to protect against accidental spills of hydrocarbon materials would be beneficial in preventing the entrance of pollutants into the Revolon Slough. In addition, the on-site retention of storm waters should be required to prevent contaminated drainage runoff from flowing into the slough. Moreover, a contingency plan should be prepared to prevent accidental oil spills from reaching to Mugu Lagoon.

I. FIRE PROTECTION⁹

1. Setting

The project site is located in an area that has been designated in the Seismic Safety and Safety Element of the General Plan as having a low susceptibility to a potential fire hazard. However, there are production oil wells occupying small portions of the site and these wells have inherently high fire risks associated with their operation.

2. Impact

Fire hazards resulting directly from the project could prove extremely hazardous due to the significant amounts of combustible fuel that would have to be stored on the project site. According to the Ventura County Fire Department, however, this alone would not create a significant impact if standard fire department conditions for oil field safety are adhered to. Moreover, fire protection for the project site would be absorbed within the Fire Department's normal service capability for the area.

3. Mitigation Measures

According to the Ventura County Fire Department adherence to the uniform fire code and the provision of adequate amounts of water for fire protection would mitigate against any potential fire hazards.

J. AESTHETICS

1. Setting

The project's Oxnard Plain location and flat terrain combined with that area's intense agricultural usage leaves large areas unobstructed for viewing. The proposed project would be observable from Wood, Pleasant Valley and Sturgis Roads.

2. Impact

The proposed oil recovery operation would be highly noticeable by persons passing by throughout the day from the presence of tankage, pumps and steam generating equipment. Nighttime operations that entail the use of lights on the drilling rigs would be visible far greater distances. Moreover, the potential use of flaring devices could similarly make the site highly visible. Views of the project in operation would be in stark contrast with the area's rural setting even though there is some oil activity already on the site and in the vicinity. Nevertheless, the visibility of the project would be greater due to the intensity of the operation compared with the less intense surrounding land uses, excepting that of the airport.

3. Mitigation Measures

The proposed project's visual impacts could be, in part, reduced through the placement of significant amounts of landscaping materials compatible with agricultural operations, suitable fencing, and to a lesser extent earth toned paint.

K. PUBLIC FACILITY¹⁰

1. Setting

As previously mentioned in the Flooding and Drainage Section of this report, the project site has in the past been subject to severe flooding during major storms. This problem, however, is in the process of being partially mitigated through the installation of an area-wide flood control project directed by the Ventura County Flood Control District. The District's plans include the channelization of the Revolon Slough through the project site by the Summer of 1979 and channelization of the Camarillo Hills Drain when local funds are available.

2. Impact

The improved Revolon Slough Channel through the project site has been designed with slopes of a magnitude of 0.2 percent due to the topographical constraints of the Oxnard Plain (flatness). Accordingly, the completed channels would be unusually sensitive to any topographical changes beyond the current subsidence rate. If oil withdrawal activities were to result in subsidence, then the carrying capacity of the flood control channels over the tar sands would be significantly affected. Subsequently, areas that would have been made relatively free from flooding by the Flood Control District's improvements would be provided with a reduced level of protection. Hence, the effectiveness of this federally and locally funded project would be reduced (see Figure 6).

3. Mitigation Measures

Refer to the mitigation measures presented in the Subsidence Section of this Report on page 25.

L. TRAFFIC AND CIRCULATION¹¹

1. Setting

The project site's location on the Oxnard Plain offers many alternative access routes, but the most likely route to the project site is the Ventura Freeway via Rice Avenue to Sturgis Road. Currently, a large section of Rice Avenue has been widened and carries 7,540 ADT. Sturgis Road, on the other hand, is narrow and carries 780 ADT. Year-round use of Sturgis Road may not always be possible since this road is subject to flooding. Accordingly, Pleasant Valley Road could be used for emergency access although its use on a regular basis would be limited due to poor road alignment and an inadequate intersection at Sturgis and Wood Roads.

The proposed project would be serviced by oilfield waste disposal trucks that would probably be routed from the site via Gonzales Road which has a traffic volume of 3,020 ADT when in this vicinity and 7,760 ADT through the City of Oxnard. At Harbor Boulevard, oilfield waste truck traffic would proceed south to one of two existing oilfield waste disposal sites on West 5th Street.

2. Impact

According to the Public Works Agency, project related traffic increases are small and within the capabilities of the local road system to handle. Hence, no significant impacts have been noted with regard to traffic. This conclusion has been based on a potential trip generation figure of 50 ADT during either Phase I or II. This figure, however, does not take into consideration the use of trucks that would be required to transport oil from the project site to the Oxnard Refinery located in the vicinity of East 5th Street and Del Norte Boulevard. This nearby facility is the only Ventura County

refinery capable of converting the heavy crude oil into useful asphalt products. Assuming that all production wells are successful during the pilot phase, up to 2,080 barrels per day of oil would have to be transported for processing. This amount of oil would constitute approximately 12 tanker loads. Economics may dictate, however, that an alternative transport be used during Phase I in which case a pipeline would be the most efficient and least expensive method for transporting the crude oil to the refinery. Phase II, if successful, would probably produce more oil than could be processed at the Oxnard Oil Refinery, in which case further pipeline utilization would likely result. Hence, the 50 ADT traffic estimate during Phase II would still be appropriate.

3. Mitigation Measures

None are proposed.

M. ENERGY¹²

1. Setting

The proposed oil recovery operation would be primarily dependant on the use of diesel fuel in the recovery process. This fuel source would provide the power for drilling and the generation of steam.

2. Impact

The proposed project, as noted above, would be a heavy user of diesel fuel which at this time is generally only available through the refining of light crude oils. Fuel usage during Phase I of the project is estimated at 53,837 barrels of diesel. Phase II of the operation would use approximately 98 barrels a day, or 715,400 barrels of diesel over the next 20 years. Fuel expenditures associated with this project would not be compensated through oil recovery since the oil produced from the tar zones may be used exclusively for asphalt products. Nevertheless, it is possible that once the field was successful, the oil so produced could be deasphalted by delayed coking and then isocracking the upgraded coker distillates to motor gasoline, diesel and other light oil products. This method, if successful, could provide additional energy resources. At this time, however, the applicant has not proposed any use for the oil recovered from the project site other than its conversion into asphalt products.

3. Mitigation Measures

None are proposed.

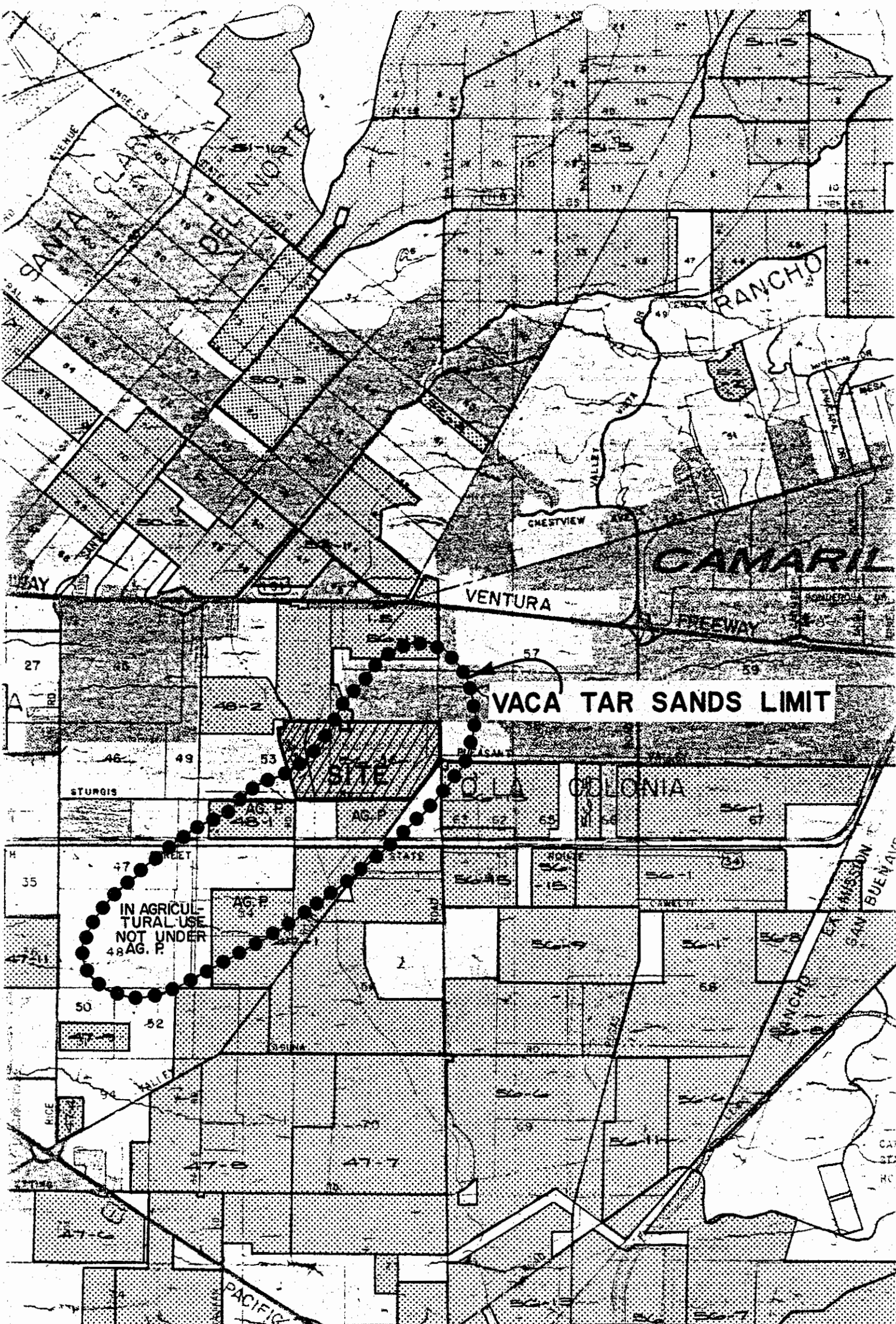
N. AGRICULTURE

1. Setting

Agriculture in the Ventura-Oxnard area dates back to about 1782 with the arrival of the Mission Fathers, but it wasn't until one hundred years ago that active farming began with the raising of sugar beets. More recently, however, the Revolon watershed, including the project area, has been used for field crops.

Although the Oxnard Plain has almost perfect climatical conditions for agriculture, the area, including the project site, is subject to a high water table which requires a subdrainage system to prevent alkali accumulations. In 1978, the project site's agricultural operator installed a subdrainage system to lower the water table, thus preventing alkali accumulations and maintaining dry soil conditions for a longer time period. Accordingly, dry soil provides the needed warmth and air circulation for the bacterial growth associated with the conversion of organic matter and fertilizer into nutrients required for proper plant development. In addition, properly drained soils can be worked earlier in the spring to provide faster seed germination and root development which, in turn, produces greater agricultural yields and less plant related diseases.

Irrigation is also necessary for the intensive agriculture practiced in the area. Water is usually obtained from onsite wells whose levels



Ventura County
Environmental
Resource
Agency

CUP-3566



VACA TAR SANDS LIMIT OVERLAYING
AGRICULTURAL PRESERVES

recede during the dry years but recover during the wet years. However, the general trend of wells in the area has been that of recession due to a serious problem of aquifer overdrafting.

As noted in Section V-C of this report, the project site is subject to flooding and throughout the years has experienced various degrees of damage. While flooding has occurred two years out of every three, the greatest amount of damage has occurred once every ten years. Flood prevention measures passing through the project site are currently in progress, however, these alone will not totally eliminate the area's flooding problems since flooding results from other sources (i.e., Pleasant Valley drain, Camarillo Hills drain, and local sheet flow).

2. Impact

As noted in Section V-A of this report, approximately 45 acres of land would be taken out of agricultural production. The related economic loss to the community has been estimated as \$661,500 annually but this figure could vary upward or downward depending on the type of crops selected, weather conditions, number of croppings and market conditions. However, the economic loss to the community could be reduced or equalled by jobs, income and tax revenues from oil recovery operations. Nevertheless, farming operations on the remaining agricultural acreage would be limited since direct access to all portions of the parcel would be, in part, hampered by the installation of production equipment, berms and roads.

Presently, the project site is subject to flooding and as a result would require the installation of berms to protect against the entrance of pollutants into flood flows. According to the Ventura County Flood Control District, these berms would not significantly change either the quantity of flood waters, the area of flooding or the rate of flow over adjacent lands. There would, however, be some aspect of the channelization or flow, between the production island but this would not significantly change the existing flooding situation in the area.

As previously mentioned, the project site is underlain in an east-west direction with a subsurface drainage system constructed of tile pipes spaced one hundred feet apart and buried five feet deep. There is a possibility that once the production islands are prepared, soil compaction where the tile pipes are crossed could change the gently sloping grade where the tiles have been installed. If this were to occur, a lower than uniform drainage flow and increased siltation beyond that which would normally be expected could result. Accordingly, a decrease in the effectiveness of the system coupled with an increase in maintenance costs to the farm operator could result.

The location of the north-south trending production islands could interfere with the farm operator's ability to work the land in the most efficient manner, especially, if the furrows had to be placed in an east-west direction. When farming conditions require an east-west placement, additional land for tractor turnaround areas would be needed. Estimates of a tillable land loss of up to eight acres have been calculated. However, land tilled in a north-south direction would not be similarly impacted since tractor turnaround areas have been previously positioned.

As noted in Section V-A, the proposed project would produce sulphur oxides during Phase I and Phase II. If left unmitigated, sulphur oxides could result in an undeterminable amount of crop damage. In addition, dust generations from oil vehicular traffic on the service roads could result in an indeterminable amount of crop damage, especially for those crops located adjacent to those roads.

3. Mitigation Measures

There are no mitigation measures proposed for the loss of agricultural land or the potential damage to the underdrain system.

Please refer to the mitigation measures presented in the Air Quality section of this report on page 32.

SECTION VI

GROWTH INDUCING IMPACTS

A. SETTING¹³

According to the Division of Oil and Gas the only presently known potential tar oil reserves of any significant size in the Oxnard oil field are the Vaca Tar sands and the Lower Tar sands. The lower tar sands occur erratically in the Monterey Formation throughout the field but very little reservoir data are available on them. Both of these tar sands are at relatively shallow depths, with the Lower Tar sands in the north-central portion of the oil field and the Vaca Tar sands stratigraphically higher and to the southeast of the Lower Tar.

B. IMPACT

According to the latest data from C.W.O.D. and study of the Vaca Tar sands by DOG, the reservoirs volume is estimated at 315,400 acre-feet, with 402,135,000 barrels of stock tank oil in place. Since the average thickness of the sands is relatively large, about 220 feet, it is highly probable that the proposed thermal process can prove to be an economical success at today's oil prices. Assuming a 25 percent recovery rate, the recoverable oil is estimated at 100,533,750 barrels from the entire Oxnard Oil Field which could be worth over a billion dollars at \$10 a barrel.

Further oil recovery operations in the Vaca Tar sands could involve the drilling of up to 400 new wells on the remaining 1,416 acres (1,774 acres total, including the project site). Associated with this potential increase in drilling activity would be the installation of additional storage tanks, pipelines, fluid treatment facilities, production facilities and various other types of equipment. As a result of this expanded development, further air quality degradation, agricultural land loss and further deterioration of scenic views could be expected. Successful oil recovery operations could also lead to the installation of a synthetic crude upgrading plant. Such plants are capable of handling 30,000 barrels a day of tar oil and converting it into low sulphur fuel oil suitable for conventional oil refinery processing.

The area limits of the Lower Tar sands are about the same as the Vaca tar sands. The Lower Tar, however, is located at depths that range between 2,800 to 4,300 feet with a zone thickness averaging about 50 feet. Reservoir capacity of the Lower Tar is less than one-half of the total oil in place than that of the Vaca. As yet, oil recovery operations in the Lower Tar appear to be uneconomical due to the expense of increased drilling costs. Nevertheless, if further development of the Vaca Tar sands proves successful, the impetus for exploration and development in the Lower Tar zones could be provided.

C. MITIGATION MEASURES

The effects mentioned above could be partially mitigated through the unitization of coordinated oil recovery activities in the Vaca Tar sands. Chanslor-Western Oil and Development Company has proposed that if, at the end of the pilot phase, full-scale development were decided, unit agreements would have to be worked out among all the neighboring operators holding mineral interests in the Vaca Tar sands. DOG concurs with this proposal for the reasons of preventing waste, increasing the ultimate recovery of oil, efficient use of surface lands, and central monitoring of land elevation in the field.

In a unit operation of an oil reservoir, all the wells are operated as a single unit, irrespective of surface property lines; and through agreement, wells are orderly spaced and equitable drainage is determined. In summary, the principal reason for unitizing or pooling several leases or tracts of land is to enable the underlying oil or gas reservoir to be operated as a single unit so as to allow the maximum ultimate recovery of the petroleum reserves, while at the same time preserving the equity interests of landowners and operators. Unitization also allows for a more economic operation because it avoids the duplication of surface facilities, thus simplifying and reducing the surface area needed to operate the oil or gas field.

SECTION VII

ALTERNATIVES TO THE PROPOSED PROJECT

A. "NO PROJECT" ALTERNATIVES

The "no project" alternative would maintain the existing environment of the permit area. None of the adverse impacts of the proposed project as described in Section V would occur. Also, the area would not be explored for oil at this time and any potential producible reserves would not be recovered.

B. ALTERNATIVE PROJECT LOCATIONS

The area limits of the Vaca Tar sand deposit is approximately 1,774 Acres. Therefore, there are up to four other sites where a similar project could be envisioned if leasing agreements were obtainable. Nevertheless, even if these sites were available, those impacts relating to air quality, subsidence, hydrology, aesthetics, and agriculture would be similar due to the Oxnard Plain's unique topographical and geological factors and the relatively homogenous land use pattern. However, the potential for flooding could be avoided. Inasmuch as the recovery of petroleum products is limited to areas where such resources are found, the use of other locations, other than those so mentioned in this report, may not be practical. Thus, all oil recovery would unavoidably be limited to the range of known deposits.

C. ALTERNATIVE PROJECT SIZE

The ultimate placement of 120 wells, most of which would be used for production purposes, could be halved to approximately 60 wells on half the acreage, thereby reducing the project related infringement on agricultural lands, project visibility, and air pollution by lengthening the production period from 20 years to 40 years.

SECTION VIII

ORGANIZATIONS, AGENCIES, AND INDIVIDUALS CONTACTED AND REFERENCES

A. PROJECT CONTRIBUTORS

Report Prepared by:

Ron Vogelbaum
Project Evaluation Section
Environmental Resource Agency

Agency Contributors:

Public Works Agency
Road Administration Division

Environmental Resource Agency
Environmental Health Division
Air Pollution Control District
Building and Planning Services Division

Property Administration Agency

Ventura County Fire Department

B. PERSONS AND ORGANIZATIONS CONTACTED DURING PREPARATION

California State Division of Oil and Gas

C. REFERENCES

Richard C. Bott, "Cyclic Steam Project in A Virgin Tar Reservoir", Journal of Petroleum Technology, May, 1967.

M. W. Dosch and W. S. Mitchell, "Oxnard Oil Field", Summary of Operations - California Oil Fields, Vol. 50, No. 1, 1964.

A. G. Bride and J. W. Scott, "Ways to Hydroprocess Resids", Hydrocarbon Processing, May, 1975.

Ventura County Flood Control District, Watershed Work Plan, Revolon Watershed, December, 1963.

SECTION IX

FOOTNOTES

1. M. W. Dosch and W. J. Mitchell, "Oxnard Oil Field", Summary of Operations, California Oil Fields, Vol. 50, No. 1, Sacramento 1964, p. 21.
2. Division of Oil and Gas, Subsidence Study of Oxnard Oil Field and Vicinity, Ventura County, California, 1977, pp. 6-30.
3. Ventura County, Watershed Work Plan, Revolon Watershed, December 1963.
4. See Footnote 2
5. Ibid
6. Memo to Victor Husbands from Jan Bush, Subject: Chanslor-Western Oil Development Company, Oxnard Project; March 21, 1978
7. Memo to Ron Vogelbaum from Alex Kirkish, Subject: Archaeological Assessment of CUP-3566; April 3, 1978.
8. Memo to Victor Husbands from A. P. Stokes, Subject: Wildlife Assessment - CUP-3566 - Chanslor-Western Oil and Development Company, January 14, 1976.
9. Memo to Ron Vogelbaum from R. Burleson, Subject: EIR for CUP-3566; January 13, 1976.
10. Memo to Subdivision Engineering to Flood Control - Planning, Subject: CUP-3566 - Chanslor-Western Oil and Development, Oxnard Plain Subsidence Study; September 1, 1977.
11. See Footnote 8.
12. Memo to Victor Husbands from A. P. Stokes, Subject: Chanslor-Western Oil and Development CUP-3566; February 3, 1976.
13. See Footnote 2.

SECTION X

APPENDIX A

Draft EIR Distribution List

FEDERAL

United States Army Corps of Engineers
Federal Aviation Administration

STATE

State Clearinghouse

CITY

City of Oxnard
City of Camarillo

ORGANIZATIONS

Environmental Coalition
Calleguas Municipal Water District

INDIVIDUALS AND PRIVATE FIRMS

Chanslor-Western Oil and Development Company

LIBRARIES

Main Library, Ventura
Camarillo Branch Public Library
Oxnard Public Library

APPENDIX B

List of Responsible Agencies

California State Division of Oil and Gas for Drilling Permits.

United States Government, Federal Aviation Administration for filing of FAA form 7460-1, Notice of Proposed Construction Near an Airport.

APPENDIX C

INITIAL STUDY CHECKLIST

I. BACKGROUND

1. Name of Applicant CHANSIOR WESTERN OIL AND DEVELOPMENT CO.
2. Project Description A two phased oil explanation project in the in the Oxnard Plain involving the initial drilling of 20 steam injected wells which if successful could result in the drilling of 120 wells.
3. Project Location Adjacent & N.W. of the intersection of Surgis and Pleasant Valley Roads
4. Date Checklist Completed September 26, 1975

II. ENVIRONMENTAL IMPACTS

Planning Division Input

Yes Maybe No

1. Land Use. Will the proposal result in a substantial alteration of the present or planned land use of an area? X — —
2. Population. Will the proposal alter the location, distribution, density, or growth rate of the human population of an area? — — X
3. Housing. Will the proposal affect existing housing, or create a demand for additional housing? — — X
4. Aesthetics. Will the proposal result in the obstruction of an scenic vista or view open to the public, or will the proposal result in the creation of an aesthetically offensive site open to public view? X — —
5. Recreation. Will the proposal result in an impact upon the quality or quantity of existing recreational opportunities? — — X
6. Natural Resources. Will the proposal result in:
 - a. Increase in the rate of use of any natural resources? — — X
 - b. Substantial depletion of any non-renewable natural resources (e.g., loss of prime agricultural land)? X — —
7. Public Services. Will the proposal and/or the cumulative demands of other pending projects have an effect upon, or result in a need for new or altered governmental services in any of the following areas:
 - a. Sanitation — — X
 - b. Water (not under County Jurisdiction)? — — X
 - c. Fire Protection? — X —
 - d. Police Protection? — — X
 - e. Schools? — — X
 - f. Parks or other recreational facilities? — — X
 - g. Other governmental services ? — X —

APCD Input

Yes Maybe No

8. Air. Will the proposal result in:

- | | | | | |
|----|--|----------|----------|----------|
| a. | Substantial air emissions or deterioration of ambient air quality? | <u>X</u> | <u>—</u> | <u>—</u> |
| b. | The creation of objectionable odors? | <u>—</u> | <u>—</u> | <u>X</u> |
| c. | Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally? | <u>—</u> | <u>—</u> | <u>X</u> |
| d. | Is there a potential for cumulative adverse impacts on air quality in the project area? | <u>X</u> | <u>—</u> | <u>—</u> |

Public Works Agency Input

9. Earth. Will the proposal result in:

- | | | | | |
|----|--|----------|----------|----------|
| a. | Unstable earth conditions or in changes in geologic substructures? | <u>X</u> | <u>—</u> | <u>—</u> |
| b. | Disruptions, displacements, compaction or overcovering of the soil? | <u>X</u> | <u>—</u> | <u>—</u> |
| c. | Change in topography or ground surface relief features? | <u>X</u> | <u>—</u> | <u>—</u> |
| d. | The destruction, covering or modification of any unique geologic or physical features? | <u>—</u> | <u>—</u> | <u>X</u> |
| e. | Any increase in wind or water erosion of soils, either on or off the site? | <u>—</u> | <u>—</u> | <u>X</u> |
| f. | Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake? | <u>—</u> | <u>—</u> | <u>X</u> |
| g. | Exposure of people or property to geologic hazards such as earthquakes, landslides, mudslides, ground failure, liquefaction, tsunami or similar hazards? | <u>X</u> | <u>—</u> | <u>—</u> |

10. Transportation/Circulation. Will the proposal result in:

- | | | | | |
|----|--|----------|----------|----------|
| a. | Generation of substantial additional vehicular movement? | <u>—</u> | <u>—</u> | <u>X</u> |
| b. | Effects on existing parking facilities, or demand for new parking? | <u>—</u> | <u>—</u> | <u>X</u> |
| c. | Substantial impact upon existing transportation systems? | <u>—</u> | <u>—</u> | <u>X</u> |
| d. | Alterations to present patterns of circulation or movement of people and/or goods? | <u>—</u> | <u>—</u> | <u>X</u> |
| e. | Alterations to waterborne, rail or air traffic? | <u>—</u> | <u>—</u> | <u>X</u> |
| f. | Increase in traffic problems to motor vehicles, bicyclists or pedestrians? | <u>—</u> | <u>—</u> | <u>X</u> |

	Yes	Maybe	No
g. Would the project area system of roads be unable to accommodate the traffic to be generated by the project and all other pending projects in the area?	—	—	X
11. <u>Utilities</u> . Will the proposal and/or the cumulative demands of other pending projects impact or result in a need for new public service systems, or substantial alterations to the following utilities?			
a. Electricity or natural gas?	—	—	X
b. Communication systems?	—	—	X
c. Street lighting annexation and improvements?	—	—	X
12. <u>Energy</u> . Will the proposal result in:			
a. Use of substantial amounts of fuel or energy?	X	—	—
b. Substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?	—	—	X
<u>Flood Control and Water Resources Department Input</u>			
13. <u>Hydrology</u> . Will the proposed result in:			
a. Effects upon a Flood Control District's jurisdiction channel?	X	—	—
b. Effects upon a secondary drain?	—	—	X
c. Changes in drainage patterns or the rate and amount of surface water runoff?	X	—	—
d. Alterations to the course or flow of flood waters?	—	X	—
e. Exposure of people to water related hazards such as flooding or tsunami?	—	—	X
f. Degradation of groundwater quality?	X	—	—
g. Degradation of surface water quality?	X	—	—
h. Reduction in groundwater quantity?	X	—	—
i. Increase in groundwater quantity?	—	—	X
j. High groundwater table?	—	—	X
k. Sewage disposal limitations?	—	—	X
14. <u>Plant Life</u> . Will the proposal result in:			
a. Affect any <u>unique</u> , <u>rare</u> or <u>endangered</u> plant species?	—	X	—
b. Change the <u>diversity</u> of plant <u>species</u> ?	—	X	—

	Yes	Maybe	No
c. Threaten to eliminate or otherwise reduce either <u>native</u> , <u>ornamental</u> or <u>agricultural</u> plant populations?	X	—	—
d. Introduce new plant species into an area which will represent a <u>fire hazard</u> to project residents?	—	—	X
15. <u>Animal Life</u> . Will the proposal result in:			
a. Restrict the range of or otherwise affect any <u>rare</u> or endangered animal species?	—	X	—
b. Restrict the range of or otherwise affect any <u>unique</u> animal species?	—	—	X
c. Change the <u>diversity</u> of animal species?	—	—	X
d. Reduce wildlife populations?	—	—	X
e. Introduce new wildlife species in an area?	—	—	X
f. Affect existing wildlife <u>food webs</u> , <u>habitat</u> or <u>migration patterns</u> ?	—	X	—
g. Deteriorate or cause an existing <u>fish</u> or <u>wildlife</u> population to drop below self-sustaining levels?	—	—	X
16. <u>Archaeological/Historical</u> . Will the proposal:			
a. Affect possible unknown archaeological or historical sites?	X	—	—
b. Result in destruction or alteration of a known archaeological or historical site within the vicinity of the project?	—	—	X
c. Result in destruction or alteration of a known archaeological or historical site near the vicinity of the project?	—	—	X
17. <u>Water Supply (Purveyors Under County Jurisdiction)</u> : Will the proposal result in:			
a. A project and/or cumulative demand for additional off-site water facilities?	—	—	X
b. A significant project and/or cumulative demand on existing water supply?	X	—	—
<u>Environmental Health Input</u>			
18. <u>Sanitation</u> . If the proposal will utilize septic tank systems, can the sewage generated by the project create a significant adverse health impact on the area?	—	—	X
19. <u>Water</u> . Will the proposal and/or all other pending projects in the area result in substantial reduction in the amount of water otherwise available from public water supplies?	—	—	X

- | | <u>Yes</u> | <u>Maybe</u> | <u>No</u> |
|--|------------|--------------|-----------|
| 20. <u>Solid Waste</u> . Will the proposal result in: | | | |
| a. Production of significant amounts of solid waste? | — | — | <u>X</u> |
| b. Would this waste create a significant impact on the existing solid waste disposal system? | — | — | <u>X</u> |
| 21. <u>Noise</u> . Will the proposal result in: | | | |
| a. Significant increases in existing noise levels? | — | — | <u>X</u> |
| b. Exposure of people to severe noise levels? | — | — | <u>X</u> |
| 22. <u>Light and Glare</u> . Will the proposal produce significant amounts of new light or glare? | — | <u>X</u> | — |
| 23. <u>Risk of Upset</u> : Does the proposal involve a risk of an explosion or the release of hazardous substances (including, but not limited to, oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions? | — | <u>X</u> | — |
| 24. <u>Human Health</u> . Will the proposal result in: | | | |
| a. Creation of any health hazard or potential health hazard (excluding mental health)? | — | <u>X</u> | — |
| b. Exposure of people to potential health hazards? | — | <u>X</u> | — |

III. MANDATORY FINDINGS OF SIGNIFICANCE

- | | | | |
|--|----------|----------|---|
| 1. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | <u>X</u> | — | — |
| 2. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future?) | — | <u>X</u> | — |
| 3. Does the project have impacts which are individually limited, but cumulatively considerable? (Several projects may have relatively small individual impacts on two or more resources, but where the effect of the total of those impacts on the environment is significant?) | — | <u>X</u> | — |
| 4. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? | <u>X</u> | — | — |

IV. RECOMMENDATION

On the basis of this initial evaluation:

- ☐ In conformance with Section 15060 of the State EIR Guidelines, I find with certainty that the proposal would not have a significant impact on the environment.
- ☐ I find the proposed project is categorically exempt pursuant to Class _____.
- ☐ I find the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION should be prepared.
- ☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet could be applied to the project. A CONDITIONAL NEGATIVE DECLARATION SHOULD BE PREPARED.
- ☒ I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find the proposed project MAY have a significant effect on the environment, and an ADDENDUM to an existing certified Environmental Impact Report is required.
- ☐ I find the proposed project MAY have a significant effect on the environment, and this effect is adequately addressed in a certified Environmental Impact Report, and thus SUBSEQUENT USE of the existing EIR is required.

Date:

9/29/75

J. C. Berman
(Signature of Environmental Planner)

Initial Study Contributors:

Public Works Agency

Environmental Health Division

Building and Planning Services

Air Pollution Control District

JH:ss/401

APPENDIX D

VENTURA COUNTY OXIDANTS PERCENTAGE OF ADVERSE DAYS July - September

	<u>1970</u>	<u>71</u>	<u>72</u>	<u>73</u>	<u>74</u>	<u>75</u>	<u>76</u>	<u>77</u>
Camarillo	49	40	19	43	55	10	5	27
Ojai Valley	-	81	69	87	98	81	51	73
Ventura	-	-	-	20	28	14	9	18
Simi Valley	-	-	-	95	93	89	65	85
Santa Paula	-	-	-	51	59	49	26	49
Pt. Hueneme	-	-	-	6	18	-	12	16
Pt. Mugu	-	-	-	-	1	9	10	-
Thousand Oaks	-	-	-	58	57	60	43	64
Piru	-	-	-	-	-	-	55	84

VENTURA COUNTY OZONE EPISODES OF 3.20 PPM OR GREATER HOURLY AVERAGE

	<u>1970</u>	<u>71</u>	<u>72</u>	<u>73</u>	<u>74</u>	<u>75</u>	<u>76</u>	<u>77</u>
Camarillo	2	0	0	3	0	0	1	2
Ojai	-	1	0	8	2	2	0	0
Ventura	-	-	-	0	0	0	1	0
Simi	-	-	-	28	10	2	2	3
Santa Paula	-	-	-	1	1	0	1	1
Port Hueneme	-	-	-	-	0	0	0	0
Point Mugu	-	-	-	0	0	-	1	0
Thousand Oaks	-	-	-	0	0	0	1	1
Piru	-	-	-	-	-	-	2	1

VENTURA COUNTY
TOTAL SUSPENDED PARTICULATE (TSP)

Percentage of 24-hour TSP Samples
In Excess of the California 100 ug/m³ 24-hr. Standard

	<u>1971</u>	<u>72</u>	<u>73</u>	<u>74</u>	<u>75</u>	<u>76</u>	<u>77</u>
Camarillo	-	24	36	28	25	26	26
Lockwood Valley	-	-	-	-	-	10	2
Ojai	15	18	19	25	11	5	22
Oxnard	-	-	33	12	19	20	19
Pt. Mugu	-	-	5	9	2	3	5
Pt. Hueneme	-	-	59	53	-	27	30
Santa Paula	-	20	23	51	34	24	24
Simi Valley	-	-	41	29	53	32	37
Thousand Oaks	-	-	37	29	38	9	14
Ventura	-	-	27	22	11	13	5

VENTURA COUNTY
TOTAL SUSPENDED PARTICULATE (TSP)

TSP - Annual Geom. Mean (ug/m³)
(Fed. & State Std. = 60 ug/m³)

	<u>1971</u>	<u>72</u>	<u>73</u>	<u>74</u>	<u>75</u>	<u>76</u>	<u>77</u>
Camarillo	-	73	80	76	77	74	77
Lockwood Valley	-	-	-	-	-	34	33
Ojai	73	67	66	62	74	59	71
Oxnard	-	-	77	67	78	73	72
Pt. Mugu	-	-	58	64	58	55	52
Pt. Hueneme	-	-	106	103	-	84	83
Santa Paula	-	76	68	85	89	79	79
Simi Valley	-	-	75	70	87	71	74
Thousand Oaks	-	-	77	73	82	56	60
Ventura	-	-	73	77	67	63	57

APPENDIX E

ASSUMPTIONS AND REFERENCES FOR AIR QUALITY CALCULATIONS

DRILLING

PILOT PHASE: Eight wells drilled during first year, nine during second year, ten days drilling per well, one 1300 H.P./Hour rig, 75 percent load, 24-hour operation. Emission factors from EPA, Table 3.3.3-1, AP-42, 1976. Reactivity per ARB "Emissions and Air Quality Assessment," 1976.

PRODUCTION PHASE: Same as in pilot phase except two rigs.

PRODUCTION HOIST

PRODUCTION PHASE: Hoist powered by one 300 H.P. diesel engine, uses 2 gallons fuel per hour, operates 50 percent of time (12 hours per day), 75 percent load.

Emission factors from EPA, Table 3.3.3-1, AP-42, 1976.

STEAM GENERATORS

PILOT PHASE: One 22×10^6 BTU/hour steam generator during first year, two during second year, each uses 157 gallons of 0.5 percent sulfur fuel per hour, operates 95 percent of time (23 hours per day).

Emission factors from EPA, Appendix C, AP-42, 1976.

Reactivity per ARB "Emissions and Air Quality Assessment," 1976.

PRODUCTION PHASE: Same as in pilot phase except three additional 50×10^6 BTU/hour steam generators, using 357 gallons of 0.5% sulfur fuel per hour, each.

HEATERS

PILOT PHASE: Two 5×10^6 BTU/hour circulating hot water heaters, natural gas fired at 5×10^3 C.F./ hour, operating 95 percent of time (23 hours per day).

Emission factors from EPA, Appendix C, AP-42, 1976.

Reactivity per ARB "Emissions and Air Quality Assessment," 1976.

PRODUCTION PHASE: Four 6×10^6 BTU/hour heater treaters, using 43 gallons diesel per hour each, operating 95 percent of time (23 hours per day).

Emission factors from EPA, Table 3.3.3-1, AP-42, 1976.

HC reactivity reference: ARB "Emissions and Air Quality Assessment," 1976.

STORAGE TANKS

PILOT PHASE:

All storage tank data supplied by applicant, December 22, 1977. Emission factors from EPA, Supplement 7, AP-42, 1976. Reid vapor pressure for diesel (0.5) assumed applicable to crude mixtures, conversion to true vapor pressure via nomograph extrapolation presented in Figure VI-1, "Hydrocarbon Emissions from Fixed-Roof Petroleum Tanks," prepared for WOGA, 1977. Reactivity per ARB "Emissions and Air Quality Assessment," 1976.

PRODUCTION PHASE: Same as in pilot phase.

FUGITIVE SOURCES:

PILOT PHASE: 17 Wells.

Emission factor is 2.1 pounds THC/well/day, from ARB hydrocarbon program preliminary results, 1977.

Reactivity per ARB's "Emissions and Air Quality Assessment," 1976.

PRODUCTION PHASE: Same as in pilot phase.

VEHICULAR TRAFFIC:

PILOT PHASE: 12 heavy-duty diesel trucks per day at 60 miles per round trip, 2 light-duty trucks per day at 15 miles per round trip, 6 light-duty autos per day at 15 miles per round trip, operation during eight hours per day. Emission factors references: EMFAC 3, 1980 emission factors. EPA, AP-42 Suppl. 5.

PRODUCTION PHASE: 5 light-duty trucks per day at 15 miles per round trip, 7 light-duty autos per day at 15 miles per round trip.

Emission factors same as in pilot phase.

PRODUCT TRANSPORT

PILOT PHASE:

TANK TRUCK TRANSPORT: Throughput of 1300 BBL/day (60 percent vaca crude, 40 percent diesel dilluent), two 180-BBL tank trucks loaded per hour.

Emission Factor: 8 pounds RHC/1000 gallons, from EPA's supplement 7, AP-42, 1976. Reactivity per ARB's "Emissions and Air Quality Assessment," 1976.

PRODUCTION PHASE

TANKER TRANSPORT: Throughput of 5000 BBL/day (60 percent vaca crude, 40 percent diesel dilluent), 10,000 BBL/hour load rate.

Emission factor = 0.6 pounds/1000 gallons transferred, from "Hydrocarbon Emissions During Marine Loading of Crude Oils," CHEVRON Research Co., 1977.

Reactivity per ARB's "Emissions and Air Quality Assessment," 1976.

RAIL CAR TRANSPORT: Assumptions same as tank truck loading except one 500 BBL rail car loaded in a given hour.

OXNARD PROJECT
TANK LISTING
12/19/77

TANK	CAPACITY BBLs.	DIAM FT.	HEIGHT FT.	TYPE	COLOR	TEMP. °F	THROUGH-PUT BBL/DAY		FLUID TYPE	VAP CONTROL TYPE ₁
							Phase I	Phase II		
KEWANEE NE GADGE	500	15	16	Bolted	Tan	200	300	0 ₄	Wet Crude ₂	1
KEWANEE MAIN GADGE	500	15	16	Bolted	Tan	200	300	300	Wet Crude	2
KEWANEE Wash #1	2000	30	16	Bolted	Tan	200	2500	4000	Wet Crude	2
KEWANEE Suction	2000	30	16	Bolted	Tan	180	1300	5000	Crude ₃	2
EXETER GADGE	500	15	16	Bolted	Tan	200	300	300	Wet Crude	2
EXETER Wash #1	2000	30	16	Bolted	Tan	200	2500	4000	Wet Crude	2
EXETER Diluent	2000	30	16	Bolted	Tan	AMB	1000	4000	Diesel	2
EXETER Fuel	500	15	16	Bolted	Tan	AMB ₅	200	600	Diesel ₅	2
EXETER Cond. Wash	500	15	16	Bolted	Tan	80	200	1200	Raw Cond. ₆	2
EXETER Condensate	250	15	8	Bolted	Tan	80	10	60	Condensate ₇	2
KEWANEE Fuel	500	15	16	Bolted	Tan	AMB ₅	0	600	Diesel ₅	2
Exeter Wash #2	2000	30	16	Bolted	Tan	200	0	4000	Wet Crude	2
EXETER Wash #3	2000	30	16	Bolted	Tan	200	0	4000	Wet Crude	2
KEWANEE Wash #2	2000	30	16	Bolted	Tan	200	0	4000	Wet Crude	2
KEWANEE Wash #3	2000	30	16	Bolted	Tan	200	0	4000	Wet Crude	2

1. Vapor Control Types - 1 = STD. Breather Value, 2 = Vapor recovery
2. Wet Crude = 30% Water, 40% Vaca Crude, 30% Diesel Diluent.
3. Crude = 60% Vaca Crude, 40% Diesel Diluent
4. Zero (0) Indicates no tank in this phase.
5. If Fuel is low sulfur fuel oil, tank temp. will be 200°F+
6. Raw Cond. = Raw condensate = Condensate plus water = 95% water, condensate.
7. Condensate is estimated to be a C12 - C18 Hydrocarbon with an API GRAV. of 35°-45°.

APPENDIX F

Comments Received During Review Process and Lead Agency Response

1. City of Oxnard letter dated December 11, 1978. Response Provided
2. State Clearinghouse cover letter of January 29, 1979 (SCH #78121897) including:
 - a. Department of Transportation, District 07 Comments of December 19, 1978. Response Provided.
 - b. State Water Resources Control Board comments of January 18, 1979. See Response Provided to 2.c below.
 - c. Los Angeles Regional Quality Control Board comments of January 4, 1979. Response Provided.
3. State Clearinghouse cover letter of February 9, 1979 (late response) covering:
 - a. Air Resources Board's comments of February 2, 1979. Response Provided.
4. City of Camarillo letter of February 22, 1978. Response Provided.



CITY OF OXNARD CALIFORNIA

December 11, 1978

PLANNING DEPARTMENT
GENE L. HOSFORD, DIRECTOR
305 WEST THIRD STREET
OXNARD, CALIFORNIA 93030
PHONE 488-2601, EXT. 292

Robert K. Laughlin, Supervisor
Project Evaluation Section
Environmental Resource Agency,
Building and Planning Services
800 South Victoria Avenue
Ventura, California 93009

Re: DEIR for CUP-3566

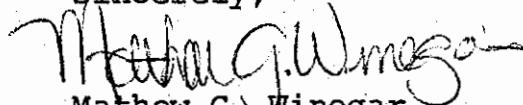
Gentlemen:

Thank you for the opportunity to review the above referenced draft environment impact report. In general, the DEIR appears to adequately address concerns we may have with the project. We would like to offer the following specific comments:

1. Page 26: Among the mitigation measures for subsidence is the possibility of injection of sea water as a replacement fluid. Should this water be injected above the aquifers, groundwater quality could be degraded through percolation. It is difficult to determine the relationship between the levels of the aquifers and tar sand strata based on the information presented in the report.
2. Page 33: The use of pipeline transfer as mitigation for air quality impacts should be strongly encouraged.

Thank you once again for the opportunity to review this document. Should you have any further questions please contact this office.

Sincerely,


Mathew G. Winegar
Planning Assistant

MGW:alg

Response to City of Oxnard Letter of December 11, 1978

Comment No. 1 - page 26 in EIR

Response: Reference to the use of seawater as a mitigation measure has been deleted in the text of the Final EIR.

While seawater injection is a common tool used to enhance oil recovery in non-steam injected wells, its use with this project would be of little value because the steam flooded wells must be maintained at a high temperature in order for the oil to flow easily from the tar sands. Therefore, the injection of cold seawater would cool the sands thus making oil recovery impossible. Furthermore, due to the seawater's high mineral content (TDS) it would have to be converted into freshwater before it could be used for injection purposes, otherwise mineralization resulting in clogging of the steam generators would occur. In conclusion, it would be more energy efficient, less environmentally damaging and more economical to use available fresh water sources.

Comment No. 2 - page 33 in EIR

No response needed.

RL:RV:pEIR2a



EDMUND G. BROWN JR.
GOVERNOR

State of California

GOVERNOR'S OFFICE
OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO 95814

January 29, 1979

Robert K. Laughlin
Ventura County
800 South Victoria Avenue
Ventura, CA 93009

SUBJECT: SCH #78121897 - CONDITIONAL USE PERMIT NO. CUP-3566 CHANSLOR
WESTERN OIL AND DEVELOPMENT CO.

Dear Mr. Laughlin:

State agencies have commented on your draft environmental document (see attached). If you would like to discuss the concerns and recommendations in their comments, contact the staff from the agencies whose names and addresses appear on the comments.


You may formally respond to the agencies' comments by writing to them (including the State Clearinghouse number on all such correspondence). When filing the Final EIR, you must include all comments and responses (State EIR Guidelines, Section 15146). State review of your draft environmental document will then be complete.

To aid in preparing environmental assessments on future projects, you should send to state agencies and the Office of Planning and Research your Notice of Preparation as prescribed by AB 884 and Section 15066 of the EIR Guidelines.

If you would care for assistance or if the need arises, the Office of Planning and Research is available to help identify responsible agencies, distribute Notices of Preparation, organize coordination meetings, mediate disputes, and hold consolidated hearings.

Please contact Pam Aronhalt at (916) 445-0613 if you have any questions.

Sincerely,


Stephen V. Williamson
State Clearinghouse

SVW/nb
Attachment
cc: Ken Fellows, DWR
Keith E. McKean, CalTrans
Thomas E. Bailey, SWRCB

State of California

Business and Transportation Agency

Memorandum

OK - ACC

To : JIM BORDEN, DEPUTY DIVISION CHIEF - DOTP
Department A-95 Coordinator
1120 N Street
Sacramento, California 95814
Attention: Mr. A. C. Lichtman

Date: December 19, 1978

File : A-95 REVIEW

From : KEITH E. McKEAN - District 07
DEPARTMENT OF TRANSPORTATION

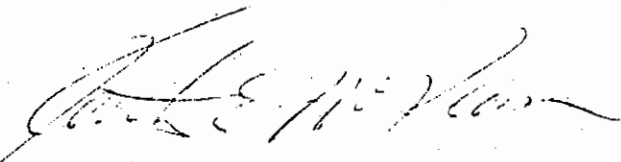
Subject: Project Review Comments

SCH NUMBER

78121897

Chanslor Western Oil

No comments if access to drilling site by trucks is as described in document. However, if change is made and trucks enter and leave the freeway at Rice Avenue the existing interchange may not handle the increased amount of big rigs. The existing interchange has very short radius turns and short acceleration lanes.



KEITH E. McKEAN, Chief
Environmental Planning Branch
Transportation District 07
Clearinghouse Coordinator
For information, contact Jim Danley
(ATSS) 640-5567 or (213) 620-5567
VR:jh
Attachment

Memorandum

To : 1. Mr. L. Frank Goodson
Projects Coordinator
The Resources Agency
Resources Building, 13th Floor
2. Ventura County Environmental
Resources Agency
800 S. Victoria Avenue
Ventura, CA 93009

Date: JAN 18 1979

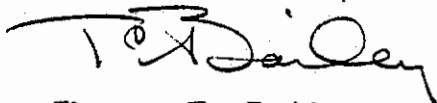
In Reply Refer
To: 420: DC

(916) 322-9875

From : **STATE WATER RESOURCES CONTROL BOARD**
DIVISION OF PLANNING AND RESEARCH

Subject: REVIEW OF NOTICE OF INTENT: SCH 78121897, DRAFT EIR, CONDITIONAL
USE PERMIT NO. CUP-3566, CHANSLOR WESTERN OIL AND DEVELOPMENT
COMPANY, VENTURA COUNTY

The attached comments from the California
Regional Water Quality Control Board
constitute the comments of the State Water
Resources Control Board.



Thomas E. Bailey
Assistant Division Chief

Attachment


cc: California Regional Water Quality
Control Board, Los Angeles Region
107 South Broadway, Room 4027
Los Angeles, CA 90012

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

INTERNAL MEMO

TO: State Water Resources Control Board, Division of Planning and Research
ATTN: Environmental Analysis Unit
DATE: JAN 04 1979

FROM: Los Angeles Region

SIGNATURE: 
RAYMOND M. HERTEL
Executive Officer
By
RICHARD A. HARRIS
Assistant Regional
Executive Officer

SUBJECT: SCH 78121897; Draft
Environmental Impact Report
(DEIR) for Conditional Use
Permit No. CUP-3566; Chanslor
Western Oil and Development
Company

We have reviewed the subject DEIR for the proposed development of oil wells in the Oxnard Oil Field. The project calls for drilling and steam injection operations.

On page 11, it is stated that the project site is subject to severe flooding from local sheet flow and overland flow from Revolon Slough, Camarillo Hills Drain and Pleasant Valley Drain. The site must be protected against flooding in order to prevent water pollution from oily wastes.

The disposal of wastes other than those described in this Board's Resolution No. 56-45 (copy attached) is subject to waste discharge requirements and/or National Pollutant Discharge Elimination System permit, and would require filing of a report of waste discharge with this Board.

Encl.

CALIFORNIA INDUSTRIAL WASTE QUALITY CONTROL BOARD
Los Angeles Region
107 South Broadway - Suite 407
Los Angeles, California 90012

RESOLUTION NO. 56-45

ADOPTING AN OPERATING PROCEDURE FOR SIMPLIFYING FILING OF
REPORTS ON DISPOSAL OF ROTARY MUD RESULTING FROM OIL WELL
DRILLING OPERATIONS

- WHEREAS, based upon the Attorney General's Opinion No. 50/139, dated October 25, 1950, rotary mud, when it is no longer used as a drilling fluid for oil wells, becomes an industrial waste within the statutory definition; and
- WHEREAS, when such wastes are dumped or allowed to drain into waters of the State, the Regional Water Pollution Control Boards may act to control pollution or nuisance; and
- WHEREAS, investigations conducted by the staff of this Board indicate, in general, that in those instances where uncontaminated and unpolluted rotary mud, resulting from the drilling of one well, is disposed of at the well site in such a manner that it is not dumped or allowed to drain into waters of the State, there is no threat of pollution or nuisance; however, structural failures or washout by storm water flow have been responsible for the discharge of rotary mud into natural water-courses, drainage channels, public highways, or private properties from a central disposal site used for the disposal of rotary mud from more than one well; and
- WHEREAS, uncontaminated and unpolluted rotary mud shall mean clay base drilling mud mixed with fresh water and containing weight materials and conditioning chemicals ordinarily used by the oil industry in oil well drilling operation; oils contained in the mud shall only be in amounts utilized as additives, and when the chemical constituents of the leachate from the drilling mud does not exceed the following limits: Total Dissolved Solids - 2,000 ppm; Chloride - 250 ppm; Boron - 1.5 ppm; and percent sodium 60%; and
- WHEREAS, it is the objective of this Board to simplify reporting of uncontaminated and unpolluted rotary mud discharges for the oil operators by the adoption of uniform operating procedures in the Los Angeles Region; and
- WHEREAS, the problem of disposal of rotary muds, resulting from oil well drilling operations, and operating procedures for simplifying filing of reports on the disposal of rotary drilling muds have been discussed with representatives of local agencies, the Industrial Waste Committee of the Western Gas and Oil Association; and with other persons interested in this disposal problem.

Requirements

Operating Procedure for Simplifying Filing
of Reports-Rotary Mud

NOW, THEREFORE, BE IT RESOLVED, that the following operating procedure for filing reports on disposal of uncontaminated and unpolluted rotary mud, resulting from oil well drilling operations, be adopted by the Los Angeles Regional Water Pollution Control Board No. 4 for use in administering Section 13054 of the Water Code:

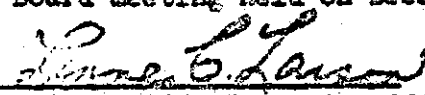
1. When a person proposes to dispose at the well site, uncontaminated and unpolluted rotary mud resulting from the drilling of one oil well in such a manner that it will not be dumped or allowed to drain into any waters of the State, a Report of Proposed Waste Discharge will not be required to be filed with this Board.
2. When a person proposes to dispose of uncontaminated and unpolluted rotary mud in any other manner except as specified in paragraph 1 above, a Report on Proposed Waste Discharge shall be filed with this Board in accordance with the provisions of Section 13054 of the Water Code of the State of California; and

BE IT FURTHER RESOLVED, that the disposal of all other oil field wastes, including all other rotary drilling muds which do not comply with the characteristics hereinbefore specified for uncontaminated and unpolluted rotary mud, shall be reported to this Board in accordance with the provisions of Section 13054 of the Water Code, and in accordance with the attached standard procedures adopted by the Division of Oil and Gas and the Water Pollution Control Boards for reporting proposed oil field waste discharges; and

BE IT FURTHER RESOLVED, that Resolution No. 52-1 (Adopting An Operating Procedure for Simplifying Filing of Reports on Disposal of Rotary Mud Resulting from Oil Well Drilling Operations) adopted by this Board on July 24, 1952, is hereby rescinded and superseded by this Resolution; and

BE IT FURTHER RESOLVED, that the Executive Officer of this Board is hereby authorized and directed to transmit copies of this Resolution to the oil operators, all State and local agencies concerned, and to all other interested persons.

I, Linne C. Larson, Executive Officer of the Los Angeles Regional Water Pollution Control Board No. 4, State of California, do hereby certify that the foregoing is a full, true, and correct copy of a resolution adopted by the Los Angeles Regional Water Pollution Control Board at the Board meeting held on December 20 1956.


LINNE C. LARSON, Executive Officer

11-23-56
LCL/mh

Response to State Clearing House Cover Letter of January 29, 1979

Comment No. 1 Department of Transportation Comment of December 19, 1978

Response: Mention has been made in the cumulative traffic section of the short radius turns and short acceleration lane at the Ventura Freeway and Rice Road interchanges.

Comment No. 2 State Water Resources Control Board Comment of January 4, 1979

No response needed.

Comment No. 3 Response to Los Angeles Regional Water Quality Control Board Letter of January 4, 1979

Response: This comment is acknowledged and will be transmitted to the Ventura County Planning Commission for consideration.



EDMUND G. BROWN JR.
GOVERNOR

State of California

GOVERNOR'S OFFICE
OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO 95814
(916) 445-0613

February 9, 1979

Robert K. Laughlin
Ventura County
800 South Victoria Avenue
Ventura, CA 93009

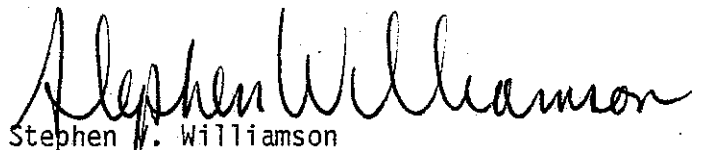
SUBJECT: SCH# 78121897 - CONDITIONAL USE PERMIT NO. CUP-3566 CHANSLOR
WESTERN OIL AND DEVELOPMENT CO.

Dear Mr. Laughlin:

The enclosed comments were prepared by the Air Resources Board regarding your project. These comments were not included in the package you received dated January 29th certifying State review of your draft environmental document.

To ensure compliance with the intent of the California Environmental Quality Act you should attempt to incorporate these additional comments into the preparation of your final environmental document.

Sincerely,


Stephen F. Williamson
State Clearinghouse

SVW/nb
Attachment
cc: Ken Fellows, DWR
Harmon Wong-Woo, ARB

State of California

Memorandum

To : L. Frank Goodson
Project Coordinator
Resources Agency

Date : February 2, 1979

Subject: Comments on the
Conditional Use
Permit No. CUP-3566,
Chanslor Western Oil
and Development Co.
SCH #78121897

From : **Air Resources Board**
Harmon Wong-Woo, Chief
Stationary Source Control Division

Introduction

The proposed project is a two-phased thermal oil recovery program in the Vaca tar sand deposit near Camarillo in Ventura County. Phase I would include heater, storage facility, and drilling and steam injection operations for up to 20 wells in the Oxnard Oil Field over a 30 month testing period. If Phase I proves successful, then production (Phase II) would commence with the development of an additional 100 wells (for a total of 120 wells), along with additional heaters and storage facilities. Ultimately, 45 acres of the 358.35 acre project site would be used for the drilling and siting of various types of pumping, tankage, and steam generation equipment over a 20 to 22 year period. Estimated production during Phase I is 1,300 barrels per day, and 5,000 barrels per day in Phase II.

During Phase I, production will be transferred by tank trucks to one of several possible refineries. All storage and transfer operations are planned to be equipped with vapor recovery controls, except for one 500 barrel capacity gauge tank.

During Phase II, oil will be transferred by one of three different alternatives: shipped by pipeline to existing tanker terminals in Ventura, shipped by pipeline directly to a refinery, or shipped by rail cars. All storage tanks and the rail car operation would employ vapor recovery.

General Comments

It does not appear that all emissions associated with the project are identified and tabulated in the draft. In addition, sufficient information is often lacking to verify the emission calculations. There also appears to be numerous, mostly minor, errors in the emissions calculations.

Specific Comments

1. The draft indicates that trade-offs for carbon monoxide are required if emissions are more than 50 lbs. The emission limit listed should be 100 lbs per hour, not 50 lbs per hour.
2. The draft does not include emissions from pumps for the pipeline, and

fuel combustion emissions from locomotives and oil tankers are also not considered. If the pipeline pumps are electric, this fact should have been stated in the draft, and emissions to produce the electricity for the pumps should have been calculated and tabulated.

3. The draft should have discussed which refineries would be likely to use the crude oil, and whether there would be any emission increases at the refinery due to the increased availability of crude oil.
4. In Table 3, emissions listed under "Production Noise" and Production Hoise" probably should be labeled "Production Hoist". In addition, Table 3 emissions labeled as "tons per hour", probably should be labeled "tons per year".
5. Emissions listed in Tables 2 and 3 do not all agree with data on the following page. For instance, emission of 33.7 lbs/hour of NOx should be 63.7 lbs/hour according to Table 2. Emissions of 288.3 lbs/hour of RHC and 32.23 lbs/hour of PM should be 266.3 and 29.63 lbs/hour respectively, according to Table 3.
6. The draft should have clarified whether the hydrocarbon emission calculations assumed 90% vapor recovery for storage and loading operations.
7. In Appendix E the number of wells drilled per year should have been included under "Drilling-Production Phase".
8. Also in Appendix E the fuel usage of two gallons per hour for the production hoist is inconsistent with the engine rating of 300 hp and a load factor of 75%. The energy content of two gallons of diesel fuel is only about half that of an engine whose output is 75% of 300 hp for one hour.
9. The emissions for the heaters in Phase I of the project appear to be too low by a factor of about three, based on the energy rating and fuel usage. In addition, the source of the emission factors for the heaters in Phase II appears to be incorrect. The source found in the draft applies to gasoline and diesel internal combustion engines.
10. The draft does not contain sufficient information on the number, size, throughput, and other parameters regarding storage tanks to verify the emissions calculations for these tanks.
11. The vehicle traffic emissions in Table 2 appear to be incorrect. The carbon monoxide emissions should be greater than any other pollutant, yet the table indicates that carbon monoxide emissions are the lowest of all pollutants.
12. The draft should have explained how emissions from pipeline, tanker, and rail car transportation were calculated. In addition, insufficient information is provided to verify the transportation emissions in Table 2. The transportation emission factor used for Table 2 appears to be for gasoline loading, not crude oil loading.

Response to Letter From California Air Resources Board, February 2, 1979

Comment No. 1

Response: The emission limit has been corrected in the EIR to specify 100 lbs per hour.

Comment No. 2

Response: Specific information was not available on the transportation systems. Since most of these emissions will not be generated in the project area, evaluation of these emissions was not considered critical by the Ventura County APCD.

Comment No. 3

Response: The applicant has not indicated where the extracted oil would be refined. Unless this location were known along with the specific oil characteristics and regulations pertaining to that facility, an analysis of secondary impacts of increased air emissions cannot be performed at this time.

Comment No. 4

Response: EIR has been corrected to note ARB comments.

Comment No. 5

Response: EIR has been corrected to note ARB comments.

Comment No. 6

Response: 90% vapor recovery was assumed on all storage and wading operations with the exception of one isolated gadge tank (in Phase I) and tanker loading.

Comment No. 7

Response: Specific information regarding phasing of wells per year is not available from the applicant.

Comment No. 8

Response: The information and assumptions in Appendix E were provided by the applicant. According to the Air Pollution Control District, since the estimated emissions coming from the production hoist were determined to be minor, even a change in these assumptions as suggested by the ARB comment would not result in a significant change in these emissions.

Comment No. 9

Response: The emissions from heaters in Phase I has been corrected in EIR; factors are from AP-42, Appendix C and Table 1.3-1. for industrial boilers. In the absence of better data, these factors are used.

Comment No. 10

Response: Information has bee included in Appendix E.

Comment No. 11

Response: Due to the use of diesel trucks, emissions of NOx are greater than other pollutants under Phase I Vehicle Traffic.

Comment No. 12

Response: Assumptions were inadvertantly left out of Appendix and have been included in the Final EIR.

CITY OF CAMARILLO

601 CARMEN DRIVE
P. O. BOX 248
CAMARILLO, CALIFORNIA 93010

(805) 482-8921

February 22, 1979

Mr. Robert K. Laughlin, Supervisor, Project Education Section
Ventura County Environmental Resource Agency
Building and Planning Services
800 South Victoria Avenue
Ventura, CA 93009

Subject: Draft EIR for CUP-3566, Chanslor Western Oil and Development Company

Gentlemen:

We feel that this EIR does not adequately describe the probable adverse impacts of this proposed project on the City of Camarillo. We expressed these same concerns to the County when this activity was initially proposed in mid-1976, and a draft EIR prepared by a consultant firm for Chanslor Western circulated for comment.

1. The maps do not show the extent of the 1774 acre tar sand deposit within the Oxnard plain and its relationship to existing agricultural preserves and to the City of Camarillo. The proposed pilot project should be shown in its true relationship to the much greater potential ultimate development. The maps and air photo used illustrate the project as though it is in the middle of a vast undeveloped area. The actual setting is in a growing community of 30,000 residents, all within three miles and in the prevailing airflow direction. The three schools including the County facility for severely handicapped children less than one mile distant from it must be shown and described to meet the requirements of CEQA.
2. The existing steam extraction facility is not shown, and it should be to give readers and residents an example of what these facilities typically are. Chanslor and the County may intend something better, but the virtually complete absence of description of this necessary machinery, combustion equipment, tanks, and trucks, falls far short of full disclosure required by CEQA.
3. There are no photos of existing roads which must carry construction traffic and tank trucks. The inadequacy of the Sturgis-Pleasant Valley intersection, bordered by deep drain ditches, to accommodate any other normal through traffic when obstructed by a large tractor-trailer should be shown. The route from field to point of storage or shipment should be shown.

Mr. Robert K. Laughlin
February 22, 1979
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4. The impact of odors from asphalt production, use of AP1-5 for steam generation, hot crude oil spills, and torching of waste gases including hydrogen sulfide has not been addressed in the Air Quality discussion. In view of the poor record of the existing plants in this regard throughout their 14 years of operation, this issue must be addressed.
5. The potential for acute health hazard from accidents or malfunction has not been addressed. Since the Poza Rica, Mexico, episode in which 32 persons died from a half-hour hydrogen sulfide torch failure is well known in APCD, this issue should be addressed.
6. The source of firefighting equipment and personnel is inadequately explored. In the event of a major fire (highly likely at some time during the project, since it involves developmental process equipment, continuous combustion in the presence of fuels including natural gases, and large quantities of tanked products) where is the equipment to come from, what existing communities are thereby deprived of normal protection, and who pays for it?
7. Phasing of development of the rest of the tar deposit (if the CUP-3566 project is satisfactory) is not explored. How many other companies own 400-acre sized portions of the 1774 acre field, and how many would immediately enter full scale production if a severe shortage of asphalt, concrete, or fuel develops in 1982, or any other year thereafter? The impact on Camarillo, which is projected to reach 64,000 population over the next 1-2 decades, will be increasingly severe with each elapsed year.
8. Impact on agriculture is inadequately described. The Summary on P-6 should state that \$661,500 is the annual (not total) loss, and that this figure is based on two crops a year and a gross of \$2100 per acre per crop. This is unrealistically conservative; celery has netted over \$4000 per acre per crop (\$8000-\$12000 per year) in the area served by the Camarillo office of the Ventura County Agricultural Commissioner for the past several years, and the outlook is for increasingly higher returns. The relationship of the oil field to existing agricultural preserves should be shown, and it should be noted that the project occupies 45 acres of preserves (see attached map). The impact of greatly increased emissions on agriculture throughout the Oxnard Plain and Las Posas Valley should be examined. There is a passing mention of sulfur oxides on P-13, but no followup in P27-33. Many pollutants and effluents are damaging to agriculture, not simply sulfur oxides.
9. Mitigation of subsidence by pumping down high quality high cost imported Northern California aqueduct water, when the project adjoins the Revolon Slough drainage basin, the cause of the adverse perched-groundwater table and flooding in the Sturgis Road area, seems poor use of resources. Surely this wasted runoff water or reclaimed treatment plant effluent, could accomplish anti-subsidence repressurization equally as well as TDS-100 water, and at far less cost.

Who is to pay for the elaborate monitoring and anti-subsidence measures described on P-27.

Mr. Rober K. Laughlin

February 22, 1979

Page 3

10. The fire hazard discussion on P-25 should mention the proximity of the airport; drilling rig towers and fuel tanks pose some additional risk. The area has a low fire potential now because it is in irrigated row crops. If farming is replaced by weed growth, the risk would of course increase.
11. Flora and fauna discussion, P-34, should note that Mugu Lagoon is a designated area of Special Biological Significance and is a habitat for three rare/endangered bird species. (See California Department of Fish and Game "Natural Resources of Mugu Lagoon", June 1976). Since the project lies well within the Beardsley-Revolon flood plain and the Sturgis Road area is flooded about 3 years out of 5, the likelihood of project contaminants reaching the Lagoon seems appreciable.
12. In view of the amount of existing oil development in the Oxnard Plain, and the potential extent of further development both from this application and other leasees throughout the Vacca tar sands field, we recommend that a cumulative EIR be accomplished so that the existing, added, and probable future emissions from this source (Oxnard Plain oil development) can be shown.

Attached are copies of typical conditions imposed on oil operations in Camarillo and sections of the Camarillo Zoning Ordinance as it applies to oil exploration.

Respectfully submitted,

M. L. Feuerborn

Marvin L Feuerborn
Planning Analyst

MLF:p

Enclosures

1-11-77

CONDITIONS

CUP-9

1. This Conditional Use Permit shall be considered for drilling of an exploratory core hole only. Should a discovery of oil be made, then a more detailed study of the effects of oil extraction will need to be completed by the City and the applicant shall apply for another Conditional Use Permit for the extraction of oil and/or gas.
2. Only portable equipment shall be used in the test hole operations and there shall be no fixed derricks or other fixed apparatus. Any utility relocation shall be made at developer's expense and to the satisfaction of the City Engineer. The location on the site of the drawworks and other equipment must be approved by the City.
3. In no event shall there be any detonation of explosive to obtain the seismic readings.
4. Once the actual drilling activities cease; all equipment shall be removed from the drill site within ninety (90) days. The hole shall be properly plugged to meet any requirements of the Fire Department, City of Camarillo and the Division of Oil and Gas of the State of California.
5. Internal combustion engines used in drilling the exploratory well shall be muffled to reduce noise to a minimum. In the event the noise from the drilling operation at any time becomes objectionable to the residents or operators of business activities in the vicinity, additional soundproofing will be provided to the satisfaction of the City Planning Department upon the finding that the noise level is above an acceptable level.
6. The drilling of the test hole shall be conducted in accordance with good oil field practice and latest technique and refinements in equipment and materials shall be used, including the installation and maintenance of the latest and most effective blowout prevention equipment, in accordance with the requirements of the Division of Oil and Gas. All materials used for soundproofing shall be of an approved type of fire retardant material.
7. The operator shall provide an electric log of the well starting at 50 feet below the surface. When a drilling depth of 2,000 feet is reached, the operator shall immediately analyze the log and provide the City Engineer with a copy of said log, together with the interpretation, showing any aquifers and an estimate of the salinity of all waters encountered. From the information so obtained, a joint determination shall be made of the required depth at which cementing or cement plugs must be set to protect all fresh water in abandonment of the test hole and to prevent movement of brine into fresh water zones, and thereafter such cement plugs or cementing shall be provided in the abandonment of the test hole. The casing and

equipment shall be abandoned to the City if potable water is found in production quantities and if the City decides it wants the casing and equipment, and if the City can negotiate for acquisition. At all times, the permittee shall comply with the provisions of the Public Resources Code of the State of California, relating to the protection of underground water supply and in connection with oil and gas extraction.

8. The public water supply system shall be protected against back-flow where necessary in a manner acceptable to the City and meeting the requirements of the Uniform Plumbing Code. Representatives of the City and other agencies or jurisdiction may enter upon the premises at any reasonable time for routine investigation of operations and/or facilities. Deficiencies or violations of ordinances and laws shall be corrected within a reasonable time as determined by the investigator. Local violations shall be coordinated through the Planning Director.
9. The drilling site and approaches thereto shall at all times be kept in a clean, neat appearing condition free from weeds and debris, other than necessary and incidental drilling equipment and supplies. All mechanical equipment and appurtenances used in the process of preparing, drilling, boring and abandoning an exploratory test hole and collecting geological data shall be adequately guarded and protected to insure the public safety. During these hours in which drilling operations are not being conducted, a watchman shall be stationed at the site to prevent the entry of unauthorized individuals.
10. All parking of vehicles, including those used by employees in connection with the operations in questions, shall be upon the subject site and include visitor parking in a manner and at a location approved by the City.
11. Upon completion of the test hole exploration work, an analysis of the information obtained as well as any other detailed information concerning the results which may be requested shall be supplied to the City Engineer, said information to be kept confidential if requested by the applicant.
12. That all piping, valves, fittings and equipment for drilling of an exploratory well shall be capable of withstanding the internal and external pressures and structural stresses to which they may be subjected. Such piping, valves, fittings and equipment shall be installed, used and maintained according to recognized good engineering practices.
13. All equipment and facilities shall be installed in a manner satisfactory to the Ventura County Fire Department and adequate fire protection shall be provided during drilling operations.
14. A 10-foot high sound deadening wall shall be installed along the westerly side project line. The wall shall be dark green in color.

15. All waste substances, such as drilling muds, oil, brine or acids produced or used in connection with drilling operations, shall be retained in water-tight receptors from which they may be piped or held for disposal at a site approved by the California State Regional Water Pollution Control Board.
16. All oil drilling operations shall be conducted in such a manner as to eliminate, as far as practicable, dust, noise, vibration, or noxious odors and shall be in accordance with the best accepted practices incident to drilling for oil, gas and other hydrocarbon substances. Proven technological improvements in drilling methods shall be adopted as they may become available.
17. No sign shall be constructed, erected, maintained or placed on the premises or any part thereof, except those required by law or ordinance to be displayed in connection with the drilling of the exploratory well.
18. Suitable and adequate sanitary toilet facilities shall be installed and maintained in a clean and sanitary condition at all times.
19. The City reserves the right to impose additional conditions or require corrective measures to be taken if it finds after actual observation or experience with drilling the test hole that additional conditions are necessary to afford greater protection to surrounding property and improvements. The City also reserves the right, upon request of the applicant-operator to modify any of the conditions which are found to be impractical by virtue of actual drilling experience on the site where the general intent of the conditions is still fulfilled.
20. The applicant shall post a performance bond in the amount of \$25,000 to guarantee site restoration and abandonment of the test well. In addition, a Certificate of Insurance for property damage and public liability in the amount of \$500,000 shall be provided and \$1,000,000 for bodily injury shall be provided.
21. No earthen sump shall be constructed or maintained within five hundred (500) feet, and no drilling shall be permitted within one hundred (100) feet of any natural channel in which there is or may be flowing water.
22. That the permit is granted for the land as described in the application and any attachments thereto and as shown on the plot plan submitted labeled Exhibit "A".
23. That the location of all buildings, fences, roadways, parking areas, landscaping and other facilities or features shall be located substantially as shown on the plan labeled "A".
24. That unless the use is inaugurated or the construction of the structure is commenced and being diligently pursued not later than twelve (12) months after the date this permit is granted, this permit will automatically expire on that date; however, if there have been no changes in the proposed plot plans or adjacent area, the Planning Director may grant one (1) additional six-month extension of time for use inauguratic

3. Oil Exploration and Extraction

It is declared to be in the interest of the public health, safety, welfare and the purpose and intent of this Section that the following conditions shall be and they are hereby automatically imposed and made a part of any conditional use permit for oil and gas drilling and extraction hereafter issued.

- a. Soundproofing. Whenever the drilling or redrilling of any oil or gas well is situated within five hundred (500) feet of any dwelling not owned by the permittee, or if applicable, the lessor of the permittee, the derrick, portable rig and machinery or equipment used to operate in connection with drilling, shall be enclosed with fire resistant and soundproofing material, unless the Planning Director is furnished written consent to waiver such condition by all owners and tenants of said dwellings. If a noise nuisance develops after written consent has been given and if inspection under supervision of the Planning Director sustains that the noise level constitutes a nuisance, the original provisions of soundproofing will prevail.
- b. That the exercise of any right granted by the permit shall conform in all respects to the regulations and requirements of the California State Regional Water Pollution Control Board No. 4. and the California Division of Oil and Gas; and that all water, mud, oil, or any other substances removed as waste material from the land for which the permit is issued shall be deposited in a disposal site approved by the Planning Commission and the California State Regional Water Pollution Control Board.

-
- c. That no earthen sump shall be constructed or maintained within five hundred (500) feet, and no drilling shall be permitted within one hundred (100) feet of any natural channel in which there is or may be flowing water.
 - d. That within ninety (90) days after a well is producing, the derrick, all boilers and all other drilling equipment shall be removed from the premises unless permission to store them on the premises is obtained from the Planning Commission.
 - e. That all sumps, or debris basins, or any depressions, ravines, gullies, barrancas or the like which are used for the impounding or depositing of water, mud, oil, or any other fluid, semi-fluid, or any combination thereof, shall be fenced. When any such place is located more than one-half (1/2) mile away from any school, playground or dwelling, it shall be enclosed by a cattle fence with wood or steel posts not less than four (4) feet above the ground with not less than three (3) strands of barb wire secured horizontally to posts. When any such place is located within one-half (1/2) mile of any school, playground or dwelling, it shall be enclosed by a wire fence of a wire mesh type with a maximum of two (2) inches by four (4) inches opening and said fence shall be secured to steel posts not less than five (5) feet in height above the ground and said posts shall have forty-five (45) degree arms attached to top of posts with three (3) strands of barbed wire attached thereto.
 - f. That no permanent buildings or structures shall be erected within one hundred (100) feet of boundaries
 - g. That the permittee shall at all times comply with the provisions of the Public Resources Code of the State of California, relating to the protection of underground water supply and in connection with oil and gas extraction.

- h. That upon abandonment of any well or cessation of drilling operations, all earthen sumps or other depressions containing drilling mud, oil, or other waste products from the drilling operation shall be cleaned up by removing such waste products or by consolidating all mud, oil, or other waste products into the land by disking, harrowing, and leveling to restore the land to the condition existing prior to the issuance of this permit as nearly as practicable so to do.
- i. Transfer of permit. Unless otherwise provided in the terms of a permit, the permit shall expire no later than when the permittee's ownership, lease or other right to develop the property in the manner described in the application is terminated. A permit may be transferred to another person only with the approval of the Planning Commission. A transfer shall be null and void unless and until (a) the Planning Commission has approved the transfer, (b) the Planning Commission has been furnished satisfactory evidence of the transfer, (c) the transferee files with the Planning Commission a writing wherein he obligates himself to comply with every term and condition of the permit, and (d) the transferee has filed an approved bond.
- j. That no drilling or other uses for which this permit is granted shall be commenced or continued unless and until permittee has filed, and the Planning Director has accepted a bond in the penal amount of twenty-five thousand dollars (\$25,000) for each well that is drilled or to be drilled. Any operator may, in lieu of filing such bond for each well drilled, redrilled, produced or maintained, file a bond in the penal amount of one hundred thousand dollars (\$100,000) to cover all operations conducted in the City of Camarillo, a political subdivision of the State of California conditioned upon the permittee will and truly obeying, fulfilling and performing each and every term and provision of the permit, and that in case of any failure by the permittee to perform or comply with any term or provision thereof, the Planning

Commission may, by resolution, declare the bond forfeited and the sureties and principal will be jointly and severally obligated to pay forthwith the full amount of the bond to the City of Camarillo. The forfeiture of any bond shall not insulate the permittee from liability in excess of the sum of the bond for damages or injury or expense or liability suffered by the City of Camarillo from any breach by permittee of any term or condition of said permit or any applicable ordinance or of this bond. The transfer of this permit, as provided for in Section 9602.3, City of Camarillo, shall not be effective unless and until the transferee has also complied with this condition for posting an approved bond.

- k. That all drilling and production operations shall be conducted in such a manner as to eliminate, as far as practicable, dust, noise, vibration or noxious odors, and shall be in accordance with the best accepted practices incident to drilling for and the production of oil, gas and other hydrocarbon substances. Where economically feasible, generally accepted and used technological improvements for reducing factors of nuisance and annoyance shall be employed by permittee.
- l. That a certificate of insurance for property damaged and public liability in the amount of \$500,000 and \$1,000,000 for bodily injury be provided.

I. REVOCATION, MODIFICATION, AND EXPIRATION OF CONDITIONAL USE PERMITS

1. Revocation of Conditional Use Permits

Upon recommendation by the Director, the body which initially granted the conditional use permit, shall conduct a noticed public hearing to determine whether such conditional use permit should be revoked. If the granting body finds any one of the following facts to be present, it shall revoke the conditional use permit.

- a. That the permit was obtained by fraud; or

Response to City of Camarillo Comments of February 22, 1979

Comment

Response

1. A new graphic (Figure 14 on page 37) has been prepared to show the geographical limits of the Vaca Tar Sands in relationship with existing agricultural lands. Figure 2 has been expanded to denote schools and hospitals in the Camarillo area (reference new Figure 2A).
2. Appendix E contains a list of all equipment that would be used for the proposed project.
3. The attached cumulative impact section makes mention of poor road alignment along Pleasant Valley Road and its inadequate intersections at Wood Road and Sturgis Road. Please note, however, that road improvements including the widening and realignment of Pleasant Valley are expected to be completed by the County in 1983. These improvements are expected to mitigate the road's existing inadequacies.
4. Please note that the area's existing odor problem is discussed on page 32. A further discussion of odor prevention measures is discussed in Comment No. 5.
5. The installation of a vapor recovery system has been proposed as a mitigation measure on page 32 of the EIR. Such a system, if installed on all wellheads and tanks, would insure that 95 percent of all vapors, including H₂S would be collected and then incinerated in one of the diesel fired steam generators. This system is proposed to control odors and to preclude a similar accident as occurred in Posa Rica.
6. According to the Ventura County Fire Department, the existing fire station located at the Camarillo Airport is fully equipped and staffed to provide emergency services to the site without significantly decreasing service to the City of Camarillo. Funding for fire protection services in the project area is provided by the Ventura County Fire Protection District. Funding for the District is provided on a countywide basis excluding incorporated areas who either provide their own fire protection services or contract with the District.
7. It is impossible to answer this question completely, but based on a survey of all oil lease holders and operators in the area, the Ventura County Planning Division has noted that only 88 wells are probable in the next 20 years. The impact of these wells has been addressed in the attached cumulative assessment.
8. Please note that the dollar figures in the text of the EIR are only estimates of agricultural income. Therefore, agricultural income could vary a great deal depending on the types of crops, number of croppings and weather conditions. For the purpose of this EIR; however, the figures chosen are considered adequate. According to the Air Pollution Control District, no information is available to quantify the exact amount of agricultural crop damage due to air quality degradation.
9. Please note, that the water sources you have mentioned have prohibitively high mineral contents so that their use in steam generators may be restricted (see this Agency's response to the City of Oxnard's similar comment). As for the subsidence monitoring program and equipment, the operator would be required to provide this program free from public expense.
10. According to the Property Administration Agency, the drilling rig towers pose no significant threat to airport operations.
11. Your comments have been so noted in the Final EIR.
12. An Air Quality Cumulative Impact section has been prepared to answer this question (see the attached Air Quality Cumulative Impact Section).

OXNARD PLAIN
OIL DEVELOPMENT
CUMULATIVE IMPACT ASSESSMENT

METHODOLOGY

The Oxnard Plain Oil Development Cumulative Assessment was prepared using all existing, proposed, and probable oil drilling and production projects in the area including primarily the Oxnard and West Montalvo oil fields. The inventory of existing wells was developed from annual and monthly reports of the State Division of Oil and Gas (D.O.G.). The proposed project list was prepared using permits currently filed with either the County or the Cities of Oxnard or Camarillo. The inventory of probable projects was obtained from direct contact with current permit operators to identify their future development programs for the next twenty (20) year period.

The attached map (Figure No. "A") illustrates all existing County Conditional Use Permits (CUP's) for oil drilling operations. This map also identifies the approximate location of existing producing wells as of June 24, 1978 (Source: D.O.G. map of Oxnard and West Montalvo oil fields - Nos. 213 and 214).

Definition of the "Cumulative Project"

Based upon the inventory referenced above, the cumulative oil development project was defined as:

- 92 Existing producing wells*
- 121 Proposed production wells
- 88 Probable future production wells that could be implemented over the next twenty (20) year period.
- 301 Total well count

Cumulative Analysis

The following cumulative impact assessments were prepared on the "worst case" assumption that all of the above referenced proposed and probable projects would occur over the next twenty (20) year time period. Other specific assumptions used during analysis are referenced within each factor assessment. This cumulative assessment analyzes the factors of air quality, groundwater, subsidence, and traffic and identifies cumulative mitigation measures where feasible.

A. CUMULATIVE AIR QUALITY ASSESSMENT

1. Setting

The Oxnard and West Montalvo oil fields are located in an area of flat, low-lying terrain. The prevailing wind is from the west during the day, with a less developed easterly wind occurring at night. During the day, as oxidant levels increase, this wind pattern causes oxidants and oxidant forming materials from the Oxnard Plain to travel inland through Moorpark to Simi Valley, through Santa Paula to the Fillmore-Piru area, and through the Conejo Pass to Thousand Oaks. A significant air quality problem exists in these areas, especially during the smog season. Under other meteorological conditions, pollutants from the Oxnard Plain may be transported to the Ojai area or to areas outside of Ventura County (See Figure 11, page 27 of this EIR).

2. Impact

According to the ³Air Pollution Control District Emission from oil production in RSA³ presently account for emissions of 390.2 tons per year of RHC, 1369.7 tons of NOx, 6.7 tons of PM, and 190.8 tons of CO. Assuming that activity at the Vaca Tar Sands proceeds as proposed, emissions from Phase II of the project will be so indicated in Table A. A cumulative project definition prepared by the Ventura County Planning Division has indicated probable 88 additional steam injection wells to be sited in the Oxnard Plain area (RSA3).

* Note: Latest D.O.G. monthly record of September 1978 (Report PRO4)
P97c1

Emissions from this activity as indicated in Table A would have a significant effect on the area's air quality on a "worst case" basis by roughly doubling the expected emissions coming from the proposed project.

3. Mitigation

Cumulative mitigation measures would be as previously indicated under project mitigation (see Section V-F in this EIR).

TABLE A
EMISSIONS FROM EXISTING, PROPOSED AND PROBABLE
OIL PRODUCTION PROJECTS IN RSA3

EXISTING (1977)*

<u>Source</u>	<u>Emissions (Tons/Year)</u>				
	<u>RHC</u>	<u>NOx</u>	<u>PM</u>	<u>CO</u>	<u>SOx</u>
Compressors/Engines	55.4	1339.8	5.0	187.0	-
Boilers	0.2	13.8	0.8	1.6	-
Heaters	0.2	16.1	0.9	2.2	-
Storage	72.4	-	-	-	-
Sumps/Pits	204.7	-	-	-	-
Fugitive	41.5	-	-	-	-
Truck Racks	15.8	-	-	-	-
TOTAL EXISTING	390.2	1369.7	6.7	190.8	-
<u>PROPOSED (CUP-3566)**</u>	72.6	720.4	114.4	106.1	538.8
<u>PROBABLE***</u>	63.9	634.0	100.7	93.4	474.1
Total Existing, Proposed and Probable:	526.7	2724.1	221.8	390.3	1012.9

*From Ventura County APCD Emissions Inventory

**Phase II Exceeding Transportation of Crude

***Based Upon: Assumption of 100% steam injection assumption that emissions are similar to CUP-3588 and are proportional to the wells drilled (88/100 or 88%).

B. CUMULATIVE GROUNDWATER ASSESSMENT

1. Setting

There is an ultimate potential for the development of up to 301 oil wells in the Oxnard Plain. Of these 301 oil wells, there could be a total of 216 existing, proposed and probable wells located in the vicinity of the Vaca Tar Sands over the next twenty (20) years. Oil wells drilled and operated in the Vaca Tar Sands will most probably be developed using the steam recovery method. As noted in the groundwater section (see Section V-D), seawater intrusion has been occurring in the Oxnard Aquifer Zone due to local waterwell overdrafting. Furthermore the Mugu Aquifer is also being overdrafted but data is unavailable to determine the exact rate.

2. Impact

The potential development of up to 218 oil wells using steam recovery methods could result in the demand for 72,270,000 barrels of water over the next twenty years (assuming each well used 1100 barrels of water per day, per year). The cumulative impact, if this amount of water was withdrawn from the Oxnard Aquifer Zone, would be a further expansion of the existing seawater intrusion front with an associated reduction in available fresh water reserves through contamination.

3. Mitigation Measures

Water for oil production for wells using steam injection could be supplied by either the use of water from the Fox Canyon Aquifer or from imported sources in order to preclude further overdrafting in the Oxnard and Mugu Aquifer Zones.

C. CUMULATIVE SUBSIDENCE ASSESSMENT

1. Setting

As noted in the subsidence section of this report (see Section V-E), up to two feet of subsidence has occurred since 1920 and another foot is expected over the next 22 years. While the exact reason for subsidence has not been specifically identified, it is thought to be the result of either natural tectonics, water withdrawal or oil withdrawal activities.

2. Impact

If additional wells (beyond the 120 wells proposed) are drilled in the Vaca Tar Sands, further subsidence could be expected at likely the same rate as projected for the proposed project (see Section V-E). According to the EIR assessment, 1.34 feet of subsidence (additional to the existing rate of subsidence) and one foot of horizontal displacement could result if the natural oil zone pressure is reduced by 400 PSI as a result of oil extraction. If the oil zone's pressure is reduced by 400 PSI the result would be a substantial pressure reduction with subsequent subsidence. Surface subsidence, if it occurred, could affect the efficiency of public and private drainage facilities, additional ponding of storm waters, and reduced agricultural productivity.

3. Mitigation Measures

The mitigation measures stated in Section V-E are applicable to the cumulative project as well as the proposed project. These measures include repressurization and monitoring to preclude the possibility of the tar sand compression whereby subsidence could occur.

D. CUMULATIVE TRAFFIC ASSESSMENT

1. As noted in the traffic and circulation Section (see Section V-L), the Oxnard oil field is accessible via either Rice Ave., or Pleasant Valley Road. Currently, the interchange at Rice Ave., and the Ventura Freeway has a very short radius for turning and short acceleration lanes. Caltrans has noted that this interchange may not be suitable for heavy truck travel. Rice Ave., south of the interchange with Ventura Freeway has two lanes but has been widened to four lanes and, in places, six lanes. Further widening along the entire route is not expected to occur within the next five years. However, an engineering study by the City of Oxnard for future widening has been authorized and is expected to be completed by 1983.

Pleasant Valley Road, on the other hand, has an adequate connection to the Ventura Freeway via four lanes on Las Posas Road. Pleasant Valley Road itself, however, is in need of realignment, especially at its intersections with Wood Road and Sturgis Road.

2. Impact

All proposed and probable oil recovery projects could cumulatively generate up to 100 ADT of project related traffic. Accordingly, no significant impact on the area's roads is anticipated as long as Rice Ave., was used for primary access from and onto the Ventura Freeway. However, large vehicles and trucks should use Pleasant Valley via the Las Posas Road interchange even though Pleasant Valley Road does not offer completely adequate access due to poor road alignment and inadequate intersections. This is recommended because Caltrans has indicated Rice Ave., is not suitable for heavy truck traffic.

3. Mitigation Measures

According to the PWA, construction plans and approved budgeting to widen Pleasant Valley Road and to correct its alignment and intersection inadequacies are expected to be completed by 1982. When these improvements are completed, Pleasant Valley Road may be the most appropriate route for oil related traffic.

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EXHIBIT 2

State Water Resources Control Board

December 7, 2018

Kenneth A. Harris Jr., State Oil & Gas Supervisor
Department of Conservation
Division of Oil, Gas & Geothermal Resources
801 K Street, MS 18-05
Sacramento, CA 95814-3530
ken.harris@conservation.ca.gov

PRELIMINARY CONCURRENCE ON THE AQUIFER EXEMPTION PROPOSAL, VACA TAR SANDS, OXNARD OIL FIELD, VENTURA COUNTY

Dear Mr. Harris:

State Water Resources Control Board staff, in consultation with Los Angeles Regional Water Quality Control Board staff (collectively Water Boards staff), have reviewed the proposal provided on February 2, 2017 by the Division of Oil, Gas and Geothermal Resources (DOGGR) to expand the aquifer exemption for the Vaca Tar Sands located within the Santa Barbara and Pico formations (including the Lower Tar Sands within the Modelo Formation) of the Oxnard Oil Field. Water Boards staff assessed whether the proposal meets the criteria set forth in California Public Resources Code (PRC) section (§) 3131 and § 146.4 of Title 40 of the Code of Federal Regulations (CFR).

Preliminary Concurrence with Limitations on Underground Injection Control (UIC) Projects

Pending the public comment process, State Water Board staff preliminarily concur with the exemption proposal for the Vaca Tar Sands. However, to ensure injected fluids do not affect the quality of water that is, or may reasonably be, used for any beneficial use, and remain in the proposed exempted area, the following limitations shall be incorporated in UIC project approvals:

- Injected fluids must be of similar or better quality than the existing groundwater in the Grimes Canyon Aquifer, as determined by Water Boards staff; and
- Fluids may only be injected into the Vaca Tar Sands (including the Lower Tar Sands).

In conjunction with the evaluation of current and future Class II UIC projects in the proposed exempted area, DOGGR and Water Boards staff will consider incorporating conditions, described below, into UIC project approvals.

State and Federal Exemption Criteria

As required by PRC § 3131(a)(1) and 40 CFR § 146.4(a), the proposed exempted area does not currently serve as a source of drinking water. No water supply wells were identified within the proposed exempted area. Water supply wells identified in proximity to the proposed exempted area are completed in the shallower alluvium, Saugus, San Pedro, and Santa Barbara Formations and are not hydrologically connected to the proposed exempted area. The deepest water supply well in the area is vertically separated from the proposed exempted area by more than 380 feet.

Consistent with 40 CFR § 146.4(b)(1), the proposed exempted area will not in the future serve as a source of drinking water because it is hydrocarbon producing. In addition, as per PRC § 3131(a)(2), the injected fluids are not expected to affect the quality of water that is, or may reasonably be, used for any beneficial use because (1) the groundwater contained in the proposed exempted area is not expected to be put to beneficial use because it contains petroleum hydrocarbons with oil saturations as high as 80 percent, (2) higher quality groundwater is available in shallower geologic zones, and (3) the injected fluids are expected to remain in the proposed exempted area.

The requirement of PRC § 3131(a)(3) is also satisfied because a detailed technical review has demonstrated that the injected fluids are expected to remain in the proposed exempted area due to a combination of geologic conditions and operational controls. Vertical containment for the proposed exempted area is provided by silty clays and shale beds, the high viscosity and immobile tar-saturated sands of the Vaca Tar Sands, operational controls, and the underlying low permeability Miocene Formations. Lateral containment in the proposed exempted area will be maintained by a production-induced inward hydraulic gradient and by the high viscosity and immobile nature of the tar in the Vaca Tar Sands.

Conditions on UIC Projects

Approval of Class II UIC projects involves a joint review by DOGGR and Water Boards staff. DOGGR and Water Boards staff will consider incorporating conditions into approvals of Class II injection projects. Potential conditions include, but are not limited to:

1. Verifying the presence of the Vaca Tar Sands and demonstrating that the project's perforation intervals are within the Vaca Tar Sands if injection is proposed into an area where oil production has not been established;
2. Ensuring that thermal enhanced oil recovery operations (e.g., cyclic steaming and steam flooding) do not compromise the containment capabilities of the tar along the boundaries of the proposed exempted area; and
3. Monitoring to demonstrate that injected fluids remain in the exempted area. If a groundwater monitoring requirement is incorporated in a UIC project approval, the operator must submit a work plan to the Los Angeles Regional Water Quality Control Board for review.

If you have any questions regarding this matter, please contact Mr. John Borkovich at (916) 341-5779 or john.borkovich@waterboards.ca.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jon Bishop".

Jonathan Bishop
Chief Deputy Director

cc: Renee Purdy
Acting Executive Officer
Los Angeles Regional Water Quality Control Board
renee.purdy@waterboards.ca.gov

Pat Abel
Deputy, Coastal District
Department of Conservation
Division of Oil, Gas & Geothermal Resources
pat.abel@conservation.ca.gov

EXHIBIT 3

**MEMORANDUM
COUNTY OF VENTURA
COUNTY COUNSEL'S OFFICE**

**LEGAL ANALYSIS OF ANTIQUATED OILFIELD
CONDITIONAL USE PERMITS**

The County of Ventura's ("County") ability to impose new conditions on antiquated oilfield permits is very limited. Because of the vested rights doctrine and constitutional protections afforded these permits, the County can impose new, narrowly tailored conditions on these permits only when a compelling public necessity, such as danger, harm or public nuisance, or significant violations exist, and not through an ordinary exercise of the police power for the general welfare.

If an antiquated oilfield permit contains open-ended conditions that allow for future requirements or modifications to the permit, the permit language might provide a limited basis for new conditions based on the terms of the permit. Older permits do not contain such language, and imposition of new conditions under this theory would require detailed analysis of each permit's terms and the conditions sought.

ANALYSIS

A. BACKGROUND

The drilling of wells for oil and gas production has been continuously subject to a permit from the County since the adoption of the County's first zoning ordinance in 1947. (Ventura Co. Ord. No. 412, §16 II.10., adopted March 18, 1947.)

Over time, the zoning ordinance has become more stringent in its regulation of oil and gas exploration and production and the conditions imposed on use permits have become more stringent. The language authorizing the oil and gas exploration and production use in permits, as well as conditions on the permits, vary greatly depending on when the use permit was first issued or later modified at the permittee's request.

The County's ordinance provisions for oil permits must be interpreted in a manner consistent with constitutional requirements, as analyzed below.

B. VESTED RIGHTS AND PERMIT MODIFICATIONS

A county may, under its police power, impose new requirements on an antiquated oilfield conditional use permit when a modification to the permit is sought by the

permittee. In such instances a county has broad powers to apply new modern conditions to a permittee-initiated request, subject to principles of reasonable relationship, essential nexus, rough proportionality and preemption. (See Gov. Code, § 65909; *Nollan v. California Coastal Com'n* (1987) 483 U.S. 825 [107 S.Ct. 3141]; *Dolan v. City of Tigard* (1994) 512 U.S. 374 [114 S.Ct. 2309]; *County Sanitation Dist. No. 2 v. County of Kern* (2005) 127 Cal.App.4th 1544, 1618-1624.)

Vested rights limit the power of a county to impose new, more restrictive zoning regulations, new conditions and other use limitations on a property owner after a certain point in the approval process or after actual development has occurred. (See *City of Claremont v. Kruse* (2009) 177 Cal.App.4th 1153, 1179 [holding that zoning moratorium may operate retroactively to require denial of pending applications or nullify permits issued but not utilized, but may not operate retroactively to divest permittee of vested rights previously acquired].)

In *Avco Community Developers, Inc. v. South Coast Regional Com.* (1976) 17 Cal.3d 785, the California Supreme Court stated the vested rights doctrine as applied to land use as follows:

“[I]f a property owner has performed substantial work and incurred substantial liabilities in good faith reliance upon a permit issued by the government, he acquires a vested right to complete construction in accordance with the terms of the permit. [Citations.] Once a landowner has secured a vested right the government may not, by virtue of a change in the zoning laws, prohibit construction authorized by the permit upon which he relied.” (*Id.* at p. 791.)

The vested rights doctrine protects a permit holder’s right not only to construct, but also to use the premises as authorized by the permit. (*County of San Diego v. McClurken* (1951) 37 Cal.2d 683, 691.) Also, for purposes of analyzing the scope of a vested right to operate a business, a business cannot be broken down into components and vested rights recognized for less than the entire business operation. (See *Hansen Brothers Enterprises, Inc. v. Board of Supervisors* (1996) 12 Cal.4th 533, 565-566 [indicating there is “no authority for refusing to recognize a vested right to continue a component of a business that itself has a vested right to continue using the land on which it is located for operation of the business.”].)

The vested rights rule is grounded upon the constitutional principle that a vested right is a property right which may not be taken without due process of law or just

compensation. (*Urban Renewal Agency v. California Coastal Zone Conservation Com.* (1975) 15 Cal.3d 577, 583-584.) When a conditional use permit has been issued and then relied upon by the permittee, giving rise to a vested right, the permit becomes immunized from impairment or revocation by subsequent government action. This rule is subject to the qualification that such a vested right, while immune from divestment through ordinary police power regulations, may be impaired or revoked if the use authorized or conducted under the permit constitutes a menace to public health and safety or a public nuisance. (*Highland Development Co. v. City of Los Angeles* (1985) 170 Cal.App.3d 169, 186.) Thus, a vested right creates a property right in the permit holder which cannot be terminated or impaired by the imposition of new conditions *at all*, unless constitutional requirements addressing the permittee's rights of due process are met. (See *Washington v. Glucksberg* (1997) 521 U.S. 702, 721-722 [117 S.Ct. 2258]; *Kerley Industries, Inc. v. Pima County* (9th Cir. 1986) 785 F.2d 1444, 1446.)

There are both procedural and substantive due process constitutional requirements that apply to governmental interference with such rights. The procedural requirements include notice to the permittee, a hearing on the termination of the permit or impairment of the permit through modified conditions, findings based on evidence received at the hearing and a decision based on the findings. (See *Trans-Oceanic Oil Corp. v. Santa Barbara* (1948) 85 Cal.App.2d 776, 797; *Topanga Assn. For a Scenic Community* (1974) 11 Cal.3d 506, 511.)^{1/} The substantive due process requirements are that vested rights cannot be terminated or impaired by ordinary police power regulations, and can be revoked or impaired (such as by new conditions imposed by a county) *only* to serve a "compelling state interest," such as a harm, danger or menace to public health and safety or public nuisance, and that the government's interference with the vested right be

^{1/} "The fourteenth amendment to the constitution of the United States provides that no person shall be deprived of life, liberty, or property, without due process of law. Article I, Section 1, of the constitution of California, provides that all men have certain inalienable rights, among them being those of enjoying liberty and possessing and protecting property, and section 13 thereof provides that no person shall be deprived of life, liberty, or property, without due process of law. The deprivation of such right without due process of law would be a violation of these provisions. The meaning of this is that no one can be deprived thereof without notice and an opportunity for a hearing before some tribunal authorized to determine the question. . . ." (*Trans-Oceanic Oil Corp. v. Santa Barbara*, *supra*, 85 Cal.App.2d at p. 796.)

narrowly tailored to address the compelling interest and its magnitude. (See *Washington v. Glucksberg, supra*, 521 U.S. at p. 721.)

These principles are best explained by the two following cases.

In *Davidson v. County of San Diego* (1996) 49 Cal.App.4th 639 (“*Davidson*”), the court addressed an attempt by the county to impose a new 650-foot setback requirement on a property owner that had a vested right to a building permit for a crematorium without the new setback. The court explained that:

“Vested rights, of course, may be impaired ‘with due process of law’ . . .” (*Davidson, supra*, 49 Cal.App.4th at p. 648.)

“The vested rights doctrine in the land use context ‘is subject . . . to the qualification that such a vested right, *while immune from divestment through ordinary police power regulations, may be impaired or revoked if the use authorized or conducted thereunder constitutes a menace to the public health and safety or a public nuisance.* [Citations.]’ (*Highland Development Co. v. City of Los Angeles* (1985) 170 Cal.App.3d 169, 186 [] (italics added), disapproved on other grounds in *Morehart v. County of Santa Barbara* (1994) 7 Cal.4th 725, 743, fn. 11 [].) Public welfare demands may even require the complete destruction of vested property rights. (*Sunset Amusement Co. v. Board of Police Commissioners* (1972) 7 Cal.3d 64, 80 [].)” (*Davidson, supra*, at p. 649.)

“The constitutional question, on principle, therefore, would seem to be, not whether a vested right is impaired [by a change in the law], but whether such a change reasonably could be believed to be sufficiently necessary to the public welfare as to justify the impairment.” (*Davidson, supra*, at p. 649.)

‘Probably the single most important factor to be considered in determining whether a particular impairment is constitutionally permissible is the nature and extent of the impairment. “The severity of the impairment measures the height of the hurdle the . . . legislation must clear.”’ [Citations.] Other important factors to be considered are the nature, importance and urgency of the interest to be served by the challenged legislation; and whether the legislation was appropriately tailored and limited to the situation necessitating its enactment. [Citations.]” (*Davidson, supra*, at p. 649.)

The court concluded that, while the usual exercises of the police power in the land use context are not so directly related to danger or potential danger to the health and safety (such as down-zoning of uses, lot densities and height requirements) to be applied to the property owner's permit, it was conceivable that the 650-foot setback requirement could be applied to the crematorium project, but only if the county could demonstrate that such a setback was necessary to prevent the operation of the crematorium from being a danger or nuisance to the public. (*Davidson, supra*, at p. 650.)

Similarly, in *O'Hagen v. Board of Zoning Adjustment* (1971) 19 Cal.App.3d 151, ("O'Hagen"), the court reviewed a city's revocation of a use permit for the operation of a drive-in restaurant for which the permittee held a vested right under an ordinance which allowed revocation of permits "for violation of conditions and other good cause upon notice and hearing." The court stated that:

"Once a use permit has been properly issued the power of a municipality to revoke it is limited. (*Trans-Oceanic Oil Corp. v. Santa Barbara* [*supra*,] 85 Cal.App.2d [at p.] 783 [].) Of course, if the permittee does nothing beyond obtaining the permit it may be revoked. (*Trans-Oceanic Oil Corp. v. Santa Barbara, supra*.) Where a permit has been properly obtained and in reliance thereon the permittee has incurred material expense, he acquires a vested property right to the protection of which he is entitled. (*Trans-Oceanic Oil Corp. v. Santa Barbara, supra*, at pp. 784-787; *Dobbins v. Los Angeles* [(1904)] 195 U.S. 223, 239 [[] 25 S.Ct. 18]; *Jones v. City of Los Angeles* [(1930)] 211 Cal. 304, 309-312 []; see *Brougher v. Board of Public Works* [(1928)] 205 Cal. 426, 433-434 [].) When a permittee has acquired such a vested right it may be revoked if the permittee fails to comply with reasonable terms or conditions expressed in the permit granted (*Trans-Oceanic Oil Corp. v. Santa Barbara, supra*, at p. 783; *Brougher v. Board of Public Works, supra*, at p. 433) or if there is a compelling public necessity. (*Jones v. City of Los Angeles, supra*, at p. 314; see *Lawton v. Steele* [(1894)] 152 U.S. 133, 137 [[] 14 S.Ct. 499]."

(*O'Hagen, supra*, 19 Cal.App.3d at p. 158, italics added.)

The court further explained that procedurally:

"The constitutional requirements are met with respect to the right of revocation for good cause when notice is given to the licensee or permittee of the charges made against him and he has been given an opportunity to be heard in his defense." (*O'Hagen, supra*, at p. 160.)

And that substantively:

“[I]n order to justify the interference with the constitutional right to carry on a lawful business it must appear that the interests of the public generally require such interference and that the means are reasonably necessary for the accomplishment of the purpose, and not unduly oppressive upon individuals. (*Lawton v. Steele*, *supra*, 152 U.S. [at p.] 137 [].)

As observed in *Lawton*, ‘The legislature may not, under the guise of protecting the public interests, arbitrarily interfere with private business, or impose unusual and unnecessary restrictions upon lawful occupations.’ (At p. 137 []; see *Dobbins v. Los Angeles*, *supra*, 195 U.S. [at p.] 236 [].)” (*O’Hagen*, *supra*, at p. 159.)

“In the present case we perceive that since plaintiff acquired a vested right in the use permit we must equate the term ‘good cause’ with ‘compelling public necessity.’ Such ‘compelling public necessity,’ in turn, must be viewed in the context of a public nuisance, i.e., whether the operation of plaintiff’s drive-in restaurant constituted a public nuisance in fact. If it did constitute a nuisance in fact, our inquiry is then directed to whether there was a compelling necessity warranting the revocation of the use permit.” (*O’Hagen*, *supra*, at p. 161.)

The court then indicated that conditions should be imposed on the permit to eliminate any public nuisance, if possible, rather than to prohibit the business operations by revocation of the permit. (*O’Hagen*, *supra*, at p. 165.)

Moreover, permits subject to vested rights are afforded special judicial protection by the courts when there is judicial review of the governmental decision to impair or revoke them. Longstanding vested rights under a use permit are generally treated as creating “fundamental vested rights” to use the property in the manner specified in the conditions for purposes of judicial review. This results in the court applying an “independent judgment” standard of review, rather than the more deferential “substantial evidence” standard of review ordinarily applied to land use decisions. (See *Malibu Mountains Recreation, Inc. v. County of Los Angeles* (1998) 67 Cal.App.4th 359, 368-370; *Goat Hill Tavern v. City of Costa Mesa* (1992) 6 Cal.App.4th 1519, 1526.) So, after affording the government’s findings a presumption of correctness, the court may, upon reviewing the record, exercise its own judgment in making its own findings and reach a different decision from that of the government. (See *Fukuda v. City of Angels* (1999)

20 Cal.App.4th 805, 819). Thus, these fundamental vested rights enjoy “heightened protection against government interference” under the due process clause. (*Washington v. Glucksberg*, *supra*, 521 U.S. at p. 720.)

Consistent with the above case law, a county must establish the facts and make its decision justifying any modification of conditions or revocation of an antiquated oilfield permit on the basis of harm, danger or menace to the public health and safety or public nuisance.

The vested right in a permit entitles a permit holder significant and heightened judicial protections from revocation, imposition of new regulations, and changes to the permit. To impose new conditions on antiquated permits, a public agency has to demonstrate that for each condition it imposed, there was a danger or menace to public health and safety or public nuisance causing public concern that was addressed by the new condition in a manner commensurate to the level of public concern. The vested rights doctrine and constitutional principles of due process prevent a county from a general exercise of its police power to add modern conditions to antiquated oilfield permits just for the sake of improving their operation for the general welfare.

In addition to the harm/nuisance qualification on the exercise of a vested right, there are other limitations to vested rights. The rights which may vest are no greater than those specifically granted by the permit and its conditions. (*Santa Monica Pines, Ltd. v. Rent Control Board* (1984) 35 Cal.3d 858, 866; *Metropolitan Outdoor Advertising Corp. v. City of Santa Ana* (1994) 23 Cal.App.4th 1401, 1401-1404.) Accordingly, a vested right may be modified or revoked for cause if the permit holder fails to comply with the conditions in the permit. (*O’Hagen, supra*, at p. 158.)

While violation of conditions or laws do provide a basis for permit revocation or modification separate from the “danger to the public/public nuisance” basis, courts continue to apply the heightened scrutiny to the government’s actions revoking or impairing permits on the bases of noncompliance with conditions or violations of law. The court decisions indicate that where failure to comply is extensive and alternative remedies are not feasible, revocation of a permit can be justified. (See *Malibu Mountains Recreation, Inc. v. County of Los Angeles, supra*, 67 Cal.App.4th at p. 359 [involving longtime, multiple uses that violated underlying zoning ordinance and failure to engage in initially allowed use].) However, heightened scrutiny arising out of the vested right in the permit and its due process protections would require a county to “narrowly tailor” its action, and when alternative remedies can achieve compliance with permit conditions, the county would need to pursue such alternatives to revocation if feasible.

(See *Korean American Legal Advocacy Foundation v. City of Los Angeles* (1994) 23 Cal.App.4th 376, 391-393, fn. 5 [indicating that harsh remedy of revocation requires strictest adherence to principles of due process and that alternative remedies to revocation (such as additional conditions or controls) that achieve goal of eliminating violations ought to be pursued if feasible].)

Another qualification on the exercise of a vested right is the existence of open-ended conditions in a vested permit which contemplate future limitations. Such open-ended conditions may restrict the permit holder's vested right when those limitations are subsequently enacted.

For example, in *Russ Bldg. Partnership v. City and County of San Francisco* (1988) 44 Cal.3d 839, 846, a developer was ordered to pay a transit impact development fee enacted after the permit was issued and substantial construction had commenced, based on a permit condition that required future participation in some type of transportation funding. The post-permit issued transit development fee was found by the court to be within the scope of the condition originally imposed and was properly applied to the permittee on this basis.