ANNETTE ISLANDS RESERVE PRIORITY CLIMATE ACTION PLAN

Metlakatla Indian Community
Metlakatla, Alaska

April 2024

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Prepared April 2024 for:

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LIST OF ABBREVIATIONS

Alaska Native Claims Settlement Act	ANCSA
Alaska Native Tribal Health Consortium	ANTHC
Annette Islands Reserve	AIR
Annette Islands Reservation Integrated Resources Management Plan	IRMP
Building Resiliency Infrastructure Community's Program	BRIC
Bureau of Indian Affairs	BIA
Carbon Dioxide	CO_2
Climate Pollution Reduction Grant	CPRG
Comprehensive Climate Action Plan	CCAP
Dissolved Oxygen	DO
Emissions & Generation Resource Integrated Database	eGRID
Facility Level Information on Greenhouse Gasses Tool	FLIGHT
Federal Emergency Management Agency	FEMA
Geographic Information Systems	GIS
Greenhouse Gas	GHG
Greenhouse Gas Reporting Program	CHGRP
Hazard Mitigation Assistance	HMA
Heating, Ventilation, and Air Conditioning	HVAC
High Density Polyethylene	HDPE
Indian Health Services	IHS
Ketchikan Public Utilities	KPU
Kilowatt	kW
Local Government Operations Protocol	LGOP
Megawatt	MW
Megawatt Hours	mWh
Methane	CH_4
Metlakatla Indian Community	MIC
Metlakatla Power & Light	MPL
Metric Tons of Carbon Dioxide Equivalent	$MTCO_2e$
National Climate Assessment	NCA
National Emissions Inventory	NEI
National Indian Carbon Coalition	NICC
National Oceanic and Atmospheric Administration	NOAA
National Pollutant Discharge Elimination System	NPDES
Nitrous Oxide	N_2O
Preliminary Engineering Report	PER
Priority Climate Action Plan	PCAP

Request for Proposals	RFP
Tribal Utility Authority	TUA
U.S. Department of Agriculture	USDA
U.S. Department of Agriculture, Rural Development	RD
U.S. Environmental Protection Agency	EPA
Vehicle Miles Traveled	VMT
Wastewater Treatment Facilities	WWTF

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METLAKATLA INDIAN COMMUNITY COUNCIL

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EXECUTIVE SUMMARY

The Metlakatla Indian Community (MIC) applied for and received funding under the Climate Pollution Reduction Grant (CPRG) program, administered by the Environmental Protection Agency (EPA), to develop and expand on climate action plans for the expeditious implementation of investment-ready policies, programs, and projects to reduce greenhouse gas (GHG) pollution in the near term.[1]

This Priority Climate Action Plan (PCAP) includes the following required elements:

⇒ GHG Inventory
⇒ GHG Reduction Measures
⇒ Benefits Analysis
⇒ Review of Authority to Implement GHG Reduction Measures

The PCAP is a narrative report that includes a focused list of near-term, high-priority, and implementation-ready measures to reduce GHG pollution. Benefits of implementation include improved environmental and community conditions. This document largely draws from existing Tribal-level resource, climate, and land use plans. As a federally recognized tribal government, the MIC Tribal Council has the authority to implement reduction measures outlined in this document by virtue of the Tribe's government-to-government relationship with the United States, as well as the responsibilities, powers, and obligations of such Indian Tribes.[2]

Tribal CPRG priorities include:

METLAKATLA INDIAN COMMUNITY
CPRG Priority Measures
Table 1-1

CPRG PRIORITY GHG REDUCTION MEASURES	
Sector Measure	**Measure Description**
ELECTRIC POWER SECTOR	
Chester Lake Dam Extension Project	Raise Chester Lake Dam to increase energy storage systems on government-owned facilities.
Tamgas Creek Hatchery Water Line and Small-Scale Hydroelectric Facility	Promote electrification of government-owned buildings through the incorporation of a small-electric hydroelectric facility element in the hatchery water line design and construction.
Metlakatla-Ketchikan Intertie Project	Gap funding for the Metlakatla-Ketchikan Intertie Project to support the development of distributed renewable energy generation

[1] Environmental Protection Agency. (March 1, 2023). *Climate Pollution Reduction Grant Program Formula Grants for Planning: Program Guidance for Federally Recognized Tribes, Tribal Consortia, and U.S. Territories*. EPA. Accessed March 27, 2024, at https://www.epa.gov/system/files/documents/2023-02/EPA%20CPRG%20Planning%20Grants%20Program%20Guidance%20for%20Tribes-Tribal%20Consortia-Territories%2003-01-2023.pdf.

[2] FR Doc. 2022-01789.

METLAKATLA INDIAN COMMUNITY
CPRG Priority Measures
Table 1-1

CPRG PRIORITY GHG REDUCTION MEASURES	
Sector Measure	**Measure Description**
	infrastructure in disadvantaged communities, including rural and remote regions.
FACILITIES AND BUILDINGS SECTOR	
Wastewater Treatment Facilities Upgrades	Gap funding for wastewater treatment facility upgrades to support energy efficiency measures at WWTF and reduce fugitive emissions.
Tamgas Creek Hatchery Pink and Chum Incubation Building Upgrades	Mechanical addition and HVAC system design and installation to support programs and policies to implement end-use energy efficiency measures in existing government-owned buildings.
Annette Island Packing Company Fish Processing Facility	Replace Annette Island Fish Processing Facility to implement the most up-to-date building energy codes for new commercial buildings at government-owned facilities to be more energy efficient.
Tribal Law & Order Code Update, Land Use Plan Update, and Public Education	Perform Tribal Law & Order Code Update and Conduct Community Education/Outreach to Promote Energy Conservation & Clean Climate.
WASTE AND MATERIALS SECTOR	
Implement Best Management Practices	Implement best management practices (BMPs) to reduce harmful landfill emissions.
Tribal Code Update and Public Education	Perform Tribal Law & Order Code Update and Conduct Community Education/Outreach Regarding Solid Waste Disposal
Foster High-Quality Job and Training Opportunities	Foster High-Quality Job and Training Opportunities in the Waste and Materials Management Sector.
CARBON SEQUESTRATION SECTOR	
European Green Crab	Implement Early Detection and Rapid Response on Annette Islands Reserve and waters to the south of the reserve to enhance carbon removal.
Improve Forest, Wetland and Coastal Management	Improve forest, wetland, and coastal resource management to enhance carbon stocks.

Applying for CPRG implementation dollars and conducting additional research and data collection needed to develop the Comprehensive Climate Action Plan (CCAP) – the second deliverable required under the CPRG Planning Grant – are the next steps. The MIC will focus future funding requests on those measures that will have the most impact on reducing GHG emissions.

The MIC will focus future funding requests on those measures that will have the most impact on reducing GHG emissions, including improved solid waste management, wastewater treatment upgrades, regulations, public outreach, and workforce development. Additional impacts can be made through reducing reliance on diesel generation by increasing energy storage. The MIC will collect Tribal-level data and work with carbon reduction experts to further develop emission reduction estimates needed for the CCAP.

1.0 INTRODUCTION

1.1 AUTHORITY TO IMPLEMENT

Metlakatla Indian Community (MIC) is a federally recognized Indian tribe that occupies the Annette Islands Reserve (AIR) in Southeast Alaska.[3] The Reserve was created by Congress in 1891 to legally authorize the settlement of a group of Tsimshian Indians who emigrated from British Columbia a few years earlier.[4] Waters 3,000 feet from the shore at mean low water line were later reserved to the MIC through a 1918 Presidential Proclamation for the purpose of creating an exclusive fishing and economic zone that would promote economic development and self-governance.[5,6]

The Community is the only federally recognized Indian Reservation in Alaska and therefore does not participate in any Alaska Native Claims Settlement Act (ANCSA) Programs. Metlakatla Indian Community is a listed Indian entity eligible for funding and services from the Bureau of Indian Affairs (BIA) because of the MIC's status as a recognized Indian Tribe. The Community has the immunities and privileges available to federally recognized Indian Tribes by virtue of the Government-to-Government relationship with the United States, as well as the responsibilities, powers, limitations, and obligations of such Indian Tribes.[7]

The government of the MIC is vested to a twelve-member Council pursuant to the Constitution and By-laws of the Metlakatla Indian Community, as amended, and established in accordance with 25 U.S.C. Section 476.[8] The Tribal Council is authorized to make and enforce ordinances; employ counsel; prevent the sale, disposition, lease or other encumbrance of community lands, and other interests in lands; negotiate with federal and territorial governments; levy tax; issue permits to members to occupy lands; form committees; and create additional offices as necessary for effective administration of the Tribal government.[9]

1.2 PLANNING LOCATION

The AIR is located in southeast Alaska near the southern end of the Alexander Archipelago. Annette Island is approximately 600 miles north of Seattle, Washington and 600 miles south of Skagway, Alaska in the Inside Passage. The Reservation includes 86,313 acres of land and 46,019 acres of water. In addition to Annette Islands, the Reservation includes the waters 3,000 feet offshore from the mean low water line of the Annette Island, Walker Island, Spire Island, Ham Island, and adjoining small islands.

[3] Located 16 nautical miles from Ketchikan, AK at 55 degrees 07'48.66N 131 degrees 39'38.78W.
[4] 26 Stat. 1101 Section 15, Act of March 3, 1891.
[5] Proclamation No. 64, 39 Stat. 1777-1778.
[6] See Attachment A-1 "Legal Boundaries-Overview" Map
[7] FR Doc. 2022-01789.
[8] Indian Reorganization Act (1934).
[9] Article IV, Powers of Council. Constitution and Bylaws of the Metlakatla Indian Community Annette Islands Reserve, Alaska.


Metlakatla
Inset
Anchorage
Annette
Islands
Reserve
Seattle
N
130
0
130
Miles
Data Sources: MIC; BLM; ESRI
Location Map

1.3 PLANNING AREA & AFFECTED ENVIRONMENT

1.3.1 Ownership Patterns

The AIR is the only Reservation in the state of Alaska. The AIR is a "closed" reservation whereby public access is restricted. AIR Reservation is 100 percent trust lands held by the U.S. Federal Government for the benefit of Tribe and held in common by the Metlakatla Indian Community. Article VI Section 1 of the Constitution and By-Laws of the Metlakatla Indian Community, as amended, authorizes the Tribal Council to issue lot permits to any member of the Community.

1.3.2 Population

The total resident population for the Annette Islands Reserve is 1,465 (2020 Decennial Census).[10] There are 625 total housing units in the Metlakatla Indian Community census subarea (2020 Decennial Census PL94 Redistricting Data), with 560 total occupied housing units (2020 American Community Survey 5-Year Estimate). According to the 2020 Decennial Census, there are 529 occupied units within the town of Metlakatla (PL94 Redistricting Data).[11]

1.3.3 Jobs and Economy

Sixty-three (63) percent of Metlakatla's workforce are classified as government workers.[12] Federal grants and contracts provide for many jobs through Tribal programs. Employment by industry data shows that the majority of government positions are classified as public administration jobs (23%) and educational services, health care, and social assistance jobs (38%). Agriculture, forestry, fishing and hunting, and mining workers make up five (5) percent of those employed on the AIR. Twelve (12) percent of jobs held on the AIR are classified as construction, manufacturing, and wholesale trade jobs. Transportation, warehousing, and utility workers make up eight (8) percent of jobs. Three (3) percent of jobs are classified as professional, scientific, management, and administration.[13]

Aside from government, the commercial fishing industry is by far the largest industry in Metlakatla. The Tribal hatchery, *Tamgas Creek Hatchery*, is extremely productive, contributing to both the Tribal and regional economies. Other Tribal enterprises include the MIC Gaming Hall, the Metlakatla Smoke Shop, and the Port of Metlakatla. There are a handful of private businesses on Annette Island that serve both residents and visitors, including the Tongass Federal Credit Union; Alaska Commercial Company Market;

[10] Metlakatla Indian Community census subarea Price of Wales-Hyder Census Area, Alaska. United States Census Bureau. Accessed on 2022, April 13 at https://data.census.gov/cedsci/profile?g=0600000US0219848873

[11] According to Ms. Judith Eaton, the MIC Tribal Secretary, the Metlakatla Indian Community has 2,476 enrolled members (2022, May 19).

[12] Table DP03 Selected Economic Characteristics, Class of Worker. 2020 American Community Survey 5-year estimate subject table.

[13] Table DP03 Selected Economic Characteristics, Industry. 2020 American Community Survey 5-year estimate subject table.

Alaska Commercial Company Mini Mart; the Metlakatla Inn; and other niche businesses. The Community looks to expand current industries or gain foothold in new sectors of existing industries related to fish processing and distribution, tourism, kelp farming, and energy.

1.3.4. Geology and Topography

Annette Island is composed of bedrock formations ranging in age from 62 million to 350 or more million years old. Most of the mountains on Annette Island were formed as molten lava that solidified underground as igneous intrusive rock. In time, these intrusive rocks gradually lifted up above sea level in large blocks. Glaciation then formed the valleys, lakes, inlets, coves, and rugged shoreline that is seen today.[14]

The Metlakatla Peninsula, however, is formed of a metamorphosed rock characterized by foliation which makes it less strong than the intrusive rocks of the mountains. This is a softer rock that was more eroded by the glaciers. With the exception of Yellow Hill, metamorphosed rock on the Metlakatla Peninsula was sheared off flat resulting in a relatively low topography with elevations less than 100 feet.

Years of waves, tidal currents, and glacier movement created an uplifting process that formed raised beach deposits comprised of sand and gravel. According to the Annette Islands Reserve Coastal Management Program Plan, raised beach deposits measure up to thirty-three (33) feet in thickness and are permeable. Therefore, the deposits are a source of potential groundwater (p. 60).[15]

The Annette Islands Reserve Coastal Management Program Plan describes Annette Island's soils as an "outgrowth of its geology, climate and vegetation" (p. 63). Despite coastal erosion and landslides becoming more frequent due to harsh wave action and extreme weather events, it is these factors that create the soil's ability to support structures, grow timber, and withstand disturbances. Muskeg is the primary vegetation in lowland areas, while alpine meadows and forest vegetation are found at higher elevations.

1.3.5 Climate

The climate system of the Annette Islands Reserve is an oceanic climate classified as Maritime. Annette Island's climate is typical of west coasts at middle latitudes of most continents. This climate is dominated year-round by the polar front, leading to changeable and often overcast weather. Typically, precipitation is evenly dispersed throughout the year in Oceanic climates. However, recent weather patterns are more inconsistent and less reliable. The following table outlines National Oceanic and Atmospheric Administration (NOAA) precipitation data for years 2013 through 2021 on Annette Island.[16]

[14] Annette Islands Reserve Coastal Management Program, Pacific Rim Planners (1979)
[15] Ibid.
[16] Monthly Average Precipitation for Metlakatla 6 S, AK. NOAA Regional Climate Center. Accessed on April 11, 2022, at https://xmacis.rcc-acis.org/.

The warm season lasts from the end of June to the beginning of September, with July and August being the hottest months. Although temperatures are rising, summers on Annette Island are generally cool due to cool ocean currents. For instance, in 2021, July and August averaged 59 degrees Fahrenheit and 58 degrees Fahrenheit, respectively. The cold season lasts from mid-November through early April, with December being the coldest month. Temperatures during these months averaged 35 degrees Fahrenheit in 2021.[17]

Not unlike other regions across the globe, climate change and extreme weather events threaten Alaska. According to the 2017 National Climate Assessment (NCA), Alaska is vulnerable to warming temperatures, receding sea ice, thawing permafrost, rising ocean temperatures, and acidification.[18] Annette Island has experienced significant shifts in weather, intensified storms, flooding, and drought conditions in recent years. For instance, the community was forced to respond to a critical water and energy shortage in 2016 through preparedness and operational planning, conservation, and community outreach.

With respect to managing climate change, the MIC Tribal government primarily relies on the Metlakatla Indian Community Climate Adaptation Plan 2017-2027; the Metlakatla Indian Community Tribal Hazard Mitigation Plan (2019); and the Annette Islands Reserve Energy and Water Emergency Preparedness, Impact, and Response Plan (2016).

1.4 PLAN BACKGROUND

The MIC applied for and received funding under the Climate Pollution Reduction Grant (CPRG) program, administered by the Environmental Protection Agency (EPA), to develop and expand on climate action plans for the expeditious implementation of investment-ready policies, programs, and projects to reduce greenhouse gas (GHG) pollution in the near term."[19] Consistent with the EPA's programmatic priorities for the CPRG, the purpose of this document is to better understand current and future GHG emissions so that the Tribal government can prioritize actions that reduce such emission and harmful air pollution. This includes evaluating ambitious programs, policies, projects, and measures that will position the MIC to:

1. Achieve cumulative GHG reductions by 2030 and beyond,
2. Achieve substantial community benefits through improved human and earth health and the creation of training opportunities to prepare Tribal members for high-quality career pathways that enable economic mobility,

[17] Monthly Average Temperature for Metlakatla 6 S, AK. NOAA Regional Climate Center. Accessed on April 11, 2022, at https://xmacis.rcc-acis.org/.
[18] Accessed on 2022, April 11 at https://science2017.globalchange.gov/chapter/11/.
[19] Environmental Protection Agency. (March 1, 2023). *Climate Pollution Reduction Grant Program Formula Grants for Planning: Program Guidance for Federally Recognized Tribes, Tribal Consortia, and U.S. Territories*. EPA. Accessed March 27, 2024, at https://www.epa.gov/system/files/documents/2023-02/EPA%20CPRG%20Planning%20Grants%20Program%20Guidance%20for%20Tribes-Tribal%20Consortia-Territories%2003-01-2023.pdf.

3. Maximize CPRG and other funding opportunities through the power of leverage, and
4. Pursue innovative policies and programs that are replicable and can be scaled up.

1.5 PLAN SCOPE

This Priority Climate Action Plan (PCAP) includes the following required elements:

⇒ GHG Inventory
⇒ GHG Reduction Measures
⇒ Benefits Analysis
⇒ Review of Authority to Implement GHG Reduction Measures

The PCAP is intended to use the GHG Inventory to inform the design of GHG reducing measures that will minimize or address impacts of climate change and the challenges posed by aging and deteriorating infrastructure, stressed ecosystem, and long-standing inequities. The MIC is unique in that thanks to the vast forested land that makes up the AIR, the Tribe has a negative GHG emission value. The Tribe's forest resources enhance carbon removal and therefore act as a carbon "sink." Despite this good news, more detailed data collection and study is needed to fully understand the GHG emissions within the AIR. Those findings will be included in the Comprehensive Climate Action Plan (CCAP).

In the meantime, through the PCAP planning process, the MIC has identified several GHG reduction measures that directly relate to aging and deteriorating infrastructure, stressed ecosystems, and long-standing inequities. The MIC has prioritized those measures that, once addressed, will minimize harmful methane, carbon dioxide, nitric oxide and other pollutants coming from the electric power, transportation, facilities and buildings, and waste and materials management sectors of the Tribe's economy. The GHG reduction measures outlined in this PCAP are aimed at both reducing GHG emissions and further enhancing carbon removal.

1.6 SECTORS

The MIC has exclusive authority to introduce and implement operational and health, safety, and environmental policies on the AIR, including those related to electric power, water, wastewater, and solid waste. The PCAP addresses direct and indirect GHG emission sectors:

⇒ Electric power
⇒ Transportation
⇒ Facilities and buildings
⇒ Waste and materials management
⇒ Carbon sequestration

1.7 PLANNING PROCESS

The PCAP draws on existing Tribal plans and policies already adopted by the Tribal Council. In the making of this document, the planning team conducted an in-depth review of applicable Tribal plans including their respective planning records. This includes survey responses and documented stakeholder comments collected during previously held planning sessions. Tribal personnel facilitated interdepartmental and cross-organizational coordination with MIC's various departments and programs and outside organizations throughout the PCAP planning process. This included facilitating formal and informal meetings with the MIC Planning Committee to communicate progress and get feedback on priority reduction measures.

The reduction measures included in this PCAP directly support GHG reduction efforts and projects already underway in the Metlakatla Indian Community. In the instance where new stand-alone GHG reduction measures will be implemented solely through CPRG funding, such measures are in harmony with ongoing efforts and are key to carrying out and enhancing already adopted and approved Tribal policies, programs, goals, and objectives. For instance, the GHG waste and materials management sector reduction measures are stand-alone measures that the MIC has not received funding for in recent years. However, the measures are consistent with high-ranking priorities found across multiple Tribal plans. Additionally, these measures directly support or otherwise respond to community input obtained through previous planning efforts.

Program personnel from the Institute for Tribal Environmental Professionals, Northern Arizona University, contributed all the GHG emissions by sector data and calculations included in this PCAP. This GHG inventory is intended to provide a historical accounting of estimated amounts of greenhouse gasses emitted to, and removed from, the atmosphere in 2020 from the various activities within the Tribe's boundaries. Additional analysis and data collection will be conducted during the coming months to develop the CCAP.

Although choosing a specific baseline year is not required for the PCAP, the MIC selected 2020 as the baseline year for data collection. This year was chosen based on the availability of underlying data to support the GHG targets. The GHG Inventory covers primary GHGs, including Carbon Dioxide (CO_2), Methane (CH_4) and Nitrous Oxide (N_2O). All GHG data is reported in metric tons of carbon dioxide equivalent ($MTCO_2e$)

Several data sources and tools were utilized in the development of this inventory, including the National Emissions Inventory (NEI) census area data and AKMS eGRID subregion data. Additionally, the Tribal GHG Inventory Tool and EPA's NEI Wagon Wheel Tool were used to access and evaluate the data included in this inventory. Other resources utilized in the development of this inventory include the EPA's Greenhouse Gas Reporting Program (GHGRP) Facility Level Information on Greenhouse Gases Tool (FLIGHT), the Local Action Framework publication, and the Local Government Operations Protocol (LGOP) publication.

1.8 RELATED PLANS

Annette Islands Reserve Integrated Resources Management Plan (2023)
The IRMP considers the natural, physical, and human resources of the AIR. The IRMP lays out the MIC's management philosophy which is focused on the AIR's entire ecosystem rather than select resources. The goal of the plan is to help maintain the ecological processes to promote the long-term protection of all resources on the AIR. The MIC uses the plan to exercise Tribal sovereignty, assert authority over Tribal resources, optimize resource use and improve resource values.

Annette Island Forest Resources Management Plan (draft)
The final Annette Island Forest Resources Management Plan will replace the 2001-2010 Forest Resources Management Plan in entirety. The Plan establishes a management direction for the Tribe and the BIA concerning the forest resources on Annette Island by setting policies and guidelines for forestry resource management on AIR.

Metlakatla Indian Community Tribal Hazard Mitigation Plan (2019)
The Tribal Hazard Mitigation Plan was developed to meet the requirements of the Disaster Mitigation Act of 2000 and to assess risks posed by natural and human caused hazards and to develop mitigation action plans to reduce risk.

Salmon Fisheries Enhancement 20-Year Production Plan (2019)
The Salmon Fisheries Enhancement Plan is a twenty (20) year plan developed to identify long-term salmon enhancement goals and to focus salmon enhancement efforts and resources in ways that facilitate the achievement of fishery goals.

Plan Metlakatla 2028 (2018)
Plan Metlakatla 2028 updates the Community's 1971 Comprehensive Land Use Plan. Plan Metlakatla was developed to decide how Metlakatla will sustain and use the Community's natural and energy resources efficiently. It is used to assist leadership in determining where to focus Tribal resources and to encourage compatible land uses on Annette Island.

Metlakatla Indian Community Integrated Solid Waste Management Plan (2018)
The Integrated Solid Waste Management Plan evaluates existing solid waste systems and assesses waste management needs. The Plan also provides best management practices by naming ways to develop, implement, and monitor a more effective and sustainable solid waste program.

Noxious Weeds and Invasive Species Management Plan and Environmental Assessment (2017-2022)
The Noxious Weeds and Invasive Species Management Plan establishes goals and alternative actions for management of invasive species and noxious weeds on Annette Island.

Metlakatla Indian Community Climate Change Adaptation Plan (2017)
The Climate Change Adaptation Plan was developed to provide support to the Metlakatla Indian Community as the Annette Islands Reserve is directly impacted by changing climate. The plan offers recommended adaptation strategies.

Strategic Energy Plan (2017)
The Energy Plan was developed with the intent to provide MIC guidance on energy development in the upcoming years. The plan is consistent with both the 2016 Strategic Plan and the 2018 Comprehensive Land Use Plan. The goal of the plan is to build energy security through sustainable management of energy resources through informed decision-making.

Salmon Fishery Management Plan (2017)
The Salmon Fishery Management Plan describes the MIC's strategy for management of the Annette Islands Reserve 2017 salmon fisheries. The strategy relies heavily on in-season management, and places great responsibility on the Fisheries Management Board. The plan outlines the goals and objectives of the Council for the salmon fishery.

Energizing Metlakatla: Strategic Plan (2016)
Energizing Metlakatla is a short-term community development plan. The plan includes topics relating to natural resources and energy, economic development, and community development.

Tribal Transportation Safety Plan (2016)
The plan was developed with the intent of providing actions that should be taken by the Council to make Metlakatla roads pedestrian and bicycle friendly. Policy areas include education, emergency response, engineering, and legal enforcement.

Emergency Preparedness, Impact and Response Plan (2016)
The Metlakatla Emergency Preparedness Taskforce Committee developed the Emergency Plan to ensure organizational continuity of operations in case of disruption to power and water services. The plan guides preparedness, response, and recovery actions specific to water and power shortages and outages.

Noxious Weeds and Invasive Species Management Plan (2016)
The plan guides management actions necessary to preserve the natural state of the island; protect AIR's resources against undesirable impacts caused by noxious weeds and invasive species; and institute an Early Detection Rapid Response (EDRR) program.

Community Forestry Management Plan (2016-2020)
The Community Forestry Plan focuses on the urban tree canopy located within the town of Metlakatla. Goals and policies established in the plan support the Council's ongoing commitment to maintaining, enhancing, and preserving public trees along streets, in parks, and around public and Tribal facilities.

Metlakatla Indian Community Aggregate Resource Evaluation on Annette Island (2015)
The Metlakatla Indian Community Aggregate Resource Evaluation Plan assesses construction grade aggregates on Annette Island and establishes a mine plan for aggregates located at the Yellow Hill Quarry.

Integrated Solid Waste Management Plan (Revised in 2015)
The plan updates the Tribal Solid Waste Management Program Plan and identifies opportunities for reducing, reusing, and recycling discarded materials.

Forest Resources Management Plan for the Annette Islands Reserve (2002-2011)
The Forest Resource Management Plan provides the Bureau of Indian Affairs and the Tribal Forestry Program direction in managing commercial forest lands on the AIR. The Plan establishes goals and objectives for the Tribe's forestry resources.

Metlakatla Indian Community Municipal Dump Closure Plan (2002)
The plan outlines the steps needed to permanently close the municipal landfill. The plan recommends removal and off-site disposal alternatives, which include partial and full removal and a closure-in-place alternative.

Annette Islands Reserve Coastal Management Plan (1979)
The 1979 Coastal Management Plan is the MIC's most recent coastal plan. The Plan presents information related to the physical and biological processes affecting coastal resources on the Annette Islands Reserve. The plan communicates the major issues the Community faces in the coastal management zone and outlines goals to remedy those issues.

1.9 TRIBAL AND EPA CPRG CONTACTS

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2.0 ANNETTE ISLANDS RESERVE GHG INVENTORY

The AIR GHG Inventory included in this PCAP is a simplified inventory that utilizes existing data from previously published inventories. This GHG inventory is intended to provide a historical accounting of estimated amounts of greenhouse gases emitted to, and removed from, the atmosphere in 2020 from the various activities within the Tribe's boundaries. Additional analysis and data collection will be conducted during the coming months to develop the CCAP.

Although choosing a specific baseline year is not required for the PCAP, the MIC selected 2020 as the baseline year for data collection. This year was chosen based on the availability of underlying data to support the GHG targets. The GHG Inventory covers primary GHGs, including CO_2, CH_4, and N_2O. All GHG data is reported in $MTCO_2e$.

Several data sources and tools were utilized in the development of this inventory, including the NEI census area data and AKMS eGRID subregion data. Additionally, the Tribal GHG Inventory Tool and EPA's NEI Wagon Wheel Tool were used to access and evaluate the data included in this inventory. Other resources utilized in the development of this inventory include the EPA's GHGRP Facility Level Information on Greenhouse Gases Tool, and the LGOP publication.

The Annette Islands Reserve GHG Inventory is organized by emission sectors and scope. The following five (5) emission sectors are included under this PCAP.

1. **Electric Power Sector**
2. **Transportation Sector**
3. **Facilities and Buildings Sector**
4. **Waste Materials and Management Sector**
5. **Carbon Sequestration Sector**

Each sector is further divided by scope.

⇒ **Scope 1: Direct GHG Emissions**
Scope one includes emissions from sources within the boundary of the Annette Island Reserve that the Tribal government owns or controls. These emissions are further divided into stationary combustion, mobile combustion, process emissions, and fugitive emissions.

⇒ **Scope 2: Indirect GHG Emissions**
Scope two emissions include those associated with the consumption of purchased or acquired electricity, heating, steam, or cooling. Indirect GHG emissions are a consequence of activities that take place within the reservation boundaries but occur at sources not owned or controlled by the Metlakatla Indian Community.

⇒ **Scope 3: Other Indirect GHG Emissions**
Scope three emissions include all other indirect GHG emissions not included under Scope 2. Emissions from ferry and airplane mobile sources are an example of Scope 3 GHG emissions included under this PCAP.

The following inventory generally describes sector emissions included under the respective scope. Following the description is an inventory methodology and calculation overview. Each sector concludes with a GHG emissions calculation table that communicates annual emissions based on available data.

This GHG Inventory directly informs Annette Islands Reserve GHG reduction measures discussed in Part 4.

2.1 ELECTRIC POWER SECTOR

2.1.1 Description

Scope 1
The MIC has exclusive authority to introduce and implement operational and health, safety, and environmental policies on the AIR, including those related to stationary combustion. Additionally, all electric power sector stationary combustion activity for the planning area occurs at Tribal owned facilities located within the exterior boundary of the AIR. Therefore, the MIC has complete operational and financial control over the GHG categories covered under this sector. Scope one stationary combustion sources primarily include combustion of distillate fuels used to generate electricity needed to meet the percentage of the community load not met by hydropower energy output. Other scope one electric power sources include operational fuel use associated with powering the offices (i.e., self-generated power consumed in the power generation facilities), and fugitive emissions associated with transmission and distribution loss.[20]

Metlakatla Power & Light (MPL) provides electric service to the community. MPL is a Tribal owned and operated Tribal Utility Authority (TUA). The purpose of MPL is to make electric energy available to consumers through the generation and supply of electrical energy. According to the MPL bylaws and policies, the MPL Board of Directors and General Manager are responsible for administering a demand side management program that aims to reduce peak demand through adding energy efficiency measures and load control before adding additional generation. The MPL Board and General Manager are also responsible for setting rates and for determining the proper use of MPL's funds.[21]

[20] Local Governments for Sustainability. (2010). *Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories* (Volume 1.1). p. 48.
https://climatesmart.ny.gov/fileadmin/csc/documents/GHG_Inventories/2010-05-06-LGO-1.1.pdf
[21] Metlakatla Power & Light Bylaws and Policies (updated 11/2019)

MPL's existing electrical generation and distribution system began servicing the MIC in 1927. MPL's current generation capacity primarily comes from hydroelectric generation units and diesel fueled generators. Hydropower is sourced from Chester and Purple Lakes on Annette Island. The Chester Lake Hydroelectric Project includes one 1.2 MW unit. The Purple Lake Hydroelectric Project includes three 1,000 kW units. Combined, the Chester Lake and Purple Lake hydro plants have an average generation potential of 20,407 megawatt hours (mWh). Diesel generators provide supplemental diesel energy as needed to meet demand. MPL's diesel generation assets include a 5.0-megawatt (MW) diesel generator and a 1.5 MW diesel generator. The community's daily energy demand averages between 2.5 to 3.0 MW and has peaked as high as 4.0MW in recent years.

MPL's hydropower facilities are capacity limited in times of drought. Unfortunately, lower-than-normal precipitation in recent years has limited MPL's hydro generation capacity. For example, in 2016, MPL's total hydro generation was only 19,052 mWh. This resulted in a need for 3,309 mWh's of diesel generation. In response to changing weather conditions and increasingly strained water resources, the MIC Tribal Council formed an Emergency Task Force and adopted the community's first emergency preparedness plan in April of 2016 to address energy capacity and potable water supply needs. Since the plan's adoption, the Task Force has successfully coordinated with the Tribal Council and MPL to better manage the AIR's potable water and energy resources.

Three implementation ready projects aimed at improving resilience include the Chester Lake Dam Extension Project, the Tamgas Creek Water Line and Small Hydroelectric Project, and the Metlakatla-Ketchikan Intertie Project. The Chester Lake Dam Extension Project is important for storing excess water during times of extreme rainfall (i.e., for energy banking) to better manage times of inundation and build hydro capacity. The MIC is ready to move forward with this shovel-ready project once final funding is in place. To date, the Tribal government has completed the preliminary engineering report and the required environmental review. The Tribe is now in the process of completing the final design engineering and working to secure final funding. The second project, the Tamgas Creek Water Line and Small Hydroelectric Project promotes electrification of government-owned buildings. Final engineering and construction documents are expected to be complete in mid- to late-2024.

The third project, the Metlakatla-Ketchikan Intertie Project, includes the installation of a 2.1-mile submarined transmission line that will connect the electric systems of the MPL in Metlakatla on the Annette Island to Ketchikan Public Utilities (KPU) in the nearby community of Ketchikan on the Revillagigedo Island. This project will mutually benefit Metlakatla and Ketchikan, and potentially other Southeast Alaska communities receiving energy from the intertie project because it will allow MPL to purchase hydroelectric from KPU instead of relying on diesel to meet demand and sell back clean hydroelectric power in times of surplus. MPL and the MIC are coordinating to secure final phase funding for this project.

In addition to the intertie, hydroelectric, and dam extension projects, the MIC has a collection of Tribal plans adopted by the MIC Tribal Council that prioritize investing in new renewable energy projects including wind, solar, and small hydro to meet the community load and support additional energy banking.[22] These projects will diversify the MPL's current energy portfolio and increase hydroelectric capacity.

Scope 2

None to report.

Scope 3

None to report.

2.1.2 Inventory Methodology and Calculation Overview:

Scope 1

Calculations used for scope one stationary combustion GHG emissions represent the emissions from the 5.0 MW Caterpillar generator at the hydro plant. Data on fuel consumption was gathered from MPL. Fuel consumption in gallons for 2020 was 90,669. The total gallons of fuel used was multiplied by the emission factors provided by the Tribal GHG Inventory Tool and converted to the appropriate units, so the results are shown as metric tons. The results CH_4 and N_2O were then multiplied by the global warming potential to express the results as metric tons of CO_2 equivalent ($MTCO_2e$). Understanding the PCAP is intended to be a high-level report communicating results of a general GHG inventory, the MIC will conduct additional research and data collection related to this sector to inform the CCAP.

2.1.3 GHG Emissions Calculation

METLAKATLA INDIAN COMMUNITY
GHG FOR 2020
Table 2-1

2020 ELECTRIC POWER SECTOR EMISSIONS					
Sector	**Category**	**Annual GHG Emissions by Sector ($MTCO_2e$)**			
		CO_2	**CH_4**	**N_2O**	**Total**
Stationary Combustion					
Electric Power	*Energy Production*	925.730	1.052	1.991	928.773
	Grand Total	**925.730**	**1.052**	**1.991**	**928.773**

[22] See Attachment A-2 "Metlakatla Critical Infrastructure – Energy" Map

2.2 TRANSPORTATION SECTOR

2.2.1 Description

Scope 1

On-road scope one sources of transportation related GHG emissions include emissions from the MIC's transit fleet and privately owned passenger cars, medium-and heavy-duty trucks, light-duty trucks, sport utility vehicles, and minivans. The Tribal vehicle fleet includes mobile combustion and fugitive emissions from tribal transit-oriented busses and vehicles, vehicles used for solid waste, emergency, and other departmental purposes. Other scope one mobile combustion emissions within the reservation include those categorized as "off-road." Off-road mobile combustion emissions include Tribal owned watercraft, private- and commercial-owned fishing vessels, and Tribal-, commercial-, and privately-owned heavy equipment and small equipment and tools. This includes GHG's from backhoes, tractors, lawn mowers, and all-terrain vehicles.[23]

Additional scope one off-road mobile combustion emissions in the general inventory include government-, institutional-, and privately-owned emergency diesel generators. Government and institutional emergency generators included in this category refer to those located at MIC's administrative buildings and other Tribal-owned facilities as well as the emergency generators at the Annette Island School District and the Annette Island Service Unit. Per the LGOP, scope one off-road mobile combustion calculations do not include stationary generators located at the power generation facility.[24]

Scope 2

None to report.

Scope 3

Scope three off-road mobile combustion sources includes commercial ferry vessels owned and operated by the Alaska Marine Highway System, barge transportation vessels owned and operated by Samson Tug & Barge, and commercial air related transportation provided by Taquan Air. Other scope three air related travel includes commercial helicopter transportation, flight for life transportation, and postal service-related transportation.[25]

[23] See Attachment A-3 "Metlakatla Critical Infrastructure – Transportation Overview" Map

[24] Local Governments for Sustainability. (2010). *Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories* (Volume 1.1). p. 80. https://climatesmart.ny.gov/fileadmin/csc/documents/GHG_Inventories/2010-05-06-LGO-1.1.pdf

[25] See Attachment A-4 "Metlakatla Critical Infrastructure – MIC Transportation" Map

2.2.2 Inventory Methodology and Calculation Overview:

Scope 1

No major roads traverse the reservation, however, there are a network of minor roads that run throughout the reservation, consisting of both paved and unpaved roads. Local VMT data was collected from three frequently traveled roads on the island – Walden Point Road, Purple Lake Road, and Tait-Ferry Terminal Road.[26] Because tribal-level data is not available to calculate mobile emissions, calculations used for scope one on-road mobile combustion GHG emissions represent state estimates scaled to MIC's population. On-road mobile source emissions were estimated by scaling down (i.e., taking a percentage or fraction of) 2020 annual vehicle miles traveled (VMT) data for the Prince of Wales-Hyder census area downloaded from the 2020 NEI. Off-road mobile sources were excluded from the GHG calculations.

Understanding the PCAP is intended to be a high-level report communicating results of a general GHG inventory, the MIC will conduct additional research and data collection related to this category to inform the CCAP.

Scope 3

Methodologies used to calculate scope one transportation sector emissions were employed to calculate scope three off-road mobile combustion emissions. For this calculation, state emission estimates were scaled to MIC's population. The PCAP inventory includes off-road emissions data for commercial fishing vessels operating out of Metlakatla. Off-road mobile source data was downloaded from the 2020 NEI for Prince of Wales-Hyder census area. Because it was assumed that the port size is roughly correlated with port activity, commercial boat data was scaled down by size of port for the purpose of calculating GHG emissions.

Due to lack of data, off-road emissions calculations related to commercial floatplane and helicopter transportation, flight for life transportation, and postal service-related transportation are excluded from scope three off-road calculations. The MIC intends to conduct additional research and data collection related to this category to inform the CCAP.

2.2.3 GHG Emissions Calculation

METLAKATLA INDIAN COMMUNITY
MOBILE COMBUSTION GHG FOR 2020
Table 2-2

2020 TRANSPORTATION SECTOR EMISSIONS					
Sector	**Category**	**Annual GHG Emissions by Sector ($MTCO_2e$)**			
		CO_2	**CH_4**	**N_2O**	**Total**
Mobile Combustion					
Transportation	*On-Road vehicles*	1,051.44	6.37	2.54	1,060.35

[26] See Attachment A-5 "Metlakatla Local Transportation" Map

METLAKATLA INDIAN COMMUNITY
MOBILE COMBUSTION GHG FOR 2020
Table 2-2

2020 TRANSPORTATION SECTOR EMISSIONS					
Sector	**Category**	**Annual GHG Emissions by Sector ($MTCO_2e$)**			
		CO_2	**CH_4**	**N_2O**	**Total**
Mobile Combustion					
	Off-Road (Commercial Marine Vessels)	2,376.05	-	-	2,376.05
	Grand Total	**3,427.48**	**6.37**	**2.54**	**3,436.40**

2.3 FACILITIES AND BUILDINGS SECTOR

2.3.1 Description

Scope 1

Wastewater Treatment and Discharge

All wastewater treatment and discharge activities occur at Tribal owned facilities located within the exterior boundaries of the AIR. The MIC Public Works Department manages and oversees the community wastewater treatment facilities (WWTF).[27] Wastewater service in Metlakatla directly serves residential, commercial, industrial, and government users through a mix of piped gravity sewer collection and septic systems. Wastewater collected by the gravity sewer system flows to a lift station which pumps it to an aerated sewage lagoon system located approximately 1 mile southwest of the community. Waste sludge from the lagoons and wastewater from the septic haul is discharged to a sludge stabilization pond located southwest of the sewage lagoon. This facility discharges treated effluent to tribal waters and currently operates under an individual National Pollutant Discharge Elimination System (NPDES) discharge permit.

Constructed in 1999, the current wastewater treatment system is failing due to age. To correct deficiencies and expand the Tribal government's capacity to meet further community growth, the MIC Tribal Council has prioritized the design and construction of two new lagoon cells and installation of dissolved oxygen (DO) sensors, upgraded aeration controls, upgraded aeration system, and sludge removal system. Other needs include lagoon liner repairs and replacement of the headworks facility for primary treatment of influent wastewater and the flow measurement of the influent and effluent wastewater. Although the MIC secured a large portion of funding needed to undertake the named upgrades from the EPA, Indian Health Services (IHS), and United States Department of Agriculture

[27] See Attachment A-6 "Metlakatla Air Quality" Map

(USDA) Rural Development (RD) in late 2023, additional funds are needed to ensure the completion of WWTF upgrades.

The principal source of scope one wastewater treatment and discharge related emissions is electricity used at the treatment plant.

Water Treatment

All water treatment occurs at Tribal owned facilities located within the exterior boundaries of the AIR. Located to the east of Metlakatla, Chester Lake is located atop a high, perched valley at approximately 850 feet elevation. The lake's surface area is roughly 71 acres in size. Although the Chester Lake hydroelectric facilities have an estimated power output capacity of 1 MW, the lake primarily serves as the community's municipal water source. Metlakatla Public Works Department is responsible for maintaining and managing the municipal water supply. The department is dedicated to building and sustaining critical infrastructure, including the community's water infrastructure. Recorded high water consumption times are between 6:00 a.m. and 7:00 p.m.

Consumption levels dip slightly after the lunch hour but increase shortly thereafter. Similar to the fluxes in power consumption and generation the MPL experiences due to industrial uses, Metlakatla Public Works Department shows the community's water consumption increases significantly in the summer months when the fish plant is processing fish. Prior to reduced operations in 2019, the Public Works Department documented demand increasing from 300 to 350 gallons per minute in the fall and winter to approximately 1,000 gallons per minute in the spring and summer.

The principal source of scope one water treatment related emissions is electricity used at the water treatment plant and at the small and large lift stations.

Scope 2

Wastewater Treatment and Discharge

Scope two wastewater related emissions include fugitive emissions from residential and commercial septic tanks.

Commercial and Residential Buildings

Scope two commercial and residential buildings related emissions include emissions from heating, cooling, and other residential and commercial building needs. According to the IRMP, commercial buildings in Metlakatla include the grocery store, convenience stores, retail shops, a garden nursery, and the Metlakatla Indian Community Bingo Hall. Additional commercial establishments include the Metlakatla Hotel, Tongass Federal Credit Union, and the Annette Island Gas Station. Several churches and other buildings of worship are also located on the AIR. Cultural and historic buildings include the Longhouse and Duncan's Cottage Museum. Community buildings include the Town Hall, Council Chambers, a community health facility, and behavioral health center. Other community buildings include

those used for education and land and resource management. Other commercial facilities include the Tamgas Creek Hatchery and the Annette Island Packing Company.[28]

Residential housing units on the AIR primarily include single-family residences, multi-family residences, mobile home units, group dwelling units, and congregate housing facilities. According to 2020 U.S. census data, there were 586 housing units on Annette Island at the time of the survey, 529 of which were occupied at that time. The same dataset shows that 77% of the housing stock was constructed between 1960 and 2010. Tribal documents show the earliest constructed residential buildings still being occupied date back to 1887.

Recognizing the need to address such emissions, several of the MIC's previously adopted Tribal plans, including the Comprehensive Land Use Plan; the Emergency Preparedness, Response and Mitigation Plan; the Climate Change and Adaptation Plan; the Tribal Hazard Mitigation Plan; and the Annette Islands Integrated Resources Management Plan set goals and objectives aimed at acquiring resources needed to assist Tribal departments, private-sector businesses, homeowners, and renters to conserve energy and water resources.

To reduce GHG facility and building sector emissions, the MIC Council has prioritized making improvements to Tribal-owned buildings and facilities known to be extremely inefficient. Priority improvements include updating the lighting and heating, ventilation, and air conditioning (HVAC) system at the Tamgas Creek Hatchery Pink and Chum Incubation Building to be more energy efficient. The lighting and heating systems in the operations building are extremely inefficient. Updating the lighting and HVAC system will reduce GHG emissions and electricity costs. Other energy intensive and inefficient Tribal facilities that need upgrades include the Annette Island Packing Company Fish Processing Facility, the hatchery fishway, and the mariculture and shellfish lab. The MIC has also prioritized installing a small hydroelectric facility element at the hatchery's water source to meet its electrical needs.

In addition to prioritizing the physical improvements needed at Tribal-owned facilities to reduce GHG emissions, the MIC Council agrees the Tribal Law and Order Code, land use plan, and official zoning map need to be updated to better address modern problems related to climate change. Updated laws and policy will consider known impacts on the environment. Leadership looks to support policy solutions that will protect the environment and promote energy conservation and efficient land use patterns.

Scope 3

None to report.

[28] See Attachment A-7 "Metlakatla Critical Facilities" Map

2.3.2 Inventory Methodology and Calculation Overview:

Scope 1

Wastewater Treatment and Discharge

Emissions from wastewater treatment and discharge were calculated by scaling down (i.e., taking a percentage or fraction of) the 2020 Alaska GHG emissions to the reservation level based on a population allocation. The on-reservation population is 1,465[29] and the population of Alaska using the EPA 2020 NEI Wagon Wheel Tool is 731,158[30]. Therefore, the population ratio used to estimate the reservation emissions is 0.0020037.

Water Treatment

The Tribal GHG Inventory Tool was used to calculate water treatment emissions for Metlakatla. The AKMS eGRID subregion data was used to determine how many pounds of each greenhouse gas are emitted per mWh of electricity used for water treatment in the region. Kilowatt-hours of electricity used for the small and large lift station buildings in 2020 was summed then multiplied by the emission factors provided by the Tribal GHG Inventory Tool and converted to the units so the results are shown as metric tons. The results for CH_4 and N_2O were then multiplied by the global warming potential to express the results as metric tons of CO_2 equivalent ($MTCO_2e$).

Scope 2

Wastewater Treatment and Discharge

Not included due to lack of data. The MIC will conduct additional research and data collection related to this category to inform the CCAP.

Commercial and Residential Buildings

Not included due to lack of Tribal-level data and to otherwise avoid "double-counting." The MIC will conduct additional research and data collection related to this category to inform the CCAP.

[29] U.S. Census 2018-2022 American Community Survey 5-Year Estimates, accessed at https://www.census.gov/tribal/?aianihh=0110.

[30] EPA 2020 NEI Wagon Wheel Tool accessed at https://www.epa.gov/air-emissions-inventories/2020-nei-supporting-data-and-summaries.

2.3.3 GHG Emissions Calculation

METLAKATLA INDIAN COMMUNITY
GHG FOR 2020
Table 2-3

2020 FACILITIES AND BUILDINGS SECTOR EMISSIONS					
Sector	**Category**	**Annual GHG Emissions by Sector ($MTCO_2e$)**			
		CO_2	**CH_4**	**N_2O**	**Total**
Facilities and Buildings					
Wastewater	*Treatment and Discharge*	-	42	103	145
Water	*Electricity Consumption*	21.75878	0.0308	0.53982107	22.32940107
	Grand Total	**21.75878**	**42.0308**	**103.53982107**	**167. 32940107**

2.4 WASTE AND MATERIALS MANAGEMENT SECTOR

2.4.1 Description

Scope 1

The MIC has exclusive authority to introduce and implement operational and health, safety, and environmental policies on the AIR, including those related to waste and materials management. All solid waste and materials management occurs at Tribal owned facilities located within the exterior boundaries of the AIR. The MIC operates three primary solid waste facilities which include the community landfill, the metals dump, and an overburden area.[31] Each facility is located south of the Town of Metlakatla on Airport Road. As an island community with limited space and resources to develop and manage community facilities, waste management is challenging. MIC's solid waste facilities accept community solid waste from residences, commercial operations, industry, and government facilities.

GHG emissions from solid waste facilities and the community landfill result from incineration, fuel combusting equipment, purchased electricity, waste-hauling fleet vehicles, and heavy equipment. Under the MIC Law and Order Code, the MIC Environmental Office is solely responsible for the Community's waste management services, including facility construction and maintenance.

The MIC has a handful of reports, plans and policies that directly and indirectly involve solid waste and materials management. Despite this, leadership and Tribal personnel agree that more needs to be done to address waste management and related environmental concerns. The MIC Public Works Department needs additional resources, including staffing, technology, and equipment to implement current waste management policies, plans and corresponding guides that outline best management practices.

[31] See Attachment A-8 "Metlakatla Critical Infrastructure – Waste Management" Map

Scope 2
None to report.

Scope 3
None to report.

2.4.2 Inventory Methodology and Calculation Overview:

Scope 1
Emissions from solid waste disposal were calculated by scaling down (i.e., taking a percentage or fraction of) the 2020 Alaska GHG emissions to the reservation level based on a population allocation. The on-reservation population is 1,465[32] and the population of Alaska using the EPA 2020 NEI Wagon Wheel Tool is 731,158[33]. Therefore, the population ratio used to estimate the reservation emissions is 0.0020037. Understanding the PCAP is intended to be a high-level report communicating results of a general GHG inventory, the MIC will conduct additional research and tribal-level data collection related to this sector to inform the CCAP.

2.4.3 GHG Emissions Calculation

METLAKATLA INDIAN COMMUNITY
GHG FOR 2020
Table 2-4

2020 WASTE AND MATERIALS MANAGEMENT SECTOR EMISSIONS					
Sector	**Category**	**Annual GHG Emissions by Sector ($MTCO_2e$)**			
		CO_2	**CH_4**	**N_2O**	**Total**
Waste and Materials Management					
Solid Waste	*Management*	-	920	-	920
	Grand Total	**-**	**920**	**-**	**920**

2.5 CARBON SEQUESTRATION SECTOR

2.5.1 Description

Forests and Muskeg
Annette Island supports 86,393 acres of forest land. Of those acres, 21,675 are designated by the Bureau of Indian Affairs (BIA) as commercial forest lands. Forest resources include deciduous forest, evergreen

[32] U.S. Census 2018-2022 American Community Survey 5-Year Estimates, accessed at https://www.census.gov/tribal/?aianihh=0110.
[33] EPA 2020 NEI Wagon Wheel Tool accessed at https://www.epa.gov/air-emissions-inventories/2020-nei-supporting-data-and-summaries.

forest, mixed forest, woody wetlands, and associated plant and wildlife communities.[34] The forest lands support a range of consumptive subsistence values important for meeting home heat, dietary, medicinal, and other needs[35]. These vast forest and muskeg resources also serve as a valuable carbon sink and are fundamental to carbon storage. With respect to carbon sequestration and carbon markets, the AIR's forested lands have the qualities necessary for MIC to enter the environmental commodities sector in the future. According to the National Indian Carbon Coalition (NICC), carbon offsets are an excellent opportunity for tribal nations to protect their land and generate sustainable long-term income.[36]

Seaweed and Salt Marsh Habitats

The watersheds on Annette Island support an expansive cluster of drainage systems. The low-lying estuaries found within the watersheds support a range of aquatic plants and algae, including brown kelp, brown rockweed, and sea lettuce. These resources serve as an essential food supply for marine life and promote habitat restoration important for commercial fish and other sea creatures who rely on seaweed to thrive. Aquatic plants and algae found on the AIR are also valued for their role in cleaning the water and the air. These resources are beneficial for carbon sequestration and are known as a natural solution for reducing ocean acidification in surrounding waters. This process includes removing carbon from the earth's atmosphere and contributes to clean air, clean water, and healthy soils.

Unfortunately, the MIC, along with other coastal communities throughout the country, is now battling invasive green crab. Green crabs are recognized as one of the worst invasive species, destroying seagrass, salt marshes and shellfish populations. Green crabs directly threaten this important "blue carbon" sink. The MIC Department of Fish and Wildlife and Invasive Species Program has been working hard to address the European Green Crab since before it was officially confirmed within the AIR boundary in July of 2022. Because this species has potential to decimate critical seaweed and salt marsh habitats within the reserve, the MIC Tribal Council and Tribal personnel continue to prioritize this effort and need additional financial, human, and technological resources to effectively manage this natural resource crisis.

2.5.2 Inventory Methodology and Calculation Overview:

Forests and Muskeg

Emission estimates for this category were calculated by scaling down state data from the EPA's GHG Emissions and Sinks online database using the ratio of Metlakatla's forest area relative to the state's forest area. Because additional information is needed to understand the area of muskeg, data estimates for this category focus on forest lands. Calculations for this category involved converting the number of non-commercial forested acres recorded by the MIC Forestry Department to hectares. The MIC Forestry

[34] See Attachment A-9 "Annette Islands Reserve Land Cover" Map

[35] Metlakatla Indian Community. (2023). *Annette Islands Reserve Integrated Resources Management Plan* (p. 238). Metlakatla, AK.

[36] See National Indian Carbon Coalition at https://www.indiancarbon.org/about-us/.

Department's inventory shows the AIR has 51,134 acres or 20,693 hectares of non-commercial forested lands. It is important to note, however, that commercial forestry activities on the AIR ceased in 1999, when the last commercial timber contract was closed due to federal restrictions on logging in the Tongas National Forest.[37]

The MIC will conduct additional research and data collection related to this category to inform the CCAP.

Seaweed and Salt Marsh Habitats

Not included due to lack of data. The MIC will conduct additional research and data collection related to this category to inform the CCAP.

2.5.3 GHG Emissions Calculation

METLAKATLA INDIAN COMMUNITY
GHG FOR 2020
Table 2-5

2020 CARBON SEQUESTRATION SECTOR EMISSIONS					
Sector	**Category**	**Annual GHG Emissions by Sector ($MTCO_2e$)**			
		CO_2	**CH_4**	**N_2O**	**Total**
Carbon Sequestration					
Forest Land	*Forests Remaining Forest Land*	-12,957.17	-	22.26	-12,934.90
	Forest Fires[38]	-	70.36	69.83	117.92
	Grand Total	**-12,957.17**	**70.36**	**92.09**	**-12,816.98**

[37] Metlakatla Indian Community. (2023). *Annette Islands Reserve Integrated Resources Management Plan* (p. 125). Metlakatla, AK.

[38] There were no fires on Annette Island in 2020.

3.0 ANNETTE ISLANDS RESERVE GHG REDUCTION MEASURES

Greenhouse gas reduction measures included in this PCAP are actions that can be taken by the MIC to reduce GHG emissions produced and created in its boundary. The following near-term, high-priority, and implementation-ready measures give the EPA the opportunity to invest in a cleaner economy that will spur innovation and economic growth and will ultimately help to ensure that the MIC has a more resilient community.

1. Electric Power Sector
    - Measure One: Chester Lake Dam Extension Project
    - Measure Two: Tamgas Creek Hatchery Water Line and Small-Scale Hydroelectric Facility
    - Measure Three: Metlakatla-Ketchikan Intertie Project

2. Transportation Sector
    - None identified.

3. Facilities and Buildings Sector
    - Measure One: WWTF Upgrades
    - Measure Two: Tamgas Creek Hatchery Pink & Chum Incubation Building Upgrades
    - Measure Three: Annette Island Packing Company Fish Processing Facility
    - Measure Four: Tribal Law & Order Code Update, Land Use Plan Update, and Public Education

4. Waste Materials and Management Sector
    - Measure One: Implement Best Management Practices
    - Measure Two: Tribal Law & Order Code Update, Land Use Plan Update, and Public Education
    - Measure Three: Foster High-Quality Job and Training Opportunities

5. Carbon Sequestration Sector
    - Measure One: European Green Crab
    - Measure Two: Improve Forest, Wetland, and Coastal Management

3.1 ELECTRIC POWER SECTOR

3.1.1 Reduction Measure One

Chester Lake Dam Extension Project

Electric power sector reduction measure one is a new GHG measure where the MIC has already secured partial funding from several other sources and funding from the CPRG would secure total funding. The Chester Lake Dam Extension Project is important for storing excess water during times of extreme rainfall (i.e., for energy banking) to better manage inundation and build hydro capacity. The MIC is ready to move forward with this shovel-ready project once final funding is in place. To date, the Tribal government has completed the preliminary engineering report and the required environmental review. The Tribe is now in the process of completing final design and engineering.

This Reservoir is situated in a natural bowl between the Purple and Leadville Mountains. With a surface area of approximately 86 acres, Chester Lake can hold an estimated 1,544-acre feet of water. The existing dam was constructed in 1985. The dam has a total measured height of 32 feet from the base to the crest. In addition to supplying the community's municipal water, Chester Lake serves as a critical hydroelectricity energy bank. As previously discussed in the GHG Inventory, Chester Lake supports one 1.2MW hydroelectric unit that MPL runs to maintain adequate water levels in Purple Lake.

The impetus for first evaluating reservoir capacity was the 2015 drought that lasted through 2018. The drought continuously threatened the community's municipal and energy water supplies. Observation showed that despite being in a state of drought, the existing dam would overtop during significant rain events. In this state, the dam's capacity to hold additional water limited the Tribe's ability to bank clean and inexpensive energy supplies. While the current conditions have improved with respect to the drought, more rain merely means an ever-increasing net loss to the Tribe's clean energy bank.

The MIC commissioned the 2020 Preliminary Engineering Report (PER) with funding from the State of Alaska Village Safe Water, Alaska Native Tribal Health Consortium (ANTHC), and Tribal resources. The completed PER recommends extending the existing dam by 10 feet to capture annual estimated rainfall. Since completing the PER, the MIC applied for and received funding from the Federal Emergency Management Agency (FEMA), Hazard Mitigation Assistance (HMA) grants program for $26,000 to complete the environmental review needed to make construction possible. At the same time, MIC applied to the FEMA Building Resilient Infrastructure and Communities (BRIC) program and was funded $774,900 to complete design and engineering. MIC is working with its consultant to get this work completed in 2024. This will provide updated cost estimates, a refined scope of work, and inform the design build request for proposal (RFP) for construction in 2025, pending funding.

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-1

ELECTRIC POWER SECTOR		
Measure 1: Raise Chester Lake Dam to increase energy storage systems on government-owned facilities.[39]	Implementing Agency/Agencies	Metlakatla Indian Community. The project was informed by public planning process and has been approved by Tribal Council.
	Milestones for Obtaining Authority to Implement	NEPA review is scheduled for 2024.
	Implementation Schedule	1. Comprehensive Condition Assessment (2019) 2. Preliminary Engineering Report (2020) 3. Preliminary cost and environmental consideration report (2021) 4. Design Engineering (2022) 5. Finalize cost estimates and release RFP (2024) 6. Commence construction in 2025
	Geographic Location	Annette Islands Reserve
	Metrics Tracking Progress	Gallons of diesel fuel replaced
	Cost	Cost estimate in progress at time of PCAP development
	Funding Sources	EPA CPRG Program, State of Alaska

3.1.2 Reduction Measure Two

Tamgas Creek Hatchery Water Line and Small-Scale Hydroelectric Facility

Electric power sector reduction measure two is a new stand-alone GHG measure that would be implemented solely through CPRG funding. The existing water source intake and facility piping distribution is 40 years old, and some elements of the system (fiberglass intake and mixing boxes, valve works, etc.) have reached the end of their service life. Additionally, it may be advantageous to reorganize the existing deteriorating single 36-inch diameter steel pipe, from the lake to the facility, into two high density polyethylene (HDPE) pipes with intakes at different depths (shallow and deep). This would provide the ability to adjust the water source temperature at each rearing unit, depending on specific fish culture needs, rather than a single adjustment for the entire facility.

This reduction measure will directly promote electrification of government-owned buildings through the incorporation of a small hydroelectric facility element in the design which would provide the hatchery a renewable energy option for its electrical needs. The approved proposal for engineering and conceptual design has been completed and the project is ready for the next step.

[39] Please see Attachments for discussion of co-pollutants associated with this measure.

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-2

ELECTRIC POWER SECTOR		
Measure 2: Promote electrification of government-owned buildings through the incorporation of a small-electric hydroelectric facility element in the hatchery water line design and construction.	Implementing Agency/Agencies	Metlakatla Indian Community. The project was informed by public planning process and has been approved by Tribal Council.
	Milestones for Obtaining Authority to Implement	N/A
	Implementation Schedule	1. Engineering and conceptual design completed (2020) 2. Final design engineering and construction documents (2024) 3. Finalize cost estimates and release RFP (2025) 4. Construct the facility/install water line (2026)
	Geographic Location	Annette Islands Reserve
	Metrics Tracking Progress	Gallons of diesel fuel replaced
	Cost	$ 6,500,000
	Funding Sources	EPA CPRG Program, State of Alaska

3.1.3 Reduction Measure Three

Metlakatla-Ketchikan Intertie Project

Electric power sector reduction measure three is a new GHG measure where the MIC has already secured partial funding from several other sources and funding from the CPRG would secure total funding. Gap funding for this important project which includes the installation of a 2.1-mile submarined transmission line that will connect the electric systems of the MPL in Metlakatla on the Annette Island to KPU in the nearby community of Ketchikan on the Revillagigedo Island. This project will mutually benefit Metlakatla and Ketchikan, and potentially other Southeast Alaska communities receiving energy from the intertie project, because it will allow MPL to purchase hydroelectric from KPU instead of relying on diesel to meet demand and sell back clean hydroelectric power in times of surplus.

The intertie is a 34.5 kV transmission line. When completed, the Intertie will connect Metlakatla to KPU's Mountain Point Substation with 14 miles of overhead wood pole transmission line and approximately 3 miles of submarine cable. The project includes control system upgrades for integrated operation of the interconnection systems. As of December 2017, the overhead line and control system upgrades have been completed. The business model for the intertie project is to purchase cheap and clean hydro electricity from KPU instead of using diesel to meet the community load.

Under this approach MPL can take advantage of inexpensive and clean power from KPU instead of relying on expensive and environmentally harmful diesel generation. Moreover, the diesel generation at Metlakatla can be used as an interruptible load to negotiate a lower wholesale rate from Ketchikan. By

entering into a power purchase agreement with Ketchikan, Metlakatla could substitute all its diesel consumption with clean and affordable hydro-electric generation from Ketchikan.

The intertie project will serve Metlakatla well for the foreseeable future. The significant benefits of interconnecting the island to the rest of the electric system include power reliability, access to cheaper and cleaner electricity, and the potential of selling energy back to the grid if the current conditions reverse and Metlakatla experiences energy surplus. MIC has several developments that are currently underway (School District Career and Technical Education building, hatchery expansion, housing etc.) and others that are in the initial proposition stages (hospitality, fish processing plant, municipal facilities) that would benefit directly from the successful implementation of this Intertie project.

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-3

ELECTRIC POWER SECTOR		
Measure 3: Gap funding for the Metlakatla-Ketchikan Intertie Project to support the development of distributed renewable energy generation infrastructure in disadvantaged communities, including rural and remote regions.	Implementing Agency/Agencies	Metlakatla Indian Community. The project was informed by public planning process and has been approved by Tribal Council. Full schedule showing permits applied for and obtained and regulations met will be provided with any subsequent CPRG program application.
	Milestones for Obtaining Authority to Implement	NEPA completed (2023)
	Implementation Schedule	Installation is currently underway with full project completion expected in 2025.
	Geographic Location	Annette Islands Reserve
	Metrics Tracking Progress	Gallons of diesel fuel replaced
	Cost	$ 2,002,000
	Funding Sources	EPA CPRG Program, State of Alaska

3.2 TRANSPORTATION SECTOR

N/A

3.3. FACILITIES AND BUILDINGS SECTOR

3.3.1 Reduction Measure One

WWTF Upgrades

Facilities and buildings sector reduction measure one is a new GHG measure where the MIC has already secured partial funding from several other sources and funding from the CPRG would secure total funding. Upgrades at the wastewater treatment plant and lagoon facility are needed to reduce wastewater GHG

emissions. The MIC Public Works Department manages and oversees the community wastewater treatment facilities (WWTF). Wastewater service in Metlakatla directly serves residential, commercial, industrial, and government users through a mix of piped gravity sewer collection and septic systems. Wastewater collected by the gravity sewer system flows to a lift station which pumps it to an aerated sewage lagoon system located approximately 1 mile southwest of the community. Waste sludge from the lagoons and wastewater from the septic haul is discharged to a sludge stabilization pond located southwest of the sewage lagoon. This facility discharges treated effluent to tribal waters and currently operates under a NPDES discharge permit.

Constructed in 1999, the current wastewater treatment system is failing due to age. To correct deficiencies and expand the Tribal government's capacity to meet further community growth, the MIC Tribal Council has prioritized the design and construction of two new lagoon cells and installation of dissolved oxygen (DO) sensors, upgraded aeration controls, upgraded aeration system, and sludge removal system. Other needs include lagoon liner repairs and replacement of the headworks facility for primary treatment of influent wastewater and the flow measurement of the influent and effluent wastewater and wastewater treatment plant upgrades. Although the MIC secured a large portion of funding needed to undertake the named upgrades from the EPA, Indian Health Services (IHS), and United States Department of Agriculture (USDA) Rural Development (RD) in late 2023, additional funds are needed to ensure the completion of WWTF upgrades.

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-4

FACILITIES AND BUILDINGS SECTOR		
Measure 1: Gap funding for wastewater treatment facility upgrades to support energy efficiency measures at WWTF and reduce fugitive emissions.	Implementing Agency/Agencies	Metlakatla Indian Community. The project was informed by public planning process and has been approved by Tribal Council.
	Milestones for Obtaining Authority to Implement	N/A
	Implementation Schedule	1. Preliminary Engineering Report (2022) 2. Partial funding secured (2023) 3. Full project completion expected in 2025.
	Geographic Location	Annette Islands Reserve
	Metrics Tracking Progress	Increased energy efficiency determined by electric bills and reduced fugitive emissions
	Cost	Cost estimate in progress at time of PCAP development
	Funding Sources	EPA CPRG Program, State of Alaska

3.3.2 Reduction Measure Two

Tamgas Creek Hatchery Pink and Chum Incubation Building Upgrades

Facilities and buildings sector reduction measure two is a new stand-alone GHG measure that would be implemented solely through CPRG funding. To reduce GHG facility and building sector emissions, the MIC Council has prioritized making improvements to Tribal-owned buildings and facilities known to be extremely inefficient. Priority improvements include updating the lighting and heating, ventilation, and air conditioning (HVAC) system at the Tamgas Creek Hatchery Pink and Chum Incubation Building to be more energy efficient. The lighting and heating systems in the operations building are extremely inefficient. Updating the lighting and HVAC system will reduce GHG emissions and electricity costs.

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-5

FACILITIES AND BUILDINGS SECTOR		
Measure 2: Mechanical addition and HVAC system design and installation to support programs and policies to implement end-use energy efficiency measures in existing government-owned buildings.	Implementing Agency/Agencies	Metlakatla Indian Community. The project was informed by public planning process and has been approved by Tribal Council.
	Milestones for Obtaining Authority to Implement	N/A
	Implementation Schedule	Project would begin immediately upon funding and is expected to take 9 to 12 months to complete.
	Geographic Location	Annette Islands Reserve
	Metrics Tracking Progress	Increased energy efficiency determined by electric bills
	Cost	$ 10,644
	Funding Sources	EPA CPRG Program, State of Alaska

3.3.3 Reduction Measure Three

Annette Island Packing Company Fish Processing Facility

Facilities and buildings sector reduction measure three is a new stand-alone GHG measure that would be implemented solely through CPRG funding. The MIC plans to construct and equip a seafood processing plant and ancillary facilities to replace the Tribe's end-of-life infrastructure critical to indigenous and commercial processing. The replacement of the Tribe's 100-plus year-old cannery will enable the Tribe to increase processing capacity, improve return on investments made in the Tribe's hatchery, and realize the full benefits of its world class fishery products by once again entering the processing, wholesaling, and retailing sectors of the seafood industry. A new modern processing plant will drastically reduce GHG emissions realized from purchased electricity, electricity generated onsite by diesel generators, and processing waste.

The project involves the development, construction, and installation of a modern processing plant, ancillary facilities and infrastructure needed to expand seafood processing capacities. The MIC's Annette Island Packing Company has operated in Metlakatla for over 100 years, employing up to 450 people during the peak of the salmon season. The plant reduced operations in 2019 due to high operating costs and other liabilities associated with running an aging facility. Prior to 2019, the Metlakatla cold storage operated year-round and employed about 235 people. Although some of the processing and cold storage equipment is functional, the processing plant itself is now considered to be at the end of service life. The plant is currently functioning in a limited capacity; primarily purchasing and selling to tenders.

The new processing facilities will replace the existing cannery and be constructed on waterfront property owned by the MIC. The property adjoins ocean waters located within the exterior boundary of the AIR. The MIC has exclusive jurisdictional authority over adjoining ocean waters 3,000 feet from the mean low tide. MIC's authority over these waters is critical for supplying the raw fishery resources needed to supply the processing plant and unload and transport tenders and processed seafood products.

The purpose of the processing plant is to increase the profitability of MIC's fisheries by investing in value-added functions needed to participate in additional food markets. The processing plant is critical to the Tribe because process manufacturing allows the Annette Island Packing Company to sell finished seafood products at a much higher cost than the value the raw materials demand. The MIC aims to enter, at minimum, the seafood processing stage of the value chain by 2027 to improve the Tribal supply chain and once again be competitive in the commercial seafood industry.

Other goals include to increase processing production at the new facility over and above past peak production by improving process, output, labor, and quality efficiency. The processing plant will enable the MIC to recoup a reasonable return on the investments made in the Tribal fishery program; ensure economic opportunity; provide for high-quality jobs; and provide access to healthy, affordable, and culturally appropriate food.

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-6

FACILITIES AND BUILDINGS SECTOR		
Measure 3: Replace Annette Island Fish Processing Facility to implement the most up-to-date building energy codes for new commercial buildings at	Implementing Agency/Agencies	Metlakatla Indian Community. The project was informed by public planning process and has been approved by Tribal Council.
	Milestones for Obtaining Authority to Implement	NEPA will be required if new plant is built, rather than renovating existing plant.
	Implementation Schedule	Project would begin immediately upon funding and is expected to take 24-36 months to complete.
	Geographic Location	Annette Islands Reserve
	Metrics Tracking Progress	Increased energy efficiency determined by electric bills

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-6

FACILITIES AND BUILDINGS SECTOR		
government-owned facilities to be more energy efficient.	Cost	Cost estimate in progress at time of PCAP development
	Funding Sources	EPA CPRG Program, State of Alaska

3.3.4 Reduction Measure Four

Tribal Law & Order Code Update, Land Use Plan Update, and Public Education

MIC's legal subsets and departments mostly act independently. This is primarily because the Tribe lacks formal policies needed to guide integrated management and interdepartmental collaboration. The Council and Tribal personnel see this as a barrier to effective resource management and resource conservation. As such, the MIC views the CPRG as an opportunity to address policy gaps and associated implementation challenges. This measure is directly supported by MIC's existing plans including the IRMP, 2018 Comprehensive Land Use Plan, 2016 Climate Adaptation Plan, and the 2015 Strategic Plan, which prioritizes updating the MIC Law & Order code to promote integrated management of the Tribe's water supply.

With respect to public outreach, the MIC continues to prove its commitment to improving public awareness by investing in public outreach and community awareness activities. This is achieved through working with the school district, hosting community expos, facilitating community workshops, and employing student interns. The CPRG is a good way to expand current efforts to maximize financial and human investments in pollution reduction measures.

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-7

FACILITIES AND BUILDINGS SECTOR		
Measure 4: Perform Tribal Law & Order Code Update and Conduct Community Education/Outreach to Promote Energy Conservation & Clean Climate.	Implementing Agency/Agencies	Metlakatla Indian Community. The project was informed by public planning process and has been approved by Tribal Council.
	Milestones for Obtaining Authority to Implement	N/A
	Implementation Schedule	1. Procure qualified contractor immediately after funded to review existing plans, codes, and departmental policies (2024-25) 2. Make required updates (2025) 3. Develop and distribute educational materials and work with schools, community members, and departmental staff to inform stakeholders of regulatory and policy changes and provide tools for implementation (2025)

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-7

FACILITIES AND BUILDINGS SECTOR		
		4. Organize outreach events to encourage conservation (2025+)
	Geographic Location	Annette Islands Reserve
	Metrics Tracking Progress	Increased energy efficiency determined by electric bills
	Cost	Cost estimate in progress at time of PCAP development
	Funding Sources	EPA CPRG Program, State of Alaska

3.4 WASTE AND MATERIALS MANAGEMENT SECTOR

3.4.1 Reduction Measure One

Implement Best Management Practices

Waste and materials management sector reduction measure one is a new stand-alone GHG measure that would be implemented solely through CPRG funding. This measure involves undertaking a robust waste management initiative at government-owned waste and materials management facilities to address ongoing environmental concerns by implementing standards to reduce methane emissions from landfills through collection and destruction, including programs and incentives to reduce or divert food and or yard waste.

Other activities under this measure include to further develop and expand the waste management program to better implement Tribal regulations and policies related to Environmental Protection and Location and Standards for Solid Waste Management Facilities, and Solid Waste Disposal System. This measure directly draws on goals, priorities, and needs outlined in the IRMP, Plan Metlakatla 2028 Comprehensive Land Use Plan, Energizing Metlakatla 2016 Strategic Plan, and is necessary to implement the Metlakatla Indian Community Integrated Solid Waste Management Plan Update (2018) and the Metlakatla Indian Community Municipal Disposal Site Management Plan (2018).

Measure one is especially important because waste management on Annette Island is a persistent problem for the Community. Under the MIC Law and Order Code, the MIC Environmental Office is solely responsible for the Community's waste management services. Although the department has support from Tribal leadership, implementation of policies is a challenge. Waste management is also a high priority for most community members. When surveyed for the IRMP, 63% of community survey

respondents expressed that supporting solid waste management activities is "extremely important."[40] As such, the MIC intends to use the CPRG to support the reduction of GHG emissions in this sector.

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-8

WASTE AND MATERIALS MANAGEMENT SECTOR		
Measure 1: Implement best management practices (BMPs) to reduce harmful landfill emissions.	Implementing Agency/Agencies	Metlakatla Indian Community. The project was informed by public planning process and has been approved by Tribal Council.
	Milestones for Obtaining Authority to Implement	N/A
	Implementation Schedule	Measure will take 48-60 months to implement once funding is received.
	Geographic Location	Annette Islands Reserve
	Metrics Tracking Progress	Reduced air pollution.
	Cost	Cost estimate in progress at time of PCAP development
	Funding Sources	EPA CPRG Program, State of Alaska

3.4.2 Reduction Measure Two

Tribal Code Update and Public Education

While the Tribe has adopted a handful of solid waste disposal and management regulations to address solid waste management issues on the AIR, implementation and enforcement is a challenge. The MIC Council is aware of the value of solid waste management codes, laws, and regulations but lack the financial resources to refine and implement them. The MIC views the CPRG as an opportunity to further develop and implement solid waste management codes to promote tribal waste management goals, protect public health and the environment.

Better developed codes will promote good behaviors, such as proper separation of solid waste materials and implementing waste reduction measures. Codes will also prevent bad behaviors such as open dumping. To achieve this The MIC needs to review its current solid waste codes and further develop, implement, and enforce codes to address management issues and open burning.

Finally, the MIC plans to initiate a public outreach campaign to educate the community on new regulations, landfill policies, and good practices. According to the EPA's Tribal Decision-Makers Guide to Solid Waste Management, public support is needed to successfully develop and implement waste management regulations. Suggested activities include developing brochures that include excerpts from the tribe's solid waste code and the community trash pickup schedule. The handbook also recommends

[40] Metlakatla Indian Community. (2023). *Annette Islands Reserve Integrated Resources Management Plan* (p. 350). Metlakatla, AK.

supporting a tribal hotline number for reporting illegal waste disposal.[41] Public outreach measures will ensure that tribal members are aware of the PCAP waste reduction measures.

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-9

WASTE AND MATERIALS MANAGEMENT SECTOR		
Measure 2: Perform Tribal Law & Order Code Update and Conduct Community Education/Outreach Regarding Solid Waste Disposal.	Implementing Agency/Agencies	Metlakatla Indian Community. The project was informed by public planning process and has been approved by Tribal Council.
	Milestones for Obtaining Authority to Implement	N/A
	Implementation Schedule	1. Procure qualified contractor immediately after funded (2024) 2. Review existing plans, codes, and departmental policies (2024-25) 3. Make updates consistent with new programing and departmental process and procedures and other applicable factors (2025-26) 4. Develop and distribute educational materials and work with schools, community members, and departmental staff to inform stakeholders of regulatory and policy changes and provide tools for implementation (2025-2026) 5. Organize outreach events to reduce household waste and inform public of new rules (2025+)
	Geographic Location	Annette Islands Reserve
	Metrics Tracking Progress	Implementation of best management practices at the community landfill and reduced household waste
	Cost	Cost estimate in progress at time of PCAP development
	Funding Sources	EPA CPRG Program, State of Alaska

3.4.3 Reduction Measure Three

Foster High-Quality Job and Training Opportunities

Waste and materials management sector reduction measure three is a new stand-alone GHG measure that would be implemented solely through CPRG funding. Under this reduction measure the MIC will realign current workforce training and development resources already in place to support job training opportunities for high-quality, entry-level, and middle skill career pathways to enable economic mobility in the waste and materials management sector. This measure will support high-quality training models

[41] U.S. Environmental Protection Agency. (N.D.). *Tribal Decision-Makers Guide to Solid Waste Management* (Chapter 3: Developing, Implementing, and Enforcing Solid Waste Codes, Laws, and Regulations).

including apprenticeship programs, joint labor-management and/or mentorship training programs, and paid internships.

Reduction measure three will directly help forward Tribal goals related to job and career development, specifically Tribal goals to (1) develop and deploy a workforce development strategy to meet current and future workforce needs, and (2) to secure the financial and human resources and partnerships needed to invest in workforce training and guide students towards natural resource-related fields to meet current and future workforce needs.[42] The Tribal government is committed to ensuring MIC's youth, young adults and mid-career Tribal members and residents have an opportunity to pursue higher education and internships in natural resources and land management fields to acquire knowledge and skills needed to fill high-quality jobs.

Fostering high-quality job and training opportunities is also a high priority for most community members. When surveyed for the IRMP, 70% of community survey respondents expressed that it is "extremely important" for the MIC to support investments in workforce development programs to encourage MIC members to enter natural resource and land management related fields.[43]

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-10

WASTE AND MATERIALS MANAGEMENT SECTOR		
Measure 3: Foster High-Quality Job and Training Opportunities in the Waste and Materials Management Sector.	Implementing Agency/Agencies	Metlakatla Indian Community. The project was informed by public planning process and has been approved by Tribal Council.
	Milestones for Obtaining Authority to Implement	N/A
	Implementation Schedule	1. Evaluate workforce skills, knowledge, and capabilities to determine alignment with departmental needs (2024) 2. Develop a comprehensive set of strategies, programs, and initiatives aimed at enhancing the skills, knowledge, and capabilities of the workforce in the waste and materials management sector (2024-25) 3. Work with the school system to bridge skills gap needed for entry-level workforce and to meet eligibility requirements for advanced training (2025-26) 4. Support an internship/mentorship program to foster recruitment and long-term career development (2025-2026)

[42] Metlakatla Indian Community. (2023). *Annette Islands Reserve Integrated Resources Management Plan* (p. 404). Metlakatla, AK.
[43] Metlakatla Indian Community. (2023). *Annette Islands Reserve Integrated Resources Management Plan* (p. 396). Metlakatla, AK.

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-10

WASTE AND MATERIALS MANAGEMENT SECTOR		
		5. Establish relationships with technical colleges and apprentice programs to enhance workforce capabilities (2025+)
	Geographic Location	Annette Islands Reserve
	Metrics Tracking Progress	Increased collaboration between the Tribal government and education providers, trade associations, and industry leaders. Increased training attendance/certifications for existing personnel and recruitment of new personnel. Improved waste and materials regulation implementation and enforcement.
	Cost	Cost estimate in progress at time of PCAP development
	Funding Sources	EPA CPRG Program

3.5 CARBON SEQUESTRATION SECTOR[44]

3.5.1 Reduction Measure One

European Green Crab

Carbon sequestration sector reduction measure one is expansion of a GHG measure already being implemented where the CPRG will fund the expanded measure. The watersheds on Annette Island support an expansive cluster of drainage systems. The low-lying estuaries found within the watersheds support a range of aquatic plants and algae, including brown kelp, brown rockweed, and sea lettuce. These resources serve as an essential food supply for marine life and promote habitat restoration important for commercial fish and other sea creatures who rely on seaweed to thrive.

Aquatic plants and algae found on the AIR are also valued for their role in cleaning the water and the air. These resources are beneficial for carbon sequestration and are known as a natural solution for reducing ocean acidification in surrounding waters. This process includes removing carbon from the earth's atmosphere and contributes to clean air, clean water, and healthy soils. Unfortunately, the MIC is now battling invasive green crab. Green crabs are recognized as one of the worst invasive species, destroying seagrass, salt marshes and shellfish populations. Green crabs directly threaten this important “blue carbon” sink.

[44] Note that the Carbon Sequestration Sector GHG Reduction Measures draw on goals, priorities, and needs outlined in the IRMP. The IRMP expressly prioritizes managing AIR’s land and resources for indirect use values, including carbon sequestration. Tribal leadership recognizes that managing resources for indirect benefits realized from enhancing the natural processes that remove carbon from the earth’s atmosphere and contribute to earth health are also beneficial for the economy and for local jobs. Additionally, the AIR’s forest, muskeg, and coastal resources yield opportunity for innovations in clean climate jobs.

The MIC Department of Fish and Wildlife and Invasive Species Program has been working hard to address the European Green Crab since before it was officially confirmed within the AIR boundary in July of 2022. Because this species has potential to decimate critical seaweed and salt marsh habitats within the reserve, the MIC Tribal Council and Tribal personnel continue to prioritize this effort and need additional financial, human, and technological resources to effectively manage this natural resource crisis.

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-11

CARBON SEQUESTRATION SECTOR		
Measure 1: Implement Early Detection and Rapid Response on Annette Islands Reserve and waters to the south of the reserve to enhance carbon removal.	Implementing Agency/Agencies	Metlakatla Indian Community. The project was informed by public planning process and has been approved by Tribal Council.
	Milestones for Obtaining Authority to Implement	N/A
	Implementation Schedule	More than 3,100 crabs have been removed since the species first detected in 2022. The MIC is destroying and disposing in the local community garden. Other options must be explored should the volume of crabs continue to increase.
	Geographic Location	Annette Islands Reserve
	Metrics Tracking Progress	Habit remains intact and unharmed
	Cost	Cost estimate in progress at time of PCAP development
	Funding Sources	EPA CPRG Program

3.5.2 Reduction Measure Two

Improve Forest, Wetland, and Coastal Management

Carbon sequestration sector reduction measure two is a new stand-alone GHG measure that would be implemented solely through CPRG funding. This measure involves fostering innovative job growth in the carbon stock management field to enhance long-term carbon sequestration benefits. Annette Island supports 86,393 acres of forest land. Forest resources include deciduous forest, evergreen forest, mixed forest, woody wetlands, and associated plant and wildlife communities. This vast forest and muskeg resources serve as a valuable carbon sink and are fundamental to carbon storage. With respect to carbon sequestration and carbon markets, the AIR's forested lands and coastal waters have the qualities necessary for MIC to enter the environmental commodities sector in the future.

In addition to enhancing the AIR's important carbon sinks, this measure will help forward Tribal goals related to job and career development, specifically goals to (1) develop and deploy a workforce development strategy to meet current and future workforce needs, and (2) to secure the financial and

human resources and partnerships needed to invest in workforce training and guide students towards natural resource-related fields to meet current and future workforce needs.[45]

The Tribal government is committed to ensuring MIC's youth, young adults and mid-career Tribal members and residents have an opportunity to pursue higher education and internships in natural resources and land management to acquire knowledge and skills needed to fill high-quality jobs. Fostering high-quality job and training opportunities is also a high priority for most community members. When surveyed for the IRMP, 70% of community survey respondents expressed that it is "extremely important" for the MIC to support investments in workforce development programs to encourage MIC members to enter natural resource and land management related fields.[46]

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-12

CARBON SEQUESTRATION SECTOR		
Measure 2: Improve forest, wetland, and coastal resource management to enhance carbon stocks.	Implementing Agency/Agencies	Metlakatla Indian Community. The project was informed by public planning process and has been approved by Tribal Council.
	Milestones for Obtaining Authority to Implement	N/A
	Implementation Schedule	1. Evaluate workforce skills, knowledge, and capabilities to determine alignment with departmental and program needs (2024) 2. Develop a comprehensive set of strategies, programs, and initiatives aimed at enhancing the skills, knowledge, and capabilities of the workforce in the waste and materials management sector (2024-25) 3. Work with the school system to bridge skills gap needed for entry-level workforce and to meet eligibility requirements for advanced training (2025-26) 4. Support an internship/mentorship program to foster recruitment and long-term career development (2025-2026) 5. Establish relationships with technical colleges and apprentice programs to enhance workforce capabilities (2025+)
	Geographic Location	Annette Islands Reserve

[45] Metlakatla Indian Community. (2023). *Annette Islands Reserve Integrated Resources Management Plan* (p. 404). Metlakatla, AK.
[46] Metlakatla Indian Community. (2023). *Annette Islands Reserve Integrated Resources Management Plan* (p. 396). Metlakatla, AK.

METLAKATLA INDIAN COMMUNITY
GHG REDUCTION MEASURES
Table 3-12

CARBON SEQUESTRATION SECTOR		
	Metrics Tracking Progress	Creation of new clean climate positions, recruitment of qualified employees, and maintained/improved forest, wetland, and coastal habitat.
	Cost	Cost estimate in progress at time of PCAP development
	Funding Sources	EPA CPRG Program

4.0 ANNETTE ISLANDS RESERVE GHG INVENTORY RESULTS

METLAKATLA INDIAN COMMUNITY
GHG FOR 2020
TABLE 4-1

GHG INVENTORY RESULTS					
Sector	**Category**	**Annual GHG Emissions by Sector ($MTCO_2e$)**			
		CO_2	**CH_4**	**N_2O**	**Total**
1.0 Stationary Combustion					
Electric Power	*Energy Production*	925.730	1.052	1.991	928.773
2.0 Mobile Combustion					
Transportation	*On-Road*	1,051.44	6.37	2.54	1,060.35
	Off-Road (Commercial Marine Vessels)	2,376.05	-	-	2,376.05
3.0 Facilities and Buildings					
Wastewater	*Treatment and Discharge*	-	42	103	145
Water	*Electricity Consumption*	21.75878	0.0308	0.53982107	22.32940107
4.0 Waste and Materials Management					
Solid Waste	*Management*	-	920	-	920
5.0 Carbon Sequestration					
Forest Land	*Forests Remaining Forest Land*	-12,957.17	-	22.26	-12,934.90
	*Forest Fires**	-	70.36	69.83	117.92
	Grand Total	- 8,582.19122	1,039.8128	200.16082107	- 7,364.477599

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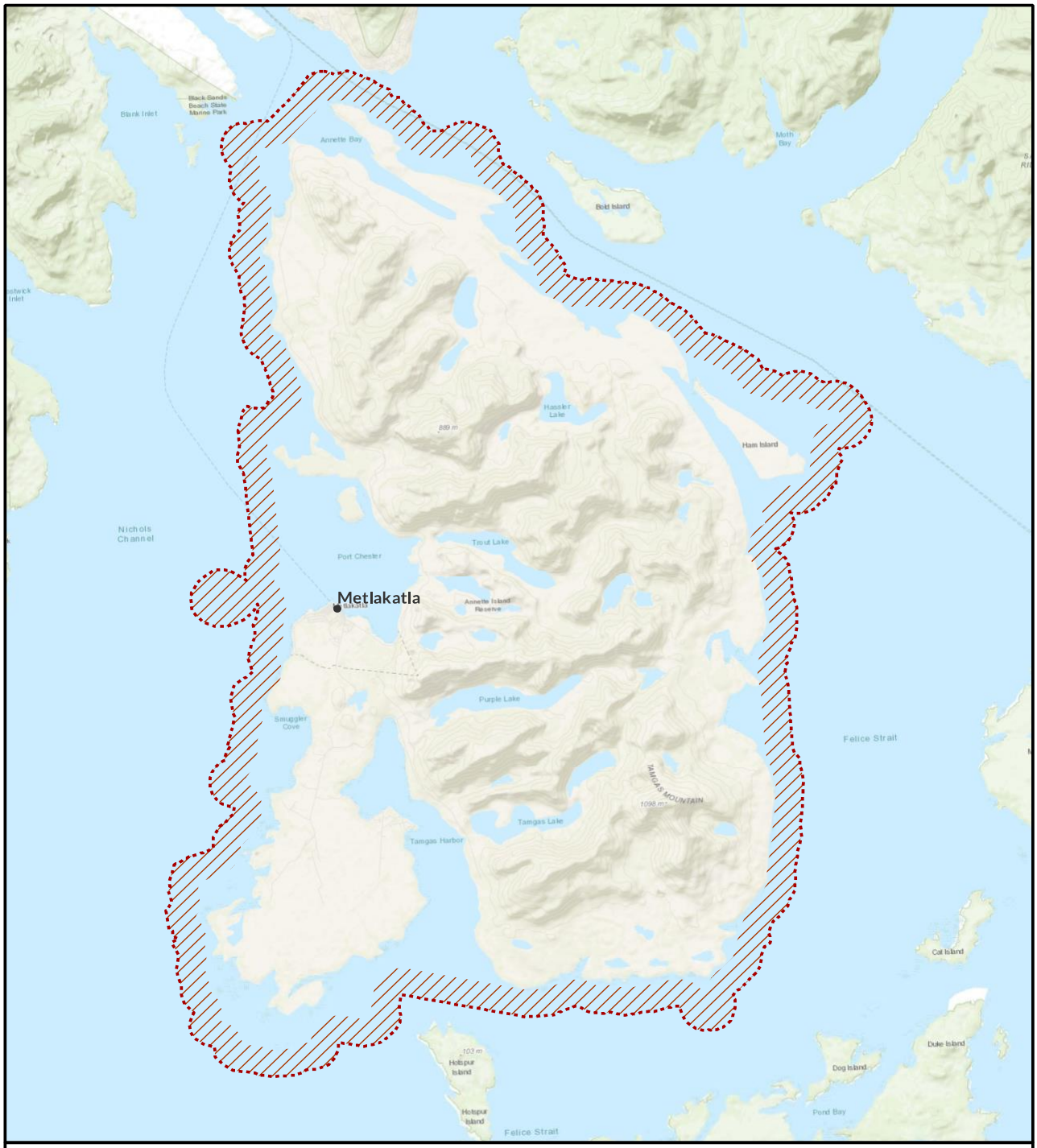
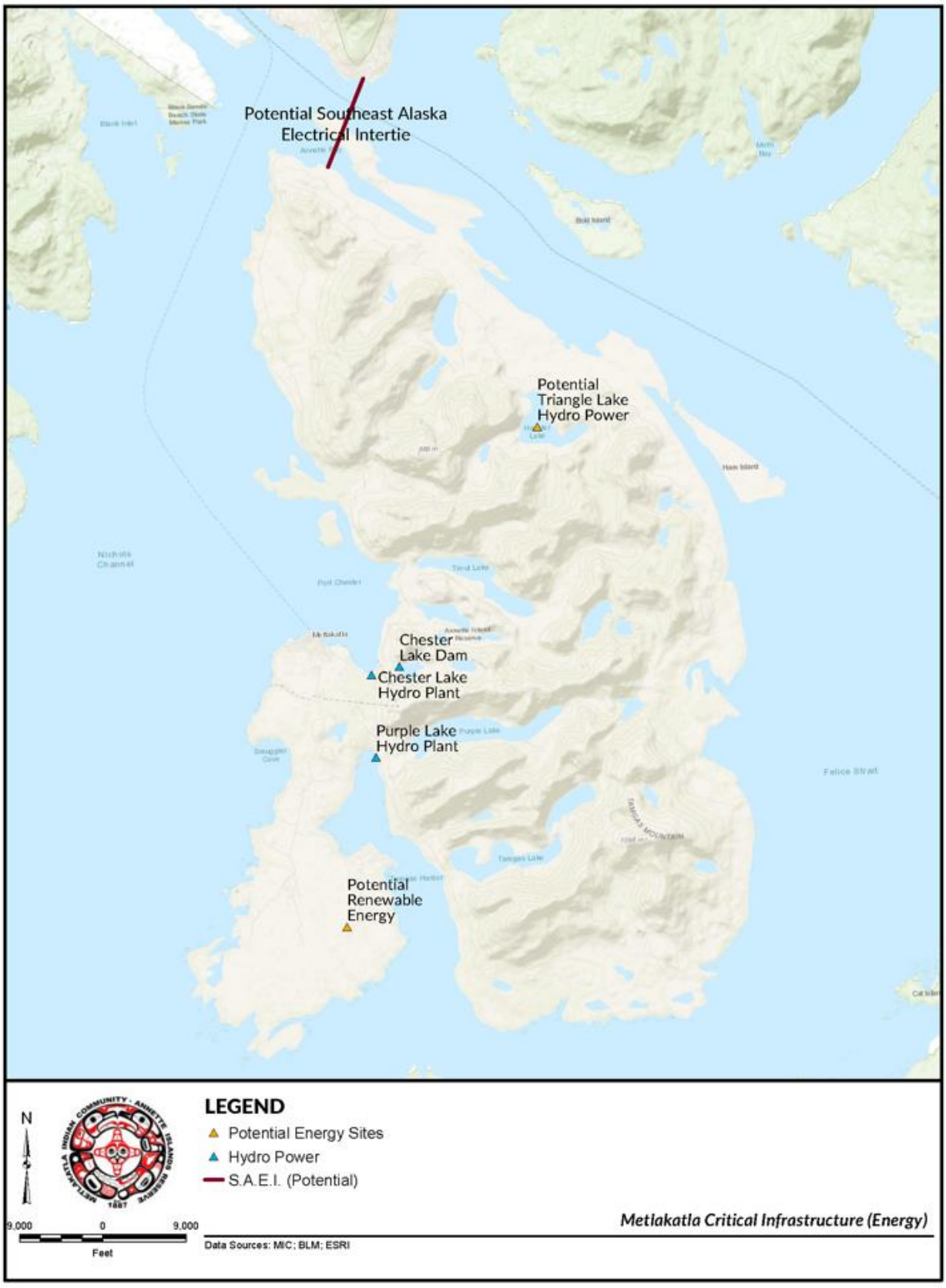
Attachment A-1: Legal Boundaries (Overview)

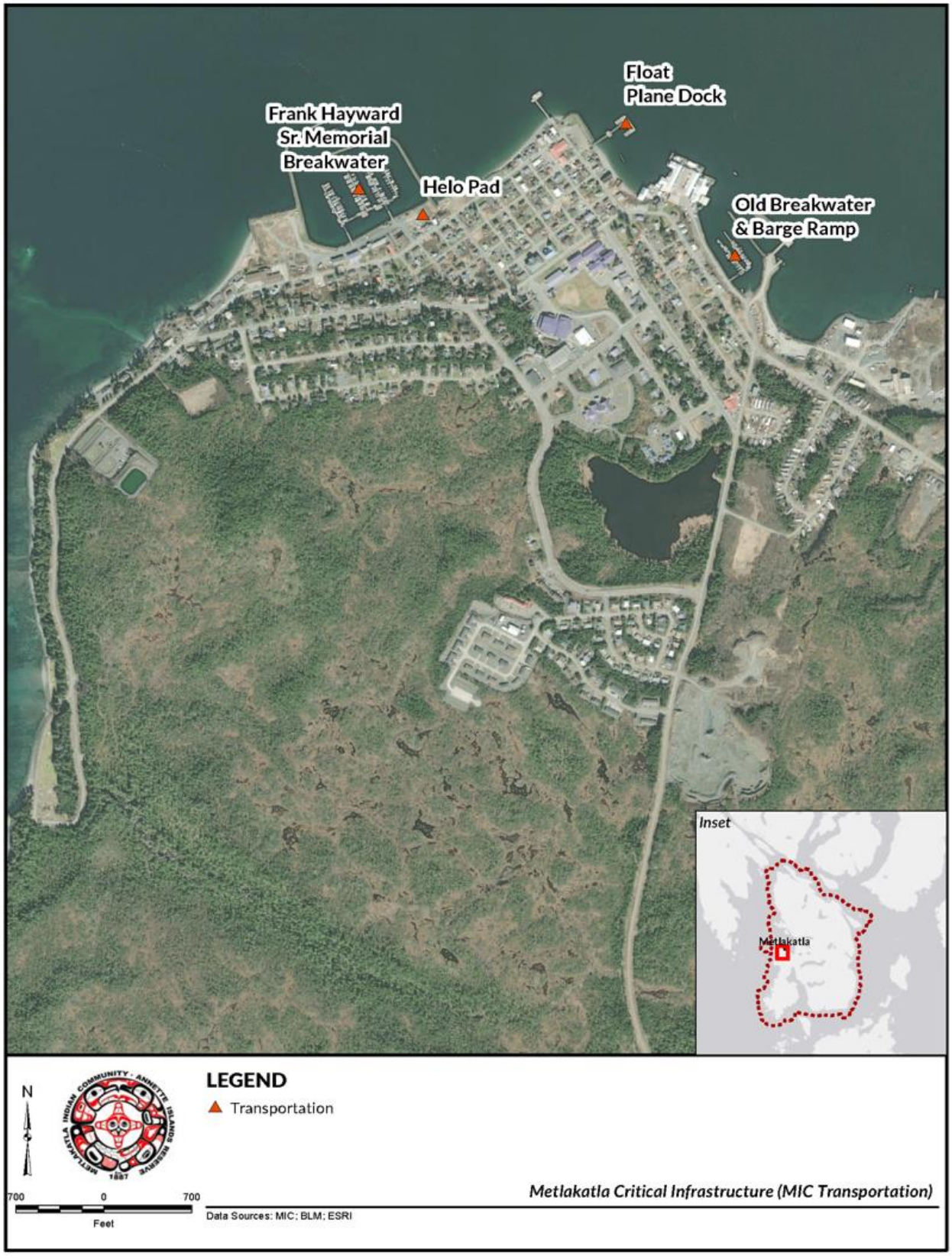


Attachment A-2: Critical Infrastructure (Energy)



Attachment A-3: Critical Infrastructure (Transportation Overview)

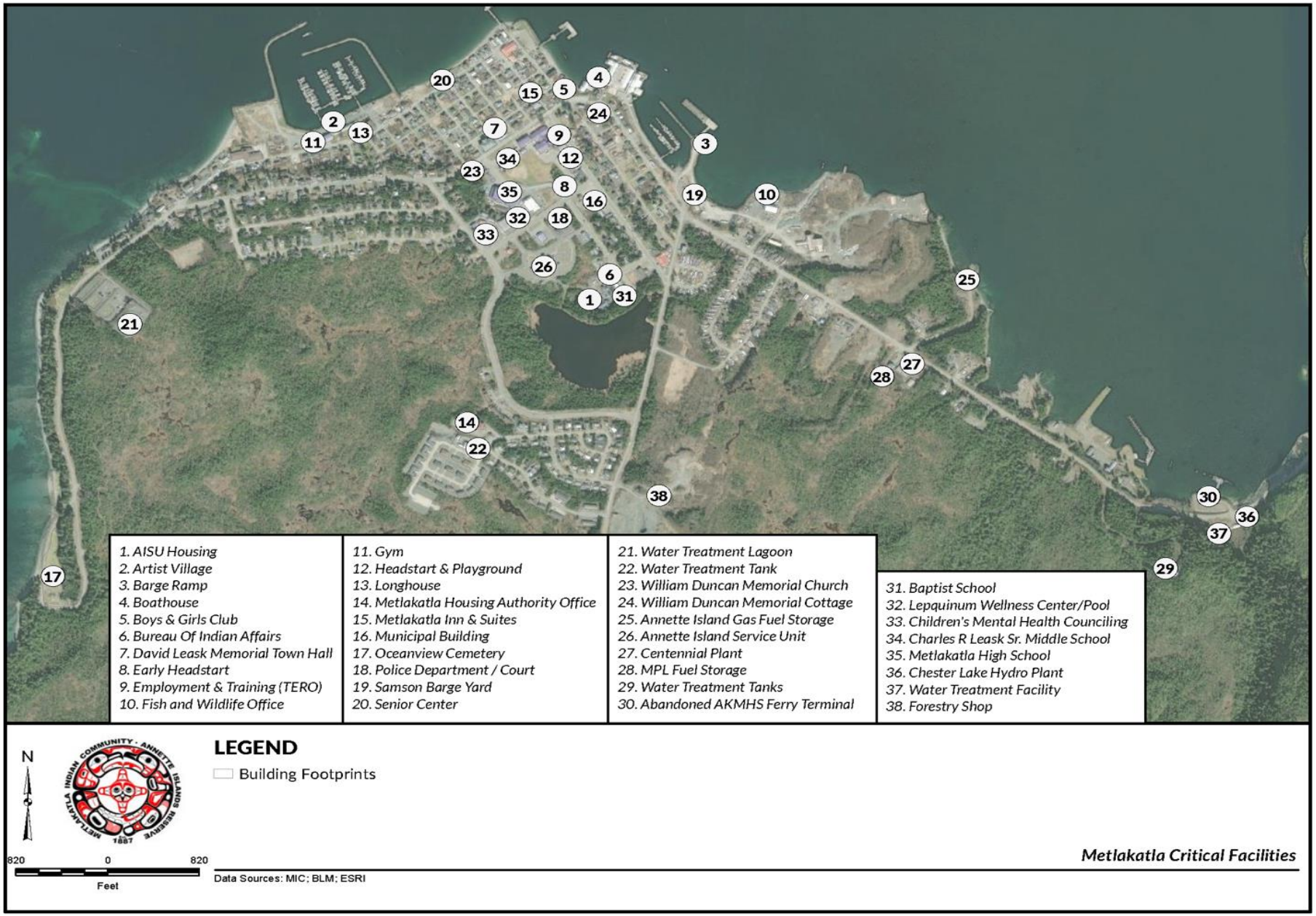
Attachment A-4: Critical Infrastructure (MIC Transportation)



Attachment A-5: Metlakatla Local Transportation

Attachment A-6: Metlakatla Air Quality

Attachment A-7: Metlakatla Critical Facilities



Attachment A-8: Critical Infrastructure (Waste Management)

Attachment A-9: Annette Islands Reserve Land Cover

Attachment B-1: Solid Waste and Wastewater Treatment Data

Table B-1

Alaska 2020 GHG Emissions by Inventory Sector in Metric Tons CO2 Equivalent (MT CO2e)					
Inventory Sector					
		CO2	**CH4**	**N2O**	**Totals**
Electricity (Indirect)					
	Fossil Fuel Combustion	2,735,907	2,589	26,439	2,764,935
Solid waste					
	Solid Waste Disposal		459,269		459,269
Wastewater Treatment					
	Wastewater Treatment and Discharge		21,057	51,581	72,638
				* Domestic WW treatment only - not including industrial WW treatment	
				* MSW landfills only - not including industrial waste landfills	
Alaska 2020 population*:	731,158				
Metlakatla 2020 population:**	1,465				
Population ratio:	0.0020037				
* From EPA 2020 NEI Wagon Wheel Tool (https://www.epa.gov/air-emissions-inventories/2020-nei-supporting-data-and-summaries)					
** From US Census 2018-2022 American Community Survey 5-Year Estimates (https://www.census.gov/tribal/?aianihh=0110)					

Metlakatla Indian Community 2020 GHG Emissions by Inventory Sector in Metric Tons CO2 Equivalent (MT CO2e)					
Inventory Sector					
		CO2	**CH4**	**N2O**	**Totals**
Electricity (Indirect)					
	Fossil Fuel Combustion	**5,482**	**5**	**53**	**5,540**
Solid waste					
	Solid Waste Disposal		**920**		**920**
Wastewater Treatment					
	Wastewater Treatment and Discharge		**42**	**103**	**146**

Attachment B-2: Water Data

Table B-2

Small Lift Station Building:								GHG Emissions (metric tons CO2e)		
Start Date	End Date	Start Read	End Read	Meter Mult.	Adj Consump	Raw Consump	Bill Period	CO2	CH4	N2O
11/30/20	12/30/20	28866	28945	1	79	79	20-Dec	0.238133	0.000337	0.000590793
10/30/20	11/30/20	28760	28866	1	106	106	20-Nov			
9/30/20	10/30/20	28716	28760	1	44	44	20-Oct			
8/31/20	9/30/20	28670	28716	1	46	46	20-Sep			
7/31/20	8/31/20	28614	28670	1	56	56	20-Aug			
6/30/20	7/31/20	28565	28614	1	49	49	20-Jul			
5/29/20	6/30/20	28512	28565	1	53	53	20-Jun			
4/30/20	5/29/20	28467	28512	1	45	45	20-May			
3/31/20	4/30/20	28404	28467	1	63	63	20-Apr			
2/28/20	3/31/20	28294	28404	1	110	110	20-Mar			
1/31/20	2/28/20	28183	28294	1	111	111	20-Feb			
12/31/19	1/31/20	27962	28183	1	221	221	20-Jan			
				Total (kWhr):	**983**					

Large Lift Station Building:								GHG Emissions (metric tons CO2e)		
Start Date	End Date	Start Read	End Read	Meter Mult.	Adj Consump	Raw Consump	Bill Period	CO2	CH4	N2O
11/30/20	12/30/20	67086	78336	1	11250	11250	20-Dec	21.52065	0.030463	0.053391315
10/30/20	11/30/20	54967	67086	1	12119	12119	20-Nov			
9/30/20	10/30/20	49011	54967	1	5956	5956	20-Oct			
8/31/20	9/30/20	42739	49011	1	6272	6272	20-Sep			
7/31/20	8/31/20	33668	42739	1	9071	9071	20-Aug			
6/30/20	7/31/20	26352	33668	1	7316	7316	20-Jul			
5/29/20	6/30/20	20164	26352	1	6188	6188	20-Jun			
4/30/20	5/29/20	17124	20164	1	3040	3040	20-May			
3/31/20	4/30/20	13257	17124	1	3867	3867	20-Apr			
2/28/20	3/31/20	7499	13257	1	5758	5758	20-Mar			
1/31/20	2/28/20	99910	7499	1	7589	7589	20-Feb			
12/31/19	1/31/20	89500	99910	1	10410	10410	20-Jan			
				Total (kWhr):	**88836**					

	CO2	CH4	N2O
Emissions factors (lb/MWh):	534.073	0.027	0.005
Global warming potential	1	28	265
(from TGIT for AKMS eGRID subregion)			

Totals (metric tons CO2e):		
CO2	CH4	N2O
21.75878	0.0308	0.053982107

Attachment B-3: Annette Island Traffic Statistics

Table B-3

Station ID	Station Name	Description	Traffic Link ID	Route ID	From Milepoint	To Milepoint	Region	Borough	Functional Class	Latitude	Longitude	Year	AADT	Statistics type	K-Factor	D-Factor	Future AADT	Station Type
#000060910000	60910000	Walden Point Road Milepost 11	AL003115	4001006X000	0	15.4533745	Southcoast	Unorganized Borough	5R : Rural Major Collector	55.22718	-131.595513	2022	130	Estimated	0.4326	0.96	160	Short Term
#000060913000	60913000	Purple Lake Rd	AL300324	4001001X000	0	1.8499385	Southcoast	Unorganized Borough	6R : Rural Minor Collector	55.0866	-131.5615	2022	800	Estimated	0.1169	1	1010	Short Term
#000060914000	60914000	Tait - Ferry Terminal	AL003116	4001005X000	0	0.0858783	Southcoast	Unorganized Borough	5R : Rural Major Collector	55.1174	-131.5469	2022	1020	Estimated	0.1164	1	1290	Short Term
from Alaska Department of Transportation (https://alaskatrafficdata.drakewell.com/publicmultinodemap.asp)																		

Station	2022 AADT	2022 Truck %	2021 AADT	2021 Truck %	2020 AADT	2020 Truck %	2019 AADT	2019 Truck %	2018 AADT	2018 Truck %	2017 AADT	2017 Truck %	2016 AADT
60910000	130		130		120		138		136		155		
60913000	800		800		750		867		851		949		
60914000	1020		1020		950		1102		1082		1228		
from Alaska Department of Transportation (https://alaskatrafficdata.drakewell.com/publicmultinodemap.asp)													

Road Segment	2020 AADT	Distance (mi.)	Daily VMT	Annual VMT
Walden Point Road Milepost 11	120	15.4533745	1854.4	676857.8031
Purple Lake Rd	750	1.8499385	1387.5	506420.6644
Tait - Ferry Terminal	950	0.0858783	81.6	29778.30053
			Total:	**1,213,057**

Attachment B-4: Off-Road Mobile - Commercial Marine Vessels Data

Table B-4

State	State-County	POLLUTANT	Emissions (Tons)	POLLUTANT_TYPE	SCC Code	EIS Sector	Source Description	SCC LEVEL 1	SCC LEVEL 2	SCC LEVEL 3	SCC LEVEL 4	EPA Region	FIPS
Alaska	AK - Prince of Wales-Hyder	Carbon Dioxide	16.67788	GHG	2280002102	Mobile - Commercial Marine Vessels	Nonpoint	Mobile Sources	Marine Vessels, Commercial	Diesel	C1C2 Port emissions: Auxiliary Engine	10	02198
Alaska	AK - Prince of Wales-Hyder	Carbon Dioxide	0.21609	GHG	2280002101	Mobile - Commercial Marine Vessels	Nonpoint	Mobile Sources	Marine Vessels, Commercial	Diesel	C1C2 Port emissions: Main Engine	10	02198
Alaska	AK - Prince of Wales-Hyder	Carbon Dioxide	9,355.04400	GHG	2280002202	Mobile - Commercial Marine Vessels	Nonpoint	Mobile Sources	Marine Vessels, Commercial	Diesel	C1C2 Underway emissions: Auxiliary Engine	10	02198
Alaska	AK - Prince of Wales-Hyder	Carbon Dioxide	9,640.81600	GHG	2280002201	Mobile - Commercial Marine Vessels	Nonpoint	Mobile Sources	Marine Vessels, Commercial	Diesel	C1C2 Underway emissions: Main Engine	10	02198
Alaska	AK - Prince of Wales-Hyder	Carbon Dioxide	720.42930	GHG	2280002204	Mobile - Commercial Marine Vessels	Nonpoint	Mobile Sources	Marine Vessels, Commercial	Diesel	C3 Underway emissions: Auxiliary Engine	10	02198
Alaska	AK - Prince of Wales-Hyder	Carbon Dioxide	361.78850	GHG	2280002203	Mobile - Commercial Marine Vessels	Nonpoint	Mobile Sources	Marine Vessels, Commercial	Diesel	C3 Underway emissions: Main Engine	10	02198
From 2020 National Emissions Data for Commercial Boats from PoW-Hyder Census Area (note that this does not include pleasure boats, which are included in a different section of the NEI and calculated with a different methodology)													

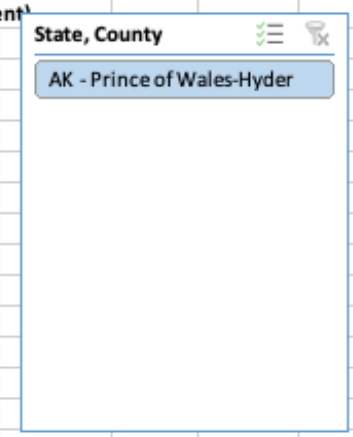
Prince of Wales-Hyder Census Area Ports*						
ShapeID	FIPS	PortName	XLongitude	YLatitude	Area_sqmi	facid
20171	2198	Kake, AK	-133.9451353	56.9728603	0.01097769	P20171F02280
20602	2198	Coffman Cove, AK	-132.8325655	56.0111739	0.02382583	P20602F02201
20603	2198	Metlakatla, AK	-131.56989	27.7585024	0.00954733	P20603F02201
20605	2198	Hydaburg, AK	-132.825128	55.201815	0.01751205	P20605F02201
20619	2198	Prince of Wales Island, AK	-132.5190758	55.5162962	0.01138738	P20619F02201
Total Port Area (sqmi):	0.073250279					
Metlakatla % of total:	13.0338%					
* From the commercial marine vehicles nonpoint sources supporting documents to the 2020 National Emissions Inventory (https://gaftp.epa.						

Total CO2 Emissions (tons)*:	20,094.97	
Total CO2 Emissions (metric tons):	18,229.85	
* From 2020 National Emissions Data for Commercial Boats from PoW		
MIC CO2 Emissions (metric tons)*:	**2,376.05**	
* Scaled down from census area emissions by port area		

Attachment B-5: On-Road Mobile Data

Table B-5-1

2020 On-Road Mobile Emissions by County (metric tons CO2 equivalent)			
Emissions (mt CO2e per year)			
	CO2	N2O	CH4
AK - Prince of Wales-Hyder	34,546	209	84
Grand Total	**34,546**	**209**	**84**



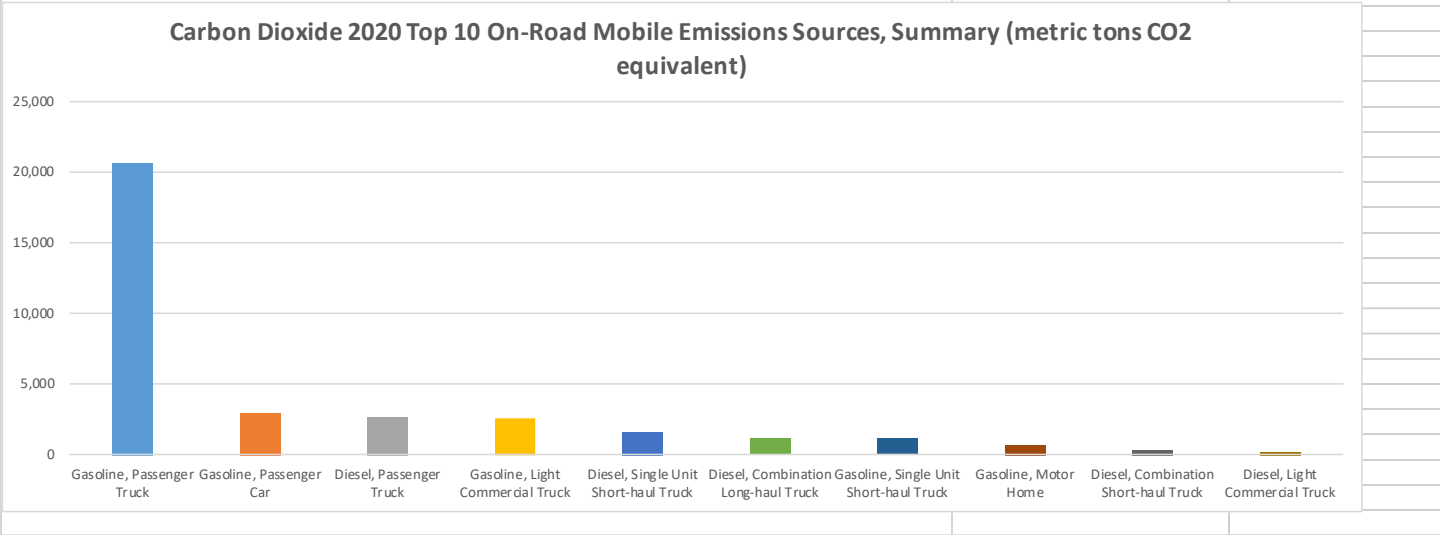
	2020 Annual County VMT	Annual Reservation VMT
AK - Prince of Wales-Hyder	39,856,512	1,213,057

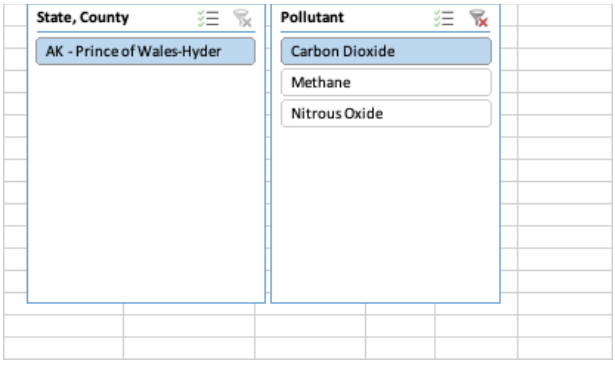
2020 Reservation On-Road Mobile Emissions (metric			
	CO2	N2O	CH4
AK - Prince of W	1,051.44	6.37	2.54
Grand Total	**1,051.44**	**6.37**	**2.54**

Attachment B-5: On-Road Mobile Data

Table B-5-2

Carbon Dioxide 2020 Top 10 On-Road Mobile Emissions Sources, Summary (metric tons CO2 equivalent)		
	Emissions (mt CO2e per year)	**Percentage**
Gasoline, Passenger Truck	20,685	59.88%
Gasoline, Passenger Car	2,874	8.32%
Diesel, Passenger Truck	2,741	7.94%
Gasoline, Light Commercial Truck	2,595	7.51%
Diesel, Single Unit Short-haul Truck	1,572	4.55%
Diesel, Combination Long-haul Truck	1,113	3.22%
Gasoline, Single Unit Short-haul Truck	1,087	3.15%
Gasoline, Motor Home	663	1.92%
Diesel, Combination Short-haul Truck	291	0.84%
Diesel, Light Commercial Truck	216	0.63%
Top 10 Total Emissions	**33,837**	**97.95%**





Attachment B-5: On-Road Mobile Data

B-5-3

Carbon Dioxide 2020 On-Road Mobile Emissions Sources, Summary (metric tons CO2 equivalent)		
	Emissions (mt CO2e per year)	Percentage
Gasoline, Passenger Truck	20,685	59.88%
Gasoline, Passenger Car	2,874	8.32%
Diesel, Passenger Truck	2,741	7.94%
Gasoline, Light Commercial Truck	2,595	7.51%
Diesel, Single Unit Short-haul Truck	1,572	4.55%
Diesel, Combination Long-haul Truck	1,113	3.22%
Gasoline, Single Unit Short-haul Truck	1,087	3.15%
Gasoline, Motor Home	663	1.92%
Diesel, Combination Short-haul Truck	291	0.84%
Diesel, Light Commercial Truck	216	0.63%
Gasoline, Refuse Truck	195	0.56%
Diesel, Transit Bus	136	0.39%
Diesel, Single Unit Long-haul Truck	130	0.38%
Diesel, Passenger Car	66	0.19%
Gasoline, Motorcycle	52	0.15%
Gasoline, Single Unit Long-haul Truck	49	0.14%
Gasoline, Combination Short-haul Truck	38	0.11%
Gasoline, Transit Bus	27	0.08%
Diesel, School Bus	10	0.03%
Diesel, Refuse Truck	5	0.02%
Compressed Natural Gas (CNG), Transit Bus	2	0.01%
Compressed Natural Gas (CNG), Single Unit Long-haul Truck	1	0.00%
Gasoline, School Bus	1	0.00%
Grand Total	**34,546**	**100.00%**

Attachment B-5: On-Road Mobile Data

B-5-4

Carbon Dioxide 2020 On-Road Mobile Emissions Sources by SCC Description (metric tons CO2 equivalent)		
	Emissions (mt CO2e per year)	Percentage
Highway Vehicles - Gasoline	**28,264**	**81.81%**
Passenger Truck		
All on and off-network processes except refueling	20,685	59.88%
Passenger Car		
All on and off-network processes except refueling	2,874	8.32%
Light Commercial Truck		
All on and off-network processes except refueling	2,595	7.51%
Single Unit Short-haul Truck		
All on and off-network processes except refueling	1,087	3.15%
Motor Home		
All on and off-network processes except refueling	663	1.92%
Refuse Truck		
All on and off-network processes except refueling	195	0.56%
Motorcycle		
All on and off-network processes except refueling	52	0.15%
Single Unit Long-haul Truck		
All on and off-network processes except refueling	49	0.14%
Combination Short-haul Truck		
All on and off-network processes except refueling	38	0.11%
Transit Bus		
All on and off-network processes except refueling	27	0.08%
School Bus		
All on and off-network processes except refueling	1	0.00%
Highway Vehicles - Diesel	**6,280**	**18.18%**
Passenger Truck		
All on and off-network processes except refueling	2,741	7.94%
Single Unit Short-haul Truck		
All on and off-network processes except refueling	1,572	4.55%
Combination Long-haul Truck		
All on and off-network processes except refueling	1,113	3.22%
Combination Short-haul Truck		
All on and off-network processes except refueling	291	0.84%
Light Commercial Truck		
All on and off-network processes except refueling	216	0.63%
Transit Bus		
All on and off-network processes except refueling	136	0.39%
Single Unit Long-haul Truck		
All on and off-network processes except refueling	130	0.38%
Passenger Car		
All on and off-network processes except refueling	66	0.19%
School Bus		
All on and off-network processes except refueling	10	0.03%
Refuse Truck		
All on and off-network processes except refueling	5	0.02%
Highway Vehicles - Compressed Natural Gas (CNG)	**3**	**0.01%**
Transit Bus		
All on and off-network processes except refueling	2	0.01%
Single Unit Long-haul Truck		
All on and off-network processes except refueling	1	0.00%
Grand Total	**34,546**	**100.00%**

Attachment B-6: Stationary Combustion – Electric Power Sector Data

Table B-6-1

Big Cat (diesel generator at power plant)			
Fuel consumption in gallons (2020):	90,669		
	CO2	**CH4**	**N2O**
Emissions factors (kg/gal):	10.21	0.000414286	8.28571E-05
Global warming potential	1	28	265
(from TGIT sheet for stationary units)			
	Emissions (metric tons CO2e):		
	CO2	**CH4**	**N2O**
	925.730	1.052	1.991

Attachment B-6: Stationary Combustion – Electric Power Sector Data

Table B-6-2

Average heating value of diesel (Btu/lb):	19,300												
Density of diesel (lb/gallon):	7.1												
Low sulfur diesel sulfur content (%):	0.05												
Ultra-low sulfur diesel sulfur content (%):	0.0015												
Pounds per metric ton:	2,204.623												
							Hazardous Air Pollutants (HAPs)						
	NOx	**CO**	**SOx****	**PM3*****	**PM10**	**Benzene**	**Toluene**	**Xylenes**	**Formaldehyde**	**Acetaldehyde**	**Acrolein**	**Naphtalene**	
Emissions factors (lb/MMBtu)*:	3.2	0.85	1.01	0.0479	0.0573	7.76E-04	2.81E-04	1.93E-04	7.89E-05	2.52E-04	7.88E-06	1.30E-04	
* From AP-42 section 3.4: Large Stationary Diesel And All Stationary Dual-fuel Engines (https://www.epa.gov/sites/production/files/2020-10/documents/c03s04.pdf). Assumes there are no emissions controls installed on the engine.													
** Must be multiplied by the sulfur percentage of the diesel fuel used													
*** For some reason this section of the AP-42 doesn't give PM2.5 emissions factors. But the numbers are so close between PM1 (0.0478) and PM3 (0.0479) that we can probably just go with the PM3 factor													

Co-Pollutant Emissions (metric tons):												
Criteria Pollutants					Hazardous Air Pollutants (HAPs)							
NOx	**CO**	**SOx***	**PM2.5**	**PM10**	**Benzene**	**Toluene**	**Xylenes**	**Formaldehyde**	**Acetaldehyde**	**Acrolein**	**Naphtalene**
18.03	4.79	0.01	0.27	0.32	0.00437	0.00158	0.00109	0.00044	0.00014	0.00004	0.00073

* The value for SOx assumes the diesel used in the generator is ultra-low sulfur diesel (ULSD). If instead low sulfur diesel is being used the value would be:

0.28

Co-Pollutant Notes:

(1) Pollutants grouped by Criteria Pollutants and Hazardous Air Pollutants (HAPs)

(2) Emissions reported in Metric ton equivalents

(2) EPA AP-42 manual does not provide an emissions factor for PM2.5, therefore the emissions factor for PM3 was used to get the PM2.5 emission estimates.

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