CITY OF LONG BEACH

Memorandum

Date: May 25, 2023

To: Thomas B. Modica, City Manager

From: Robert Dowell, Director, Energy Resources

For: Mayor and Members of the City Council

Subject: **Ordered Revisions of and Supplements to the Long Beach Unit Program Plan (July 1, 2023 through June 30, 2028) and Annual Plan (July 1, 2023 through June 20, 2024)**

On March 21, 2023, the City Council adopted the proposed Long Beach Unit (LBU) Program Plan (July 1, 2023 through June 30, 2028) and the Annual Plan (July 1, 2023 through June 30, 2024) (collectively, Plans) and authorized submittal to the State Lands Commission (SLC) for its review and adoption. Chapter 941 of the Statutes of 1991 and operating agreements relating to the LBU require the City of Long Beach (City) and its contractor to prepare the Plans generally in a manner which maximizes oil production, subject to certain conditions. The City Council has no authority to amend the provisions of State law or amend the requirements of the SLC. As required by Chapter 941, the Plans were submitted to SLC staff on March 23, 2023, and thereafter, as required by Chapter 941, Statutes of 1991, the SLC had 45 days to review the Plans otherwise the Plans are deemed to be accepted by the SLC.

Pursuant to Section 3 (a) of Chapter 941, the SLC may order revisions to the Program Plan for:

1. Consistency with good oil field practice;
2. Consistency with the Optimized Waterflood Program Agreement (OWPA);
3. Consistency with the LBU and Unit Operating Agreements; or
4. Environmental and safety concerns.

The City and its contractor must revise the Program Plan to incorporate any changes ordered by the SLC where the SLC has found the changes to be necessary to assure that the plan (1) is consistent with good oil field practice, (2) is consistent with the OWPA, (3) is consistent with the LBU and Unit Operating Agreements, or (4) does not involve significant safety or environmental risks.

On April 7, 2023, the SLC ordered certain revisions and supplements to the LBU Program Plan and Annual Plan. The revisions were ordered to incorporate risk identification and analysis to provide the transparency necessary to evaluate the efficacy of current and future operations including:

1. SB 1137;
2. CalGEM Injection Gradients;

3. Power Plant Operations;
4. Commodity Price Volatility;
5. Sea Level Rise;
6. Environmental Justice;
7. Well Abandonment Plan;
8. Make-Up Water Sources;
9. Social costs and impacts of oil extraction;
10. Public health impacts of oil production on local communities, including minority communities (such analysis to reflect collaboration between City and its local health department regarding this issue); and,
11. Anticipated abandonment and decommissioning costs for the Long Beach Unit and the balance of the oil liability trust fund.

Staff has completed the revisions ordered by the SLC and the accompanying supplement was provided earlier today to the SLC incorporating risk identification and analysis for each of the eleven issues identified. Section 3 of Chapter 941 states that the revisions ordered by the SLC become immediately effective without the need for further action by the City Council.

If you have any questions, please contact Bob Dowell, Energy Resources Director, at (562) 570-2001.

ATTACHMENT

CC: DAWN MCINTOSH, CITY ATTORNEY
DOUGLAS P. HAUBERT, CITY PROSECUTOR
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DEPARTMENT HEADS

CITY OF LONG BEACH

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May 25, 2023

Peter Regan
Assistant Chief – Mineral Resources Management Division
California State Lands Commission
301 E Ocean Boulevard, Suite 550
Long Beach, CA 90802-8833

Subject: Ordered Revisions of and Supplements to the Long Beach Unit Program Plan (July 1, 2023 through June 30, 2028) and Annual Plan (July 1, 2023 through June 30, 2024)

Your letter dated April 12th ordered certain revisions and supplements to the Long Beach Unit Program Plan (July 1, 2023 through June 30, 2028) and Annual Plan (July 1, 2023 through June 30, 2024), Long Beach Unit, Wilmington Oil Field, Los Angeles County. These included eight risks identified by staff and detailed in the SLC's Staff Report and three additional issues included in the Commission's unanimous order.

The accompanying supplement is provided to incorporate the risk identification and analysis for each of the eleven issues identified in your letter. I trust that you will find this both responsive and insightful about the Long Beach Unit operations.

Sincerely,

Robert M. Dowell
Director of Energy Resources

Attachment

cc: Thomas Modica: City Manager - City of Long Beach
Linda Tatum: Assistant City Manager – City of Long Beach
Richard Anthony: Principal Deputy City Attorney - City of Long Beach
Shahed Meshkati: Chief - Planning & Development – California State Lands Commission
Jonathan Hilton: Vice President Coastal Operation - California Resources Corporation
Scott Biagiotti: Oil Operations Manager - Long Beach Energy Resources

Introduction

The Long Beach Unit (LBU or Unit) refers to oil and gas extraction operations on four man-made Oil Islands and Pier J that have supplied a portion of resident energy needs since the 1960's. Today, natural resources produced from the LBU represent approximately two-thirds of citywide oil production and an estimated 1.1% of statewide oil and gas demand.[1] Furthermore, their visibility offshore, history, and their important role in secure, affordable infrastructure makes the LBU operations a point of public interest.

The ensuing information is in response to the eleven issues raised by the State Lands Commission (SLC) during its review of the City of Long Beach's (City) LBU Program Plan (July 1, 2023 through June 30, 2028) and Annual Plan (July 1, 2023 through June 30, 2024). This is intended to supplement the published documents and, moreover, frames the manner in which the LBU operations fit into the overall challenge of meeting California's energy and natural resource demands.

SB 1137

Since the 1970's when California adopted its Environmental Quality Act (CEQA), local agencies have considered health impacts of building houses, schools, and businesses adjacent to California's oil fields. This means that for specific proposed projects, qualified professionals assessed potential health impacts of developing land next to producing oil wells and associated facilities.

Similarly, proposed oil and gas development plans also underwent health impact assessments to scrutinize potential impacts on neighboring land uses. Examples of this are the "Inglewood Oil Field Communities Health Assessment" dated February 2011 by Los Angeles County Department of Public Health and "Health Impact Assessment – E&B Oil Drilling and Production Project" dated September 2014 by Intrinsik for the City of Hermosa Beach.

In each case, project-specific settings were examined and tailored mitigation measures, where needed, were put into place. This means that the very communities who balance realistic energy needs with housing and community facility needs make local decisions about protective measures of compatibility.

That project-specific approach to land use compatibility and setbacks between oil and gas facilities and other land uses endured for decades. Then in 2017, the state legislature enacted AB 617, the Community Air Protection Program whose focus is to "reduce exposure in communities most impacted by air pollution". One year later, the California Air Resources Board rolled out a program under AB 617 known as the Study of Neighborhood Air near Petroleum Sources (SNAPS) to conduct "limited-term, intensive air quality monitoring with a particular focus on production facilities". Information gathered

[1] Long Beach Unit oil production for 2021 averaged 15,255 bopd as compared to statewide demand of 1.44 million bopd.

in SNAPS monitoring was to measure air pollution contributions associated with oil and gas production and, if needed, advise on setbacks or other mitigation measures needed to address emissions.

Only one location has undergone SNAPS monitoring as of this writing, Lost Hills located in Kern County. The monitoring reported on volatile organic carbon measurements drew no conclusions about causal effects linked to oil and gas production or any other specific activity.

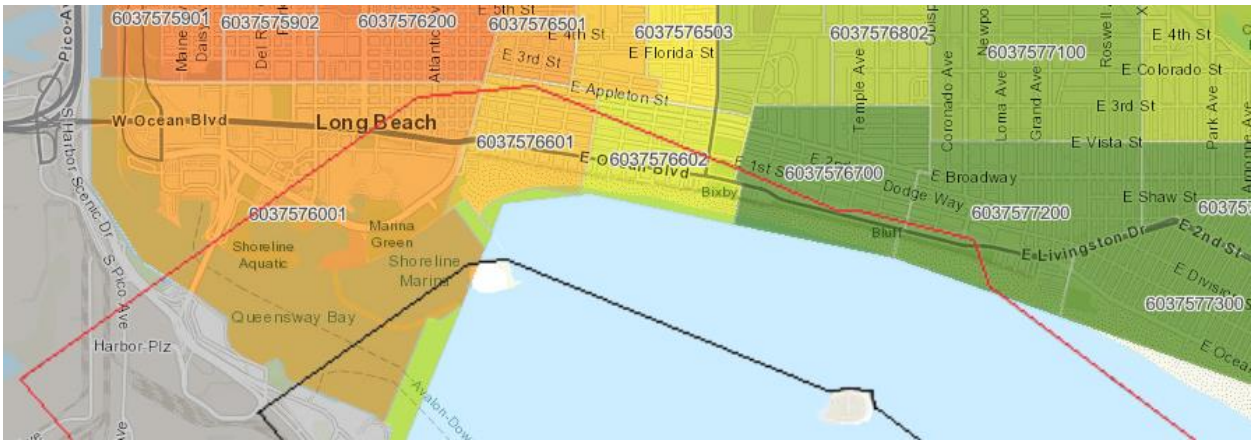
On September 16, 2022, the Governor of California signed into law Senate Bill No. 1137 (SB 1137), which established 3,200 feet as the minimum setback distance between new oil and natural gas production wells and certain sensitive receptors such as homes, schools and businesses open to the public.

Regulations to implement SB 1137 included requirements of notice to property owners and tenants regarding the work performed and offering the sampling and test of water wells or surface water before and after drilling; the contents of required notices for new production facilities; the annual submission of a sensitive receptor inventory and sensitive receptor map and the contents and format of the same; and the requirements of statements where operators have determined a location to be within the 3,200 feet setback distance. Additional provisions of SB 1137 include, among others, the imposition of health, safety, and environmental controls applicable to both current and new wells located within this distance of sensitive receptors related to noise, light, and dust pollution controls and air emission monitoring, and the immediate suspension of operations at production facilities determined to not be in compliance with certain air emission requirements.

SB 1137 was to have taken effect on January 1, 2023, but in December 2022, more than the requisite number of registered voters signed a referendum to put SB 1137 on the 2024 ballot. On February 3, 2023, the Secretary of State of California certified the signatures and confirmed that the Referendum qualifies for the November 2024 ballot. Accordingly, SB 1137 is stayed until it is put to a vote of the general electorate.

SB 1137 Impacts Specific to the LBU

While the legislation requires some level of interpretation regarding the definition of “sensitive receptor”, we currently believe that sensitive receptors may exist within 3,200 feet of both Island Grissom and Pier J and potentially some or all of Island White. The following picture depicts the areas of the City that potentially contain sensitive receptors and would be within 3,200 feet of existing LBU wells (the coastal side of the red line):



In these impacted areas, the SB 1137 requirement stipulating that a leak detection plan be submitted to the California Geological Energy Management Division (CalGEM) by January 1, 2025, with full implementation by January 1, 2027, would apply. The State Air Resources Board would set performance standards for the emissions detections systems.

While the LBU may see some preliminary costs in 2025 as a result of SB 1137, full costs are undetermined at this time because the standards have not yet been published and full implementation is over three years out given that SB 1137 is currently stayed. We are currently in the process of identifying and evaluating the various emissions detection technologies and equipment available to meet the requirements of SB 1137. Once a decision has been reached, the purchase and installation costs for that equipment will be known and can be shared in the future.

Oil and gas revenues and expenses for the LBU are not anticipated to be impacted until year two after the implementation of SB 1137 becomes effective, essentially FY 26/27 and beyond. Revisions to the July 2023 – June 2028 Program Plan economics for FY 26/27 and beyond would only be speculation at this time as the outcome of the SB 1137 vote is unknown. The next Program Plan developed covering the July 2025 – June 2030 period will include any relevant SB 1137 impacts to LBU operations if the bill is approved by the voters in November 2024.

There is a potential impact to future development of approximately 30 wells between 2025-2028. These projects are not incorporated in the Program Plan, as presented. The current five-year Program Plan drilling program, as scheduled, is not expected to be additionally impacted by the adoption of the legislation in 2025 as the Unit plans to conduct future development activities outside of the 3,200 feet minimum setback distance.

Should SB 1137 be approved by voters on the November 2024 ballot, the opportunity to redrill the approximately 30 wells excluded from the current five-year Program Plan will be eliminated. The SB 1137 would also limit the Unit's ability to maintain existing well operations and would eliminate the opportunity to redrill, repair, and convert existing wells to injectors. It is estimated that at least one-half of the Unit's current wells would be directly impacted by SB 1137. While the law does allow for Notices of Intent (NOI) to be granted

based on environmental concerns, we are not certain if subsidence management would be so interpreted by CalGEM.

For more information on the potential economic impacts of SB 1137 and the ability to fund future abandonment activities, please see https://www.longbeach.gov/globalassets/city-manager/media-library/documents/memos-to-the-mayor-tabbed-file-list-folders/2022/december-9--2022---revenue-implications-of-sb-1137---health-and-safety-setbacks-around-new-and-reworked-existing-oil-wells

CalGEM Injection Gradients

As is the case in the State of California's (State) mature oil fields, much of the fluid that comes to the surface during operation of the LBU is water with a smaller amount of crude oil. Oil is separated out and sent to market and produced gas is utilized in the LBU power plant. The remaining water is returned to the producing formation from which it came and those producing formations at the LBU are 2,200 feet to 5,500 feet below the surface.

The process under which produced waters are returned subsurface is known as the State's Underground Injection Control (UIC) program, a program that is designed to isolate injected fluid from the State's valuable sources of groundwater. The LBU operates its water injection project under a set of Project Approval Letters (PAL) issued by the State and consequently has succeeded in protecting underground drinking waters since injection began. Each PAL states the maximum pressure, or "injection gradient", at which water may be injected underground.

The SLC review of the Program Plan suggests that State regulators have provided guidance pointing to an injection gradient that differs from both PALs and the operator's own reservoir management strategy. However, State regulators have yet to substantiate the reasoning behind any change to the gradients.

The Wilmington Oil Field has safely operated at approved injection gradients ranging from 0.80 to 0.90 psi/ft for over 40 years. Each active waterflood injector in the Wilmington Oil Field has a production logging program which clearly demonstrates containment of injected fluids in zone – contained by massive impermeable shales well below the base of fresh water.

The impact of a dramatic reduction in the Unit's existing injection gradient, necessitating a significant reduction in overall injection volumes by approximately a half a million barrels of water per day, are unknown and could result in disastrous consequences. Issues with crossflow, compaction, or other unforeseen subsurface changes could cause irreversible damage to surface elevations, especially in downtown Long Beach which is located east of the Los Angeles River. This area has been under careful voidage management since the 1960s and has therefore never experienced the drastic subsidence that was seen west of the Los Angeles River in the mid-1900s.

Rigorous study must precede any change in the maximum allowable injection pressure gradient. The City and its contractor, a subsidiary of California Resources Corporation (CRC), continue to engage in technical dialogue with State regulators regarding the Unit's waterflood operations and are collecting further geologic and technical data to support practices that have been in place for more than four decades.

LBU Power Plant Operations

A point raised in the SLC's April 12, 2023 letter concerns the term of the land lease for the LBU power plant which is expiring in July 2024. When the Program Plan was drafted, the landowner had entered into a sales agreement with a third party which stalled LBU's lease extension negotiations. As of April 19, 2023, that sales agreement with a third party is no longer in place and negotiations have resumed with the LBU in good faith. Concurrent with these negotiations, the Unit is also exploring other options including construction of a new natural gas pipeline or potentially re-injection of the produced gas as alternative solutions.

LBU Commodity Price Volatility

The Program Plan revenue forecast for the July 1, 2023 to June 30, 2028 period is based on an assumed average oil price of $65/bbl and a natural gas price of $3.00/MMBtu. To address potential commodity pricing volatility, two additional scenarios were also run with oil prices at $75, and $85/bbl with natural gas prices fixed at $3/MMBtu. To demonstrate the influence of natural gas pricing, two additional scenarios are also presented with varying natural gas prices at $4, and $7/ MMBtu and oil prices held flat at $65/bbl.

This analysis of varying commodity pricing concludes that projected net income from the LBU operations range from $239 million to $764 million from fiscal year 2023/24 through 2027/28. See the table below for tabulations of those financial scenarios:

Long Beach Unit Projected Net Income
Fiscal Years 24 thru 28
Millions of USD ($MM)

Scenario	FY24	FY25	FY26	FY27	FY28	FY24-28
$85/bbl oil, $3/MMbtu gas	**$142**	**$148**	**$163**	**$165**	**$146**	**$764**
$75/bbl oil, $3/MMbtu gas	**$88**	**$94**	**$110**	**$114**	**$96**	**$501**
$65/bbl oil, $7/MMbtu gas	$44	$51	$66	$72	$55	$287
$65/bbl oil, $4/MMbtu gas	$37	$43	$59	$64	$48	$251
$65/bbl oil, $3/MMbtu gas	**$34**	**$41**	**$56**	**$62**	**$46**	**$239**

Sea Level Rise Impacts to the LBU

ABS Consulting prepared a tsunami hazard assessment which identified surface elevations for LBU facilities. Per their findings, “the maximum tide in the Long Beach harbor area is approximately seven feet and most times the tide is below six feet.” The surface elevation of the Oil Islands and Pier J are approximately 15 feet, leaving 8 feet of freeboard above current high tide levels. Based on this surface elevation and tide data, the “extreme risk aversion” projection of 2.6-foot sea level rise by 2050 noted in the State’s Ocean Protection Council’s 2018 Sea-Level Risk Guidance does not present a significant hazard to THUMS or the Unit’s operations.

Vulnerability assessments (such as the screening mentioned above) and subsequent adaptation strategies (developed as needs are identified during assessments) are two of the many tools the LBU implements as part of an on-going commitment to the protecting the public and the environment.

Environmental Justice Issues Related to the LBU

The United States Environmental Protection Agency (US EPA) defines environmental justice as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.” It goes on to state that fair treatment means “no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies.”

In the context of the “Long Beach Unit Program Plan (July 1, 2023 through June 30, 2028) and Annual Plan (July 1, 2023 through June 30, 2024)”, Long Beach Unit, Wilmington Oil Field, Los Angeles County, the SLC remarks that “more detail should be added to ensure against significant safety or environmental risks to those communities that are disproportionally impacted by the pollution burdens of the Long Beach Unit operations”.

Pollution burdens refer to emissions of air pollutants. As will be shown in the section on Long Beach Unit GHG Emissions (see page 10), LBU’s 2022 reported emissions contributed less than 1/700th of total NOx and less than 1/2000th of the VOCs, CO, SOx, and PM relative to Air District-wide reported emissions. In 2023 the NOx emissions were reduced further with an upgrade to the LBU power plant.

To further put this in perspective, the City’s Department of Health and Human Services published the “Community Health Assessment” in 2013, remarking that “Specific to Long Beach, air quality is impacted by the 710 freeway along the West, the Long Beach/Los Angeles port complex along the Southwest, State Route 103 and major oil refineries in the West, the 405 freeway through the center of the City, and major industrial sectors, mainly in the South. As noted above, improvements have been made to reduce air quality impacts, such as the use of lower emission vehicles and equipment at the Port of Long Beach and the introduction of green space along the 710 corridor. Figure 116 of the

"Community Health Assessment" shows how air quality has improved over the last 10 years with the number for "Unhealthy" and "Very Unhealthy" days decreasing by over 30 percent since 2002".

Couple this with the California Communities Environmental Health Screening Tool (CalEnviroScreen 4.0 – October 2021) findings discussed later beginning on page 12, it is apparent that oceanside residents closest to the LBU operations are categorized as having a mid to low impact score and that public health professionals point to freeway, refining and port activity as having greater impacts on air quality.

Every barrel of oil not produced in California requires import, most of which arrives through the Ports of Los Angeles and Long Beach. These two ports are significant sources of air pollution in the region. Per the SCAQMD, 85% of the NOx emissions (nitrous oxide compounds, a significant contributor to smog) in the air basin are from mobile sources, such as ships, long haul trucking, and trains. SCAQMD has identified diesel particulate matter as the largest contributor of Toxic Air Contaminants in the Long Beach area originating from ships, commercial harbor craft, railroads, and trucks.

Further, a repeated theme in public health department reporting is that public health is more closely related to factors other than industrial activities in the physical environment. For example, the Los Angeles County Public Health Department "Community Health Improvement Plan 2015-2020" states that, "research has increasingly shown that social and economic conditions contribute to approximately 40% of our health status, followed by health behaviors (30%), clinical care (20%), and the physical environment (10%)."

Meanwhile, measures persist to mitigate emissions of pollutants at the LBU. The Unit's wells and drilling rigs are all-electric and produce minimal emissions. Emissions of NOx, VOC, and PM reported to the Air District make up less than 1% of emissions in the South Coast Air Basin (LA County, Orange County, Riverside County, portions of San Bernardino County).

LBU Well Abandonment Plan

The LBU manages all its wells to maximize benefit to Unit participants in accordance with the Unit agreements and to maintain compliance with its approved CalGEM Idle Well Management Plan (IWMP). The Unit attempts to minimize the inventory of idle wells that have no further economic benefit. Wells with no further economic use are abandoned to reduce the Unit's future abandonment liability. Unit engineers regularly review existing idle wells and evaluate their potential value to the Unit. Those found to have no value are added to the queue of wells to be plugged or abandoned. A typical LBU well abandonment to surface is currently estimated to cost approximately $300,000.

There are 212 idle wells in the Unit as of year-end 2022 and approximately 1,300 active wells. Approximately 65 wells are currently identified for abandonment through calendar year 2027 and the remaining idle wells are managed under the IWMP. Per IWMP requirements, the Unit is committed to eliminating a specific number of long-term idle

wells each calendar year. The IWMP and any revisions must be approved by CalGEM. The IWMP may cover a period up to 5 years and is subject to annual review by CalGEM. The rate of idle well elimination in the IWMP is based on the Unit's idle well inventory as of January 1 on each calendar year.

The table below highlights previous year well abandonments and the projected number for the Program Plan years:

Long Beach Unit Well Abandonments

	Actual	Program Plan
	FY22	FY24-28
LBU Well Abandonments	24	79 - 140

LBU Make-up Water Sources

Another point relating to field management and underground injection is the need to maintain a reliable source of make-up water for injection which is vital to the success of the LBU. Water injected into the formations serves two purposes: 1) controlling subsidence and 2) enhancing oil recovery. To meet injection-to-voidage requirements, make-up water is purchased from sources outside of the Unit. The Unit's primary make-up water sources include Reclaimed Water from the Long Beach Utilities Department and make-up water from the Tidelands Oil Production Company. Of these sources, approximately 44% consists of reclaimed water, 36% is oilfield produced water, 17% is from source water wells that do not meet the standards for municipal water use, and the remaining 3% is from a variety of sources including Port Toe Drain Water, Harbor Co-Gen, and Storm Water. Fresh Potable Water is not used as a make-up water source in LBU's operations.

Social Costs and Impacts of LBU Oil Extraction

In August 2022, the City adopted the Long Beach Climate Action Plan (CAP), a comprehensive planning document outlining the City's proposed approach both to address climate impacts on the City and to reduce the City's impact on the climate. The CAP includes "Appendix G: Long Beach Oil Gas Technical Memorandum" (Appendix G), which defines lifecycle greenhouse gas emissions associated with oil and gas in Long Beach using the Carnegie Endowment's Oil Climate Index method and data from the California Air Resources Board's annual Low Carbon Fuel Standards: Crude Oil Life Cycle Assessment.

Appendix G identifies the Upstream Carbon Intensity of Long Beach Oil as 33 kilograms of CO_2 equivalent per barrel of oil (kg $C0_2e$/bbl). For reference, oil imported to California from 2018 to 2021 averaged an Upstream Carbon Intensity of 60 kg $C0_2e$/bbl, nearly

double the upstream carbon equivalent footprint of oil produced by the LBU, according to data from State's Air Resources Board.

Although estimates of the social cost of GHG emissions vary widely, the US EPA currently estimates the social cost of carbon emissions at approximately $51 per metric ton. Using these metrics, in FY 2021-22, the social cost of LBU operations was $9.1 million. For reference, an equivalent amount of foreign oil imported to California has a social cost of $16.6 million.

Californians consume an estimated 1.8 million barrels of oil every day, using hydrocarbons to fuel homes, cars, and aircraft, to fertilize farmlands, to pave streets, and to produce countless other products. The social benefits of local oil production as compared to tankered oil imports cannot be overstated.

Much of the profit from the LBU is shared among public agencies. In FY 2021-22, the State received $92.7 million in profit from the LBU and the City received $19.1 million in profit for the same period. LBU paid an additional $10.0 million in production and ad valorem taxes that fiscal year.

Since 2003, Wilmington oil operations have generated more than $5 billion for the State, County of Los Angeles, and the City.

The City uses its portion of profits to fund capital investments in the coastal portion of the City, community services, and public safety. Measure US Barrel Tax revenues also support climate change, community health, and youth services programs throughout the City. Other taxes paid by the LBU, including Property Tax, Sales Tax, and Utilities Users Tax, fund a variety of other services within the City.

Public Health Impacts on Local Community from the LBU

Long Beach Unit GHG Emissions

The Long Beach Climate Action Plan (CAP) – Appendix G (August 2022) assesses lifecycle emissions associated with oil and natural gas extraction operations occurring within the City boundary. Of the total oil and gas lifecycle emissions, 76% occur downstream (i.e., transport to consumers and end use of fuel), 14% occur midstream (i.e., oil refining), and 5% occur upstream (i.e., extraction); the remaining 4% are lifecycle natural gas emissions.

The CAP also quantifies GHG emissions within the City by sector. In 2015, the Transportation sector was the largest contributor, emitting 44.5% of the annual total. Energy use in Residential, Commercial, and Institutional buildings was second with 26.0%, while Manufacturing & Construction activities where responsible for an additional 14.3%. The Energy sector was responsible for 7.9% of the annual total. Waste and Fugitive Emissions accounted for the remainder.

Using the 2015 Long Beach lifecycle emissions as a starting point, the emissions associated with the activities covered under the LBU FY24 – FY28 Program and Annual Plan can be estimated. The estimation accounts for the percent of LBU production relative to the Long Beach total (which has declined since 2015) and the percentage contribution of program plan activities towards the lifecycle emission.

The estimated emissions in FY24 from the LBU Program and Annual Plan are estimated to be about 2% of the 2015 Long Beach lifecycle emissions as detailed in the table below:

Description	Oil (bo)	Gas (mcf)	Oil Emissions (MT CO_2e)	Gas Emissions (MT CO_2e)	Total Emissions (MT CO_2e)	% of 2015 Long Beach Total
2015 Long Beach Total	13,321,018	5,116,441	8,000,604	328,689	8,329,293	100%
2015 LBU	8,528,511	3,238,873	5,122,224	208,071	5,330,295	64%
FY24 LBU Forecast	5,390,000	2,479,000	3,237,234	159,255	3,396,489	41%
FY24 LBU emissions (5% of total life cycle emissions attributable to upstream, e.g., extraction)					169,824	2%

Even though the LBU's contribution to carbon dioxide equivalents is estimated at only 2% of citywide contributions, the City has made investments in its oil operations to reduce GHG and air pollutant emissions and to address the environmental impact of extraction activities. These investments include:

- Reducing the City's flare hours and NOx emissions by over 60% through an investment in connecting its Tidelands processing plants to the THUMS power plant in 2014
- Investing $2 million into the power plant to reduce its NOx emissions by 50% in the year 2024
- Utilization of electric drilling rigs on the THUMS islands

Long Beach Unit Air Emissions

Separate from GHG emissions, the LBU reports other emissions from its operations within the South Coast Air Quality Management District (SCAQMD).

These emissions include Volatile Organic Compounds (VOCs), NOx, CO, SOx, and Particulate Matter (PM). Unit operations accounted for significantly less than 1% of the Air District total for all such emissions over the last four years:

LBU Criteria Emissions Percent of SCAQMD Totals					
	VOCs	NOx	CO	SOx	PM
2019	0.03%	0.13%	0.03%	0.06%	0.07%
2020	0.03%	0.16%	0.04%	0.07%	0.08%
2021	0.03%	0.13%	0.04%	0.06%	0.06%
2022	0.03%	0.14%	0.02%	0.04%	0.05%

Additionally, CRC reports other toxic emissions from its operations, which include the LBU, to the SCAQMD. In 2020, the last year for which data is available, their operations accounted for approximately 0.10% of total toxic emissions in the Air District.

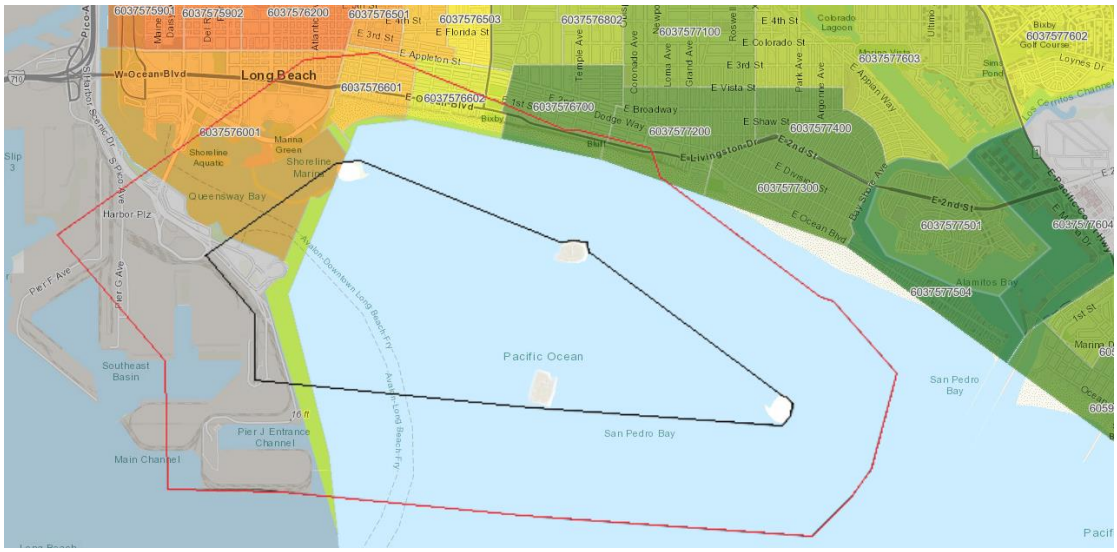
As part of the City's August 2022 CAP, seven near-term emission reduction actions were identified for implementation by the City. Specific to the LBU operations, action Item BE-8 requires identifying strategies it can devise and pursue under its own authority, those it will need to pursue through existing and/or expanded partnerships with federal, state and regional agencies that have regulatory authority, and those that it can partner on with the private sector, to reduce oil and gas extraction emissions.

Action item AQ-7 from the CAP requires the City to increase air monitoring systems to gather relevant, reliable air quality data in real time to help make informed safety decisions. As part of its implementation, the City included in the FY23 Budget a new position in the Development Services Department to support the City's annual oil well inspection program and the oil well abandonment and methane gas mitigation programs. This position will help ensure oil wells are inspected annually. Data collected from these inspections, along with the data collected from increased air monitoring, will be available to the public as well as the regulatory agencies.

California Communities Environmental Health Screen Tool

The latest iteration of the California Communities Environmental Health Screening Tool (CalEnviroScreen 4.0 – October 2021) was used to assess the community impacted by the LBU operations. The tool analyzes data on environmental, public health and socioeconomic conditions in California's 8,000 census tracts to provide a clear picture of cumulative pollution burdens and vulnerabilities in communities throughout the state.

A total of five census tracts are located within a 3,200 feet radius of the LBU wells as shown in red below:



Many factors, often referred to as stressors, contribute to an individual or a community's pollution burden and vulnerability. People are simultaneously exposed to multiple contaminants from multiple sources and have multiple stressors based on their health status as well as living conditions. The table below summarizes the population and socioeconomic factors in the five tracts:

Parameters	Tract No. 6037576001	6037576601	6037576602	6037576700	6037577200	Average*
Population	5,174	4,293	4,423	3,935	5,848	
Race/Ethnicity Profiles						
White	50.9%	53.8%	56.2%	62.4%	63.0%	57.3%
Hispanic	12.7%	30.7%	25.3%	15.4%	22.7%	21.2%
African American	13.7%	10.4%	6.9%	8.9%	6.9%	9.4%
Asian American	20.2%	3.4%	6.4%	9.9%	5.6%	9.3%
Other	2.4%	1.8%	5.2%	3.4%	1.8%	2.8%
Age Profiles						
Between 10 - 64	86.9%	82.2%	82.6%	70.2%	85.8%	82.2%
Elderly (Age 65 or Greater)	9.2%	12.7%	12.2%	23.1%	10.7%	13.1%
Children (Age 10 or Less)	3.9%	5.1%	5.2%	6.7%	3.5%	4.7%
Poverty Indicator Percentage**						
Poverty Indicator	15%	27%	32%	27%	19%	23%

* Population-weighted average

** Percentage of people in the census tract living below twice the federal poverty level

The average population and socioeconomic factors from the five tracts immediately adjacent to the LBU wells, and within SB's 1137 prescribed 3,200 feet setback, indicate the following key results:

- The highest race/ethnic group is White at 57%, which is overrepresented compared to the City's population of 28%
- The elderly (age 65 or greater) comprises 13% of the population, slightly higher than the City's population of 12%, and
- 23% of the population live below twice the federal poverty level, lower than the City's population of 59%

Long Beach Health and Human Services Department 2021 – 2026 Strategic Plan

The City has its own Health Department and is also within the jurisdiction of the Los Angeles County Department of Public Health. In April 2021, the City's Health and Human Services Department (Health Department) issued its 2021 – 2026 Strategic Plan. The intent of this plan is to focus on the priorities and to move the City into a healthier and brighter future for all. Through this plan, the Health Department seeks to pave the way for

opportunities that will enable everyone in Long Beach to enjoy their full potential. This Strategic Plan was created with equity and trauma- and resiliency-informed lenses, utilizing a population health perspective, and an understanding of the need for health in all policies.

The Health Department stands for Equity: Everyone in Long Beach has the opportunity to be healthy, safe and thriving regardless of their race, color, sex, gender, nationality, sexual orientation, income or where they live. Equity is the lens through which the City assesses, prioritizes, and implements all policies and services. Utilizing an equity lens, the following objectives are documented in the Strategic Plan to provide the support towards the vulnerable populations in Long Beach:

- Focus efforts to improve the birth outcomes of Black women in Long Beach
- Reduce the incidence of chronic diseases (asthma, hypertension, cardiovascular disease, and diabetes) among Black residents in Long Beach
- Implement partnerships, programs and services focused on improving the social determinants of health that affect obesity, chronic diseases, and violence for the Latino/Latinx population in low income and high-density areas of Long Beach
- Improve the mental and physical health of the Cambodian population in Long Beach
- Improve the health outcomes of older adults in Long Beach
- Improve health and wellness outcomes for Veterans in Long Beach

LBU Abandonment and Decommissioning Costs

In 1999 the City created an abandonment reserve fund to cover the costs for the City's and State's ultimate abandonment and decommissioning of the Wilmington Oil Field. The abandonment reserve was funded through a continuing monthly per barrel charge based on tidelands oil production.

In 2002, the State sought to compel the City to cease withholding funds for the Wilmington Oil Field's abandonment and decommissioning liabilities and for the City to pay to the State all funds previously withheld. According to the State, the expense for well plugging and abandonment will occur "only after the revenue stream from production operations ends," and when no oil revenues will be available to pay the cost. The State ultimately lost this case and the funds remained in the State's abandonment fund thereby ensuring that the oil and gas operations pay for their future abandonment and decommissioning liabilities and not shift the cost to the State's taxpayers or the City's general fund.

Starting in 2018, the City has been accelerating the amount it reserves annually for its share of the Wilmington Oil Field's abandonment liability. The City intends to have its share of the abandonment liability fully funded (totaling $154 million) in the 2035 timeframe, a full ten years before Governor Newsom directed the California Air Resources Board in April 2021 to evaluate how to phase out oil and gas extraction in California by 2045.

On September 25, 2022, AB 353 was approved which deleted the provision in existing law that the State's Abandonment Reserve Fund (Fund) be capped at $300 million. Under AB 353, the State Controller now transfers to the Fund $2,000,000 or 50 percent of remaining oil revenue, whichever is less, on the last day of each month beginning January 31, 2023.

The current estimate for the State's share of the abandonment and decommissioning costs for the Wilmington Oil Field is $939,660,000. This estimate is taken from the "Fiscal Year 2023 Oil Field Abandonment Liability" memorandum prepared by City of Long Beach Energy Resources on September 21, 2022. The letter indicates that at the time, less than one-third of the State's abandonment liability was reserved (approximately $300 million) in the State's Abandonment Reserve Fund.

AB 353 now directs the State to reserve a maximum of $2 million per month beginning in January 2023. At this rate, the State's Abandonment Reserve Fund would reach the $940 million total around the year 2050. Approximately 73% of the State's total abandonment and decommissioning liability is associated with the LBU and the remaining 27% is associated with the West Wilmington oil operations.

The transition away from fossil fuels will require meticulous planning, funding of environmental responsibilities and recognition of the fiscal liabilities related to this transition. The revenues generated from today's oil and gas extraction operations to fund future abandonment liabilities are at risk from an evolving legislative environment at the state level.

Presently the State has less than one-third of its projected total abandonment liability reserved in its oil liability trust fund. The City has set an aggressive goal to have its share of the Wilmington Oil Field abandonment liability fully funded around 2035. Absent further action, the State is not projected to be fully funded to potentially begin abandonment and decommissioning activities in the Wilmington Oil Field until 2050, approximately fifteen years after the City would be ready. The City implores the State to consider undertaking a similar accelerated funding approach to ensure complete funding of their oil liability trust fund in the same 2035 timeframe.