HELIX Environmental Planning

Cottonwood Sand Mine Project

Greenhouse Gas Emissions Technical Report

PDS2018-MUP-18-023; PDS2018-RP-18-001;
PDS2018-ER-18-19-007

November 2021 | 02975.00002.002

Prepared for:

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Planning & Development Services
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Project Proponent:

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ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
amsl	above mean sea level
CAA	Clean Air Act (Federal)
CAFE	Corporate Average Fuel Economy
CalEEMod	California Emission Estimator Model
CalRecycle	California Department of Resources Recycling and Recovery
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAA	California Clean Air Act
CEQA	California Environmental Quality Act
CGS	California Geological Survey
CH_4	methane
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	County of San Diego
CY	cubic yard
EO	Executive Order
EPIC	Energy Policy Initiative Center
°F	degrees Fahrenheit
GHG	greenhouse gas
GWP	global warming potential
HFCs	hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
LCFS	Low Carbon Fuel Standard
LLG	Linscott, Law & Greenspan, Engineers
LMA	local mobility analysis
MMT	million metric tons
mpg	miles per gallon
mph	miles per hour
MPOs	Metropolitan Planning Organizations
MRZ	Mineral Resource Zone
MT	metric ton
MUP	Major Use Permit

ACRONYMS AND ABBREVIATIONS (cont.)

NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NSR	New Source Review
PAL	plantwide applicability limitations
PCC	Portland Cement Concrete
PFCs	perfluorocarbons
ppm	parts per million
PRC	Public Resources Code
PSD	Prevention of Significant Deterioration
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SDAB	San Diego Air Basin
SDAPCD	San Diego County Air Pollution Control District
SF_6	sulfur hexafluoride
SMARA	Surface Mining and Reclamation Act of 1975
SR	State Route
TIA	Transportation Impact Analysis
VMT	vehicle miles traveled
USEPA	U.S. Environmental Protection Agency
WRI	World Resource Institute

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EXECUTIVE SUMMARY

This report evaluates the potential greenhouse gas (GHG) emission impacts associated with the Cottonwood Sand Mine Project (project). An assessment was made to determine whether the project would be consistent with the San Diego County General Plan growth projections and applicable polices, the San Diego Association of Governments' (SANDAG's) "San Diego Forward: The Regional Plan" (Regional Plan), and the California Air Resource Board's (CARB's) Climate Change Scoping Plan (Scoping Plan). An estimate of the GHG emissions that would occur as a result of construction and operation of the project is also provided.

The project would result in GHG emissions during both its construction and operational phases. Construction GHG emissions would be associated with heavy construction equipment, hauling trucks, and worker/vendor vehicle use. Construction activities are assumed to occur for two distinct purposes: site preparation and grading to prepare a pad for the sand processing equipment and truck loading area, and for construction the settling ponds; and demolition to remove structures prior to the start of each mining phase.

Operational GHG emissions would be associated with exhaust from off-road equipment, worker and vendor vehicles, and delivery trucks; electricity used for sand conveyance, sand processing, water pumping, and lighting; and solid waste disposal. All sand extraction, processing, and delivery activities are assumed to occur in three phases: Phase 1 would commence in 2022 and last 3 years; Phase 2 would commence in 2024 and last 3 years; and Phase 3 would commence in 2027 and last 4 years. The total duration of sand extraction activity is anticipated to last 10 years. Reclamation activities would occur throughout the mining as sand extraction is completed and areas are graded and revegetated, followed by final reclamation at the conclusion of mining, in accordance with the mining and reclamation plan.

The project would result in a reduction in regional truck VMT and the project would not conflict with or obstruct implementation of plans, policies, or regulations with the purpose of reducing GHG emissions including the Regional Plan and the Scoping Plan. The project would result in a peak annual net increase of 1,815.8 metric tons (MT) of carbon dioxide equivalents (CO_2e) per year, which is less than the South Coast Air Quality Management District's industrial source screening threshold of 10,000 MT CO_2e per year.

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1.0 INTRODUCTION AND PROJECT DESCRIPTION

1.1 PURPOSE OF THE REPORT

This report analyzes the significance of the proposed Cottonwood Sand Mine Project's (project) consistency with applicable regional and statewide plans for the purpose of reducing greenhouse gas (GHG) emissions, and contribution of GHG emissions to statewide GHG emissions and GHG emissions reduction targets and goals.

1.2 PROJECT LOCATION

The project is located at 3121 Willow Glen Drive in the unincorporated communities of Rancho San Diego and Jamul, southeast of the City of El Cajon in eastern San Diego County. The site is north of State Route (SR) 94 and east of SR 54 (see Figure 1, *Regional Location*, and Figure 2, *Aerial Vicinity*). More specifically, the project site is located southeast of Willow Glen Drive, north of Jamul Drive, east of Jamacha Road, and west of Hillsdale Road. Steele Canyon Road bisects the project site from north to south, near the center of the project. Principal site access is from Willow Glen Drive, with regional access from SR 54/Jamacha Boulevard and SR 94/Campo Road.

The approximately 280-acre site is situated within the Sweetwater River valley and in the floodplain of the Sweetwater River, which flows in a northeast-to-southwest direction through the site. Elevations on the project site range from approximately 320 feet above mean sea level (amsl) to 380 feet amsl. Land uses in the project vicinity include residential and rural residential development to the north and south, extractive operations to the east, and an adjacent golf course to the southeast. Open space is present in the hills south, east, and west of the site. A National Wildlife Refuge abuts the western end of the property along the river.

1.3 PROJECT DESCRIPTION

The project proposes to convert two golf courses to a sand mining operation that would be conducted in three phases over 10 years. The project requires approval of the following discretionary actions:

- A Major Use Permit (MUP) to allow mining activities; and
- A Reclamation Plan (RP) to specify the standards to which the site must be reclaimed upon completion of mining activities in accordance with the California Surface Mining and Reclamation Act of 1975 (SMARA).

The project's mining operations would extract, process, and transport sand using conventional earth moving and processing equipment. Approximately 4.3 million cubic yards (CY; 6.40 million tons) of material are proposed to be extracted. Mining and extraction activities are expected to produce approximately 3.8 million CY (5.7 million tons) of sand and gravel for market use. Extraction operations would be limited to a maximum production of 380,000 CY (570,000 tons) of construction grade aggregate (sand) per calendar year, with a 10 percent waste factor from the total amount extracted that includes wash fines and materials undesirable for processing. Material extracted and processed at the site would be suitable for construction uses and would be available to customers in San Diego County. Approximately 214 acres of the approximately 280-acre Project site are proposed for extractive use

under a phased extraction program. Surface areas not disturbed by mining would be subject to removal of invasive species in the river channel on the southwest portion of the site or be left in their current condition. The existing Sweetwater River channel and the majority of native habitat that currently exists on the site would be retained.

The project would be developed in three continuous mining phases, with sub-phases in each major phase of less than 30 acres per phase, and a fourth phase for cleanup, equipment removal, and final reclamation (see Figure 3, *Mining Phases*). Prior to the initiation of Phase 1, pre-mining activities such as the restriping of Willow Glen Drive between Steele Canyon Road and the Project ingress driveway to provide Class II buffered bike lanes on both sides of the roadway, improvements to the access point from Willow Glen Drive to the Phase 1 excavation area, and installation of screening landscaping would be implemented. Phase 1 would begin with the placement of the processing plant west of the existing clubhouse adjacent Willow Glen Drive. The plant site would consist of aggregate processing and washing facilities, three settling ponds, loadout area, and support structures and buildings (e.g., scale, office kiosk, and office trailer). A portable conveyor line would be installed to minimize the use of on-site roads to transport excavated materials to the processing plant from the excavation areas. The conveyor line would be mobile to provide access within each phase and would be relocated as mining activity is concluded in each phase. The mobile conveyor is proposed to minimize the use of on-site roads to transport excavated material between the plant and excavation areas.

Operations would commence west of the Steele Canyon Road bridge, and then generally proceed in a southwest-to-northeast direction across the project site. Existing vegetation, structures, and infrastructure within the golf courses would be removed as mining operations proceed, with approximately 20 to 30 acres subject to mining at any one time. Sand extraction during Phase 1 is anticipated to commence in 2022 and would be located within the area currently occupied by the closed Lakes Course to the west of Steele Canyon Road. Phase 2 is anticipated to commence in 2024 and would be located in the center of the site, east of Steele Canyon Road, on the currently operating Ivanhoe Course. Phase 3 mining operations are anticipated to commence in 2027 and would encompass the remaining acreage of the project site located to the east of Phase 2. Upon approval of the project and MUP, the eastern Ivanhoe Course would be closed, and all golf course operations would cease; the existing golf clubhouse would be demolished near the end of Phase 2 mining. Phase 4 would consist of removal of the processing plant, grading to final contours, final reclamation and revegetation efforts, cleanup, and equipment removal.

Each phase will include three to four sub-phases that are less than 30 acres each to begin reclamation as soon as possible. Excavation in each sub-phase would be completed before moving the conveyor and excavation equipment to the next sub-phase and reclamation would begin in the completed sub-phase. Topsoil and vegetation stripping would occur in each subsequent sub-phase in advance of completing excavation in the preceding sub-phase. The maximum excavation depth is proposed to be 40 feet below the existing land surface. The average depth of excavation is expected to be approximately 20 feet below the existing land surface outside the main Sweetwater River channel. Excavation would not occur within the bottom of the existing low-flow channel in order to retain existing hydrologic characteristics.

Aggregate material would be processed, sized, and stored in stockpiles up to 25 feet in height near the plant. Wash fines produced from the processing plant would be gathered in three settling ponds located near the plant that would be 300 feet long, 50 feet wide, and 10 feet deep. When ponds are cleaned, wash fines (silt, clay, and organic material) would either be sold as a soil amendment or returned to

excavation areas that have been completed to be used as backfill or incorporated into the surface of reclaimed areas as soil amendment.

Sand excavation and processing would occur Monday through Friday, between the hours of 7:00 a.m. and 5:00 p.m. Trucking operations for material sales would occur from 9:00 a.m. to 3:30 p.m. Monday through Friday to avoid peak traffic periods.

The project proposes to widen Willow Glen Drive between Steele Canyon Road and the project egress driveway to four lanes with intermittent travel lanes per the County Roadway Standards and the General Plan Mobility Element roadway classification. A new access off Willow Glen Drive would be provided to the west of the existing driveways to the Cottonwood Golf Club parking lot to provide access for mining operations, material sales, employees, and vendors. The project proposes to construct a two-way left-turn lane between the existing driveways, which would serve as a refuge lane for trucks to complete their outbound maneuver as they are exiting the site. Between the egress driveway and the easterly property line, the project would construct the necessary improvements to provide the required lane transitions and lane drops from the proposed four lanes to the existing two lanes east of the project site. In addition, a new access point to the property from Willow Glen Drive west of the Steele Canyon Road (Phase 1 area) would be necessary as the clearance height of the bridge that crosses the Sweetwater River on Steele Canyon Road would not allow most large trucks used by service vendors to pass beneath the bridge. An additional access point is proposed to be constructed at the intersection of Willow Glen Drive and Muirfield Drive. The new driveway would be restricted to servicing the mining operations.

Areas disturbed by resource extraction would be progressively reclaimed in an ongoing process that commences when mining operations have ceased within a given sub-phase area and continues until all mining-related disturbance is reclaimed and all equipment involved in these operations has been removed. Reclamation would include establishment of all final slopes and topographic features, incorporation of accumulated wash fines and topsoil (as applicable), installation of irrigation lines, revegetation of the channel and slopes using appropriate native species, weed control, and monitoring. Upon completion of the extraction activities, the entire site would be reclaimed in accordance with the mining and reclamation plan. Reclamation of the site would include: (1) removal of all manufactured structures; (2) grading to achieve final landforms; and (3) revegetation and monitoring. The final landform is proposed to be a relatively flat plain that gently slopes downward from east to west, with a widened river channel bisecting the length of the site. The reclaimed river channel is expected to average approximately 250 to 300 feet in width; the low-flow channel would be retained to accommodate annual water transfers from Loveland Reservoir to Sweetwater Reservoir. Reclaimed and revegetated areas would be restored to an end use of undeveloped lands, recreational trails, and land suitable for uses allowed by the Open Space land use designation and existing zoning classifications. Revegetation monitoring would continue until revegetation standards are met after this final phase.

2.0 ENVIRONMENTAL SETTING

2.1 UNDERSTANDING GLOBAL CLIMATE CHANGE

Global climate change refers to changes in average climatic conditions on Earth, as a whole, including temperature, wind patterns, precipitation, and storms. Global temperatures are moderated by naturally occurring atmospheric gases. These gases are commonly referred to as GHGs because they function like

a greenhouse by letting light in but preventing heat from escaping, thus warming the Earth's atmosphere. These gases allow solar radiation (sunlight) into the Earth's atmosphere but prevent radiative heat from escaping, thus warming the Earth's atmosphere.

GHGs are emitted by natural processes and human (anthropogenic) activities. Anthropogenic GHG emissions are primarily associated with (1) the burning of fossil fuels during motorized transport, electricity generation, natural gas consumption, industrial activity, manufacturing, and other activities; (2) deforestation; (3) agricultural activity; and (4) solid waste decomposition.

The temperature record shows a decades-long trend of warming, with 2016 global surface temperatures ranking as the warmest year on record since 1880 (National Aeronautics and Space Administration [NASA] 2021). The latest news release of long-term warming trends announced 2020 ranked as tied with 2016 for the warmest year on record with an increase of 1.02 degrees Celsius (1.84 degrees Fahrenheit) compared to the 1951-1980 average (NASA 2021). GHG emissions from human activities are the most significant driver of observed climate change since the mid-20th century (United Nations Intergovernmental Panel on Climate Change [IPCC] 2013). The IPCC constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The statistical models show a "high confidence" that temperature increase caused by anthropogenic GHG emissions could be kept to less than two degrees Celsius relative to pre-industrial levels if atmospheric concentrations are stabilized at about 450 parts per million (ppm) carbon dioxide equivalent (CO_2e) by the year 2100 (IPCC 2014).

2.2 GREENHOUSE GASES OF PRIMARY CONCERN

GHGs, as defined in Section 15364.5 of the CEQA Guidelines, include, but are not limited to, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Although water vapor is the most abundant and variable GHG in the atmosphere, it is not considered a pollutant; it maintains a climate necessary for life.

Carbon Dioxide. CO_2 is the most important and common anthropogenic GHG. CO_2 is an odorless, colorless GHG. Natural sources include the decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungi; evaporation from oceans; and volcanic outgassing. Anthropogenic sources of CO_2 include burning fuels, such as coal, oil, natural gas, and wood. Data from ice cores indicate that CO_2 concentrations remained steady prior to the current period for approximately 10,000 years. The atmospheric CO_2 concentration in 2010 was 390 ppm, 39 percent above the concentration at the start of the Industrial Revolution (about 280 ppm in 1750). In February 2021, the CO_2 concentration was 416 ppm, a 48 percent increase since 1750 (National Oceanic and Atmospheric Administration [NOAA] 2021).

Methane. CH_4 is a gas and is the main component of natural gas used in homes. A natural source of methane is from the decay of organic matter. Geological deposits known as natural gas fields contain methane, which is extracted for fuel. Other sources are from decay of organic material in landfills, fermentation of manure, and cattle digestion.

Nitrous Oxide. N_2O is produced by both natural and human-related sources. N_2O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage

treatment, mobile and stationary combustion of fossil fuel, adipic (fatty) acid production, and nitric acid production.

Fluorocarbons. Fluorocarbons are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. Chlorofluorocarbons (CFCs) are nontoxic, nonflammable, insoluble, and chemically nonreactive in the troposphere (the level of air at Earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone; therefore, their production was stopped as required by the Montreal Protocol.

Sulfur Hexafluoride. SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semi-conductor manufacturing, and as a tracer gas for leak detection.

GHGs have long atmospheric lifetimes that range from one year to several thousand years. Long atmospheric lifetimes allow for GHGs to disperse around the globe. Because GHGs vary widely in the power of their climatic effects, climate scientists have established a unit called global warming potential (GWP). The GWP of a gas is a measure of both potency and lifespan in the atmosphere as compared to CO_2. For example, because methane and N_2O are approximately 25 and 298 times more powerful than CO_2, respectively, in their ability to trap heat in the atmosphere, they have GWPs of 25 and 298, respectively (CO_2 has a GWP of 1). CO_2e (CO_2 equivalent) is a quantity that enables all GHG emissions to be considered as a group despite their varying GWP. The GWP of each GHG is multiplied by the prevalence of that gas to produce CO_2e. The atmospheric lifetime and GWP of selected GHGs are summarized in Table 1, *Global Warming Potentials and Atmospheric Lifetimes*. As shown in the table, the GWP for common GHGs ranges from 1 (CO_2) to 22,800 (SF_6).

Table 1
GLOBAL WARMING POTENTIALS AND ATMOSPHERIC LIFETIMES

Greenhouse Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)
Carbon Dioxide (CO_2)	50-200	1
Methane (CH_4)	12	25
Nitrous Oxide (N_2O)	114	298
HFC-134a	14	1,430
PFC: Tetraflouromethane (CF_4)	50,000	7,390
PFC: Hexafluoroethane (C_2F_6)	10,000	12,200
Sulfur Hexafluoride (SF_6)	3,200	22,800

Source: IPCC 2007
HFC: hydrofluorocarbon; PFC: perfluorocarbon

2.3 WORLDWIDE AND NATIONAL GHG INVENTORY

In 2013, total GHG emissions worldwide were estimated at 48,892 million metric tons (MMT) of CO_2e emissions (World Resource Institute [WRI] 2021). The U.S. contributed the second largest portion (13 percent) of global GHG emissions in 2014. The total U.S. GHG emissions was 6,319 MMT CO_2e in 2014, of which 82 percent was CO_2 emission (WRI 2021). On a national level, approximately 27 percent of GHG emissions were associated with transportation and about 38 percent were associated with electricity generation (WRI 2021).

2.4 STATE GHG INVENTORIES

CARB performed statewide inventories for the years 1990 to 2018, as shown in Table 2, *California Greenhouse Gas Emissions by Sector*. The inventory is divided into six broad sectors of economic activity: agriculture, commercial, electricity generation, industrial, residential, and transportation. Emissions are quantified in MMT CO_2e.

Table 2
CALIFORNIA GREENHOUSE GAS EMISSIONS BY SECTOR

Sector	Emissions (MMT CO_2e) 1990	Emissions (MMT CO_2e) 2000	Emissions (MMT CO_2e) 2010	Emissions (MMT CO_2e) 2018
Agriculture and Forestry	18.9 (4%)	31.0 (7%)	33.7 (8%)	32.6 (8%)
Commercial	14.4 (3%)	14.1 (3%)	20.1 (4%)	23.9 (6%)
Electricity Generation	110.5 (26%)	105.4 (22%)	90.6 (20%)	63.2 (15%)
Industrial	105.3 (24%)	105.8 (22%)	101.8 (23%)	101.3 (24%)
Residential	29.7 (7%)	31.7 (7%)	32.1 (7%)	30.5 (7%)
Transportation	150.6 (35%)	183.2 (39%)	170.2 (38%)	173.8 (41%)
Unspecified Remaining	1.3 (<1%)	0.0 (0%)	0.0 (0%)	0.0 (0%)
Total	430.7	471.1	448.5	425.3

Source: CARB 2007; CARB 2019; and CARB 2020
MMT = million metric tons; CO_2e = carbon dioxide equivalent

As shown in Table 2, statewide GHG source emissions totaled 431 MMT CO_2e in 1990, 471 MMT CO_2e in 2000, 449 MMT CO_2e in 2010, and 425 MMT CO_2e in 2018. Transportation-related emissions consistently contribute the most GHG emissions, followed by electricity generation and industrial emissions.

A San Diego regional emissions inventory that was prepared by the University of San Diego (USD) School of Law, Energy Policy Initiative Center (EPIC) accounted for the unique characteristics of the region. Its 2012 emissions inventory for San Diego is presented in Table 3, *San Diego County GHG Emissions by Sector in 2012*. The sectors included in this inventory are somewhat different from those in the statewide inventory. Similar to the statewide emissions, transportation related GHG emissions contributed the most countywide, followed by emissions associated with energy use.

Table 3
SAN DIEGO COUNTY GHG EMISSIONS BY SECTOR IN 2012

Sector	2012 Emissions MMT CO_2e (% total)[1]
Passenger Cars & Light Duty Vehicles	13.14 (37.2%)
Electricity	7.97 (22.6%)
Natural Gas	2.84 (8.0%)
Heavy Duty Trucks & Vehicles	1.89 (5.4%)
Solid Waste	1.75 (4.9%)
Other Fuels	1.64 (4.6%)
Industrial	1.43 (4.1%)
Aviation	1.37 (3.9%)
Off-Road	0.92 (2.6%)

Sector	2012 Emissions MMT CO_2e (% total)[1]
Wildfire	0.81 (2.3%)
Other – Thermal Cogeneration	0.64 (1.8%)
Water	0.52 (1.5%)
Wastewater	0.16 (0.5%)
Rail	0.11 (0.3%)
Agriculture	0.08 (0.2%)
Marine Vessels (ocean-going vessels and harbor craft)	0.05 (0.1%)
Development and Sequestration	(-0.65)
Total	**34.67**

Source: USD EPIC 2015. 2012 Greenhouse Gas Emissions Inventory and Projections for the San Diego Region. Prepared by the University of San Diego School of Law, Energy Policy Initiative Center (EPIC), and available online at: https://www.sdforward.com/pdfs/RP_final/AppendixD2012GreenhouseGasEmissionsInventoryfortheSanDiegoRegionandProjections.pdf.

[1] Percentages may not total 100 due to rounding.

MMT = million metric tons; CO_2e = carbon dioxide equivalent

2.5 ON-SITE GHG INVENTORY

The project site is currently developed with two 18-hole golf courses, one of which is currently active, and an 11,500-square foot clubhouse and restaurant. Existing sources of GHG emissions are from vehicle emissions associated with customers, employees, and vendors driving to and from the golf course; emissions resulting from energy used in operation of the golf course and clubhouse; emissions resulting from the disposal of solid waste; emissions from the electricity required to pump water from on-site wells; and emissions from golf course maintenance activities.

3.0 REGULATORY SETTING

3.1 FEDERAL GREENHOUSE GAS REGULATIONS

The U.S. Supreme Court ruled on April 2, 2007, in *Massachusetts* v. *U.S. Environmental Protection Agency* (USEPA), that CO_2 is an air pollutant, as defined under the Clean Air Act (CAA), and that the USEPA has the authority to regulate emissions of GHGs. The USEPA announced that GHGs (including CO_2, CH_4, N_2O, HFC, PFC, and SF_6) threaten the public health and welfare of the American people. This action was a prerequisite to finalizing the USEPA's GHG emissions standards for light-duty vehicles, which were jointly proposed by the USEPA and the United States Department of Transportation's National Highway Traffic Safety Administration (NHTSA). The standards were established on April 1, 2010 for 2012 through 2016 model year vehicles and on October 15, 2012 for 2017 through 2025 model year vehicles (USEPA and NHTSA 2012).

3.1.1 Mandatory Reporting Rule of Greenhouse Gases

On January 1, 2010, the USEPA began requiring large emitters of heat-trapping emissions to begin collecting GHG data under a new reporting system. This program covers approximately 85 percent of the nation's GHG emissions and applies to roughly 10,000 facilities. Fossil fuel and industrial GHG suppliers, motor vehicle and engine manufacturers, and facilities that emit 25,000 metric tons or more of CO_2e per year are required to report GHG emissions data to the USEPA annually. This reporting threshold is equivalent to the annual GHG emissions from approximately 4,600 passenger vehicles.

3.1.2 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards

The USEPA and the NHTSA have been working together on developing a national program of regulations to reduce GHG emissions and to improve fuel economy of light-duty vehicles. The USEPA established the first-ever national GHG emissions standards under the CAA, and the NHTSA established Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act. On April 1, 2010, the USEPA and NHTSA announced a joint Final Rulemaking that established standards for 2012 through 2016 model year vehicles. This was followed up on October 15, 2012, when the agencies issued a Final Rulemaking with standards for model years 2017 through 2025. On August 2, 2018, the agencies released a notice of proposed rulemaking—the Safer Affordable Fuel-Efficient Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks (SAFE Vehicles Rule). The purpose of the SAFE Vehicles Rule is "to correct the national automobile fuel economy and greenhouse gas emissions standards to give the American people greater access to safer, more affordable vehicles that are cleaner for the environment." The direct effect of the rule is to eliminate the standards that were put in place to gradually raise average fuel economy for passenger cars and light trucks under test conditions from 37 miles per gallon (mpg) in 2020 to 50 mpg in 2025. By contrast, the new SAFE Vehicles Rule freezes the average fuel economy level standards indefinitely at the 2020 levels. The new SAFE Vehicles Rule also results in the withdrawal of the waiver previously provided to California for that State's GHG and Zero-Emissions Vehicle programs under Section 209 of the CAA. The combined USEPA GHG standards and NHTSA CAFE standards resolve previously conflicting requirements under both federal programs and the standards of the State of California and other states that have adopted the California standards. The SAFE Vehicles Rule Part I (SAFE-1), which withdraws the waiver, was published in September 2019 and Part II (SAFE-2), which finalizes the regulation, was published in April 2020. On April 26, 2021, the USEPA published the Notice of Reconsideration of Previous Withdrawal of a Waiver for California's Advanced Clean Car Program. The purpose of this Notice of Reconsideration is to seek comment on a number of issues in the SAFE-1 action including:

- Whether it was proper for the USEPA to reconsider a previously issued CAA waiver.
- Whether USEPA's actions to withdraw California's waiver was appropriate.
- Whether the SAFE-1 interpretation of the CAA that enabled USEPA to withdraw California's waiver was appropriate.
- Whether the SAFE-1 interpretation of CAA Section 177 that could disallow other states' ability to adopt California GHG emission standards was appropriate.

3.1.3 Prevention of Significant Deterioration/Title V GHG Tailoring Rule

GHG emissions from the largest stationary sources were, for the first time, covered by the Prevention of Significant Deterioration (PSD) and Title V Operating Permit Programs beginning on January 2, 2011. USEPA's GHG Tailoring Rule, issued in May 2010, established a commonsense approach to permitting GHG emissions under PSD and Title V. The rule set initial emission thresholds, known as Steps 1 and 2 of the Tailoring Rule, for PSD and Title V permitting based on CO_2e emissions. Step 3 of the GHG Tailoring Rule, issued on June 29, 2012, continued to focus GHG permitting on the largest emitters by retaining the permitting thresholds that were established in Steps 1 and 2. In addition, the Step 3 rule improved the usefulness of planetwide applicability limitations (PALs) by allowing GHG PALs to be established on

CO_2e emissions, in addition to the already available mass emissions PALs, and to use the CO_2e-based applicability thresholds for GHGs provided in the "subject to regulation" definition in setting the PAL on a CO_2e basis. The rule also revised the PAL regulations to allow a source that emits or has the potential to emit at least 100,000 tons per year of CO_2e, but that has minor source emissions of all other regulated New Source Review (NSR) pollutants, to apply for a GHG PAL while still maintaining its minor source status.

3.2 CALIFORNIA GREENHOUSE GAS REGULATIONS

3.2.1 Executive Order S-3-05

On June 1, 2005, Executive Order (EO) S-3-05 proclaimed that California is vulnerable to climate change impacts. It declared that increased temperatures could reduce snowpack in the Sierra Nevada, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To avoid or reduce climate change impacts, EO S-3-05 calls for a reduction in GHG emissions to the year 2000 level by 2010, to year 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. EOs are not laws and can only provide the governor's direction to state agencies to act within their authority.

3.2.2 Executive Order B-30-15

On April 29, 2015, EO B-30-15 established a California GHG reduction target of 40 percent below 1990 levels by 2030. The EO aligns California's GHG reduction targets with those of leading international governments, including the 28-nation European Union. California is on track to meet or exceed the target of reducing greenhouse gas emissions to 1990 levels by 2020, as established in AB 32. The updated emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the ultimate goal established by EO S-3-05 of reducing emissions 80 percent under 1990 levels by 2050.

EOs are not laws, they provide the governor's direction to state agencies to act within their authority and to reinforce existing laws. Legislation is required to enact the goals of EO S-3-05 and EO B-30-15 and establish a framework for statewide implementation.

3.2.3 Assembly Bill 32 – Global Warming Solutions Act of 2006

The California Global Warming Solutions Act of 2006 (Assembly Bill 32 and Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599), widely known as AB 32, requires that the CARB develop and enforce regulations for the reporting and verification of statewide GHG emissions. CARB is directed to set a GHG emission limit, based on 1990 levels, to be achieved by 2020. The bill requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions. AB 32 enacts the goals of EO S-3-05.

3.2.4 Senate Bill 32 – 2016 Amendments to the California Global Warming Solutions Act of 2006

Approved by Governor Brown in September 2016, Senate Bill (SB) 32 (Amendments to the California Global Warming Solutions Action of 2006) extends California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to

authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030, which set the next interim step in the State's continuing efforts to pursue the long-term target expressed in EO B-30-15 of 80 percent below 1990 emissions levels by 2050.

3.2.5 Assembly Bill 197 – 2016 Climate Equity and Transparency Act

A condition of approval for SB 32 was the passage of AB 197. AB 197 requires that CARB consider the social costs of GHG emissions and prioritize direct reductions in GHG emissions at mobile sources and large stationary sources. AB 197 also gives the California legislature more oversight over CARB through the addition of two legislatively appointed members to the CARB Board and the establishment a legislative committee to make recommendations about CARB programs to the legislature.

3.2.6 Assembly Bill 1493 – Vehicular Emissions of GHGs

AB 1493 (Pavley) requires that CARB develop and adopt regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty truck and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State." On September 24, 2009, CARB adopted amendments to the Pavley regulations that intend to reduce GHG emissions in new passenger vehicles from 2009 through 2016. The amendments bind California's enforcement of AB 1493 (starting in 2009), while providing vehicle manufacturers with new compliance flexibility. The amendments also prepare California to merge its rules with the federal CAFE rules for passenger vehicles. In January 2012, CARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single packet of standards called Advanced Clean Cars.

3.2.7 Assembly Bill 75

AB 75 was passed in 1999 and mandates state agencies to develop and implement an integrated waste management plan to reduce GHG emissions related to solid waste disposal. In addition, the bill mandates that community service districts providing solid waste services report the disposal and diversion information to the appropriate city, county, or regional jurisdiction. The bill requires diversion of at least 50 percent of the solid waste from landfills and transformation facilities, and submission to the California Department of Resources Recycling and Recovery (CalRecycle; formerly known as California Integrated Waste Management Board) of an annual report describing the diversion rates.

3.2.8 Executive Order S-01-07

EO S-01-07 was signed by Governor Schwarzenegger on January 18, 2007 and directs that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It orders that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California and directs CARB to determine whether an LCFS can be adopted as a discrete early action measure pursuant to AB 32. The CARB approved the LCFS as a discrete early action item with a regulation adopted and implemented in 2010. Although challenged in 2011, the Ninth Circuit reversed the District Court's opinion and rejected arguments that implementing LCFS violates the interstate commerce clause in September 2013. CARB is therefore continuing to implement the LCFS statewide.

3.2.9 Senate Bill 350

Approved by Governor Brown on October 7, 2015, SB 350 increases California's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030. This will increase the use of Renewables Portfolio Standard eligible resources, including solar, wind, biomass, and geothermal. In addition, large utilities are required to develop and submit Integrated Resource Plans to detail how each entity will meet their customers resource needs, reduce greenhouse gas emissions, and increase the use of clean energy.

3.2.10 Senate Bill 100

Approved by Governor Brown on September 10, 2018, SB 100 extends the renewable electricity procurement goals and requirements of SB 350. SB 100 requires that all retail sale of electricity to California end-use customers be procured from 100 percent eligible renewable energy resources and zero-carbon resources by the end of 2045.

3.2.11 Senate Bill 97 – CEQA: Greenhouse Gas Emissions

Approved by Governor Schwarzenegger on August 24, 2007, SB 97 required the OPR to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, including but not limited to, effects associated with transportation or energy consumption. The Resources Agency certified and adopted the guidelines on December 31, 2009. The OPR guidance states that the lead agency can rely on qualitative or other performance-based standards for estimating the significance of GHG emissions, although the new CEQA Guidelines did not establish a threshold of significance.

3.2.12 Senate Bill 375 – The Sustainable Communities and Climate Protection Act of 2008

SB 375 aligns regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPOs) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the MPOs' Regional Transportation Plan (RTP). Qualified projects consistent with an approved SCS or Alternative Planning Strategy categorized as "transit priority projects" would receive incentives to streamline CEQA processing.

3.2.13 California Air Resources Board: Scoping Plan

In December 2008, CARB adopted its first version of its Climate Change Scoping Plan (Scoping Plan), which contained the main strategies California will implement to achieve the mandate of AB 32 to reduce statewide GHG emissions to 1990 levels by 2020. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program (CARB 2008).

On December 14, 2017, CARB adopted the 2017 Climate Change Scoping Plan (2017 Scoping Plan), which lays out the framework for achieving the mandate of SB 32 (2016) to reduce statewide GHG emissions to at least 40 percent below 1990 levels by the end of 2030 (CARB 2017a).

The 2017 Scoping Plan includes guidance to local governments in Chapter 5, including plan-level GHG emissions reduction goals and methods to reduce communitywide GHG emissions. In its guidance, CARB recommends that "local governments evaluate and adopt robust and quantitative locally-appropriate goals that align with the statewide per capita targets and the State's sustainable development objectives and develop plans to achieve the local goals." CARB further states that "it is appropriate for local jurisdictions to derive evidence-based local per capita goals [or some other metric] that the local jurisdiction deems appropriate, such as mass emissions or per service population, based on local emissions sectors and population projections that are consistent with the framework used to develop the statewide per capita targets" (CARB 2017a).

3.3 LOCAL POLICIES AND PLANS: COUNTY OF SAN DIEGO

3.3.1 SANDAG: San Diego Forward: The Regional Plan

The San Diego Association of Governments' (SANDAG's) RTP/SCS "San Diego Forward: The Regional Plan" (Regional Plan) is the long-range planning document developed to meet the requirements of SB 375 and to address the region's housing, economic, transportation, environmental, and overall quality-of-life needs. Growth assumptions included in the Regional Plan are based on approved and allowable land uses identified by each jurisdiction in the region. The Regional Plan establishes a planning framework and implementation actions that increase the region's sustainability and encourage "smart growth while preserving natural resources and limiting urban sprawl." The Regional Plan encourages the regions and the County to increase residential and employment concentrations in areas with the best existing and future transit connections, and to preserve important open spaces. The focus is on implementation of basic smart growth principles designed to strengthen the integration of land use and transportation (SANDAG 2015).

3.3.2 County of San Diego General Plan

The County 2011 General Plan includes a plan to balance population growth and development with infrastructure needs and resource protection. The current General Plan is based on smart growth and land planning principles that will reduce vehicle miles travelled (VMT), and thus result in a reduction of GHGs. This will be accomplished by locating future development within and near existing infrastructure.

The Conservation and Open Space Elements present goals and policies designed to balance the regional need for construction materials with the community need for freedom from any disturbing effects of mining and aggregate processing activities while protecting public health (County 2011). The goal of the long-term production of mineral materials is to meet the local County average annual demand, while maintaining permitted reserves equivalent to a 50-year supply, using operational techniques and site reclamation methods consistent with California standards so that adverse effects on surrounding land uses, public health, and the environment are minimized. These policies include the following:

COS-10.5 Reclamation Plans. Require all mining projects to be conducted in accordance with a reclamation plan that meets the minimum reclamation standards required by the California Surface Mining and Reclamation Act and the associated State Mining and Geology Board regulations. Require the reclamation plan to include a phasing plan that provides for the completion of the surface mining on each segment of the mined lands so that the reclamation can be initiated at the earliest possible time on those portions of the mined lands that will not be subject to further disturbance by the surface mining operation.

COS-10.6 Conservation of Construction Aggregate. Encourage the continued operation of existing mining facilities and streamline the permitting of new mining facilities consistent with the goal to establish permitted aggregate resources that are sufficient to satisfy 50 years of County demand.

COS-10.8 New Mining Facilities. Develop specific permit types and procedures for the authorization of new mining facilities that recognize the inherent physical effects of mining operations and the public necessity for available mineral resources adequate to meet local demand, in accordance with Public Resources Code (PRC) Section 2762.

3.3.3 County of San Diego Construction and Demolition Recycling Ordinance

The County has a construction and demolition recycling ordinance that is designed to divert debris from construction and demolition projects away from landfill disposal in the unincorporated County of San Diego. The ordinance requires that 90 percent of inert materials and 70 percent of all other construction materials from a project be recycled. In order to comply with the ordinance, applicants must submit a Construction and Demolition Debris Management Plan and a fully refundable Performance Guarantee prior to building permit issuance.

3.3.4 County of San Diego Climate Action Plan

In February 2018, the County adopted a long-term programmatic CAP that outlines the actions the County will undertake to achieve its proportional share of state GHG emission reductions to be compliant with AB 32 and EO S-3-05 (County 2018). The CAP was developed to ensure that new developments incorporate more sustainable design standards and applicable GHG reduction measures (County 2018). Appendix A of the CAP includes a project-level CAP Consistency Review Checklist (Checklist) that may be used to demonstrate a project's consistency with the General Plan growth projections, land use assumptions, and applicable CAP measures. The purpose of the Checklist is to, in conjunction with the CAP, provide a streamlined review process for proposed new development projects that are subject to discretionary review and trigger environmental review pursuant to CEQA.

In March 2018, multiple petitioners filed a lawsuit against the County seeking to set aside certain portions of the CAP and the supplemental environmental impact report (SEIR) on which the CAP was based. In December 2018, the San Diego County Superior Court issued a writ ordering the approval of the CAP and its SEIR to be set aside. In January 2019, the County appealed the San Diego County Superior Court's ruling, but in June 2020, the Fourth District Court of Appeal, Division One (Case No. D075478) upheld the trial Superior Court's ruling. Accordingly, there is no approved CAP in San Diego County and the CAP Checklist cannot be used to determine the significance of a project's cumulative GHG emissions impacts until such time as it is reapproved in compliance with CEQA.

4.0 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.1 METHODOLOGY

The Project's GHG emissions were calculated using a combination of the California Emission Estimator Model (CalEEMod), Version 2020.4.0 and CARB's emission inventory models EMFAC and OFFROAD. GHG emissions are estimated in terms of total MT of CO_2e.

4.1.1 Construction Emissions Methodology and Assumptions

Construction of the project would generate GHG emissions from the use off-road equipment and from vehicles traveling to and from the site on public roads (haul trucks, work vehicles, and vendor vehicles). GHG emissions for project construction were calculated using CalEEMod, Version 2020.4.0. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from a variety of land use projects. The model was developed for CAPCOA in collaboration with the California air districts. CalEEMod allows for the use of default data (e.g., emission factors, trip lengths, meteorology, source inventory) provided by the various California air districts to account for local requirements and conditions, and/or user-defined inputs. The calculation methodology and input data used in CalEEMod can be found in the CalEEMod User's Guide Appendices A, D, and E (CAPCOA 2021). The input data and subsequent construction and operation emission estimates for the proposed project are discussed below. CalEEMod output files for the project are included in Appendix B to this report.

Construction activities including site access, improvements to Willow Glen Drive, site preparation, demolition, and grading would be required prior to the start of mining (prior to Phase 1) to clear land and prepare a pad for the sand processing area. Demolition activities would also be required prior to commencement of mining phases 2 and 3. The construction analysis included modeling of the projected construction equipment that would be used during each construction activity and quantities of earth and debris to be moved. Heavy equipment would be required during site preparation, demolition, and grading. Because all equipment and structures would be mobile and/or prefabricated, the project would not require building construction, paving, or architectural coatings (e.g., painting). Construction equipment estimates are based on default values in CalEEMod and input from the project applicant.

Table 4, *Construction Equipment Assumptions*, presents a summary of the assumed equipment that would be involved in each stage of construction.

Table 4
CONSTRUCTION EQUIPMENT ASSUMPTIONS

Construction Phase	Equipment	Number
Site Access (Prior to Phase 1 only)	Graders	1
	Rubber Tired Dozers	1
	Tractors/Loaders/Backhoes	1
Willow Glen Drive Improvements – Demolition (Prior to Phase 1 only)	Concrete/Industrial Saws	1
	Graders	1
	Water Trucks	1
	Crawler Tractors	1
Willow Glen Drive Improvements – Grading (Prior to Phase 1 only)	Rollers	1
	Skid-Steer Excavators	1
	Water Trucks	1
Willow Glen Drive Improvements – Paving (Prior to Phase 1 only)	Pavers	1
	Paving Equipment (curb former)	1
	Rollers	1
Willow Glen Drive Improvements – Striping (Prior to Phase 1 only)	Crane (light installation)	1
	Striping Truck	1
Site Preparation (Prior to Phase 1 only)	Rubber Tired Dozers	1
	Tractors/Loaders/Backhoes	1
	Excavators	1
Grading (Prior to Phase 1 only)	Graders	1
	Rubber Tired Dozers	1
	Tractors/Loaders/Backhoes	3
Demolition (Prior to Phases 1, 2 and 3)	Concrete/Industrial Saws	1
	Excavators	1
	Rubber Tired Dozers	1

Source: CalEEMod (output data, including equipment horsepower, is provided in Appendix B)

The construction schedule was determined by using CalEEMod defaults, input from the project applicant, and consideration of the size of the processing pad and estimates of structures to be demolished from aerial images. To be conservative, it was assumed that project construction and demolition prior to Phase 1 would commence as early as February 2022 and finish by May 2022. Delays in the start of construction would slightly decrease construction GHG emissions due to improved on-road emissions from worker and vendor vehicles. Demolition activity prior to Phase 2 and Phase 3 is assumed to occur near the end of the prior phase and concurrent with mining activities. Phase 2 demolition would last approximately 10 working days and Phase 3 demolition (which includes the golf course clubhouse) would last approximately 20 working days.

Development under the project would also result in changes in CO_2 sequestration from the atmosphere. By removing existing vegetation (golf course grass), the project would also result in a carbon exchange. While typically accounted for in a project's construction period analysis, this release of sequestered carbon is not analyzed here because it would only be temporary. Upon completion of mining activities, the site would be reclaimed as open space with native vegetation, resulting in additional carbon sequestration.

Construction emissions were summed for all phases, amortized over the anticipated 10-year mining duration, and added to the operational GHG emissions for each mining phase.

4.1.2 Operational Emissions Methodology

4.1.2.1 On-Road Vehicle Emissions

Operational emissions were modeled for each mining phase. GHG emissions from on-road vehicle trips (including trucks delivering sand to customers and employee vehicles) associated with each mining phase of the project were modeled using CalEEMod version 2020.4.0. The trip rates and vehicle miles traveled assumed in the model were provided in the local mobility analysis (LMA) for the project (LLG 2021a). Emissions were modeled for the first full year of operation for each mining phase: 2023 for Phase 1; 2025 for Phase 2; and 2028 for Phase 3 (mining phases may commence during the prior year). CalEEMod's default motor vehicle emission rates and fleet mix for San Diego County are based on CARB's EMFAC2017 database. The CalEEMod option to account for the SAFE Vehicles Rule in accordance with CARB off-model EMFAC2017 adjustments factors was selected. Sand delivery trip distance used in the model were provided in the transportation impact analysis (TIA) for the project (LLG 2021b). The San Diego County default CalEEMod values for vehicle speeds, worker and vendor trip lengths, and trip purpose were used. The model output data sheets are included in Appendix B.

4.1.2.2 Off-Road Vehicle Exhaust Emissions

GHG emissions from vehicle exhaust due to all vehicle and equipment movement within the project site were calculated using emissions and equipment data for San Diego County from the CARB Off-road Diesel Analysis & Inventory, OFFROAD2017 - ORION Web Database (CARB 2017b). To be conservative, it was assumed that the mining equipment used would be a mixture of new and used equipment. The age of off-road equipment analyzed corresponds to the average ages of equipment for the year 2022 in San Diego. All equipment was assumed to comply with the minimum fleet average exhaust emissions for off-road diesel equipment per CARB regulations. The equipment types, numbers, and usage in mining and processing operations for the project were identified in the *Project Description for the Cottonwood Sand Mining Project* prepared by EnviroMINE, Inc. and are listed in Table 5, *Operational Off-road Diesel Equipment* (EnviroMINE 2018). Typical load factors for off-road equipment was provided in the CARB Off-road Diesel Emission Factors: Load Factor Look Up Table (CARB 2017c). All off-road equipment was assumed to operate a maximum of eight hours per day multiplied by the usage factor. The spreadsheet print files used in calculating off-road vehicle exhaust GHG emissions are included in Appendix A.

Table 5
OPERATIONAL OFF-ROAD DIESEL EQUIPMENT

Equipment	Horsepower	Number	Purpose	Equipment Operating Hours per Day
Loader (Cat 988K)	541	2	Sand Extraction, Reclamation	8
Excavator (Cat 349)	396	1	Sand Extraction, Reclamation	6.4
Dozer (Cat D8T)	354	1	Mine area clearing/grading, Reclamation	6.4
Loader (Cat 988K)	541	1	Highway Truck Loading	6.4
Loader (Cat 966M-BR)	276	1	Highway Truck Loading	1.6
Skid Steer Loader (Cat 246D)	74	1	Highway Truck Loading	4
Off-Road Haul Truck (Cat 740EJ)	496	1	Reclamation Fines Hauling	3.2
Supervisor/Maintenance Truck	450	1	Quality Control/Maintenance	1.2
Water Truck (4000 gallon)	350	1	Dust Suppression	6
Grader (Cat 140K)	171	1	Reclamation Finish Grading	2.4
Seeding Truck	450	1	Hydroseeding	N/A[1]

Source: EnviroMINE 2018

[1] Hyrdroseeding during mine operation assumed to require a 4,000-gallon seeding truck for 8 hours per day, 3 days per year.

4.1.2.3 Electricity Use

The project's equipment required for sand conveyance and processing was identified in the *Project Description for the Cottonwood Sand Mining Project* prepared by EnviroMINE, Inc. (2018). Electricity use of the sand conveyance and processing equipment was calculated using the provided motor size and a power factor of 0.86, assuming 3-phase motors running at 75 percent of rated load (Engineering ToolBox 2019). The sand conveyance and processing equipment required for operation of the project is shown in Table 6, *Sand Conveyance and Processing Equipment*.

Table 6
SAND CONVEYANCE AND PROCESSING EQUIPMENT

Equipment	Horsepower	Quantity
Feed Hopper	25	1
Groundline Conveyor 825 feet	50	5
Groundline Conveyor 375 feet	30	1
Groundline Conveyor 200 feet	25	1
Truss Frame Conveyor	50	1
Triple Deck Screen	50	1
Blade Mill	100	1
Fine Material Washer	50	1
Radial Stacker 80 feet	25	1
Radial Stacker 100 feet	30	1

Source: EnviroMINE 2018

Operation of the project would require approximately 227 acre-feet of water per year supplied by eight existing groundwater wells on the project site (EnviroMINE 2020a). According to the Cottonwood Sand Mine Draft Reclamation Plan, an alluvial aquifer underlies the project site and maximum depth to bedrock at the site is approximately 55 feet (EnviroMINE 2020b). Therefore, the electricity required to

pump the water was estimated assuming a conservative average pump depth of 100 feet. Electricity for security lighting and for the mobile office and equipment control buildings were estimated using default factors for San Diego County from CalEEMod (CAPCOA 2021). GHG Intensity factors for determining emissions from the project's electricity use for San Diego Gas and Electric were taken from the *CalEEMod User's Guide Appendix D* (CAPCOA 2021). The spreadsheet print files used in calculating electricity use GHG emissions are included in Appendix A.

4.1.2.4 Solid Waste

Operation of the project would result in the generation of some solid waste related to the day-to-day activities of the project employees. GHG emissions associated with the collection and disposal of the project's solid waste were calculated using factors for San Diego County from the *CalEEMod User's Guide Appendix D* (CAPCOA 2021). GHG emissions related to the collection and transport of demolition debris are included in the construction emissions estimates. The spreadsheet print files used in calculating solid waste disposal GHG emissions are included in Appendix A.

4.1.2.5 Reclamation Activities

As mining operations are completed, all areas disturbed by mining and processing activities would be graded and revegetated in accordance with the required mining and reclamation plans. Reclamation would be implemented in those areas of the site for which no further mining is planned and concurrently with mining using the same equipment used for clearing and sand extraction activities, and a grader and the wash fines off-road haul truck (as shown in Table 5). Accordingly, the emissions estimates account for grading, replacing topsoil, seeding or revegetation, and irrigation of areas where mining is complete. Once all mining is complete, final reclamation activities would occur (Phase 4). During Phase 4, final grading of the last Phase 3 extraction sub-area would be accomplished in a few days with the grader and dozer listed in Table 7. In addition, a small tractor with a cultivator and a hydroseed truck may be used for a short period for final revegetation. Because the total equipment used for final reclamation activities (a dozer, grader, hydroseed truck, and small tractor) would be a small fraction of equipment used for operations (all of the equipment listed in Table 5), operating for a short duration, the intensity (and annual GHG emissions) of these final reclamation activities would not be any greater than the ongoing reclamation activities assumed to occur concurrently with mining activities. As such, the GHG emissions associated with final reclamation would be substantially lower than the GHG emissions estimated for the remainder of the project. Therefore, emissions from final reclamation activities are not separately estimated in this report.

4.2 SIGNIFICANCE CRITERIA

Given the relatively small levels of emissions generated by a typical project in relationship to the total amount of GHG emissions generated on a national or global basis, individual projects are not expected to result in significant, direct impacts with respect to climate change. However, given the magnitude of the impact of GHG emissions on the global climate, GHG emissions from individual projects could result in significant, cumulative impacts with respect to climate change. Thus, the potential for a significant GHG impact is limited to cumulative impacts.

According to Appendix G of the CEQA Guidelines, a project would have a significant environmental impact if it would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

The determination of significance is governed by CEQA Guidelines 15064.4, entitled "Determining the Significance of Impacts from Greenhouse Gas Emissions." CEQA Guidelines 15064.4(a) states, "[t]he determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in Section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to … [use a quantitative model or qualitative model]" (emphasis added). In turn, CEQA Guidelines 15064.4(b) clarifies that a lead agency should consider "Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project." Therefore, consistent with CEQA Guidelines 15064.4, the GHG analysis for the project appropriately relies upon a threshold based on the exercise of careful judgement and believed to be appropriate in the context of this particular project.

On December 5, 2008, the South Coast Air Quality Management District (SCAQMD) Governing Board adopted their *Interim CEQA Greenhouse Gas Significance Threshold*. The policy objective of the SCAQMD's recommended threshold is to achieve an emission capture rate of 90 percent of all new or modified stationary source projects. A GHG significance threshold based on a 90 percent emission capture rate may be more appropriate to address the long-term adverse impacts associated with global climate change because most projects will be required to implement GHG reduction measures. Further, a 90 percent emission capture rate sets the emission threshold low enough to capture a substantial fraction of future stationary source projects that will be constructed to accommodate future statewide population and economic growth, while setting the emission threshold high enough to exclude small projects that will in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions. This assertion is based on the fact that SCAQMD staff estimates that these GHG emissions would account for slightly less than one percent of the future 2050 statewide GHG emissions target.

As the County of San Diego does not currently have any approved quantitative thresholds related to GHG emissions, the quantitative analysis provided herein relies upon the SCAQMD adopted screening threshold for heavy industrial projects of 10,000 MT CO_2e (SCAQMD 2008). The SCAQMD's jurisdiction has similar climate and land use patterns as San Diego County (i.e., dense population centers and industrial areas to the west and along the coast, and rural, low population density areas to the east) and the relative mix of GHG sources in the two regions are similar. Though the SCAQMD's industrial threshold was intended for use with stationary source projects, it is worth noting that the application of the threshold with a project that includes other sources (such as mobile) results in a conservative analysis. Furthermore, as later discussed in Section 5.2, mobile emissions account for the largest portion of the project's GHG emissions (approximately 65 percent), but the project would actually result in a net reduction in regional vehicle miles traveled. Therefore, the majority of the project's emissions are, in fact, generated by stationary sources.

5.0 PROJECT IMPACT ANALYSIS

5.1 GHG REDUCTION PLAN CONSISTENCY

The project was analyzed for consistency with the General Plan land use growth projections; the General Plan goals and policies applicable to the project that affect regional GHG emissions; the Regional Plan; and the CARB Scoping Plan.

5.1.1 General Plan Land Use

The project site is currently zoned as Open Space (S80), Specific Planning Area (S88), and Holding Area (S90). The S80 designation is used to provide appropriate controls for areas considered generally unsuitable for intensive development, including hazard or resource areas, public lands, recreation sites, or lands subject to open space easement or similar restrictions. The S90 zone is intended to prevent premature urban or non-urban development until more precise zoning regulations are prepared. Mineral extraction use is allowed within the S80 and S90 classifications with the issuance of a Major Use Permit. S88 zoning restricts extractive uses to site preparation, which allows the off-site removal of materials when it is secondary to the future use of the site. Two of the project's parcels are zoned S88 and the end use for both parcels would be open space, consistent with the Rancho San Diego Specific Plan. The entire project site is identified in the General Plan Land Use Element Open Space-Recreation (OS-R) land use designation, which applies to large, existing recreational areas and allows for active and passive recreational uses. The project does not have a residential component and would not result in direct or indirect population growth in the County. The project is anticipated to employ approximately nine persons, less than the recent employment from the project site's past use as golf courses. Therefore, the project would be consistent with the General Plan growth projections used in development of the Regional Plan and in development of GHG emissions inventories and projections used to in the CARB Scoping Plan.

5.1.2 General Plan Goals and Policies

The Conservation and Open Space Elements of the County General Plan present goals and policies designed to balance the regional need for construction materials with the community need for freedom from any disturbing effects of mining and aggregate processing activities while protecting public health (County 2011). The goal of the long-term production of mineral materials is to meet the local County average annual demand, while maintaining permitted reserves equivalent to a 50-year supply, using operational techniques and site reclamation methods consistent with California standards so that adverse effects on surrounding land uses, public health, and the environment are minimized. The Project would be consistent with these policies and support reductions in regional and statewide mobile source GHG emissions by reducing the VMT associated with importing construction aggregate into the County:

COS-10.6 Conservation of Construction Aggregate. Encourage the continued operation of existing mining facilities and streamline the permitting of new mining facilities consistent with the goal to establish permitted aggregate resources that are sufficient to satisfy 50 years of County demand.

COS-10.8 New Mining Facilities. Develop specific permit types and procedures for the authorization of new mining facilities that recognize the inherent physical effects of mining operations and the public

necessity for available mineral resources adequate to meet local demand, in accordance with PRC Section 2762.

5.1.3 Regional Plan and Scoping Plan

As described in Section 5.2, below, the project would result in a 75.8 percent reduction in County VMT associated with construction grade sand transport, and the majority (approximately 65 percent) of the project's GHG emissions would be associated with truck trips for hauling sand. A reduction in regional VMT (and VMT-related GHG emissions) is a primary objective of the Regional Plan as the San Diego County RTP/SCS in accordance with the mandates of SB 375. Implementation of the RTP/SCS plans in the state's metropolitan areas to reduce VMT is a key component of the mobile source GHG emissions reduction policies and control measure the CARB Scoping Plan. In addition, as discussed above, the project would be consistent with the General Plan growth projections used in development of the Regional Plan and in development of GHG emissions inventories and projections used in the CARB Scoping Plan. Therefore, the project would be consistent with and would not obstruct implementation of the SANDAG Regional Plan or the CARB Scoping Plan, and the impact would be less than significant.

5.2 GHG EMISSIONS

As described in Section 4.1, the Project's GHG emissions were calculated using a combination of CalEEMod and CARB's emission inventory models EMFAC and OFFROAD.

5.2.1 Construction Emissions Inventories

Emissions of GHGs related to the construction of the project were estimated using CalEEMod, as described in Section 4.1. Two main purposes of construction activity were analyzed. First, construction for site access, improvements to Willow Glen Drive, and grading of the processing pad and settling ponds would take place in early to mid-2022 and last approximately four months. Second, demolition of large structures would take place prior to the start of each mining phase. Emissions were summed for all construction phases and amortized over the 10-year operational life of the project. The estimated construction GHG emissions and amortized amounts are summarized in Table 7, *Estimated Construction GHG Emissions*.

Table 7
ESTIMATED CONSTRUCTION GHG EMISSIONS

Emission Sources	Emissions (MT CO_2e)
Phase 1 (2022)	91.59
Phase 2 (2024)	9.4
Phase 3 (2027)	21.3
Total Construction Emissions	**122.3**
Amortized Emissions	**12.2**

Source: CalEEMod, output data is provided in Appendix B
MT = metric tons; CO_2e = carbon dioxide equivalent

5.2.2 Operational Emissions Inventories

The operational GHG emissions for each mining phase (analyzed for the first full year of each mining phase) are summarized by source of emissions in Table 8, *Estimated Operational GHG Emissions*. As described in Section 4.1, the amortized construction GHG emissions associated with each phase of mining and on-going reclamation activities are included in the operational GHG emissions inventory. As discussed in Section 4.1.2, because the total equipment used for final reclamation activities (a dozer, grader, hydroseed truck, and small tractor) would be a small fraction of equipment used for operations (all of the equipment listed in Table 5) and operated for a short duration, the intensity (and GHG emissions) of these final reclamation activities would be substantially lower than the emissions analyzed for project operations. Therefore, GHG emissions from final reclamation activities are not included in the operational GHG emissions inventory (shown in Table 8, *Estimated Operational GHG Emissions*). The spreadsheet print files and CalEEMod output files used for these estimates are included in Appendices A and B.

Table 8
ESTIMATED OPERATIONAL GHG EMISSIONS

Emission Sources	Emissions ($MT CO_2e$/year)
Phase 1 (2023)	
Off-Road Equipment Exhaust	424.6 (23.4%)
On-Road Mobile Emissions	1,188.0 (65.4%)
Electricity	186.1 (10.2%)
Solid Waste	4.8 (0.3%)
Amortized Construction	12.2 (0.74%)
Total Phase 1	**1,815.8**
Phase 2 (2025)	
Off-Road Equipment Exhaust	424.6 (24.0%)
On-Road Mobile Emissions	1,143.3 (64.6%)
Electricity	186.1 (10.5%)
Solid Waste	4.8 (0.3%)
Amortized Construction	12.2 (0.7%)
Total Phase 2	**1,1771.0**
Phase 3 (2028)	
Off-Road Equipment Exhaust	424.6 (25.0%)
On-Road Mobile Emissions	1,069.4 (63.0%)
Electricity	186.1 (11.0%)
Solid Waste	4.8 (0.3%)
Amortized Construction	12.2 (0.7%)
Total Phase 3	**1,697.1**

Source: CalEEMod, CARB 2017b, output data is provided in Appendices A and B
Notes: Totals may not sum due to rounding.
MT = metric ton; CO_2e = carbon dioxide equivalent

5.2.3 Project GHG Emissions Impact

As shown in Table 8, above, the dominant source of GHG emissions for the project would be on-road mobile emissions (up to 65 percent of emissions). More than 95 percent of mobile emissions for the project would be from aggregate delivery trucks transporting material to batch plants where it would be

used. Generally, in CEQA impact analyses, the GHG emissions associated with transportation of the aggregate are added to the GHG emissions of the project receiving the aggregate. Thus, emissions of GHGs associated with the project's delivery trucks may already be accounted for in other San Diego County project GHG emissions inventories. For example, the GHG analysis for a new concrete batch plant would include the GHG emissions associated with truck trips hauling supplies, including sand, to the project site. To be conservative in accounting for all project GHG emissions, all project related GHG emissions, including hauling truck emissions, are assumed to be new and not accounted for in other inventories.

Aggregate material (including sand) produced by San Diego County mines and quarries are typically used by construction projects. The demand for aggregate material by construction projects is not supply-driven, meaning a new supply of aggregate material does not generate new construction projects. Because of the high weight and bulk of aggregate materials, a significant portion their cost is associated with delivery to the end use site. Therefore, construction project managers will typically purchase necessary aggregate products from the closest available source with acceptable quality.

In addition, improving local supplies of aggregate material reduces the need to import material from more distant mines using trucks, rail, and/or barges. This issue is highlighted in the California Geological Survey (CGS) Special Report 240, *Update of Mineral Land Classification: Portland Cement Concrete-Grade Aggregate in the Western San Diego County Production-Consumption Region* (2017, pp. viii-x):

> "Since the mid-1990s, local aggregate production has not been sufficient to meet local demand in the P-C Region [Western San Diego County Production-Consumption Region]. This shortfall has been met by importing construction aggregate, **predominately sand** [emphasis added], from neighboring aggregate producing regions. At various times, construction aggregate has been imported into the P-C Region from mines in Los Angeles, San Bernardino, Riverside, and Imperial counties, and Baja California, Mexico. […] When compared to local production, importing aggregate is often more expensive and results in higher emissions of greenhouse gases, air pollution, traffic congestion, and road wear and maintenance because of increased truck traffic. These impacts occur both within the importing region and in the neighboring regions that supply the material and through which the material is transported."

The CGS Special Report emphasizes the scarce nature of Portland Cement Concrete-(PCC) grade aggregate (2017, p. 4):

> "The material specifications for PCC-grade aggregate are more restrictive than the specifications for the other grades of aggregate. This restrictiveness makes deposits for use as PCC-grade aggregate the scarcest and most valuable of aggregate resources."

Because evaluation of material from the project site indicates that it meets the engineering requirements for PCC-grade aggregate, the CGS has reclassified the project site from Mineral Resource Zone (MRZ)-1 (areas where available geologic information indicates that little likelihood exists for the presence of significant mineral resources) and MRZ-3 (areas containing mineral occurrences of undetermined mineral resource significance) to MRZ-2 (areas where adequate information indicates that significant mineral deposits are present) (CGS 2017).

The CGS report estimates that an average of 2.02 million tons per year of aggregate (primarily sand) was imported into western San Diego County between 1995 and 2014 (CGS 2017). Based on the data and conclusions in the CGS report, it is reasonable to assume that production of PCC-grade sand on the

project site would result in a reduction in regional mobile-source GHG emissions. The results of the VMT analysis contained within the TIA confirm this. As detailed therein, under existing conditions with a total county sand demand of 2.5 million tons per year, the total annual truck VMT associated with transporting 570,000 tons of sand (the anticipated annual project sand production) into and within San Diego County without the proposed project is 13,499 miles.[1] The truck VMT associated with obtaining 570,000 tons of sand from the project site would be 2,806 miles, which is a reduction of 10,693 miles from the without project scenario. This corresponds to an approximately 79.2 percent reduction in region-wide VMT from sand transportation in the existing plus project scenario. In the near-term plus project scenario, with a total county sand demand of 3.5 million tons per year and anticipated in-County production of 650,000 tons of sand, obtaining 570,000 tons of sand from the project site would result in an approximately 75.8 percent reduction in (LLG 2021b) region-wide VMT. By reducing regional truck VMT, the project would result in an overall net reduction in mobile source GHG emissions. However, to be conservative, all mobile GHG emissions associated with the project are included in the project GHG emissions inventory.

As shown in Table 8, above, the project would result in a peak annual net increase of 1,815.8 MT CO_2e per year, below the SCAQMD screening level for industrial sources of 10,000 MT CO_2e per year. Therefore, the project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, and the impact would be less than significant.

6.0 CUMULATIVE IMPACT ANALYSIS

Given the relatively small levels of emissions generated by a typical project in relationship to the total amount of GHG emissions generated on a national or global basis, individual projects are not expected to result in significant, direct impacts with respect to climate change. However, given the magnitude of the impact of GHG emissions on the global climate, GHG emissions from individual projects could result in significant, cumulative impacts with respect to climate change. Thus, the potential for a significant GHG impact is limited to cumulative impacts. As described in Sections 5.1 and 5.2, the project would result in a reduction in regional truck VMT and the project would not conflict with or obstruct implementation of GHG reduction plans including the SANDAG Regional Plan and the CARB Scoping Plan. The project's maximum annual GHG emissions of 1,815.8 MT CO_2e per year would not exceed the SCAQMD industrial source screening threshold of 10,000 MT CO_2e per year. Further, the project would reduce regional truck VMT associated with transport of aggregate materials. Therefore, the project's GHG emissions impacts would be less than cumulatively considerable.

[1] The existing conditions VMT assumes that 60 percent of the sand used in San Diego is imported from sources north of the county, 35 percent is imported from sources south of the county, and 5 percent is transported from the East County Sand Mine. The hauling distances used in the VMT calculation are the average distance from the sand sources to the midpoint of existing concrete ready-mix batch plants in the county.

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Appendix A

Emissions Calculation Sheets

Appendix B

CalEEMod Output