

PXP

Odor Minimization Plan Inglewood Oil Field

Baldwin Hills CSD Condition
E.2.c; L.2.a

February 2009

Prepared for:

Plains Exploration & Production Co.
5640 South Fairfax Avenue
Los Angeles, CA 90056

Prepared by:

InterAct PMTI
4567 Telephone Rd., Suite 203
Ventura, CA 93009

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
1.1	Background.....	1
1.2	Odor Events and Odor Thresholds.....	1
1.3	Requirement for an Odor Minimization Plan.....	1
2.0	POTENTIAL NUISANCE ODOR SOURCES.....	3
3.0	ODOR MINIMIZATION MEASURES.....	4
3.1	Minimizing Odors at the BioFarms.....	4
3.2	Minimizing Odors from Drilling, Redrilling and Reworking.....	5
3.3	Closed Systems.....	5
3.4	Setbacks.....	6
4.0	ADDITIONAL IMPLEMENTATION STEPS.....	6
4.1	Odor Investigation.....	6
4.2	Odor Detection Awareness Training.....	6
5.0	ODOR COMPLAINTS MANAGEMENT.....	7
5.1	Receipt of Odor Complaints.....	7
5.2	Odor Complaints Resolution Protocol.....	7

ATTACHMENTS

Attachment A - Public Complaint Log

1.0 INTRODUCTION

1.1 BACKGROUND

Plains Exploration and Production (PXP) operates the Inglewood Oil Field in the Baldwin Hills Zoned District of Los Angeles County. The Inglewood Oil Field, covers approximately 1,000 acres, and is surrounded by single-family homes, multiple family dwellings, recreational, institutional, commercial and industrial uses. The oil field is located within the South Coast Air Basin, which is in the jurisdiction of the South Coast Air Quality Management District (SCAQMD).

To address issues of land use compatibility, the Los Angeles County Board of Supervisors recently adopted the Baldwin Hills Community Standards District (CSD) to provide a means of implementing regulations, safeguards, and controls for activities related to drilling for and production of oil and gas within the oil field located in the Baldwin Hills area of the Los Angeles County.

1.2 ODOR EVENTS AND ODOR THRESHOLDS

Several non-hazardous compounds associated with oil and gas production and processing may produce nuisance odors if released into the atmosphere and carried towards a populated area. Sulfur compounds, found in oil and natural gas, have very low odor threshold levels. Hydrocarbons contained in crude oil and natural gas typically have a petroleum odor with varying odor thresholds. An odor detection threshold is the lowest concentration of an odorous substance that a person can smell. The nuisance or annoyance level is typically caused by an odor concentration greater than the odor threshold.

The Final Environmental Impact (FEIR) for the Baldwin Hills Community Standards District (CSD) defines an odor “event” as a scenario where odors are released and negatively impact the surrounding community, measured as generating a considerable number of odor complaints to the SCAQMD and confirmed by the SCAQMD as attributable to the oil field.

1.3 REQUIREMENT FOR AN ODOR MINIMIZATION PLAN

To address the public concerns relating to odor events and to reduce the frequency of odor events the Baldwin Hills Community Standards District (CSD) Section E.2.c requires:

“At all times the operator shall comply with the provisions of an odor minimization plan that has been approved by the director. The odor minimization plan shall include any measures requested by the director. The plan shall provide detailed information about the facility and shall address all issues relating to odors from oil operations. Matters addressed within the plan shall include setbacks, signs with contact information, logs of odor complaints, method of controlling odors such as flaring and odor suppressants, and the protocol for handling odor complaints. The odor minimization plan shall be reviewed by the operator on an annual basis to determine if modifications to the plan are required.”

Any modifications to the odor minimization plan shall be submitted to the director for review and approval.”

Requirement for odor minimization from muds is outlined in Condition E.2.h:

h. Odor Suppressant for Drilling and Redrilling Operations.

The operator shall use an odor suppressant spray system on the mud shaker tables for all drilling and redrilling operations to ensure that no odors from said operations can be detected at the outer boundary line.

The implementation schedule of the Odor Minimization Plan is in Section L.2.a:

“Odor Minimization Plan. Within 90 days following the [CSD] effective date or at such later date as may be approved by the director for good cause shown, the operator shall develop and deliver to the director an odor minimization plan for review and approval satisfying the requirements of subsection E.2.c. The plan shall be reviewed and approved by the director in consultation with the SCAQMD. The operator shall take such actions as may be necessary for the plan to be approved by the director.”

Additionally, SCAQMD Rule 402 prohibits emissions that generate a nuisance, which includes generation of nuisance odors:

“A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.”

2.0 POTENTIAL NUISANCE ODOR SOURCES

Current Inglewood Oil Field operations include extraction of oil and gas from subsurface reservoirs, processing the crude oil to remove water, and processing the gas to remove water and gas liquids. Oil is processed through separation vessels and stored in tanks before being shipped offsite. Separated gas is dried, compressed and sent to one of the sales pipelines. All vessels and tanks are connected to a vapor recovery system that keeps the oil processing system under a slight vacuum that minimizes emissions of potentially odorous compounds.

The Inglewood Oil Field utilizes bioremediation farms (biofarms) to process and remediate non-hazardous oil-contaminated soils from the field. Biofarms are open areas where the oil contaminated soil is spread and mixed with a biological agent that destroys oil residuals and treats about 30,000 cubic yards per year.

Drilling in the oil field is conducted 24 hours per day and up to 3 rigs may operate simultaneously. In addition to drilling of new wells, well re-drilling, reworking, and well maintenance operations occur routinely.

There are several potential sources of nuisance odors at the Inglewood Oil Field:

- **Fugitive emissions:** Compressors, pumps, pressure relief devices, flange and threaded connections in the piping in light liquid or gas service may produce very small amounts of emissions due to their design. These emissions are termed “fugitive emissions” and are regulated by the SCAQMD. PXP has a vapor recovery system designed to collect vapors from tanks and other vessels and minimizes fugitive emissions from facility. Fugitive emissions may produce odorous emissions. PXP has an ongoing quarterly fugitive emissions inspection and monitoring program that assures leaks are promptly detected and repaired.
- **Bioremediation farms:** Odors may be emitted from the non-hazardous oil-contaminated soils when the soils are first spread on the biofarm. PXP currently has an established odor abatement process that involves spraying in the biofarms with an odor suppressant. The suppressant is a clear, non-toxic, non-hazardous liquid with fragrance-like odor. The suppressant is dispensed with sprinklers or sprayers.
- **Drilling muds:** During drilling operations, drilling mud is pumped to the bottom of the drilled hole and returns to the surface carrying rock cuttings. Small amounts of reservoir oil and gas contained in the rock can become entrained in the mud. Some of the entrained reservoir gases and gaseous compounds may vaporize out of the mud when it reaches the surface and passes over the mud shaker tables. During normal drilling operations, the density of the drilling mud minimizes oil and gas entry into the mud and subsequent outgassing at the surface. In addition, mud pH neutralizes hydrogen sulfide (H₂S), and/or chemical additives in the mud scavenge (react with) H₂S, which is one of the compounds with a very low odor threshold.

- **Accidental releases of gas from a well due to formation overpressure and well kick:** Drilling, redrilling or reworking of wells can release odorous gaseous compounds during an unexpected pressure event (“a kick”), in which the density of the mud or workover fluid is insufficient to prevent the entry of reservoir fluid into the wellbore. During the operations to control the well following a kick, the reservoir fluids are circulated to the surface, and gas or volatile compounds, if present in the reservoir fluid, may be released to the atmosphere. The Nodular Shale zone is known to contain gas and gaseous compounds in greater quantities than other zones in the Inglewood field.

3.0 ODOR MINIMIZATION MEASURES

To reduce the frequency of nuisance odor events generated from the Inglewood Oil Field activities, PXP will implement the following control measures that are required by the CSD and Final Environmental Impact Report (EIR) for the Baldwin Hills CSD:

- Use of odor suppressant(s) for bioremediation farms,
- Maintaining a portable flare with a gas buster at the Inglewood Oil Field,
- Use of portable flare with a gas buster for drilling in the Nodular Shale zone,
- Use of odor suppressant(s) for drilling muds,
- Use of closed systems, and
- Setbacks for drilling/redrilling and locations of new oil storage tanks.

In addition to the Odor Minimization Plan, an Air Monitoring Plan has been prepared to address emissions of total hydrocarbons from the Inglewood gas plant and drilling operations, and hydrogen sulfide from drilling operations, per the CSD requirements. The Air Monitoring Plan describes monitoring for the compounds that may create nuisance odors, and requires shutdowns when the monitored compounds exceed specified levels.

3.1 MINIMIZING ODORS AT THE BIOFARMS

- PXP will spray the odor suppressant onto the areas of the biofarms where contaminated soils are offloaded, spread, or tilled. The personnel that operate the biofarms will be instructed to ensure that all areas with freshly-exposed oil contaminated soils are sprayed with the odor suppressant.
- If nuisance odors are determined to be originating from the biofarms, additional suppressant will be applied where appropriate.

3.2 MINIMIZING ODORS FROM DRILLING OR REDRILLING

Equipment specifications:

- Muds and cuttings passing through the mud shakers will be sprayed with an odor suppressant when the shakers are in operation.
- A mud-gas separator vessel (i.e., gas buster) and portable flare approved by the SCAQMD will be available at the Inglewood Oil Field. The gas buster will vent to the portable flare if its use is required.
- The portable flare will have an automatic pilot ignitor to ensure the gases sent from the gas buster are combusted. The portable flare will have a flow recording device.

Drilling procedures:

- When drilling through the Nodular Shale zone, the drill rig will be outfitted with a gas buster and portable flare, designed to remove entrained gases from the muds and combust the gas.
- The combusted gas volume (if any) will be documented in the drilling log/tally.
- The drill site supervisor will report the flared gas volume to the PXP Ombudsperson at the 24-hour contact number, if any measurable amount of gas has been combusted in the portable flare; or if any gas was released without being combusted.
- The Los Angeles County Fire Chief (Fire Chief) and SCAQMD will be notified within 48 hours, by the PXP designated person, in the event a measurable amount of gas is burned by the portable flare. The volume of gas will be specified.
- The Fire Chief and the SCAQMD will be notified within 24 hours of the event, by the PXP designated person, if un-combusted gas from the portable flare was released into the atmosphere.
- The drill site supervisor or his designee will contact the PXP Ombudsperson through the 24-hour contact number with the appropriate notification information. The Ombudsperson will make the appropriate agency notifications.

3.3 CLOSED SYSTEMS

- Produced water and oil will be contained within closed systems at all times except for sampling.
- All produced water, oil storage and wash tanks will be vapor tight and will be connected to the vapor recovery system.
- Releases from tanks will be minimized by the required oil tank pressure monitoring and venting CSD condition (E.2.f). This condition requires that all oil tanks that contain or

could contain oil shall have a fully operational pressure monitoring system that continuously measures and digitally records the pressure in the vapor space of each tank. If pressure reaches up to within 10% of the tank relief pressure, the plant operator(s) will receive an automatic alarm, requiring the operator(s) to take an immediate corrective action to reduce the tank pressure before a release occurs.

3.4 SETBACKS

- Drilling and re-drilling within the Inglewood Oil Field will be set back 400 feet from developed areas and 20 feet from any roadway. (CSD Condition E.2.n)
- All new storage tanks, excluding replacement tanks, will be constructed no closer than 500 feet from any developed area, nor closer than 200 feet from any public road. No building will be constructed within 50 feet of any oil storage tank. (CSD Condition E.29.b)

4.0 ADDITIONAL IMPLEMENTATION STEPS

4.1 ODOR INVESTIGATION

- Field operators, drilling personnel and biofarm operators will be trained to detect and proactively report odors at their work site to the PXP 24-hour contact number, as specified in the Odor Detection Awareness Training Section of this Plan.
- Each odor complaint will be investigated to determine if odors originated from PXP operations at the Inglewood Oil Field.
- If the odors reported in the complaint are confirmed to be originating from the Inglewood Oil Field, PXP will determine what mitigations are necessary to minimize or eliminate the odors and will proceed to implement those mitigating actions in a timely manner. The specific location where odors originate will be identified and targeted.

4.2 ODOR DETECTION AWARENESS TRAINING

- To assure that the odor minimization measures are adhered to, PXP will conduct Awareness Training for employees and contractors involved in drilling operations and at the bioremediation farm. PXP employees will be trained on the contents of this plan.
- Personnel will be trained to recognize what kind of activities are most likely to create odors and how to distinguish odors that can potentially generate complaints from acceptable background odor levels which would not be detectable at the receptors.
- Personnel will be instructed to take corrective measures to prevent potential complaints should they detect odors onsite.
- At least one individual will be designated as the Odor Monitor (who can also perform other duties) and will monitor for any odors during daily facility rounds. Any detected

odors will be brought to the attention of the operators of a specific location where odors are detected, and notification will be made to the PXP 24-hour contact number.

- Field operators, drilling personnel and biofarm operators will be trained in detecting and proactively reporting odors at their work site to the PXP 24-hour contact number.
- PXP's Environmental Health & Safety (EH&S) staff will track training events and will conduct internal inspections to make sure appropriate odor minimization measures are being implemented.

5.0 ODOR COMPLAINTS MANAGEMENT

5.1 RECEIPT OF ODOR COMPLAINTS

There are several ways that the public can contact the PXP Ombudsperson to register an odor complaint:

- 24-hour contact information will be posted on signs at the Oil Field entrances and along the perimeter fencing. This contact number (800-766-4108) reaches the PXP Ombudsperson directly. Also posted on the signs are the phone numbers for LA County Department of Regional Planning Enforcement (213-974-6453) and the South Coast Air Quality Management District (800-288-7664).
- PXP has a website (www.baldwinhillscsd.com) dedicated to informing the public about Inglewood Oil Field operations. The website includes company and agency contact information for registering complaints.
- PXP will distribute an annual newsletter to the interested public. This letter will provide PXP and agency contact information for the purpose of registering complaints.

Once any report of odor complaint is received, PXP will handle it through a protocol specifically established for this purpose (see below).

5.2 ODOR COMPLAINTS RESOLUTION PROTOCOL

- PXP has a designated Ombudsperson who is responsible for documenting and responding to odor complaints. The Ombudsperson will be familiar with all the provisions of the CSD and all conditions of approval related to permits and approvals issued by the County or other agencies. The Ombudsperson is responsible for facilitating, to the extent feasible, the prompt resolution of any issues that may arise relating to compliance matters or impacts of the oil field operations.
- All odor complaints received by PXP will be documented on the Public Complaint Log Form provided in Attachment A.

- Each odor complaint record will include the date, time, name, phone number, type of complaint, PXP Action, Caller Response, and Date and time of Agency Reporting.
- The Ombudsman will notify EH&S personnel, who will initiate an investigation to determine if odors are/have been caused by PXP operations.
- If the odors are confirmed to be originating from the Inglewood Oil Field, immediate corrective action to minimize or eliminate odors will be determined and undertaken as long as doing so can be done in a safe and controlled manner without health or safety hazards.
- PXP will notify via e-mail the Director, the Environmental Compliance Coordinator (ECC) (hired by L.A. County), and the SCAQMD on the same business day of receiving the complaint. If the complaint is received after normal business hours, it will be reported to these parties at the opening of the next business day.

Draft
Information
Only

ATTACHMENT A

**COMMUNITY STANDARD DISTRICT
COMPLAINT LOG**

REFERENCE NUMBER	DATE/TIME	NAME (LAST, FIRST)	PHONE NUMBER	TYPE OF COMPLAINT	PXP ACTION	CALLER RESPONSE	CSD REPORTING	DATE/TIME REPORTED	COMMENTS

Draft
Information Only

Draft
Information
Only