Santa Ynez Band of Chumash Indians
Climate Pollution Reduction Program
Priority Climate Action Plan

Prepared by

Blue Tomorrow, LLC

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1.0 INTRODUCTION

CPRG Overview

The CPRG program supports the development of strategic plans for reducing greenhouse gas (GHG) emissions and implementation of projects that reduce GHGs and associated co-pollutants. The initial planning phase includes the development of a Priority Climate Action Plan (PCAP) and Comprehensive Climate Action Plan (CCAP). This document serves as the Santa Ynez Band of Chumash Indians (SYBCI) PCAP and contains the required elements including: GHG emissions inventories, quantified emissions reduction measures, benefits analysis, and review of authority to implement.

PCAP Overview

The SYBCI PCAP is focused on an initial GHG inventory for the base year of 2022. For this inventory, data was collected from the Tribe in accordance with the Quality Assurance Project Plan (QAPP). Where available, data from the Reservation included electricity use, point sources, non-point sources, on-road and non-road mobile sources, solid waste generation, water consumption, and wastewater processing. If site specific data was unavailable, emissions estimates were made using national or regional databases and downscaled based on specific characteristics of the Santa Ynez Reservation.

Emissions reduction measures were identified and prioritized by the Tribe to form a strategic plan to reduce GHG emissions. In determining these measures, the Tribe considered CPRG program alignment, existing or planned projects, funding and cost considerations, and time constraints for implementation. Emissions reduction estimates were calculated where feasible and are included in the PCAP.

The included emissions reduction measures benefits analysis contains an inventory of co-pollutants for the Reservation for the base year of 2022. These estimates are based on the National Emissions Inventory (NEI) and downscaled by population. Additionally, associated co-pollutant reductions and general community benefits are discussed for each proposed measure. The goal of this benefits analysis is to consider pollution reduction and improvements to Tribal economy, health, safety, and resiliency.

The CCAP will expand on the PCAP to include a comprehensive GHG inventory using more specific emissions and energy use data, if available, and also include GHG sinks from carbon sequestration. GHG emissions reduction targets and projects will be included in the CCAP to help gauge the performance and success of reducing emissions. Plans for funding and workforce requirements will be developed to build a roadmap to guide the implementation of emissions reduction measures.

1.1 CPRG Objectives

The CPRG program, administered by the U.S. Environmental Protection Agency (EPA), is funded through the Inflation Reduction Act of 2022 (IRA). Three overarching objectives the EPA intends to achieve through the IRA include:

- Tackle damaging climate pollution while supporting the creation of good jobs and lowering energy costs for families
- Accelerate work to address environmental injustice and empower community-driven solutions in overburdened neighborhoods
- Deliver cleaner air by reducing harmful air pollution in places where people live, work, play, and go to school

CPRG is designed to reduce GHG emissions that contribute to climate change by providing funding to states, municipalities, Tribes, and territories for planning and implementation of emissions reduction measures. Through implementing GHG emission reduction measures, CPRG also aims to restore ecosystems, improve deteriorating infrastructure, foster economic growth, and bolster public health by reducing the pollution burden that disproportionately affects disadvantaged communities.

The two phases of the CPRG program include: 1) Planning (PCAP & CCAP); and 2) Implementation. The PCAP prioritizes emissions reduction measures that will be pursued during Phase 2. This implementation phase contains specific goals for Tribes (and other eligible applicants). These include:

1. Implement ambitious measures that will achieve significant cumulative GHG reductions by 2030 and beyond
2. Pursue measures that will achieve substantial community benefits (such as reduction of criteria air pollutants (CAPs) and hazardous air pollutants (HAPs), particularly in low-income and disadvantaged communities
3. Complement other funding sources to maximize these GHG reductions and community benefits; and
4. Pursue innovative policies and programs that are replicable and can be “scaled up” across multiple jurisdictions

1.2 PCAP Objectives

The primary objective of this PCAP is to serve as a strategic plan for reducing Tribal emissions of GHG's and other harmful pollutants. This is achieved through the following plan objectives:

- Perform interdepartmental collaboration within the Santa Ynez Chumash Reservation
- Document baseline GHG emissions
- Identify and prioritize emission reduction measures
- Evaluate associated GHG reductions and co-benefits from implementing prioritized emissions reduction measures

The outcomes of this PCAP, which encompasses GHG and co-pollutant emissions inventories, proposed GHG reduction measures, and benefits analysis, will ultimately bolster community capacity, increase economic and climate resilience, and promote energy independence. The PCAP is poised to create solutions that deliver the maximum benefit to communities that are overburdened and underserved, in turn furthering the EPA's goals for the IRA and the CPRG program.

2.0 BACKGROUND

The Santa Ynez Band of Chumash Indians Reservation ("Santa Ynez Chumash Reservation") is home to the Santa Ynez Band of Chumash Indians, who trace their heritage to the Chumash. The Chumash territory once spanned 7,000 square miles, stretching along the coast from Malibu to Paso Robles and inland to the western edge of the San Joaquin Valley (SYBCI, 2023). Following the acquisition of California by the United States, Spanish land treaties with Native Americans were not only left unratified but were also systematically hidden by the U.S government, as to give no right over the land to Natives. After many decades of turmoil over land ownership, the original Reservation parcel was held in trust for the SYBCI in 1901, making the SYBCI the only federally recognized Chumash Band. This property was a narrow strip of land along the Zanja de Cota Creek, which lies entirely in a floodplain, 40 percent being in a flood zone. For many years, very little Chumash resided there because there was no indoor plumbing, running water, or electricity until the 1960s (Kahn, 2018). More homes were built in the 1970s which allowed more Tribal members to move into the Reservation (SYBCI, 2018). Now there are over 100 homes stretching along the Zanja de Cota Creek. SYBCI has 136 Tribal members and 1,300 lineal descendants. Of these members and descendants, about 250 of them currently reside on the Reservation (BIA, 2014). The Zanja de Cota Creek, a tributary of the Santa Ynez River, was the site of famous steelhead trout fishing derbies in the early 1900s. Currently, the dam at the bottom of the creek and increased runoff pollution from the neighboring Gainey Winery has prevented steelhead from accessing the Reservation (SYCEO, 2022).

Natural Features

The Santa Ynez Chumash Reservation is located in Santa Barbara County, just north of the Santa Ynez Mountains. The area experiences a mild, mediterranean climate with mild summers and cool winters. The Santa Ynez River runs east to west towards the Pacific Ocean, just south of the Reservation. Along this river, and to the west of the Reservation, lies a man-made reservoir called Lake Cachuma. The Santa Ynez Chumash Reservation is bordered by vineyards, with the Santa Ynez Airport just to the west, the Santa Ynez River to the south, and downtown Santa Ynez to the north. The Zanja de Cota Creek runs north to south along the Reservation and is a tributary of the Santa Ynez River. It briefly travels underneath the Chumash Casino Resort and then flows parallel to the neighborhoods on the Reservation.

Facilities and Enterprises

In 2003, the Santa Ynez Chumash opened the Chumash Casino Resort (SYBCI, 2018). The Chumash Casino resort is located at the northernmost part of the Reservation, just off Highway 246. The resort contains three restaurants and a café, a swimming pool, a hotel tower, and a wastewater treatment plant. The casino contains 2,300 slot machines and over 45 table games. The Chumash Casino Resort Hotel is a AAA Four Diamond-rated hotel with a 135-foot tower that houses 320 rooms and 58 luxury suites (SYBCI, 2023). The economic success from the casino caused a dramatic increase in economic opportunity for the Tribe. An additional 6.9-acre parcel was purchased by the Tribe in 2014, where they began building the Santa Ynez Chumash Museum and Cultural Center. In 2019, the Santa Ynez Chumash

purchased the 1,411-acre Camp 4 property, which was placed in federal trust with the goal of providing on-Reservation housing to more Tribal members. The purchase increased the size of the Chumash Reservation ten-fold and will allow the Tribe to develop an additional 143 homes (Santa Ynez Chumash Museum and Cultural Center, 2023).

Most of the residents live off Sanja Cota Ave, which extends south of Highway 246, parallel to the Zanja de Cota Creek and along the eastern border of the Reservation. On the western side of the Reservation there are a few more homes, a health clinic, the Tribal Administration building, and the Environmental Office. Two parks are centrally located on the Reservation for recreational activities.

The Chumash Fire Department is located just west of the Chumash Casino Resort. They currently have one station, fifteen employees, a gear trailer, and two fire engines – a type three fire engine and a type six fire engine (SYBCI, 2023).

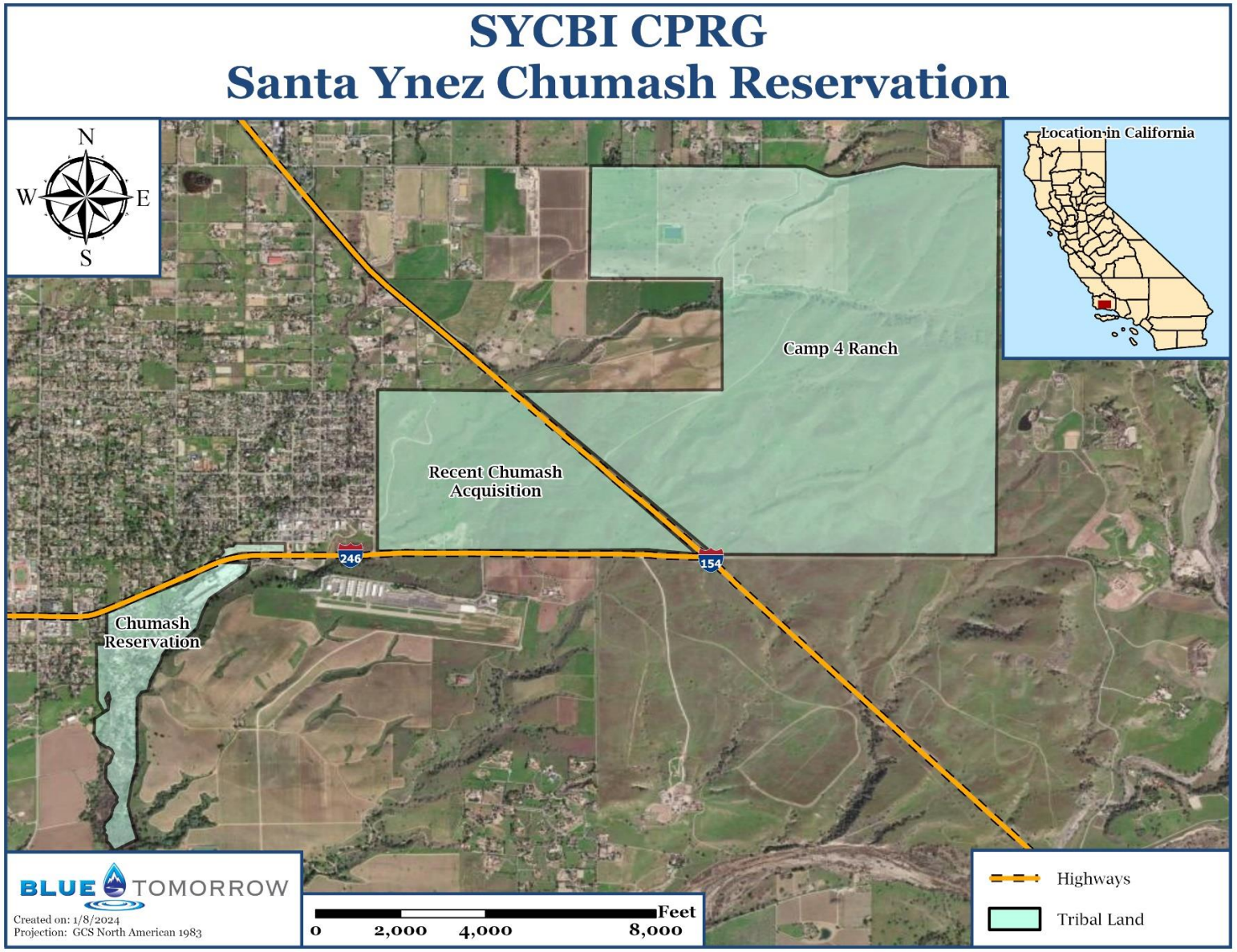
The Chumash Tribal Health Clinic, established in 2002 is a state-of-the-art facility with a wide variety of services including: general family care, pediatrics, nutrition counseling, dermatology, dental care, substance abuse treatment, endocrinology, and more. The clinic specializes in providing care for Native Americans and low-income people of diverse ethnicity by providing them with alternative resources to cover service fees. Tribal members receive services at little or no cost (EPA, 2020). The clinic also provides EV charging via four Level-2 chargers in the parking lot.

Other facilities include the Santa Ynez Chumash Environmental Office, Tribal Hall, the Santa Ynez Chumash Museum and Cultural Center, and the Camp 4 property. There are two primary entities that manage the Reservation's facilities: the Tribal government manages the Tribal government offices, the health clinic, the fire station, and Camp 4, while the Casino Facilities Department manages all other properties. The Reservation owns a fleet of about twenty vehicles (Davenport, 2014). The Tribal Hall and Museum and Cultural Center both provide EV charging via four Level-2 chargers in each parking lot.

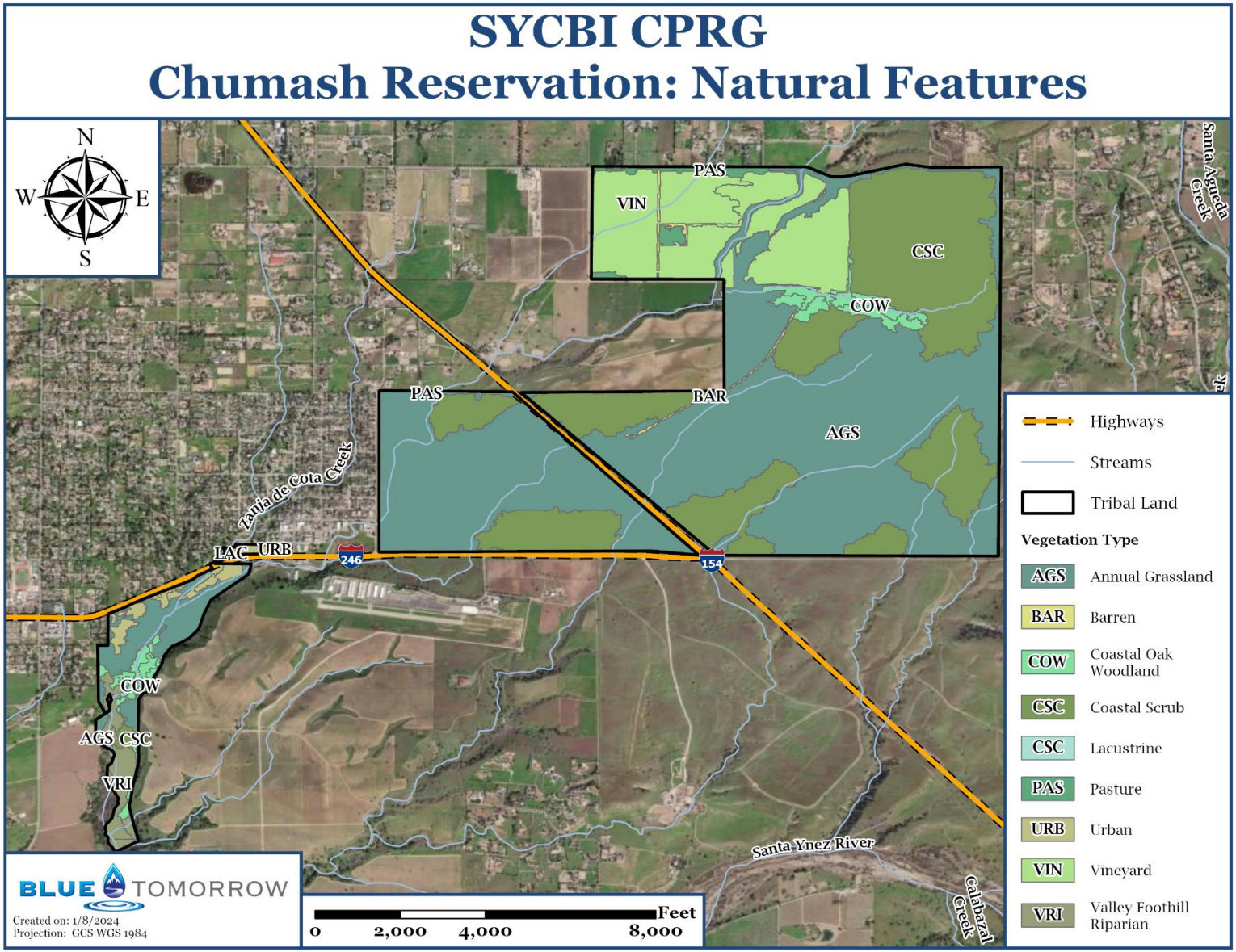
Existing Environmental Management Programs

The Santa Ynez Chumash Environmental Office collects hazardous waste from residents in order to ensure proper disposal (SYBCI, 2023). The closest transfer station for non-hazardous waste material is the Santa Ynez Valley Recycling and Transfer Station located in Los Olivos. Recyclable material is sorted out of the solid waste at this location and the remaining waste is discarded at the Tajiguas landfill, which is projected to reach maximum capacity in 2026 (BIA, 2014).

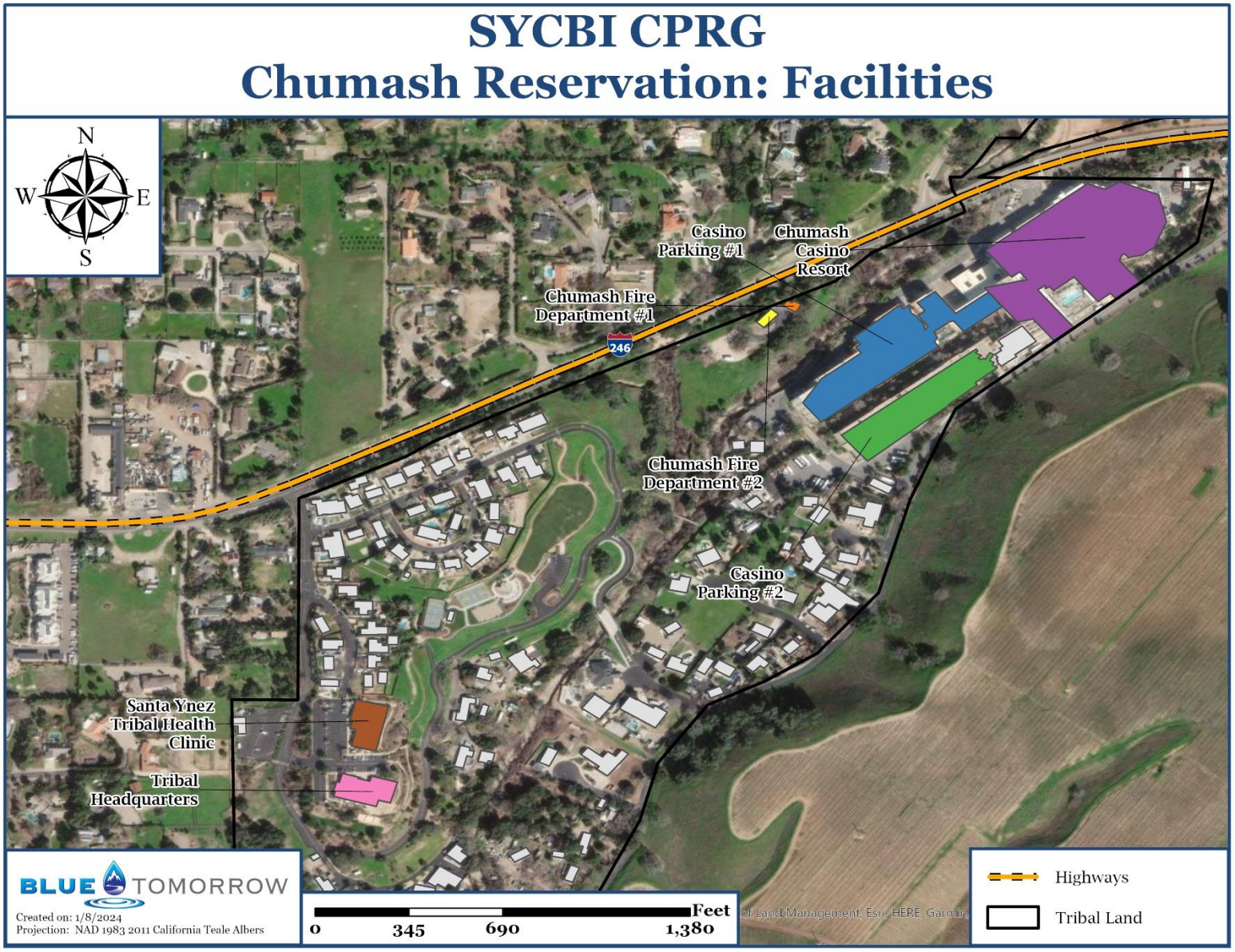
Map 1 – Santa Ynez Chumash Reservation



Map 2 – Natural Features on Santa Ynez Chumash Reservation



Map 3 – Facilities on Santa Ynez Chumash Reservation



3.0 GHG EMISSIONS INVENTORY

The emissions inventory is organized by the following sources, where applicable: electricity use, point sources, non-point sources, on-road and non-road mobile sources, solid waste generation, agriculture, land management, water, and wastewater processing. A comprehensive narrative of the methods and calculations of emissions for the Tribe is included in the Appendix (Section 7.1)

The quantified emissions are also categorized by the following sectors: residential, commercial, mixed, and electricity generation. The residential sector is comprised of only emissions related to the people living within the boundaries of the respective Reservation. The commercial sector is comprised of for-profit businesses and governmental/administrative enterprises. The electricity generation sector only includes emissions pertaining to the generation of electricity within the Reservation boundaries. This does not include electricity purchased from the grid, which is generated elsewhere. The mixed sector emissions are those which could not be easily separated into any of the above-mentioned sectors. For this inventory, the only emissions that fall into the "mixed" sector come from on-road mobile sources.

This emissions calculations section outlines the steps taken to calculate each source of GHG emissions from the Reservation. Wherever possible, data sources and estimation tools are cited and described below. Tools that were utilized most frequently include the Tribal Greenhouse Gas Inventory Tool (TGIT), the U.S. Energy Information Administration Commercial Building Energy Consumption Survey (CBECS), the EPA's Waste Reduction Model (WARM), and the EPA's Carbon Footprint Calculator.

3.1 GHG Emissions Inventory Scope

This GHG emissions inventory and the other components of the Priority Climate Action Plan focus on GHG reduction measures that will be implemented within the original 144-acre Reservation. Since this Reservation was placed in trust by the federal government in 1901, the Santa Ynez Band of Chumash Indians has since purchased additional land parcels and placed some of them into trust. Of these additional parcels placed in trust, the Camp 4 Ranch and "triangle property" are the largest, to be utilized for Tribal housing in the future. Also, a 6.9-acre parcel across Highway 246 from the Chumash Casino is home to the recently established Santa Ynez Chumash Museum and Cultural Center. However, this facility was not operated during the base year of 2022, and therefore is not included in this base year inventory. The Chumash also owns other facilities outside of the afore-mentioned trust land; however, these facilities are not the focus of the GHG reduction measures desired to be implemented by the Tribe identified in the PCAP, and therefore are not included in this emissions inventory. For the purposes of this GHG emissions inventory, the geographical scope is within the original 144-acre Reservation. A full list of the facilities that are within the scope of this emissions inventory is in Section 7.1.1, Table 7.

3.2 GHG Emissions Inventory Overview

The total estimated annual GHG emissions derived from sources and activities on the Santa Ynez Chumash Reservation in the base year 2022 is 6,321 MTCO2e (Table 1). Within the Reservation, the primary sources of emissions are non-point sources, with the Chumash Casino natural gas consumption contributing the highest emissions among all sources. This is primarily because the facility is open 24/7, with substantial energy consumption.

Table 1 – Total Emissions by Sector and Source in Metric Tons of CO2 Equivalent

Sector	Electricity	Non-point Sources	Non-road Mobile	On-road Mobile	Solid Waste	Wastewater	Water	Total
Commercial	599.4	2,367.7	0.5	1,656	428	67.6	14.6	5,133.8
Residential	19.5	270.4	-	826	71	-	-	1,186.9
Total	618.9	2,638.1	0.5	2,482	499	67.6	14.6	**6,320.7**

On-road mobile transportation follows as the second-largest contributor to emissions. This is an expected outcome, because the largest source of greenhouse gas emissions in the country is the transportation sector (EPA, 2023). The Santa Ynez Chumash Reservation plans to implement priority measures that are focused on reducing on-road mobile transportation-related greenhouse gas emissions through the CPRG implementation grant competition.

If emissions are combined into their source category groups (Table 2), stationary non-point sources contribute the most to the total emissions on the Reservation (41.7%). The second largest combined source category is on-road mobile transportation (39.3%), followed by electricity consumption (9.8%), solid waste generation (7.9%), wastewater treatment (1.1%), water consumption (0.2%), and non-road mobile sources (<0.1%). It is important to note that, given the lack of Reservation-specific data, many of these calculations relied on county-level or national averages for various components. While these calculations serve as general estimations of emissions on the Reservation, they should be refined with acquired data for the CCAP emissions inventory.

The per capita emissions for residents of the Reservation are 25 MTCO2e/year, although this value is significantly skewed by emissions from the casino. When considering emissions solely within the residential sector, per capita emissions are significantly reduced to 5 MTCO2e/year.

When this inventory is revisited and improved upon for the Comprehensive Climate Action Plan (CCAP), it may be possible to acquire more specific emissions and energy use data from commercial and residential buildings resulting in an inventory more representative of the actual emissions of the Santa Ynez Chumash Reservation.

Figure 1 – GHG Emissions (MTCO2e) by Source

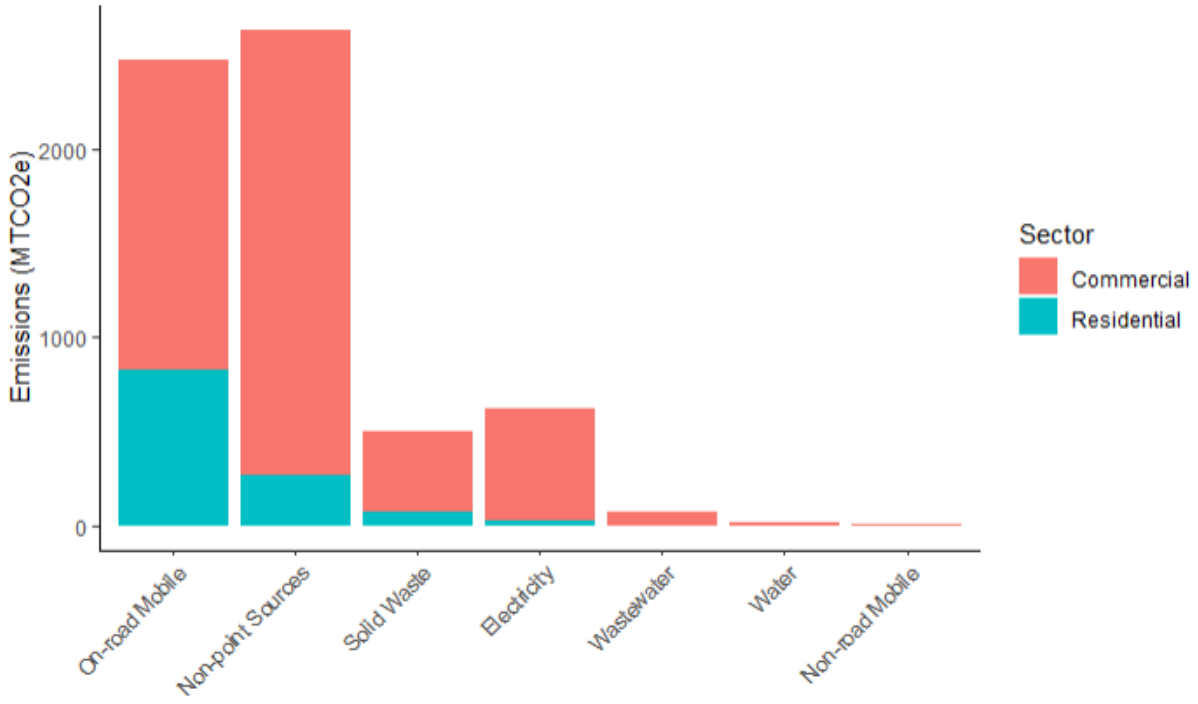


Table 2 – GHG Emissions Percentages by Source

Source	Emissions	Percent
Non-point Sources	2,638.10	41.7%
On-road Mobile	2,482.00	39.3%
Electricity	618.90	9.8%
Solid Waste	499.00	7.9%
Wastewater	67.60	1.1%
Water	14.62	0.2%
Non-road Mobile	0.50	0%

Figure 2 – Reservation GHG Emissions (MTCO2e) by Sector

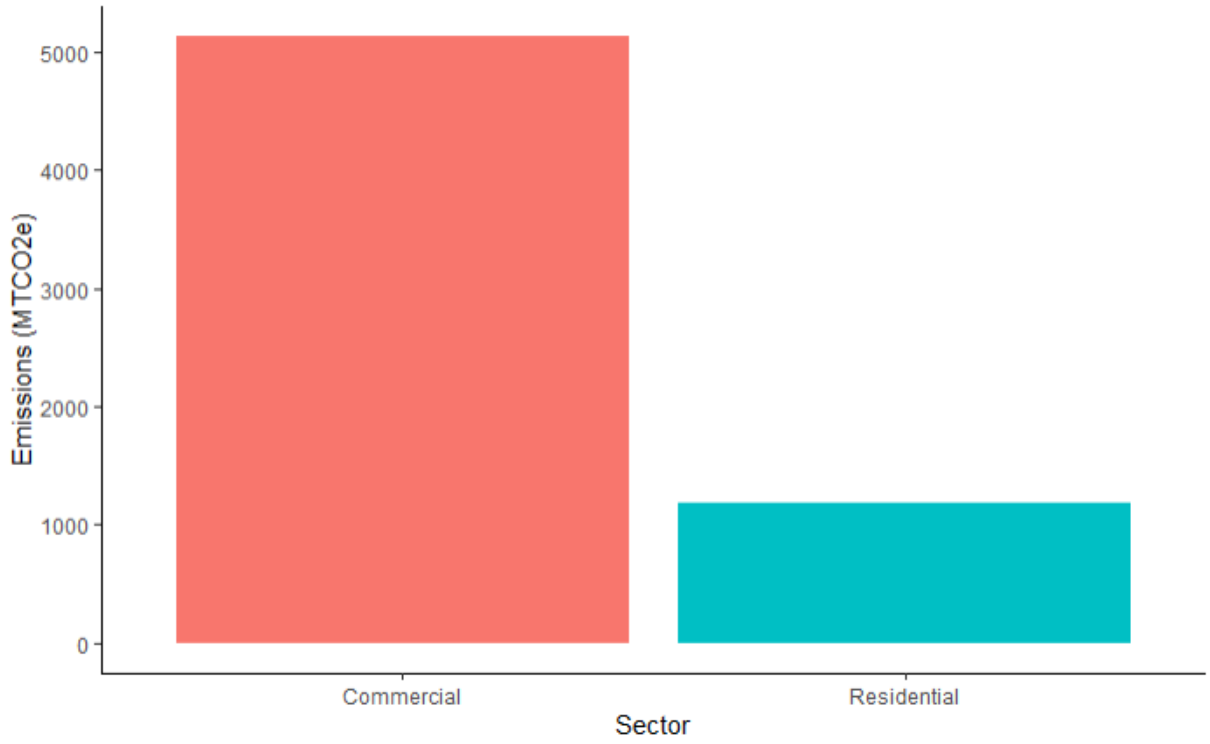


Table 3 – Reservation GHG Emissions Percentages by Sector

Sector	Emissions	Percent
Commercial	5,133.82	81.2%
Residential	1,186.90	18.8%

4.0 QUANTIFIED GHG REDUCTION MEASURES

This section provides information on the priority GHG emissions reduction measures identified by the Tribe along with a quantified estimate of the GHG reductions that would be achieved if implemented. The following information is provided for each reduction measure: estimate of the quantifiable GHG emissions reductions, implementing agency or agencies, implementation schedule and milestones, milestones for obtaining implementing authority as appropriate, geographic location, metrics for tracking progress, and the applicable sector. All estimates of quantifiable GHG emissions reductions are rounded to the nearest metric ton of carbon dioxide equivalent. Refer to the Appendix (Section 7.2) for an explanation of how these GHG reduction measures were quantified and the assumptions used.

GHG reduction measures were prioritized based on their alignment with projects already in progress, the benefits for the community, maximum GHG emissions reductions, and the goals of the Tribal government. In order to choose projects to propose in this PCAP, the Tribe conducted outreach to community stakeholders and residents via social media and in-person meetings. Determining the feasibility of these projects involved interdepartmental communication and collaboration, along with occasional Tribal Council and Elders meetings.

The Tribe identified four (4) priority GHG reduction measures for the PCAP (Table 4).

Table 4 – Priority GHG Reduction Measures

Source	Priority Reduction Measures
Transportation	1. EV Charging Station Installation
Electricity	2. Solar Installation in Tribal Homes and Facilities 3. Lighting Upgrades in Tribal Homes and Facilities
Carbon Removal	4. Wetland Restoration, Green Infrastructure, and Stormwater Management

4.1 EV Charging Station Installation

Expansion of EV charging infrastructure on the Chumash Reservation is prioritized to meet the increasing demand and needs of its workers, residents, and visitors. The Tribe currently has 12 Level-2 chargers across the Reservation. The proposed GHG emissions reduction measure includes the installation of 12 additional Level-2 chargers. The expansion of the EV charging infrastructure on the Chumash Reservation aims to reduce fuel consumption and encourage the shift from gasoline and diesel-powered vehicles to EVs. With the addition of 12 EV chargers, this measure promotes the use of cleaner transportation options. In an optimal scenario where the chargers are used for 12 hours per day in lieu of traditional fuels such as gasoline, this measure has the potential reduce up to 279 MTCO2e per year. Costs associated with this measure would include the purchase, installation, and maintenance of EV chargers. The industry standard assumption for the lifespan of EV chargers is ten years.

Chumash Priority Measure #1: EV Charging Station Installation	
Description	Install 12 Level 2 chargers on the Reservation in addition to existing chargers. These will be installed in parking areas for the Tribal Hall, Health Clinic, and the Museum and Cultural Center.
Estimate of the Quantifiable GHG Emissions Reductions	279 MTCO2e/year
Implementing Agency	SYCEO
Milestones For Obtaining Implementing Authority	Tribal Council Approval
Implementation Schedule and Milestones	Year 1: Install 6 Level 2 chargers Year 2: Install 6 Level 2 chargers
Geographical Location	Tribal Hall, Health Clinic, and Museum and Cultural Center.
Metrics for Tracking Progress	EV miles charged per year
Applicable Sector	Transportation and electricity generation/consumption

4.2 Solar Installation in Tribal Homes and Facilities

This measure aims to provide fully funded installations of solar PV panel systems with net metering to the existing 103 Tribal homes on the Reservation, along with select Tribal facilities including the Tribal Hall, Environmental Office, and Tribal Health Clinic. Net metering allows homeowners to sell surplus electricity generated by solar panels back to the grid electricity provider, in this case, Pacific Gas and Electric. Net metering not only conserves energy by selling excess electricity back to the grid, but also significantly offsets the homeowner's energy costs. Given current energy demand, it is estimated that each home would have to install approximately 179 square feet, or about 10 solar panels (17.5 sq ft each), to offset all electricity costs and emissions from the residential sector. This equates to a reduction of 19.5 MTCO2e per year, the same amount estimated to be emitted annually. Depending on the specifics of each solar installation, installing more than 10 solar panels per home could potentially generate excess electricity homeowners could sell back to the grid. If the Tribe were to install enough solar panels to offset all electricity emissions from the three Tribal facilities they want to solarize, this would further reduce emissions by another 10.4 MTCO2e per year, for a total reduction of approximately 30 MTCO2e per year for this measure.

Chumash Priority Measure #2: Solar Installation in Tribal Homes & Facilities	
Description	Offer fully funded solar panel installations for community members and select Tribal facilities. The goal is to set up 103 homes and the Tribal Hall, Environmental Office, and Health Clinic with solar and net metering ability to allow the Tribe to receive credit for excess electricity generated and fed back to the grid.
Estimate of the Quantifiable GHG Emissions Reductions	30 MT CO2e/year
Implementing Agency	SYCEO
Milestones for Obtaining Implementing Authority	Tribal Council Approval
Implementation Schedule and Milestones	Year 1: 50 Tribal homes solarized Year 2: 53 Tribal homes solarized Year 3: Four Tribal facilities solarized
Geographical Location	Chumash Reservation
Metrics for Tracking Progress	Number of homes installed with solar panels per year Avoided GHG emissions per year Energy sold to utility provider and associate savings/profit
Applicable Sector	Electricity Generation & Consumption

4.3 Lighting Upgrades in Tribal Homes and Facilities

Currently, the Tribal Hall, Environmental Office, and Tribal Health Clinic use traditional incandescent and fluorescent lightbulbs to illuminate their spaces. The SYCEO runs a lightbulb recycling program, so it is acutely aware of the constant turnover and replacement of burnt-out lightbulbs (SYCEO, 2024). This emissions reduction measure aims to replace all the traditional lightbulbs within the Tribal Hall, Environmental Office, and Tribal Health Clinic facilities with energy efficient LED lightbulbs. Additionally, this project would initiate a program where Tribal residents can trade in their traditional lightbulbs for new LED lightbulbs to increase energy efficiency within their homes. Funds from the implementation of this emissions reduction measure would also be allocated to installing energy efficient lighting for new buildings within Camp 4. If all of the lighting in the listed facilities and 30% of residential homes were

transitioned to LED lighting, this measure has the potential to reduce annual GHG emissions by 2.38 MTCO2e.

Priority Measure #3: Lighting Upgrades in Tribal Homes and Facilities	
Description	Allocate implementation funding to retrofit Tribal Hall, Environmental Office, and Tribal Health Clinic with energy efficient LED lightbulbs. Offer a program for residents to trade in their old lightbulbs for new LED bulbs. Support energy efficient lighting in future building construction on Camp 4.
Estimate of the Quantifiable GHG Emissions Reductions	2.38 MTCO2e/year
Implementing Agency	SYCEO
Milestones For Obtaining Implementing Authority	Tribal Council Approval
Implementation Schedule and Milestones	Year 1: Program development/resource allocation Year 2: 50% Lighting upgrades for commercial sector complete Year 3: 100% Lighting upgrades for commercial sector complete, and 30% residential lighting upgrade complete
Geographical Location	Santa Ynez Chumash Reservation
Metrics for Tracking Progress	Number of lightbulbs purchased and installed Electricity savings and GHG emissions reduced
Applicable Sector	Electricity

4.4 Wetland Restoration, Green Infrastructure, and Stormwater Management

The Tribe aims to continue restoring the area around the Zanja de Cota Creek. Restoration activities would include planning, identification and removal of invasive species, and planting of native vegetation. Funding would be allocated toward employing a team of individuals responsible for assessing habitat quality along the creek and establishing a restoration plan to improve ecosystem functions. If 57.6 acres in the surrounding wetland of Zanja de Cota Creek are restored to perform natural ecosystem function,

it has the potential to sequester 75 MTCO2e per year on the Reservation. Additionally, some key areas around the creek will be installed with green infrastructure such as bioswales and rain gardens to control erosion and impede pesticides from flowing into the creek from surrounding vineyards.

Priority Measure #4: Wetland Restoration and Green Infrastructure	
Description	Evaluate the ecological status of the area surrounding Zanja de Cota Creek and set clear restoration goals and objectives in the comprehensive restoration plan. Activities will include clearing invasive species and planting appropriate native vegetation for the site. Monitor and evaluate progress with a focus on keystone species.
Estimate of the quantifiable GHG emissions reductions	75 MT CO2e/year
Implementing agency	SYCEO
Milestones for obtaining implementing authority	Tribal Council Approval
Implementation schedule and milestones	Year 1: Develop planning document for restoration of project area Year 2: Begin implementing restoration measures in the project area Year 3+: Ongoing maintenance & restoration activities
Metrics for tracking progress	Area of land restored per year Estimated carbon sequestered by area Keystone species health and presence within the project area
Applicable sector	Carbon Removal

5.0 BENEFITS ANALYSIS

For the CPRG PCAP, the EPA mandates a general benefits analysis, as well as a benefits analysis specifically for disadvantaged communities. Because Native American Reservations are already classified as disadvantaged communities, this PCAP has one overarching benefits analysis. This approach follows EPA guidelines and allows the Tribe to integrate considerations for all community members uniformly within their overall climate action strategies.

The benefits analysis will include a base year (2020) co-pollutant inventory, and a description of both the co-pollutant related benefits and other community benefits for each quantified GHG reduction measure proposed. Co-pollutants that are included in this analysis may be criteria air pollutants (CAPs), which are emphasized, or hazardous air pollutants (HAPs).

At the time this inventory was created, there was no Reservation-specific co-pollutant data available for this analysis. The EPA 2020 NEI was utilized in order to meet PCAP requirements for this section. In order to provide base year co-pollutant emissions estimates, the Santa Barbara County co-pollutant data from the NEI was programmatically scaled down to the population of the Santa Ynez Chumash Reservation.

Description of Prevalent Co-pollutants

The co-pollutants that are prevalent in the 2020 Santa Barbara County NEI data include volatile organic compounds (VOCs), carbon monoxide (CO), particulate matter (PM10 and PM2.5), methanol, ammonia, nitrogen oxides (NOx), formaldehyde, toluene, and xylenes.

Volatile Organic Compounds (VOCs)

VOCs include a variety of compounds frequently found in petroleum fuels, hydraulic fluids, paint thinners, and dry-cleaning agents. Some VOCs have short term health effects such as eye nose and throat irritation as well as long term health effects such as exacerbation of asthma and other respiratory conditions (EPA, 2023).

Carbon Monoxide (CO)

Carbon monoxide is a product of incomplete oxidation of carbon in combustion. Sources of carbon monoxide include gas stoves and furnaces, generators and other gasoline-powered equipment, automotive exhaust, and tobacco smoke (EPA, 2023).

Particulate Matter (PM)

Particulate matter includes both solid particles and liquid droplets that are small enough to be inhaled, which can cause serious adverse health effects. PM2.5 particles are smaller than 2.5 micrometers in diameter, while PM10 particles are smaller than 10 micrometers in diameter (EPA, 2023). PM can penetrate into the lungs and bloodstream, leading to respiratory and cardiovascular problems which may cause premature death.

Methanol

Methanol is primarily used as an industrial solvent for inks, resins, adhesives, and dyes, as well as for chemical manufacturing. Exposure to airborne methanol may occur due to inhalation of evaporative gases from solvent use or vehicle exhaust. Airborne methanol exposure may cause immediate health effects such as visual disturbances and neurological damage, as well as long term health conditions such as cancer and reproductive or developmental effects (EPA, 2000).

Ammonia

Airborne ammonia is a toxicant derived from vehicle exhaust, decomposition of waste, and fertilizer application. The inhalation of ammonia may cause irritation of the eyes, nose, and throat, as well as increase susceptibility to respiratory infections (EPA, 1995).

Nitrogen Oxides (NOx)

Nitrogen oxides (NOx) are a family of poisonous gases emitted via the combustion of fossil fuels. NOx plays a major role in the atmospheric reactions with VOCs that produce ozone, or smog. The inhalation of NO_2 can cause respiratory irritation, as well as contribute to the development of asthma and increase susceptibility to respiratory infections (EPA, 2023).

Formaldehyde

Formaldehyde is a byproduct of combustion and is also found in fuel burning appliances, fertilizers and pesticides, adhesives, composite wood products, building materials such as insulation, and cosmetics. Exposure to formaldehyde typically occurs via inhalation, which may cause irritation of the eyes, nose, and throat, as well as some forms of cancer (EPA, 2023).

Acetaldehyde

Airborne acetaldehyde is a product of wood combustion, vehicle exhaust fumes, waste processing, and other sources. Acute inhalation of acetaldehyde results in depressed respiratory rate and elevated blood pressure, while chronic inhalation resembles the effects of alcoholism in humans. The toxicant is also a probable cause of cancer in humans (EPA, 2000).

Sulfur Dioxide (SO_2)

The largest source of sulfur dioxide is the combustion of fossil fuels, as well as natural sources such as volcanoes. Short term exposure to sulfur dioxide causes respiratory issues in humans, especially those with underlying respiratory conditions such as asthma. It can also harm trees and plants by damaging foliage and decreasing growth, as well as contributing to acid rain (EPA, 2024).

5.1 Co-Pollutant Inventory

The highest co-pollutant emissions from the Santa Ynez Chumash Reservation are from volatile organic compounds (VOCs), at an estimated 30.6 tons. This was followed by other criteria air pollutants such as carbon monoxide, PM10, nitrogen oxides, methanol, and ammonia (Table 5).

Table 5 – Top 10 Co-Pollutant Emissions Per Year (EPA, 2024)

Pollutant	Pollutant Type	Emissions (tons)
Volatile Organic Compounds	CAP	30.61
Carbon Monoxide	CAP	21.36
PM10 Primary (Filt + Cond)	CAP	4.37
Nitrogen Oxides	CAP	3.75
Methanol	HAP	1.68
Ammonia	CAP	1.66
PM2.5 Primary (Filt + Cond)	CAP	1.31
Formaldehyde	HAP	0.43
Acetaldehyde	HAP	0.33
Sulfur Dioxide	CAP	0.14

5.2 Co-Benefits of Priority Emissions Reduction Measures

1. EV Charging Station Installation

Co-pollutant Benefits

Co-pollutant benefits from the installation of EV charging stations are very similar to the benefits acquired from switching to EVs. By providing charging infrastructure and thereby promoting the use of EVs, emissions of carbon monoxide, particulate matter, and nitrogen oxides would be reduced. VOCs have the potential to be reduced even more from this measure, as gasoline and diesel fuel storage contribute to VOC emissions. As EV adoption ramps up and more charging infrastructure is installed, it follows that VOC emissions from gas stations and gas-filling activities would also be reduced.

Additional Benefits

Expanding EV charging infrastructure would lead to improved air quality and community health on the Reservation. Because EV charging is free for Tribal members and employees, these additional charging stations would benefit Tribal members and employees, as well as help with employee retention by subsidizing transportation costs. Additional charging stations near the Chumash Casino can help encourage visitation and stay duration at Tribal enterprises.

2. Solar Installation in Tribal Homes and Facilities

Co-pollutant Benefits

Grid electricity relies on power generation from a variety of different sources, including ones that utilize the combustion of fossil fuel to generate power. The combustion of fossil fuels is known to cause emissions of carbon monoxide, nitrogen oxides, VOCs, particulate matter, and sulfur dioxide. Although these emissions typically are *scope 2* emissions occurring upstream of the site where the electricity is used, the electricity used still causes these emissions to occur elsewhere. Solar power does not involve the combustion of fossil fuels, and therefore solarizing Tribal homes and facilities would eliminate emissions of the aforementioned pollutants on the Reservation.

Additional Benefits

Installing solar panels on Tribal facilities offers many advantages, including financial savings, environmental benefits, and increased energy independence. This project could significantly reduce electricity bills, with the potential of selling excess electricity back to grid through net metering. Having a renewable solar system supplying electricity also increases resilience during power outages and allows the Tribe to be more energy independent. The installation and maintenance of these solar systems will stimulate the local economy by producing valuable job opportunities for locals.

3. Lighting Upgrades in Tribal Homes and Facilities

Co-pollutant Benefits

LED lights do not emit VOCs during operation like their incandescent and fluorescent counterparts do, therefore upgrading to energy efficient lighting will contribute to increased indoor air quality. LED lighting is also very energy efficient, which will reduce the demand for electricity in facilities where they are installed. Grid electricity relies on power generation including fossil fuel combustion which is known to emit the above listed co-pollutants.

Additional Benefits

Implementing this project can significantly reduce energy costs for the Tribe, which receives electricity from the most expansive energy utility in California. LED lighting also offers a high return on investment due to the very long lifespan of the bulbs. This will also reduce costs associated with lighting maintenance. LED lights also produce directional light, which can minimize light pollution and glare, creating safer and more comfortable nighttime environments for residents and wildlife.

4. Wetland Restoration, Green Infrastructure, and Stormwater Management

Co-pollutant Benefits

Wetlands play a large role in carbon sequestration, capturing and storing carbon dioxide from the atmosphere. Wetlands reduce nitrogen oxide and ammonia pollution, as microbial activity in the soils goes through the process of denitrification. Particulate matter emissions could also be reduced by wetlands as they help to trap and filter particulate matter from the air and water. Vegetation structure could also act as a natural barrier, reducing the concentration of PM2.5 and PM10 in the surrounding air and water.

Green infrastructure reduces the use of impervious surfaces, such as asphalt and concrete, which emit VOCs through evaporation. Installing rain gardens and bioswales will enhance natural processes that remove nitrogen oxides from the atmosphere, such as plant uptake and soil microbial activity. Green infrastructure also reduces the need for conventional stormwater management systems such as underground pipes and concrete channels, which require energy-intensive construction materials that can emit co-pollutants during manufacturing. This infrastructure installation will reduce PM emissions by trapping dust, soot, and pollen particles on leaves and within soil, leading to improved local air quality.

Additional Benefits

Wetland restoration has many ecological and societal benefits. Wetlands are among the most biologically diverse ecosystems, providing critical habitat for a variety of plant and animal species. Wetlands act as natural filters and enhance water quality by trapping and removing pollutants from water. Furthermore, vegetation and root systems in wetlands stabilize soils and prevent erosion, which also provides benefits for flood control and stormwater management. Wetlands may also have cultural value to the Tribe and restoring them helps to preserve cultural heritage and traditional knowledge. Overall, wetlands enhance ecosystem services and strengthen climate resilience which can highly benefit the Tribal community.

Green infrastructure will improve the aesthetics of urban areas, creating more attractive communities and green spaces that promote community interaction and quality of life for residents. Access to spaces like these are linked to improved mental health and well-being, as well as lower stress, anxiety, and depression. This restoration and stormwater management project will increase vegetation in urban areas, which in turn lowers temperatures and mitigates the urban heat island effect. It will also improve water quality in the Zanja de Cota Creek, providing safer and healthier recreation opportunities for residents. Green infrastructure also mitigates flooding and erosion during heavy rainfall events, which will increase public safety and maintain the integrity of natural landscapes. The implementation of this project will also result in the creation of full-time, part-time, and volunteer job opportunities for locals.

6.0 REVIEW OF AUTHORITY TO IMPLEMENT

The Santa Ynez Band of Chumash Indians has the authority to implement GHG emissions reduction measures that are located on their Reservation and other lands held in federal trust. The governments of sovereign Tribal nations maintain the power to determine their own governance structures and enforce their own laws and regulations within their jurisdiction, including the implementation of GHG reduction measures. All the GHG emissions reduction measures identified in Section 4.0 are located on the Santa Ynez Chumash Reservation land. Approval from Tribal Council is required prior to implementing any GHG reduction measure.

If an emissions reduction measure is funded through a CPRG implementation grant, an official resolution would be adopted by the Tribal Council to approve acceptance of the grant and authorize the implementation of the project. A cultural monitor will be required for any GHG emissions reduction measures that will result in ground disturbance.

Section 4.0 contains a schedule of milestones for obtaining implementing authority for each priority emissions reduction measure.

7.0 APPENDIX

7.1 GHG Emissions Inventory Methodology

This emissions calculations section outlines the steps taken to calculate each source of GHG emissions on the Reservation. Wherever possible, data sources and estimation tools are cited and described below. Tools that were utilized most frequently include the Tribal Greenhouse Gas Inventory Tool (TGIT) (EPA, 2010), the U.S. Energy Information Administration Commercial Building Energy Consumption Survey (CBECS) (EIA, 2024), and the EPA's Waste Reduction Model (WARM) (EPA, 2024).

7.1.1 Electricity

This electricity section of the emissions inventory includes *scope 2* emissions, which are emissions derived from electricity that is consumed within the geographical scope of this inventory but generated elsewhere.

The Santa Ynez Chumash Reservation is served by Pacific Gas and Electric (PG&E) utility provider which is part of the CAMX eGrid subregion. According to the 2022 PG&E power content label, energy from this source emits 56 lbs. CO2e per MWh generated (PG&E, 2022). Electricity derived from this utility provider is 95% carbon free, representing some of the cleanest delivered electricity in the United States.

Commercial Electricity Use

The Chumash Casino (excluding the hotel) is the only facility whose electricity use is explicitly stated in the 2015 SEMP (Santa Ynez Chumash Environmental Office, 2015). Using this value, the electricity use was scaled to provide an estimate for the base year of 2022 to include the expansion of the casino in 2016, as well as the expansion of other facilities (Hodgson, 2016). The scaling calculation is provided in Table 6 below.

Table 6 – Chumash Casino Electricity Consumption

Facility Name	Area (sq ft) 2012	Electricity use (kWh) 2012	kWh/sq ft	Area (sq ft) 2022	Estimated Electricity Use (kWh) 2022	MTCO2e
Casino	180,000	13,320,000	74	260,000	19,240,000	488.7

The electricity consumption for other commercial facilities described in the 2015 SEMP include facilities that are outside of the scope of this emissions inventory, and are aggregated into one value, so it is impossible to include specific electricity use data for each building in this report. For this reason, it is necessary to estimate electricity use for these other facilities using average electricity consumption from the 2018 U.S. Energy Information Administration Commercial Building Energy Consumption Survey

(CBECS). In order to accomplish this, data from CBECS table C21 was used, which contains average electricity consumption in kWh per square foot for buildings of various sizes, uses, occupancy, climate zone, and more (EIA, 2024). The Reservation's commercial buildings were classified by activity type and size to estimate the electricity consumption of each. The CBECS average energy use factors do not include all building activity types, so buildings are categorized within the activity type that matches each building the closest. Additionally, rooftop solar panels on the Tribal Hall and Health Clinic generated a total of 87,487 kWh during 2012 (Santa Ynez Chumash Environmental Office, 2015).

The estimated total electricity use for these facilities is 4,357,909 kWh, resulting in emissions of 111 MTCO2e (PG&E, 2022). In total, with the Chumash Casino electricity use (Table 6) summed with that of the other facilities on the Reservation (Table 7), *scope 2* GHG emissions from the Reservation's annual commercial electricity consumption is estimated to be 600 MTCO2e.

Table 7 – Other Facilities on Santa Ynez Chumash Reservation Electricity Consumption

Facility	Area (sq ft)	Principal Building Activity	Energy Intensity by area (kWh/sq ft)	Electricity Use (kWh/yr)	MTCO2e
Chumash Casino Hotel	290,000	Lodging	13.6	3,944,000	100.2
Santa Ynez Tribal Health Clinic	12,243	Health Care	19.1	233,841	5.9
Tribal Hall	12,042	Office	13.2	158,954	4.0
Learning Center	5,000	Education	11.2	56,000	1.4
Fire Station	2,500	Public Order and Safety	14.2	35,500	0.9
Environmental Office	1500	Office	11.4	17,100	0.4
Solar Panels	NA	NA	NA	-87,487	NA
Total				4,357,909	110.7

Residential Electricity Use

The Santa Ynez Chumash Environmental Office (SYCEO) produced the SEMP in 2015 using 2009 electricity use data for 76 out of 103 homes on the Reservation. Within the SEMP, this available data was scaled to estimate the total electricity consumption of all 103 homes (Santa Ynez Chumash Environmental Office, 2015). The number of homes on the Reservation has not changed since this study was conducted, so the resulting estimate should accurately represent 2022 electricity use. The 2015 SEMP also accounted for the electricity generated by 13 homes that have rooftop solar. It is very likely that the number of homes with solar PV has increased since 2009. With the longer timeline available to collect data for the Comprehensive Climate Action Plan (CCAP), it may be possible to collect utility bills from residential buildings in order to more accurately calculate emissions from electricity use. According to the 2015 SEMP, a total of 766,559 kWh is estimated to have been consumed by the residential sector during the year 2022 (Santa Ynez Chumash Environmental Office, 2015), resulting in *scope 2* GHG emissions of 19.5 MTCO2e (PG&E, 2022).

7.1.2 Stationary Point Sources

A point source is a single, identifiable source of pollution, such as a large facility that emits pollution from a single place. Sources that are geographically numerous and difficult to keep track of (i.e., gas-fired water heating tanks) are considered non-point sources. This section of the inventory is left blank because there are no identifiable point sources of GHG emissions on the Santa Ynez Chumash Reservation.

7.1.3 Stationary Non-Point Sources

Non-point sources are any source of pollution which is outside of the definition of point sources in Section 7.1.2. A stationary non-point source of greenhouse gases is one that is not mobile, but too many to count individually or keep track of easily. The sources that are estimated and included in this section are natural gas heaters, appliances, and water boilers, as well as small electricity generators.

Generators

According to the Santa Ynez Chumash Environmental Office (SYCEO), there is one 150 kW backup generator located at the Tribal Health Clinic which is not typically used. However, it runs for about 20 minutes each month for maintenance purposes. Unfortunately, it was not possible to obtain fuel use data from this generator. With the longer timeline anticipated to complete the CCAP emissions inventory, it may be possible to obtain specific fuel use data for this generator, as well as conduct residential surveys to identify additional generator use on the Reservation.

Residential Natural Gas Use

All homes on the Reservation are reported to use natural gas for heating and cooking. The Santa Ynez Chumash Environmental Office (SYCEO) collected natural gas use data for the year 2012, for 76 out of 103 homes on the Reservation. Within the SEMP, available data from the 76 homes was scaled to approximate the total natural gas use of all 103 homes. The number of homes present on the Reservation has not changed since this study was conducted, so the resulting estimate should accurately represent residential natural gas use in 2022. According to the 2015 SEMP, a total of 5,092 mmBtu of natural gas is estimated to have been consumed by the residential sector during the year 2012 (Santa Ynez Chumash Environmental Office, 2015), resulting in GHG emissions of 270 MTCO2e (EPA, 2023). With the longer timeline available to collect data for the Comprehensive Climate Action Plan (CCAP), it may be possible to collect up-to-date utility bills from residential buildings in order to more accurately calculate emissions from natural gas use.

Commercial Natural Gas Use

The Chumash Casino (excluding the hotel) is the only facility whose natural gas use is explicitly stated in the 2015 SEMP. The amount of natural gas used in 2022 was estimated by averaging the amount of natural gas consumed per square foot of the casino in 2015, then scaled based on the increase in square footage with the 2016 casino expansion (Hodgson, 2016). The scaling calculation is provided in Table 8 below.

Table 8 – Chumash Casino Natural Gas Consumption

Facility	Area (sq ft) 2015	Natural Gas use (mmBtu) 2015	mmBtu/sq ft	Area (sq ft) 2022	Estimated Natural Gas Use (mmBtu) 2022	MTCO2e
Casino	180,000	22,768	0.13	260,000	32,887	1,747

The natural gas use for other commercial facilities described in the 2015 SEMP include facilities that are outside of the scope of this emissions inventory, and are aggregated into one value, so it is impossible to include specific natural gas use data for each building in this report. Natural gas consumption for the Reservation's commercial sector was estimated using national averages for natural gas consumption from the 2018 U.S. Energy Information Administration Commercial Building Energy Consumption Survey (CBECS). Data from CBECS Table C31 contains average natural gas use in standard cubic foot (scf) per square foot for buildings of various sizes, uses, occupancy, climate zone, and more (EIA, 2024). The Reservation's commercial buildings were classified by activity type and size to estimate the natural gas consumption of each. The CBECS average energy use factors do not include all building activity types, so buildings are categorized within the activity type that best matches each building's principle use. The estimated total commercial natural gas use is 11,389 thousand cubic feet (mcf), resulting in emissions of 621 MTCO2e (EPA, 2023). In total, summing the natural gas use of the Chumash Casino (Table 8) and that of other commercial facilities on the Reservation (Table 9), natural gas use was estimated to have resulted in GHG emissions of 2,368 MTO2e.

Table 9 – Other Facilities on Santa Ynez Chumash Reservation Natural Gas Consumption

Facility	Area (sq ft)	Principal Building Activity	Energy Intensity by area (scf/ sq ft)	Natural Gas Usage (mcf/yr)	MTCO2e
Chumash Casino Hotel	290,000	Lodging	35.7	10,353	564.2
Santa Ynez Tribal Health Clinic	12,243	Health Care	36.1	442	24.1
Tribal Hall	12,042	Office	25	301	16.4
Learning Center	5,000	Education	30.8	154	8.4
Fire Station	2,500	Public Order and Safety	39.5	99	5.4
Environmental Office	1,500	Office	27	41	2.2
Total				11,389	620.7

7.1.4 Solid Waste Generation

The emissions associated with solid waste generation on the Santa Ynez Chumash Reservation are known as *scope 3* emissions. *Scope 3* emissions can be described as "downstream" emissions, where the activity from one region subsequently causes emissions in another region. This is the case with the Reservation's solid waste generation, as there is no landfill located within the Reservation boundaries. Waste is hauled to Tajiguas Landfill. The Reservation's contribution to methane emissions associated with decomposing waste material at these locations is accounted for below.

At the time this inventory was created, there was no data available from the solid waste transfer station. It is anticipated that due to the longer timeline available for creating the CCAP emissions inventory, it may be possible to obtain Reservation-specific solid waste generation data. In the absence of Reservation-specific solid waste generation data, the CalRecycle Estimated Solid Waste Generation Rates were used to generate estimates of solid waste generation by both the residential and commercial sector. In total, 499 MTCO2e of *scope 3* emissions from solid waste were generated by the Reservation (Table 10).

Table 10 – Santa Ynez Chumash Reservation Solid Waste Generation

Sector	Units	Waste Generation Rate	Waste Generated (short tons/yr)	MTCO2e
Commercial	583,285 sq ft	13 lbs/1000 sq ft/day	1,384	428
Residential	103 households	12.23 lbs/household/day	230	71
Total			1,614	499

Residential Solid Waste Generation

The CalRecycle Estimated Solid Waste Generation Rates webpage cites that an average of 12.23 pounds of solid waste is generated per household per day (CalRecycle, 2024). This is equivalent to 4,463 pounds per household per year. There are 103 households on the Santa Ynez Chumash Reservation, which means that there is an estimated 230 short tons of solid waste generated by Reservation residents annually (Table 10). The resulting emissions associated with the decomposition of this amount of solid waste is 71 MTCO2e (EPA, 2024).

Commercial Sector Solid Waste Generation

The CalRecycle Estimated Solid Waste Generation Rates webpage cites that an average of 13 pounds of solid waste is generated per 1,000 square feet of commercial space per day. This is equivalent to 4.745 pounds per square foot per year (CalRecycle, 2024). A list of commercial and institutional buildings on the Santa Ynez Chumash Reservation was created, omitting buildings that typically would not generate waste such as pump houses, warehouses, storage, wastewater facilities, and parking lots. The total indoor area of all these buildings combined was 583,285 square feet. Using the estimation factor listed above, the total estimated annual waste generated was 1,384 short tons (Table 10). The resulting emissions associated with the decomposition of this amount of solid waste is 428 MTCO2e (EPA, 2024).

7.1.5 On-Road Mobile

On-road mobile emissions include any sources that are within the transportation sector that originate from paved roadways.

Commercial On-Road Mobile

For the purposes of this emissions inventory, the commercial sector includes institutional and administrative entities. The 2015 SEMP reported that the Santa Ynez Chumash Reservation Tribal fleet was made up of 20 vehicles in 2012, including approximately twelve full-sized shuttle busses (Santa Ynez Chumash Environmental Office, 2015). The report also noted that there may be some vehicles missing from this calculation. Due to the short timeline of the PCAP and its associated emissions inventory, it was not possible to obtain an updated fleet vehicle list with fuel consumption data for 2022. With the longer timeline anticipated to complete the CCAP emissions inventory, it may be possible to collect updated, comprehensive data on the Tribal fleet and its annual fuel consumption.

According to the 2015 SEMP, the Santa Ynez Chumash Reservation Tribal fleet vehicles used a total of 410 gallons of gasoline and 161,816 gallons of diesel fuel in 2012 (Santa Ynez Chumash Environmental Office, 2015). In total, this fuel use would result in annual GHG emissions of 1,656 MTCO2e (EPA, 2010).

Residential On-Road Mobile

At the time this inventory was constructed, there was no data available on vehicles or vehicle miles travelled by residents. To address these data gaps, estimates from the 2020 National Emissions Inventory for Santa Barbara County for passenger cars and trucks (EPA, 2024) were scaled down based on the population of the Santa Ynez Chumash Reservation (248 people). The approximate GHG emissions from residential mobile sources was determined to be 826 MTCO2e (EPA, 2024).

7.1.6 Non-Road Mobile

Non-road mobile sources of emissions include any source that is not stationary and does not travel on paved roadways. The source on the Santa Ynez Chumash Reservation that fits in this category is lawn and garden equipment. There may be additional emissions that come from recreational vehicle use, but there was no activity data available at this time.

Lawn and Garden Equipment

According to the SYCEO, the Santa Ynez Chumash owns the following lawn and garden equipment for maintaining the public landscaping on the parcel, as well as for environmental management purposes: three chainsaws, two leaf blowers, a leaf trimmer, a woodchipper, and a log splitter. Due to the short timeline to complete the PCAP GHG emissions inventory, it was not possible to obtain specific hours of operation and fuel consumption for this equipment. With the longer timeline available to complete the CCAP comprehensive GHG emissions inventory, it may be possible to acquire this data. However, the SYCEO estimates that the leaf trimmer is used two hours per week for a total of 104 hours per year, while each of the other equipment listed above is used for approximately four hours per year. Using the average fuel consumption per hour of use shown by the equipment specifications of each equipment type, it is estimated that lawn and garden equipment use results in emissions of 0.5 MTCO2e per year (EPA, 2023).

7.1.7 Water

Water is not typically thought to be associated with energy use; however, the treatment, delivery, and disposal of municipal water usually requires some level of electricity consumption. The Tribal GHG Inventory Tool (TGIT) can estimate the emissions associated with the processes surrounding the import of municipal water based on the amount of water imported to the location. There was no data available on the residential water consumption at the time this inventory was created, so only commercial water use is included here. According to the 2015 SEMP, the Chumash Casino Resort and the landscaping on the Reservation consumed about 10.8 million gallons of water in 2012 (Santa Ynez Chumash Environmental Office, 2015), resulting in emissions of 14.6 MTCO2e (EPA, 2010). Water use continues to change on the Reservation, with the construction of new buildings and the use of reclaimed water for landscaping and toilets. Water use estimates will be further explored and refined for the CCAP emissions inventory.

7.1.8 Wastewater

The Santa Ynez Chumash Reservation operates a wastewater treatment plant (WWTP) within the casino facility. The casino receives approximately 8,000 patrons per day (Santa Ynez Chumash Environmental Office, 2015). There is no industrial nitrogen loading to the system. The system conducts nitrification/denitrification and provides grey water for use in toilets, irrigation, and chillers. Using the

framework the TGIT uses to estimate GHG emissions from wastewater processing, the Chumash Casino WWTP emits an estimated 68 MTCO2e per year (EPA, 2010).

7.2 Priority Reduction Measures Methodology

This emissions calculations section outlines the steps taken to calculate the quantity of GHG emissions reduced by each of the proposed emissions reduction measures in Section 4.0. Wherever possible, data sources and estimation tools are cited and described below.

7.2.1 EV Charging Station Installation

Emissions reductions achieved by installing EV charging stations were quantified by utilizing miles charged per year. Assuming each of the 12 new chargers are used 12 hours per day, the chargers combined would be able to provide electricity for 65,700 miles per year. Using the current average fuel efficiency of 24.1 miles per gallon for passenger gasoline-powered vehicles (EPA, 2010), the Reservation could see an annual reduction in emissions of 279 MTCO2e (EPA, 2023).

7.2.2 Solar Installation in Tribal Homes and Facilities

This reduction measure was quantified by calculating the number of solar panels necessary to offset all emissions related to residential electricity use. Given an annual average plane of array (POA) irradiance of 208 kWh per square foot per year (NREL, 2024) and a solar conversion efficiency of 20% (Enel X, 2024), it is estimated each of the 103 homes has rooftop space for ten (10) solar panels, each covering 17.5 sq ft. This would be enough solar panels to offset the entire residential sectors electricity consumption which accounts for annual emissions of 19.5 MTCO2e. In the commercial sector, the Tribal Hall, Health Clinic, and Environmental Office all have ample rooftop space to completely offset their current annual electricity consumption. If sufficient battery storage capacity and net metering were to be incorporated, these facilities could generate surplus energy to sell to PG&E, further reducing *scope 2* emissions linked to off-Reservation electricity generation. In total, this measure has the potential to offset the entirety of electricity use from the residential sector and that of these three facilities in the commercial sector, effectively reducing annual emissions by 30 MTCO2e (PG&E, 2022).

7.2.3 Lighting Upgrades in Tribal Homes and Facilities

According to Energy Star, electricity used for lighting makes up 17% of all electricity consumed by commercial buildings in the United States, and LED lightbulbs use 90% less energy than traditional fluorescent and incandescent lightbulbs (Energy Star, 2024). Using these averages, it is possible to calculate an estimate of energy savings from converting facilities to LED lighting. The estimated total annual electricity use of the Tribal Hall, Health Clinic, and Environmental Office is 409,895 kWh. Applying

the above Energy Star averages, the total energy consumption of these buildings would be reduced by 15.3%, or 62,714 kWh.

The United States Department of Energy (DOE) reports that lighting accounts for an average of 15% of a household's energy use. The SYCEO aims to replace at least 30% of the fluorescent and incandescent bulbs in Reservation homes with LED alternatives through the trade-in program. Given that LED lightbulbs require only 10% of the electricity consumed by traditional lightbulbs and 15% of the total electricity used in homes is used for lighting, this measure has the potential to save 31,046 kWh of residential electricity. In total, this GHG emissions reduction measure has the potential to reduce electricity use by 93,760 kWh annually, resulting in an emissions reduction of 2.38 MTCO2e per year (PG&E, 2022).

7.2.4 Wetland Restoration, Green Infrastructure, and Stormwater Management

The wetland area to be restored is the entire riparian corridor surrounding the Zanja de Cota Creek. This area is approximately 57.6 acres. Assuming freshwater wetland carbon sequestration is approximately 1.43 metric tons per acre per year (Lal, et al., 2018), the area on the Reservation that would be restored has the potential to sequester 165 MTCO2e per year.

8.0 REFERENCES

BIA. (2014). *Final Environmental Assessment, Santa Ynez Band of Chumash Indians Camp 4 Fee-to-trust volume 1.* Sacramento, CA: U.S. Department of the Interior Bureau of Indian Affairs.

CalRecycle. (2024). *Estimated Solid Waste Generation Rates* . Retrieved from CalRecycle: https://www2.calrecycle.ca.gov/wastecharacterization/general/rates

Davenport, L. (2014). *Santa Ynez Chumash Strategic Energy Planning and Capacity Building Project Presentation.* Santa Ynez, CA: Santa Ynez Band of Chumash Indians.

EIA. (2024, January). *Commercial Buildings Energy Consumption Survey (CBECS): 2018 Survey Data*. Retrieved from U.S. Energy Information Administration: https://www.eia.gov/consumption/commercial/data/2018/index.php?view=consumption

Enel X. (2024, February). *Solar Panel Efficiency*. Retrieved from Enel X S.r.l: https://corporate.enelx.com/en/question-and-answers/are-solar-panels-energy-efficient#:~:text=The%20efficiency%20of%20solar%20panels,as%20much%20as%20nearly%2023%25%20&%20https://css.umich.edu/publications/factsheets/energy/photovoltaic-energy-factsheet

Energy Star. (2024). *Upgrade your Lighting*. Retrieved from Energy Star : https://www.energystar.gov/buildings/save-energy-commercial-buildings/ways-save/upgrade-lighting#:~:text=Lighting%20makes%20up%2017%25%20of,your%20lighting%20more%20energy%20efficient.

EPA. (1995). *Control and Pollution Prevention Options for Ammonia Emissions.* United States Environmental Protection Agency .

EPA. (2000, January). *United States Environmental Protection Agency*. Retrieved from Acetaldehyde: https://www.epa.gov/sites/default/files/2016-09/documents/acetaldehyde.pdf

EPA. (2000, January). *United States Environmental Protection Agency* . Retrieved from Methanol: https://www.epa.gov/sites/default/files/2016-09/documents/methanol.pdf

EPA. (2010). Tribal Greenhouse Gas Inventory Tool.

EPA. (2020). *National Pollutant Discharge Elimination System Permit Fact Sheet.* Santa Ynez, CA: Environmental Protection Agency.

EPA. (2023, July 25). *Basic Information about NO2*. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/no2-pollution/basic-information-about-no2

EPA. (2023, September). *GHG Emissions Factors Hub*. Retrieved from EPA United States Environmental Protection Agency: https://www.epa.gov/climateleadership/ghg-emission-factors-hub

EPA. (2023). *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021.* U.S. Environmental Protection Agency .

EPA. (2023, July 11). *Particulate Matter (PM) Basics*. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/pm-pollution/particulate-matter-pm-basics

EPA. (2023, March 28). *United States Environmental Protection Agency* . Retrieved from Facts about Formaldehyde: https://www.epa.gov/formaldehyde/facts-about-formaldehyde

EPA. (2023, March 15). *What are volitile organix compounds (VOCs)?* Retrieved from United States Enviroenmental Protection Agency: https://www.epa.gov/indoor-air-quality-iaq/what-are-volatile-organic-compounds-vocs

EPA. (2023, December 11). *What is carbon monoxide?* Retrieved from United States Environmental Protection Agency: https://www.epa.gov/indoor-air-quality-iaq/what-carbon-monoxide

EPA. (2024, January). *NEI Data Retrieval Tool (San Diego, CA)*. Retrieved from U.S. Environmental Protection Agency: https://awsedap.epa.gov/public/single/

EPA. (2024, January 31). *United States Environmental Protection Agency* . Retrieved from Sulfur Dioxide Basics: https://www.epa.gov/so2-pollution/sulfur-dioxide-basics

EPA. (2024). Waste Reduction Model (WARM) Version 16. U.S.A.

Hodgson, M. (2016, July 20). *Chumash Casino ups the ante with $165M in renovations*. Retrieved from Santa Ynez Valley News: https://syvnews.com/news/local/chumash-casino-ups-the-ante-with-165m-in-renovations/article_febe2cdc-2afa-5a9d-8427-c72b2b85366b.html

Kahn, K. (2018). *Santa Ynez Band of Chumash Indians Comments on Potential Revisions to the Trust Acquisition Regulations at 25 C.F.R. Part 151.* Santa Ynez, CA: United States Bureau of Indian Affairs.

Lal, R., Smith, P., Jungkunst, H. F., Mitsch, W. J., Lehmann, J., Ramachandran, P., . . . Ravindranath, N. H. (2018). The carbon sequestration potential of terrestrial ecosystems. *Journal of Soil and Water Conservation*, 6.

NREL. (2024, February). *PVWatts Calculator*. Retrieved from National Renewable Energy Laboratory: https://pvwatts.nrel.gov/

PG&E. (2014). *PG&E's Electric Service Territory.* San Francisco, CA: Pacific Gas and Electric Company.

PG&E. (2022). *2022 Power Content Label*. Retrieved from Pacific Gas and Electric Company: https://www.pge.com/content/dam/pge/docs/account/billing-and-assistance/bill-inserts/1023-Power-Content-Label.pdf

Santa Ynez Chumash Environmental Office. (2015). *Strategic Energy Management Plan for the Santa Ynez Band of Chumash Indians.* Santa Ynez, CA: Santa Ynez Band of Chumash Indians.

Santa Ynez Chumash Museum and Cultural Center. (2023, December). *About*. Retrieved from Santa Ynez Chumash Museum: https://www.sychumashmuseum.org/about/

SYBCI. (2018). *Comments on Potential Revisions to the Trust Acquisition Regulations at 25 C.F.R. Part 151.* Santa Ynez, CA: Santa Ynez Band of Chumash Indians.

SYBCI. (2023, December). Retrieved from Santa Ynez Band of Chumash Indians: https://chumash.gov/

SYCEO. (2022). *Impacts of Climate Change on the Santa Ynez Band of Chumash Indians.* Santa Ynez, CA: Santa Ynez Band of Chumash Indians.

SYCEO. (2024). *SYCEO and 'Zero Waste'*. Retrieved from Santa Ynez Chumash Environmental Office: https://syceo.org/zerowaste