CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2005-0134

# WASTE DISCHARGE REQUIREMENTS FOR CHEVRON USA, INC. SECTION 29 SURFACE IMPOUNDMENTS LOST HILLS OIL FIELD KERN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds that:

1. Chevron USA, Inc. (Discharger) is a corporation organized under the laws of the State of the Commonwealth of Pennsylvania and authorized to do business in the State of California.

2. The Discharger owns and operates crude oil production wells in the area and a wastewater disposal facility consisting of eight unlined surface impoundments located on the Section 29 property in the Lost Hills Oil Field. The facility is as shown on Attachments A and B which are attached to and made part of this Order.

3. Non-hazardous production water from the Discharger's oil wells and filter backwash water from a water treatment plant (wastewater) are discharged to the impoundments.

4. This Order implements the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition - 1995* (Basin Plan), which designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.

5. The discharges are subject to the requirements of Title 27, California Code of Regulations (Title 27), Section 20090(b), and are currently regulated by Waste Discharge Requirements (WDRs), Resolution No. 58-275. The WDRs are outdated and are being updated to reflect Basin Plan policy, current regulations, and new site-specific technical information.

## LOCATION AND DESCRIPTION

6. The Lost Hills Oil Field is on the west side of the San Joaquin Valley, approximately 45 miles west-northwest of Bakersfield, in Kern County. The Section 29 Chevron fee property consists of approximately 636 acres in Section 29, T26S, R21E, MDB&M (Assessor Parcel Nos. 058-180-18-3 and 058-180-17-5).

7. The impoundments, which have a surface area of approximately 26 acres, are used for the disposal of wastewater by evaporation and percolation. Generally, in excess of 4,000,000 barrels of wastewater annually are discharged to the impoundments.

8. The impoundments are unlined and do not meet the prescriptive construction criteria for Class II surface impoundments as specified in Title 27, CCR, Section 20005, et seq.

9. The land in the SW½ of Section 29 is used for oil and gas production. The NE½ of Section 29 that is not part of the disposal facility consists of native vegetation. Currently, some of the adjacent land in Sections 20, 21, and 28 is used for growing almonds and/or pistachios.

10. The Lost Hills Oil Field lies on the Antelope Plain, an alluvial piedmont consisting of coalescing alluvial fans from the Temblor Range to the west. The region slopes to the east towards the San Joaquin Valley.

11. The site is in the South Valley Floor Hydrologic Unit, Antelope Plain Hydrologic Area (No. 558.60), as depicted on interagency hydrogeologic maps, prepared by the Department of Water Resources in August 1986.

12. The climate in the area is semi-arid, with hot, dry summers and cool winters. Available weather data through 1997 from a monitoring station at Lost Hills indicates the average annual precipitation is 5.64 inches. The annual Class A pan evaporation rate is approximately 108 inches.

13. The 100-year and 1000-year, 24-hour precipitation events calculated by the California Department of Water Resources are 2.64 inches and 3.47 inches, respectively, for the Lost Hills monitoring station based on data through 1995.

14. Federal Emergency Management Agency Flood Insurance Rate Map, Community Panel Number 060075-0375-B, dated 29 September 1986, shows the impoundments are not within the 100-year floodplain.

15. Two unnamed ephemeral stream channels traverse the Section 29 property approximately 900 feet to the northwest and 150 feet to the southeast of the facility. Natural flow in the stream channels occurs during infrequent high precipitation storm events. Where both stream channels intersect the California Aqueduct, siphons have been constructed. The stream channels are defined as West Side Streams in the Basin Plan.

16. Table II-I, Tulare Lake Basin Surface Water Beneficial Uses, designates the West Side Streams as having beneficial uses that include: agricultural supply (AGR); industrial service and process supply (IND & PRO); water contact and non-contact water recreation; warm freshwater habitat; wildlife habitat; rare and endangered species habitat; and groundwater recharge. Some beneficial uses may not be applicable to a body of water.

## HYDROGEOLOGIC INFORMATION

17. The Discharger has conducted a detailed investigation to evaluate groundwater and geologic conditions at the Section 29 property and portions of adjoining Sections 20, 21, and 28.

18. At the Section 29 property and adjoining sections, the stratigraphy (Attachment C) consists of three geologic units. The youngest unit is Alluvium, which consists of alternating sand, silt, and clay. Underlying the Alluvium is the Corcoran Clay Equivalent, which was unconformably deposited on the underlying Tulare Formation of Pleistocene age. Within the Alluvium is a sand layer designated as the Basal Alluvial Sand, analogous to the 22K Sand in the area east of the South Belridge Oil Field.

19. A regional unconformity is at the base of the Tulare Formation. Above the unconformity, the Tulare Formation and the Holocene sediments gently dip and thicken to the east-northeast towards the San Joaquin Valley.

20. Hydrogeologic information indicates that the site geology allows wastewater to migrate from the impoundments to the northeast, towards useable groundwater aquifers in the San Joaquin Valley.

21. In the Lost Hills Oil Field, the Discharger produces oil and wastewater from the Tulare, Etchegoin, and Monterey Formations. The shallowest production is in the Tulare Formation at a depth of approximately 200 feet.

22. Pursuant to 40 CFR, Section 146.4, the Tulare Formation within the administrative boundaries of the Lost Hills Oil Field, has been exempted as an underground source of drinking water in accordance with the Federal regulations, for the injection of non-hazardous Class II oil field produced wastewaters. Class II water disposal injection wells are permitted by the California Division of Oil, Gas, and Geothermal Resources (CDOGGR) under authority granted by the United States Environmental Protection Agency (USEPA).

23. In the Lost Hills Oil Field, the Discharger operates six Class II injection wells for the disposal into the Tulare and Etchegoin Formations. During 2003, the Discharger reported 1,079,000 barrels of wastewater were injected into the disposal wells.

24. No known Holocene faults traverse or are projected through the area. The nearest known Holocene fault is the San Andres Fault zone, located 22 miles southwest of the site.

## WASTEWATER CHARACTERISTICS AND CLASSIFICATION

25. On 2 September 2004, Regional Board staff collected wastewater samples from the first unnetted impoundment next to the wastewater inlet pipe. A state certified laboratory

analyzed the samples and reported the following results: Specific Conductance (EC), 33,000 µS/cm; total dissolved solids (TDS), 21,000 mg/L; chloride, 11,000 mg/L; boron, 90 mg/L; total ammonia as nitrogen, 140 mg/L; and total Kjeldahl nitrogen, 170 mg/L.

26. Non-hazardous waste that contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state is defined in California Water Code, §13173 (b) as "Designated Waste."

27. The Discharger has conducted a feasibility study of disposal alternatives, and has determined that two alternatives are feasible: (a) extensive wastewater treatment plant modifications and disposal of wastewater into Class II injection wells; and, (b) installation of additional treatment plant and off-plant facilities to reclaim oxygen free water for the waterflood, and disposal of remaining oxygen saturated wastewater into Class II injection wells permitted by the CDOGGR.

28. The Discharger, in correspondence dated 25 October 2004, committed to permanently cease wastewater discharges to land for purposes of disposal, and close the surface impoundments in accordance with the time schedule contained in this Order.

## BASIN PLAN INFORMATION

29. The Basin Plan contains maximum numerical salinity limits for the disposal of oil field production wastewater in unlined impoundments overlying groundwater with existing and future probable beneficial uses. The maximum concentration limits are: electrical conductivity at 25$^{o}$ C, 1,000 µmhos/cm; chloride, 200 mg/L; and, boron, 1 mg/L.

30. Table II-2 in the Basin Plan lists the beneficial uses of groundwater. The facility is in the Kern County Basin Hydrologic Unit and the 259 Detailed Analysis Unit, which has the following beneficial uses of groundwater: municipal and domestic supply (MUN), agricultural supply (AGR), and industrial service supply (IND). The Basin Plan defines MUN as uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply. The Basin Plan defines AGR as uses of water for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing. The Basin Plan defines IND as uses of water for industrial activities that do not depend primarily on water quality, including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.

31. The Basin Plan allows the Regional Board to consider criteria for exceptions to beneficial uses of groundwater. One of the exception criteria for both the MUN and AGR beneficial use designations is: "The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, Section 146.4 for the purpose of

underground injection of fluids associated with the production of hydrocarbon or geothermal energy…" An exception criteria for just the MUN designation is: "The total dissolved solids (TDS) must exceed 3,000 mg/L (or an electrical conductivity exceeding 5,000 µmhos/cm) and the aquifer cannot be reasonably expected to supply a public water system."

32. Where a Regional Board finds that one of the exception criteria apply, it may remove the designation for the particular water body through a formal Basin Plan amendment, which includes a public hearing. The exception becomes effective upon approval by the State Water Resources Control Board (State Board) and Office of Administrative Law. Table II-2 in the Basin Plan lists those beneficial use exceptions that have been considered by the Regional Board.

## GROUNDWATER INFORMATION

33. There are no drinking water supply wells within one mile of the facility.

34. The Discharger owns and operates three industrial service supply wells in Sections 3 and 10 of T27S, R21E, MDB&M, approximately three miles southeast of the facility. The wells supply approximately 30,000 to 32,000 barrels per day of groundwater from the Tulare Formation for use by the Discharger for waterflood injection. The groundwater has concentrations that average about 4,500 mg/L for TDS and 10.5 mg/L for boron. These wells are completed below the Corcoran Clay Equivalent, in the Tulare Formation.

35. The nearest agricultural supply well is the idle Munger Farms well in the SW¼, SW¼, Section 21, T26S, R21E, MDB&M, approximately 3,200 feet northeast of the impoundments (Attachment B). The well was drilled in 1976 and David Munger has stated that it has never been used. The well is gravel-packed to near the surface with a screened interval from 300 - 570 feet. Analytical results of a groundwater sample collected from the well in 1976 had the following concentrations: TDS, 3,752 mg/L; chloride, 743 mg/L; and boron, 5.2 mg/L.

36. An investigation conducted by the California Department of Water Resources in 1956 (*Geologic and Waste Disposal Investigation, Lost Hills Oil Field, Kern County, Project No. 57-5-1*) includes information stating that a stock watering well in the SE¼, SW¼, Section 28, T26S, R21E, MDB&M (Attachment B) was sampled in 1956. The total depth of the well was 190 feet, which is estimated to be deep enough to have penetrated the Basal Alluvial Sand. The well was subsequently abandoned. The sample had the following concentrations: TDS, 3,190 mg/L; chloride, 664 mg/L; and boron, 4.5 mg/L. These concentrations appear to be representative of background groundwater quality.

37. In 2000, the Discharger installed groundwater monitoring well 29MW-1 approximately 575 feet southwest of the impoundments (Attachment B). The well screen was installed across the uppermost Tulare Formation (Attachment C). A groundwater sample collected

in 2004 had the following salinity and boron concentrations: TDS, 12,900 mg/L; chloride, 4,670 mg/L; and boron, 6.6 mg/L.

38. In 2001, the Discharger conducted a surface geophysical survey in the area downgradient of the facility to evaluate possible wastewater impacts. The results of the survey indicated elevated groundwater conductivities between the facility and the California Aqueduct.

39. In 2002, the Discharger advanced four borings (designated as GW1 - GW4) northeast (downgradient) of the impoundments to depths between 317 and 450 feet (Attachment B).

40. In 2004, the Discharger advanced five additional borings (designated as GW5, GW6, 21MW-1, 21MW-2, & 21MW-3) northeast of the impoundments to depths between 277 and 415 feet (Attachment B). The Discharger then constructed groundwater monitoring wells 21MW-1, 21MW-2, and 21MW-3, east of the California Aqueduct. The well screens were installed across the lowermost part of the Basal Alluvial Sand (Attachment C). Groundwater samples had the following salinity and boron concentration ranges: TDS, 3,840 - 4,100 mg/L; chloride, 934 - 1,510 mg/L; and boron, 4.0 - 4.8 mg/L.

41. Groundwater is first encountered in all borings (except the 29MW-1 boring) as thin, perched zones at depths ranging from 17 to 55 feet (Attachment C). The samples had the following concentration ranges: TDS, 6,850 - 36,700 mg/L; chloride, 540 - 15,300 mg/L; and boron, 10 - 48 mg/L.

42. Borings GW1 and GW2 are approximately 1,400 feet northeast of the impoundments (Attachment B). While advancing the borings, groundwater samples were collected at various depths (97 – 337 feet) in aquifers above and below the Corcoran Clay Equivalent. The samples had the following concentration ranges: TDS, 14,700- 33,800 mg/L; chloride, 5,880 - 16,200 mg/L; and boron, 21- 86 mg/L. Based on the data submitted, groundwater to a depth of approximately 337 feet has been impacted by wastewater migrating from the impoundments. Groundwater in the Alluvium, Basal Alluvial Sand, and the upper Tulare Formation is impacted by wastewater (Attachment C).

43. Borings GW3, GW5, and GW6 are approximately 2,600 to 4,000 feet northeast of the impoundments (Attachment B). While advancing the borings, groundwater samples were collected at various depths (85 – 415 feet) in aquifers above and below the Corcoran Clay Equivalent. The samples have the following concentration ranges: TDS, 2,940 - 29,400 mg/L; chloride, 4,270 - 11,500 mg/L; and boron, 3 - 67 mg/L. Based on the data submitted, groundwater to a depth of 278 feet has been impacted by wastewater migrating from the impoundments. Groundwater in the Alluvium, the lowermost part of the Basal Alluvial Sand, and the upper Tulare Formation is impacted by wastewater (Attachment C).

44. Borings GW4, 21MW-2, and 21MW-3 are approximately 6,000 to 6,600 feet northeast of the impoundments (Attachment B). While advancing the borings, groundwater samples

were collected at various depths (75 – 395 feet) in aquifers above and below the Corcoran Clay Equivalent. The samples have the following concentration ranges: TDS, 2,820 - 10,400 mg/L; chloride, 539 - 3,500 mg/L; and boron, 2.1 - 17 mg/L. Based on the data submitted, there is no conclusive information indicating groundwater in the Alluvium, Basal Alluvial Sand, or the upper Tulare Formation has been impacted by wastewater from the impoundments (Attachment C).

45. Based on the data submitted, the maximum lateral extent of wastewater migration from the impoundments within the Basal Alluvial Sand extends to the northeast to between the California Aqueduct and monitoring wells 21MW-1, 21MW-2, and 21MW-3 (Attachment C).

46. Based on the data submitted, the maximum lateral extent of wastewater migration from the impoundments both above and below the Basal Alluvial Sand extends to the northeast between boring GW3 and the California Aqueduct (Attachment C).

47. The Discharger has submitted information stating the flow direction of groundwater in the Basal Alluvial Sand is to the northeast at a gradient of 0.0036 feet/feet.

## CEQA AND OTHER LEGAL REFERENCES

48. The action to adopt WDRs for existing facilities is exempt from the provisions of the California Environmental Quality Act (Public Resources Code 21000, et seq.), in accordance with Title 14, California Code of Regulations, Section 15301.

49. This Order requires the Discharger to submit technical reports as authorized under CWC Section 13267(b)(1), which states in part:

    "In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the Regional Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports."

50. The technical reports required by this Order and the attached "Monitoring and Reporting Program No. R5-2005-0134" are necessary to assure compliance with these WDRs. The Discharger owns and operates the facility and discharges waste subject to this Order.

51. The Discharger is not required to obtain coverage under a National Pollutant Discharge Elimination System (NPDES) general industrial stormwater permit, provided the facility has not experienced a reportable spill since 19 November 1987. It is the responsibility of the Discharger to comply with USEPA federal stormwater regulations (40 CFR Parts 122, 123, and 124) should the facility not qualify for exemption.

52. This Order is consistent with the antidegradation provisions of State Board Resolution 68-16. Provided the Discharger complies with the Order, discharges in the future should not cause adverse impacts on groundwater.

## PROCEDURAL REQUIREMENTS

53. The Regional Board has notified the Discharger, interested agencies, and persons of its intent to prescribe WDRs for this discharge and has provided them with an opportunity to submit their written views and recommendations.

54. The Regional Board, in a public meeting, heard and considered all comments pertaining to this proposed Order.

55. Any person adversely affected by this action of the Regional Board may petition the State Board to review the action. The petition must be received by the State Board within 30 days of the date of issuance of this Order. Copies of the law and regulations applicable to filing petitions are available at http://www.waterboards.ca.gov/water_laws and will be provided upon request.

IT IS HEREBY ORDERED, that Resolution No. 58-275 be rescinded, and that pursuant to Sections 13263 and 13267 of the California Water Code, Chevron USA, Inc., its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and plans, policies, and regulations adopted thereunder, shall comply with the following:

## A. PROHIBITIONS

1. The acceptance, treatment, or discharge of "hazardous waste" is prohibited. For purposes of this Order, the term "hazardous waste" is as defined in Title 23, California Code of Regulations, §2510, et seq.

2. Discharges of waste to surface water or surface water drainage courses are prohibited.

3. The discharge of waste to land other than wastewater associated with the production of petroleum hydrocarbons described in Finding No. 3 is prohibited.

4. Following closure, the temporary discharge of wastewater to an impoundment during an upset or emergency condition is prohibited without having a Spill Prevention Control and Countermeasures Plan previously approved by the Executive Officer.

## B. SPECIFICATIONS

1. Wastewater discharged to unlined surface impoundments that do not meet the prescriptive construction criteria for classified waste management units as specified in Title 27 and overlying groundwater with existing and future probable beneficial uses shall not exceed the following limits prescribed in the Basin Plan: electrical conductivity at 25$^{o}$ C, 1,000 µmhos/cm; chloride, 200 mg/L; and, boron, 1 mg/L.

2. In order to comply with specification B.1, the Discharger has committed to implement the disposal alternatives and close the surface impoundments as described in Finding No. 27 and Finding No. 28 in accordance with the time schedule contained in Provision C.11 of this Order.

3. The impoundment berms shall be maintained to prevent seepage or leakage caused by erosion, slope failure, or animal burrowing.

4. The impoundments shall have sufficient freeboard to prevent overtopping caused by successive precipitation events, high velocity winds, or seismic shaking. In no case shall there be less than two feet (measured vertically) of freeboard.

5. Precipitation and drainage control systems shall be designed, constructed, and maintained to accommodate the anticipated volume of precipitation and peak flows from surface runoff under 100-year, 24-hour precipitation conditions. Annually, prior to the anticipated rainy season, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the impoundments.

6. The impoundments shall either be free of oil or effectively netted to preclude entry of wildlife in accordance with Title 14, CCR, §1770 (b) (3).

7. Public contact with wastewater shall be precluded through such means as fences, signs, or other acceptable alternatives.

8. The Discharger shall operate and maintain the wastewater impoundments in a manner that prevents liquids, precipitates, and sludges from concentrating to hazardous levels.

## C. PROVISIONS

1. The Discharger shall comply with the attached Monitoring and Reporting Program No. R5-2005-0134, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

2. The Discharger shall comply with those applicable sections of the *"Standard Provisions and Reporting Requirements for Waste Discharge Requirements"* (Standard Provisions) dated August 1997, which are attached to, and by reference, a part of this Order. To the extent that the Standard Provisions are inconsistent with any terms, conditions, or requirements in this Order, this Order shall govern.

3. In the event of any change in control or ownership of the wastewater disposal facility, then the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall also be forwarded to this office, at least 14 days in advance of the change in control or ownership.

4. To assume ownership or operation of the wastewater disposal facility under this Order, the succeeding owner or operator must apply in writing to the Regional Board requesting transfer of the Order within 14 days of assuming ownership or operation of the facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name, address, and telephone number of the persons responsible for contact with the Regional Board, and a statement that the new owner or operator assumes full responsibility for compliance with this Order. The request must comply with the signatory requirements of this Order. Failure to submit the request shall be considered a discharge without requirements, which is a violation of the California Water Code. Transfer of this Order to a succeeding owner or operator shall be approved or disapproved by the Regional Board.

5. The Discharger shall maintain a copy of this Order and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel upon request.

6. The Discharger shall immediately notify Regional Board staff of any flooding, equipment failure, slope failure, or other change in site conditions, which could impair the integrity of waste containment facilities or precipitation and drainage control structures.

7. The Regional Board will review this Order periodically and will revise these requirements when necessary.

8. The Discharger may be required to submit technical reports as directed by the Executive Officer as provided for in California Water Code Section 13267.

9. Technical reports and plans are to be prepared by or under the direction of and signed and certified by the appropriate registered professional, which may be a Registered Geologist, Registered Civil Engineer, Certified Engineering Geologist, or Certified Hydrogeologist. All registered professionals must be licensed by the State of California.

10. This Order does not authorize violation of any federal, state, or local laws or regulations.

## COMPLIANCE SCHEDULE

11. The Discharger, whose wastewater effluent exceeds the limitations stated in Specification B.1, shall implement a wastewater disposal program consistent with current state regulations and policy. The wastewater disposal program shall include the following tasks to be completed by the compliance dates:

| Task & Description | Compliance Date |
|---|---|
| **Compliance Plan & Time Schedule**<br>The Discharger shall submit a detailed master plan & time schedule describing how compliance will be achieved with this Order. | **31 December 2005** |
| **Corrective Action Plan**<br>The Discharger shall submit a plan describing potential corrective action and select the corrective action and groundwater monitoring program that best addresses Findings No. 33-47 contained in the Groundwater Information section of this Order. | **30 June 2006** |
| **Closure Plan**<br>The Discharger shall submit a plan that describes the closure process(es) for all of the impoundments. | **31 December 2006** |
| **Cease Wastewater Discharge**<br>The Discharger shall cease the discharge of wastewater to all impoundments in accordance with the compliance plan. | **30 June 2008** |

| | |
|---|---|
| **Closure Certification Report**<br>The Discharger shall submit a construction certification report describing the closure process, containing all engineering data, testing results and analyses, and containing the stamp and signature of a California registered civil engineer or engineering geologist, certifying that surface impoundment closure was completed in accordance with the approved plans and specifications. | **31 December 2008** |

The Discharger shall, where appropriate, submit quarterly reports describing progress towards achieving compliance with each task, and shall report any delay in the implementation of any required task, describing in detail the reasons for such delay.

I, Thomas R. Pinkos, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 16 September 2005.

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THOMAS R. PINKOS, Executive Officer

DLW:dlw/rac

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2005-0134
FOR
CHEVRON USA, INC.
SECTION 29 SURFACE IMPOUNDMENTS
LOST HILLS OIL FIELD
KERN COUNTY

Compliance with this Monitoring and Reporting Program is required pursuant to Water Code Section 13267.

## A. REQUIRED MONITORING REPORTS

| | | |
|---|---|---|
| 1. | Proposed Sampling and Analysis Plan (Section C) | **By 30 November 2005** |
| 2. | Facility Monitoring (Section C.1) | **Semi-Annually** |
| 3. | Wastewater Monitoring (Section C.2) | **Semi-Annually** |
| 4. | Groundwater Monitoring (Section C.3) | **Quarterly** |

## B. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program. Reports that do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the Waste Discharge Requirements. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. Data shall also be submitted in a digital database format acceptable to the Executive Officer. The data shall be summarized in such a manner so as to illustrate clearly the compliance with Waste Discharge Requirements or the lack thereof. A short discussion of the monitoring results, including notations of any water quality violations, shall precede the tabular summaries.

The monitoring reports must be signed by a person identified below:

1. For a corporation: by a principal executive officer of at least the level of senior vice-president.

2. For a partnership or sole proprietorship: by a general partner or the proprietor.

3. A duly authorized representative of a person designated in a, b or c above if:

    a. The authorization is made in writing by a person described in a or b of this provision;

    b. the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position

of plant manager, operator of a Unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and,

c. the written authorization is submitted to the Regional Board.

The monitoring reports must include the following certification on the cover page:

*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*

| Sampling Frequency | Reporting Frequency | Reporting Periods End | Report Date Due |
|---|---|---|---|
| Monthly | Semi-Annually | Last day of Month | **31 January**<br>**31 July** |
| Quarterly | Quarterly | 30 September<br>31 December<br>31 March<br>30 June | **31 October**<br>**31 January**<br>**30 April**<br>**31 July** |
| Semi-Annually | Semi-Annually | 31 December<br>30 June | **31 January**<br>**31 July** |
| Annually | Annually | 31 December | **31 January** |

The results of any monitoring conducted more frequently than required at the locations specified herein or by the waste discharge requirements shall be reported to the Regional Board.

## C. MONITORING

All monitoring shall be conducted in accordance with an approved sampling and analysis plan. A proposed Sampling and Analysis Plan for the facility shall be submitted by **30 November 2005**.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those that cannot be quantified and/or specifically identified. Samples for the constituents of concern shall be collected and analyzed in accordance with the methods listed in Table I.

The Discharger may use analytical test methods, including new U.S. EPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program.

**1. Facility Monitoring**

**a. Freeboard Monitoring**

Freeboard measuring devices shall be installed in each of the perimeter surface impoundments. Freeboard levels shall be observed and recorded monthly and reported semi-annually.

**b. Facility Inspection**

The Discharger shall inspect all containment facilities for damage semiannually. The Discharger shall report any damages observed to the Regional Board staff immediately. Any necessary work related to construction, maintenance, or repairs shall be implemented within 30 days of the inspection. Any subsequent repairs conducted by the Discharger shall be reported to the Regional Board staff within 30 days of completion of the repairs.

**c. Storm Events**

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage within 7 days following a storm yielding one inch or more of precipitation within 24 hours. Necessary repairs shall be completed within 30 days of the inspection. The Discharger shall report any damage and subsequent repairs within 30 days of completion of the repairs.

**d. Earthquake Events**

The Discharger shall perform a full-scale facility inspection within 7 days following an earthquake that could potentially damage waste management units and/or the facility. Necessary repairs shall be completed within 30 days of the inspection. The Discharger shall report any damage and subsequent repairs within 30 days of completion of the repairs.

**2. Wastewater**

Sampling stations shall be established where representative grab samples of the wastewater discharge can be collected. As a minimum, wastewater samples shall be collected from (1) the influent to the initial impoundment; and (2) from the final impoundment. Samples should be representative of the volume and nature of the discharge. The following shall constitute the wastewater monitoring program:

| **Constituent** | **Units** | **Sampling Frequency** |
|---|---|---|
| Total Discharge Flow to the facility | barrels | Monthly |
| Field Parameters[1] | | Semi-annually |
| Monitoring Parameters[1] | | Semi-Annually |
| Constituents of Concern[1] | | Semi-Annually |

[1] See Table I

**3. Groundwater Monitoring**

The Discharger shall operate and maintain groundwater monitoring systems in accordance with the Monitoring Plan described herein. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan.

Water level elevations shall be collected according to the monitoring schedule set forth below. The Discharger shall determine groundwater flow rate in any zone(s) of saturation monitored pursuant to this Monitoring and Reporting Program, and report the results quarterly. Additionally, hydrographs of each well shall be prepared showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be submitted semi-annually.

Groundwater samples shall be collected and analyzed according to the monitoring schedule set forth below. The Constituents of Concern shall be evaluated with regards to the cation/anion balance semi-annually. The chloride and total dissolved solids monitoring parameters and the calcium, sodium, and sulfate constituents of concern shall be graphically presented using a geochemical chart semi-annually.

The following shall constitute the groundwater monitoring program:

| Constituent | Units | Sampling Frequency |
|---|---|---|
| Groundwater Level Elevations | Ft. & hundredths, M.S.L. | Quarterly |
| Field Parameters[1] | | Quarterly |
| Monitoring Parameters[1] | | Quarterly |

| Constituent | Units | Sampling Frequency |
|---|---|---|
| Constituents of Concern[1] | | Quarterly |

[1] See Table I

The Discharger shall implement the above monitoring program on the effective date of this Program.

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

16 September 2005
Date

DLW:dlw/rac

**TABLE I**

**MONITORING PARAMETERS**

| Constituent | Units | US EPA Method |
|---|---|---|
| **Groundwater Elevation** | | |
| Groundwater Elevation | Ft. & hundredths, M.S.L. | |
| **Field Parameters** | | |
| Temperature | °C | |
| Specific Conductance | µmhos/cm | |
| pH | pH units | |
| **Monitoring Parameters** | | |
| Total Dissolved Solids (TDS) | mg/L | 160.1 |
| Specific Conductance | µmhos/cm | 120.1 |
| Chloride | mg/L | 300.0 |
| Boron, dissolved | mg/L | 6010B |
| **Constituents of Concern** | | |
| Standard Minerals | | |
| Alkalinity, dissolved | mg/L | 310.1 |
| Sulfate, dissolved | mg/L | 300.0 |
| Nitrate, dissolved | mg/L | 300.0 |
| Calcium, dissolved | mg/L | 6010B |
| Magnesium, dissolved | mg/L | 6010B |
| Sodium, dissolved | mg/L | 6010B |
| Potassium, dissolved | mg/L | 6010B |
| Aromatic Hydrocarbons | | |
| Benzene | µg/L | 8260B |
| Ethylbenzene | µg/L | 8260B |
| Toluene | µg/L | 8260B |
| Xylene | µg/L | 8260B |

INFORMATION SHEET

ORDER NO. R5-2005-0134
FOR CHEVRON USA, INC.
SECTION 29 IMPOUNDMENTS
LOST HILLS OIL FIELD
KERN COUNTY

Chevron USA, Inc. (Discharger), owns and operates eight surface impoundments that receive produced water and treatment backwash water from oil field operations owned by the Discharger in the Lost Hills Oil Field. The impoundments, which have a surface area of approximately 26 acres, are used for the disposal of wastewater by evaporation and percolation. Generally, in excess of 4,000,000 barrels of wastewater annually are discharged to the impoundments. The impoundments are unlined and do not meet the prescriptive construction criteria for surface impoundments as specified in Title 27. The wastewater disposal operation is currently regulated by Waste Discharge Requirements (WDRs), Resolution No. 58-275. The WDRs are outdated and are being updated to reflect Basin Plan policy and current regulations.

The facility lies on Quaternary age lithologic units, which include the Alluvium, Corcoran Clay Equivalent, and the Tulare Formation. Alluvium contains sand, silty sand, silt, and clay beds. Within the Alluvium and overlying the Corcoran Clay Equivalent is a sand layer, the Basal Alluvial Sand (BAS). The Corcoran Clay Equivalent is the lateral equivalent of the Corcoran Clay and consists of predominantly silt and clay. The Tulare Formation is comprised of interbedded clay, silt, and sand.

The Discharger has conducted a detailed hydrogeologic investigation to determine the lateral and vertical extent of wastewater migration and if wastewater is degrading groundwater quality. The Discharger advanced eight borings to depths between 277 and 450 ft to the northeast (downgradient) of the impoundments. Groundwater in the Alluvium was sampled at depths ranging from 75 to 197 ft. The samples had the following salinity concentration ranges: total dissolved solids (TDS), 5,800 to 32,900 mg/L; chloride, 1,060 to 16,000 mg/L; and, boron, 8 to 86 mg/L. Groundwater in the BAS was sampled at depths ranging from 165 to 295 ft and had the following salinity concentration ranges: TDS, 3,500 to 29,600 mg/L; chloride, 732 to 13,200 mg/L; and, boron, 4.1 to 67 mg/L. Groundwater in the upper Tulare Formation was sampled at depths ranging from 208 to 437 ft. The samples had the following salinity concentration ranges: TDS, 2,820 to 33,800 mg/L; chloride, 466 to 16,200 mg/L; and boron, 2.1 to 78 mg/L.

A groundwater monitoring well, 29MW-1, was installed in a boring to the southwest (upgradient) of the impoundments. Three monitoring wells, 21MW-1, 21MW-2, and 21MW-3, were installed in borings to the northeast of the California Aqueduct. The Discharger has collected information from the borings and monitoring wells confirming that the maximum lateral extent of groundwater degradation occurs in the BAS and extends northeast from the impoundments to between the Aqueduct and monitoring wells, 21MW-1, 21MW-2, and 21MW-3. Wastewater is free to migrate from beneath the impoundments in the downgradient (northeast) direction towards useable groundwater aquifers in the San Joaquin Valley.

The beneficial uses of groundwater beneath the area, as designated by Table II-2 in the Basin Plan, are municipal and domestic supply, agricultural supply, and industrial service supply. There are

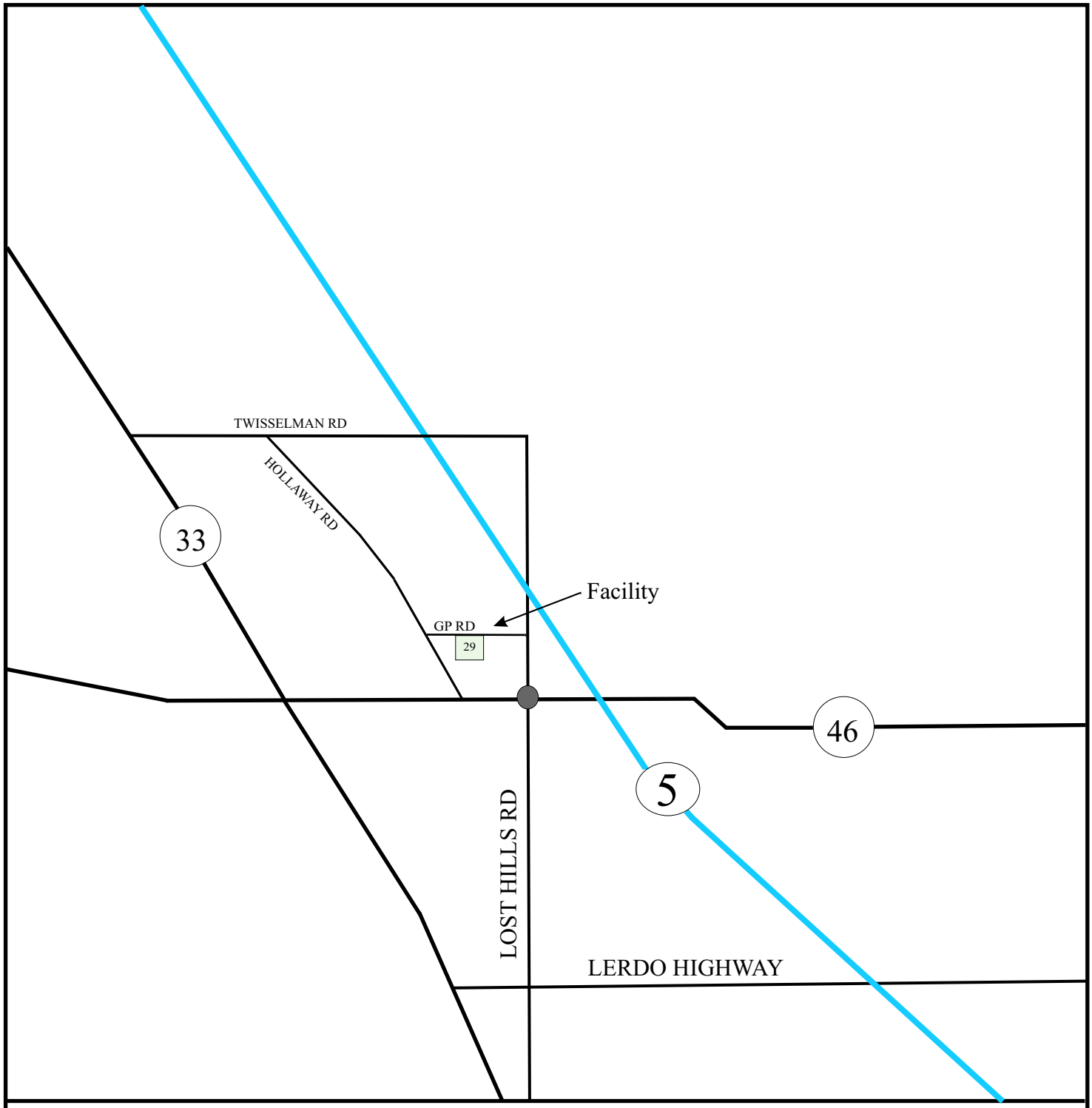
no municipal or domestic supply wells in the area. The nearest agricultural supply well is on property owned by Munger Farms and is approximately 3,200 ft. to the northeast of the impoundments. According to Mr. David Munger, the well has not been used since it was drilled in 1976. The idle well is gravel-packed to near the surface and has a screen interval between 300 and 570 ft. In 1976, the well was sampled and had the following salinity concentrations: TDS, 3,752 mg/L; chloride, 743 mg/L; and, boron, 5.2 mg/L.

Wastewater discharged to the impoundments has the following salinity concentrations: TDS, 22,200 mg/L; chloride, 11,800 mg/L; and boron, 94 mg/L. The wastewater has salinity and boron concentrations that exceed maximum numerical salinity limits prescribed in the Basin Plan for oilfield discharges to unlined impoundments overlying groundwater with existing and future probable beneficial uses. The wastewater salinity exceeds applicable water quality objectives and has affected the beneficial uses of the waters of the State. The wastewater discharge is subject to the requirements of Title 27 for discharges of waste to land.

The Discharger, in a written statement, proclaimed a formal commitment to permanently cease the discharge of wastewater to the impoundments. The Order contains a compliance schedule for the Discharger to cease the wastewater discharge and close the impoundments.

The action to adopt WDRs for an existing facility is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.) in accordance with Title 14, California Code of Regulations, Section 15301.

DLW:dlw/rac:9/16/2005




**Waste Discharge Requirements For**
**Chevron USA, Inc.**
**Section 29 Surface Impoundments, Lost Hills Oil Field**
**Kern County**

**Order Number R5-2005-0134**

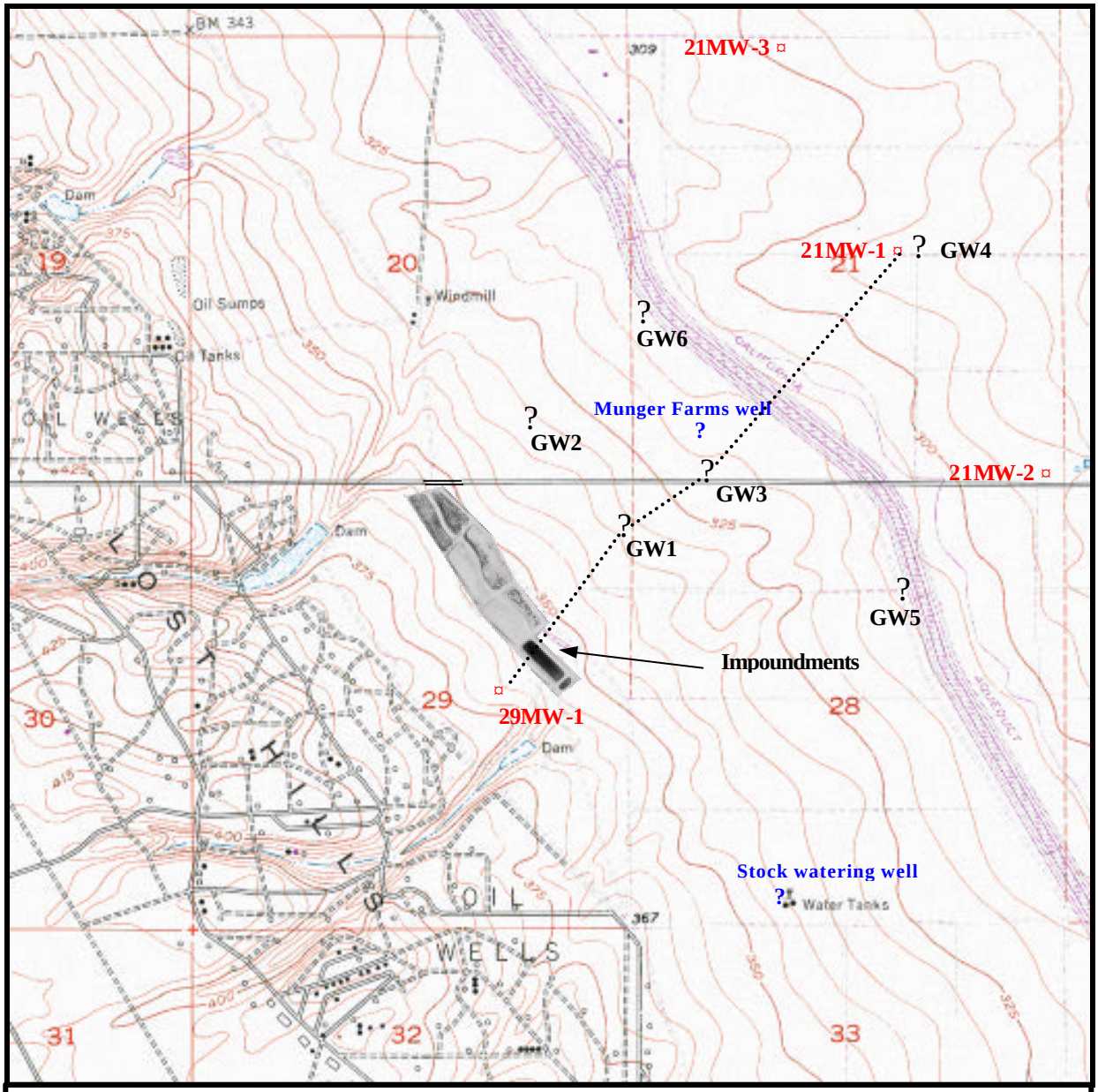
N

Not to Scale

LOCATION MAP

Section 29, T26S, R21E, MDB&M
Lost Hills NW 7.5 Minute USGS Quadrangle

**Attachment A**




# Waste Discharge Requirements For
# Chevron USA, Inc.
# Section 29 Surface Impoundments, Lost Hills Oil Field
# Kern County

**Order Number R5-2005-0134**

? Boring locations

¤ Monitoring well

? Munger Farms well

? Stock watering well

····· Cross-section line (Attachment C)

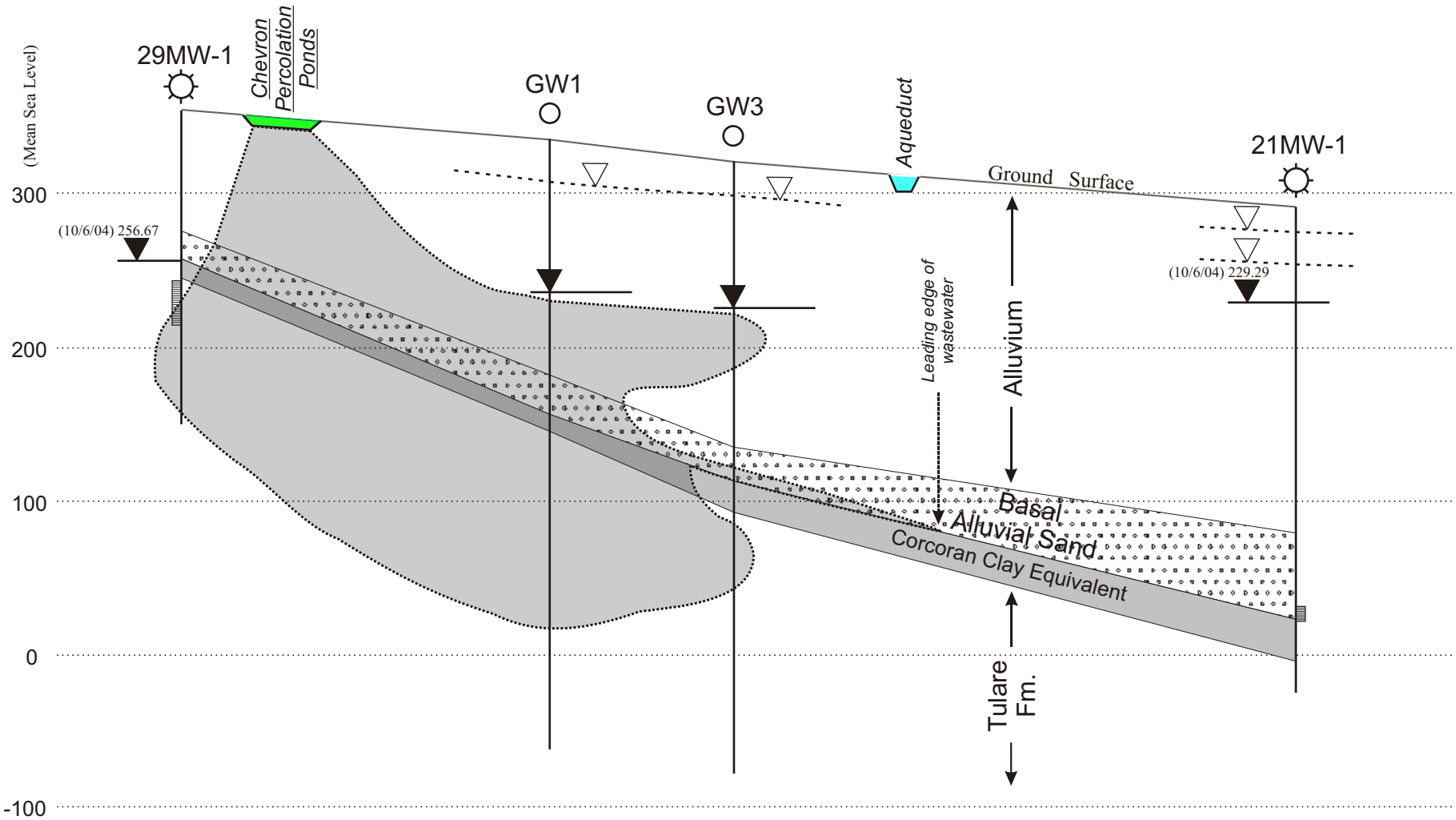
VICINITY MAP

Section 29, T26S, R21E, MDB&M
Lost Hills NW 7.5 Minute USGS Quadrangle

N

1" = 2000'

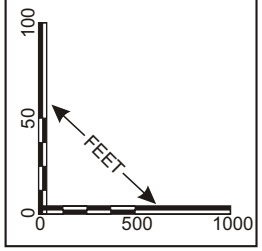
**Attachment B**




## LEGEND

- Monitoring Well
- Borings
- Screened Intervals
- Approximate extent of wastewater
- Water Table Elevation
- Perched Zones Elevation

## SCALE




Waste Discharge Requirements For
Chevron USA Inc.
Section 29 Surface Impoundments, Lost Hills Oil Field
Kern County

Order No. R5-2005-0134

CROSS-SECTION

**Attachment C**