Santa Clara Valley Water District
Environmental and Water Resources Committee Meeting

HQ Boardroom
5700 Almaden Expressway
San Jose, CA 95118

REGULAR MEETING
AGENDA

Monday, January 27, 2025
6:00 PM

District Mission: Provide Silicon Valley safe, clean water for a healthy life, environment and economy.

Charles Ice, Committee Chair
Arthur M. Keller, Committee Vice Chair

Director Shiloh Ballard, District 2
Director Nai Hsueh, District 5 Director
Tony Estremera, District 6

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John Bourgeois
Vincent Gin
(Staff Liaisons)

Dave Leon, (COB Liaison)
Assistant Deputy Clerk II
daveleon@valleywater.org
1-408-630-2006

Note: The finalized Board Agenda, exception items and supplemental items will be posted prior to the meeting in accordance with the Brown Act.

Santa Clara Valley Water District
Environmental and Water Resources Committee

REGULAR MEETING
AGENDA

Monday, January 27, 2025	**6:00 PM**	**HQ. Bldg. Boardroom, 5700 Almaden Expressway, San Jose, California**
		Join Zoom Meeting:
		https://valleywater.zoom.us/j/94403145442

IMPORTANT NOTICES AND PARTICIPATION INSTRUCTIONS

Santa Clara Valley Water District (Valley Water) Board of Directors/Board Committee meetings are held as a "hybrid" meetings, conducted in-person as well as by telecommunication, and is compliant with the provisions of the Ralph M. Brown Act.

To maximize public safety while still maintaining transparency and public access, members of the public have an option to participate by teleconference/video conference or attend in-person. To observe and participate in the meeting by teleconference/video conference, please see the meeting link located at the top of the agenda. If attending in-person, you are required to comply with Ordinance 22-03 - AN ORDINANCE OF THE SANTA CLARA VALLEY WATER DISTRICT SPECIFYING RULES OF DECORUM FOR PARTICIPATION IN BOARD AND COMMITTEE MEETINGS located at https://s3.us-west-2.amazonaws.com/valleywater.org.if-us-west-2/f2-live/s3fs-public/Ord.pdf

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- Members of the Public may test their connection to Zoom Meetings at: https://zoom.us/test
- Members of the Public are encouraged to review our overview on joining Valley Water Board Meetings at: https://www.youtube.com/watch?v=TojJpYCxXm0

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Meeting ID: 944 0314 5442
Join by Phone:
1 (669) 900-9128, 94403145442#

1. CALL TO ORDER:

1.1. Roll Call.

2. TIME OPEN FOR PUBLIC COMMENT ON ANY ITEM NOT ON THE AGENDA.

Notice to the public: Members of the public who wish to address the Board/Committee on any item not listed on the agenda may do so by filling out a Speaker Card and submitting it to the Clerk or using the "Raise Hand" tool located in the Zoom meeting application to identify yourself to speak. Speakers will be acknowledged by the Board/Committee Chair in the order requests are received and granted speaking access to address the Board/Committee. Speakers' comments should be limited to three minutes or as set by the Chair. The law does not permit Board/Committee action on, or extended discussion of, any item not on the agenda except under special circumstances. If Board/Committee action is requested, the matter may be placed on a future agenda. All comments that require a response will be referred to staff for a reply in writing. The Board/Committee may take action on any item of business appearing on the posted agenda.

2.1. Election of Committee Chair and Vice-Chair. 25-0014

Recommendation: Elect 2025 Committee Chair and Vice-Chair.
Manager: Candice Kwok-Smith, 408-630-3193

Est. Staff Time: 5 Minutes

3. APPROVAL OF MINUTES:

3.1. Approval of October 21, 2024 Environmental and Water Resources Committee Minutes. 25-0013

Recommendation: Approve the minutes.

Manager: Candice Kwok-Smith, 408-630-3193

Attachments: Attachment 1: 102124 EWRC minutes

Est. Staff Time: 5 Minutes

4. REGULAR AGENDA:

4.1 Green Stormwater Infrastructure in Santa Clara County. 25-0106

Recommendation: Receive an update on the status of Green Stormwater Infrastructure Implementation in Santa Clara County.

Manager: John Bourgeois, 408-630-2990

Attachments: Attachment 1: PowerPoint

Est. Staff Time: 15 Minutes

4.2. Greenhouse Gas Reduction Plan Update 25-0047

Recommendation:
A. Receive information on Santa Clara Valley Water District's Draft Greenhouse Gas Reduction Plan; and
B. Provide input on Draft Greenhouse Gas Reduction Plan to staff.

Manager: Lisa Bankosh, 408-630-2618

Attachments: Attachment 1: Draft Greenhouse Gas Reduction Plan
Attachment 2: PowerPoint

Est. Staff Time: 20 Minutes

4.3. Review and Approve 2024 Annual Accomplishments Report for Presentation to the Board (Committee Chair). 25-0012

Recommendation:
A. Approve the 2024 Accomplishments Report for presentation to the Board; and
B. Provide comments to the Committee Chair to share with the Board as part of the Accomplishments Report presentation pertaining to the purpose, structure, and function of the Committee.

Manager: Candice Kwok-Smith, 408-630-3193

Attachments: Attachment 1: 2024 EWRC Accomplishments Report

Est. Staff Time: 5 Minutes

4.4. Review and Receive Updates on the Environmental and Water Resources Committee's Working Groups. 25-0015

Recommendation:
A. Review and receive updates on the Environmental and Water Resources Committee's Working Groups, and
B. Provide comments to the Board on implementation of Valley Water's mission applicable to working groups' recommendations.

Manager: Candice Kwok-Smith, 408-630-3193

Attachments: Attachment 1: EWRC Working Groups January 2025
Attachment 2: EWRC FINAL Working Group Restructure

Est. Staff Time: 5 Minutes

4.5. Review Environmental and Water Resources Committee Work Plan, the Outcomes of Board Action of Committee Requests, the Committee's Next Meeting Agenda, and Recommend the Proposed 2025 EWRC Work Plan to the Board. 25-0016

Recommendation: Review the Committee work plan to guide the committee's discussions regarding policy alternatives and implications for Board deliberation; and recommend the proposed 2025 EWRC Work Plan to the Board.

Manager: Candice Kwok-Smith, 408-630-3193

Attachments: Attachment 1: Draft 2025 EWRC Work Plan - January 2025

Est. Staff Time: 5 Minutes

5. STANDING ITEMS

5.1. Director's Reports.

5.2. Manager's Reports.

6. CLERK REVIEW AND CLARIFICATION OF COMMITTEE REQUESTS.

This is an opportunity for the Clerk to review and obtain clarification on any formally moved, seconded, and approved requests and recommendations made by the Committee during the meeting.

7. ADJOURN:

7.1. Adjourn to Regular Meeting at 6:00 p.m. on April 21, 2025.

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Santa Clara Valley Water District

File No.: 25-0014

Agenda Date: 1/27/2025
Item No.: 2.1.

COMMITTEE AGENDA MEMORANDUM
Environmental and Water Resources Committee

Government Code § 84308 Applies: Yes ☐ No ☒
(If "YES" Complete Attachment A - Gov. Code § 84308)

SUBJECT:
Election of Committee Chair and Vice-Chair.

RECOMMENDATION:
Elect 2025 Committee Chair and Vice-Chair.

SUMMARY:
Per the Board Resolution, the duties of the Chair and Vice-Chair are as follows:

The officers of each Committee shall be a Chair and Vice-Chair, both of whom shall be members of that Committee. The Chair and Vice-Chair shall be elected by the Committee, each for a term of one year commencing on January 1 and ending on December 31 and for no more than two consecutive terms. The Committee shall elect its officers at the first meeting of the calendar year. All officers shall hold over in their respective offices after their term of office has expired until their successors have been elected and have assumed office.

The Chair shall preside at all meetings of the Committee, and he or she shall perform other such duties as the Committee may prescribe consistent with the purpose of the Committee.

The Vice-Chair shall perform the duties of the Chair in the absence or incapacity of the Chair. In case of the unexpected vacancy of the Chair, the Vice-Chair shall perform such duties as are imposed upon the Chair until such time as a new Chair is elected by the Committee.

Should the office of Chair or Vice-Chair become vacant during the term of such office, the Committee shall elect a successor from its membership at the earliest meeting at which such election would be practicable, and such election shall be for the unexpired term of such office.

Should the Chair and Vice-Chair know in advance that they will both be absent from a meeting, the Chair may appoint a Chair Pro-tempore to preside over that meeting. In the event of an unanticipated absence of both the Chair and Vice-Chair, the Committee may elect a Chair Pro-tempore to preside over the meeting in their absence.

BACKGROUND:
The District Act provides for the creation of advisory boards, committees, or commissions by resolution to serve at the pleasure of the Board.

Accordingly, the Board has established Advisory Committees, which bring respective expertise and community interest, to advise the Board, when requested, in a capacity as defined: prepare Board policy alternatives and provide comment on activities in the implementation of the District's mission for Board consideration. In keeping with the Board's broader focus, Advisory Committees will not direct the implementation of District programs and projects, other than to receive information and provide comment.

Further, in accordance with Governance Process Policy-3, when requested by the Board, the Advisory Committees may help the Board produce the link between the District and the public through information sharing to the communities they represent.

The Board may also establish Ad-hoc Committees to serve in a capacity as defined by the Board and will be used sparingly.

ATTACHMENTS:
None.

UNCLASSIFIED MANAGER:
Candice Kwok-Smith, 408-630-3193

Santa Clara Valley Water District

File No.: 25-0013

Agenda Date: 1/27/2025
Item No.: 3.1.

COMMITTEE AGENDA MEMORANDUM
Environmental and Water Resources Committee

Government Code § 84308 Applies: Yes ☐ No ☒
(If "YES" Complete Attachment A - Gov. Code § 84308)

SUBJECT:
Approval of October 21, 2024 Environmental and Water Resources Committee Minutes.

RECOMMENDATION:
Approve the minutes.

SUMMARY:
In accordance with the Ralph M. Brown Act, a summary of Committee discussions, and details of all actions taken by the Capital Improvement Program Committee, during all open and public Committee meetings, is transcribed and submitted to the Committee for review and approval.

Upon Committee approval, minutes transcripts are finalized and entered into the Committee's historical record archives and serve as the official historical record of the Committee's meeting.

ENVIRONMENTAL JUSTICE IMPACT:
There are no Environmental Justice impacts associated with this item.

ATTACHMENTS:
Attachment 1: 102124 EWRC Minutes

UNCLASSIFIED MANAGER:
Candice Kwok-Smith, 408-630-3193

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ENVIRONMENTAL AND WATER RESOURCES COMMITTEE

DRAFT MINUTES

Monday, October 21, 2024

(Paragraph numbers coincide with agenda item numbers)

A regularly scheduled meeting of the Environmental and Water Resources Committee (Committee) Meeting was held on October 21, 2024, at Santa Clara Valley Water District, Headquarters Building, 5700 Almaden Expressway, San Jose, California.

1. CALL TO ORDER/ROLL CALL

Committee Chair Charles Ice called the meeting to order at 6:02 p.m. A quorum was established with 11 members present.

Members in attendance were:

District 1: Swanee Edwards and Loren Lewis
District 2: Chairperson Charles Ice
District 3: Charles Taylor, Bill Roth
District 4: Bob Levy
District 5: Mike Michitaka
District 6: Eleni Jacobson, Rebecca Gallardo
District 7: Vice Chairperson Arthur M. Keller, Ph.D.

Members not in attendance were:
District 2: Shiloh Ballard
District 5: Patrick Kwok
District 7: Tess Byler

Member Jim Piazza arrived late as noted below.

Board members in attendance were: Director Nai Hsueh (District 5) and Director Tony Estremera (District 6).

Staff members in attendance were: John Bourgeois, Andrew Garcia, Cindy Kao, Dave Leon, Vanessa de la Piedra, Kirsten Struve, and Jing Wu.

Public in attendance were: Jason Gurdak and Katja Irvin.

2. PUBLIC COMMENT

Chairperson Ice declared time open for public comment on any item not on the agenda. There was no one who wished to speak.

3. APPROVAL OF MINUTES

3.1 APPROVAL OF MINUTES

It was moved by Vice Chairperson Keller, seconded by Member Edwards, and majority vote carried, to approve the July 15, 2024 Committee meeting minutes as presented. Members Gallardo and Jacobson abstained.

4. REGULAR AGENDA ITEMS

4.1. RECEIVE INFORMATION AND PROVIDE FEEDBACK ON VALLEY WATER'S WATER SUPPLY MASTER PLAN 2050

Jing Wu reviewed the information on this item, per the attached Committee Agenda Memo, and the corresponding presentation materials contained in Attachments 1 through 6.

Jing Wu, Cindy Kao, Vanessa de la Piedra, and Kirsten Struve were available to answer questions.

Member Piazza arrived at 6:06 p.m.

The Committee received the information and took no formal action.

4.2 REVIEW AND RECEIVE UPDATES ON ENVIRONMENTAL AND WATER RESOURCES COMMITTEE'S WORKING GROUPS

John Bourgeois reviewed the information on this item, per the attached Committee Agenda Memo, and the corresponding presentation materials contained in Attachments 1 and 2, and was available to answer questions.

The Committee received the information and took no formal action.

4.3 RECEIVE VERBAL UPDATE ON THE ANDERSON DAM SEISMIC RETROFIT PROJECT

Andrew Garcia provided information relating to the microtunnel boring machine, pipe installation, and lake tap work. He further reported on ongoing work inside the tunnel and the diversion outlet structure.

The Committee received the information and took no formal action.

4.4 REVIEW ENVIRONMENTAL AND WATER RESOURCES COMMITTEE WORK PLAN, THE OUTCOMES OF BOARD ACTION OF COMMITTEE REQUESTS; AND THE COMMITTEE'S NEXT MEETING AGENDA.

Dave Leon and John Bourgeois reviewed the information on this item, per the attached Committee Agenda Memo, and the corresponding presentation materials contained in Attachments 1 and 2 and were available to answer questions.

The Committee received the information and took no formal action.

5. STANDING ITEMS

5.1 DIRECTOR'S REPORTS

Director Keegan noted that this would be her final meeting as a Valley Water Director, thanked the Committee members for their service, and recognized former EWRC member Elizabeth Sarmiento for her service.

Director Estremera thanked Director Keegan for her service to the Committee.

5.2 MANAGER'S REPORTS

No reports were given.

6. CLERK REVIEW AND CLARIFICATION OF COMMITTEE'S REQUESTS TO THE BOARD

The Committee took no action.

7. ADJOURNMENT

7.1 ADJOURN

Chairperson Ice adjourned the meeting at 7:23 p.m. to the next regular meeting on Monday, January 27, 2025 at 6:00 p.m.

Dave Leon
Assistant Deputy Clerk II

Date approved:

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Santa Clara Valley Water District

File No.: 25-0106

Agenda Date: 1/27/2025
Item No.: 4.1

COMMITTEE AGENDA MEMORANDUM
Environmental and Water Resources Committee

Government Code § 84308 Applies: Yes ☐ No ☒
(If "YES" Complete Attachment A - Gov. Code § 84308)

SUBJECT:
Green Stormwater Infrastructure in Santa Clara County.

RECOMMENDATION:
Receive an update on the status of Green Stormwater Infrastructure Implementation in Santa Clara County.

SUMMARY:
Green Stormwater Infrastructure (GSI) refers to engineered-as-natural ecosystems such as green roofs, porous pavement, swales, bioretention facilities, and rain gardens that largely use soil and vegetation to infiltrate, evapotranspirate, and/or harvest stormwater runoff to reduce and clean flows to storm drains. GSI has been a requirement of NPDES Stormwater Permit programs for several years. Most implementation has occurred in conjunction with development and re-development projects and are relatively small in scale, capturing and treating only the drainage area associated with an individual development site. As fewer small areas are available, larger "regional" projects are being evaluated and implemented to capture runoff from larger areas. This presentation provides a status report on GSI implementation within the County and likely trajectory of future implementation.

ENVIRONMENTAL JUSTICE AND EQUITY IMPACT:
Green Stormwater Infrastructure addresses water quality equity by helping to improve water quality and increase green space in all communities, including disadvantaged communities.

ATTACHMENTS:
Attachment 1: PowerPoint

UNCLASSIFIED MANAGER:
John Bourgeois, 408-630-2990

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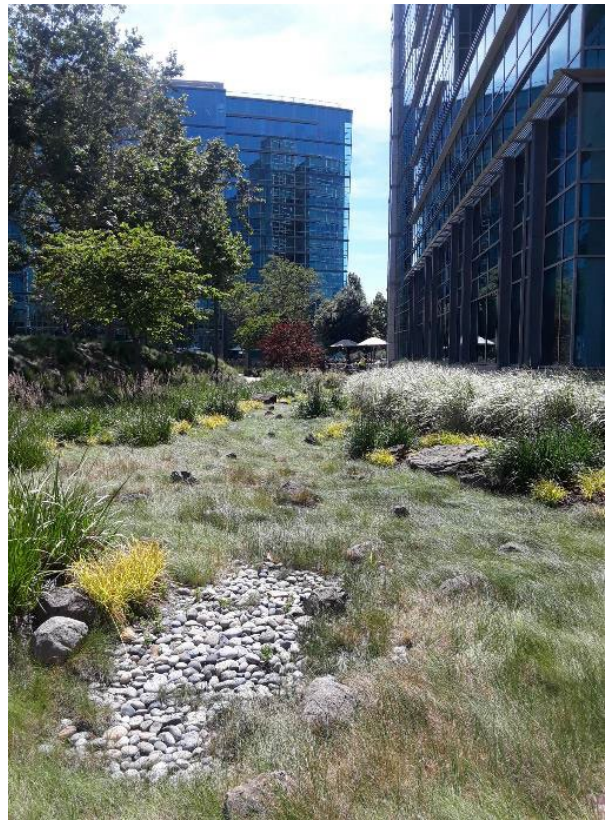
Presentation to Valley Water
Environmental and Water Resources Committee
January 27, 2025

Implementation of Green Stormwater Infrastructure in Santa Clara County

Jill Bicknell, P.E., Santa Clara Valley Urban Runoff Pollution Prevention Program
Ileana Alvarado, City of Morgan Hill
Tanya Carothers, City of Morgan Hill

Presentation Overview

- What is Green Stormwater Infrastructure (GSI)?
- Regulatory Requirements
- North County Implementation
- South County Implementation
- Questions and Answers



Green Stormwater Infrastructure

- Systems that use vegetation, soils, and natural processes to capture and treat stormwater
- Most urban GSI involves retrofitting public streets, roofs and parking lots to divert runoff to:
  - Vegetated areas ("stormwater planters" or "stormwater curb extensions")
  - Pervious pavements
  - Rain gardens ("bioretention areas")
  - Infiltration areas
  - Cisterns and rain barrels

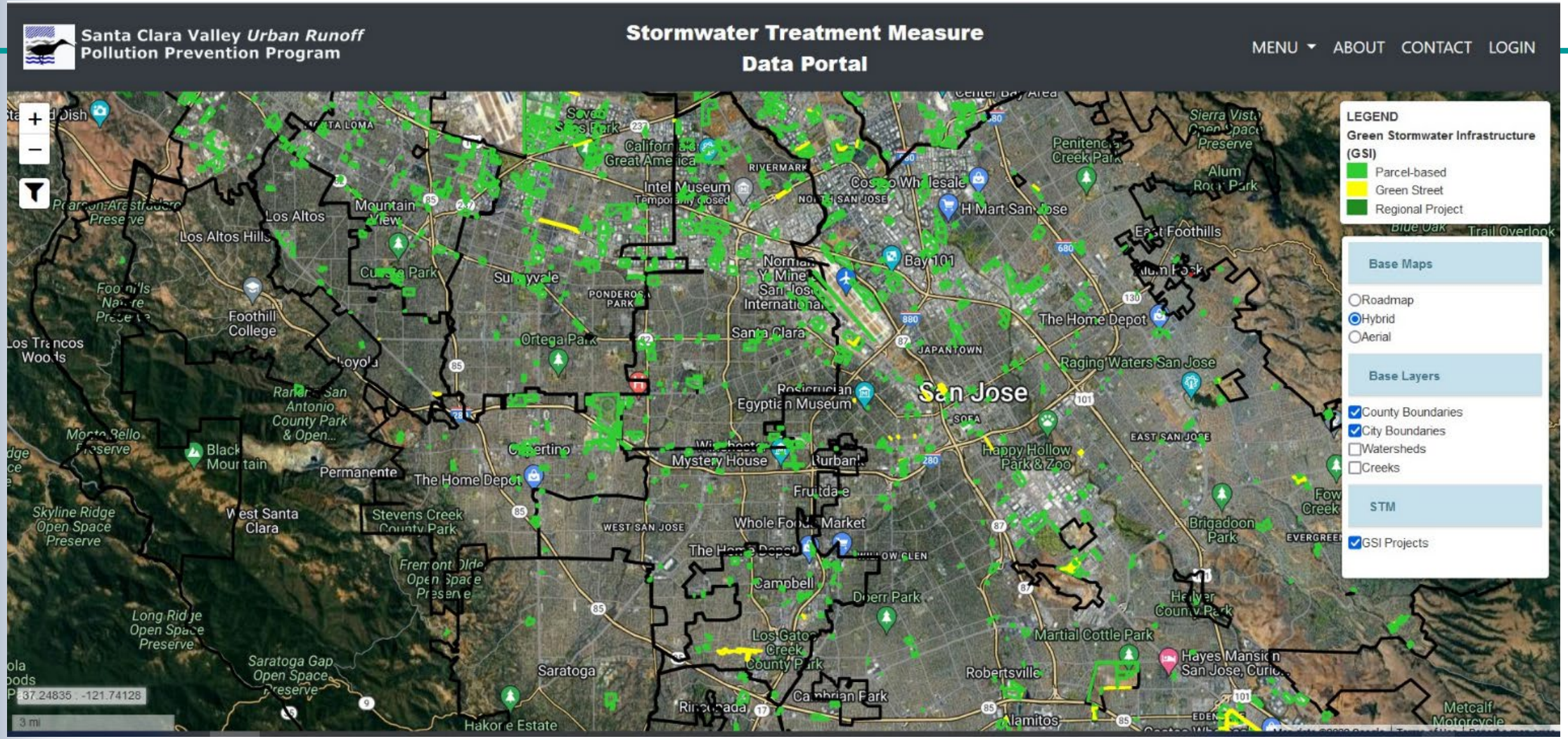
Parcel Based LID

Green Streets

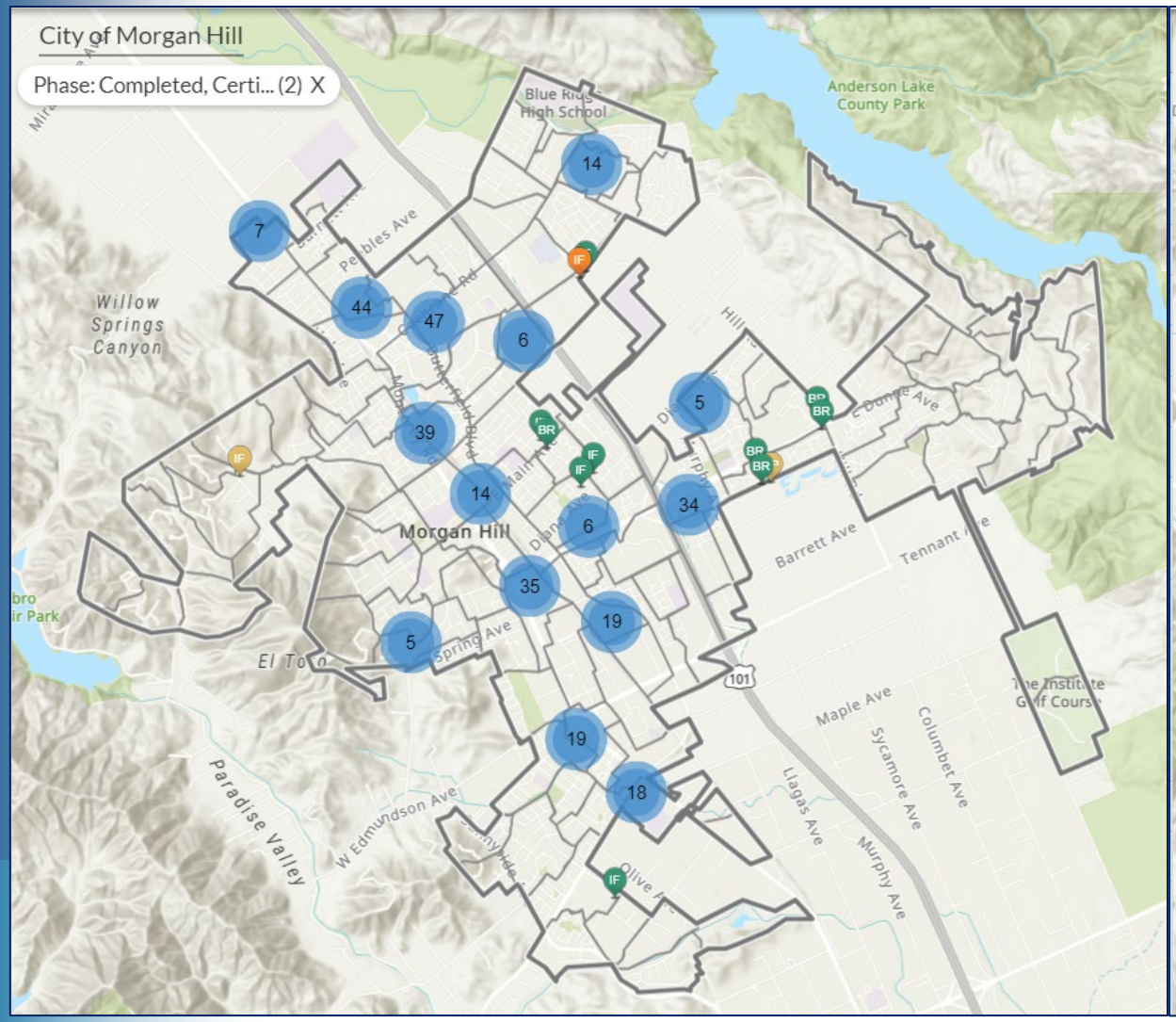
Regional Projects

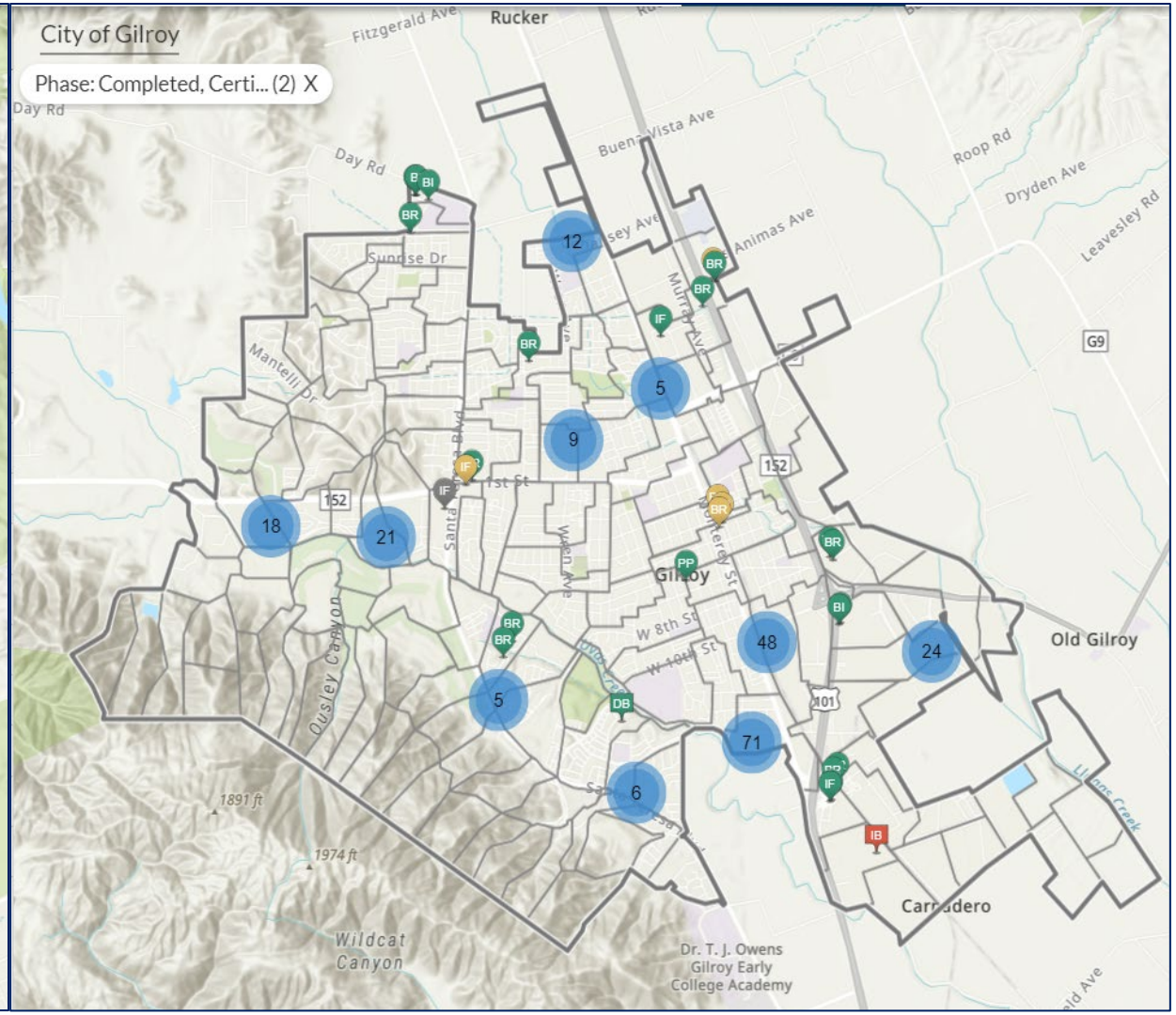

Division of Santa Clara County into California Regional Water Quality Control Board Region 2 (San Francisco Bay Watershed) and Region 3 (Monterey Bay Watershed)
Lower South San Francisco Bay
Region 2
Morgan Hill
Region 3
Gilroy
Pacific Ocean
Legend
Santa Clara County
Boundary between Regions 2 & 3
Major Highways
N
W
E
S
Miles
0 2.5 5 10
280
880
680
85
87
101
17
152

Implementation of GSI in North County



Implementation of GSI in South County

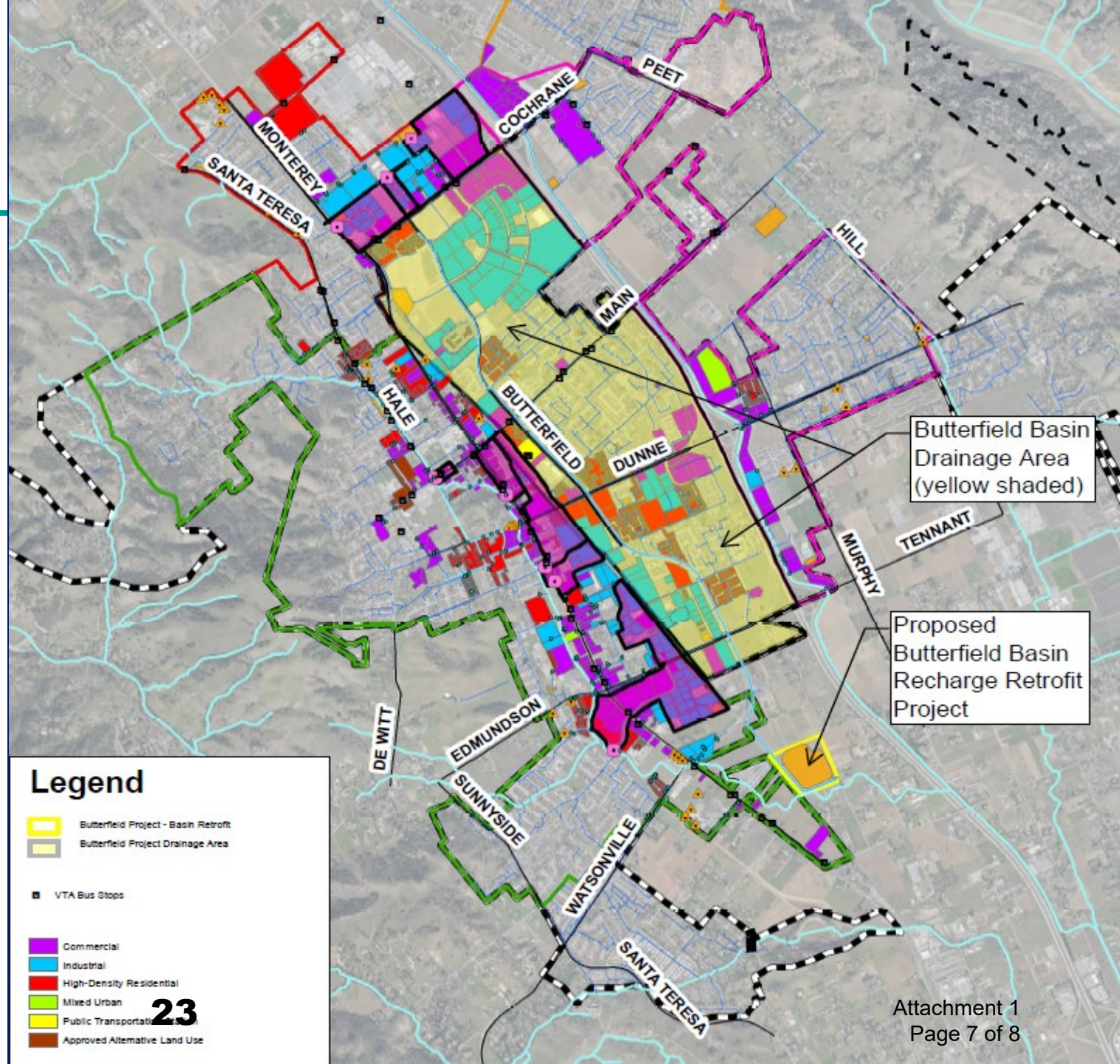




CITY OF MORGAN HILL

Butterfield Basin Recharge Retrofit Project

CITY OF MORGAN HILL



Questions?

Jill Bicknell, P.E.
EOA/SCVURPPP
jcbicknell@eoainc.com

Ileana Alvarado
Ileana.Alvarado@morganhill.ca.gov
Tanya Carothers
tanya.carothers@morganhill.ca.gov

Santa Clara Valley Water District

File No.: 25-0047

Agenda Date: 1/27/2025
Item No.: 4.2.

COMMITTEE AGENDA MEMORANDUM
Environmental and Water Resources Committee

Government Code § 84308 Applies: Yes ☐ No ☒
(If "YES" Complete Attachment A - Gov. Code § 84308)

SUBJECT:
Greenhouse Gas Reduction Plan Update

RECOMMENDATION:
A. Receive information on Santa Clara Valley Water District's Draft Greenhouse Gas Reduction Plan; and
B. Provide input on Draft Greenhouse Gas Reduction Plan to staff.

SUMMARY:
Since 2010, Santa Clara Valley Water District (Valley Water) has worked to inventory and reduce its greenhouse gas (GHG) emissions. In 2013, Valley Water's Board of Directors provided policy direction for achieving carbon neutrality by 2020. Valley Water implemented an energy optimization plan and began procuring over 95% of its electricity from zero emission sources. This voluntary carbon reduction framework accounted for GHG emissions from operations, fleet, energy usage, imported water, and employee commutes. The framework also accounted for offsets associated with the co-benefits of emissions reductions from water conservation and environmental stewardship actions such as habitat restoration and the Santa Clara County Green Business Program. Under this framework, Valley Water achieved carbon neutrality in 2016.

In 2021, the Board of Directors adopted the Climate Change Action Plan (CCAP), which includes goals, strategies, and actions to support climate adaptation and continued reduction of GHG emissions. As recommended in the CCAP, Valley Water has now developed a draft Greenhouse Gas Reduction Plan (GHGRP) to update and expand the approach from Valley Water's original voluntary carbon reduction framework and provide California Environmental Quality Act (CEQA) streamlining for future Valley Water projects. Consistent with guidance from the California Air Resources Board, the GHGRP emissions inventory accounts for additional indirect emissions from construction activities and other emissions sources not previously included due to lack of data.

The inventory establishes Valley Water's current, baseline GHG emissions using a five-year average from 2017 to 2021. The five-year average accounts for variability in operations and imported water deliveries. The baseline inventory indicates that indirect emissions from construction and imported water are Valley Water's largest GHG sources, accounting for approximately 70% of total emissions.

These results reflect the success of Valley Water‘s previous efforts to reduce direct emissions.

The GHGRP emissions forecast estimates future emissions through 2045 and assumes mandatory reductions from existing policies and regulations, such as mandates for renewable energy and alternative fuels. With these mandates, overall emissions are forecasted to decrease approximately 50% by 2045 relative to the 2017-2021 baseline, with construction emissions comprising the largest remaining emissions source. Using the gap between forecasted emissions and the 2045 carbon neutrality target, the GHGRP establishes numerous GHG reduction measures that can be implemented across Valley Water’s operations. Each GHG reduction measure quantifies cumulative emissions reductions anticipated by 2030 and 2045 and includes specific implementation steps.

The largest emissions reductions will be derived from Measures OF-1 (Zero Emission Off-Road Fleet), CN-1 (Zero Emission Off-Road Construction Vehicles), and CS-1 (Sequester Carbon). Measures OF-1 and CN-1 require that zero emission fuels comprise an increasing share of fuel usage by Valley Water’s off-road fleet and contracted off-road construction vehicles. Measure CS-1 establishes a framework to track emissions reductions derived from the additional carbon sequestered by restoration projects that Valley Water implements.

Collectively, the GHGRP reduction measures provide a pathway for Valley Water to achieve carbon neutrality by 2045, consistent with California’s emission reduction targets established by AB 1279. Valley Water will track its future emissions against a carbon budget that provides a maximum limit for emissions from 2025 through 2045. The carbon budget is analogous to a container with a set capacity to hold future emissions. Emissions from Scopes 1-3 represent flows into the container, which will gradually slow as reduction measures are implemented. Emissions reductions derived from carbon sequestration and water conservation represent flows out of the container and provide a mechanism to balance the carbon budget.

The Draft GHGRP was published on Valley Water’s website in December 2024 and comments have been received. Next steps include responding to these comments as well as feedback received from the EWRC and the Board Policy and Monitoring Committee, completing California Environmental Quality Act (CEQA) review, and presenting the plan to the Board of Directors to consider it for adoption.

ENVIRONMENTAL JUSTICE AND EQUITY IMPACT:
There are no environmental justice and equity impacts associated with the Greenhouse Gas Reduction Plan. Implementation of the GHGRP would reduce Valley Water’s GHG and air pollutant emissions, thereby reducing Valley Water’s overall environmental impact. None of the GHGRP measures would result in a negative impact to environmental justice or equity.

ATTACHMENTS:
Attachment 1: Draft Greenhouse Gas Reduction Plan
Attachment 2: PowerPoint Presentation

UNCLASSIFIED MANAGER:
Lisa Bankosh, 408-630-2618

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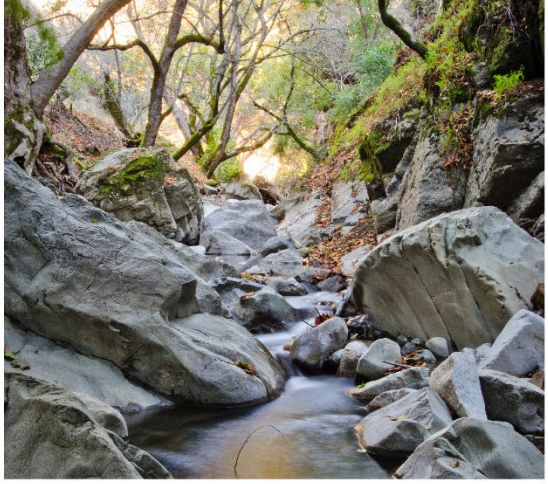




Valley Water

November 2024

FINAL ADMINSTRATIVE DRAFT

Greenhouse Gas Reduction Plan

PREPARED FOR:
Santa Clara Valley Water District

Water Resources Planning and Policy Unit
5750 Almaden Expressway
San Jose, CA 95118

REVISED FINAL ADMINISTRATIVE DRAFT

Greenhouse Gas Reduction Plan

PREPARED FOR

Santa Clara Valley Water District
Water Resources Planning and Policy Unit
5750 Almaden Expressway
San Jose, CA 95118

PREPARED BY

Ascent Environmental, Inc. dba Ascent
455 Capitol Mall, Suite 300
Sacramento, CA 95814
Brenda Hom,
Project Manager

NOVEMBER 21, 2024

PREPARED BY

Ascent

Brenda Hom, Project Manager

Fred Hochberg, Technical Lead

Honey Walters, Principal

Valley Water

Samantha Greene, *Water Resources Planning and Policy Manager*

Sarah Young, *Senior Project Manager*

Nick Mascarello, *Associate Environmental Planner*

Plan Contributors and Implementation Leads

Tony Leonardo, *Facilities Management Unit*

Frank Chesonis, *Equipment Management Unit*

Emily Scanlan, *Equipment Management Unit*

Carlos Avila, *Facilities Management Unit*

John Brosnan, *Utility Electrical and Control Systems Unit*

Brendan Maher, *Utility Electrical and Control Systems Unit*

Jing Wu, *Water Supply Planning and Conservation Unit*

Todd Sexauer, *Dam Safety Environmental Services Unit*

Tiffany Chao, *Dam Safety Environmental Services Unit*

Wendy Young, *Dam Safety Environmental Services Unit*

Justin Burks, *Water Supply Planning and Conservation Unit*

Richard Gilmore, *Operations and Maintenance Environmental Support Unit*

Jeffrey Lewis, *Operations and Maintenance Environmental Support Unit*

Nina Roguski, *Operations and Maintenance Environmental Support Unit*

Joseph Chavez, *Operations and Maintenance Environmental Support Unit*

Under the Direction of

Lisa Bankosh, *Assistant Officer, Watersheds Stewardship and Planning Division*

ACKNOWLEDGEMENTS

GEI Consultants

Ryan Jolley, *Contract Manager*

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Appendices

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1 INTRODUCTION

The Santa Clara Valley Water District (Valley Water) supplies clean and safe water, provides flood protection, and serves as a steward of streams on behalf of Santa Clara County's 1.9 million residents. The effects of climate change, including warmer temperatures, changing precipitation and runoff patterns, reduced snowpack, and rising sea levels, challenge Valley Water's ability to provide these services. Managing climate change-related uncertainties, vulnerabilities, and risks to local communities, water resources, and water supplies is critical to fulfilling Valley Water's mission. The mitigation of greenhouse gas (GHG) emissions in this Greenhouse Gas Reduction Plan (GHGRP) supports Valley Water's mission to act as an environmental steward.

The GHGRP aims to reduce Valley Water's emissions and achieve a carbon neutrality target by 2045. This target aligns with the State of California's goals under Assembly Bill (AB) 1279, signed by Governor Newsom in 2022. The GHGRP updates an inventory of Valley Water's GHG emissions through 2021, a forecast of future GHG emissions, and a list of measures to achieve a goal of net zero emissions by 2045. It provides specific implementation steps as well as metrics to measure progress.

This GHGRP aligns with the framework outlined under the California Environmental Quality Act (CEQA) Guidelines §15183.5. The intent is to provide a "CEQA-qualified" plan, adopted by the Board of Directors to streamline GHG analyses and support incorporating reduction measures needed in project-specific CEQA documents.

1.1 BACKGROUND AND PURPOSE

In 2021, Valley Water adopted its Climate Change Action Plan (CCAP) (Valley Water 2021a). The CCAP established a guide for Valley Water to respond to climate change through adaptation and mitigation. Climate mitigation focuses on reducing GHG emissions, including those emitted by Valley Water operations from 2010 through 2017, excluding emissions from construction and other sources. Additionally, the CCAP called for preparing a qualified GHGRP that meets the requirements of the CEQA Guidelines §15183.5. Chapter 2 provides more details on CEQA-qualified plans.

Given the State's latest target to achieve carbon neutrality statewide by 2045 under AB 1279, the direction in the CCAP, and the framework outlined under CEQA Guidelines §15183.5, this GHGRP has the following objectives:

- Update Valley Water's GHG emissions inventory to include historical years 2017 through 2021 to support emissions forecasts for 2030 and 2045;
- Establish a carbon budget that supports a carbon neutrality target by 2045 consistent with State GHG targets under AB 1279;
- Develop new and refined GHG reduction measures that, if implemented, would help Valley Water achieve the GHG reduction targets;
- Develop an implementation and monitoring plan to ensure the progress of the reduction measures;
- Develop a CEQA Streamlining Checklist for future projects that may tier from the GHGRP;
- Be adopted through a public process following environmental review.

Valley Water intends for the GHGRP to provide CEQA streamlining for future Valley Water construction activity through 2045, whose environmental documents, such as Environmental Impact Reports, have not yet gone through the public review process and/or do not already include actions to achieve net zero greenhouse gas emissions. Hence, the forecast of construction emissions is necessary for this GHGRP.

This GHGRP does not discuss the impacts of climate change on the Santa Clara Valley or Valley Water's actions to adapt to climate change. These items are discussed in the 2021 CCAP.

This document also organizes emissions in terms of scope. The scope of emissions sources indicates an entity's level of control over the sources. The three emissions scopes are described as:

- Scope 1: Emissions under the reporting entity's direct control (e.g., methane emissions from natural gas combustion in buildings, fuel combustion in the district-owned fleet, and refrigerant leakage).
- Scope 2: Emissions generated by purchased energy, where the actual energy generation source is outside the inventory boundary, but the use of that energy is within the inventory boundary (e.g., grid-purchased electricity).
- Scope 3: All other emissions sources that are not Scope 1 or Scope 2 sources. Valley Water's Scope 3 emissions include business travel, construction, water imported from the State Water Project, employee commute, wastewater, solid waste, and contracted sediment hauling.

1.2 VALLEY WATER'S COMMITMENT TO GHG REDUCTION

Since 2008, Valley Water has committed to reducing GHG emissions. A partial list of its progress to date is provided below. Measures in this GHGRP are intended to go above and beyond these efforts.

- Since 2016, Valley Water has procured zero-emission power for its facilities from the Power and Water Resources Pooling Authority (PWRPA) via the Zero Carbon Water portfolio. PWRPA provides over 94 percent of Valley Water facilities' electricity usage. Due to this and ongoing reductions in the carbon intensity of other grid-based electricity under the State's Renewable Portfolio Standards, total emissions from Valley Water's electricity consumption have fallen by over 94 percent since 2016.
- Valley Water is committed to water conservation to reduce per capita water use in its service territory. Water conservation provides numerous benefits, including reducing GHG emissions by avoiding energy usage for conveyance and treatment of additional water supply, increased drought resilience, cost savings, and ecosystem function. Valley Water's long-term savings target is to achieve approximately 99,000 acre-feet per year (AFY) in water savings by 2030, 109,000 AFY by 2040, and 126,000 AFY by 2050 (Valley Water 2019: 25 and A-5, Valley Water 2024a). As of fiscal year (FY) 2023, Valley Water's Water Conservation Programs and policies have saved 83,174 acre-feet per year (Valley Water 2024b: 93).
- Valley Water implements and provides grants and partnership funding for riparian and wetland habitat enhancement and restoration projects throughout the South San Francisco Bay (South Bay). By restoring native habitats and removing invasive species, Valley Water has expanded carbon sequestration while preserving or enhancing ecosystem health.
- Valley Water provides a telework program and commuter benefits that reduce its employees' commuting emissions. Valley Water employees also maintain the Green Team Employee Resource Group (ERG), which promotes sustainable practices through lifestyle changes and workplace improvement.
- In addition to decarbonizing its operations, Valley Water supports countywide programs to reduce GHG emissions. For instance, Valley Water contributed to the Countywide green business program and promoted best practices for energy management, water efficiency, pollution prevention, waste minimization, recycling, and material reuse.

2 A CEQA-QUALIFIED GREENHOUSE GAS REDUCTION PLAN

As part of the California Environmental Quality Act (CEQA) process, a lead agency must determine if discretionary projects' GHG emissions result in a significant impact. According to the CEQA Guidelines, "the determination of the significance of GHG emissions calls for careful judgment by the lead agency…" (§15064.4(a)). Across the San Francisco Bay Area, many project CEQA analyses use the Bay Area Air Quality Management District's (BAAQMD) significance thresholds to determine whether a project has a significant impact from GHGs. BAAQMD's thresholds focus on emissions from the operation of new land use projects meeting specific design criteria (e.g., no natural gas appliances in new buildings) (BAAQMD 2022). However, most of Valley Water's discretionary projects are related to infrastructure improvements that generally do not result in new operational emissions beyond Valley Water's existing maintenance efforts. BAAQMD also allows projects to determine significance based on consistency with a qualified plan per CEQA Guidelines §15183.5.

Valley Water intends for the GHGRP to meet the qualifications outlined in §15183.5(b)(1) of the CEQA Guidelines (See Box 1) to streamline the determination of significance during the environmental review of future capital improvement projects (CIPs) that demonstrate consistency with the GHGRP. Questions a) and b) under part VIII (Greenhouse Gas Emissions) of Appendix F of the CEQA Guidelines question if a project would "[g]enerate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment" and if it would "[c]onflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases." A project consistent with the GHGRP can conclude, under both questions, that the project would have a less than significant impact on greenhouse gas emissions.

To determine project consistency with the GHGRP, this document includes a GHGRP Consistency Review Checklist (See Appendix B). Project managers can use the Checklist to determine whether a proposed Valley Water project is consistent with the GHGRP and, thereby, determine its CEQA GHG impact. The checklist provides a streamlined review process for projects subject to discretionary approval that prompts environmental review under CEQA. Projects that demonstrate consistency with the GHGRP may be able to conclude that they cause no additional significant environmental effects with respect to GHG emissions and climate change in their CEQA review. According to CEQA Guidelines §15183.5:

a) *Lead agencies may analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level, such as in a general plan, a long range development plan, or a separate plan to reduce greenhouse gas emissions. Later project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review.*

b) *Public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.*

In addition, under CEQA Guidelines §15183.5, a CEQA-qualified GHG reduction plan must consist of the following attributes, which are covered under the objectives of this GHGRP:

- Quantifies GHG emissions, both existing and projected over a specified period, resulting from activities within a defined geographic area;
- Establishes a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
- Identifies and analyzes GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- Specifies measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified levels; and
- Is adopted in a public process following the preparation and adoption of CEQA documentation corresponding to the GHG reduction plan.
- Projects that do not demonstrate consistency may, at Valley Water's discretion, include a more comprehensive project-specific analysis of GHG emissions consistent with CEQA requirements.

What Projects Can Tier from the GHGRP?

- New projects that have not yet undergone public review of their CEQA documents are eligible to be tiered from the GHGRP.

And

- Projects that are currently under CEQA review and have not yet been adopted may choose to tier from this document.

CEQA Guidelines §15382 defines a "significant" impact as "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance." To determine whether a Valley Water project has a significant impact from GHG emissions, the project must not cause Valley Water to exceed its GHG reduction target.

3 REGULATORY CONTEXT

Below is a partial list of the primary guiding policies the State of California adopted to achieve its climate goals, in addition to supporting guidelines from BAAQMD. These policies inform Valley Water's emissions forecasts and the development of Valley Water's GHG reduction targets.

- **Executive Order (EO) S-3-05 (2005)** directs California to reduce statewide GHG emissions to 1990 levels by 2020 and 80 percent below 1990 levels by 2050.
- **Assembly Bill (AB) 32**, the **Global Warming Solutions Act of 2006**, established regulatory requirements to reduce statewide emissions to 1990 levels by 2020 and gave the California Air Resources Board (CARB) the authority to develop regulations and market mechanisms necessary to achieve these reductions. AB 32 also established the State's first Climate Change Scoping Plan to establish a pathway for achieving the statewide emission reduction goals. The State met AB32's 2020 target in 2017, four years earlier than mandated (CARB 2024a).
- **Senate Bill (SB) 32 (2016)** requires that CARB ensures GHG reductions of 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050.
- **AB 1279 (2022)** requires California to achieve net zero GHG emissions as soon as possible but no later than 2045 and maintain net negative GHG emissions thereafter. By 2045, anthropogenic GHG emissions must be reduced by at least 85 percent below 1990 levels.
- **CARB's December 2022 Scoping Plan** provides a path to achieving the AB 1279 targets, including analyses of specific emissions sectors such as building decarbonization and electric vehicle deployment.
- **BAAQMD's 2022 CEQA Guidelines** include guidance for local government-qualified GHG reduction plans. The guidance clarifies the requirements under CEQA Guidelines §15183.5 and recommends, in support of AB 1279, that local governments demonstrate a 40 percent reduction below 1990 levels by 2030 and be able to demonstrate that they will "achieve as ambitious emissions reductions as technologically and financially feasible by 2045, minimizing the residual amount of emissions needed to close the gap to carbon neutrality" (BAAQMD 2022). The 2022 CEQA Guidelines do not include thresholds of significance specifically for construction-related GHG emissions. Instead, BAAQMD continues to encourage the use of best management practices to minimize construction-related GHG emissions.

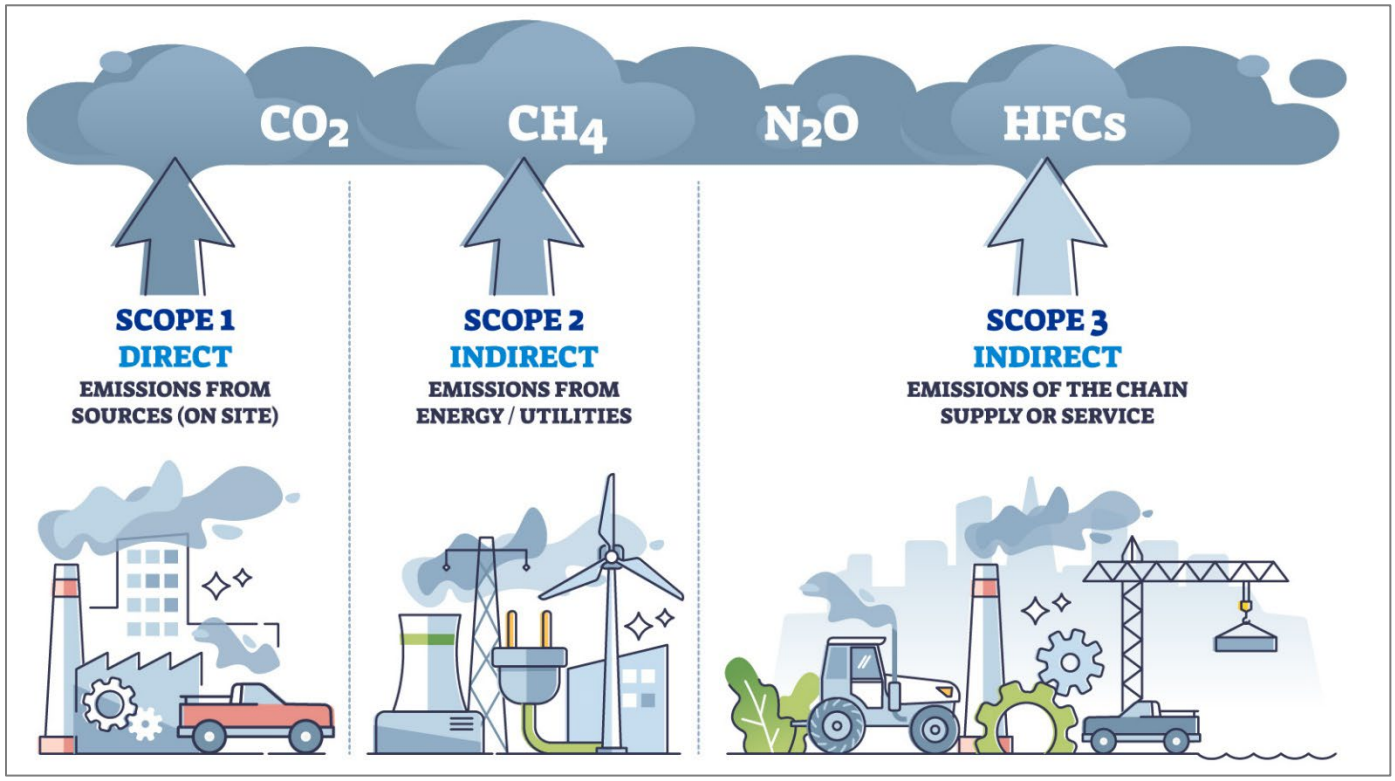
4 GHG EMISSIONS INVENTORY

This chapter presents Valley Water's updated GHG emissions for calendar years 2017 through 2021 and forecasts for 2030 and 2045. It updates the 2021 CCAP's GHG estimates, which presented emissions from 2010 to 2017, and adds additional emissions from sectors that were not accounted for in the CCAP owing to limited data availability: construction, solid waste, high Global Warming Potential (GWP) gases, employee-generated wastewater, and sediment hauling.

4.1 EMISSIONS SCOPES

For tracking purposes, emissions fall under one of three "scopes," which the U.S. Environmental Protection Agency (EPA) defines as follows and illustrated in Figure 1:

- **Scope 1 (Direct Emissions):** Direct emissions that occur from sources controlled or owned by an organization (e.g., emissions associated with fuel combustion in on-site boilers, furnaces, and vehicles directly controlled by the organization).
- **Scope 2 (Indirect Emissions):** Indirect emissions associated with purchasing electricity, steam, heat, or cooling. (Valley Water does not purchase steam, heat, or cooling from third parties, so only electricity purchases are included in this GHGRP)
- **Scope 3 (Indirect Emissions):** Indirect emissions from activities from assets not owned or controlled by the reporting organization, but that the organization indirectly affects its value chain (EPA 2023).



Source: Prepared by Ascent in 2024.

Figure 1 Emission Scopes

An emission's scope is highly related to an organization's degree of control over a particular sector. Valley Water generally has more control over Scope 1 and 2 emissions because it directly controls Scope 1 sources and has discretion over its Scope 2 electricity purchases (i.e., it can choose to buy or not buy a low-carbon electricity product). Scope 3 emissions, in contrast, are indirect and come from non-Valley Water entities. Valley Water can persuade and influence these entities (e.g., via outreach to employees to reduce waste disposal, implementing countywide water conservation programs, or contracting policies for new construction that incentivize GHG reductions), but cannot directly control them. Despite the lack of direct control over Scope 3 emissions, Valley Water is committed to including and mitigating as many sources of the district's emissions as possible, including those from Scope 3. Table 1 describes Valley Water's specific emissions sectors and their associated scope.

Table 1 Valley Water Included Emissions Sectors by Scope

Scope	Emissions Sector	Description
1	Natural Gas Use in Buildings	Valley Water buildings (e.g., offices, pumping plants, and water treatment plants) combust natural gas for space and water heating.
	On-Road Fleet	Valley Water owns and operates on-road vehicles to transport employees and perform maintenance on its assets. Many of these vehicles consume gasoline.
	Off-Road Fleet	Valley Water owns and operates construction equipment and other off-road heavy-duty equipment for infrastructure and stream maintenance that consume diesel.
	High GWP Gases	Refrigerants are the primary high-GWP gases used by Valley Water for building and vehicle cooling. These annual purchases correspond to the annual leakage of these refrigerants into the atmosphere. The high-GWP gases associated with refrigerants can be thousands of times as potent as CO_2 in warming the atmosphere.
2	Facility Electricity Use	Valley Water buildings consume electricity procured from PWRPA, PG&E, SJCE, and SVP. Electricity use is primarily from operating facilities and equipment, such as water treatment plants, the advanced water purification center, pipeline pumps, lighting, appliances, air conditioning, plug loads, and on-site EV charging stations.
3	Imported Water	Valley Water imports water mainly from two sources: SWP and CVP. Water extraction and conveyance[1] consume electricity, which in turn results in emissions.
	Employee Commute	Valley Water employees commute to work in light-duty vehicles, which generally combust gasoline or use electricity.
	Business Travel	Valley Water employees use a combination of passenger cars (which combust gasoline or use electricity) and aircraft (which combust aviation gasoline) for business travel.
	Construction	Valley Water's capital improvement projects produce emissions through contracted activities such as operation of construction equipment, hauling of materials, and construction worker commute.
	Solid Waste	Valley Water facilities produce landfilled materials that decompose and produce methane.
	Wastewater	Valley Water facilities produce wastewater. Anaerobic decomposition of this wastewater produces methane.
	Sediment Hauling	Valley Water performs sediment management on its system to remove sediment from waterways. This work involves contracting with third-party companies that use dump trucks to haul sediment from the job site to nearby landfills as needed. The dump trucks consume diesel.

Notes: GWP = global warming potential, PG&E = Pacific Gas & Electric, PWRPA = Power and Water Resources Pooling Authority, SJCE = San Jose Clean Energy, SVP = Silicon Valley Power, EV = electric vehicles, SWP = State Water Project, CVP = Central Valley Project, CH4 = methane, GHG = greenhouse gas.

Emissions from construction and maintenance activities performed by fleet vehicles and equipment owned by Valley Water are included in Scope 1.

Source: Prepared by Ascent in 2024.

[1] Extraction is defined as taking the water from its point of origin, such as a river or aquifer, and conveyance is defined as moving the water from the river or aquifer to its destination—in this case, to Valley Water's service territory.

The policies and guidelines in Chapter 3 apply to Scope 1 and Scope 2 emissions as aligned with how they are captured in the State's emissions inventory. However, the policies and guidelines do not prescribe how entities within the state address emissions from each scope. Indeed, due to the difference in the organizational and operational boundaries, the State defines emissions scopes differently than an entity within the state, such as Valley Water, would. An entity operating within the state, such as Valley Water, can generate emissions from all three scopes, as defined at the beginning of Chapter 4.1, but these emissions could be entirely categorized under the State's Scope 1 and 2 emissions given that the entity functions within the boundaries of the state. For example, a business that sources supplies locally, delivers goods locally, and hires local workers within the state would have Scope 3 emissions associated with employee commute and transport of goods that occur within the state; these emissions would be categorized under the State's Scope 1 and 2 emissions. As a local agency, Valley Water functions similarly by working within state boundaries – only using electricity and natural gas within the state, sourcing water from the state, and burning fuel within the state. Therefore, Valley Water's Scope 3 emissions occur as part of the State's Scope 1 and 2 emissions. Although the State itself does not include Scope 3 emissions relative to statewide emissions, Valley Water recognizes the importance of its own Scope 3 emissions from construction and other sources especially in the context of the State's comprehensive climate goals like carbon neutrality by 2045. By integrating strategies that address all scopes within the agency's emissions inventory, Valley Water aims to create a robust and effective approach to reducing its carbon footprint and supporting statewide climate goals.

4.2 VALLEY WATER'S UPDATED GHG EMISSIONS INVENTORY

This section updates Valley Water's 2010-2017 emissions to include data through 2021 and additional emissions sources, documenting trends over time and providing data to support emissions forecasting through 2045. Additionally, a new baseline emissions level was created that accounts for the latest 5-year average between 2017 and 2021. Figure 3 shows the updated historical trend of Valley Water's emissions from 2010 to 2021. As shown, Valley Water emissions have declined over time, and especially since the agency began purchasing zero-carbon emission electricity in 2016 through a Zero Carbon Water Portfolio purchase agreement with the Power and Water Resources Pooling Authority (PRWPA).

Given the significant change in the emissions portfolio starting in 2016, Valley Water decided to use the span of emissions from calendar years 2017 through 2021 to update its baseline emissions level. This five-year average baseline was selected to normalize the variability that affects Valley Water's operations and resulting emissions. For example, the amount of imported water delivered to Valley Water fluctuates significantly from year to year depending on hydrological conditions (dry years generally require more imported water, and wetter years require less). Using a single year for an emissions inventory could capture a year with an unusually high or low quantity of imported water (and its associated emissions), thus substantially overstating or understating Valley Water's typical emissions.

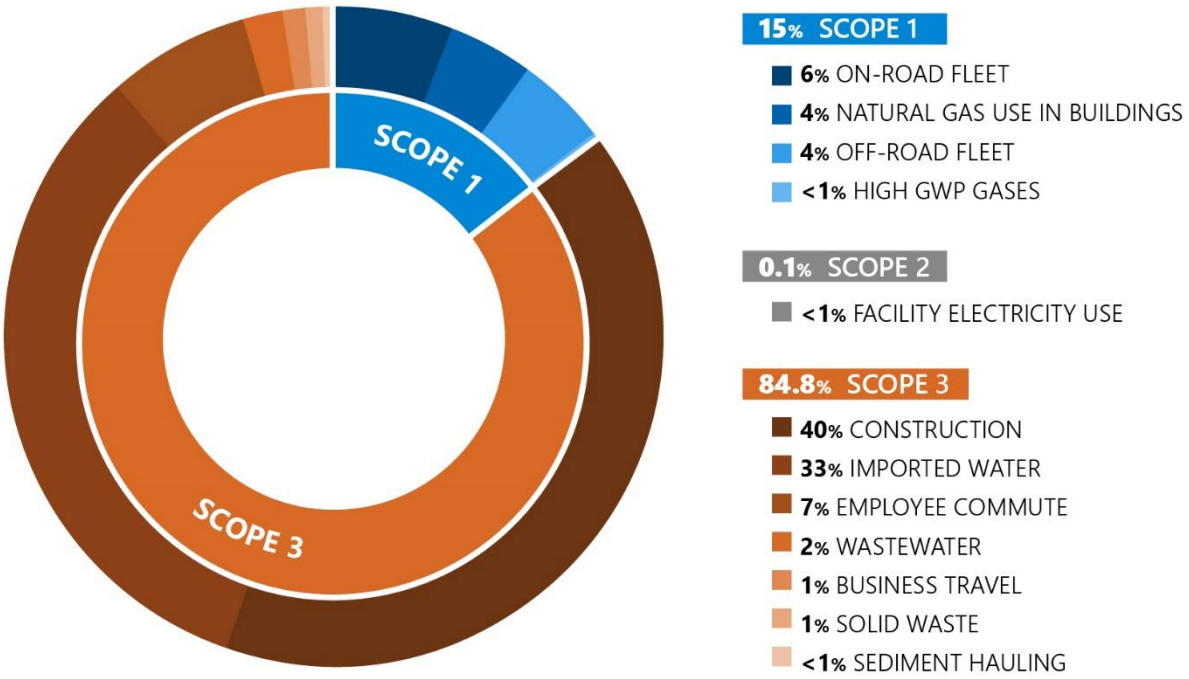
As shown in Table 2 and Figure 2, Valley Water's operations generated an average of 17,342 $MTCO_2e$ per year between 2017 and 2021.

Table 2 2017-2021 Valley Water GHG Emissions Inventory by Scope and Sector

Scope	Sector	Average GHG Emissions ($MTCO_2e$)	Percent of Total
1	On-Road Fleet	1,102	6.4%
	Natural Gas Use in Buildings	725	4.2%
	Off-Road Fleet	703	4.1%
	High GWP Gases	79	0.5%
	Scope 1 Total	**2,609**	**15.0%**
2	Electricity Use in Buildings	20	0.1%
	Scope 2 Total	**20**	**0.1%**
3	Construction	6,990	40.3%
	Imported Water	5,715	33.0%
	Employee Commute	1,219	7.0%
	Wastewater	343	2.0%
	Solid Waste	236	1.4%
	Business Travel	147	0.8%
	Sediment Hauling	62	0.4%
	Scope 3 Total	**14,713**	**84.8%**
Total		**17,342**	**100.0%**

Notes: GWP = global warming potential, $MTCO_2e$ = metric tons of carbon dioxide equivalent, NA = not applicable, kg= kilogram

Source: Prepared by Ascent in 2024.



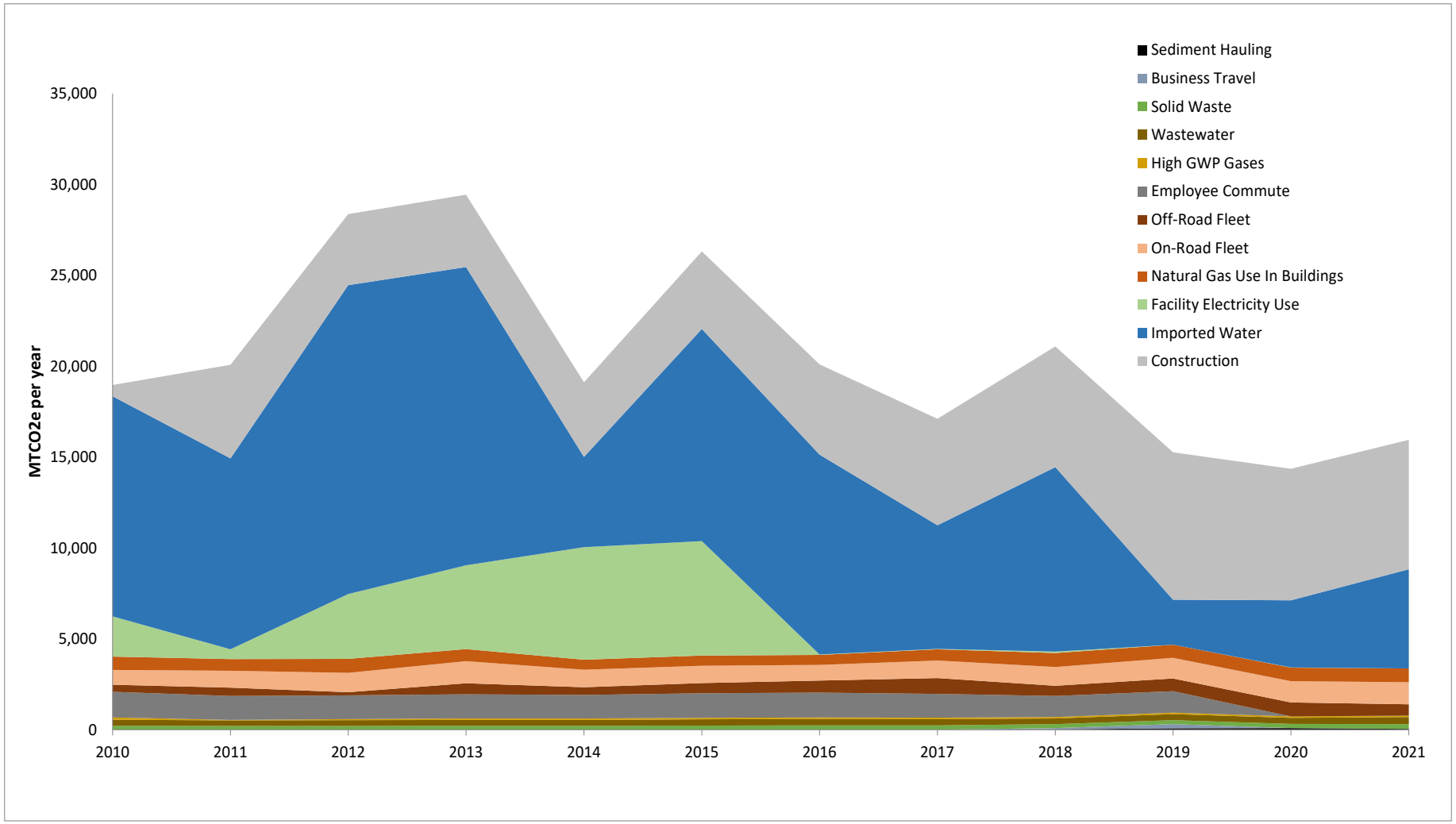
Source: Prepared by Ascent in 2024.

Figure 2 Valley Water Greenhouse Gas Baseline Emissions (2017-2021 Average)

In addition, Scope 3 emissions account for 85 percent of Valley Water's total emissions in 2017-2021, with 40 percent generated by construction-related activities and 33 percent from imported water. As previously mentioned, the CCAP did not include construction emissions. Thus, adding construction emissions to this GHGRP substantially increased Valley Water's emissions inventory relative to the CCAP, accounting for up to 53 percent of Valley Water's baseline emissions, depending on the year. Solid waste, high-GWP gases, and wastewater resulted in smaller increases of up to five percent of total emissions depending on the year.

Valley Water's historic emissions are higher than previously calculated under the CCAP due to the expansion of Scope 3 emissions accounting. However, the update shows that Valley Water's total annual emissions have decreased over the past decade. Imported water (accounting for 64 percent of emissions in 2010) was the largest single source in 2010, but emissions from this sector have declined. This is primarily due to decreased GHG emission factors for the electricity used to pump and treat water, despite interannual variability in the volume imported[2]. For example, by 2021, the imported water emissions factor declined to approximately 39 percent of its 2010 value. Emissions dropped substantially in 2016, as shown in Figure 3, because over 94 percent of Valley Water's energy has been provided through a Zero Carbon Water Portfolio purchase agreement with PRWPA. With this decline, Scope 3 construction-related emissions comprised a greater percentage of total emissions; in 2019, they accounted for 53 percent of Valley Water's emissions. Additional details of the results, methodology, and data used to develop the updated inventory can be found in Appendices A and D.

[2] Although the quantity of imported water fluctuated as well over this time period due to hydrological conditions, there was no meaningful upward or downward trend in that quantity; thus, the drop in imported water emissions is largely due to the decline in electric emissions factors just described.



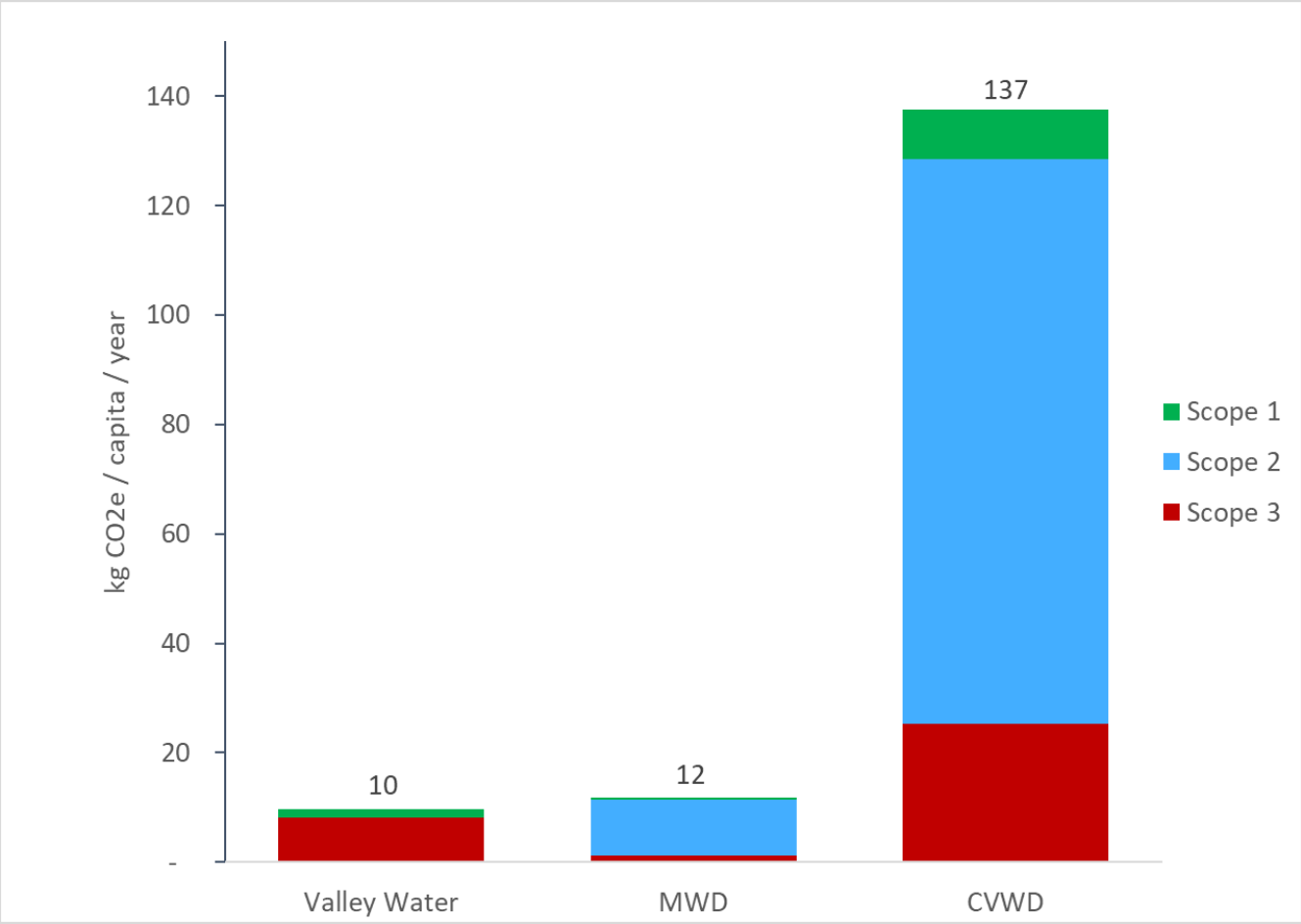
Notes: GHG = Greenhouse Gas, MT CO_2e = metric tons of CO_2-equivalent.

Source: Prepared by Ascent in 2024.

Figure 3 Valley Water Greenhouse Gas Emissions (2010 to 2021)

5 COMPARISON OF EMISSIONS INVENTORIES ACROSS WATER DISTRICTS

During the development of this GHGRP, the project team reviewed two other water district climate action plans (CAP), which are analogous to this GHGRP: the Coachella Valley Water District (CVWD) Climate Action and Adaptation Plan (September 2021) and the Metropolitan Water District of Southern California's (MWD's) Climate Action Plan (May 2022). The review helped to inform and contextualize Valley Water's inventory methodology, reduction goals, and measures among other water districts. On a per-capita basis (emissions per service population per year), Valley Water has lower emissions than these two water districts. Figure 4 below shows this graphically. Valley Water also has the largest proportion of Scope 3 emissions. To ensure comparability across these water districts, emissions related to wastewater treatment were removed from CVWD's totals, as Valley Water and MWD do not perform significant amounts of wastewater treatment.



Source: Prepared by Ascent in 2024.

Notes: MWD = Metropolitan Water District of Southern California; CVWD = Coachella Valley Water District; kg CO_2e = kilograms of carbon dioxide equivalent.

Emissions data from MWD (2022: 81) and CVWD (2021: 49); population data from Valley Water (2021b: 2), MWD (2022: 32), and CVWD (n.d.).

Figure 4 Annual Average Emissions per Capita Comparison Across Water Districts

In addition to the quantitative GHG values above, the following qualitative assessments were made of these plans:

- MWD and CVWD's plans set a carbon neutrality goal by 2045 but note several caveats. MWD stated that emissions have high interannual variability because they depend heavily on pumping water supplies, and thus, MWD uses a carbon budget-based approach (which measures total emissions over a range of years rather than reductions in a single year; see Chapter 7 for more details on carbon budget) to help achieve carbon neutrality (MWD 2022: ES.7). CVWD acknowledged that its suite of measures still resulted in emissions in 2045 and stated that future CAPs would have additional measures to achieve this goal (CVWD 2021: 53). However, both plans were finalized before the passage of AB 1279 in September 2022, which means that the State's carbon neutrality target by 2045 was not yet in effect.
- MWD and CVWD's plans describe carbon reduction pathways for Scope 1, 2, and 3 emissions sources (See Chapter 4 for an explanation of emission scopes), including the phase-out of natural gas combustion and the replacement of internal combustion engine vehicles with zero-emission vehicles (CVWD 2021: ES-6 through ES-7 and MWD 2022: 5.1 through 5.22).
- Neither plan quantified the reduction potential of all GHG reduction measures—instead, both districts labeled some measures as "supportive" in reducing GHG emissions (CVWD 2021: ES-7 and MWD 2022: 5.1 through 5.22). Note that Valley Water's GHGRP does estimate the potential of the proposed GHG reduction measures.
- Cost was an important issue, as water districts must balance the need for climate action with their ratepayers' need for affordable water. Therefore, CVWD removed measures from consideration that could result in a "significant" increase in costs (CVWD 2021: 54), and MWD resolved to update the implementation measures to balance the cost of providing water to its customers (MWD 2022: 5.3).
- Availability of technology dictated the pace and scale of climate action. For example, MWD divided its measures into "Phase 1" and "Phase 2." Phase 1 measures had already available technology, whereas Phase 2 measures required additional research and new or emerging technology (MWD 2022: ES.18).

6 VALLEY WATER'S GREENHOUSE GAS EMISSIONS FORECAST

To determine the level of GHG reductions needed to meet Valley Water's goals, it is necessary to forecast its emissions in future years. To this end, two forecasts were developed for this GHGRP, a Business-As-Usual (BAU) and a legislative-adjusted forecast. The BAU forecast extrapolates from historical trends and assumes that no additional action is taken beyond current levels by local, State, or federal agencies to reduce GHG emissions. The legislative-adjusted forecast begins with the BAU forecast as a starting point and accounts for the effects of the emissions-reducing policies detailed in Chapter 3. Both forecasts were developed based on trends identified in 2010-2021 data and consultation with subject matter experts at Valley Water on likely future trends in emissions drivers such as fuel usage, electricity usage, and construction activity.

6.1 LEGISLATIVE REDUCTIONS

In addition to the high-level State and regional policies and guidance listed in Chapter 3, the emissions forecast in this GHGRP considers the effects of specific emissions-reducing regulations, listed in Table 3 below. These are called "legislative reductions" and are assumed to reduce Valley Water's future emissions in specific sectors without any new actions from Valley Water.

Table 3 State of California Legislative Effects on Valley Water's GHG Emissions Reduction Measures

No.	Legislative Reduction	Description	Sectors Affected
1	SB 100 (Renewables Portfolio Standard)	Requires California energy utilities to procure 60 percent of electricity from renewable sources by 2030 and 100 percent carbon-free electricity by 2045.	Building Energy, Imported Water
2	SB 1020 (Clean Energy, Jobs, and Affordability Act)	Requires that 100% renewable electricity is procured to serve all State agencies by December 31, 2035 (this affects imported water received from the Department of Water Resources).	Imported Water
3	SB 1206 (Stationary Hydrofluorocarbon Reduction Measures)	Sets increasingly stringent prohibitions on the GWP content of bulk HFCs. In 2025, sales of HFCs with GWP over 2,200 are prohibited; in 2033, sales of HFCs with GWP over 750 are prohibited. Additionally, by January 1, 2025, CARB must post an assessment on its website specifying how to transition the state's economy, by sector, away from HFCs and to ultra-low or no GWP alternatives no later than 2035.	High-GWP[1]
4	SB 1383 (Short-Lived Climate Pollutant Reduction Strategy)	Targets a 40 percent reduction in methane and a 40 percent reduction in hydrofluorocarbons (e.g., high-GWP refrigerants) compared to 2013 levels by 2030. Includes specific targets for reducing organic waste in landfills.	Solid Waste, Wastewater, High-GWP[1]
5	Advanced Clean Car Standards (ACC)	Establishes GHG emission reduction standards for model years 2017-2025 that are more stringent than federal CAFE standards.	On-Road Fleet, Employee Commute, Business Travel, Construction Emissions
6	Advanced Clean Cars II (ACCII)	Assumes that 100 percent of new light-duty vehicle sales will be either ZEV or PHEV by model year 2035. Requirements will ramp up from a 35 percent requirement for the 2026 model year.	On-Road Fleet, Employee Commute, Business Travel, Construction Emissions
7	Advanced Clean Fleet (ACF)	Establishes zero-emissions targets for heavy-duty vehicles (such as utility trucks with a gross vehicle weight of over 8,500 pounds, dump trucks, and haulers) in California fleets.	On-Road Fleet, Construction Emissions

Notes: CAFE = Corporate Average Fuel Economy; CARB = California Air Resources Board; CEC = California Energy Commission; EPA = U.S. Environmental Protection Agency; GHG = greenhouse gas; HFC = hydrofluorocarbons; SB = Senate Bill; ZEV = zero emission vehicle; PHEV = plug-in hybrid electric vehicle; GWP = global warming potential.[1] The effects of SB 1383 do not impact Valley Water's future emissions because Santa Clara County is already implementing separate organic waste collection. Also, the State's Refrigerant Management Program, which supports the reduction of high GWP gases, is mainly focused on record keeping and mitigating leaks. The effects of SB 1206 are accounted for in the GHG reduction measures.

Source: Compiled by Ascent in 2024.

6.2 FORECAST RESULTS

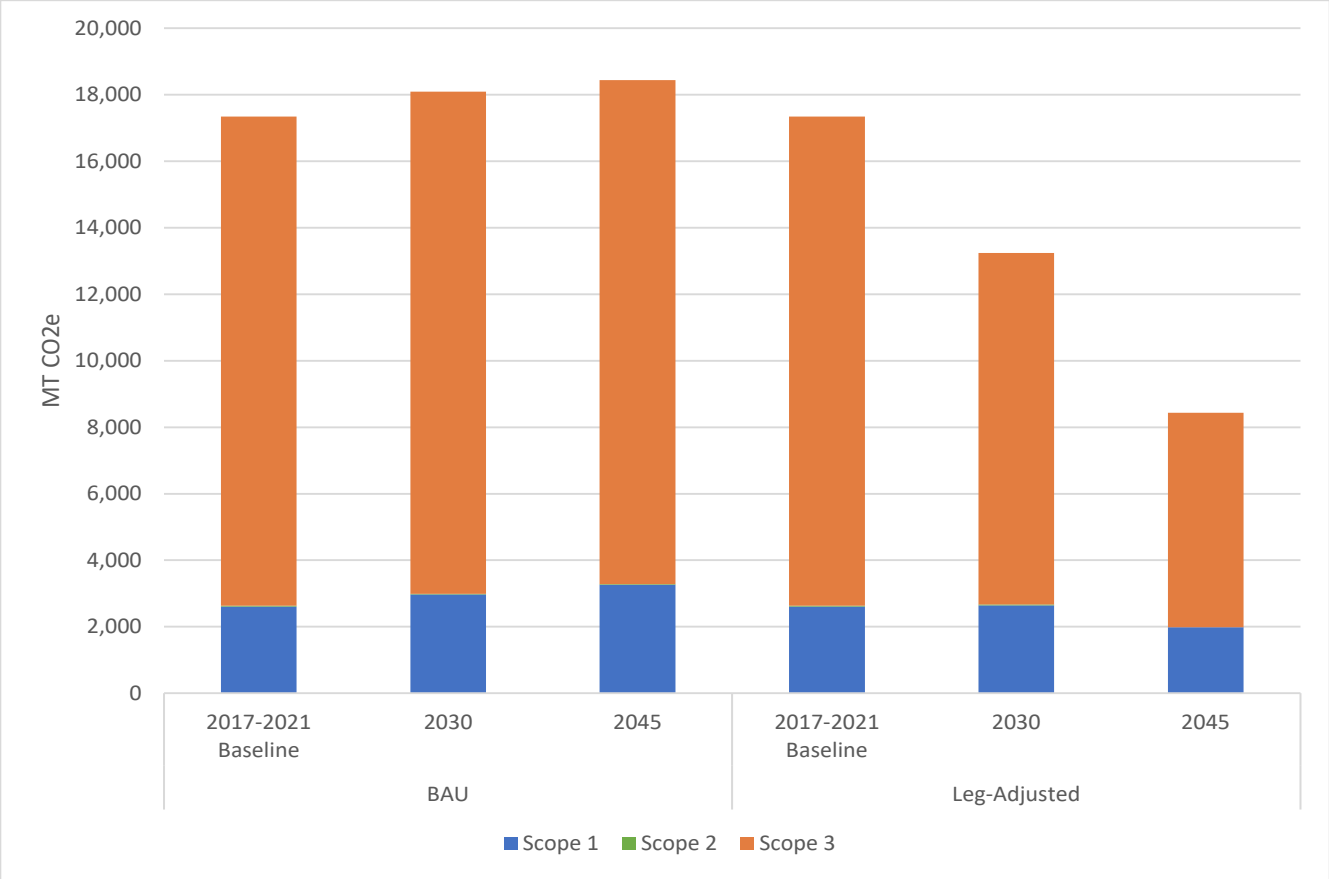
Table 4 shows the BAU and legislative-adjusted forecasts for 2030 and 2045 by emissions scope and sector. Figure 5 visually summarizes the same data to illustrate the trends over time. In the legislative-adjusted forecast, Valley Water's GHG emissions are expected to decline by 24 percent to 13,243 $MTCO_2e$ by 2030 and by 51 percent to 8,430 $MTCO_2e$ by 2045 relative to baseline values. These legislative-adjusted values are the starting point for the reduction measures described in this plan.

Table 4 BAU and Legislative-Adjusted Emissions Forecasts and Targets by Sector ($MTCO_2e$/year)

Scope	Sector	Baseline Emissions	BAU GHG Emissions		Legislative-Adjusted GHG Emissions	
		2017-2021	2030	2045	2030	2045
1	On-Road Fleet	1,102	1,212 (7%)	1,378 (7%)	890 (7%)	103 (1%)
	Natural Gas Use in Buildings	725	725 (4%)	725 (4%)	725 (5%)	725 (9%)
	Off-Road Fleet	703	952 (5%)	1,082 (6%)	952 (7%)	1,082 (13%)
	High GWP Gases	79	79 (0%)	79 (0%)	79 (1%)	79 (1%)
	Scope 1 Subtotal	**2,609**	**2,969 (16%)**	**3,264 (18%)**	**2,646 (20%)**	**1,990 (24%)**
2	Facility Energy	20	23 (0%)	23 (0%)	23 (0%)	0 (0%)
	Scope 2 Subtotal	**20**	**23 (0%)**	**23 (0%)**	**23 (0%)**	**0 (0%)**
3	Construction	6,990	8,115 (45%)	8,115 (44%)	7,384 (56%)	5,629 (67%)
	Imported Water	5,715	5,211 (29%)	5,270 (29%)	1,783 (13%)	0 (0%)
	Employee Commute	1,219	981 (5%)	981 (5%)	651 (5%)	129 (2%)
	Wastewater	343	343 (2%)	343 (2%)	343 (3%)	343 (4%)
	Solid Waste	236	236 (1%)	236 (1%)	236 (2%)	236 (3%)
	Business Travel	147	147 (1%)	147 (1%)	131 (1%)	104 (1%)
	Sediment Hauling	62	62 (<1%)	62 (<1%)	47 (<1%)	(<1%)
	Scope 3 Subtotal	**14,713**	**15,095 (83%)**	**15,155 (82%)**	**10,574 (80%)**	**6,441 (76%)**
Total		**17,342**	**18,087 (100%)**	**18,442 (100%)**	**13,243 (100%)**	**8,430 (100%)**
Percent Change from Baseline Levels		**NA**	**4%**	**6%**	**-24%**	**-51%**

Notes: BAU = Business-As-Usual; $MTCO_2e$ = metric tons of carbon dioxide equivalent, GWP = global warming potential, GHG = greenhouse gas, NA = not applicable.

Source: Prepared by Ascent in 2024.



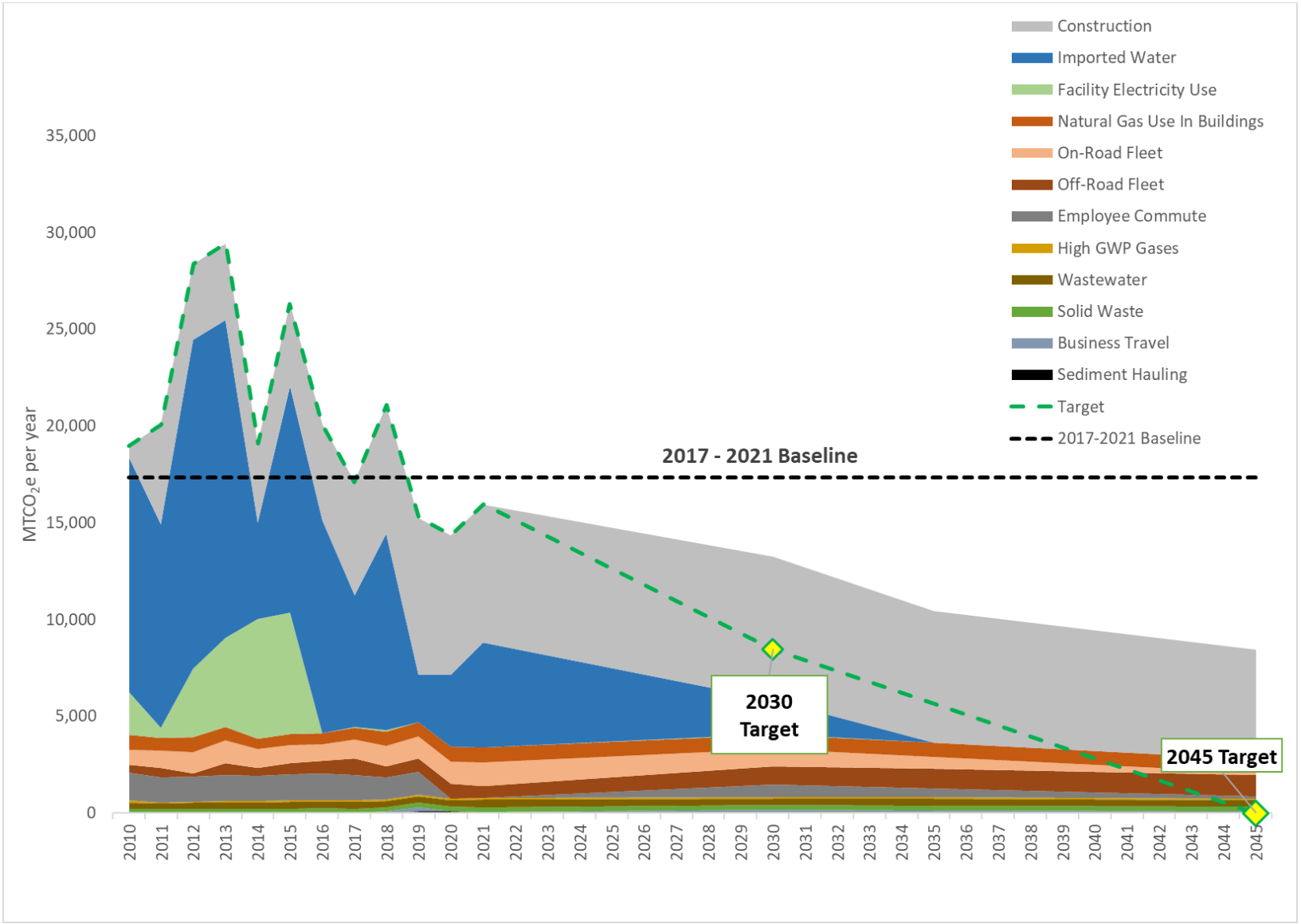
Note: Valley Water's Scope 2 emissions are included in this graph but are less than 25 MTCO2e/year.

Source: Prepared by Ascent in 2024.

Figure 5 Business-As-Usual and Legislative-Adjusted Forecast Emissions Forecasts ($MTCO_2e$/year)

Emissions reductions are primarily due to the State's progression toward a carbon-neutral electricity grid and cleaner vehicles, as detailed in Table 3 (Legislative Reductions). Reduced emissions from the electricity grid and vehicles result in less emissions from Valley Water's on-road fleet, facility energy, construction, imported water, employee commute, business travel, and sediment hauling. Based on existing data, activity and emissions from other sectors, such as facility natural gas and high-GWP gas use and solid waste and wastewater production, are anticipated to remain unchanged in the forecast. The emissions forecasts and comparisons to 2017-2021 baseline emissions are shown in Table 4 and Figure 6. A detailed description of the underlying assumptions can be found in Appendix D.

With the implementation of legislative reductions from SB 1020 and SB 100, electricity for importing water becomes cleaner, and the associated emissions from imported water are expected to be reduced. As a result, construction-related emissions are anticipated to dominate Valley Water's future emissions profile. By 2045, construction emissions are predicted to account for 67 percent of Valley Water's total emissions—up from 40 percent in the baseline. Emissions from future projects with CEQA mitigation measures requiring net-zero construction emissions, including the Anderson Dam Seismic Retrofit Project and Pacheco Reservoir Expansion Project, are not included in the GHGRP construction emissions forecast. Although construction emissions will make up a larger share of the emissions portfolio, absolute construction emissions are forecasted to decrease over time from the baseline of 6,990 $MTCO_2e$/year to 5,629 $MTCO_2e$/year by 2045. This underscores Valley Water's aspiration to reduce construction-related emissions beyond Valley Water's direct control.



Source: Prepared by Ascent in 2024.

Figure 6 Legislative-Adjusted Emissions Forecasts by Sector with Targets ($MTCO_2e$/year)

7 TARGET SETTING

Establishing a GHG emissions reduction goal, commonly referred to as a "GHG reduction target," is a key step in the local GHG reduction planning process. Valley Water's updated GHG emissions inventory and forecast provide a basis for target setting by understanding the relative changes needed to meet emissions targets. They also provide a benchmark against which future GHG reductions can be tracked. Local GHG reduction targets are often developed in a way that is consistent with statewide GHG emissions goals or targets established under State law.

The State's current GHG reduction targets were established by SB 32 and AB 1279 and incorporated into the State's most recent Climate Change Scoping Plan. They include the following:

- Reduce statewide anthropogenic GHG emissions to 40 percent below 1990 levels by 2030 (SB 32);
- Reduce statewide anthropogenic GHG emissions to 85 percent below 1990 levels by 2045 (AB 1279); and
- Achieve statewide net zero GHG emissions (i.e., "carbon neutrality") no later than 2045 and achieve and maintain net negative GHG emissions after that (AB 1279).

AB 1279 defines net zero GHG emissions as any remaining GHGs emitted into the atmosphere by 2045 must be balanced by removals of GHG emissions over the same time. AB 1279 further defines "removals" to include a range of carbon capture, utilization, and storage (CCUS) activities to be managed under a statewide regulatory program.

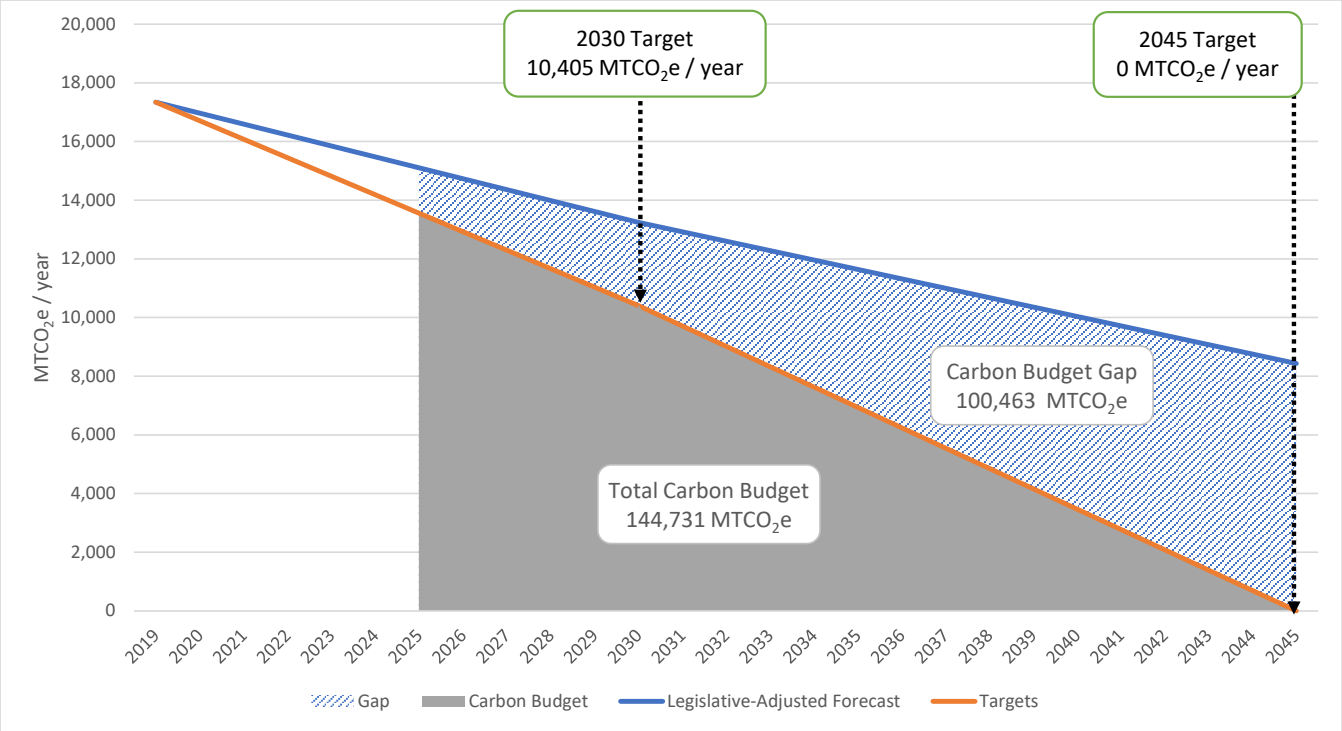
The State's 2030 and 2045 targets are aligned with the scientifically established levels needed to limit the rise in global temperature to no more than 2 degrees Celsius (°C), or 3.6 °F, above pre-industrial levels. A 2 °C rise in global temperature is the warming threshold at which major climate disruptions, such as mega-droughts and rising sea levels, are projected. These targets also pursue efforts to limit the global temperature increase even further to no more than 1.5 °C, or 2.7 °F, in alignment with the goals of the United Nations Framework Convention on Climate Change (UNFCC) Paris Agreement of 2015 (United Nations 2015).

7.1 TARGETING CARBON NEUTRALITY BY 2045

Consistent with SB 32 and AB 1279, statewide targets under the 2022 Scoping Plan, and guidance from the BAAQMD, Valley Water is targeting a 40 percent reduction in annual emissions from its 2017-2021 baseline by 2030 and net zero emissions by 2045. The 2030 target meets and exceeds the State's target set by SB 32 to reduce emissions to 40 percent below 1990 levels. Although information to estimate Valley Water's emissions in 1990 was unavailable, the State's 2030 target is approximately 35 percent below the state's average emissions between 2017 and 2021, less aggressive than Valley Water's 40 percent reduction target by 2030. These targets are based on comparing annual emissions (e.g., $MTCO_2e$/year).

These targets were then translated into a carbon budget, discussed further in Chapter 7.2, for 2025 to 2045. A carbon budget limits cumulative GHGs emitted over a set time frame. This limit is equivalent to the sum of annual GHG emissions that, across a set number of years, follow a linear trajectory toward achieving the emissions reduction targets (see Figure 7). Based on the 2045 zero emissions target, Valley Water's total carbon budget is 144,731 $MTCO_2e$ for the GHGs emitted between 2025 and 2045. To be consistent with this target, Valley Water's total emissions from 2025 to 2045 must be less than or equal to this amount to remain within the budget. 2025 is likely when implementation of this GHGRP will begin and as such, was chosen as the year in which emissions accounting under the carbon budget would begin.

Figure 7 below shows this concept graphically. The gray-shaded area represents the carbon budget, and the blue-striped "gap" between the legislative-adjusted forecast and the targets line represents additional reductions that must be achieved by the measures described in Chapter 8. The orange line shows that the planned annual emissions that form the carbon budget follow a trajectory from the baseline level to zero by 2045. The baseline shown in Figure is the average annual emissions between 2017-2021, assigned to the year 2019 and the median year between 2017 and 2021.



Notes: $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Prepared by Ascent in 2024.

Figure 7 Legislative-Adjusted Forecast, Targets, and Carbon Budget, 2025-2045

7.1.1 Emissions Reduction Target Alignment with CEQA

These targets, as aligned with SB 32 and AB 1279, provide the basis for the GHGRP's use as a qualified plan adopted to reduce emissions of GHGs. Concerning GHG emissions, CEQA Guidelines Section 15064.4(a) states that lead agencies "shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions resulting from a project. The CEQA Guidelines note that an agency has the discretion to either quantify a project's GHG emissions or rely on a "qualitative analysis or performance-based standards" (Section 15064.4[a]). A lead agency may use a "model or methodology" to estimate GHG emissions and has the discretion to select the model or methodology it considers "most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change" (Section 15064.4[c]). The CEQA Guidelines provide that the lead agency should consider the following when determining cumulatively considerable impacts from GHG emissions on the environment (Section 15064.4[b]):

1. *The extent a project may increase or reduce GHG emissions as compared to the existing environmental setting.*
2. *Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.*
3. *The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.*

As proposed, the GHGRP and its targets satisfy these criteria by providing a framework for future projects' contribution of GHG emissions above baseline conditions and serves as a threshold that is inherently tied to the State's long-term GHG reduction targets using Valley Water's local, independent inventory.

After adopting the GHGRP, future Valley Water projects may tier from the GHGRP under CEQA, and this GHGRP establishes a pathway to ensure Valley Water's operations do not result in a cumulatively considerable level of emissions

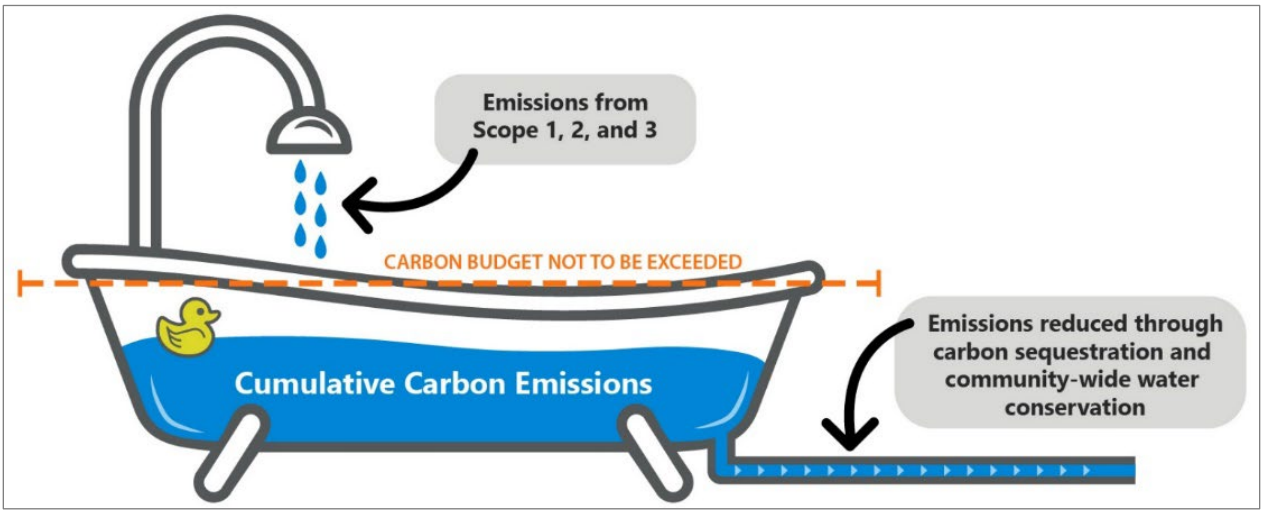
by committing to net zero emissions by 2045. This level of commitment is consistent with AB 1279, the guidance outlined in the CARB's 2022 Climate Change Scoping Plan (Scoping Plan), and the BAAQMD's 2022 CEQA Guidelines. Under the latest Scoping Plan, the State also aims to achieve carbon neutrality by 2045 but does so with carbon dioxide removal (CDR) technologies and sequestration to achieve carbon neutrality (CARB 2022a). Although access to CDR technologies is currently infeasible for Valley Water, Valley Water has a significant role in local conservation, restoration, and enhancement of riparian lands, wetlands, and other aquatic cover types, which could help offset Valley Water's anthropogenic GHG emissions. The role of increasing carbon sequestration is discussed in Chapter 8.

7.2 THE CARBON BUDGET CONCEPT

Traditionally, CAPs prepared by cities and counties set a GHG reduction target by which a community or agency's operations should reduce their annual emissions in a particular future year (e.g., 40 percent reduction in annual emissions below baseline levels by 2035). These targets are based on communitywide emissions that are generally consistent year-to-year, except under extreme socioeconomic or environmental circumstances. However, as a water district, Valley Water's GHG emissions often vary year to year, primarily based on the availability of local water resources (which affect its demand for imported water) and the need to perform construction projects.

With this variable emissions trend, a traditional approach to targeting a percent reduction in annual emissions from a past baseline year could result in the unintended consequence of exceeding a particular year's GHG reduction target. To address this issue, the GHGRP uses a carbon budget approach similar to that adopted by the Metropolitan Water District of Southern California (MWD) in their CAP (MWD 2022).

Figure 8 provides a visual aid to explain the carbon budget approach: a bathtub. A bathtub has an inflow, a holding capacity, and an outflow. The water circulated in this bathtub represents emissions. In the case of the carbon budget concept, the inflow represents emissions generated from Valley Water operations and construction activities, and the outflow represents emissions reduction credits from carbon sequestration and community-wide water conservation. When the inflow increases and the outflow decreases, water begins to accumulate in the bathtub (i.e., cumulative emissions); the capacity of the bathtub represents the total carbon budget. To stay within budget (i.e., keep the tub from overflowing), the inflow can either decrease through the reduction of operational and construction emissions implemented through the GHGRP measures, or the outflow can increase through the implementation of increased community-wide water conservation and local carbon sequestration. Any imbalance of these flows, over time, can result in the tub becoming overfilled, representing an exceedance of the carbon budget. Tracking the rate of these flows and the accumulation in the "tub," as well as the ability to change the flow is essential for remaining under the budget to achieve Valley Water's carbon neutrality goals by 2045.



Source: Prepared by Ascent in 2024.

Figure 8 Carbon Budget Illustration

8 GREENHOUSE GAS REDUCTION MEASURES

Identifying and implementing GHG reduction measures to reduce Valley Water's contribution to its carbon budget is essential to achieving Valley Water's carbon neutrality objectives. Meeting this target will require unprecedented levels of investment in zero-emission on-road and off-road vehicles, building decarbonization, waste reduction, and a serious commitment to conserving and enhancing natural lands, thereby increasing carbon sequestration. As was previously mentioned and discussed further below, Valley Water's jurisdiction is limited, especially for Scope 3 emissions, which, by definition, are caused indirectly. Valley Water cannot unilaterally mandate that its contractors or employees perform specific actions. Furthermore, Valley Water has an obligation to its ratepayers to provide safe, clean water—a necessity for all life—at an affordable rate, and thus must balance the implications of additional costs and the resulting rate effects on low-income customers. Despite these challenges, Valley Water is committing to reach a target of net zero emissions for Scopes 1, 2, and, as feasible, Scope 3.

This chapter proposes 11 measures reducing emissions across Valley Water's emissions sources from all scopes and providing Scope 3 emissions credits through water conservation and carbon sequestration. It establishes a pathway to carbon neutrality consistent with AB 1279 and CEQA Guidelines Section §15183.5(b)(1)(D). The final adoption of these measures is subject to future Valley Water Board approval.

Table 5 and Figure 9 below summarize the list of GHGRP measures, presented by scope, and the anticipated reductions resulting from implementing each measure. The GHG reduction values are shown as cumulative reductions for two periods: 2025 through 2030 and 2025 through 2045. The cumulative reductions by 2030 and 2045 are compared against the cumulative emissions under the legislative adjusted forecast and the allowed carbon budget by those years. If successfully implemented, the proposed measures would achieve a 43 percent reduction in annual emissions below the baseline by 2030 and carbon neutrality by 2045 with support from carbon sequestration-related actions. As construction emissions are forecasted to comprise the majority of Valley Water's emissions in 2045, much of the proposed measure reductions are focused on construction activities. Note that no Scope 2 measures were proposed because electricity, the only emissions source under that scope, does not currently and will not generate GHG emissions in the future under Valley Water's subscription to PWRPA's Zero Carbon Water portfolio.

A detailed discussion of each measure is included under "8.1 Measure Details."

Table 5 Cumulative GHG Reductions from Measures in 2030 and 2045 ($MTCO_2e$)

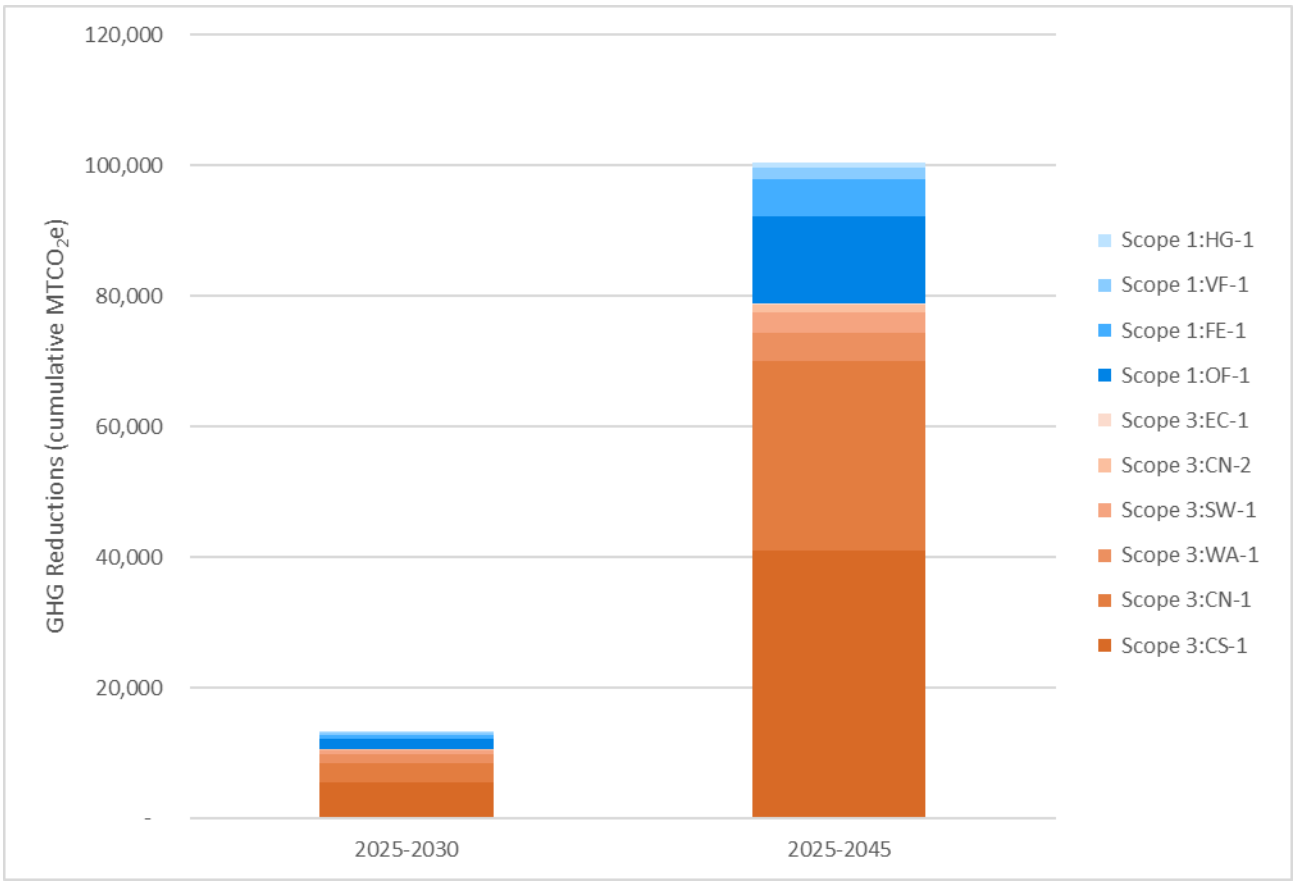
Sector	Measure Number	Measure Name	Measure Description	2025-2030 Cumulative Reduction	2025-2045 Cumulative Reduction
Scopes 1 and 2					
Fleet	VF-1	Zero Carbon On-Road Fleet	Convert 35% of Valley Water's on-road fleet fuel use to zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) by 2030, and 100% by 2045.	305	1,842
Fleet	OF-1	Zero Carbon Off-Road Fleet	Require the use of zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) instead of conventional diesel in 50% of Valley Water's off-road fleet by 2030, and 100% by 2045.	1,428	13,416
High GWP Gases	HG-1	Phase Out High-GWP refrigerants	Replace high-GWP refrigerants with low-GWP alternatives above and beyond the requirements of SB 1206.	122	734
Facility Energy	FE-1	Facility Electrificatio n	Electrify 30% of existing facility natural gas use by 2030, and 60% by 2045.	653	5,656
Total Scope 1 Reductions				2,508	21,648

Sector	Measure Number	Measure Name	Measure Description	2025-2030 Cumulative Reduction	2025-2045 Cumulative Reduction
Scope 3					
Employee Commute	EC-1	Reduce Employee Commute Emissions	Implement incentives to encourage employees to reduce their VMT or reduce emissions from their commute vehicle.	39	171
Solid Waste	SW-1	Increase Solid Waste Diversion	Divert 80% of waste from Valley Water offices from landfills by 2030, and 90% by 2045. Improve solid waste tracking by conducting regular assessments of waste characterization.	472	3,147
Construction	CN-1	Zero Carbon Off-Road Construction Equipment	For all contracted construction projects, require the use of zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) instead of conventional diesel in 17% of off-road construction equipment fuel use in equipment greater than 25 hp by 2030, and 45% by 2045 regardless of the engine Tier.	2,855	28,949
Construction	CN-2	Zero Carbon On-Road Construction Vehicles	For all contracted construction projects, require the use of zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) instead of conventional fuel in 35% of on-road construction vehicle fuel use by 2030, and 95% by 2045.	312	1,229
Water Conservation	WA-1	Increase Water Conservation	Increase communitywide water conservation to 98,800 acre-feet per year by 2030 and 118,000 acre-feet per year by 2045.	1,448	4,263
Carbon Sequestration	CS-1	Sequester Carbon	Sequester carbon in habitat enhancement and restoration projects. Collaborate with regional conservation agencies to identify projects that are beyond project mitigation.	5,522	41,056
Offsets	CS-2	Purchase Carbon Offsets	Purchase carbon offsets from verified offset registries, prioritizing local or regional projects and, if necessary, projects outside of the state, but within the United States. Prohibit carbon offset purchases that are unverified or located outside the United States.	Not Quantified	Not Quantified
			Total Scope 3 Reductions	10,649	78,815
			Total Cumulative Reductions (all scopes)	13,157	100,463
			Legislative-adjusted forecast emissions (before measure reductions)	85,049	245,194
			Legislative-adjusted forecast emissions (after measure reductions)	71,893	144,731
			Allowed Carbon Budget	71,893	144,731

Notes: VMT = Vehicle Miles Traveled, $MTCO_2e$ = metric tons of carbon dioxide equivalent, GHG = greenhouse gas emissions, BMP = best management practices.

[1] Also impacts Scope 3 emissions from Employee Commute.

Source: Modeled by Ascent in 2024.



Source: Prepared by Ascent in 2024.

Figure 9 Cumulative GHG Reductions from GHGRP Measures in 2030 and 2045

The discussion below presents the details of each measure. For each measure, a short measure summary is provided, followed by the context of the measure in terms of Valley Water operations, substantiation of specific measure targets, if any, the calculation assumptions, and the resulting estimated cumulative reductions. Additionally, the discussion recommends specific implementation actions and are categorized as either "quantified" or "supportive." These actions are described as "quantified" if they were directly used in the calculation of a measure's GHG reduction potential. "Supportive" actions were not quantified but are essential to support the successful implementation of the measure (e.g., annual reporting and updating purchasing policies).

8.1 SCOPE 1 REDUCTION MEASURES

VF-1: Zero Emission On-Road Fleet

Convert 35% of on-road fleet fuel use to zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) by 2030, and 100% by 2045.

Under current practices, Valley Water-owned on-road vehicles (including passenger cars, pickup trucks, and heavy-duty trucks) are replaced at the end of their life (generally around 100,000 miles or 10 years) with hybrid or zero-emission vehicles (ZEVs). Under ACCII, an increasing number of new light-duty vehicle sales are required to be zero-emission vehicles, and under ACF, an increasing percentage of local government agencies' heavy-duty fleets must be ZEVs. As these regulations are implemented, 27 percent of Valley Water's on-road vehicles are projected to be ZEVs by 2030 and 93 percent by 2045—see Section 2.3 of Appendix D for more details on how ACCII and ACF were used to derive these projections. VF-1 proposes that Valley Water exceed these projections to achieve a 35 percent ZEV fleet by 2030 and a 100 percent ZEV fleet by 2045; these values are 8 and 7 percent above the 2030 and 2045 legislative-adjusted forecast, respectively.

2030 Target	2045 Target
35% of Valley Water's on-road fleet uses zero-emission fuels.	100% of Valley Water's on-road fleet uses zero-emission fuels.
Install 10 electric vehicle charging stations	Install 20 electric vehicle charging stations
Cumulative Reduction Potential by 2030: 305 $MTCO_2e$	**Cumulative Reduction Potential by 2045: 1,842 $MTCO_2e$**

- **Quantified Action VF-1.1:** Require an expansion of ZEV procurement during vehicle replacement or fleet growth, where available and financially feasible, such that 35 percent of Valley Water's on-road fleet fuel use comes from zero-emission fuels by 2030 and 100 percent by 2045.
- **Supportive Action VF-1.2:** Install up to 10 electric vehicle charging stations by 2030 and 20 by 2045 per CALGreen Tier 2 standards.

Calculation Assumptions

During the baseline period, the majority of Valley Water's on-road fleet was all gasoline or diesel vehicles, with a weighted average emissions factor of approximately 628 grams CO_2e per vehicle mile traveled (VMT). ACF and ACCII are expected to increase the penetration of zero-emission vehicles in the fleet, so this emissions factor is expected to drop to 461 grams CO_2e per VMT in 2030 and 47 grams CO_2e per VMT in 2045. This implies that 73 percent of the fuel used in the fleet would be from gasoline and diesel use in 2030, and 7 percent in 2045. Under Measure VF-1, those percentages would further decrease to 65 percent in 2030 and 0 percent in 2045. These rates are applied to forecast future fleet growth based on historical fuel use trends in Valley Water's fleet.

OF-1: Zero Emission Off-Road Fleet

Convert 50% of Valley Water's off-road fleet conventional diesel use to zero-emission fuels in 2030 and 100% by 2045, regardless of engine tier.

Off-road vehicles and equipment, such as excavators and bulldozers, are typically fueled by diesel. However, zero-emission technologies exist, such as electric lawn and garden equipment, and electric backhoes. Additionally, renewable diesel is readily available, with 24 stations already operating in Santa Clara County, according to the U.S. Department of Energy (DOE) (DOE 2023a). Renewable diesel is sourced solely from renewable sources, similar to B100 biodiesel, but is chemically identical to conventional diesel and can be used in its place without the need for new equipment or modifications. The combustion of renewable diesel is biogenic, resulting in net zero carbon emissions by returning the carbon sequestered from biological activities back into the atmosphere. Thus, for the purposes of this GHGRP, the combustion of renewable diesel and biodiesel is counted as zero-emissions. This is consistent with CARB's GHG reduction strategies and the state's GHG inventories, which do not count biogenic CO_2 towards the total GHG emissions allowed by AB 32 (CARB 2022b: 12-13). Additionally, it is consistent with guidance from Local Governments for Sustainability (also known as the International Council for Local Environmental Initiatives, or ICLEI), which states that biogenic carbon emissions are part of the short-term carbon cycle and, thus, should not be added to any inventory total (Local Governments for Sustainability 2013: 5).

OF-1 proposes that Valley Water uses either zero-emission off-road fleet equipment or zero-emission fuels (e.g., renewable diesel) to replace 50 percent of conventional fuel use in its off-road fleet by 2030 and 100 percent by 2045. As of 2024, 100 percent of diesel dispensed at Valley Water's headquarters fueling station is renewable diesel. While zero-carbon emissions fuels, such as renewable diesel, are sufficient in achieving the climate goals of the GHGRP, true zero-emissions vehicles emit neither direct GHG emissions nor direct criteria air pollutant emissions. As such, under OF-1, Valley Water would maintain existing renewable diesel usage and expand the use of other zero-emissions fuels, such as electric alternatives, where feasible. Electric alternatives have additional air quality benefits, such as zero criteria air pollutants, that renewable diesel does not. In cases where new zero-emission off-road technology is unavailable or financially infeasible, this measure is designed to be flexible to enable Valley Water to determine how it can achieve zero carbon emissions from its off-road fleet. Progress toward these targets will be subject to market availability, operational feasibility, and emerging technologies that meet Valley Water's requirements. This phased approach provides flexibility to adapt to evolving market conditions while advancing sustainability goals. Additional discussion about the current and future availability of renewable diesel and the accounting of biogenic emissions from renewable diesel can be found in Appendix C.

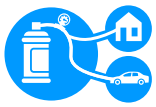
2030 Target	2045 Target
50% of Valley Water's off-road fleet fuel use is from zero-emission fuels.	100% of Valley Water's off-road fleet fuel use is from zero-emission fuels.
Cumulative Reduction Potential by 2030:	**Cumulative Reduction Potential by 2045:**
1,428 $MTCO_2e$	**13,416 $MTCO_2e$**

- **Quantified Action OF-1.1:** Require the use of zero-emission fuels or purchase and use of zero-emission equipment during vehicle replacement or fleet growth, such that 50 percent of Valley Water's off-road fleet fuel use comes from zero-emission fuels by 2030 and 100 percent by 2045.

Calculation Assumptions

In the legislative-adjusted scenario, emissions in this sector are expected to increase over time due to increased conventional diesel fuel usage (10 percent over the 2017 – 2021 maximum for 2030, and 25 percent over the 2017 - 2021 maximum for 2045; [Young, pers. comm., 2023]). Implementation of this measure would result in a reduction of these emissions by 50 percent and 100 percent in each of those years. This reduction is driven, in part, by the CARB Off-Road

Regulation. This regulation requires that beginning January 1, 2024, all California fleets procure and use R99 or R100 renewable diesel fuel in vehicles subject to the regulation, with limited exceptions (such as vehicles in captive attainment areas, fleets that already have Tier 4 off-road engines, or vehicles operating in cold weather) (CARB 2023b). The rest of the reduction is assumed to be due to the use of other zero-emission fuels, such as electricity, renewable diesel, and hydrogen (the use of which goes above and beyond the Off-Road Regulation). This measure applies to the off-road fleet operated by Valley Water and does not pertain to off-road equipment used by Valley Water contractors, which is addressed by Measure CN-1.



HG-1: Phase Out High-GWP Refrigerants

Replace high-GWP refrigerants with low-GWP alternatives above and beyond the requirements of SB 1206.

High-GWP gases account for less than 1 percent of Valley Water's total emissions, but as a Scope 1 source, Valley Water has direct control over these emissions. Refrigerant leakage and resulting fugitive emissions are the primary sources of emissions of high-GWP gases from the Valley Water facility and vehicle cooling demands. High-GWP gases have the potential to warm the earth's atmosphere hundreds to thousands of times more than CO_2. For example, a common refrigerant used in Valley Water facilities and vehicles is R-134a, which is 1,430 times more insulative than CO_2 in the atmosphere. Under SB 1206, CARB requires all refrigerants sold to have less than 750 GWP by 2035. Some examples of ultra-low GWP refrigerants that have less than 750 GWP include R-454B, R-123, and R-30 – a list is available on CARB's website (CARB 2024b). Under HG-1, Valley Water would exceed State requirements by meeting this requirement five years earlier.

2030 Target	2045 Target
100% of refrigerants purchased must be rated as low-GWP, having less than 750 GWP	100% of refrigerants purchased must be rated as low-GWP, having less than 750 GWP
Cumulative Reduction Potential by 2030:	**Cumulative Reduction Potential by 2045:**
122 $MTCO_2e$	**734 $MTCO_2e$**

- **Quantified Action HG-1.1:** Adopt an internal policy to require that all purchases of refrigerants be for low-GWP refrigerants by 2030.

Calculation Assumptions

Valley Water's refrigerants currently have a weighted average current GWP of 1,542. SB 1206 prohibits the sale of HFCs with a GWP greater than 750, starting in January 2033 (CARB 2023c). Valley Water plans to accelerate compliance with this requirement, achieving it by January 2030. Thus, compliance with this requirement would reduce Valley Water's refrigerants' weighted average GWP by approximately 51 percent.

FE-1: Facility Electrification

Electrify 30% of existing facility natural gas use by 2030, and 60% by 2045.

Natural gas consumption in buildings and facilities accounts for four percent of GHG emissions generated by Valley Water operations and 52 percent of emissions from facility operations. Decarbonizing existing buildings by replacing gas appliances with electric alternatives is critical to reducing GHG emissions from facilities. Electric alternatives to space and water heating, such as heat pumps, are already available. Under HG-1, Valley Water would gradually transition Valley Water's facilities to all-electric, targeting electrification of 30 percent of existing energy use by 2030 and 60 percent by 2045. Valley Water does not anticipate new buildings to be built through 2045.

2030 Target	2045 Target
30% of natural gas use is replaced with electricity.	60% of natural gas use is replaced with electricity.
Cumulative Reduction Potential by 2030:	**Cumulative Reduction Potential by 2045:**
653 $MTCO_2e$	**5,656 $MTCO_2e$**

- **Supportive Action FE-1.1:** At the end of their usable life, replace natural gas appliances and HVAC systems with electric alternatives.
- **Supportive Action FE-1.2:** Perform an internal review of all facilities and identify opportunities for electrification, prioritizing the replacement of older equipment first. For more challenging transitions, such as for large-scale building heating systems, conduct a formal study with a commercial or industrial energy consultant to identify feasible electrification solutions, as necessary.

Calculation Assumptions

Valley Water currently uses natural gas stoves and HVAC equipment in some of its buildings and is targeting the replacement of 30 percent of natural gas use by 2030 and 60 percent by 2045. The 2045 target is similar to that of a study estimating that 65 percent of existing commercial building stock in California could be retrofitted by 2050 (Mozingo 2021: xviii). It is assumed that the electricity used as the heat source in these buildings is procured from PWRPA's zero-carbon portfolio; thus, there would be no additional emissions from electricity.

8.2 SCOPE 3 REDUCTION MEASURES

EC-1: Reduce Employee Commute Emissions

Implement incentives to encourage employees to reduce their VMT or reduce emissions from their commute vehicle.

Emissions from employee commute trips make up seven percent of Valley Water's emissions, but these emissions are anticipated to decline in the future under ACCII. Even so, Valley Water is committed to addressing all emissions sources in this GHGRP. Although Valley Water does not have direct control over the commute choices of its employees, it can influence them by offering incentives to reduce VMT. Valley Water currently offers preferential parking for carpools, EV charging, and bicycle amenities such as secured bike parking. Other approaches Valley Water could explore include providing subsidized or free transit passes, a bike tool library, bike-to-work events, and subsidies for bicycle-related expenses. However, the California Air Pollution Control Officer Association (CAPCOA) recognizes that these types of voluntary measures have limited effectiveness (CAPCOA 2021: 83-84). Valley Water does not anticipate a net increase in the number of employees through 2045.

2030 Target	2045 Target
Implement at least 50% of the commute emissions reduction programs listed under EC-1.	Implement 100% of the commute emissions reduction programs listed under EC-1.
Cumulative Reduction Potential by 2030:	**Cumulative Reduction Potential by 2045:**
39 $MTCO_2e$	**171 $MTCO_2e$**

- **Supportive Action EC-1.1**: Evaluate the possibility of offering free or subsidized transit passes to all employees.
- **Supportive Action EC-1.2:** See Action VF-1.2
- **Supportive Action EC-1.3:** Evaluate the status of existing bicycle facilities and amenities at Valley Water office buildings and identify areas of improvement. Install or improve bicycle facilities and amenities, if necessary, to:
  - Continue providing and ensuring that existing bicycle parking facilities are 1) secured either indoors, 2) secured in outdoor lockers, or 3) secured in outdoor racks with video monitoring.
  - Continue offering well-maintained on-site showers.
  - Make available a secured bicycle tool library and tire pumps at or near bicycle parking facilities to assist with any on-site maintenance needs.
- **Supportive Action EC-1.4:** Encourage cycling through holding bike-to-work events and prizes.
- **Supportive Action EC-1.5:** Expand preferential parking for carpools and ZEVs.

<u>Calculation Assumptions</u>

This measure assumes that in 2030 and 2045, 50 and 100 percent of the actions recommended in this measure would be implemented, respectively. These actions are assumed to directly apply to forecasted emissions from employee commutes. This program is assumed to reduce VMT by 4 percent (California Air Pollution Control Officers Association 2021: 83-84).

SW-1: Increase Solid Waste Diversion

Divert 80% of waste from Valley Water offices from landfills by 2030, and 90% by 2045. Improve solid waste tracking by conducting regular assessments of waste characterization.

Employee-generated solid waste accounts for 1 percent of Valley Water's emissions. Although Valley Water does not have direct control over the emissions generated from the decomposition of this generated waste, it can influence it by first having a better understanding of the characterization of the waste being generated (e.g., percent organics vs percent recyclable). Once the waste stream is better understood and with the knowledge that organic waste is the primary source of methane in landfills, Valley Water can take steps to reduce organics from being landfilled by encouraging increased usage of organics collection bins and utilizing the organics waste collection services offered by Republic Services. Under SW-1, Valley Water would target an 80 percent diversion rate from landfills by 2030 and 90 percent by 2045.

2030 Target	2045 Target
80% of organics and recyclables must be diverted from landfills by 2030.	90% of organics and recyclables must be diverted from landfills by 2045.
Cumulative Reduction Potential by 2030:	**Cumulative Reduction Potential by 2045:**
472 $MTCO_2e$	**3,147 $MTCO_2e$**

- **Supportive Action SW-1.1**: Begin regular tracking of waste disposal at all Valley Water facilities to better understand the characterization of Valley Water's waste generation rates (e.g., pounds of recyclable waste per employee per year)
- **Supportive Action SW-1.2:** Conduct an annual waste characterization study that identifies the distribution of organics, recyclables, and non-recyclables among the generated waste.
- **Supportive Action SW-1.3:** Where not already implemented, provide and collect separate organics and recycling bins.

Calculation Assumptions

Currently, 40 percent of waste is assumed to be diverted from landfills, and the remaining 60 percent is landfilled (CalRecycle 2023). This measure would increase diverted waste to 80 and 90 percent by 2030 and 2045, implying landfill rates of 20 percent and 10 percent by those years, respectively.

CN-1: Zero Emission Off-Road Construction Equipment

For all contracted construction projects, require the use of zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) instead of conventional diesel in 17% of off-road construction equipment fuel use in equipment greater than 25 hp by 2030, and 45% by 2045 regardless of the engine Tier.

As a provider of flood protection and safe, clean water, construction activities occur regularly as Valley Water continues to enhance and improve the water resources and ecosystems of Santa Clara County. These include both large- and medium-scale infrastructure improvements like the construction of flood walls, levees, dams, pipelines, and water treatment plants, as well as smaller flood protection activities, such as levee and stream maintenance, and restoration of native habitat. Using a combination of historical trends, CIPs from Valley Water's Five Year Capital Improvement Program, and known legislative reductions, Valley Water anticipates construction-related emissions to decline modestly in the future by about 20 percent from baseline conditions through 2045 (Valley Water 2023a). However, it will still be

the largest emissions sector in 2045, comprising 67 percent of the total emissions in that year. Thus, to achieve Valley Water's 2045 carbon neutrality target, additional actions need to be taken to reduce emissions further.

Construction emissions come from off-road equipment and on-road vehicles (on-road vehicles include both construction vehicles, such as pickup trucks, as well as the vehicles that construction workers use to commute to the job site). Currently, off-road emissions account for 67 percent of construction emissions, with the other 33 percent from on-road vehicles. However, on-road emissions are expected to drastically decline under ACCII and ACF policies, resulting in off-road emissions accounting for a much greater share of construction emissions by 2045 (96 percent off-road and 4 percent on-road). Because ACCII and ACF generally do not apply to off-road construction equipment and because construction is Valley Water's largest emissions sector, reducing emissions from off-road construction equipment is a crucial step towards achieving Valley Water's agency-wide emission reduction goals.

As discussed under OF-1 and Appendix C, technology and zero-carbon fuels for off-road equipment are currently available and are anticipated to become more prevalent in the future. For projects where Valley Water operates its own off-road fleet, OF-1 would be implemented. However, for contracted construction projects, Valley Water may not control contractors' fuel selection and use of equipment, but it can require in its contract terms that contractors use a certain percentage of zero-emission equipment or use available renewable diesel and require regular reporting of the equipment inventory and fuel usage to Valley Water. To allow for flexibility, the contractor may use any combination of technology or fuels to meet these requirements. Under CN-1, Valley Water would target 17 percent of off-road construction fuel use from zero-carbon sources (e.g., electricity, renewable diesel) by 2030 and 45 percent by 2045.

Additionally, in support of this measure, supporting actions include consideration of project design.

2030 Target

17% of contracted off-road equipment fuel use in active construction projects must be from zero-carbon sources by 2030.

Cumulative Reduction Potential by 2030:

2,855 $MTCO_2e$

2045 Target

45% of contracted off-road equipment fuel use in active construction projects must be from zero-carbon sources by 2045.

Cumulative Reduction Potential by 2045:

28,949 $MTCO_2e$

- **Quantified Action CN-1.1**: Update internal capital project specifications to reduce GHGs through the Technical Review Committee, including fleet and equipment specifications for contractors. This should include a requirement for construction projects to require contractors to apply all feasible construction best management practices (BMPs) to reduce GHG emissions as recommended by the BAAQMD in Table 6-1 of the 2022 CEQA Guidelines or the latest analogous set of BMPs. This list of BMPs is included as part of the GHGRP Consistency Review Checklist in Appendix B. Of the recommended BMPs, require that zero-emission fuels or technologies account for at least 17 percent of construction off-road fuel use by 2030 and 45 percent by 2045. Given the planning required for construction projects and the time needed for contractors to procure and plan for these requirements, begin the revision to the contract requirement policy process as soon as possible.
- **Supportive Action CN-1.2:** Require as part of construction contracts that contractors submit an annual report of fuel usage in the off-road equipment used on site (e.g., gallons of renewable diesel, gallons of conventional diesel, kWh of electricity and name of utility from which electricity is purchased).
- **Supportive Action CN-1.3:** Incorporate process-based geomorphic channel designs into capital projects and use natural energy (e.g., existing natural waterways and gravity-fed systems) and local materials.

Calculation Assumptions

This measure assumes that 17 percent of forecasted conventional diesel fuel use in off-road construction equipment would be replaced by zero-emission fuels by 2030 and 45 percent by 2045. See Measure OF-1 above for a discussion of eligible types of zero-emissions fuel; those same assumptions apply to this measure as well.

CN-2: Zero Emission On-Road Construction Vehicles

For all contracted construction projects, require the use of zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) instead of conventional fuel in 35% of on-road construction vehicle fuel use by 2030, and 95% by 2045.

For construction activities, the on-road vehicle fleet consists of medium- and heavy-duty trucks used for transporting building materials, equipment, and waste or earth hauling. These heavier-duty vehicles typically use conventional diesel. However, heavy-duty ZEVs and zero-carbon fuels, including renewable diesel, for on-road vehicles, are currently available and will become more prevalent in the future, as noted in Appendix E. Under ACF, some heavy-duty fleets are required to purchase only ZEVs starting in 2024. For projects where Valley Water operates its own on-road fleet, VF-1 would be implemented. However, for contracted construction projects, Valley Water may not control contractors' selection of vehicles, but it can require in its contract terms that contractors use a certain percentage of ZEVs, use available zero-carbon fuels, and require regular reporting of the on-road vehicle mileage and fuel usage to Valley Water. Under CN-1, Valley Water would require that 35 percent of on-road construction fuel use be from zero-carbon sources (e.g., electricity, renewable diesel) by 2030 and 95 percent by 2045.

2030 Target	2045 Target
35% of on-road equipment fuel use in active construction projects must be from zero-carbon sources by 2030.	95% of on-road equipment fuel use in active construction projects must be from zero-carbon sources by 2045.
Cumulative Reduction Potential by 2030:	**Cumulative Reduction Potential by 2045:**
312 $MTCO_2e$	**1,229 $MTCO_2e$**

- **Quantified Action CN-2.1**: Update internal capital project specifications to reduce GHGs, including on-road fleet specifications for contractors. This should include a requirement for construction project contractors to apply all feasible construction best management practices (BMPs) for the purposes of reducing GHG emissions as recommended by the BAAQMD in Table 6-1 of the 2022 CEQA Guidelines, or the latest analogous set of BMPs. This list of BMPs is included as part of the GHGRP Consistency Review Checklist in Appendix B. Of the recommended BMPs, require that zero-emission fuels or technologies account for at least 35 percent of construction on-road fuel use by 2030 and 95 percent by 2045. Given the planning required for construction projects and the time needed for contractors to procure and plan for these requirements, begin the revision to the contract requirement policy process as soon as possible.
- **Supportive Action CN-2.2:** Incorporate process-based geomorphic channel designs into capital projects and use natural energy and local materials to reduce transportation-related emissions.

Calculation Assumptions

As a baseline, the legislative-adjusted forecast for this measure assumes that ACCII and Advanced Clean Fleets increase the penetration of ZEVs in the on-road construction fleet. Under these rules, it is estimated that, by 2030, 73 percent of on-road heavy-duty construction vehicles would be fueled by conventional diesel and, by 2045, only 7 percent of heavy-duty vehicles would be fueled by diesel. Under this measure, the percentage of diesel-powered on-road construction fuel would be reduced to 65 percent by 2030 and 5 percent by 2045.

WA-1: Community-Wide Water Conservation

Conserve 98,800 acre-feet of water per year by 2030 and 118,000 acre-feet by 2045.

As part of its commitment to environmental stewardship, and pursuant to Board Ends Policy 2.1.5 ("Maximize water use efficiency, water conservation and demand management opportunities") and the Water Supply Master Plan 2040, Valley Water is targeting the conservation of 98,800 acre-feet (AF) of water per year by 2030 and 118,000 AF per year by 2045, up from the current rate of approximately 85,000 AF per year by 2030. This increased conservation would result from current and planned conservation activities and programs. These include landscape rebate programs (e.g., rebates for turf conversion, irrigation equipment upgrades, and rainwater capture projects, including rain barrels), incentives to update plumbing and irrigation equipment to more water-efficient versions, including products labeled by the Environmental Protection Agency WaterSense Program), and technical services to increase water-use efficiency indoors and outdoors. This conservation, in turn, results in decreased electricity use from water pumping and treatment activities incurred by Valley Water's retail customers (e.g., San Jose Water Company, City of Sunnyvale) and an associated decrease in greenhouse gas emissions. Additionally, decreased electricity use from reduced heating requirements from water-efficient plumbing (like showerheads, faucet aerators, etc.) installed by end users at residential, commercial, industrial, and institutional properties from participating in conservation programs offered. Although the emissions from retail customer pumping and treatment are not included in Valley Water's emissions inventory, these reductions would not occur without Valley Water's water conservation actions. Thus, this reduction is considered a Scope 3 emissions reduction similar to credits associated with carbon sequestration, which are also not directly included in Valley Water's emissions inventory.

2030 Target	2045 Target
98,800 acre-feet of water conserved per year	118,000 acre-feet of water conserved per year
Cumulative Reduction Potential by 2030:	**Cumulative Reduction Potential by 2045:**
1,448 $MTCO_2e$	**4,263 $MTCO_2e$**

Quantified Action WA-1: Increase implementation of water-saving programs and incentives, in keeping with Board Ends Policy 2.1.5 and the Water Supply Master Plan 2040.

Calculation Assumptions

The conservation program goals to reduce water use by 118,000 AF per year by 2045 (with other intermediate goals) is achieved through Valley Water's conservation programs and through policies and regulatory requirements. Emissions reductions are only accounted for the conservation directly attributable to Valley Water's programs, estimated to be 25% of total conservation savings. Therefore, this measure was assumed to save 22,000 acre-feet of water per year over existing annual conservation savings (based on data from the Water Supply Master Plan [Valley Water 2019]) and 30,000 additional annual conservation savings by 2045 (07/09/2024 Valley Water Board Meeting, Item 6.1). Emissions reductions per acre-foot from water conservation were calculated using the sum of:

1) A weighted average emissions factor (0.005 $MTCO_2e$ per AF in 2030) reflecting the 2030 anticipated mix of water supply sources – per the Water Supply Master Plan (Valley Water 2019) – and their associated emissions factors. This weighted average emissions factor is associated with the extraction and conveyance of water delivered by Valley Water to the retailers. These are emissions associated with pumping water from the source to Valley Water. Sources include natural groundwater recharge, local surface water, reused water, water from the San Francisco Public Utilities Commission, and Delta-Conveyed water from the Central Valley Project and State Water Project. Depending on hydrological conditions, the State Water Project sometimes

purchases non-renewable energy to pump water, and thus it has nonzero emissions in 2030 (however, per SB 1020, SWP as a State agency must procure 100 percent zero-carbon resources by 2035; its emissions factor in 2030 was interpolated accordingly). All other sources have an emissions factor of zero, due to Valley Water's Zero Carbon Water energy portfolio from PWRPA as well as the Central Valley Project using carbon-free hydroelectric energy to pump. See Appendix D, Inventory and Forecasting Technical Memo, for details on emissions factors for local and imported water.

2) An average emissions factor (0.05 $MTCO_2e$ per AF in 2030) for water treatment and distribution by the local water retailers to whom Valley Water delivers wholesale quantities of water, assuming that all water conservation avoids potable water use.

The emissions factors for extraction and conveyance were calculated using data from the Water Supply Master Plan 2040 and forecast emission factors for the water sources listed above (see Appendix D, Inventory and Forecast Technical Memo for more details on how these were derived).

The emissions factors for treatment and distribution were calculated using Valley Water's customer data on volumes delivered by retailers (Valley Water 2021c: 32). These were used in conjunction with estimated 2030 electricity emissions factors for each local utility (based on 2022 emissions factor data from the California Energy Commission (CEC) Power Content Labels, extrapolated to 2030 values assuming a carbon neutrality target of 2045), as well as energy intensity factors for water (CEC 2024, Next10 2021: 19). Table 6 below shows the values used for this calculation.

Table 6 Data used to calculate emissions factors for treatment and distribution of water.

Water Provider	Corresponding Utility Provider	Total acre-feet per year from Valley Water (2017-2021 annual average)	2030 emissions factors (lb CO2e per MWh)	Energy intensity of pumping: kWh per acre-foot per year
CWS Los Altos	SVCE	12,108	46	1,214
City of Morgan Hill	SVCE	7,340	46	1,011
City of Gilroy	SVCE	7,890	46	1,086
City of Mountain View	SVCE	9,544	46	968
City of Sunnyvale	SVCE	18,951	46	1,064
City of Milpitas	SVCE	9,153	46	989
San Jose Water Company	SJCE	115,119	76	1,193
San Jose Municipal Water	SJCE	16,997	76	1,021
Great Oaks Water Company	SJCE	10,436	76	1,150
City of Palo Alto	City of Palo Alto Utilities	10,856	283	1,075
City of Santa Clara	City of Santa Clara DBA Silicon Valley Power	18,110	345	1,118
Total		**236,503**	**NA**	**NA**

Notes: lb CO_2e per MWh = pounds of carbon dioxide equivalent per megawatt-hour; kWh = kilowatt-hour; CWS = California Water Service; SVCE = Silicon Valley Clean Energy; SJCE = San Jose Clean Energy; DBA = Doing Business As.

Source: Prepared by Ascent in 2024.

CS-1: Carbon Sequestration

Sequester carbon in habitat enhancement and restoration projects. Collaborate with regional conservation agencies to develop habitat enhancement and restoration above and beyond project mitigation requirements.

Carbon sequestration provides a natural sink of carbon emissions. Valley Water performs a variety of habitat restoration and enhancement projects as part of its mission. These include riparian habitat restoration and other native vegetation plantings that occur as part of stream maintenance activities or other projects. Additionally, Valley Water performs tidal marsh restoration work in the South Bay that converts former salt production ponds to a mosaic of wetlands with an excellent ability to absorb carbon. Under existing conditions, salt ponds are primarily open water with minimal vegetation present on their margins. As such, their potential for carbon sequestration is low. On an acre-per-acre basis, wetland restoration can sequester approximately two times more carbon than planting trees (assuming 50 trees per acre) and 30 times more carbon than riparian restoration (See Appendix A). Due to the relatively high potential for salt pond restoration to sequester carbon, this measure assessment focuses on Valley Water's tidal marsh restoration projects.

Two future Valley Water tidal marsh restoration projects were considered in this measure: the South San Francisco Bay Shoreline Phase I Project (Shoreline Phase I) and the Calabazas/San Tomas Aquino Creeks-Marsh Connection Project (Creeks Connection Project).

- Shoreline Phase I's goals are to provide levees, reduce flood risk, restore tidal marsh habitat, and provide trail connections in the area between the Alviso Slough and Coyote Creek (Valley Water 2024c). It is targeted for completion by summer 2025.
- The Creeks Connection Project's goals are to restore tidal flows and reconnect Calabazas and San Tomas Aquino Creeks to former salt ponds, provide flood protection, and enhance recreation along the Bay shoreline (Valley Water 2023b). It is targeted for completion by fall 2029.

In total, these projects would result in the restoration of approximately 4,586 acres if both are implemented. The majority of Shoreline Phase I land is owned by the U.S. Fish and Wildlife Service (USFWS) as part of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge), and the U.S. Army Corps of Engineers contributed staff, capital, and funding towards restoration efforts. The Creeks Connection Project is also a partnership project that is partially grant-funded and occurring primarily on USFWS land in the Refuge.

In terms of the ownership of these reduction credits, Valley Water is the primary implementer and lead funding agency for both projects; however, it is possible that the Army Corps of Engineers (USACE) and/or the USFWS could claim carbon reduction credit for their own contributions to tidal marsh restoration in future climate action plans. These claims could undermine the requirement for these reductions to be "additional" as defined under CEQA Guidelines §15183.5. Valley Water is currently in discussions with USACE and USFWS to address this issue of credit ownership. However, if the three agencies were to share the credits, Valley Water would only need less than 15 percent of the total sequestration potential across both tidal marsh projects to meet the carbon budget deficit that is anticipated to remain after the implementation of measures VF-1 through WA-1.

Table 7 below shows the hypothetical amount of credit that Valley Water would need to claim to close the emissions gap remaining after the implementation of the other measures. By 2045, Valley Water would need credit for approximately 14 percent of the cumulative reductions (i.e., claim credit for restoration of 620 acres out of the 4,586 acres restored) to meet its carbon budget (See Figure 10). Depending on the outcome of negotiations with USACE and USFWS, Valley Water may claim credit for a greater share of carbon sequestration than required to close its carbon budget gap as estimated in this GHGRP. Additional shares of carbon sequestration may be accounted for by Valley Water and utilized to offset construction-related emissions associated with future CIP projects (such as the Anderson Dam Seismic Retrofit Project and the Pacheco Reservoir Expansion Project) that require mitigation of GHGs as part of their CEQA compliance.

Table 7 Cumulative GHG Reductions from Valley Water Carbon Sequestration

Item	2025-2030	2025-2045
Sequestration from tidal marsh restoration (MT CO_2e / restored acre / year) [1]	3.58	3.58
Cumulative Reductions from Shoreline Phase I [2] (MT CO_2e)	51,487	205,950
Cumulative Reductions from Creeks Connection Project [3] (MT CO_2e)	6,123	97,962
Total Possible Cumulative Reductions from Tidal Marsh Restoration Projects [4] (MT CO_2e)	**57,610**	**303,912**
Valley Water Carbon Budget Gap (See Figure 7) (MT CO_2e)	**5,522**	**41,056**
Credit from salt marsh restoration needed for Valley Water to meet carbon budget (percent of total tidal marsh restoration project)	10%	14%
Credit from salt marsh restoration needed for Valley Water to meet carbon budget (project acres)	276	620

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

[1] Shahan et. al., 2022. The sum of carbon sink and minor methane emissions and assumes a 50% loss in carbon sequestered to lateral eddies.

[2] 2,876 acres by 2025

[3] 1,710 acres by 2029

[4] Possible cumulative reductions do not account for net change in sequestration from pre-project baseline to post-project future conditions. Net sequestration would be estimated as part of Supportive Action CS-1.1 and reflected in sequestration credits.

Source: Compiled by Ascent Inc. in 2024.

Although this assessment focuses on tidal marsh restoration, the intent of the measure is to allow Valley Water to achieve its carbon sequestration goals through any type of natural restoration work under its purview, so long as the work is real, quantifiable, additional, enforceable, verifiable, and permanent, consistent with Division 25.5 (commencing with Chapter 38500) of the Health and Safety Code. The calculations shown in Table 7 demonstrate the sequestration potential available and needed to close the carbon budget gap.

2030 Target

Valley Water takes credit for 276 acres of salt marsh restoration

Cumulative Reduction Potential by 2030:

5,522 $MTCO_2e$

2045 Target

Valley Water takes credit for 620 acres of salt marsh restoration

Cumulative Reduction Potential by 2045:

41,056 $MTCO_2e$

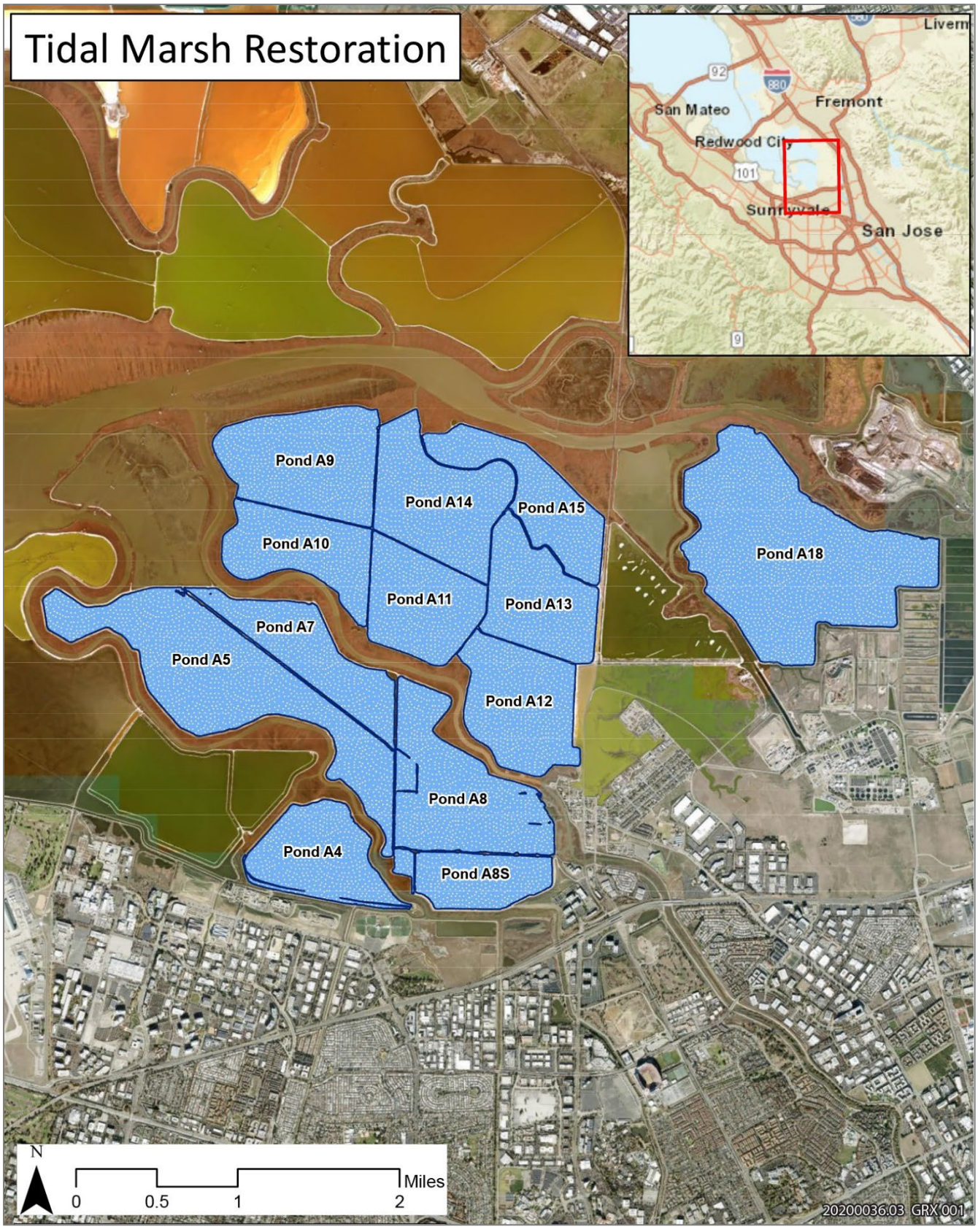
- **Supportive Action CS-1.1**: Prior to accounting for any carbon sequestration in future GHG inventories, Valley Water would establish an internal carbon sequestration registry that tracks the additional carbon sequestration derived from Valley Water projects. These projects can be any type of vegetative restoration work, so long as the work is real, quantifiable, additional, enforceable, verifiable, and permanent, consistent with Division 25.5 (commencing with Chapter 38500) of the Health and Safety Code. These terms are defined as follows (CARB 2021):
  - **"Real"** means, in the context of sequestration projects, that GHG reductions or GHG enhancements result from a demonstrable action or set of actions, and are quantified using appropriate, accurate, and conservative methodologies that account for all GHG emissions sources, GHG sinks, and GHG reservoirs within the offset project boundary and account for uncertainty and the potential for activity-shifting leakage and market-shifting leakage.
  - **"Quantifiable"** means, in the context of offset projects, the ability to accurately measure and calculate GHG reductions or GHG removal enhancements relative to a project baseline in a reliable and replicable manner for all GHG emission sources, GHG sinks, or GHG reservoirs included within the offset project boundary, while accounting for uncertainty and activity-shifting leakage and market-shifting leakage.

- **"Additional"** means, in the context of offset credits, greenhouse gas emission reductions or removals that exceed any greenhouse gas reduction or removals otherwise required by law, regulation or legally binding mandate, and that exceed any greenhouse gas reductions or removals that would otherwise occur in a conservative business-as-usual scenario.
- **"Enforceable"** means the authority for CARB to hold a particular party liable and to take appropriate action if any of the provisions of this article are violated.
- **"Verifiable"** means that an Offset Project Data Report assertion is well documented and transparent such that it lends itself to an objective review by an accredited verification body.
- **"Permanent"** means, in the context of offset credits, either that GHG reductions and GHG removal enhancements are not reversible, or when GHG reductions and GHG removal enhancements may be reversible, that mechanisms are in place to replace any reversed GHG emission reductions and GHG removal enhancements to ensure that all credited reductions endure for at least 100 years.

The calculations shown above in Table 7 provide examples of potential future sequestration enhancements that would occur after the implementation of the Shoreline Phase I and Creeks-Connection Project. A registry developed by Valley Water must track the size and type of restoration activity being conducted and will use the most accurate, scientifically sound sequestration rates available. The registry will check against the targets established under CS-1.1 or provide a stopgap for any emissions exceeding the carbon budget.

Specific Valley Water projects may already implement restoration activities as mitigation required by permits from USACE, RWQCB, and/or CDFW. The carbon sequestered by these restoration activities can only be counted toward the reductions under CS-1 if they meet the above-bulleted requirements. Thus, the carbon sequestration from those projects must be quantifiable, enforceable, verifiable, and permanent, and also:

- Not already be credited to a separate entity or project outside of CS-1 (e.g., another agency or another Valley Water project or department that is not directly supporting CS-1) and
- Result in additional carbon sequestration above and beyond any vegetation removal of the project itself, such that only the net additional carbon sequestration can be credited toward CS-1 (e.g., only account for the net increase in annual carbon sequestration between a loss of 10 acres of invasion vegetation compared to 30 acres of restored riparian habitat).



Source: Young, pers. comm., 2024.

Figure 10 Valley Water Tidal Marsh Restoration Areas under Shoreline Phase I and Creeks Connection Project

Calculation Assumptions

According to a study conducted at a similar salt pond restoration project in the eastern part of the San Francisco Bay (Bay) at Eden Landing Ecological Reserve, restoration of salt ponds in the Bay could sequester on average 407 grams of carbon per square meter per year or 6 $MTCO_2e$ per acre per year (Shanan et. al., 2022). By contrast, shrublands sequester approximately 1.5 $MTCO_2e$ per acre per year, average coastal marshes sequester 2.1 $MTCO_2e$ per acre year, and woodlands sequester 5.5 $MTCO_2e$ per acre per year (DiVittorio et. al, 2018: Appendix B). Thus, a restored salt pond or marsh in the Bay could sequester as much or more than a woodland forest acre-for-acre.

The 6 $MTCO_2e$ per acre per year value was adjusted downward to 3.6 $MTCO_2e$ per acre per year. This is a conservative assumption to account for the carbon lost laterally (i.e., that flows offsite) after restoration work. Details of this calculation appear in Appendix A, Measures Calculations.

In addition to the tidal marsh restoration projects used in the calculation above, Valley Water also performs other activities that promote carbon sequestration, such as revegetation in degraded riparian areas and tree planting. No data was available for the pace and scale of these activities, and therefore, as a conservative estimate, the associated carbon sequestration was not included in this analysis. Pending data availability, these activities could also count as reducing emissions under this measure.

CS-2: Purchase Carbon Offsets

If necessary, purchase carbon offsets from verified offset registries, prioritizing local or regional projects and, if necessary, projects outside of the state, but within the United States. Prohibit carbon offset purchases that are unverified or located in locations outside the United States.

The success of all previous measures is dependent on funding availability and technical feasibility, such as the availability of renewable diesel for construction projects or the available credit from restoration projects under CS-1. As a backstop to ensure that Valley Water can meet its GHG reduction targets if estimated reductions from previous measures do not occur, Valley Water may purchase carbon offsets from CARB-approved offset registries. At its discretion, Valley Water can make purchases following an assessment of Valley Water's remaining carbon budget (discussed further in Chapter 9), depending on the progress of the implementation of Measures VF-1 through CS-1. Any purchased offsets must be from projects that meet CARB's Compliance Offset Protocol and are listed with the CARB-approved Offset Project Registry. As of 2024, the current list of approved registries includes the American Carbon Registry, Climate Action Reserve, and Verra.

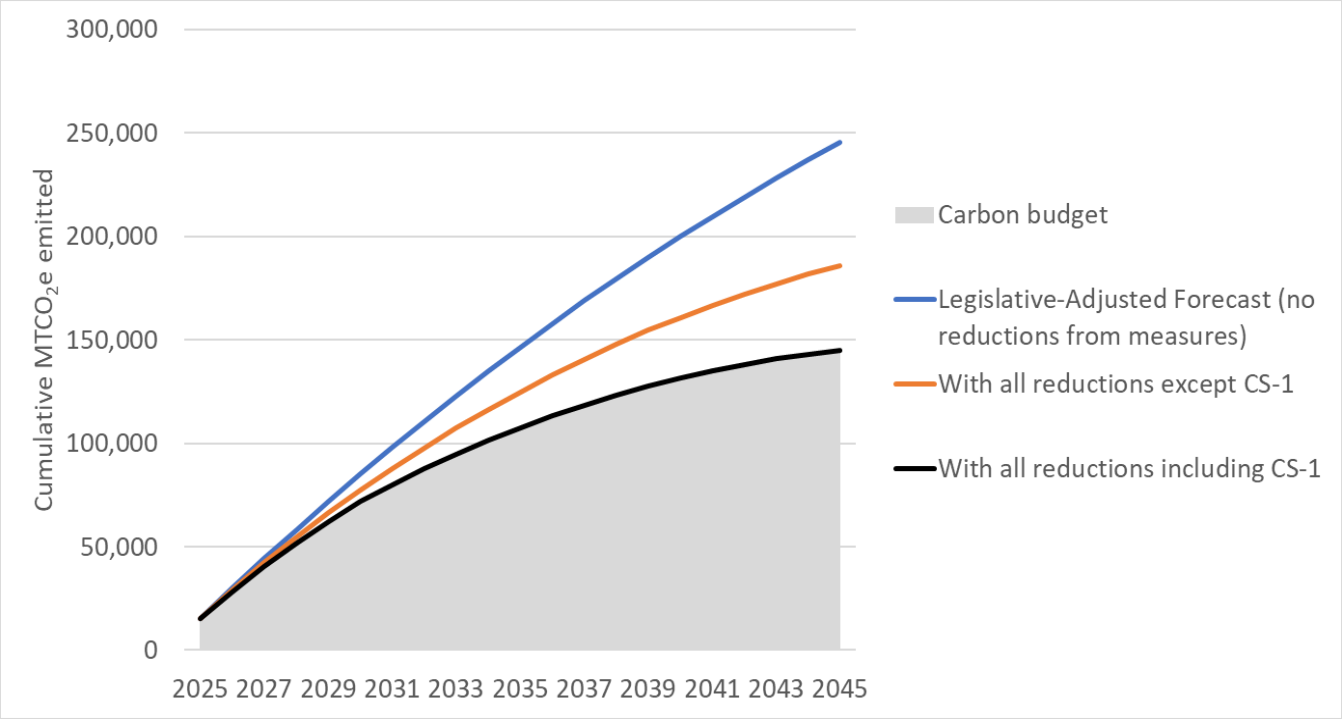
If the measures are implemented as described above, Valley Water would be within its carbon budget consistent with its goals, as shown by Table 8 and Figure 11 below. These charts illustrate the effect of the measures reductions on Valley Water's forecasted emissions.

Table 8 Comparison of Emissions Before and After Measure Reductions

	Before Measures (i.e., no measure reductions included)	After Measures (not including CS-1 sequestration)	After Measures (with CS-1 sequestration)
Total carbon budget, 2025-2045	144,731	144,731	144,731
Total emissions 2025-2045	245,194	185,787	144,731
Budget surplus (+) shortfall (-)	-100,463	-41,056	0

Notes: CS-1 refers to the Sequester Carbon measure of this Greenhouse Gas Reduction Plan.

Source: Prepared by Ascent in 2024.



Source: Prepared by Ascent in 2024.

Figure 11 Reductions Versus Carbon Budget

9 IMPLEMENTATION AND MONITORING PLAN

This chapter outlines the steps needed to ensure that the specific measures and actions identified in this GHGRP will be successfully implemented and that Valley Water's emissions stay within the carbon budget, once the plan is completed and adopted. The chapter is divided into three parts: 1) the agency-wide implementation, monitoring, and reporting process; 2) details for measure implementation; and 3) the CEQA checklist process for Valley Water projects intended to tier from this CEQA-qualified plan.

9.1 IMPLEMENTATION, MONITORING, AND REPORTING PROCESS

Successfully implementing the GHGRP will require an agency-wide evaluation of Valley Water's progress toward meeting its GHG reduction targets by staying with its carbon budget through 2045. This would be done through an annual implementation, monitoring, and reporting process that would parallel measure implementation. A key aspect of this process, summarized in Figure 12 and detailed in a flow chart in Appendix F, is an adaptive management approach where Valley Water evaluates its emissions activity drivers and GHG emissions annually. Using this information, Valley Water would assess whether it is on track to meet its carbon budget, applying credits available from measure CS-1 and purchasing carbon offset credits via CS-2. Offset purchases may occur on an as-needed basis depending on emissions trends related to the carbon budget (i.e., in some years, no offsets may be purchased, but may be purchased in others). Additionally, any new projects that were not included in this GHGRP could be used, at Valley Water's discretion, to update the forecast and recalculate the budget accordingly. This process would allow Valley Water to identify opportunities to improve measures and see which ones are being implemented behind or ahead of schedule. This process is outlined in Figure 12 and detailed below.

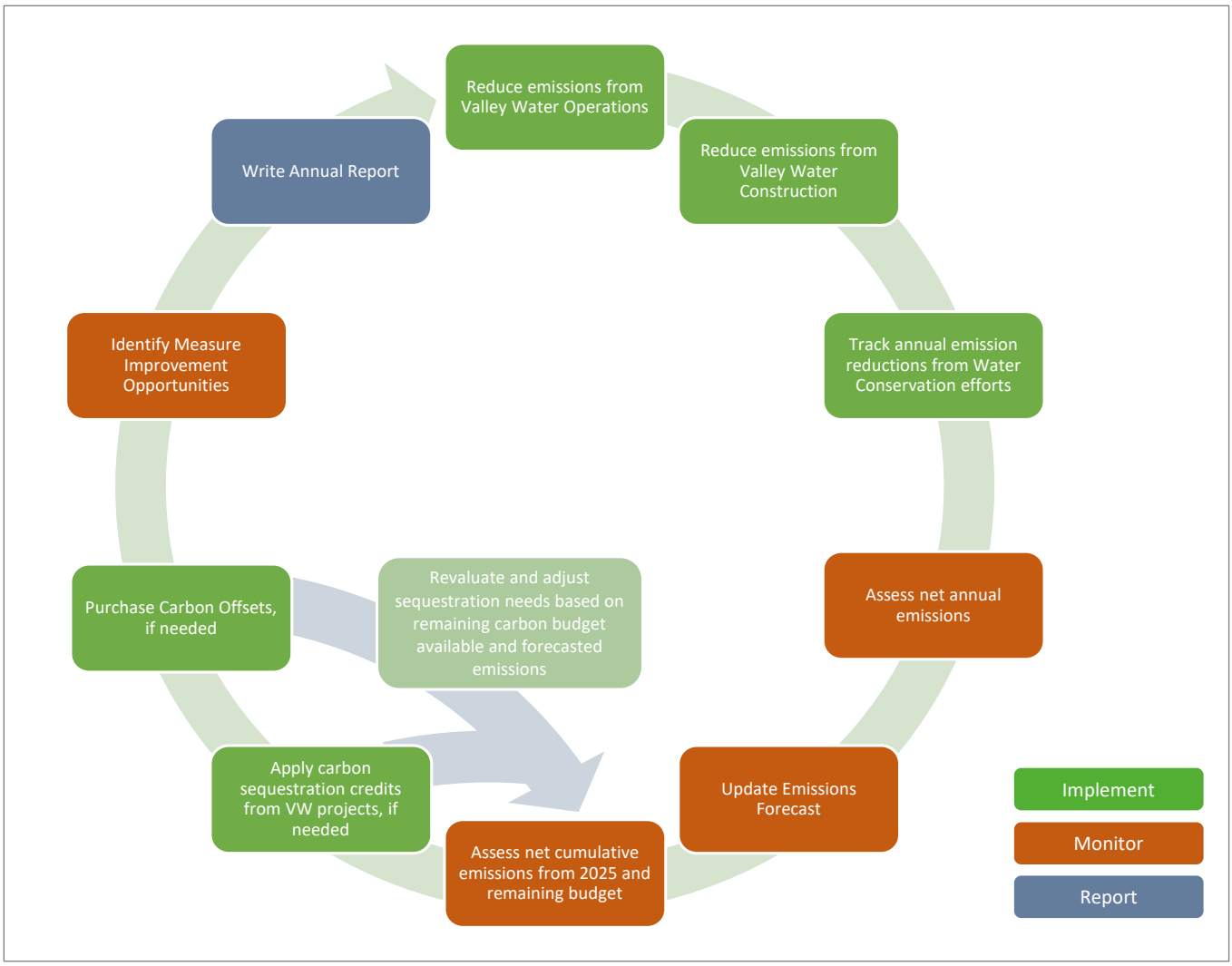
In addition to the annual process shown in Figure 12, Valley Water will update the GHGRP every five years to incorporate updates to its inventory and forecast, the latest technological developments in GHG reduction measures (e.g., the availability of zero-emissions construction equipment), regulatory changes, and Valley Water's capital improvement projects. This update process will allow Valley Water to refine its GHG reduction measures and actions to account for changing construction project schedules, market conditions, costs, and technological developments.

9.2 MEASURE IMPLEMENTATION DETAILS

Once the GHGRP is adopted, Valley Water will begin implementing the measures in order of effectiveness and the level of control Valley Water has over those emissions, starting with measures associated with Valley Water's direct operations, then moving on to measures over which Valley Water has a decreasing level of control. The role of the sequestration and offset-related measures (CS-1 and CS-2) will depend on the outcome of the annual assessment process (Figure 12).

9.2.1 Implementation Order

Valley Water has the most control over its Scope 1 and 2 emissions. Since its Scope 2 emissions are already minimal, Valley Water plans to prioritize Scope 1 emissions for reductions, subject to future feasibility and cost constraints. Because Valley Water does not have direct control over Scope 3 emissions, these are more difficult to reduce; however, this GHGRP proposes that Scope 3 reductions be prioritized in the order shown in Table 9. This order considers the certainty of reductions that can be achieved and the degree of influence that Valley Water has over measure implementation. A higher rank on the list implies more direct control and more certainty of achieving reduction; a lower rank implies less control and less certainty. A prioritization matrix that addresses the feasibility, relative cost, and GHG reduction potential for each measure is included in Appendix G.



Source: Prepared by Ascent in 2024.

Figure 12 Annual Implementation, Monitoring, and Reporting Process

Table 9 Recommended Measure Implementation Order

Implementation Order	Applicable Measures	Implementation Action
1	VF-1 through SW-1	Reduce Valley Water's operational emissions. Prioritizing measures with the greatest GHG reduction effectiveness and feasibility (See Appendix G).
2	CN-1 and CN-2	Reduce construction emissions by revising the requirements for contractors responding to Valley Water's requests for proposals (RFPs). These requirements should mandate that a certain percentage of on-road and off-road fuel used in construction be zero-emission.
3	WA-1	Continue to promote water conservation to achieve the conservation goals set by the Water Supply Master Plan. This involves influencing end-users to consume less water by scaling up existing programs, incentives, and rebates, as well as developing new programs.
4	CS-1	If the measures listed in the three rows above fail to keep Valley Water's emissions within the carbon budget, implement carbon sequestration projects in natural lands. These projects can include tidal marsh restoration, riparian restoration, and tree planting. Valley Water plans to partner with other organizations, such as the Army Corps of Engineers and the United States Fish and Wildlife Service (USFWS), to complete the tidal marsh restoration projects. Because these are shared projects and those organizations may want to claim carbon reduction credits for themselves in future climate action planning work, it is not possible to quantify Valley Water's share of those credits at this time. This GHGRP, therefore, calculates the minimum credit that Valley Water would have to receive to stay within its carbon budget. Details on this calculation are provided in "8.1 Measure Details."
5	CS-2	Purchase carbon offsets to close any remaining gap between actual emissions and the budget.

9.2.2 Implementation of Individual Measures

Implementing the individual measures will require a coordinated effort across Valley Water and a detailed plan for monitoring implementation progress for each measure. A key step is forming a **GHGRP Implementation Team** to coordinate all aspects of Plan implementation, such as oversight of reduction measures, regular assessment of GHG reduction progress, preparation of annual reports, and acquiring carbon credits, as necessary. Below are some key actions that will implement each GHGRP measure:

- **Define roles and responsibilities** for each measure, describing how the specific Valley Water programs, units, or teams will work together to implement the measures, including roles, responsibilities, and expected work products.
- **Develop a monitoring plan** that details how data on the tracking metrics (i.e., emissions activity data) will be collected and analyzed.
- **Develop enforcement mechanisms** that modify Valley Water policies and processes to ensure compliance with reduction measures.
- **Seek and source of funding** for each measure's implementation. This generally combines Valley Water's operations, capital improvement programs, grants, and incentives.

A table summarizing how these actions apply to each measure can be found in Appendix E. Specific plans for each measure will be developed after the GHGRP is adopted.

9.3 CEQA CHECKLIST FOR DISCRETIONARY PROJECTS

To ensure that proposed discretionary projects and their associated construction-related emissions are on track for reductions consistent with this GHGRP, Valley Water will collect data from each of its future construction projects on the anticipated types of vehicles to be used in construction, their annual hours of operation, and fuel usage (including both zero-emission and conventional fuels). Valley Water will then verify that these projects' emissions are consistent with this

GHGRP using the process outlined in Appendix B, GHGRP Consistency Review Checklist (Checklist), and in Chapter 9.3.1. The Checklist is intended to document whether individual projects are minimizing GHG emissions in accordance with the applicable reduction measures from the GHGRP. Project consistency with the GHGRP can also be demonstrated through a quantitative analysis that shows the project will not impede the achievement of the GHG emissions reduction targets or cause Valley Water to exceed its carbon budget (explained further in 9.3.1). Projects that fulfill the criteria in this Checklist will be streamlined and allowed to proceed without additional GHG mitigation in accordance with CEQA Guidelines Sections 15064(h) and 1513.5(b)(2). Moving forward, this Checklist will serve as the tool to document a streamlined analysis of GHG impacts consistent with CEQA Guidelines Section 15183.5(b), which states:

> *Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.*

9.3.1 Determining Project Compliance with the GHGRP

Determining a project's compliance with the GHGRP, and subsequently, its alignment with the carbon budget is inherently an iterative process due to the uncertainty of future emissions. For Valley Water's construction emissions specifically, the GHGRP's emissions forecast is based on a combination of known emissions from the continuance of existing construction projects (e.g., Stream Maintenance Program) and an extrapolation of historical trends in construction activity. This methodology is used because specific future project emissions data are unknown and unavailable at this time. Thus, once project annual emissions data are known, Valley Water must evaluate its own operational emissions and analyze how the additional construction project emissions would impact Valley Water's cumulative carbon emissions starting in 2025. This is necessary because the carbon budget is calculated based on cumulative emissions from 2025 to 2045 (Chapter 7.1). Ground truthing Valley Water's carbon budget is essential to align reality with projections, ensuring that Valley Water is genuinely reducing emissions and also providing substantial evidence for project compliance with the GHGRP where needed.

Three outlined steps below provide a process for assessing consistency with the carbon budget for a new discretionary Valley Water project that begins its CEQA process after the adoption of this GHGRP, based on the implementation process shown in Figure 12.

- First, Valley Water conducts an annual assessment of its emissions and creates a running total of emissions from its existing activities (e.g., operations and ongoing construction) starting after 2025.
- Second, Valley Water annually assesses the status of the implementation of the GHGRP measures and determines their effectiveness in reducing emissions as they are implemented.
- Third, for every new project that undergoes discretionary CEQA review, the estimated annual emissions from those projects will be added to the forecasted emissions reported in this GHGRP and evaluated for their effect on Valley Water's cumulative emissions.

For the third step, Valley Water will evaluate the contribution of the new project emissions in terms of how it affects Valley Water's cumulative emissions from 2025, alongside the concurrent implementation of the GHGRP measures. If new projects are expected to cause Valley Water's carbon budget to be exceeded before 2045, Valley Water would assess if additional reductions from operations and construction through the GHGRP measures, including CS-1, are needed to balance or offset the new project emissions. If the reductions cannot offset the new project emissions to keep Valley Water under its carbon budget prior to 2045, then the new project would be deemed inconsistent with the GHGRP and Valley Water must either find additional reductions to be consistent with the carbon budget or reject or revise the proposed project. An example assessment of the consistency of hypothetical future projects with the carbon budget is provided in Appendix H.

10 CONCLUSION

Reducing GHGs supports Valley Water's mission and its role in responding to climate change. This GHGRP outlines strategies and actions Valley Water may take to reduce GHG emissions on the path to carbon neutrality. As 100 percent renewable electricity becomes commonplace, the importance of reducing emissions from Valley Water's electricity-reliant pumping activity, which historically dominated the agency's emissions profile, has been minimized. In contrast, reducing emissions from construction activities and other non-electric sources is now a key priority. This GHGRP identifies effective measures to reduce further Valley Water's emissions from fossil fuel use in Valley Water facilities, vehicles, and equipment, as well as in contracted construction vehicles and equipment. Requirements for future projects to assess consistency with this CEQA-qualified plan will address construction-related emissions. Supporting the implementation of projects to enhance carbon sequestration locally in Santa Clara County represents an important opportunity to address forecasted operational and construction emissions and an alternative to purchased carbon offsets.

Despite the uncertainty behind the availability of technology and infrastructure solutions, Valley Water will pursue emissions reductions in these areas to the extent feasible. Additionally, Valley Water's commitment to water conservation and demonstrated responsibility towards ecological restoration provides opportunities to reduce Valley Water's emissions further. Implementing these actions where feasible, combined with regular monitoring and reporting, will ensure that Valley Water achieves its carbon neutrality goal.

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Appendix A

Inventory, Forecast, and Measures Calculations

Santa Clara Valley Water District Emissions Inventory and Forecast Tool
Version 1.6

Cell color coding used for individual sectors' inventory and forecast GHG emissions calculations

Inputs from Valley Water (generally hard-coded)
Emissions calculations (formulas)
Historical MT CO2e Results
Forecast MT CO2e Results

Note: individual purchases of refrigerants and electricity usage by building have been redacted to preserve confidentiality. Aggregated totals only are presented for these sectors.

Emissions Inventory and Forecast
All values in the table below are metric tons of CO_2 equivalent.

Scope	Emissions Sector	Link	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2017 - 2021 Baseline	BAU 2030	BAU 2045	Leg-adjusted 2030	Leg-Adjusted 2045
			Historical results														BAU Forecast		Leg-Adjusted Forecast	
			2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2017 - 2021 Baseline**	**2030**	**2045**	**2030**	**2045**
2	Facility Electricity Use	Facility Electricity Use	3,426	2,216	537	3,562	4,608	6,192	6,285	19	14	79	0	9	0	20	23	23	23	0
3	Imported Water	Imported Water	No data	12,108	10,499	16,987	16,406	4,965	11,671	10,992	6,802	10,151	2,469	3,697	5,457	5,715	5,211	5,270	1,783	0
1	High GWP Gases	High GWP Gases	111	123	28	56	79	79	79	79	79	79	79	79	79	79	79	79	79	79
3	Sediment Hauling	Sediment Hauling	No data	No data	No data	No data	No data	No data	No data	No data	No data	28	80	93	48	62	62	62	47	0
3	Business Travel	Business Travel	No data	No data	No data	No data	No data	No data	No data	No data	No data	67	227	Exclude - COVID	Exclude - COVID	147	147	147	131	104
3	Wastewater	Wastewater	No data	327	307	312	322	320	342	355	347	314	327	336	390	343	343	343	343	343
3	Solid Waste	Solid Waste	No data	225	211	215	222	221	236	244	239	216	225	232	268	236	236	236	236	236
1	Natural Gas Use In Buildings	Natural Gas Use In Buildings	715	738	649	775	672	556	571	551	625	765	727	747	763	725	725	725	725	725
3	Employee Commute	Employee Commute	No data	1,417	1,313	1,318	1,330	1,294	1,356	1,362	1,312	1,162	1,184	Exclude - COVID	Exclude - COVID	1,219	981	981	651	129
1	On-Road Fleet	On-Road Fleet	783	807	924	1,061	1,209	957	947	867	964	1,032	1,134	1,172	1,208	1,102	1,212	1,378	890	103
1	Off-Road Fleet	Off-Road Fleet	519	393	461	171	611	431	560	666	866	561	704	763	620	703	952	1,082	952	1,082
3	Construction	Construction	No data	618	5,149	3,917	3,979	4,102	4,266	4,969	5,856	6,638	8,108	7,228	7,123	6,990	8,115	8,115	7,384	5,629
	TOTAL		5,554	18,970	20,078	28,373	29,439	19,116	26,313	20,104	17,104	21,091	15,263	14,357	15,956	17,342	18,087	18,442	13,243	8,430

Emissions by High GWP gas, $MTCO_2e$

Year	HFC-134a	R-407C	Total
2009	83	28	111
2010	123	-	123
2011	-	28	28
2012	56	-	56
2013	-	-	-
2014	-	-	-
2015	-	-	-
2016	-	-	-
2017	-	-	-
2018	-	-	-
2019	-	-	-
2020	-	-	-
2021	-	-	-

Year	Emissions Sector	Fuel Type	Fuel Amount	Fuel Units	Notes	Source	Metric tons co2e/gallon	MTCO2e
2009	Fleet-OffRoad	Diesel	48,888	gallons			1.061E-02	519
2010	Fleet-OffRoad	Diesel	37,031	gallons			1.061E-02	393
2011	Fleet-OffRoad	Diesel	43,430	gallons			1.061E-02	461
2012	Fleet-OffRoad	Diesel	16,075	gallons			1.061E-02	171
2013	Fleet-OffRoad	Diesel	57,538	gallons			1.061E-02	611
2014	Fleet-OffRoad	Diesel	40,592	gallons	data gap,5 year average used		1.061E-02	431
2015	Fleet-OffRoad	Diesel	52,729	gallons			1.061E-02	560
2016	Fleet-OffRoad	Diesel	62,779	gallons			1.061E-02	666
2017	Fleet-OffRoad	Diesel	81,564	gallons			1.061E-02	866
2018	Fleet-OffRoad	Diesel	52,907	gallons			1.061E-02	561
2019	Fleet-OffRoad	Diesel	66,349	gallons			1.061E-02	704
2020	Fleet-OffRoad	Diesel	71,929	gallons			1.061E-02	763
2021	Fleet-OffRoad	Diesel	58,446	gallons			1.061E-02	620
Below rows for forecast only								
2030							1.061E-02	
2045							1.061E-02	

	Historical Gallons / Year	Future Gallons / Year (BAU and legislative adjusted)	BAU emissions (MTCO2e)	Leg-adjusted emissions (MTCO2e)
2009	48,888			
2010	37,031			
2011	43,430			
2012	16,075			
2013	57,538			
2014	40,592			
2015	52,729			
2016	62,779			
2017	81,564			
2018	52,907			
2019	66,349			
2020	71,929			
2021	58,446			
2022		61,921		
2023		65,396		
2024		68,871		
2025		72,345		
2026		75,820		
2027		79,295		
2028		82,770		
2029		86,245		
2030		89,720	952	952
2031		90,535		
2032		91,351		
2033		92,167		
2034		92,982		
2035		93,798		
2036		94,614		
2037		95,429		
2038		96,245		
2039		97,061		
2040		97,876		
2041		98,692		
2042		99,507		
2043		100,323		
2044		101,139		
2045		101,954	1,082	1,082

Year	Facility Name (Building or Pump)	Fuel Use	Energy Utility	Unit	Convert therms to MMBTU	MT CO2 per MMBTU	MT CH4 per MMBTU	MT N2O per MMBTU	100-year GWP (CO2)	100-year GWP (CH4)	100-year GWP (N2O)	MT CO2e	MT CO2e / Therm
2009	Natural Gas Uses for All Facilities	134,658	PG&E Natural Gas	Therms	13,466	5.31E-02	1.00E-06	1.00E-07	1	27	273	715	5.311E-03
2010	Natural Gas Uses for All Facilities	138,852	PG&E Natural Gas	Therms	13,885	5.31E-02	1.00E-06	1.00E-07	1	27	273	738	5.311E-03
2011	Natural Gas Uses for All Facilities	122,150	PG&E Natural Gas	Therms	12,215	5.31E-02	1.00E-06	1.00E-07	1	27	273	649	5.311E-03
2012	Natural Gas Uses for All Facilities	145,948	PG&E Natural Gas	Therms	14,595	5.31E-02	1.00E-06	1.00E-07	1	27	273	775	5.311E-03
2013	Natural Gas Uses for All Facilities	126,512	PG&E Natural Gas	Therms	12,651	5.31E-02	1.00E-06	1.00E-07	1	27	273	672	5.311E-03
2014	Natural Gas Uses for All Facilities	104,610	PG&E Natural Gas	Therms	10,461	5.31E-02	1.00E-06	1.00E-07	1	27	273	556	5.311E-03
2015	Natural Gas Uses for All Facilities	107,467	PG&E Natural Gas	Therms	10,747	5.31E-02	1.00E-06	1.00E-07	1	27	273	571	5.311E-03
2016	Natural Gas Uses for All Facilities	103,731	PG&E Natural Gas	Therms	10,373	5.31E-02	1.00E-06	1.00E-07	1	27	273	551	5.311E-03
2017	Natural Gas Uses for All Facilities	117,654			11,765	5.31E-02	1.00E-06	1.00E-07	1	27	273	625	5.311E-03
2018	Natural Gas Uses for All Facilities	144,003	PG&E Natural Gas	Therms	14,400	5.31E-02	1.00E-06	1.00E-07	1	27	273	765	5.311E-03
2019	Natural Gas Uses for All Facilities	136,803	PG&E Natural Gas	Therms	13,680	5.31E-02	1.00E-06	1.00E-07	1	27	273	727	5.311E-03
2020	Natural Gas Uses for All Facilities	140,585	PG&E Natural Gas	Therms	14,059	5.31E-02	1.00E-06	1.00E-07	1	27	273	747	5.311E-03
2021	Natural Gas Uses for All Facilities	143,586	PG&E Natural Gas	Therms	14,359	5.31E-02	1.00E-06	1.00E-07	1	27	273	763	5.311E-03

Future emissions / year from existing buildings, MT CO2e, assuming average usage continues

	BAU Existing Buildings	Leg-adjusted Existing Buildings
2030	725	725
2045	725	725

Years across which to average

Start	2017
End	2021

Year	Emissions Sector	Fuel Type	Fuel Amount	Fuel Units	Notes	Source	Get gas emissions factor from EPA, MT CO2e/gallon	Total MT CO2e
2009	Fleet-OnRoad	Gasoline	88,834	gallons			0.0088	783
2010	Fleet-OnRoad	Gasoline	91,533	gallons			0.0088	807
2011	Fleet-OnRoad	Gasoline	104,874	gallons			0.0088	924
2012	Fleet-OnRoad	Gasoline	120,412	gallons			0.0088	1,061
2013	Fleet-OnRoad	Gasoline	137,241	gallons			0.0088	1,209
2014	Fleet-OnRoad	Gasoline	108,579	gallons	data gap,5 year average used		0.0088	957
2015	Fleet-OnRoad	Gasoline	107,410	gallons			0.0088	947
2016	Fleet-OnRoad	Gasoline	98,338	gallons			0.0088	867
2017	Fleet-OnRoad	Gasoline	109,443	gallons			0.0088	964
2018	Fleet-OnRoad	Gasoline	117,064	gallons			0.0088	1,032
2019	Fleet-OnRoad	Gasoline	128,693	gallons			0.0088	1,134
2020	Fleet-OnRoad	Gasoline	132,957	gallons			0.0088	1,172
2021	Fleet-OnRoad	Gasoline	137,122	gallons			0.0088	1,208
Below rows for forecast only								

	Historical Gallons / Year	BAU Future Gallons / Year	Leg-adjusted gallons per year	BAU emissions (MTCO2e)	Leg-adjusted emissions (MTCO2e)
2009	88,834				
2010	91,533				
2011	104,874				
2012	120,412				
2013	137,241				
2014	108,579				
2015	107,410				
2016	98,338				
2017	109,443				
2018	117,064				
2019	128,693				
2020	132,957				
2021	137,122				
2022		137,171	133,103		
2023		137,220	129,083		
2024		137,268	125,064		
2025		137,317	121,044		
2026		137,366	117,025		
2027		137,415	113,006		
2028		137,464	108,986		
2029		137,513	104,967		
2030		137,561	100,947	1,212	890
2031		138,812	94,999		
2032		140,062	89,050		
2033		141,313	83,101		
2034		142,564	77,152		
2035		143,814	71,203		
2036		145,065	65,254		
2037		146,315	59,305		
2038		147,566	53,356		
2039		148,816	47,407		
2040		150,067	41,458		
2041		151,318	35,509		
2042		152,568	29,561		
2043		153,819	23,612		
2044		155,069	17,663		
2045		156,320	11,714	1,378	103

Facility Electricity Emissions Calculation

	Weighted Average Emissions Factor, lbs CO2e/MWh	Total MWh	Emissions (MT CO2e)
2009	442	17,090	3,426
2010	282	17,323	2,216
2011	70	16,866	537
2012	484	16,240	3,562
2013	590	17,211	4,608
2014	616	22,170	6,192
2015	607	22,813	6,285
2016	2	22,806	19
2017	1	24,628	14
2018	8	21,662	79
2019	0	22,990	-
2020	1	26,781	9
2021	0	23,218	-

	Year	Historical MWh at generator	Forecast MWh (BAU and leg-adjusted)	BAU forecast emissions (MT CO2e)	Leg-adjusted emissions (MT CO2e)
0	2009	17,090			
0	2010	17,323			
0	2011	16,866			
0	2012	16,240			
0	2013	17,211			
0	2014	22,170			
0	2015	22,813			
0	2016	22,806			
0	2017	24,628			
0	2018	21,662			
0	2019	22,990			
0	2020	26,781			
0	2021	23,218			
	2022		26,781		
	2023		26,781		
	2024		26,781		
	2025		26,781		
	2026		26,781		
	2027		26,781		
	2028		26,781		
	2029		26,781		
	2030		26,781	23.0	22.6
	2031		26,781		
	2032		26,781		
	2033		26,781		
	2034		26,781		
	2035		26,781		
	2036		26,781		
	2037		26,781		
	2038		26,781		
	2039		26,781		
	2040		26,781		
	2041		26,781		
	2042		26,781		
	2043		26,781		
	2044		26,781		
	2045		26,781	23	-

Weighted average emissions factor in baseline years, lbs CO2e/MWh

1.89

Interpolate leg-adjusted emissions factor for non-PWRPA power in 2030

CAMX lbs CO2 / MWh

532 2021 https://www.epa.gov/egrid/summary-data

- 2045

332 2030 Interpolated

63% 2030 emissions factor as percent of 2021

96% Percent of power in baseline years that is from zero-carbon from PWRPA

4% Percent of power in baseline years that is from other sources

TRUE

Year	Sector	Volume of Water Imported	Unit	Emissions factor, MT CO2e/acre-foot	MT CO2e
2010	Imported Water -State Water Project	45,888	AF	0.26	12,108
2011	Imported Water -State Water Project	61,040	AF	0.17	10,499
2012	Imported Water -State Water Project	63,794	AF	0.27	16,987
2013	Imported Water -State Water Project	78,620	AF	0.21	16,406
2014	Imported Water -State Water Project	39,970	AF	0.12	4,965
2015	Imported Water -State Water Project	65,773	AF	0.18	11,671
2016	Imported Water -State Water Project	68,652	AF	0.16	10,992
2017	Imported Water -State Water Project	44,995	AF	0.15	6,802
2018	Imported Water -State Water Project	77,136	AF	0.13	10,151
2019	Imported Water -State Water Project	40,533	AF	0.06	2,469
2020	Imported Water -State Water Project	52,930	AF	0.07	3,697
2021	Imported Water -State Water Project	53,665	AF	0.10	5,457
2035	Imported Water -State Water Project			0.00	
2012	Imported Water -Central Valley Project	122,857	AF	0.00	-
2013	Imported Water -Central Valley Project	102,515	AF	0.00	-
2014	Imported Water -Central Valley Project	65,661	AF	0.00	-
2015	Imported Water -Central Valley Project	43,682	AF	0.00	-
2016	Imported Water -Central Valley Project	64,085	AF	0.00	-
2017	Imported Water -Central Valley Project	80,046	AF	0.00	-
2018	Imported Water -Central Valley Project	108,805	AF	0.00	-
2019	Imported Water -Central Valley Project	79,526	AF	0.00	-
2020	Imported Water -Central Valley Project	92,865	AF	0.00	-
2021	Imported Water -Central Valley Project	87,924	AF	0.00	-
					-

Acre-feet per year of imported water	Imported Water -State Water Project	Imported Water -Central Valley Project	Total imported water	BAU emissions forecast (MT CO2e)	Leg-adjusted Emissions Forecast (MT CO2e)
2010					
2011					
2012					
2013	78,620	102,515	181,135		
2014	39,970	65,661	105,631		
2015	65,773	43,682	109,455		
2016	68,652	64,085	132,737		
2017	44,995	80,046	125,041		
2018	77,136	108,805	185,941		
2019	40,533	79,526	120,059		
2020	52,930	92,865	145,795		
2021	53,665	87,924	141,589		
2022	53,534	89,302	142,836		
2023	52,979	88,377	141,357		
2024	52,425	87,452	139,877		
2025	51,870	86,527	138,398		
2026	51,316	85,602	136,918		
2027	50,761	84,677	135,439		
2028	50,207	83,752	133,959		
2029	49,652	82,827	132,480		
2030	49,098	81,902	131,000	5,211	1,783
2031	49,135	81,965	131,100		
2032	49,173	82,027	131,200		
2033	49,210	82,090	131,300		
2034	49,247	82,153	131,400		
2035	49,285	82,215	131,500		
2036	49,322	82,278	131,600		
2037	49,360	82,340	131,700		
2038	49,397	82,403	131,800		
2039	49,435	82,465	131,900		
2040	49,472	82,528	132,000		
2041	49,510	82,590	132,100		
2042	49,547	82,653	132,200		
2043	49,585	82,715	132,300		
2044	49,622	82,778	132,400		
2045	49,660	82,840	132,500	5,270	-

Acre-feet used for interpolation from water supply maters plan

2020	145,795
2030	131,000
2040	132,000

Source: Water Supply Master Plan 2040_11.01.2019_v2.pdf (valleywater.org)

Calculate shares from baseline period

Imported Water -State Water Project	Imported Water -Central Valley Project
37%	63%

Year	Sector	Number of Employees	Percent of FTE Telecommuting	One-way commute length (miles)	Type of Employees	Notes	Source	Working days per year	Round-trip commute length per day (miles)	Number of telecommuting FTE	Number of non-telecommuting FTE	Percent of workweek in office for telecommuters	Percent of week in office for non-telecommuters	Telecommuter VMT	Non-telecommuter VMT	Total VMT	MT Co2e/VMT	MT CO2e
2010	*Employee Commute*	747	10%	10	Full Time Regular			215	20	75	672	80%	100%	256,968	2,890,890	3,147,858	408	1,283
2011	*Employee Commute*	698	10%	10	Full Time Regular			215	20	70	628	80%	100%	240,112	2,701,260	2,941,372	402	1,183
2012	*Employee Commute*	697	10%	10	Full Time Regular			215	20	70	627	80%	100%	239,768	2,697,390	2,937,158	397	1,167
2013	*Employee Commute*	675	10%	10	Full Time Regular			215	20	68	608	80%	100%	232,200	2,612,250	2,844,450	387	1,102
2014	*Employee Commute*	665	10%	10	Full Time Regular			215	20	67	599	80%	100%	228,760	2,573,550	2,802,310	379	1,062
2015	*Employee Commute*	700	10%	10	Full Time Regular			215	20	70	630	80%	100%	240,800	2,709,000	2,949,800	371	1,095
2016	*Employee Commute*	727	10%	10	Full Time Regular			215	20	73	654	80%	100%	250,088	2,813,490	3,063,578	360	1,103
2017	*Employee Commute*	733	10%	10	Full Time Regular			215	20	73	660	80%	100%	252,152	2,836,710	3,088,862	355	**1,096**
2018	*Employee Commute*	647	10%	10	Full Time Regular			215	20	65	582	80%	100%	222,568	2,503,890	2,726,458	347	**946**
2019	*Employee Commute*	710	10%	10	Full Time Regular			215	20	71	639	80%	100%	244,240	2,747,700	2,991,940	340	**1,018**
2020	*Employee Commute*	793	60%	10	Full Time Regular			215	20	476	317	0%	100%	-	1,363,960	1,363,960	335	457
2021	*Employee Commute*	884	60%	10	Full Time Regular			215	20	530	354	0%	100%	-	1,520,480	1,520,480	328	498
2010	*Employee Commute*	77	0%	10	Temps	50% FTE assumed	153	215	20	0	77	80%	100%	-	328,950	328,950	408	134
2011	*Employee Commute*	76	0%	10	Temps	50% FTE assumed	151	215	20	0	76	80%	100%	-	324,650	324,650	402	131
2012	*Employee Commute*	89	0%	10	Temps	50% FTE assumed	177	215	20	0	89	80%	100%	-	380,550	380,550	397	151
2013	*Employee Commute*	137	0%	10	Temps	50% FTE assumed	274	215	20	0	137	80%	100%	-	589,100	589,100	387	228
2014	*Employee Commute*	142	0%	10	Temps	50% FTE assumed	284	215	20	0	142	80%	100%	-	610,600	610,600	379	231
2015	*Employee Commute*	163	0%	10	Temps	50% FTE assumed	326	215	20	0	163	80%	100%	-	700,900	700,900	371	260
2016	*Employee Commute*	167	0%	10	Temps	50% FTE assumed	334	215	20	0	167	80%	100%	-	718,100	718,100	360	259
2017	*Employee Commute*	142	0%	10	Temps	50% FTE assumed	283	215	20	0	142	80%	100%	-	608,450	608,450	355	**216**
2018	*Employee Commute*	145	0%	10	Temps	50% FTE assumed	289	215	20	0	145	80%	100%	-	621,350	621,350	347	**216**
2019	*Employee Commute*	113	0%	10	Temps	50% FTE assumed	226	215	20	0	113	80%	100%	-	485,900	485,900	340	**165**
2020	*Employee Commute*	55	100%	10	Temps	50% FTE assumed	109	215	20	55	0	0%	100%	-	-	-	335	-
2021	*Employee Commute*	99	100%	10	Temps	50% FTE assumed	197	215	20	99	0	0%	100%	-	-	-	328	-
2030		753	60%	10	Full Time Regular			215	20	452	301	60%	100%	1,166,263	1,295,848	2,462,111	231	567.617
2030		110	60%	10	Temps			215	20	66	44	60%	100%	170,899	189,888	360,787	231	83.176
2045		753	60%	10	Full Time Regular			215	20	452	301	60%	100%	1,166,263	1,295,848	2,462,111	46	112.383
2045		110	60%	10	Temps			215	20	66	44	60%	100%	170,899	189,888	360,787	46	16.468

Business Travel Emissions Calculations		Plane Calcs				Car calcs						
Car or plane?	Airline revenue ($/passenger-mile	passenger-miles	gallons of fuel	kg co2e	MT co2e	miles	mtco2e emissions/vmt	mtco2e emissions	cars + planes mt co2e emissions	Lee-adjusted 2030 cars + planes mt co2e emissions (ACC2)	Lee-adjusted 2045 cars + planes mt co2e emissions (ACC2)	
Car	N/A					16,768	0.000347	6	5.82	4	1	
Car	N/A					49,401	0.000347	17	17.14	11	2	
Plane	0.19	281,431	5,249	43,767	44				43.77	44	44	
Car	N/A					35,451	0.000340	12	12.07	8	2	
Car	N/A					188,598	0.000340	64	64.19	43	9	
Plane	0.19	971,359	18,116	151,063	151				151.06	151	151	

Calculate lee-adjusted MT CO2e lusing 2018 and 2019 data onlvl			
		2030	2045
	2018	59	47
	2019	203	161
Average		131	104

Sediment Hauling Calculations

Calendar Year	Sector	Item Description	Landfilled Waste (tons)	Recycled Waste (tons)	Composted Waste (tons)	Total Waste (Tons)	Waste Utility	Notes	Total Waste CY	Recycled Waste (CY)	Landfilled Waste CY	Include all tonnage hauled from Stream Maintenance Activities (landfilled, recycled, composted)	Convert short tons to metric tons
2015	Healthy Community	Homeless Encampment removal	710									0	-
2016	Healthy Community	Homeless Encampment removal	878									0	-
2017	Healthy Community	Homeless Encampment removal	1,146									0	-
2018	Healthy Community	Homeless Encampment removal	971									0	-
2019	Healthy Community	Homeless Encampment removal	871									0	-
2020	Healthy Community	Homeless Encampment removal	219									0	-
2021	Healthy Community	Homeless Encampment removal	104									0	-
2015	Healthy Community	Good neighbor trash and debris	119									0	-
2016	Healthy Community	Good neighbor trash and debris	59									0	-
2017	Healthy Community	Good neighbor trash and debris	101									0	-
2018	Healthy Community	Good neighbor trash and debris	54									0	-
2019	Healthy Community	Good neighbor trash and debris	62									0	-
2020	Healthy Community	Good neighbor trash and debris	58									0	-
2021	Healthy Community	Good neighbor trash and debris	53									0	-
2018	Stream Maintenance	Vegetation Management				1,082						1082	982
2019	Stream Maintenance	Vegetation Management				1,203						1203	1,091
2020	Stream Maintenance	Vegetation Management				1,294						1294	1,174
2021	Stream Maintenance	Vegetation Management				1,437						1437	1,304
2018	Stream Maintenance	Sediment Management	14,843	7,270		22,113	tons/CY		19279	6338	12941	22113	20,061
2019	Stream Maintenance	Sediment Management	56,195 -			56,195	1.147		48993	0	48993	56195	50,979
2020	Stream Maintenance	Sediment Management	53,418	10,674		64,092	1.147		55878	9306	46572	64092	58,143
2021	Stream Maintenance	Sediment Management	24,730	7,423		32,154	1.147		28033	6472	21561	32153	29,169
2019	CIP Sediment Reuse	Sediment Reuse from CIP		6,304						5496		0	-

Sediment Hauling Calculations

https://ww2.arb.ca.gov/sites/default/files/2021-03/emfac2021_volume_3_technical_document.pdf

T7 Single Dump Class 8

Get Dump Truck Emissions and Trip Data from EMFAC	2018	2019	2020	2021
Number of dump truck trips (one-way)	2,356,891	2,025,225	1,986,622	1,994,444
Dump Truck Emissions (MT CO2e)	24,466	24,539	24,678	24,514
Dump Truck VMT	13,425,728	13,472,910	13,604,790	13,503,264
Emissions per VMT (MT CO2e / VMT)	1.82E-03	1.82E-03	1.81E-03	1.82E-03

Line	Item	2018	2019	2020	2021	Calculation
A	Total metric tons of sediment hauled per year	21,042	52,071	59,317	30,472	Sediment management only values. Does not include Healthy Community items such as homeless encampment removals or trash/debris removal.
B	Metric tons of sediment hauled per load	15.8	15.8	15.8	15.8	Assuming a 5-Axle Truck-Trailer with a payload of 34,760 pounds. From Table III-4 on page III-9 of: https://www.fhwa.dot.gov/reports/tswstudy/vol2-chapter3.pdf
C	Loads hauled per year	1335	3303	3762	1933	Line A / Line B
D	grams CO2e per Dump Truck VMT	1,822	1,820	1,814	1,815	From CARB EMFAC data for Santa Clara, 2018-2021. Assumes T7 Single Dump Class 8 Heavy-Heavy Duty Single Unit Dump Truck (GVWR 33001 lbs. and over)
E	Truck miles travelled per load (round trip)	11.4	13.3	13.7	13.5	Uses EMFAC values to calculate miles / trip for dump trucks
F	Metric tons of CO2e per load	0.0208	0.0242	0.0248	0.0246	Line D * Line E / 10^6
G	Metric tons of CO2e per year - BAU	28	80	93	48	Line C * Line F

		2050	2045
	Metric tons of CO2e per year - Leg-adjusted with advanced clean fleets	46.42	-

Wastewater and Solid Waste Emissions Calculations

FTE historical	FTE future
2010	823.5
2011	773.5
2012	785.5
2013	812
2014	807
2015	863
2016	894
2017	874.5
2018	791.5
2019	823
2020	847.5
2021	982.5
2022	863.8
2023	863.8
2024	863.8
2025	863.8
2026	863.8
2027	863.8
2028	863.8
2029	863.8
2030	863.8
2031	863.8
2032	863.8
2033	863.8
2034	863.8
2035	863.8
2036	863.8
2037	863.8
2038	863.8
2039	863.8
2040	863.8
2041	863.8
2042	863.8
2043	863.8
2044	863.8
2045	863.8

Calculate Emissions from Wastewater using ICLEI Protocols, Equation WW.6 (alt).

Find-com	BOD5 load	(1 - Fp)	Bo	MCFa	Days/year	mt/kg	CH4	MT CO2e
	1.25	0.09	0.675	0.6	0.8	365.25	0.001	29.8	

2010	327
2011	307
2012	312
2013	322
2014	320
2015	342
2016	355
2017	347
2018	314
2019	327
2020	336
2021	390
2022	343
2023	343
2024	343
2025	343
2026	343
2027	343
2028	343
2029	343
2030	343
2031	343
2032	343
2033	343
2034	343
2035	343
2036	343
2037	343
2038	343
2039	343
2040	343
2041	343
2042	343
2043	343
2044	343
2045	343

Appendix F - Wastewater and Water Emission Activities and Sources - U.S. Community Protocol.pdf - Adobe Acrobat Standard (32-bit)

File Edit View E-Sign Window Help

Home Tools Appendix F - Wast... ×

39 / 103 82.3%

***Equation WW.6 (alt)* Alternate Methane Emissions from Lagoons**

Annual CH_4 emissions = $((P \times F_{Ind\text{-}com}) \times BOD_5\ load \times (1\text{-}FP) \times Bo \times MCF_a \times 365.25 \times 10^{-3}) \times GWP$

Where:

Description		Value
Annual CH_4 emissions	= Total annual CH_4 emitted by lagoon ($mtCO_2e$)	Result
P	= Population served by lagoon	User Input
$F_{Ind\text{-}com}$	= Factor for significant industrial and commercial co-discharge waste (see definition above)	1.25

Description		Value
BOD_5 load	= Amount of BOD_5 treated per day (kg BOD_5/person/day)	0.090
F_P	= Fraction of BOD_5 removed in primary treatment	0.325
Bo	= Maximum CH_4 producing capacity for domestic wastewater (kg CH_4/kg BOD_5)	0.6
MCF_a	= CH_4 correction factor for anaerobic systems	0.8
365.25	= Conversion factor (day/year)	365.25
10^{-3}	= Conversion from kg to mt (mt/kg)	10^{-3}
GWP_{CH_4}	= Global Warming Potential; conversion from mt of CH_4 into mt of CO_2 equivalents	GWP^{18}

Source: As listed in LGO protocol Equation 10.4 from EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007, Chapter 8, 8-7 (2009); except F_P: Tchobanoglous, G., F.L. Burton, and H.D. Stensel, Wastewater Engineering: Treatment and Reuse, p. 396, 4th Edition (2003).

Calculate Emissions from Solid Wastes using ICLEI Protocols, Equation SW.4.1 Methane Emissions

CH4	(1 - CE)	(1 - OX)	M	EF	result
29.8	0.25	0.9	0.679185	0.06	

2010	225
2011	211
2012	215
2013	222
2014	221
2015	236
2016	244
2017	239
2018	216
2019	225
2020	232
2021	268
2022	236
2023	236
2024	236
2025	236
2026	236
2027	236
2028	236
2029	236
2030	236
2031	236
2032	236
2033	236
2034	236
2035	236
2036	236
2037	236
2038	236
2039	236
2040	236
2041	236
2042	236
2043	236
2044	236
2045	236

Equation SW.4.1 Methane Emissions

$$CH_4\ Emissions = GWP_{CH4} * (1 - CE) * (1 - OX) * M * \sum_i P_i * EF_i$$

Where:

Term	Description	Value
CH_4 emissions	= Community generated waste emissions from waste M ($mtCO_2e$)	Result
GWP_{CH4}	= CH_4 global warming potential	
M	= Total mass of waste entering landfill (wet short ton)	User Input
P_i	= Mass fraction of waste component i	User Input
EF_i	= Emission factor for material i ($mtCH_4$/wet short ton)	Table SW.5
CE	= Default LFG Collection Efficiency	No Collection, 0 Collection, 0.75
OX	= Oxidation rate	0.10

Source: As developed by ICLEI staff and Solid Waste Technical Advisory Committee. Emissions factors from U.S. EPA Municipal Solid Waste Publication (2008) available at http://www.epa.gov/epawaste/nonhaz/municipal/pubs/msw2008data.pdf

Includes employee construction working commute, materials, painting, energy consumption from grid for construction. This is direct emissions only, NOT consumption based, not embodied energy.

Start Year	End Year	Sector	Project Name	Total Project Emissions (MTCO2e)	Notes	Source	Total Years	emissions/year
2010	2011	*Construction*	South Bay Advanced Recycled Water Treatment Facility	1,235			2	617.50
2011	2011	*Construction*	Lower Berryessa Creek Program	4,531			1	4,531.24
2022	2023	*Construction*	Rinconada Water Treatment Plant Residuals Management Projct	12,530			2	6,265.00
2015	2027	*Construction*	Rinconada Water Treatment Plant: RELIABILITY IMPROVEMENT PROJECT	1,118	Some phases completed and some ongoing		13	86.00
2013	2014	*Construction*	Kirk Diversion Dam Replacement and Fish Screen Project	123			2	61.43
2014	2018	*Construction*	Upper Guadalupe River Flood Control Project- Reach 12	258			5	51.60
2014	2014	*Construction*	Coyote Ridge Long Term Management Plan	72			1	71.74
2015	2015	*Construction*	Upper Penitencia Creek Property Acquisition and Long Term Management Plan	17			1	16.80
2015	2023	*Construction*	South County Recycled Water Master Plan Project	468			9	52.01
2015	2017	*Construction*	Coyote Warehouse Project	428			3	142.79
2016	2018	*Construction*	Upper Berryessa Creek Flood Risk Management Project	1,849			3	616.27
2016	2017	*Construction*	Penitencia Delivery Main and Penitencia Force Main Seismic Retrofit Project	87			2	43.50
2016	2016	*Construction*	Penitencia and Santa Teresa Water Treatment Plants Solar Project	60			1	60.00
2017	2020	*Construction*	Upper Guadalupe Reach 6 Aquatic Habitat Improvement Project	421			4	105.30
2017	2021	*Construction*	Permanente Creek Flood Protection Project	4,206			5	841.20
2018	2019	*Construction*	Uvas Creek Levee Rehabilitation Project	235			2	117.51
2018	2019	*Construction*	Main Avenue and Madrone Pipeline Restoration Project	1,021			2	510.50
2018	2019	*Construction*	Cunningham Flood Detention Facility Certification Project	681			2	340.56
2019	2025	*Construction*	Upper Llagas Creek Flood Protection Project	14,962			7	2,137.43
2020	2022	*Construction*	Saratoga Creek Hazard Tree Removal and Restoration Project	266			3	88.60
2022	2023	*Construction*	Calabazas Creek Bank Rehabilitation Project	345	Project anticipated to finish fall 2023		2	172.50
2024	2034	*Construction*	Palo Alto Flood Basin Tide Gate Structure Replacement Project	1,769	On hold per latest CIP. Include in forecast within first 10 years.		11	160.82
2024	2034	*Construction*	Almaden Lake Improvement Projct	5,949	On hold per latest CIP. Incude in forecast within first 10 years.		11	540.82
2027	2035	*Construction*	Pacheco Reservoir Expansion Project	-	Data from EIR. Mitigated to zero. Do not include. GHGRP to provide offset mechanism.		[redacted]	
2026	2040	*Construction*	Anderson Dam Siesmic Retrofit Project	-	Data from EIR (Sept 2023). Mitigated to zero. Do not include. CAP to provide offset mechanism.			
2024	2034	*Construction*	Sunnyvale East and West Channels Flood Protection Project	1,756	On hold per latest CIP. Incude in forecast within first 10 years.		11	159.59
2022	2028	*Construction*	South San Francisco Bay Shoreline	15,769			7	2,252.68
2012	2045	*Construction*	Stream Maintenance Program (Second: 2012-2022)	133,188	2012 estimate: 4363.2 MTCO2/year; 2020 estimate 3917.3 MTCO2/year. Includes VW vehicles and equipm		34	3,917.30
2031	2045	*Construction*	Forecasted Projects (2034 to 2045) (BAU)	51,146	Annual average of non-pacheco/ADSRP/stream maintenance projects between 2010 and 2030.			
2031	2045	*Construction*	Forecasted Projects (2034 to 2045) (Leg-Adj BAU)		Annual average of non-pacheo/ADSRP projects between 2010 and 2030. Assumes that 30% of emissions are from light duty and heavy duty on-road transportation (50% employee commute and 50% haul trucks). For light duty vehicles, the forecast applies a 30% reduction to on-road transportation based on difference between 2021 (mean year) and 2030 LDV in Santa Clara County, and an 87% reduction by 2045, using data from EMFAC and ACC2. For heavy-duty vehicles, we estimate a 16% reduction by 2030 and 40% reduction by 2045 from 2021. No leg reduction are expected to apply to GHG emissions from off-road vehicles.			

Emissions assigned to year, MTCO2e

Project Name	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	Ongoing in 2030?	Assumed annual emissions in 2030
South Bay Advanced Recycled Water Treatment Facility	618	618	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	34
Lower Berryessa Creek Program	-	4,531	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	252
Rinconada Water Treatment Plant Residuals Management Projct	-	-	-	-	-	-	-	-	-	-	-	-	6,265	6,265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	696
Rinconada Water Treatment Plant: RELIABILITY IMPROVEMENT PROJECT	-	-	-	-	-	86	86	86	86	86	86	86	86	86	86	86	86	86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	62
Kirk Diversion Dam Replacement and Fish Screen Project	-	-	-	61	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	7
Upper Guadalupe River Flood Control Project- Reach 12	-	-	-	-	52	52	52	52	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	14
Coyote Ridge Long Term Management Plan	-	-	-	-	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	4
Upper Penitencia Creek Property Acquisition and Long Term Management Plan	-	-	-	-	-	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	1
South County Recycled Water Master Plan Project	-	-	-	-	-	52	52	52	52	52	52	52	52	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	26
Coyote Warehouse Project	-	-	-	-	-	143	143	143	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	24
Upper Berryessa Creek Flood Risk Management Project	-	-	-	-	-	-	616	616	616	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	103
Penitencia Delivery Main and Penitencia Force Main Seismic Retrofit Project	-	-	-	-	-	-	44	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	5
Penitencia and Santa Teresa Water Treatment Plants Solar Project	-	-	-	-	-	-	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	3
Upper Guadalupe Reach 6 Aquatic Habitat Improvement Project	-	-	-	-	-	-	-	105	105	105	105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	23
Permanente Creek Flood Protection Project	-	-	-	-	-	-	-	841	841	841	841	841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	234
Uvas Creek Levee Rehabilitation Project	-	-	-	-	-	-	-	-	118	118	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	13
Main Avenue and Madrone Pipeline Restoration Project	-	-	-	-	-	-	-	-	511	511	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	57
Cunningham Flood Detention Facility Certification Project	-	-	-	-	-	-	-	-	341	341	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	38
Upper Llagas Creek Flood Protection Project	-	-	-	-	-	-	-	-	-	2,137	2,137	2,137	2,137	2,137	2,137	2,137	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	831
Saratoga Creek Hazard Tree Removal and Restoration Project	-	-	-	-	-	-	-	-	-	-	89	89	89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	15
Calabazas Creek Bank Rehabilitation Project	-	-	-	-	-	-	-	-	-	-	-	-	173	173	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	19
Palo Alto Flood Basin Tide Gate Structure Replacement Project	-	-	-	-	-	-	-	-	-	-	-	-	-	-	161	161	161	161	161	161	161	161	161	161	161	-	-	-	-	-	-	-	-	-	-	-	Yes	161
Almaden Lake Improvement Projct	-	-	-	-	-	-	-	-	-	-	-	-	-	-	541	541	541	541	541	541	541	541	541	541	541	-	-	-	-	-	-	-	-	-	-	-	Yes	541
[redacted]																																					No	-
																																					No	-
Sunnyvale East and West Channels Flood Protection Project	-	-	-	-	-	-	-	-	-	-	-	-	-	-	160	160	160	160	160	160	160	160	160	160	160	-	-	-	-	-	-	-	-	-	-	-	Yes	160
South San Francisco Bay Shoreline	-	-	-	-	-	-	-	-	-	-	-	-	2,253	2,253	2,253	2,253	2,253	2,253	2,253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	876
Stream Maintenance Program (Second: 2012-2022)	-	-	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	Yes	3,917
																					2,605	2,605	2,605	2,605	2,605	3,466	3,466	3,466	3,466	3,466	3,466	3,466	3,466	3,466	3,466	3,466		
BAU TOTAL FORECAST	618	5.149	3.917	3.979	4.102	4.266	4.969	5.856	6.638	8.108	7.228	7.123	14.972	14.883	9.255	9.255	7.117	7.117	7.031	4.779	8.115	8.115	8.115	8.115	8.115	8.115	8.115	8.115	8.115	8.115	8.115	8.115	8.115	8.115	8.115	8.115		
Leg-Adjusted TOTAL FORECAST																					7,384															5,629		

ACC2 and ACF adjustments

EMFAC type	Definition	Legislative Adjustment	VMT / year	EMFAC type	g / vmt CO2e BAU 2019	2030	2045	g / vmt CO2e after legislative adjustments 2019	2030	2045	2019	2030	2045
LDA	Passenger Cars	ACC2	498,425	LDA	292	292	292	292	182	23	0%	-37%	-92%
LDT1	Light-Duty Trucks	ACC2	1,770,300	LDT1	366	366	366	366	287	85	0%	-22%	-77%
LDT2	Light-Duty Trucks	ACC2	28,964	LDT2	392	392	392	392	286	84	0%	-27%	-79%
MDV	Medium-Duty Trucks	ACC2	2,126,568	MDV	475	475	475	475	322	76	0%	-32%	-84%
LHD1	Light-Heavy-Duty Trucks	ACF	1,444,114	LHD1	887	887	887	887	666	-	0%	-25%	-100%
LHD2	Light-Heavy-Duty Trucks	ACF	809,438	LHD2	930	930	930	930	697	-	0%	-25%	-100%
T6TS	Medium-Heavy Duty Trucks	ACF	260,965	T6TS	1,943	1,943	1,943	1,943	1,457	-	0%	-25%	-100%
Fleetwide			6,938,774	Fleetwide	628	628	628	628	461	47	0%	-27%	-93%
T6's and T7's	Medium-Heavy Duty Trucks	ACF	-	T6's and T7's	1,715	1,715	1,715	1,715	1,286	-	0%	-25%	-100%

FLEETWIDE emissions factor due to ACC 2 and ACF, relative to 2019 baseline

2030	2045	
73.4%	7.5%	<---- all onroad vehicles
71%	18%	<---- light-duty only (for employee commute in construction calcs)
75%	0.0%	<---- heavy duty only

Advanced Clean Fleets - assuming Group 2

	% of fleet electric	% of fleet ICE
2019	0%	100%
2022	0%	100%
2023	0%	100%
2024	0%	100%
2025	0%	100%
2026	0%	100%
2027	10%	90%
2028	10%	90%
2029	10%	90%
2030	25%	75%
2031	25%	75%
2032	25%	75%
2033	50%	50%
2034	50%	50%
2035	50%	50%
2036	75%	25%
2037	75%	25%
2038	75%	25%
2039	100%	0%
2040	100%	0%
2041	100%	0%
2042	100%	0%
2043	100%	0%
2044	100%	0%
2045	100%	0%
2046	100%	0%
2047	100%	0%
2048	100%	0%
2049	100%	0%
2050	100%	0%

Calculation of EPS emission factors

Year	MWh	Metric Tons of CO2	Metric tons of CO2 per MWh	Metric tons of CO2 per acre-foot	Source for MWh and MT CO2
2010	7,017,918.90	1,740,305.63	0.25	0.26	2010 EPS report
2011	8,321,228.22	1,345,189.43	0.16	0.17	2011 EPS report
2012	7,170,510.35	1,794,499.73	0.25	0.27	2012 EPS report
2013	5,587,987.89	1,095,957.88	0.20	0.21	2013 EPS report
2014	2,796,292.10	326,431.64	0.12	0.12	2014 EPS report
2015	3,490,064.92	582,025.85	0.17	0.18	2015 EPS report
2016	6,540,308.49	984,190.13	0.15	0.16	2016 EPS report
2017	9,580,258.80	1,361,134.22	0.14	0.15	2017 EPS report
2018	5,624,903.20	695,680.59	0.12	0.13	2018 EPS report
2019	7,555,491.13	432,486.51	0.06	0.06	2019 EPS report
2020	3,818,321.11	250,688.04	0.07	0.07	2020 EPS report
2021	2,699,048.86	257,933.44	0.10	0.10	2021 EPS report

EPS reports overview: https://theclimateregistry.org/registries-resources/protocols/

1.064 < - MWh per acre foot of water delivered by SWP to Santa Clara Valley Water District

https://dwr.maps.arcgis.com/apps/Styler/index.html?appid=c112a21431884158b58fc5564e66c439

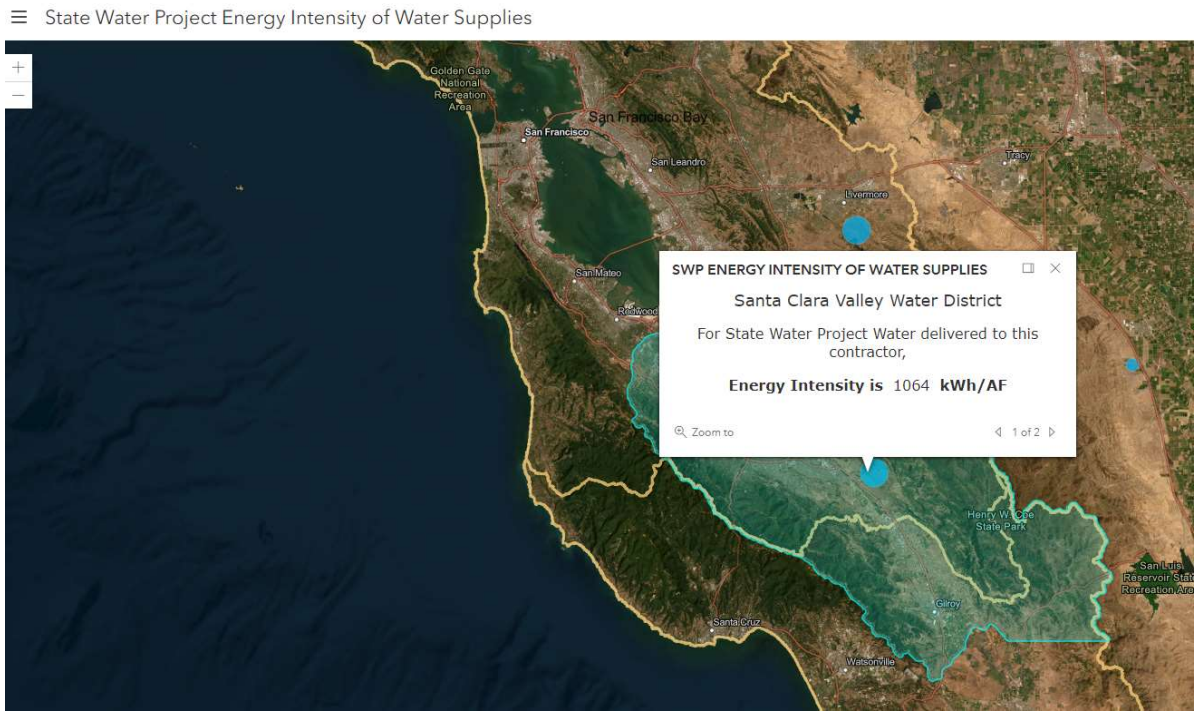

Table 3-20: Average Passenger Revenue per Passenger-Mile (current cents) from Bureau of Transportation Statistics

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Air carrier, domestic, scheduled service	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**17.7**	**16.6**	**16.9**	**15.9**	**16.5**	**17.0**	**17.2**	**17.8**	**16.2**	**15.3**	**15.2**	**14.6**	**14.9**	**16.2**	**16.2**	**17.5**	**16.0**	**17.2**	**18.4**	**18.9**	**19.3**	**19.9**	**19.2**	**18.3**	**18.3**	**18.5**	**18.6**	**15.3**	**15.6**
Index (1993 = 100)	NA	NA	NA	NA	NA	NA	NA	NA	NA	100	94	95	90	93	96	97	100	92	87	86	83	85	92	92	99	91	97	104	107	109	113	109	104	104	105	105	86	88
Commuter rail	**N**	**N**	**N**	**N**	**N**	**N**	**13.4**	**13.0**	**13.3**	**14.3**	**13.5**	**13.1**	**13.7**	**14.7**	**14.4**	**14.9**	**14.6**	**15.1**	**15.2**	**15.5**	**16.6**	**18.3**	**18.0**	**17.8**	**19.6**	**19.6**	**20.7**	**21.5**	**22.9**	**22.9**	**24.3**	**25.5**	**26.3**	**26.1**	**25.7**	**26.0**	**27.6**	**25.2**
Index (1993 = 100)	NA	NA	NA	NA	NA	NA	94	91	92	100	94	91	96	102	101	104	102	105	106	108	116	127	125	124	137	136	144	150	160	160	170	178	184	182	179	181	193	176
Intercity / Amtrak[a]	**3.0**	**3.1**	**4.0**	**6.4**	**8.0**	**11.3**	**14.1**	**14.1**	**14.1**	**14.0**	**13.7**	**14.6**	**16.6**	**17.3**	**17.5**	**18.4**	**23.2**	**24.9**	**26.8**	**25.0**	**26.0**	**27.2**	**29.7**	**30.7**	**31.8**	**30.8**	**31.0**	**33.0**	**33.9**	**35.4**	**38.0**	**37.5**	**38.4**	**39.2**	**40.7**	**41.7**	**50.0**	**42.4**
Index (1993 = 100)	22	22	29	46	57	80	101	101	100	100	98	104	118	123	125	131	165	177	191	178	185	194	212	219	227	219	221	235	241	253	271	267	274	279	290	297	356	302
Consumer Price Index (1993 = 100)	**20**	**22**	**27**	**37**	**57**	**74**	**90**	**94**	**97**	**100**	**103**	**105**	**109**	**111**	**113**	**115**	**119**	**123**	**124**	**127**	**131**	**135**	**140**	**143**	**149**	**148**	**151**	**156**	**159**	**161**	**164**	**164**	**166**	**170**	**174**	**177**	**179**	**188**

KEY: N = data do not exist; NA = not applicable.

[a] *Amtrak* began operations in 1971.

NOTES

The Bureau of Transportation Statistics rebased the consumer price index from 1982-84 = 100 to 1993 = 100.

Air carrier data source changed for data from 1993 onward. Improved estimates are not comparable to data in versions before 2021.

SOURCES

Air carrier, domestic, scheduled service:

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *TranStats Database,* Origin and Destination Survey, available at https://www.transtats.bts.gov/homepage.asp as of Nov. 9, 2022.

Commuter rail:

1990-2001: American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: 2011), tables 3 and 92 and similar tables in previous editions (passenger fares / passenger miles).

2002-21: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, Annual Database Service and Annual Database Fare Revenue (Washington, D.C.: Annual reports), available at https://www.transit.dot.gov/ntd/ntd-data as of Nov. 9, 2022.

Intercity / Amtrak:

1960-70: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues).

1975-80: Amtrak, personal communication, June 22, 2011.

1985-2002: Amtrak, *Amtrak Annual Report, Statistical Appendix* (Washington, DC: Annual Issues) (transportation revenues / passenger-miles).

2003-21: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 73 and similar pages in previous editions (passenger revenue/revenue passenger miles).

Consumer Price Index:

U.S. Department of Labor, Bureau of Labor Statistics, *Consumer Price Index-Urban, U.S. All Items Indexes*, available at http://www.bls.gov/cpi/ as of Feb. 7, 2023.

Assumed line loss
4.40%

Carbon Budget Calcs - Comparison of Annual Emissions, Measure Reductions, and Targets (MTCO2e)

			VF-1	OF-1	HG-1	FE-1	EC-1	SW-1	CN-1	CN-2	WA-1				
			0	0	0	0	0	0	0	0	0		<---- Annual Reductions in:	2025	
			102	476	41	218	13	157	952	104	308		<---- Annual Reductions in:	2030	
	Targets	Leg-adjusted emissions	103	1082	41	435	5	197	2429	24	0		<---- Annual Reductions in:	2045	
2019	17,342	17,342													
2020	16,712	16,970													
2021	16,081	16,597													
2022	15,451	16,225													
2023	14,820	15,852													
2024	14,189	15,479										Total annual reductions	Total cumulative reductions	Emissions after measures	Percent reduction below baseline
2025	13,559	15,107	0	0	0	0	0	0	0	0	0	0	0	15,107	
2026	12,928	14,734	20	95	8	44	3	31	190	21	262	674	674	14,059	
2027	12,297	14,361	41	190	16	87	5	63	381	42	281	1105	1780	13,256	
2028	11,667	13,989	61	286	24	131	8	94	571	62	294	1532	3311	12,457	
2029	11,036	13,616	81	381	33	174	10	126	761	83	303	1953	5265	11,663	
2030	10,405	13,243	102	476	41	218	13	157	952	104	308	2370	7634	10,873	
2031	9,712	12,922	102	516	41	232	12	160	1,050	99	304	2,516	10,151	10,406	40%
2032	9,018	12,601	102	557	41	247	12	163	1,149	93	297	2,660	12,811	9,942	
2033	8,324	12,281	102	597	41	261	11	165	1,247	88	289	2,801	15,612	9,479	
2034	7,631	11,960	102	638	41	276	11	168	1,346	83	278	2,941	18,553	9,019	
2035	6,937	11,639	102	678	41	290	10	170	1,444	77	264	3,077	21,630	8,562	
2036	6,243	11,318	102	718	41	305	10	173	1,543	72	248	3,212	24,842	8,106	
2037	5,550	10,997	102	759	41	319	9	176	1,641	66	230	3,344	28,186	7,653	
2038	4,856	10,676	102	799	41	334	9	178	1,740	61	210	3,474	31,659	7,203	
2039	4,162	10,355	103	840	41	348	8	181	1,838	56	187	3,601	35,260	6,755	
2040	3,468	10,035	103	880	41	363	8	184	1,937	50	162	3,726	38,986	6,309	
2041	2,775	9,714	103	920	41	377	7	186	2,035	45	134	3,848	42,834	5,865	
2042	2,081	9,393	103	961	41	392	7	189	2,133	40	104	3,969	46,803	5,424	
2043	1,387	9,072	103	1,001	41	406	6	191	2,232	34	72	4,087	50,890	4,985	
2044	694	8,751	103	1,042	41	421	6	194	2,330	29	37	4,202	55,092	4,549	
2045	0	8,430	103	1,082	41	435	5	197	2,429	24	0	4,315	59,407	4,115	

	Before Measures (i.e., no measure reductions included)	After Measures (not including CS-1 sequestration)	After Measures (with CS-1 sequestration)
Total carbon budget, 2025-2045	144,731	144,731	144,731
Total emissions 2025-2045	245,194	185,787	144,731
Budget surplus (+) shortfall (-)	-100,463	-41,056	0

CN-1		
For all contracted construction projects, require the use of zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) instead of conventional diesel in 17% of offroad construction equipment fuel use in equipment greater than 25 hp by 2030, and 45% by 2045 regardless of the engine Tier.		
	2030	**2045**
Forecasted offroad construction emissions (MT CO2e)	5,640	5,398
Percent of offroad construction equipment fuel use from renewable diesel, biodiesel, electricity, or hydrogen [1]	17%	45%
Total GHG Reductions (MT CO2e)	952	2,429

Source:

[1] Renewable diesel and biodiesel are biogenic fuels, and emissions from their combustion are not counted towards Valley Water's total emissions. This is consistent with the California Air Resource Board's emissions counting conventions, which do not include biogenic CO2 in comparing emissions to State targets. See: California Air Resources Board. 2022. California Greenhouse Gas Emissions for 2000 to 2020: Trends of Emissions and Other Indicators. Available: https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/2000-2020_ghg_inventory_trends.pdf (at 12-13).

CN-2

For all contracted construction projects, require the use of zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) instead of conventional fuel in 35% of onroad construction vehicle fuel use by 2030, and 95% by 2045.

	2030	2045
Legislative-adjusted onroad construction emissions (MT CO2e)	911	71
Estimated percent of onroad construction vehicle fuel use that is zero-emissions, based on decline in emissions factors due to ACF and ACC2.	27%	93%
Estimated percent of onroad construction vehicle fuel use from ICE vehicles	73%	7%
Target percent of onroad construction vehicle fuel use that is zero emissions [1]	35%	95%
Target percent of fleet fuel use from ICE vehicles	65%	5%
Onroad construction emissions after measure implementation	807	47
Total GHG Reductions (MT CO2e)	104	24

Source:

[1] Renewable diesel and biodiesel are biogenic fuels, and emissions from their combustion are not counted towards Valley Water's total emissions. This is consistent with the California Air Resource Board's emissions counting conventions, which do not include biogenic CO2 in comparing emissions to State targets. See: California Air Resources Board. 2022. California Greenhouse Gas Emissions for 2000 to 2020: Trends of Emissions and Other Indicators. Available: https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/2000-2020_ghg_inventory_trends.pdf (at 12-13).

VF-1			
Implement a Zero Carbon Fleet Plan to convert 35% of onroad fleet fuel use to zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) by 2030, and 100% by 2045.			
		2030	**2045**
Forecasted legislative-adjusted onroad fleet emissions (MT CO2e)		890	103
Estimate percent of VW fleet that is zero-emissions.	**2019**	**2030**	**2045**
Valley Water fleetwide legislative-adjusted emissions factor, (g CO2e / VMT)	628	461	47
Estimated percent of fleet fuel use that is zero-emissions, based on decline in emissions factors due to ACF and ACC2. In 2019 Valley Water's fleet is assumed to be all internal combustion vehicles.		27%	93%
Percent of fleet fuel use that is zero-emission under Advanced Clean Cars II (ACC II) and Advanced Clean Fleets (ACF)		27%	93%
Percent of fleet fuel use from internal combustion (ICE) vehicles under ACCII and ACF		73%	7%
Target percent zero-emission fuel use [1]		35%	100%
Target percent fuel use from ICE vehicles		65%	0%
Additional percentage of zero-emission fleet fuel use credited to this measure		8%	7%
Emissions after measure implementation (MT CO2e)		788	-
Total GHG Reductions (MT CO2e)		102	103
Note:			
[1] Electric vehicles have zero tailpipe emissions, and are thus counted as zero-emission vehicles.			
[2] 2019 is the midpoint of the 2017 - 2021 baseline period, and thus is used as an estimate of the fleet's emissions during that period.			

OF-1		
Require the use of zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) instead of conventional diesel in 50% of Valley Water's offroad fleet fuel use in equipment by 2030, and 100% by 2045 regardless of engine Tier.		
	2030	**2045**
Forecasted fleet offroad emissions (MT CO2e)	952	1,082
Zero-emission fuel targets	50%	100%
Percent fuel use in ICE vehicles after targets met	50%	0%
Emissions after targets met (MT CO2e)	476	-
Total GHG Reductions (MT CO2e)	476	1,082
Note: *Beginning January 1, 2024, offroad vehicles subject to the California Air Resource Board's Off-Road regulation are required to use only renewable diesel. This regulation excludes Tier 4 Final equipment, which has been required since model year 2013 for equipment over 25hp. However, this measure would require the use of renewable diesel regardless of Tier. See: California Air Resources Board. 2023. Fact Sheet: Renewable Diesel Fuel Requirements. Available: https://ww2.arb.ca.gov/resources/fact-sheets/fact-sheet-renewable-diesel-fuel-requirements.*		

HG-1		
Replace high GWP refrigerants with low GWP alternatives above and beyond the requirements of SB 1206.		
	2030	**2045**
Forecasted High-GWP emissions (MT CO2e)	79	79
Weighted average current GWP of refrigerants	1,542	1,542
Weighted Average GWP after replacement with low-GWP alternatives under SB 1206	750	750
Percent reduction in GWP	-51%	-51%
Total GHG Reductions (MT CO2e)	41	41

Source:
California Air Resources Board. 2023. SB 1206. Available:
https://ww2.arb.ca.gov/our-work/programs/sb-1206/about

FE-1

Electrify 30% of existing facility energy use by 2030, and 60% by 2045.

	2017-2021	2030	2045
Total emissions from combustion of natural gas in Valley Water buildings (MT CO2e)	725	725	725
Percent of natural gas end-use that is electrified [1]		30%	60%
Total GHG Reductions (MT CO2e)		218	435

Note:

[1] Assumes that procurement of additional zero-carbon electricity from the Power and Water Resources Pooling Authority (PWRPA) replaces gas heating in these buildings. Thus, there are no additional emissions from electricity.

EC-1		
Implement a companywide commute challenge with rewards and competitions to encourage employees to reduce their VMT or reduce emissions from their commute vehicle. Offer a variety of incentives, including e-bike rebates, and parking cash-out programs.		
Baseline employee commute emissions (MT CO2e)	**2030**	**2045**
Forecast legislative-adjusted employee commute emissions (MT CO2e)	651	129
Percent of programs implemented	50%	100%
Possible reductions from voluntary trip reduction program [1]	4%	4%
Total GHG Reductions (MT CO2e)	13	5

Source:

[1] See: California Air Pollution Control Officers Association. 2021. Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity. Available: https://www.caleemod.com/documents/handbook/full_handbook.pdf (at 83). 4 percent is the maximum possible reduction from Measure T-5 (Implement Voluntary Commute Trip Reduction Program).

SW-1		
Divert 80% of waste from VW offices from landfills by 2030, and 90% by 2045. Improve solid waste tracking by conducting regular assessments of waste characterization.		
	2030	**2045**
Forecast legislative-adjusted solid waste emissions (MT CO2e)	236	236
Assumed diversion rate [1]	40%	40%
Landfill rate	60%	60%
Target diversion rate	80%	90%
Target landfill rate	20%	10%
Percent of forecasted emissions remaining after measure implementation	33%	17%
Emissions after measure implementation (MT CO2e)	79	39.34
Total GHG Reductions (MT CO2e)	157	197

Source:

[1] CalRecycle. 2023. State of Disposal and Recycling in California. Available: https://calrecycle.ca.gov/reports/stateof/.

WA-1

Increase communitywide water conservation to 98,800 acre-feet per year by 2030 and 118,000 per year by 2045.

	2018	2020	2019	2022	2030	2045
Acre-feet per year conserved [1]	77,000	76,100	76,550	82,618	98,800	118,000
Net increase in acre-feet conserved, relative to baseline				6,068	22,250	41,450

Water Supply Master Plan 2040 - Supply and demand for water (acre-feet) [2]. 2022 and 2045 values interpolated.

Source of Supply (Acre-Feet)	2020	2022	2030	2040	2045
Natural Groundwater Recharge	61,000	61,000	61,000	61,000	61,000
Local Surface Water	53,000	57,000	73,000	83,000	88,000
Reuse Water	21,000	22,800	30,000	33,000	34,500
San Francisco Public Utilities Commission	55,000	55,400	57,000	58,000	58,500
Delta-Conveyed	162,000	155,800	131,000	132,000	132,500
Average Supply	352,000	352,000	352,000	367,000	374,500
Demand	358,000	360,800	372,000	399,000	412,500

Emissions Factor Calculation

Inputs for calculation of weighted average 2030 Delta-conveyed emissions factor, MT CO2e / AF

	2022	2030	2045
State Water Project (SWP) volume (AF)	53,534	49,098	49,660
Central Valley Project (CVP) volume (AF)	89,302	81,902	82,840
SWP emissions factor (MT CO2e/AF)	0.0944	0.0363	0.0000
CVP emissions factor (MT CO2e/AF)	0.00	0.00	0.00

Conveyance Emission Factors (MT CO2e / AF) [3]	2022	2030	2045
Natural Groundwater Recharge	0	0	0
Local Surface Water	0	0	0
Reuse Water	0	0	0
San Francisco Public Utilities Commission	0	0	0
Delta-Conveyed	0.0354	0.0136	0.0000

Calculate reductions in 2030 and 2045.	2022	2030	2045
Weighted average emissions factor per acre foot of water: Conveyance from source TO Valley Water (MT CO2e / AF)	0.01566	0.00507	-
Weighted average emissions factor per acre foot of water: Treatment and Distribution (FROM Valley Water to local supplier) (MT CO2e / AF)	0.0771	0.05026	0.00
Total emissions factor per acre-foot of water: extraction, conveyance, treatment, and distribution	0.09272	0.05532	-
Reduced GHG Emissions (MTCO2e) [8]		**308**	**-**

WA-1: **Calculate MTCO2e reductions from 2026-2045.**

	Acre-feet conserved	Weighted Average Emissions Factor (MTCO2e / acre-foot)	MTCO2e reduced (assumes 25 percent of savings directly attributable to Valley Water Programs) [8]
2026	14,159	0.07	262
2027	16,182	0.07	281
2028	18,205	0.06	294
2029	20,227	0.06	303
2030	22,250	0.06	308
2031	23,530	0.05	304
2032	24,810	0.05	297
2033	26,090	0.04	289
2034	27,370	0.04	278
2035	28,650	0.04	264
2036	29,930	0.03	248
2037	31,210	0.03	230
2038	32,490	0.03	210
2039	33,770	0.02	187
2040	35,050	0.02	162
2041	36,330	0.01	134
2042	37,610	0.01	104
2043	38,890	0.01	72
2044	40,170	0.00	37
2045	41,450	0.00	-

WA-1 references

[1] Page 59-60 of Water Supply Master Plan: By 2030, Valley Water anticipates that current and planned conservation activities will result in 98,800 acre-feet per year in savings. Also see page 1: Valley Water estimates that water demand would be higher, by about 77,000 AF in 2018, if not for the combined efforts of Valley Water, the water retailers, and the community to conserve water. Available: Water Supply Master Plan. https://s3.us-west-1.amazonaws.com/valleywater.org.us-west-1/s3fs-public/Water_Supply_Master_Plan_2040_11_01_2019_v3.pdf.

Also see Wedednesday, April 11, 2018 Commission Meeting Agenda for 76,100 acre-feet of water conserved in 2020. Available: https://www.valleywater.org/sites/default/files/WC-Agenda-041118.pdf

Also see: Monthly Water Tracker, available at: https://www.valleywater.org/your-water/water-supply-planning/monthly-water-tracker. Long-term program goal is to save 110,000 acre-feet by 2040, and 126,000 acre-feet by 2050. Interpolated 2045 value (118,000 acre-feet) used for these calculations.

[2] Water Supply Master Plan, page 10, Table 1: Average Baseline Water Supply through 2040. Available: https://s3.us-west-1.amazonaws.com/valleywater.org.us-west-1/s3fs-public/Water_Supply_Master_Plan_2040_11_01_2019_v3.pdf

[3] Valley Water's emissions from water pumping and treatment are assumed to be zero for all sources except Delta-conveyed (i.e., Central Valley Project [CVP] and State Water Project [SWP]) water.

-For non-Delta-conveyed sources, there are no associated emissions because Valley Water has used near-zero emissions electricity for water pumping and treatment since 2016.

-For Delta-conveyed sources, the value represents a weighted average using the associated imported water volumes and emissions factors from the CVP and SWP. Please see the "3ImportedWater" tab for details of this calculation.

In 2045, emissions factor is assumed to be zero due to State's carbon neutrality goal in AB 1279.

[4] Total Annual Water Use by Local Water Utility, available in Water Conservation Strategic Plan (Valley Water 2021), page 32. Available: https://s3.us-west-1.amazonaws.com/valleywater.org.us-west-1/s3fs-public/Water%20Conservation%20Strategic%20Plan.pdf

[5] Power Content Labels. Available: https://www.energy.ca.gov/media/9281. 2030 emissions factor interpolated assuming zero-carbon by 2045.

[6] Water Use By Sector, available in Water Conservation Strategic Plan (Valley Water 2021), page 32. Available: https://s3.us-west-1.amazonaws.com/valleywater.org.us-west-1/s3fs-public/Water%20Conservation%20Strategic%20Plan.pdf.

[7] California Electricity (kWh/AF) and Natural Gas (MMBtu/AF) Energy Intensities by Hydrologic Region, by Water Cycle Stage, page 19. San Francisco Bay value used.
Available: https://www.next10.org/sites/default/files/2021-09/Next10-Water-Energy-Report_v2.pdf

[8] Assuming that 25 percent of emissions reductions are attributable to Valley Water's programs. Greene, Samantha. Water Resources Planning and Policy Manager. Santa Clara Valley Water District, San Jose, CA. August 16, 2024-- feedback provided in Word document of draft GHGRP.

CS-1 calculations

Salt Marsh Restoration Project

	Shoreline Phase 1 Total Acres	Calabazas / San Tomas Aquino Total Acres
Year Complete	2026	2030
Total Salt Marsh Acres Restored	2,876	1,710

MT CO2e sequestered per acre per year from salt marsh restoration
3.580

Acres restored		**Annual MT CO2e reductions from sequestration projects**		
Year	Acres restored	Shoreline Phase I	Calabazas / San Tomas Aquino	Total annual reductions
2025	0	-	-	-
2026	2876	10,297	-	10,297
2027	2876	10,297	-	10,297
2028	2876	10,297	-	10,297
2029	2876	10,297	-	10,297
2030	4586	10,297	6,123	16,420
2031	4586	10,297	6,123	16,420
2032	4586	10,297	6,123	16,420
2033	4586	10,297	6,123	16,420
2034	4586	10,297	6,123	16,420
2035	4586	10,297	6,123	16,420
2036	4586	10,297	6,123	16,420
2037	4586	10,297	6,123	16,420
2038	4586	10,297	6,123	16,420
2039	4586	10,297	6,123	16,420
2040	4586	10,297	6,123	16,420
2041	4586	10,297	6,123	16,420
2042	4586	10,297	6,123	16,420
2043	4586	10,297	6,123	16,420
2044	4586	10,297	6,123	16,420
2045	4586	10,297	6,123	16,420

	2025	2025
	2030	2045
	2025-2030	2025-2045
Sequestration per restored acre per year (MT CO2e)	3.58	3.58
Cumulative Reductions from Shoreline Project (MT CO2e)	51,487	205,950
Cumulative Reductions from Calabazas (MT CO2e)	6,123	97,962
Total Cumulative Reductions (MT CO2e)	57,610	303,912
Gap (positive number means carbon budget exceeded) (MT CO2e)	5,522	41,056
Credit for salt marsh restoration needed for Valley Water to meet carbon budget (percent of total tidal marsh restoration project)	10%	14%
Credit for salt marsh restoration needed for Valley Water to meet carbon budget (project acres)	276	620

Appendix B

GHGRP Consistency Review Checklist

SANTA CLARA VALLEY WATER DISTRICT

GREENHOUSE GAS REDUCTION PLAN CONSISTENCY REVIEW CHECKLIST

Introduction and Purpose

The Valley Water Greenhouse Gas Reduction Plan (GHGRP) outlines the actions the Valley Water will undertake to achieve greenhouse gas (GHG) emissions reductions. As part of GHGRP implementation, the GHGRP Consistency Checklist (Checklist) has been developed to ensure that Valley Water-led discretionary projects appropriately incorporate all applicable GHG reduction measures from the GHGRP into project design, planning, and implementation on a project-by-project basis. Implementation of these measures will ensure that projects are executed consistently with the assumption supporting relevant GHGRP strategies toward achieving Valley Water's identified GHG reduction targets.

The Checklist, in conjunction with the GHGRP, provides a streamlined review process for proposed Valley Water projects subject to discretionary review that triggers environmental review pursuant to the California Environmental Quality Act (CEQA). Analysis of GHG emissions and potential climate change impacts from new development is required under CEQA. The GHGRP is a plan for the reduction of GHG emissions in accordance with CEQA Guidelines Section 15183.5. Pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b), a project's incremental contribution to cumulative GHG emissions may be determined to be less than significant if it complies with the applicable measures in a "plan for the reduction of GHG emissions" (e.g., GHGRP). Under these provisions, if a project can show consistency with applicable GHG reduction measures, the level of analysis for the project required under CEQA with respect to GHG emissions can be reduced considerably (i.e., a detailed analysis of project-level GHG emissions and potential climate change impacts is not needed).

Valley Water will complete a Checklist for projects requiring environmental review pursuant to CEQA. This Checklist is designed to assist Valley Water in identifying the minimum GHGRP-related requirements specific to the proposed project. However, the final determination of a project's consistency with the Checklist will be made by Valley Water's GHGRP Implementation Team before the agency's review process ends. As a result, it may be necessary to supplement the completed Checklist with supporting materials, calculations, or certifications to demonstrate full compliance with the Checklist requirements.

Projects requiring discretionary review that cannot demonstrate consistency with the GHGRP using this Checklist will be required to prepare a separate, more detailed project-level GHG analysis as part of the applicable CEQA document.

Applicability

This Checklist is intended for Valley Water construction-only projects, not for operational projects (e.g., new buildings and facilities requiring energy use). For land use projects, such as new buildings or operational facilities, projects must show mark "yes" or N/A for all questions in this Checklist and show consistency with GHGRP Measures VF-1, OF-1, HG-1, FE-1, EC-1, and SW-1. The GHGRP Implementation Team will determine the final consistency determination with the GHGRP.

Section A. General Project Information

Projects required to complete this Checklist must first provide the following information:

Project Name and Project Number:	
Property Address/Location:	
Project Footprint (Acres):	
Project Description: (submit separate attachments if necessary)	
Existing Land Use of the Property: (General Description, including an assessment of existing vegetation)	

Section B: GHGRP Measures

The completion of this Checklist will document a project's compliance with the applicable GHG reduction measures in Valley Water's GHGRP. The compliance requirements apply to projects that include discretionary review, require environmental compliance, and are not exempt under CEQA.

All applicable Checklist questions must be answered "Yes," and documentation must be provided that substantiates how compliance would be achieved. For measures for which a "Yes" is indicated, the features must be demonstrated as part of the project's design and described. All applicable requirements in the checklist will be included in the conditions of approval or issuance of building permit stage of project approval.

If any questions are marked with a "No," the project cannot be determined to be consistent with the GHGRP, and project-specific GHG analysis and mitigation would be required.

If any questions are marked "N/A" (meaning "not applicable"), a statement describing why the question is not applicable shall be provided to the satisfaction of the GHGRP Implementation Team.

Checklist Requirement	Corresponding GHGRP Measure	Yes	No	N/A
On- and Off-Road Equipment				
1) Per measure CN-1, will at least 17 percent of the Project's construction off-road fuel use be zero-emission by 2030, and (if construction is ongoing) at least 45 percent by 2045?	CN-1	☐	☐	☐
2) Per measure CN-2, will at least 35 percent of the Project's construction on-road fuel use be zero-emission by 2030, and (if construction is ongoing) at least 95 percent by 2045?	CN-2	☐	☐	☐
3) Per measure CN-1 and CN-2, will the project apply all feasible construction best management practices (BMPs) recommended in Table 6-1 of the Bay Area Air Quality Management District's 2022 CEQA Guidelines, as shown in Section C, or latest analogous set of BMPs?	CN-1 and CN-2	☐	☐	☐
4) Will contractors track and monitor fuel uses for all construction equipment and vehicles and annually submit fuel and electricity use data[1] for submission to the GHGRP Implementation Team, including the annual accounting of emissions?	CN-1 and CN-2	☐	☐	☐
Carbon Storage and Sequestration				
5) If the project results in the removal of vegetation, will the removed vegetation be composted, landfilled, reused, or otherwise avoid direct combustion?	CS-1	☐	☐	☐

If the answers to the questions above **are either N/A or Yes**, please provide the GHGRP Implementation Team with:

- Project documentation in an attachment showing the types of vehicles used, their estimated annual hours of operation, projected fuel usage (including both zero-carbon fuels and conventional fuels), if applicable, and
- Project documentation showing how the removal of existing vegetation, if any, will be treated and the difference in carbon sequestration rates for the project land use between existing conditions and project build-out.

Pending review and approval of this documentation by GHGRP Implementation Team, your project is streamlined and does not need to conduct further GHG analysis or propose additional mitigation measures.

If the answer to **EITHER of the questions above is No**, please provide GHGRP Team with documentation of your project's total construction emissions and effect on existing vegetation (i.e., existing carbon storage) and carbon sequestration.

- If the GHGRP Implementation Team determines that emissions from your project will allow Valley Water to stay within the allotted carbon budget, your project is streamlined and does not need to conduct further GHG analysis or propose additional mitigation measures.
- If the GHGRP Implementation Team determines that the net emissions from your project will NOT ALLOW Valley Water to stay within the allotted carbon budget, this project cannot streamline from the GHGRP to determine significance for GHG impacts; and the project must complete a separate CEQA document (e.g., an Environmental Impact Report) that includes a project-specific GHG impact analysis and proposes mitigation measures.

If "N/A" has been checked for any question, please provide a statement explaining why the measure is not applicable. Include attachments, if needed.

_____
_____
_____
_____

[1] Fuel and electricity use data include, but are not limited to, gallons of renewable diesel, gallons of conventional diesel, kWh of electricity and name of utility from which electricity is purchased.

Section C. Supporting Tables

Table C-1 Best Management Practices for Construction-Related GHG Emissions

1.	Use zero-emission and hybrid-powered equipment to the greatest extent possible, particularly if emissions are occurring near sensitive receptors or located within a BAAQMD-designated Community Air Risk Evaluation (CARE) area or Assembly Bill 617 community.
2.	Require all diesel-fueled off-road construction equipment be equipped with EPA Tier 4 Final compliant engines or better as a condition of contract.
3.	Require all on-road heavy-duty trucks to be zero emissions or meet the most stringent emissions standard, such as model year (MY) 2024 to 2026, as a condition of contract.
4.	Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 2 minutes (A 5-minute limit is required by the state airborne toxics control measure [Title 13, Chapters 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site and develop an enforceable mechanism to monitor idling time to ensure compliance with this measure.
5.	Prohibit off-road diesel-powered equipment from being in the "on" position for more than 10 hours per day.
6.	Use California Air Resources Board–approved renewable diesel fuel in off-road construction equipment and on-road trucks.
7.	Use U.S. Environmental Protection Agency SmartWay certified trucks for deliveries and equipment transport.
8.	Require all construction equipment is maintained and properly tuned in accordance with manufacturer's specifications. Equipment should be checked by a certified mechanic and determined to be running in proper condition prior to operation.
9.	Where grid power is available, prohibit portable diesel engines and provide electrical hook ups for electric construction tools, such as saws, drills and compressors, and using electric tools whenever feasible.
10.	Where grid power is not available, use alternative fuels, such as propane or solar electrical power, for generators at construction sites.
11.	Encourage and provide carpools, shuttle vans, transit passes, and/or secure bicycle parking to construction workers and offer meal options onsite or shuttles to nearby meal destinations for construction employees.
12.	Reduce electricity use in the construction office by using LED bulbs, powering off computers every day, and replacing heating and cooling units with more efficient ones.
13.	Minimize energy used during site preparation by deconstructing existing structures to the greatest extent feasible.
14.	Recycle or salvage nonhazardous construction and demolition debris, with a goal of recycling at least 15% more by weight than the diversion requirement in Title 24.
15.	Use locally sourced or recycled materials for construction materials (goal of at least 20% based on costs for building materials and based on volume for roadway, parking lot, sidewalk and curb materials). Wood products used should be certified through a sustainable forestry program.
16.	Use low-carbon concrete, minimize the amount of concrete used and produce concrete on-site if it is more efficient and lower emitting than transporting ready-mix.
17.	Develop a plan to efficiently use water for adequate dust control since substantial amounts of energy can be consumed during the pumping of water.
18.	Include all requirements in applicable bid documents, purchase orders, and contracts, with successful contractors demonstrating the ability to supply the compliant on- or off-road construction equipment for use prior to any ground-disturbing and construction activities.

Source: BAAQMD 2022: Table 6-1.

Section D: References

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Appendix C

Renewable Fuels Considerations

This appendix provides technical details on renewable fuels and biofuels and how they could be used to decarbonize vehicles and equipment. It also describes supply and demand dynamics with these fuels, which Valley Water should consider when incorporating them into its decarbonization strategy.

Renewable diesel and biodiesel are two options for reducing emissions from Valley Water's fleet, as well as in contracted construction vehicles. Both fuels are biogenic fuels, and thus emissions from their combustion are not counted towards Valley Water's total emissions. This is consistent with the California Air Resource Board's (CARB's) emissions counting conventions, which do not include biogenic CO_2 in comparing emissions to State targets (CARB 2022: 12-13).

While both fuels are made from biomass, they differ in their production processes and uses. Typically, biodiesel production uses vegetable oils as the feedstock, whereas renewable diesel can be produced from nearly any biomass feedstock. Renewable diesel is chemically equivalent to petroleum diesel and thus can be used as a "drop-in" fuel in any diesel engine. It can be used in its "pure" form, without mixing with petroleum diesel, or it can be blended with petroleum diesel (United States Department of Energy [DOE] 2023a). In contrast, biodiesel is rarely used in its pure form as a transportation fuel, as it contains less energy than petroleum diesel, does not perform well in cold temperatures, and is not compatible with all diesel-powered equipment and vehicles. Biodiesel is typically blended with conventional diesel or renewable diesel (with B5 and B20 blends being the most common, at 5 and 20 percent of the total fuel mix, respectively [DOE 2023b]). If biodiesel is blended with conventional diesel, only the biodiesel portion can be counted for emissions reductions—i.e., replacing a gallon of conventional diesel with a gallon of B5 biodiesel means a five percent decrease in emissions for that gallon.

Renewable diesel is currently available in Santa Clara County, with 24 active renewable diesel fueling stations (DOE 2023a). Since 2020, the price of renewable diesel has been comparable to that of conventional diesel, ranging from 30 cents per gallon cheaper to 9 cents per gallon more expensive (DOE 2023c).

In the near term, both supply and demand for renewable diesel fuel are expected to increase. On the supply side, eight new renewable diesel refineries in the United States began operation in 2022 and early 2023, which is projected to more than double domestic production (U.S. EIA: 2023a). On the demand side, consumption is anticipated to rise for these fuels due to state-level renewable and low-carbon fuel standards and the Inflation Reduction Act (IRA) tax credits. It is, therefore, possible that a feedstock "crunch" may be approaching, where these fuels may not necessarily be readily available (International Energy Agency 2022). Additionally, supply of these fuels is dependent on imports from other countries. For instance, the United States imports substantial quantities of renewable diesel from Singapore, and biodiesel from Canada, Germany, Italy, South Korea, and Spain (U.S. EIA: 2023b). Future demand in these or other countries (due, for instance, to these countries implementing their own low-carbon fuel standards) may impact the availability of renewable diesel in the United States.

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Appendix D

Inventory and Forecasting Technical Memo

Memo

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Date: November 21, 2024

To: Lisa Bankosh, Nick Mascarello, Samantha Greene (Santa Clara Valley Water District), Ryan Jolley (GEI Consultants)

From: Fred Hochberg, Brenda Hom, John Steponick, Honey Walters (Ascent)

Subject: Santa Clara Valley Water District GHG Inventory, Forecast, Emissions Reduction Targets, and Gap Analysis

PROJECT OVERVIEW

Ascent is supporting the Santa Clara Valley Water District (hereinafter referred to as "Valley Water") with preparation of a Climate Action Plan (CAP) that meets the requirements set forth in Section 15183.5 of the State's California Environmental Quality Act (CEQA) Guidelines—commonly referred to as a "CEQA-qualified CAP." A CEQA-qualified CAP provides the ability to streamline greenhouse gas (GHG) analyses of new Valley Water projects subject to CEQA compliance, and consists of the following attributes:

- Quantifies GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- Establishes a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
- Identifies and analyzes GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- Specifies measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified levels; and
- Is adopted in a public process following preparation and adoption of CEQA documentation.

Though all of these are attributes of a CEQA-qualified CAP, this memorandum (memo) addresses the first three items above. The last two items will be addressed in future deliverables.

ORGANIZATION OF THIS MEMORANDUM

This memo consists of two overarching sections:

- **Section 1: GHG Emissions Inventory** describes the data, calculation methods, and modeling results for Valley Water's GHG inventory. It also contains a discussion of the emissions sectors that are included in this inventory and the reasons for the use of average annual emissions across 2017-2021 as the appropriate inventory baseline against which reductions will be measured.

- Section 2: GHG Emissions Forecasts describes the data, calculation methods, and modeling results for Valley Water's GHG forecasts. Two sets of GHG forecast results are presented: the "business as usual" (BAU) scenario and the legislative-adjusted BAU (legislative-adjusted) scenarios for years 2030 and 2045. The BAU scenario is a forecast that takes into account growth in emissions-causing activity levels over time but does not account for GHG emissions reductions resulting from policies and regulations adopted by regional, State, or federal agencies. The legislative-adjusted scenario reflects policies and regulations enacted by regional, State, and federal agencies, without considering any Valley Water actions to reduce GHG emissions.

1 GHG EMISSIONS INVENTORY

1.1 INVENTORY SECTORS

There are 12 GHG emissions sectors analyzed and presented in this memo. These are classified under Scope 1, Scope 2, or Scope 3. Four of the sectors are within Scope 1, one under Scope 2, and the remaining seven under Scope 3. All 12 sectors are described further below, organized by Scope.

Scope 1

Scope 1 emissions are those directly generated by Valley Water operations, and are generally divided into four categories: (1) stationary combustion (e.g., fuels, heating source), (2) mobile combustion (e.g., Valley Water-operated on- and off-road vehicles and equipment), (3) fugitive emissions (e.g., high-global warming potential (GWP) gases that are released from air conditioning and refrigeration), and (4) process emissions (e.g., emissions produced from industrial processes). For Valley Water operations, the following sectors were classified under Scope 1:

- Natural Gas Use in Buildings. Valley Water buildings (e.g., offices, pumping plants, and water treatment plants) combust natural gas from Pacific Gas and Electric Company (PG&E) for space and water heating.
- On-Road Fleet. Valley Water owns and operates a combination of light and heavy-duty vehicles to transport employees and perform maintenance on its assets. These vehicles consume gasoline.
- Off-Road Fleet. Valley Water owns and operates construction equipment and other heavy-duty equipment that consume diesel.
- High GWP Gases. Valley Water purchases refrigerants for its buildings.

For Natural Gas Use in Buildings, On-Road Fleet, and Off-Road Fleet, emissions directly result from the combustion of fuel—natural gas, gasoline, and diesel, respectively. For High GWP Gases, emissions result from gases released from air conditioning and refrigeration.

Scope 2

Scope 2 emissions are considered indirect emissions from an entity's operations, and are primarily caused by electricity use. Specifically, for Valley Water operations, the following sector was classified under Scope 2:

- Facility Electricity Usage. Valley Water buildings consume electricity procured from PG&E, Power and Water Resources Pooling Authority (PWRPA), San Jose Clean Energy (SJCE), and Silicon Valley Power (SVP). Electric usage in these buildings includes items such as lighting, appliances, air conditioning, plug loads, and electric vehicle (EV) charging stations in the office parking lots.

Scope 3

Scope 3 emissions include all of an entity's indirect emissions not captured in Scopes 1 and 2. These emissions represent both upstream and downstream activities related to an entity's operations. They are dictated by human behaviors that Valley Water may attempt to influence but are ultimately the result of the choices made by customers, employees, contractors, service providers, and other external entities. Specifically, for Valley Water operations, the following sectors were classified under Scope 3.

- **Imported Water.** Valley Water imports water from two sources, the State Water Project (SWP) and the Central Valley Project (CVP). Extraction and conveyance[1] of this water results in the consumption of electricity, which in turn results in emissions.
- **Employee Commute**. Valley Water employees commute to work in light-duty vehicles, which generally combust gasoline or use electricity.
- **Business Travel.** Valley Water employees use a combination of passenger cars (which combust gasoline or use electricity) and airplanes (which combust aviation gasoline) for business travel.
- **Construction.** Valley Water services include building and maintaining a water conveyance and treatment system, flood protection assets, environmental stewardship projects, offices, and other facilities. These activities produce emissions through activity such as operation of construction equipment, construction worker commute, and electricity consumption from the grid. This sector of emissions includes construction activities conducted by contractors hired by Valley Water to perform work. Emissions from construction and maintenance activities performed by fleet vehicles and equipment owned by Valley Water are included in Scope 1.
- **Solid Waste.** Valley Water facilities produce landfilled materials that decompose and produce methane (CH_4), which is a GHG.
- **Wastewater.** Valley Water facilities produce wastewater. Anaerobic decomposition of this wastewater produces CH_4.
- **Sediment Hauling**. Valley Water performs sediment management on its system to remove sediment from waterways. This work involves contracting with third party companies using dump trucks to haul sediment from the jobsite to nearby landfills as needed. The dump trucks consume diesel.

1.2 INVENTORY DATA SOURCES

Valley Water provided data on its activities (i.e., the actions which drive emissions, such as electricity usage or vehicle miles traveled [VMT]). These activity levels were multiplied by the appropriate emissions factors to calculate total emissions. Emissions of CH_4 and nitrous oxide (N_2O), both of which are GHGs, were converted to metric tons of carbon dioxide equivalent ($MTCO_2e$)[2] per unit of activity.

Table 1 below shows a summary of the activity data provided; details on the calculation of emissions from that activity are described in the remainder of Section 1 below.

[1] Extraction is defined as taking the water from its point of origin, such as a river or aquifer, and conveyance is defined as moving the water from the river or aquifer to its destination—in this case, to Valley Water's service territory.

[2] In addition to carbon dioxide (CO_2), carbon dioxide equivalent (CO_2e) includes the GWPs of gases such as CH_4 and N_2O, if those gases are present in emissions. It is a standard unit of measure for carbon inventories. All the carbon emissions data presented in this memo use CO_2e as the unit of measurement. CO_2, CH_4 and NO_2 are converted to their CO_2e values by multiplying their mass with GWP values of 1, 27, and 273, respectively (IPCC 2022).

Table 1 Overview of Activity Data Used in Inventory Calculations

Scope	Emissions Sector	Activity Source
1	Natural Gas Use in Buildings	Total therm usage from PG&E for Valley Water buildings, 2009 – 2021
	On-Road Fleet	Total gallons of gasoline for on-road Valley Water fleet, 2009 – 2021
	Off-Road Fleet	Total gallons of diesel for off-road Valley Water fleet, 2009 – 2021
	High GWP Gases	Total purchases of refrigerants and other high GWP gases for Valley Water, 2009 - 2012
2	Facility Electricity Usage	Total MWh usage by Valley Water facility, 2009 – 2021
3	Imported Water	Acre-feet of water imported by Valley Water, 2010 – 2021
	Employee Commute	Number of commuting and telecommuting employees, 2010 – 2021
	Business Travel	Total dollars spent on reimbursement for business travel, 2018 – 2021
	Construction	Historical emissions compiled from CEQA documents, 2010 – 2021
	Solid Waste	Number of FTEs, 2010 – 2021
	Wastewater	Number of FTEs, 2010 – 2021
	Sediment Hauling	Tonnages of landfilled, recycled, and composted waste, 2018 – 2021

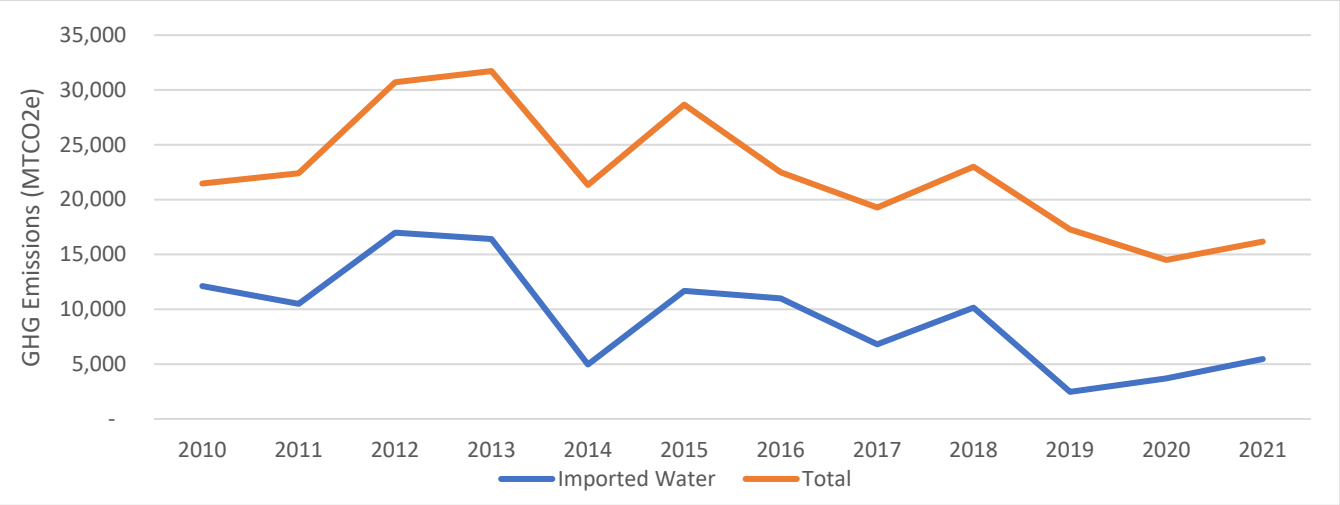
Notes: CIP = Valley Water's Five-Year Capital Improvement Program; FTE = full-time employee; GWP = global warming potential; MWh = megawatt-hours; PG&E = Pacific Gas and Electric Company.

Source: Prepared by Ascent in 2023.

1.3 BASELINE CALCULATION METHODS

To calculate emissions reductions for the purposes of a CEQA-qualified CAP, a baseline year or average across a set of years must be assumed that reflects emissions in a typical year. In the case of Valley Water, average emissions were taken across multiple years—2017 to 2021 for all sectors except Employee Commute, Business Travel, Sediment Hauling, and High GWP Gases.[3] This five-year range was selected for two reasons. First, Valley Water's emissions are variable year over year. These emissions correlate strongly with imported water emissions, as shown in Figure 1 below. The quantity of imported water, and thus the associated emissions, vary substantially year over year depending on factors including temperature, snowpack, precipitation, and other hydrological conditions. Selecting a single year would not capture the variability in these emissions and thus could overstate or understate a typical year. Selecting multiple years more accurately reflects a long-term average.

[3] 2020 and 2021 values for the Employee Commute and Business Travel emissions sectors were excluded from the average due to COVID-19 impacts. Additionally, no data for the Sediment Hauling and Business Travel emissions sectors were available for 2017, so these years were excluded from the calculation. Data on high GWP gases was only available for 2009 through 2012.



Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Modeled by Ascent in 2023.

Figure 1 Comparison of Valley Water Imported Water Emissions and Total Emissions

Second, Valley Water has procured zero-carbon PWRPA power for its buildings since 2016. PWRPA represents over 94 percent of Valley Water's electric load, depending on the year. Therefore, data older than 2016 are outdated and would not reflect the current power portfolio.

For these reasons, an average of annual emissions from 2017 to 2021 was chosen as the baseline level in this inventory.

1.4 INVENTORY EMISSIONS RESULTS

The following section presents the inventory emissions calculations and results for each of the sectors listed in Section 1.1. Data prior to 2017 is presented here for comprehensiveness and to demonstrate general trends in energy use from earliest available data and is not used in developing the baseline.

Natural Gas Use in Buildings

Valley Water provided data on natural gas usage in their buildings by year, which are summarized in Table 2 below, along with the associated GHG emissions. It was assumed that each therm of natural gas produced approximately 5.3 kilograms of CO_2e (Environmental Protection Agency 2023a).

Table 2 Valley Water Natural Gas Usage and GHG Emissions

Year	Natural Gas Usage (Therms)	GHG Emissions ($MTCO_2e$)
2009	134,658	715
2010	138,852	738
2011	122,150	649
2012	145,948	775
2013	126,512	672
2014	104,610	556
2015	107,467	571
2016	103,731	551
2017	117,654	625
2018	144,003	765
2019	136,803	727
2020	140,585	747
2021	143,586	763

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculated by Ascent in 2023; natural gas usage data provided by Valley Water.

On-Road Fleet

Valley Water owns and operates a combination of light and heavy-duty on-road vehicles to transport employees and perform maintenance to its assets, which all consume gasoline. Valley Water provided data on gasoline usage by its on-road vehicle fleet per year, which is presented in Table 3 below, along with associated GHG emissions. GHG emissions, presented as $MTCO_2e$, were calculated by multiplying the total gasoline used each year by an emissions factor of approximately 8.8 kilograms (kg) of CO_2e per gallon (EPA 2023a).

Table 3 Valley Water On-Road Fleet Gasoline Usage and GHG Emissions

Year	Gasoline Usage (Gallons)	GHG Emissions ($MTCO_2e$)
2009	88,834	783
2010	91,533	807
2011	104,874	924
2012	120,412	1,061
2013	137,241	1,209
2014	108,579	957
2015	107,410	947
2016	98,338	867
2017	109,443	964
2018	117,064	1,032
2019	128,693	1,134
2020	132,957	1,172
2021	137,122	1,208

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculated by Ascent in 2023; gasoline usage data provided by Valley Water.

Off-Road Fleet

Valley Water owns and operates a variety of construction and other heavy-duty equipment that all combust diesel. Valley Water provided data on diesel usage by its off-road equipment fleet per year, which is presented in Table 4 below, along with their associated GHG emissions. GHG emissions, presented as $MTCO_2e$, were calculated by multiplying the total diesel used each year by an emissions factor of approximately 10.6 kg CO_2e per gallon (California Air Resources Board [CARB] 2023a).

Table 4 Valley Water Off-Road Fleet Diesel Usage and GHG Emissions

Year	Diesel Usage (Gallons)	GHG Emissions ($MTCO_2e$)
2009	48,888	519
2010	37,031	393
2011	43,430	461
2012	16,075	171
2013	57,538	611
2014	40,592	431
2015	52,729	560
2016	62,779	666
2017	81,564	866
2018	52,907	561
2019	66,349	704
2020	71,929	763
2021	58,446	620

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculated by Ascent in 2023; diesel usage data provided by Valley Water.

High GWP Gases

Valley Water provided the quantity (in metric tons [MT]), of trifluoroethane (HFC-143A) and Freon (R-407C) refrigerants purchased from 2009 through 2012. These were converted to CO_2e using Intergovernmental Panel on Climate Change's (IPCC) GWP values (IPCC 2022). Results are shown in Table 5 below.

Table 5 Valley Water Fugitive Emissions from Purchased Refrigerants, $MTCO_2e$

Year	HFC-134a ($MTCO_2e$)	R-407C ($MTCO_2e$)	Total GHG Emissions ($MTCO_2e$)
2009	83	28	111
2010	123	0	123
2011	0	28	28
2012	56	0	56

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculated by Ascent in 2023; refrigerant purchase data provided by Valley Water.

Facility Electricity Usage

Valley Water provided data on metered electricity usage in megawatt-hours (MWh) in their buildings by year and utility (i.e., PG&E, PWRPA, and Community Choice Aggregations [CCAs]), along with the associated emissions factors for each. To account for transmission losses, electricity usage was scaled upwards by 4.4 percent (EPA 2023b).[4]

Table 6 below shows MWh by provider, along with the associated emissions factors.[5] PWRPA and PG&E emissions factors were compiled from The Climate Registry and Power Source Disclosure documents. CCA emissions factors were assumed to be zero—these make up less than one-tenth of one percent of total MWh usage, so the impact of this assumption is de minimis.

Table 6 Valley Water Building Electricity Usage and Emissions Factors by Utility

	Emissions Factors (lbs CO_2e / MWh)			MWh		
Year	PWRPA	PG&E	CCA	PWRPA	PG&E	CCA
2009	436	575	0	16,345	745	0
2010	275	445	0	16,578	745	0
2011	54	393	0	16,046	820	0
2012	486	445	0	15,334	906	0
2013	598	427	0	16,416	795	0
2014	621	435	0	21,491	679	0
2015	609	405	0	22,659	155	0
2016	0	29	0	21,407	1,399	0
2017	0	22	0	23,178	1,450	0
2018	0	206	0	20,645	842	175
2019	0	19	0	22,804	0	185
2020	0	15	0	25,444	1,317	20
2021	0	0	0	22,124	1,094	0

Notes: CO_2e = carbon dioxide equivalent; GHG = greenhouse gas; lbs = pounds; $MTCO_2e$ = metric tons of carbon dioxide equivalent; MWh = megawatt-hours.
Source: Calculated by Ascent in 2023; electricity usage data provided by Valley Water.

Table 7 below shows a summary of total electricity usage, a weighted average emissions factor, and total emissions. For 2016 and subsequent years, Valley Water was procuring zero-emission power from PWRPA via the Zero Carbon Water portfolio. Because PWRPA represents 94 to 99 percent of Valley Water buildings' electricity usage, depending on the year, total emissions dropped substantially beginning in 2016.

[4] This scaled value represents the quantity of electricity measured at the generator, not at the meter. It is the appropriate value for emissions inventories because it represents the amount of electricity that must be produced to serve the demand of Valley Water. All subsequent references to electric usage in this memorandum refer to this scaled value.

[5] These MWh values shown here only include energy consumption in Valley Water buildings from the listed utilities. They do not include offsetting production from onsite solar photovoltaic panels, or electricity production from the Anderson Dam. Solar panels generate approximately 268 MWh per year, or 1 percent of Valley Water's total annual load of 20,908 MWh; Anderson generates approximately 851 MWh per year, or 4 percent of annual Valley Water load.

Table 7 Valley Water Building Electricity Usage, Weighted Average Emissions Factors, and GHG Emissions

Year	Electricity Usage (MWh)	Weighted Average Emissions Factor (lb CO_2e / MWh)	GHG Emissions ($MTCO_2e$)
2009	17,090	442	3,426
2010	17,323	282	2,216
2011	16,866	70	537
2012	16,240	484	3,562
2013	17,211	590	4,608
2014	22,170	616	6,192
2015	22,813	607	6,285
2016	22,806	2	19
2017	24,628	1	14
2018	21,662	8	79
2019	22,990	0	0
2020	26,781	1	9
2021	23,218	0	0

Notes: CO_2e = carbon dioxide equivalent; GHG = greenhouse gas; lb = pounds; $MTCO_2e$ = metric tons of carbon dioxide equivalent; MWh = megawatt-hours.
Source: Calculated by Ascent in 2023; electricity usage data provided by Valley Water.

Imported Water

Valley Water imports water using two different providers, the SWP and the CVP. Both the SWP and CVP use electricity to pump water from various locations in California to Valley Water's service area. For each of these providers, the inventory approach for calculating the carbon emissions from this pumping is described below.

The SWP is a network of canals, pipelines, reservoirs, and hydroelectric dams with a primary purpose of delivering water (California Department of Water Resources 2023a). SWP is both a consumer and producer of energy; the energy the SWP uses to pump water comes from a combination of its own emissions-free hydroelectric generation and purchases of power from a combination of renewable sources, non-renewable sources, and on the wholesale market (CDWR 2023b). Thus, the emissions factor for a given year depends on the proportion of non-renewable power in that year. For example, in a drought year when hydroelectric production is low, the SWP would likely produce less energy from its own hydroelectric generation, and more from gas-fired power. Table 8 below shows the calculation of emissions factors for the SWP, compiled from Climate Registry reports (The Climate Registry 2023). The "MWh" shown in the table is the sum of the MWh produced by the SWP's own hydroelectric dams and power purchased from other sources, because both are used to pump water.

Table 8 Calculation of Emissions Factors for SWP Electricity

Year	MWh	$MTCO_2e$	$MTCO_2e$ per MWh
2010	7,017,919	1,740,306	0.25
2011	8,321,228	1,345,189	0.16
2012	7,170,510	1,794,500	0.25
2013	5,587,988	1,095,958	0.20
2014	2,796,292	326,432	0.12

Year	MWh	$MTCO_2e$	$MTCO_2e$ per MWh
2015	3,490,065	582,026	0.17
2016	6,540,308	984,190	0.15
2017	9,580,259	1,361,134	0.14
2018	5,624,903	695,681	0.12
2019	7,555,491	432,487	0.06
2020	3,818,321	250,688	0.07
2021	2,699,049	257,933	0.10

Notes: $MTCO_2e$ = metric tons of carbon dioxide equivalent; MWh = megawatt-hours.
Source: Calculated by Ascent in 2023; energy usage and emissions factors compiled from The Climate Registry (2023).

The emissions factors in Table 8 above were converted to $MTCO_2e$ per acre-foot of water pumped, using a factor of 1.064 MWh per acre-foot of water extracted and conveyed to Valley Water (CDWR 2023c), and were then applied to total acre-feet imported by Valley Water, with results shown in Table 9 below.

Table 9 Calculation of Emissions from Valley Water SWP Imports

Year	Acre-Feet of Water Imported	Emissions Factor ($MTCO_2e$ per Acre-Foot)	GHG Emissions ($MTCO_2e$)
2010	45,888	0.26	12,108
2011	61,040	0.17	10,499
2012	63,794	0.27	16,987
201	78,620	0.21	16,406
2014	39,970	0.12	4,965
2015	65,773	0.18	11,671
2016	68,652	0.16	10,992
2017	44,995	0.15	6,802
2018	77,136	0.13	10,151
2019	40,533	0.06	2,469
2020	52,930	0.07	3,697
2021	53,665	0.10	5,457

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculated by Ascent in 2023; imported water data provided by Valley Water.

The CVP is a series of dams managed by the U.S. Bureau of Reclamation. These dams generate electricity, and the priority usage of this electricity is for project pumping needs (Delta Vision Task Force: 46), including extraction and conveyance to Valley Water. On an annual basis, energy produced by the CVP dams can range from 2,400,000 to 8,600,000 MWh, whereas the projects use between 334,000 to 1,670,000 MWh, depending on the year and hydrological conditions (Western Area Power Administration 2017). Therefore, on an annual basis, carbon-free hydroelectric energy produced by the CVP far exceeds the needs of its project use. Because this energy is first required to serve project pumping needs, it was assumed that the water that the CVP sent to Valley Water is 100 percent carbon-free.

Employee Commute

Valley Water provided data on the total number of full-time employees (FTE) by year, both permanent and temporary, as well as the percentage that telecommuted from 2010 through 2021. For 2010 through 2019, data on telecommute days per week was unavailable, so telecommuting employees were assumed to travel to the Valley Water office four days per workweek and work from home for the fifth day. Temporary employees were assumed to work 50 percent of the time. A commute was assumed to be 10 miles one-way (the value for average work tour trip distance by automobile), per Plan Bay Area 2050 (Association of Bay Area Governments and Metropolitan Transportation Commission 2021: 125).

These data were matched with the CARB's Emission Factor (EMFAC) model emissions data on $MTCO_2e$ per VMT, which shows a general decline year over year due to increasing fuel mileage, to calculate emissions. Tables 10 and 11 show the results of this analysis, for permanent and temporary employees, respectively. Round-trip miles per workday per employee are expressed as a weighted average across both commuters and telecommuters. These data assume 215 working days per year per Valley Water employee.[6]

Table 10 Permanent Employee Commute Distances and Emissions

Year	Number of FTEs	Percent Telecommuting	Round-Trip Miles per Workday per Employee	Grams CO_2e / VMT	GHG Emissions ($MTCO_2e$)
2010	747	10%	20	408	1,283
2011	698	10%	20	402	1,183
2012	697	10%	20	397	1,167
2013	675	10%	20	387	1,102
2014	665	10%	20	379	1,062
2015	700	10%	20	371	1,095
2016	727	10%	20	360	1,103
2017	733	10%	20	355	1,096
2018	647	10%	20	347	946
2019	710	10%	20	340	1,018
2020	793	60%	8	335	457
2021	884	60%	8	328	498

Notes: CO_2e = carbon dioxide equivalent; FTE = full-time employee; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculated by Ascent in 2023; commute data provided by Valley Water.

[6] 215 workdays assumes 52 weeks per year, 5 days per week, less 14 designated holidays, 3 days personal leave, 12 days sick leave, and 16 days of vacation (Valley Water 2023c). 16 days of vacation is assumed to be the amount of vacation for a public sector employee with a tenure of 5 years; this 5-year tenure is assumed because it is the closest value available to the Bureau of Labor Statistics estimate of seven years of median tenure for public sector employees (Bureau of Labor Statistics 2022: 2)

Table 11 Temporary Employee Commute Distances and Emissions

Year	Number of FTEs	Percent Telecommuting	Round-Trip Miles per Workday per Employee	Grams CO_2e / VMT	GHG Emissions ($MTCO_2e$)
2010	77	0%	20	408	134
2011	76	0%	20	402	131
2012	89	0%	20	397	151
2013	137	0%	20	387	228
2014	142	0%	20	379	231
2015	163	0%	20	371	260
2016	167	0%	20	360	259
2017	142	0%	20	355	216
2018	145	0%	20	347	216
2019	113	0%	20	340	165
2020	55	100%	-	335	-
2021	99	100%	-	328	-

Notes: CO_2e = carbon dioxide equivalent; FTE = full-time employee; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculated by Ascent in 2023; commute data provided by Valley Water.

As discussed previously, only 2017 through 2019 was used as the basis of the inventory calculation—2020 and 2021 were excluded due to the effects of the COVID-19 pandemic.

Business Travel

Data were provided by Valley Water on reimbursements in dollars for passenger vehicle and plane travel by year for 2018 through 2021. Only 2018 and 2019 were included in the calculation of the baseline average, because 2020 and 2021 were years largely influenced by the COVID-19 pandemic, and thus, not representative of an average year.

For passenger vehicle travel, total VMT were calculated based on Internal Revenue Service reimbursement rates for dollars per mile, generally ranging from 55 to 58 cents per mile. These total VMT were then multiplied by EMFAC emissions per VMT rates, as shown in Table 12 below.

Table 12 Valley Water Business Travel Passenger Vehicle Emissions Calculations

Year	Reimbursement Amount	Miles	Grams CO_2e / VMT	GHG Emissions ($MTCO_2e$)
2018	$36,062	66,168	347	23
2019	$129,948	224,048	340	76

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; VMT = vehicle miles traveled.
Source: Calculated by Ascent in 2023; reimbursement data provided by Valley Water.

For airplane travel, passenger-miles were estimated from the reimbursement amounts, assuming approximately 19 cents of airline revenue per passenger-mile (Bureau of Transportation Statistics 2023). These passenger-miles were then converted to aviation gasoline combusted assuming 53.62 passenger-miles per gross gallon equivalent of aviation gasoline, which was in turn converted to CO_2e assuming 8.34 kg of CO_2e per gallon (Alternative Fuels Data Center 2022; EPA 2023a). Table 13 below shows the results of this analysis.

Table 13 Valley Water Business Travel Airplane Travel Emissions Calculations

Year	Reimbursement Amount	Passenger Miles	Gallons of Aviation Gasoline	GHG Emissions ($MTCO_2e$)
2018	$52,150	281,431	5,249	44
2019	$180,835	971,359	18,116	151

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculated by Ascent in 2023; reimbursement data provided by Valley Water.

Construction

Construction emissions, summarized in Table 14 below, were compiled by Valley Water from CEQA documents prepared for each construction project. Construction projects can last for multiple years, and the projects' total emissions were distributed on an equal per-year basis across the project's duration. For example, if a project began in 2010 and ended in 2012 and emitted a total of 600 $MTCO_2e$, an amount of 200 MT was assigned to each of the three construction years (i.e., 2010, 2011, and 2012).

Table 14 Valley Water Construction GHG Emissions

Year	GHG Emissions ($MTCO_2e$)
2010	618
2011	5,149
2012	3,917
2013	3,979
2014	4,102
2015	4,266
2016	4,969
2017	5,856
2018	6,638
2019	8,108
2020	7,228
2021	7,123

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculated by Ascent in 2023.

Solid Waste

Emissions from solid waste disposed by Valley Water employees were calculated using Equation SW 4.1 (Methane Emissions from Solid Waste) from the *U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions* (Community Protocol) (Local Governments for Sustainability 2019). This equation uses the following as inputs: 1) total mass of waste entering the landfill, 2) landfill gas efficiency collection, and 3) an emission factor for materials in terms of MT of CH_4 per wet short ton.[7] It was assumed that the landfill gas was collected with 75 percent efficiency at the Kirby Canyon landfill, and that the waste is mixed solid waste with 0.06 MT of CH_4 emissions per wet short ton (Waste Management 2023; ICLEI 2019). Employees were assumed to produce 10.53 pounds of mixed solid

[7] In this case, a wet short ton includes the weight of the waste itself and any water that it has been soaked or suspended in. This is in contrast to a dry short ton, which only includes the weight of the waste.

waste per full-time employee per workday (CalRecycle 2019), assuming 215 workdays in a year.[8] Of this 10.53 pounds, 40 percent is assumed to be recycled (CalRecycle 2023), and thus cause no emissions. The other 60 percent is assumed to be landfilled and cause methane emissions. Results are shown in Table 15 below.

Table 15 Valley Water Solid Waste GHG Emissions

Year	GHG Emissions ($MTCO_2e$)
2010	225
2011	211
2012	215
2013	222
2014	221
2015	236
2016	244
2017	239
2018	216
2019	225
2020	232
2021	268

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculated by Ascent in 2023.

Wastewater

Valley Water facility wastewater emissions were calculated using the default values cited in Equation WW.6 (Alternate Methane Emissions from Lagoons) from the Community Protocol (Local Governments for Sustainability 2019). This equation uses the following as inputs: 1) the population served by lagoon (i.e., the number of FTEs) and 2) the biological oxygen demand of the microorganisms that break down the waste and produce CH_4. Results are shown below in Table 16.

Table 16 Valley Water Wastewater GHG Emissions

Year	GHG Emissions ($MTCO_2e$)
2010	327
2011	307
2012	312
2013	322
2014	320
2015	342
2016	355
2017	347
2018	314
2019	327

[8] Telecommuting employees were assumed to have the same waste production as on-site employees.

Year	GHG Emissions ($MTCO_2e$)
2020	336
2021	390

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculated by Ascent in 2023.

Sediment Hauling

Valley Water provided data on tons of waste hauled from the Sediment Management Program from 2018-2021. Each dump truck hauling this waste was assumed to be a 5-axle truck trailer, which can carry a payload of 34,760 pounds, or 15.8 metric tons (Federal Highway Administration 2000: 9). CO_2e per dump truck VMT and VMT per trip values for dump trucks were derived from EMFAC (using the T7 Single Dump Class 8 EMFAC vehicle category), and used to calculate emissions as shown in Table 17 below.

Table 17 Valley Water Sediment Hauling Tonnages and GHG Emissions

Year	Total Sediment Hauled (MT)	Sediment Hauled Per Load (MT)	Number of Loads Hauled	Grams $MTCO_2e$ Per Dump Truck VMT	Round-Trip Truck Miles Traveled Per Load	GHG Emissions ($MTCO_2e$)
2018	21,042	15.8	1,335	1,822	11.4	28
2019	52,071	15.8	3,303	1,820	13.3	80
2020	59,317	15.8	3,762	1,814	13.7	93
2021	30,472	15.8	1,933	1,815	13.5	48

Notes: GHG = greenhouse gas; MT = metric tons; $MTCO_2e$ = metric tons of carbon dioxide equivalent; VMT = vehicle miles traveled.
Source: Sediment tonnages provided by Valley Water; calculated by Ascent in 2023.

1.5 SUMMARY OF 2017-2021 BASELINE INVENTORY RESULTS FOR ALL SECTORS

Average emissions from 2017-2021 for the individual sectors described above were summed to calculate total annual GHG emissions. On average, over the baseline years, Valley Water's emissions were 17,342 MT CO_2e per year. Results are summarized for all sectors and by scope in Table 18 below.

Table 18 2017-2021 Valley Water GHG Emissions Inventory by Scope and Sector

Scope	Sector	Average GHG Emissions ($MTCO_2e$)	Percent of Total
1	On-Road Fleet	1,102	6.4%
	Natural Gas Use in Buildings	725	4.2%
	Off-Road Fleet	703	4.1%
	High GWP Gases	79	0.5%
	Scope 1 Total	**2,609**	**15.0%**
2	Facility Electricity Use	20	0.1%
	Scope 2 Total	**20**	**0.1%**
3	Construction	6,990	40.3%
	Imported Water	5,715	33.0%
	Employee Commute	1,219	7.0%

Scope	Sector	Average GHG Emissions ($MTCO_2e$)	Percent of Total
	Wastewater	343	2.0%
	Solid Waste	236	1.4%
	Business Travel	147	0.8%
	Sediment Hauling	62	0.4%
	Scope 3 Total	**14,713**	**84.8%**
Total		**17,342**	**100.0%**

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gas; GWP = global warming potential; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Prepared and calculated by Ascent in 2023.

2 GHG EMISSIONS FORECASTS

The following section presents results for two sets of forecasts for years 2030 and 2045, the BAU scenario and the legislative-adjusted BAU (legislative-adjusted) scenario. These forecasts provide Valley Water with information needed to focus efforts on certain emissions sectors and sources that have the greatest opportunities for GHG emissions reductions. It is important to note that the legislative-adjusted forecasts only account for emissions reductions associated with adopted policies and regulations; they do not account for goals established by regional, State, and federal agencies or executive orders outside of adopted legislation and regulations.

2.1 METHODOLOGY FOR ACTIVITY FORECASTING

To calculate future activity levels for a given sector, one of the following four forecasting methods was used, depending on sector attributes and available data. Methods are ranked below in order of preference; i.e., for each sector, the first method was preferred and used if possible. If that was not appropriate, the second method was used, and if that was not appropriate, the third was used, etc.

Method 1: Use Publicly Available Forecast. If a forecast of activity level was already publicly available, that forecast was incorporated into this analysis. Construction and imported water were calculated using this method. For construction, Valley Water's Five-Year Capital Improvement Program (CIP) contained a list of projects predicted through 2028 (Valley Water 2023b)—emissions from these projects were included. For imported water, the Valley Water Supply Master Plan contains a forecast of acre-feet of imported water through 2040 (Valley Water 2019: 10).

Method 2: Consult with Valley Water Operations Facilities Staff Experts. For sectors where Method 1 could not be used, Valley Water Operations facilities staff experts with detailed operational knowledge were consulted on forecasts of activity levels for 2030 and 2045. These sectors were on-road fleet and off-road fleet.

Method 3: Use Average from Baseline Years. For sectors where Method 1 or Method 2 could not be used, a historical average was calculated and assumed to apply to forecast years. These sectors were sediment hauling, business travel, high GWP gases, natural gas use in buildings, employee commute, solid waste, and wastewater. Sediment hauling and business travel do not have enough years of data to meaningfully calculate trends (4 and 2 years, respectively). High GWP gas purchases are intermittent (i.e., not purchased on any particular time cycle) and thus cannot be precisely forecast. Natural gas usage had no meaningful relationship with year; regression analysis of usage on year resulted in an

R-squared value of 0.02.[9] Solid waste, employee commute, and wastewater are all functions of FTE, which is expected to remain at current levels (i.e. there are currently no plans to expand the size of Valley Water's existing workforce).

Method 4: Use Maximum from Baseline Years. This method was used for facility electricity usage. Valley Water building stock is largely static and is not expected to grow substantially, so a linear increase from historical trends was deemed inappropriate for forecasting. Furthermore, since the baseline period encompasses COVID years of 2020-2021, in which energy use dropped substantially, an average would likely understate the true future amount of energy used. Therefore, a maximum was considered appropriate for forecasting both the BAU and legislative-adjusted cases.

Table 19 below summarizes the forecasting approach by sector.

Table 19 Forecasting Approach by Sector

Forecasting Approach	Activity
Publicly Available Forecast	Construction
Publicly Available Forecast	Imported Water
Consult with Staff Experts	On-Road Fleet
Consult with Staff Experts	Off-Road Fleet
Use Baseline Year Average	Natural Gas Use in Buildings
Use Baseline Year Average	High GWP Gases
Use Baseline Year Average	Employee Commute
Use Baseline Year Average	Business Travel
Use Baseline Year Average	Solid Waste
Use Baseline Year Average	Wastewater
Use Baseline Year Average	Sediment Hauling
Use Baseline Year Maximum	Facility Electricity Usage

[9] R-squared indicates the percent of variation in the dependent variable (activity level) that is due to variation the independent variables (year). In this case, a low R-squared indicates that year is a poor predictor of activity level (i.e., no clear trend in activity level year over year), and a high R-squared indicates that year is a good predictor of activity level (clear trend year over year).

2.2 LEGISLATIVE ADJUSTMENTS

Legislative adjustments were applied to the emission factors for the following sectors: on-road fleet, employee commute, business travel, sediment hauling, building electricity, and imported water. Table 20 below summarizes these adjustments. Legislative adjustments were not applied to facility electricity usage because Valley Water already procures energy from the Zero Carbon Water portfolio—thus, further reductions are not possible.

Table 20 Legislative Reductions Summary

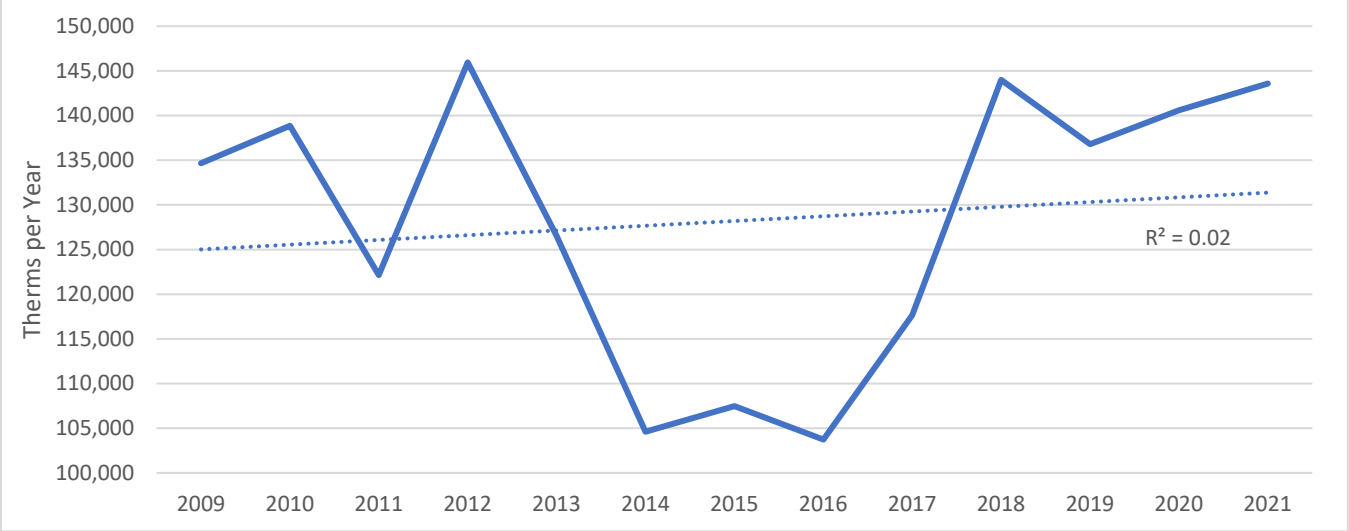
Sector	Legislative Reduction	Description	Emissions Factors Affected
On-Road Fleet (Light-Duty)	Advanced Clean Car Standards II	Establishes targets for all new passenger cars, trucks, and SUVs sold in California to be zero-emission or plug-in hybrid vehicles by 2035.	Grams CO_2e / VMT
Construction			
Employee Commute			
Business Travel (Passenger Cars Only)			
On-Road Fleet (Heavy-Duty)	Advanced Clean Fleets	Establishes ZEV milestone targets for vehicles with a GVWR above 8,500 pounds in public fleets, such as Valley Water's. Valley Water-owned vehicles, as well as contracted vehicles for construction projects, are assumed to belong to Milestone Group 2, because Group 2 encompasses work trucks that Valley Water needs to build and perform maintenance of its system. Group 2 has a target of 25 percent ZEVs by 2030, and 100 percent ZEVs by 2039. (CARB 2023b).	
Construction			
Sediment Hauling			
Building Electricity	Senate Bill 100	Requires that renewable energy and zero-carbon resources supply 100 percent of electric retail sales to end-use customers by 2045.	CO_2e / kWh
Imported Water from SWP	Senate Bill 1020	Requires that 100% renewable electricity is procured to serve all state agencies by December 31, 2035.	Grams CO_2e / Acre-Feet Water

Notes: CO_2e = carbon dioxide equivalent; GVWR = gross vehicle weight rating; kWh = kilowatt-hours; SUV = sport utility vehicle; VMT = vehicle miles traveled; ZEV = Zero Emission Vehicle.
Source: Prepared by Ascent in 2023.

2.3 FORECAST RESULTS

Natural Gas Use in Buildings

As shown in Figure 2 below, natural gas usage in Valley Water's buildings has had no meaningful upward or downward trend over time. The R-squared value that resulted when regressing therms per year on year was 0.02, and the dotted line shows the regression line.



Source: Natural gas usage data provided by Valley Water; calculations performed by Ascent in 2023.

Figure 2 Historical Natural Gas Usage in Valley Water Buildings

Because there was no meaningful trend, an average usage in the baseline years of 136,526 therms per year was assumed to carry forward to future years, resulting in emissions shown in Table 21 below. Results for the legislative-adjusted and BAU scenarios are identical because there are no known legislative adjustments for natural gas use in existing buildings.[10] In this (and all subsequent tables), "baseline" refers to an average from 2017-2021.

Table 21 Baseline and Forecasted Natural Gas Usage and GHG Emissions in Valley Water Buildings

Year	Therms per Year	BAU GHG Emissions ($MTCO_2e$)	Legislative-Adjusted GHG Emissions ($MTCO_2e$)	BAU Percent Change from Baseline	Legislative-Adjusted Percent Change from Baseline
Baseline	136,526	725	725	0%	0%
2030	136,526	725	725	0%	0%
2045	136,526	725	725	0%	0%

Notes: BAU = business as usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent. Baseline refers to an average from 2017-2021.
Source: Calculated by Ascent in 2023.

[10] Building Energy Efficiency Standards (also known as the Energy Code) developed by the California Energy Commission only apply to newly constructed buildings, additions to existing buildings, and alterations to existing buildings (California Energy Commission 2022). Thus, these were not applied to Valley Water's existing buildings.

On-Road Fleet

For the BAU forecast for Valley Water's on-road fleet, based on the expert judgment of the Valley Water facilities management staff, it was assumed that gasoline usage would increase 10 percent over the baseline year average by 2030, and 25 percent over the baseline year average by 2045 (Chesonis et al, pers. comm, 2023). To calculate emissions for the BAU case, an emissions factor from EMFAC was applied to the amount of future gallons forecasted. This resulted in 137,561 gallons of gasoline and 1,212 metric tons of MT CO_2e in 2030, and 156,320 gallons of gasoline and 1,378 metric tons of MT CO_2e in 2045.

For the legislative-adjusted scenario, the emissions factors of vehicles below 8,500 pounds of gross vehicle weight were adjusted to be consistent with ZEV targets in the Advanced Clean Cars II (ACC2) regulation, and the emissions factors of larger vehicles were adjusted using Advanced Clean Fleets (ACF), as detailed in Table 20. It was assumed that Valley Water would continue to purchase carbon-free power from PWRPA to charge these electric vehicles, so no emissions would be added from grid electricity by charging these vehicles. Both of these adjustments resulted in a lower consumption of gasoline than in the BAU case. Table 22 below shows a summary of adjustments applied.

Table 22 Valley Water On-Road Fleet VMT and Legislative Adjustments Applied

EMFAC Type	Definition	Legislative Adjustment	VMT per Year
LDA	Passenger Cars	ACC2	498,425
LDT1	Light-Duty Trucks	ACC2	1,770,300
LDT2	Light-Duty Trucks	ACC2	28,964
MDV	Medium-Duty Trucks	ACC2	2,126,568
LHD1	Light-Heavy-Duty Trucks	ACF	1,444,114
LHD2	Light-Heavy-Duty Trucks	ACF	809,438
T6TS	Medium-Heavy Duty Trucks	ACF	260,965
Total			6,938,774

Notes: EMFAC = EMissions FActor model; ACC2 = Advanced Clean Cars II; ACF = Advanced Clean Fleets; VMT = Vehicle Miles Traveled.
Source: EMFAC types from CARB (CARB 2021); VMT data provided by Valley Water; calculations performed by Ascent in 2023.

These adjustments resulted in the Valley Water fleetwide grams CO_2e per VMT emissions factor decreasing from the BAU value of 628 grams per mile to 461 grams per mile in 2030 (a reduction of approximately 27 percent below 2019 levels), and to 47 grams per mile in 2045 (a reduction of approximately 93 percent). Table 23 below shows this calculation in more detail.[11]

Table 23 Effects of ACC2 and ACF on On-road Emissions Factors

EMFAC type	BAU Emission Factors (Grams CO_2e / VMT)			Legislative-Adjusted Emission Factors (Grams CO_2e / VMT)			Percent Change in Legislative-Adjusted Emissions Factor, Compared to BAU		
	2019	2030	2045	2019	2030	2045	2019	2030	2045
LDA	292	292	292	292	182	23	0%	-37%	-92%
LDT1	366	366	366	366	287	85	0%	-22%	-77%
LDT2	392	392	392	392	286	84	0%	-27%	-79%
MDV	475	475	475	475	322	76	0%	-32%	-84%
LHD1	887	887	887	887	666	0	0%	-25%	-100%

[11] 2019 grams CO_2e / VMT values were calculated using the EMFAC database, and are used as a proxy for Valley Water vehicle emissions factors in the baseline years of 2017-2021 (2019 is the "midpoint" year of this range).

EMFAC type	BAU Emission Factors (Grams CO_2e / VMT)			Legislative-Adjusted Emission Factors (Grams CO_2e / VMT)			Percent Change in Legislative-Adjusted Emissions Factor, Compared to BAU		
	2019	2030	2045	2019	2030	2045	2019	2030	2045
LHD2	930	930	930	930	697	0	0%	-25%	-100%
T6TS	1,943	1,943	1,943	1,943	1,457	0	0%	-25%	-100%
Fleetwide	628	628	628	628	461	47	0%	-27%	-93%

Note: ACC2 = Advanced Clean Cars II, ACF = Advanced Clean Fleets, EMFAC = EMissions FActor model; BAU = Business As Usual; VMT = Vehicle Miles Traveled; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculations performed by Ascent in 2023.

These lower emissions factors imply lower gasoline consumption in the legislative-adjusted case. Table 24 below summarizes total forecast emissions in the BAU case and with legislative adjustment, compared to the baseline average.

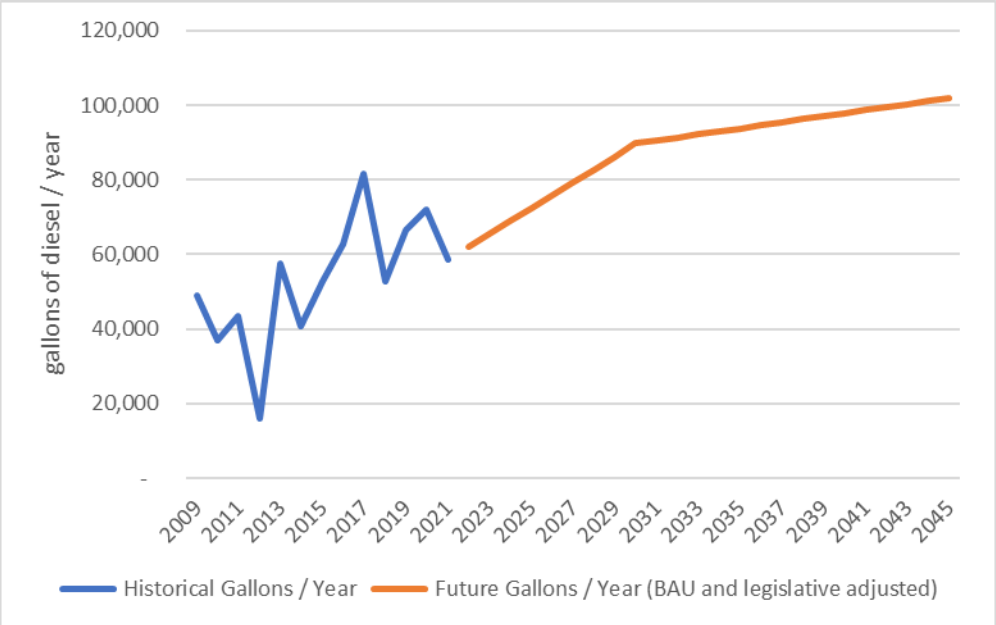
Table 24 Forecasted On-road Vehicle GHG Emissions for Valley Water Fleet

Year	BAU GHG Emissions ($MTCO_2e$)	Legislative-Adjusted GHG Emissions ($MTCO_2e$)	BAU Percent Change from Baseline	Legislative-Adjusted Percent Change from Baseline
Baseline	1,102	1,102	0%	0%
2030	1,212	890	10%	-19%
2045	1,378	103	25%	-91%

Notes: BAU = business as usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculations performed by Ascent in 2023.

Off-Road Fleet

For the BAU forecast for Valley Water's off-road fleet, based on the expert judgment of the Valley Water facilities management staff, it was assumed that diesel usage would increase 10 percent over the 2017-2021 baseline maximum by 2030, and 25 percent over that maximum by 2045 (Chesonis et al, pers. comm, 2023). No legislative adjustments were applied because Valley Water's off-road fleet is largely construction equipment, for which there is no current mandate for a transition to electric power. Figure 3 below shows the forecast for off-road vehicles.



Source: Gallons of diesel data provided by Valley Water; calculations performed by Ascent in 2023.

Figure 3 Valley Water Historical and Forecasted Off-Road Fleet Diesel Usage

This usage resulted in the emissions shown in Table 25 below.

Table 25 Forecasted Off-road Vehicle GHG Emissions for Valley Water Fleet

Year	BAU GHG Emissions ($MTCO_2e$)	Legislative-Adjusted GHG Emissions ($MTCO_2e$)	BAU Percent Change from Baseline	Legislative-Adjusted Percent Change from Baseline
Baseline	703	703	0%	0%
2030	952	952	35%	35%
2045	1082	1082	54%	54%

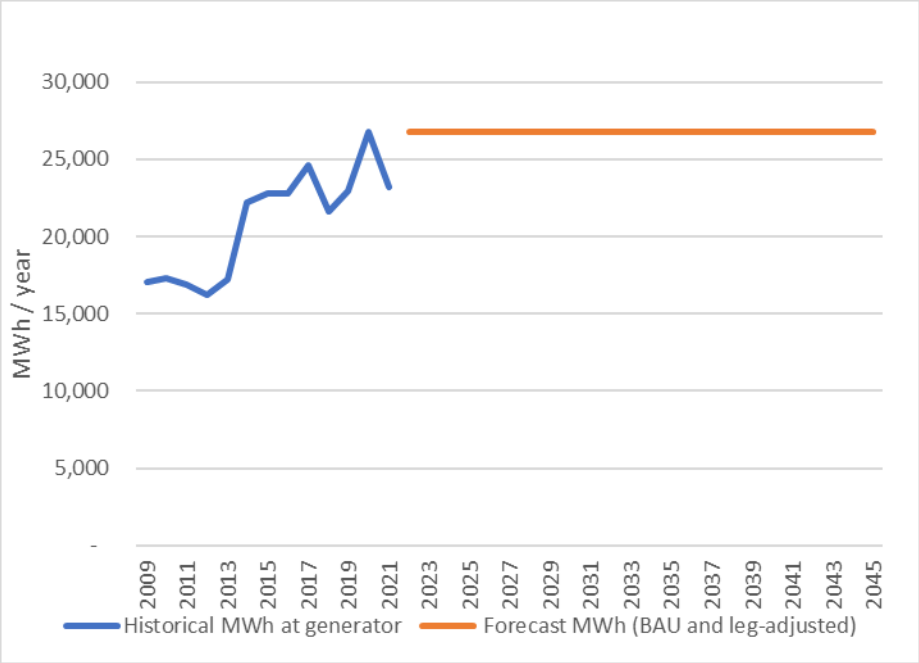
Notes: BAU = business as usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculations performed by Ascent in 2023.

High GWP Gases

High GWP gas purchases are intermittent and trends cannot be predicted with certainty; therefore, it was assumed that at some unknown future year, Valley Water would purchase more refrigerants. Thus, this historical average 2009-2012 level of 79 $MTCO_2e$ per year was assumed to apply to 2030 and 2045, in both the BAU and legislative-adjusted case.

Facility Electricity Usage

Figure 4 below shows the forecast of electricity usage in Valley Water buildings, based on the maximum across the baseline years (per feedback from Chesonis et al, pers. comm, 2023).



Note: BAU = Business-as-usual; MWh = megawatt-hours.

Source: Electric usage data provided by Valley Water; calculations performed by Ascent in 2023.

Figure 4 Historical and Forecasted Electricity Usage in Valley Water Buildings

This energy usage was used to forecast both the BAU and legislative-adjusted emissions from electricity. For BAU emissions, a weighted average emissions factor in baseline years 2017-2021 was calculated to be approximately 2 pounds of CO_2e per MWh. For legislative-adjusted emissions in 2030, it was assumed that the non-PWRPA portion of Valley Water's power portfolio (representing approximately 4 percent of the total load) decreased at a rate that would allow it to achieve carbon neutrality by 2045. For legislative-adjusted emissions in 2045, emissions were assumed to be zero commensurate with the carbon neutrality goals in SB 100. Results are shown in Table 26 below.

Table 26 Forecast Emissions Results from Facility Electricity Usage

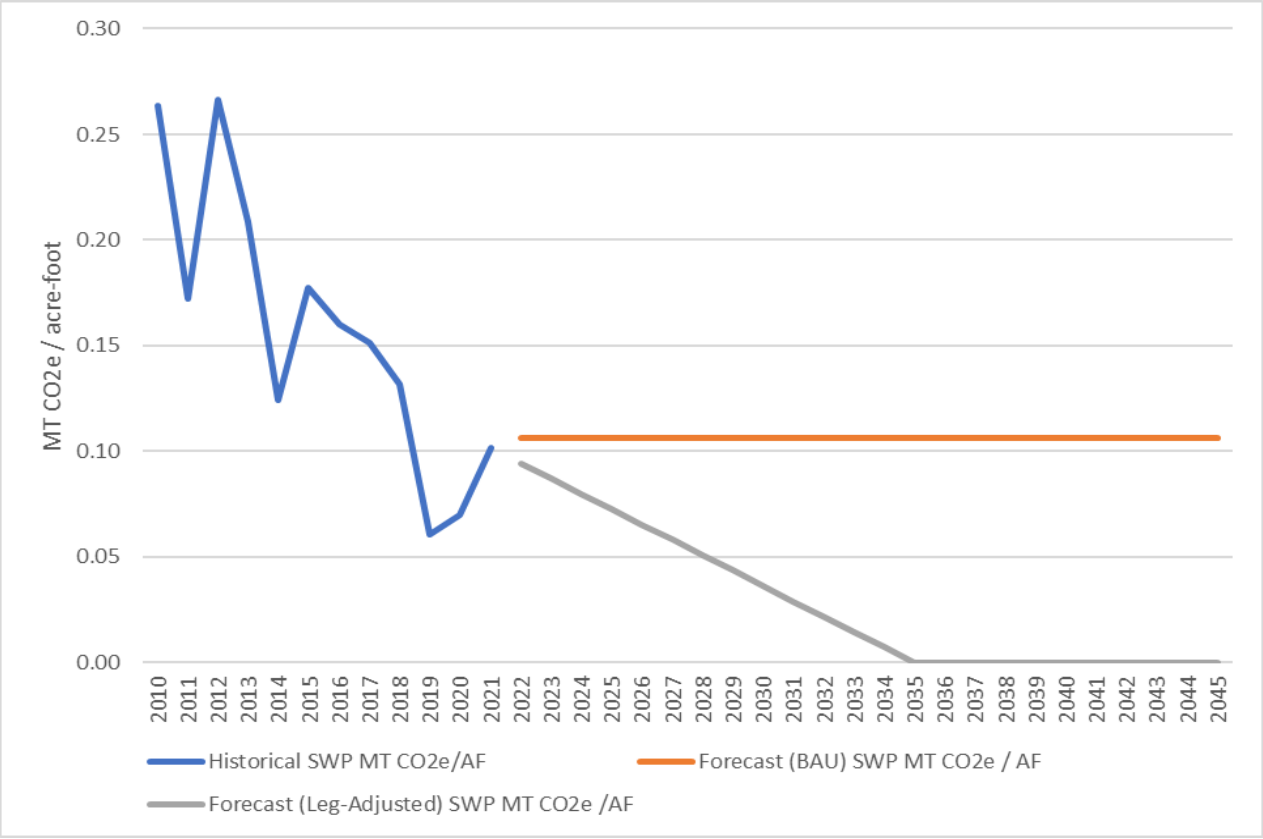
Year	MWh	BAU GHG Emissions ($MTCO_2e$)	Legislative-Adjusted GHG Emissions ($MTCO_2e$)	MWh percent change relative to baseline	BAU GHG Emissions ($MTCO_2e$) percent change relative to baseline	Legislative-Adjusted GHG Emissions ($MTCO_2e$) percent change relative to baseline
Baseline	23,856	20	20	0%	0%	0%
2030	26,781	23	23	12%	12%	10%
2045	26,781	23	0	12%	12%	-100%

Notes: BAU = business as usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Electric usage data provided by Valley Water; calculations performed by Ascent in 2023.

Imported Water

Imported water forecasts of 131,000 acre-feet in 2030 and 132,000 acre-feet in 2040 (extrapolated to 132,500 acre-feet in 2045) were based on the Water Supply Master Plan 2040 (Santa Clara Valley Water District 2019: 10). Based on data on historical shares from the 2017-2021 baseline period, this was allocated 37 percent to SWP and 63 percent for CVP.

For SWP, in the BAU case, emissions were calculated using an emissions factor of 0.11 $MTCO_2e$ per acre-foot of water, which represents an acre-foot weighted average in the baseline years. For the legislative-adjusted case, SWP emissions were adjusted to account for SB 1020, which mandates 100% renewable electricity procurement for state agencies (including DWR) by December 31, 2035. A legislative-adjusted emissions factor for 2030 (approximately 0.036 $MTCO_2e$ per acre-foot of water) was calculated by linearly interpolating between the 2021 emissions factor (the latest available year of data) and the SB 1020 target of zero emissions by 2035, as shown in Figure 5 below.



Notes: AG = Acre-feet; BAU = Business-as-usual; $MTCO_2e$ = metric tons of carbon dioxide equivalent; SWP = State Water Project.

Source: Calculations performed by Ascent in 2023.

Figure 5 State Water Project Emissions Historical and Forecasted Emissions Factors

The resultant acre-feet forecasts, emissions factors, and emissions are shown in Table 27 below.

Table 27 Forecasted Acre-Feet, Emissions Factors, and GHG Emissions for SWP and CVP Imported Water

Importer	Year	Acre-feet imported	BAU Emissions Factors ($MTCO_2e$ / Acre-Feet)	Legislative-Adjusted Emissions Factors ($MTCO_2e$ / Acre-Feet)	BAU GHG Emissions ($MTCO_2e$)	Legislative-Adjusted GHG Emissions ($MTCO_2e$)	BAU GHG Emissions percent change from baseline	Leg - adjusted GHG emissions percent change from baseline
SWP	Baseline	53,852	0.106	0.106	5,715	5,715	0%	0%
SWP	2030	49,098	0.106	0.036	5,211	1,783	-9%	-69%
SWP	2045	49,660	0.106	0	5,270	0	-8%	-100%
CVP	Baseline	89,833	0	0	0	0	0%	0%
CVP	2030	81,902	0	0	0	0	0%	0%
CVP	2045	82,840	0	0	0	0	0%	0%

Notes: BAU = business as usual; CVP = Central Valley Project; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; SWP = State Water Project.
Source: Calculations performed by Ascent in 2023.

Employee Commute

Employee commute distances were assumed to remain at 10 miles per one-way commute, per section 1.4. The number of FTE was assumed to remain at the average of 2017-2021, or 864 FTE. However, in contrast to the previous telecommute policy of one day at home and four days onsite, the forecast assumes Valley Water's new policy of two days per workweek of telecommute and three days onsite (Valley Water 2023d: 5) is implemented for all future years, for both temporary and full-time employees; this results in a decrease in VMT relative to the baseline years. Additionally, it is assumed that 60 percent of Valley Water staff (i.e. the amount of staff telecommuting in the COVID years of 2020 and 2021), both full-time regular and temporary, continue to telecommute in future.

BAU emissions factors were calculated as a VMT-weighted average across these years, and legislative-adjusted emissions factors were calculated accounting for increasing electric car adoption under ACC2. As an approximation, electric cars were assumed to have zero emissions by 2030, based on utility plans submitted by the electricity providers that serve the energy load in Santa Clara County: San Jose Clean Energy, Silicon Valley Clean Energy, and PG&E. These providers' power is forecasted to be 100, 95, and 89 percent carbon-free by 2030, respectively (San Jose Clean Energy 2022; Silicon Valley Clean Energy 2022; Pacific Gas and Electric 2022). Information on which of these three utilities a Valley Water employee might use to charge their car is speculative, so a more precise calculation of emissions factors from electric car charging was not possible. However, because these carbon values all result in zero or relatively low emissions factors,[12] the impact on total emissions was considered negligible and not included in the calculation.

Table 28 below shows the resultant forecast from these assumptions.

[12] For example, in the worst-case emissions factor per kWh scenario of the listed utilities (PG&E at 89 percent carbon-free and therefore 11 percent carbon-emitting), assuming that a natural gas generator emits 0.428 $MTCO_2e$ per MWh (CARB 2018: 16), a given kWh of energy would have approximately 0.11 * 0.428 = 0.05 MT CO_2e associated with its production. Assuming that an electric car has a fuel efficiency of 3 miles per kWh (Idaho National Laboratory n.d.), the resultant emissions are approximately 16 grams of CO_2e per VMT, or less than one-tenth of the 2030 legislative adjusted result of 231 grams of CO_2e per VMT.

Table 28 Forecasted Employee Commute VMT, Emissions Factors, and GHG Emissions

Year	BAU g CO_2e / VMT	Leg-adjusted g CO_2e/VMT	Future VMT (not counting COVID years)	MT CO_2e BAU	MT CO_2e Leg-adjusted	BAU emissions - percent change from baseline	Leg - adjusted emissions - percent change from baseline
Baseline	348	348	3,507,653	1,219	1,219	0%	0%
2030	348	231	2,822,898	981	651	-20%	-47%
2045	348	46	2,822,898	981	129	-20%	-89%

Notes: BAU = business-as-usual; CO_2e = carbon dioxide equivalent; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; VMT = vehicle miles traveled.
Source: VMT data provided by Valley Water; calculations performed by Ascent in 2023.

Business Travel

For airplane travel, emissions were assumed to be the same as the baseline average for both the BAU and legislative-adjusted scenarios, as there are no legislative adjustments affecting the aviation sector. For passenger vehicle travel, emissions were adjusted downwards to account for the effects of ACC2. Table 29 shows the results of those adjustments.

Table 29 Forecasted Emissions from Passenger Car Travel, BAU and legislative-adjusted.

Year	BAU g CO_2e/VMT	ACC2 g CO_2e/VMT for light-duty vehicles	VMT	BAU MT CO_2e	ACC2 MT CO_2e	BAU emissions percent change from baseline	Legislative-adjusted emissions percent change from baseline
Baseline	342	342	145,108	50	50	0%	0%
2030	342	231	145,108	50	33	0%	-33%
2045	342	46	145,108	50	7	0%	-87%

Notes: CO_2e = carbon dioxide equivalent; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; VMT = vehicle miles traveled.
Source: VMT data provided by Valley Water; calculations performed by Ascent in 2023.

Construction

The following considerations were taken into account when forecasting BAU construction emissions. First, both forecast years (2030 and 2045) are past the end of the forecast horizon of the Capital Improvement Plan, which only extends to 2028. Therefore, it was not possible to forecast with certainty the full set of construction projects that would occur in 2030 and 2045, although some projects are forecast to be ongoing in 2030. Second, construction investments are intermittent and thus vary substantially from year to year.

Given these considerations, total emissions in future years were calculated as the sum of 1) average annual emissions from 2011 to 2028[13] for all projects that end before 2030, and 2) 2030 emissions from projects that will be active during that year. 1) represents an estimate of emissions from "unknown" projects that could be built in 2030, but are not yet known because 2030 is beyond the end of the Capital Improvement Plan's forecast horizon. 2) represents known projects that will have emissions in 2030. The sum of unknown and known project emissions yields an estimate of the total.

Table 30 below shows the calculation of total emissions from construction per the approach above, resulting in a projected annual emissions of 8,115 $MTCO_2e$ per year for 2030 and 2045. The table is based on data from CEQA

[13] 2011 and 2028 were selected as the span of years for the average, because they capture the greatest number of years of available data. This approach was chosen to account for the substantial year-over-year variation in emissions mentioned above.

documents provided by Valley Water (as described in Section 1). The emissions value was assumed to be the same in 2030 and 2045, as currently there are no forecasts of Valley Water construction activity that extend to 2045, and thus no basis for assuming different values in 2030 and 2045.

Table 30 BAU Construction Emissions Forecasting for 2030 and 2045, MT CO_2e

Project Name	Ongoing in 2030?	Years Used for Average	Annual Average Emissions, MT CO_2e
Palo Alto Flood Basin Tide Gate Structure Replacement Project	Yes	2030	161
Almaden Lake Improvement Project	Yes	2030	541
Sunnyvale East and West Channels Flood Protection Project	Yes	2030	160
Stream Maintenance Program	Yes	2030	3,917
South Bay Advanced Recycled Water Treatment Facility	No	2011 - 2028	34
Lower Berryessa Creek Program	No	2011 - 2028	252
Rinconada Water Treatment Plant Residuals Management Project	No	2011 - 2028	696
Rinconada Water Treatment Plant: Reliability Improvement Project	No	2011 - 2028	62
Kirk Diversion Dam Replacement and Fish Screen Project	No	2011 - 2028	7
Upper Guadalupe River Flood Control Project- Reach 12	No	2011 - 2028	14
Coyote Ridge Long Term Management Plan	No	2011 - 2028	4
Upper Penitencia Creek Property Acquisition and Long Term Management Plan	No	2011 - 2028	1
South County Recycled Water Master Plan Project	No	2011 - 2028	26
Coyote Warehouse Project	No	2011 - 2028	24
Upper Berryessa Creek Flood Risk Management Project	No	2011 - 2028	103
Penitencia Delivery Main and Penitencia Force Main Seismic Retrofit Project	No	2011 - 2028	5
Penitencia and Santa Teresa Water Treatment Plants Solar Project	No	2011 - 2028	3
Upper Guadalupe Reach 6 Aquatic Habitat Improvement Project	No	2011 - 2028	23
Permanente Creek Flood Protection Project	No	2011 - 2028	234
Uvas Creek Levee Rehabilitation Project	No	2011 - 2028	13
Main Avenue and Madrone Pipeline Restoration Project	No	2011 - 2028	57
Cunningham Flood Detention Facility Certification Project	No	2011 - 2028	38
Upper Llagas Creek Flood Protection Project	No	2011 - 2028	831
Saratoga Creek Hazard Tree Removal and Restoration Project	No	2011 - 2028	15
Calabazas Creek Bank Rehabilitation Project	No	2011 - 2028	19
South San Francisco Bay Shoreline	No	2011 - 2028	876
Total	**N/A**	**N/A**	**8,115**

Notes: $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Data provided by Valley Water.

For the legislative-adjusted forecast, emissions from two sources were adjusted: 1) construction employee commute to the job site, and 2) heavy-duty on-road construction vehicles. Based on Ascent's analysis of project Environmental Impact Reports (EIRs), these emissions sources were assumed to represent approximately 16 percent and 17 percent of total project emissions in the BAU case, respectively, with the remaining 67 percent of emissions due to off-road construction vehicles. Emissions from construction employee commute to the job site were adjusted to account for

ACC2 (as employees were generally assumed to drive light-duty vehicles subject to ACC2), and emissions from heavy-duty on-road construction vehicles were adjusted to account the EV mandates in Advanced Clean Fleets.

Table 31 below shows the results of this calculation. For construction employee commute, the legislative-adjusted case shows a 30% reduction (relative to BAU) to employee commute emissions per VMT based on the difference between 2021 and 2030 light-duty emissions factors in Santa Clara County, and an 87% reduction by 2045; these reductions were calculated using EMFAC outputs, adjusted to include the effects of increasing electric vehicle penetration under ACC2. Similarly, emissions from heavy-duty on-road vehicles were adjusted based on ACF targets of 25% EVs by 2030, and 100% EVs by 2039 (these vehicles were assumed, like those of Valley Water, to be subject to the milestones of Group 2; see Table 20).

Table 31 Forecasted Emissions (MT CO_2e) from Construction, BAU and Legislative-Adjusted

Year	BAU					Leg-Adjusted				
	Total	Employee Commute Only	Heavy-Duty on-road vehicles	Off-road vehicles	BAU emissions percent change from baseline	Total	Employee Commute Only	Heavy-duty on-road vehicles	Off-road vehicles	Legislative-adjusted emissions percent change from baseline
Baseline	6,990	1,110	1,175	4,706	0%	6,990	1,110	1,175	4,706	0%
2030	8,115	1,288	1,364	5,464	16%	7,384	834	911	5,640	6%
2045	8,115	1,288	1,364	5,464	16%	5,629	161	71	5,398	-19%

Notes:; BAU = Business as Usual ; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: EIR data provided by Valley Water; calculations performed by Ascent in 2023.

For both the BAU and legislative-adjusted forecasts, construction emissions calculations did not include emissions from the Pacheco Reservoir Expansion Project and the Anderson Dam Seismic Retrofit Project. This is because emissions from these projects are required to be mitigated to net-zero by mitigation measures included in their Environmental Impact Reports (Valley Water 2021: 55 and Valley Water 2023a: 45).

Solid Waste

Solid waste activity was assumed to continue at the rate of the historical average in the baseline years, 2017-2021. Thus, emissions results are identical to those shown in Section 1.

Wastewater

Wastewater activity was assumed to continue at the rate of the historical average in the baseline years, 2017-2021. Thus, emissions results are identical to those shown in Section 1.

Sediment Hauling

Sediment hauling activity was assumed to continue at the rate of the historical average in the baseline years, 2017-2021. In the legislative-adjusted case, Advanced Clean Fleets reduced the emissions factor of the dump trucks by approximately 25 percent in 2030, and 100 percent by 2045. Table 32 below shows the effects of Advanced Clean Fleets on the emissions result.

Table 32 Forecasted Emissions from Sediment Hauling

Year	BAU GHG Emissions ($MTCO_2e$)	Legislative-Adjusted GHG Emissions ($MTCO_2e$)	BAU emissions percent change from baseline	Legislative-adjusted emissions percent change from baseline
Baseline	62	62	0%	0%
2030	62	47	0%	-25%
2045	62	0	0%	-100%

Notes: BAU = business as usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Calculations performed by Ascent in 2023.

2.4 SUMMARY OF FORECAST RESULTS FOR ALL SECTORS

Table 33 below summarizes results for 2030 and 2045 legislative-adjusted and BAU forecasts.

Table 33 Summary of Forecast Results for All Sectors

Scope	Sector	BAU GHG Emissions ($MTCO_2e$)		Legislative-Adjusted GHG Emissions ($MTCO_2e$)	
		2030	2045	2030	2045
1	On-Road Fleet	1,212	1,378	890	103
	Natural Gas Use in Buildings	725	725	725	725
	Off-road fleet	952	1,082	952	1,082
	High GWP Gases	79	79	79	79
	Scope 1 Subtotal	**2,969**	**3,264**	**2,646**	**1,990**
2	Facility Electricity Usage	23	23	23	0
	Scope 2 Subtotal	**23**	**23**	**23**	**0**
3	Construction	8,115	8,115	7,384	5,629
	Imported Water	5,211	5,270	1,783	0
	Employee Commute	981	981	651	129
	Wastewater	343	343	343	343
	Solid Waste	236	236	236	236
	Business Travel	147	147	131	104
	Sediment Hauling	62	62	47	0
	Scope 3 Subtotal	**15,095**	**15,155**	**10,574**	**6,441**
Total		**18,087**	**18,442**	**13,243**	**8,430**

Notes: BAU = business as usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Calculations performed by Ascent in 2023.

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Appendix E

Implementation Plan Details

Table E-1 Implementation Plan Details

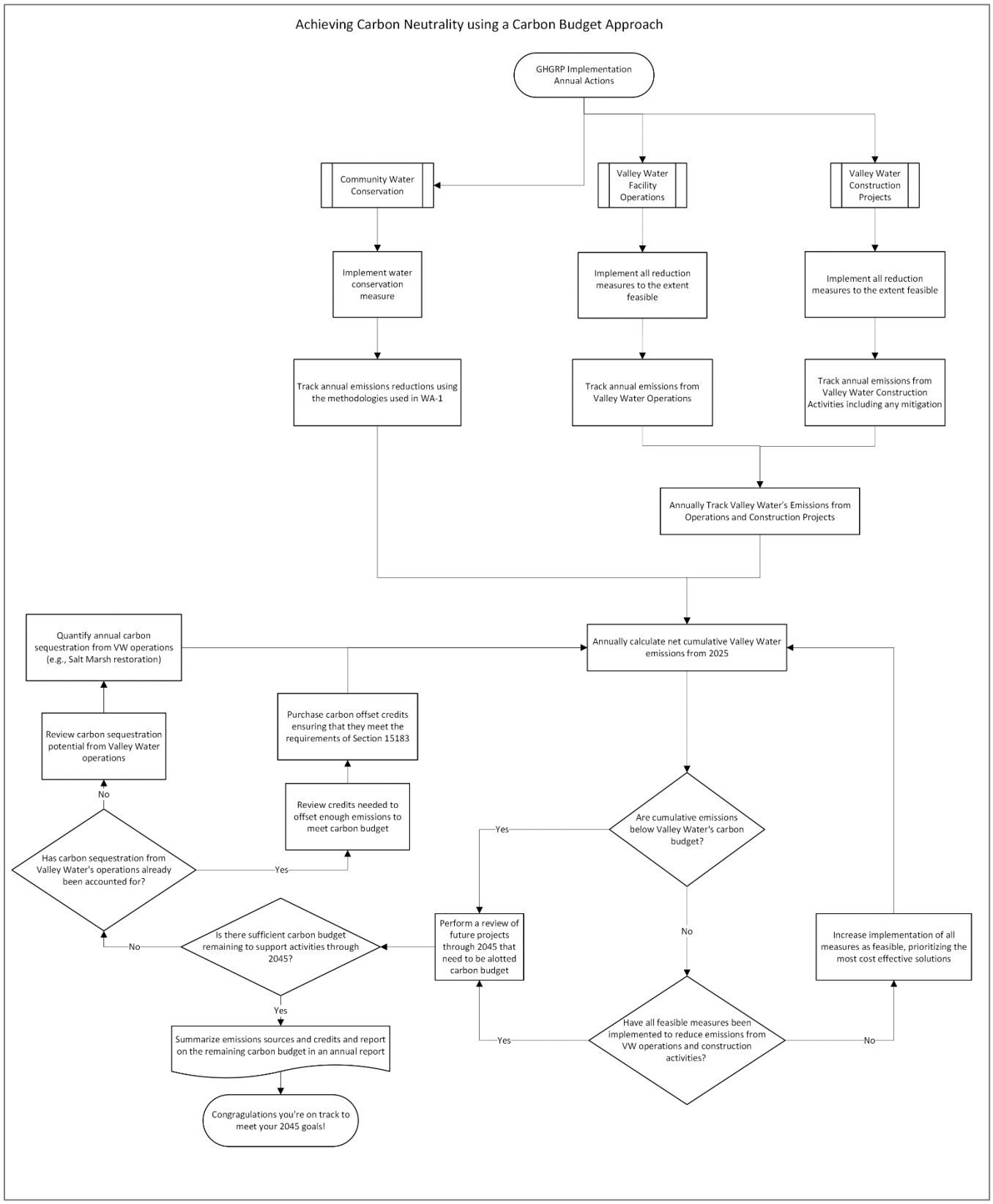
Sector	Measure #	Measure Name	Measure Description	Implementing Division and Unit	Tracking Metric	Roles and Responsibilities	Monitoring Plan	Enforcement Plan	Funding Mechanism
Fleet	VF-1	Zero Emission On-Road Fleet	Convert 35% of Valley Water's on-road fleet fuel use to zero-emission fuels by 2030, and 100% by 2045.	Division: General Services Unit: Equipment Management (885)	Total gallons of conventional fuel divided by VMT - use multiyear average to account for inter-year variability	Fleet Manager to accelerate procurement of ZEVs as necessary to achieve targets for zero-emission fuel usage.	Collect list of all vehicles in fleet, gallons of gasoline used, and their associated VMT, every 2 years.	Require fleet planning and vehicle procurement process to accelerate the replacement of existing on-road fleet vehicles with ZEVs to achieve zero-emission fuel targets.	CARB Clean Truck and Bus Vouchers, California Vehicle Rebate Program, Hybrid and Zero Emission Truck and Bus Voucher Incentive Project, Inflation Reduction Act
Fleet	OF-1	Zero Emission Off-Road Fleet	Convert 50% of Valley Water's off-road fleet conventional diesel use to zero-emission fuels in 2030 and 100% by 2045, regardless of engine tier.	Division: General Services Unit: Equipment Management (885)	Total gallons conventional fuel - multiyear average	Fleet Manager to maintain usage of renewable diesel and accelerate replacement of off-road fleet as necessary to achieve targets for zero-emission fuel usage.	Collect list of all equipment in fleet and gallons of conventional fuel used, every 2 years	Maintain contracts for renewable diesel at fuel farm and require fleet planning and vehicle procurement process to accelerate the replacement of existing off-road fleet to achieve zero-emission fuel targets.	Clean Off-Road Equipment Voucher Incentive Project (CORE), Carl Moyer Program
High GWP Gases	HG-1	Phase out High-GWP refrigerants	Replace high GWP refrigerants with low GWP alternatives above and beyond the requirements of Senate Bill 1206.	Division: General Services Unit: Facilities Management (887)	Weighted average GWP of purchased refrigerants	Supervising HVAC Mechanic to continue procurement of low GWP refrigerants at time of replacement, as feasible.	Collect list and quantities of high-GWP gases purchased annually.	Develop purchasing requirements to prohibit purchase of high-GWP refrigerants is prohibited unless no low GWP alternative is available.	CARB F-gas Reduction Incentive Program
Facility Energy	FE-1	Facility Electrification	Electrify 30% of existing facility natural gas use by 2030, and 60% by 2045.	Division: General Services Unit: Facilities Management (887)	Natural gas usage – multiyear average	Facilities Manager/ Supervising HVAC Mechanic to continue practice of replacing gas-fired equipment with electric equipment upon end of serviceable life or failure.	Collect data on natural gas usage in buildings annually.	Develop purchasing requirements to mandate the purchase of electric space and water heating equipment at time-of-replacement at the pace necessary to achieve electrification targets.	Energy Conservation Assistance Act Low-Interest loans, Inflation Reduction Act
Employee Commute	EC-1	Reduce Employee Commute VMT	Implement incentives to encourage employees to reduce their VMT or reduce emissions from their commute vehicle.	Division: Human Resources Unit: Total Rewards and Data Analytics	Employee VMT	Human Resources to explore additional incentives to reduce commute VMT and encourage alternatives to vehicle commuting.	Review utilization and effectiveness of incentives every two years.	N/A - Valley Water cannot directly control employee commute choices.	California E-Bike Incentive Project
Solid Waste	SW-1	Increase Solid Waste Diversion	Divert 80% of waste from Valley Water offices from landfills by 2030, and 90% by 2045. Improve solid waste tracking by conducting regular assessments of waste characterization.	Division: General Services Unit: Facilities Management (887)	Tons of landfilled waste collected from Valley Water facilities	Valley Water to ensure that all buildings have easily accessible recycling and composting bins and explore opportunities to educate employees about appropriate bin sorting.	Valley Water will conduct a waste characterization survey every three years, and will monitor tons landfilled, recycled, and composted.	N/A - Valley Water can advocate for waste diversion, but cannot directly enforce this measure.	Pollution Prevention (P2) Grant Program, CalRecycle Food Waste Prevention and Rescue Grant Program, CalRecycle Beverage Container Recycling Grants
Construction	CN-1	Carbon Free Off-Road Construction Equipment	For all contracted construction projects, require the use of zero-emission fuels instead of conventional diesel in 17% of off-road construction equipment fuel use in equipment greater than 25 hp by 2030, and 45% by 2045 regardless of the engine Tier.	Division: Water Utility Capital Unit: Construction Services (351)	Fuel used in construction – multiyear average	Construction Services Division to update Standard Provisions to mandate increasing percentages of zero-emission vehicles and zero-emission fuels to be used in construction.	For every future construction project, contractor to submit fuel usage reports to Valley Water, documenting fleet composition and all forms of fuel usage during project construction.	Construction contractors will be required to conform with Standard Provision dictating usage targets for zero-emission fuels and associated reporting requirements.	Clean Off-Road Equipment Voucher Incentive Project (CORE), Carl Moyer Program
Construction	CN-2	Carbon Free On-Road Construction Vehicles	For all contracted construction projects, require the use of zero-emission fuels instead of conventional fuel in 35% of on-road construction vehicle fuel use by 2030, and 95% by 2045.	Division: Water Utility Capital Unit: Construction Services (351)	Fuel used in construction – multiyear average	Construction Services to update Standard Provisions to mandate increasing percentages of zero-emission vehicles and zero-emission fuels to be used in construction.	For every new construction project, contractor to submit fuel usage reports to Valley Water, documenting all forms of fuel usage during project construction.	Construction contractors will be required to conform with Standard Provision dictating usage targets for zero-emission fuels and associated reporting requirements.	CARB Clean Truck and Bus Vouchers, California Vehicle Rebate Program, Hybrid and Zero Emission Truck and Bus Voucher Incentive Project, Inflation Reduction Act

Sector	Measure #	Measure Name	Measure Description	Implementing Division and Unit	Tracking Metric	Roles and Responsibilities	Monitoring Plan	Enforcement Plan	Funding Mechanism
Water Conservation	WA-1	Community-Wide Water Conservation	Increase communitywide water conservation to 118,000 acre-feet per year by 2045.	Division: Water Supply Unit: Water Supply Planning and Conservation	Acre-feet of water conserved	Conservation Program provide annual update on water conservation and upon request, provide funding or resources to support Valley Water facilities that results in reduced water use.	Annually review and assess effectiveness of Valley Water's water conservation program.	N/A - Valley Water can promote water conservation, but cannot directly require it.	Valley Water Operations Budget
Carbon Sequestration	CS-1	Sequester Carbon	Sequester carbon in enhancement and voluntary projects. Collaborate with regional conservation agencies to identify projects that are beyond project mitigation.	Division: Watersheds Stewardship and Planning Unit: Water Resources Planning and Policy	Additional carbon sequestration ($MTCO_2e$) derived from restoration/enhancement projects	GHGRP Implementation Team to establish Carbon Sequestration Registry per CS-1.	Track success of restoration/enhancement projects and net change in carbon sequestration.	Prepare documentation that carbon sequestration credits conform to criteria described in CS-1 prior to their accounting as part of future GHG inventories.	Measure AA, San Francisco Bay Water Quality Improvement Fund, other Local, State, Federal grants, Valley Water CIP Budget.
Carbon Sequestration	CS-2	Purchase Carbon Offsets	If necessary, purchase carbon offsets from verified offset registries, prioritizing local or regional projects and, if necessary, projects outside of the state, but within the United States. Prohibit carbon offset purchases that are unverified or located in locations outside the United States.	Division: Watersheds Stewardship and Planning Unit: Water Resources Planning and Policy	$MTCO_2e$ of carbon offsets purchased and retired	GHGRP Implementation Team to develop process to purchase carbon offsets from CARB-verified registry.	GHGRP Implementation Team to track progress of GHG reductions from measures above and assess need for carbon offsets as a backstop to remain within carbon budget.	Revise Board Ends Policy for carbon neutrality to align with GHGRP targets and carbon budget. If purchased, acquire documentation that carbon offsets conform to criteria described in CS-1 from registry.	Valley Water CIP Budget

Notes: CARB = California Air Resources Board; EV = Electric Vehicle; F-Gas = Fluorinated Greenhouse Gases; GWP = Global Warming Potential; RFP = Request for Proposal; VMT = Vehicle-Miles Traveled.
Source: Prepared by Ascent in 2024.

Appendix F

GHGRP Implementation Flow Diagram


Achieving Carbon Neutrality using a Carbon Budget Approach
GHGRP Implementation Annual Actions
Community Water Conservation
Valley Water Facility Operations
Valley Water Construction Projects
Implement water conservation measure
Implement all reduction measures to the extent feasible
Implement all reduction measures to the extent feasible
Track annual emissions reductions using the methodologies used in WA-1
Track annual emissions from Valley Water Operations
Track annual emissions from Valley Water Construction Activities including any mitigation
Annually Track Valley Water's Emissions from Operations and Construction Projects
Quantify annual carbon sequestration from VW operations (e.g., Salt Marsh restoration)
Annually calculate net cumulative Valley Water emissions from 2025
Review carbon sequestration potential from Valley Water operations
Purchase carbon offset credits ensuring that they meet the requirements of Section 15183
No
Review credits needed to offset enough emissions to meet carbon budget
Yes
Has carbon sequestration from Valley Water's operations already been accounted for?
Yes
Are cumulative emissions below Valley Water's carbon budget?
No
Is there sufficient carbon budget remaining to support activities through 2045?
Perform a review of future projects through 2045 that need to be alotted carbon budget
Increase implementation of all measures as feasible, prioritizing the most cost effective solutions
Yes
Summarize emissions sources and credits and report on the remaining carbon budget in an annual report
Have all feasible measures been implemented to reduce emissions from VW operations and construction activities?
Yes
No
Congragulations you're on track to meet your 2045 goals!

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Appendix G

Prioritization Matrix

Table H-1 Prioritization Matrix

Sector	Measure Number	Measure Name	Measure Description	Feasibility[1]	Cost[2]	GHG Reduction Potential. 2025-2045[3]
Fleet	VF-1	Zero Carbon On-Road Fleet	Implement a Zero Carbon Fleet Plan to convert 35% of on-road fleet fuel use to zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) by 2030, and 100% by 2045.	Medium[4]	Medium	Low
Fleet	OF-1	Zero Carbon Off-Road Fleet	Require the use of zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) instead of conventional diesel in 50% of Valley Water's off-road fleet fuel use in equipment by 2030, and 100% by 2045 regardless of engine Tier.	Medium	High	High
High GWP Gases	HG-1	Phase Out High-GWP refrigerants	Replace high GWP refrigerants with low GWP alternatives above and beyond the requirements of SB 1206.	High	Low	Low
Facility Energy	FE-1	Facility Electrification	Electrify 30% of existing facility energy use by 2030, and 60% by 2045.	Medium	Medium	Medium
Employee Commute	EC-1	Reduce Employee Commute Emissions	Implement a companywide commute challenge with rewards and competitions to encourage employees to reduce their VMT or reduce emissions from their commute vehicle. Offer a variety of incentives, including e-bike rebates, and parking cash-out programs.	High	Low	Low
Solid Waste	SW-1	Increase Solid Waste Diversion	Divert 80% of waste from Valley Water offices from landfills by 2030, and 90% by 2045. Improve solid waste tracking by conducting regular assessments of waste characterization.	Low	Medium	Medium
Construction	CN-1	Zero Carbon Off-Road Construction Equipment	For all contracted construction projects, require the use of zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) instead of conventional diesel in 17% of off-road construction equipment fuel use in equipment greater than 25 hp by 2030, and 45% by 2045 regardless of the engine Tier.	Low	High	High
Construction	CN-2	Zero Carbon On-Road Construction Vehicles	For all contracted construction projects, require the use of zero-emission fuels (e.g., electricity, renewable diesel, biodiesel, hydrogen) instead of conventional fuel in 35% of on-road construction vehicle fuel use by 2030, and 95% by 2045.	Low	High	Low
Water Conservation	WA-1	Increase Water Conservation	Increase communitywide water conservation to 118,800 acre-feet per year by 2045.	High	Low	Medium
Carbon Sequestration	CS-1	Sequester Carbon	Sequester carbon in enhancement and voluntary projects. Collaborate with regional conservation agencies to identify projects that are beyond project mitigation.	Medium	High	High

Notes: GHG = Greenhouse Gases; GWP = Global Warming Potential; VMT = Vehicle-Miles Traveled

[1] For feasibility, a "High" score means that the measure relies on proven, currently commercially available, and scalable technology or processes. A "Medium" score means that the technology or process to implement the measure is available but may still be in its pilot or demonstration stages and have challenges scaling or deploying. A "Low" score means that there are substantial technical barriers to implementing a measure because the technology is still in its early stages, or because its ability to scale is unknown.

[2] Cost is a qualitative metric intended only to rank the different cost impacts of measures. Quantitative cost estimates are unknown and depend on market conditions, engineering constraints, and the availability of technology. "High" means that the measure has substantial effects on Valley Water's costs; "Medium" and "Low" imply progressively lower costs.

[3] For GHG reduction potential, total 2025-2045 reductions were calculated for each measure, and then measures were then ranked according to those reductions. The top third of measures received a score of "High," the middle third "Medium," and the bottom third "Low."

[4] Depending on market conditions and supply chain availability for zero-emission fuels.

Source: Prepared by Ascent in 2024.

Appendix H

Carbon Budget Consistency Calculation Examples for New Projects

Tables H-1 and H-2, respectively, show two examples of a hypothetical project that is consistent with the carbon budget (Project A) and one that is not (Project B). The tables intend to show Valley Water's forecasted emissions with the implementation of GHGRP reduction measures, reduction credits from WA-1 and CS-1, the new project, and the carbon budget. Because actual future emissions would vary year to year depending on the status of the GHGRP implementation, the values shown in the yellow cells are example inputs and are rounded versions of the forecasts shown in Table 4 and Figure 6. Because actual future Valley Water emissions are not yet known, the example forecasts in the second column are for demonstration purposes only.

PROJECT EXAMPLE THAT MEETS THE CARBON BUDGET

In Table H-1, Project A is a six-year project that is anticipated to emit 500 $MTCO_2e$ per year between 2030 and 2035. This annual emissions level is similar to that of an environmental restoration project. The cumulative carbon budget for 2045 is 144,731 $MTCO_2e$.

Table H-1 Carbon Budget Tracking Table Example for Project A that meets Carbon Budget ($MTCO_2e$)

Year	Forecasted Emissions with Reduction Measure Implementation (Excluding WA-1 and CS-1)	Emissions Reduction Credits from WA-1 and CS-1	Emissions from New Project A	Total Annual Emissions	Cumulative Emissions from 2025	Cumulative Carbon Budget	Budget Exceeded?
2025	13,600	0		13,600	13,600	13,559	No
2026	12,900	-1,500		11,400	25,000	26,487	No
2027	12,200	-1,500		10,700	35,700	38,784	No
2028	11,500	-1,500		10,000	45,700	50,451	No
2029	10,800	-1,500		9,300	55,000	61,487	No
2030	10,100	-2,300	500	8,300	63,300	71,893	No
2031	9,600	-2,300	500	7,800	71,100	81,604	No
2032	9,200	-2,300	500	7,400	78,500	90,622	No
2033	8,800	-2,300	500	7,000	85,500	98,947	No
2034	8,400	-2,200	500	6,700	92,200	106,578	No
2035	7,900	-2,200	500	6,200	98,400	113,515	No
2036	7,500	-2,200		5,300	103,700	119,758	No
2037	7,100	-2,200		4,900	108,600	125,307	No
2038	6,700	-2,200		4,500	113,100	130,163	No
2039	6,200	-2,200		4,000	117,100	134,326	No
2040	5,800	-2,100		3,700	120,800	137,794	No
2041	5,400	-2,100		3,300	124,100	140,569	No
2042	5,000	-2,100		2,900	127,000	142,650	No
2043	4,600	-2,100		2,500	129,500	144,037	No
2044	4,100	-2,000		2,100	131,600	144,731	No
2045	3,700	-2,000		1,700	133,300	144,731	No

Source: Prepared by Ascent in 2024

Notes: Cells in yellow are sample Valley Water inputs.

As shown in Table H-1, the addition of Project A's emissions would not result in an exceedance of Valley Water's carbon budget by 2045, given the known emissions forecasts and emissions current as of the project analysis. With the project, Valley Water's cumulative emissions from 2025 to 2045 would be estimated at 133,300 MTCO2e, which is less than the carbon budget of 144,731 $MTCO_2e$.

PROJECT EXAMPLE THAT EXCEEDS THE CARBON BUDGET

In Table H-2, Project B is a 10-year project that is anticipated to emit 2,000 $MTCO_2e$ per year from 2035 through 2044. This annual emissions level is similar to that of a flood protection project. The cumulative carbon budget for 2045 remains at 144,731 $MTCO_2e$. The forecasted operational and known construction emissions remain the same, as shown in Table H-1.

Table H-2 Carbon Budget Tracking Table Example for Project B that exceeds Carbon Budget ($MTCO_2e$)

Year	Operations and On-Going Construction Projects	Credits from WA-1 and CS-1	New Project A	Total Annual Emissions	Cumulative Emissions from 2025	Cumulative Carbon Budget	Budget Exceeded?
2025	13,600	0		13,600	13,600	13,559	No
2026	12,900	-1,500		11,400	25,000	26,487	No
2027	12,200	-1,500		10,700	35,700	38,784	No
2028	11,500	-1,500		10,000	45,700	50,451	No
2029	10,800	-1,500		9,300	55,000	61,487	No
2030	10,100	-2,300		7,800	62,800	71,893	No
2031	9,600	-2,300		7,300	70,100	81,604	No
2032	9,200	-2,300		6,900	77,000	90,622	No
2033	8,800	-2,300		6,500	83,500	98,947	No
2034	8,400	-2,200		6,200	89,700	106,578	No
2035	7,900	-2,200	2,000	7,700	97,400	113,515	No
2036	7,500	-2,200	2,000	7,300	104,700	119,758	No
2037	7,100	-2,200	2,000	6,900	111,600	125,307	No
2038	6,700	-2,200	2,000	6,500	118,100	130,163	No
2039	6,200	-2,200	2,000	6,000	124,100	134,326	No
2040	5,800	-2,100	2,000	5,700	129,800	137,794	No
2041	5,400	-2,100	2,000	5,300	135,100	140,569	No
2042	5,000	-2,100	2,000	4,900	140,000	142,650	No
2043	4,600	-2,100	2,000	4,500	144,500	144,037	No
2044	4,100	-2,000	2,000	4,100	148,600	144,731	**Yes**
2045	3,700	-2,000		1,700	150,300	144,731	**Yes**

Source: Prepared by Ascent in 2024

Notes: Cells in yellow are sample Valley Water inputs.

As shown in Table H-2, the addition of Project B's emissions would exceed Valley Water's carbon budget by 2045, given the known emissions forecasts and current emissions. With the project, Valley Water's carbon budget would be exceeded two years early in 2044, by which time Valley Water's cumulative emissions from 2025 to 2044 would be estimated at 148,600 $MTCO_2e$, which is greater than the carbon budget of 144,731 $MTCO_2e$

The results in Tables H-1 and H-2 depend on emissions from all sources considered in this GHGRP, not just the emissions from the new project being evaluated. In the case where emission reduction credits from WA-1 or CS-1 may not be as high in the future or where emissions from operations and currently known construction would be higher than anticipated, the carbon budget could be exceeded. Thus, adaptive management of Valley Water's emissions is crucial to achieving carbon neutrality by 2045.

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Greenhouse Gas Reduction Plan

Nick Mascarello, Associate Water Resources Specialist

Environmental and Water Resources Committee

January 27, 2025

Presentation Outline

A. Past GHG Reduction Progress

B. 2021 Climate Action Plan

C. Greenhouse Gas Reduction Plan

   1. Updated GHG Inventory
   2. Inventory Benchmarking
   3. Emissions Forecast and Net Zero Target
   4. GHG Reduction Measures

D. Next Steps and Schedule

E. Q & A

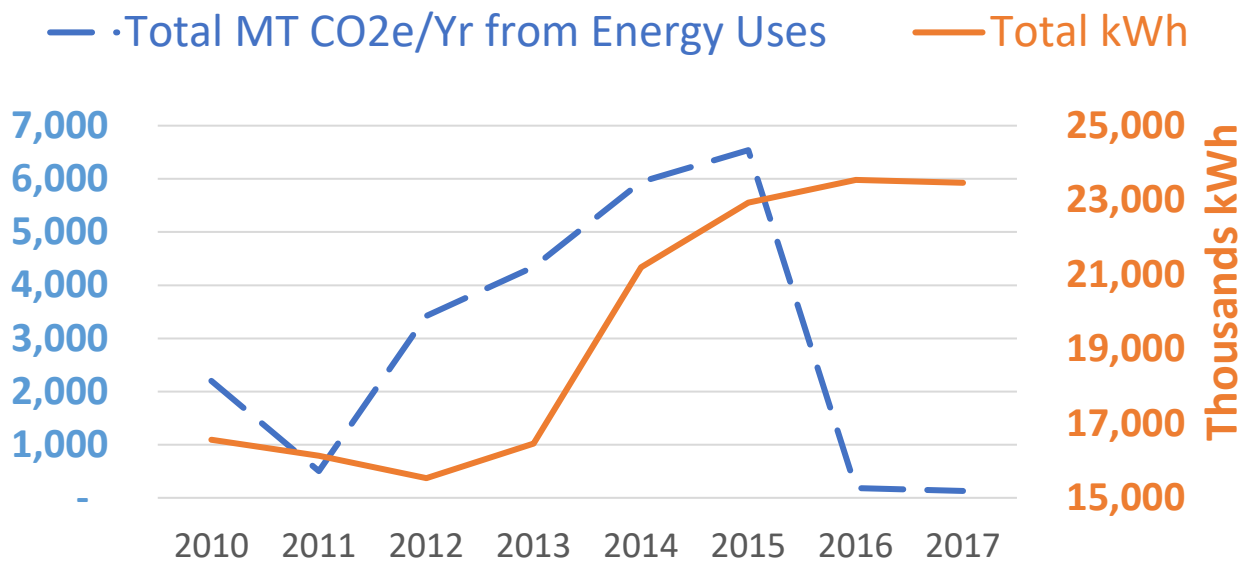
A. Past GHG Reduction Progress

Milestones

2010: Valley Water begins preparing annual GHG inventories

2016: 95% of purchased electricity from Power and Water Resources Pooling Authority (PWRPA) Carbon Free Plan

2023: Water Conservation Programs and policies saved 83,000 acre-feet per year avoiding approximately 5,000 MT CO_2e per year



GHG emissions from purchased electricity

B. 2021 Climate Change Action Plan

Reduce Direct Emissions

Expand Renewable Energy & Improve Efficiency

Reduce Indirect Emissions

Action 1.6.2: Expand GHG inventory

Action 1.6.4: Prepare CEQA-Qualified GHG Reduction Plan

C. CEQA-Qualified GHG Reduction Plan

Strategy to reduce GHG emissions

CEQA

Streamlines environmental review (CEQA) of future capital improvement projects

Consistency with regulatory guidelines

C. Emission Inventory

Scope 1
Direct Emissions

- Fleet
- Natural Gas
- Refrigerant

Scope 2
Purchased Electricity

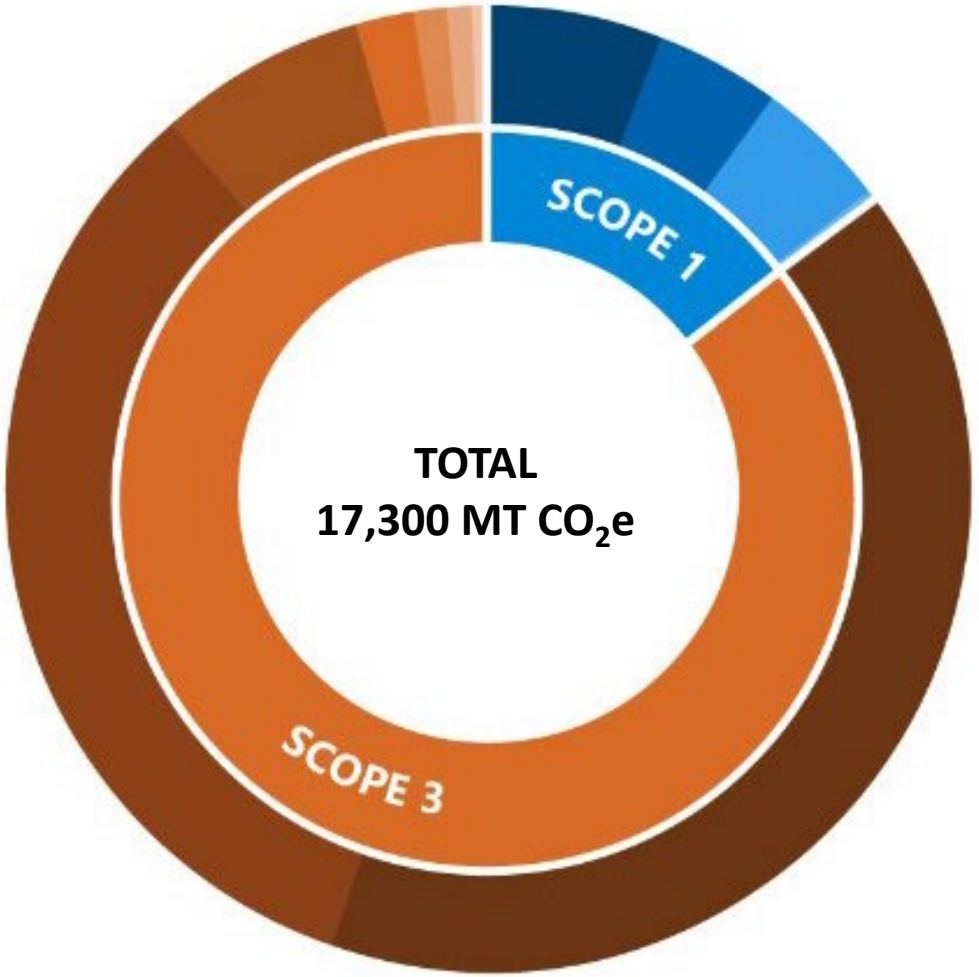
- Power and Water Resources Pooling Authority (PWRPA)
- PG&E
- Community Choice Aggregation (CCA)

Scope 3
Indirect Emissions

- Imported Water
- Business Travel
- Employee Commute
- Construction*
- Solid Waste*
- Wastewater*
- Sediment Hauling*

***emissions not in previous GHG inventories**

C. Baseline Emission Inventory



2017-2021 Baseline Inventory

SCOPE 1 **2,600 MT CO_2e**

- **6%** ON-ROAD FLEET
- **4%** NATURAL GAS USE IN BUILDINGS
- **4%** OFF-ROAD FLEET
- **<1%** HIGH GWP GASES

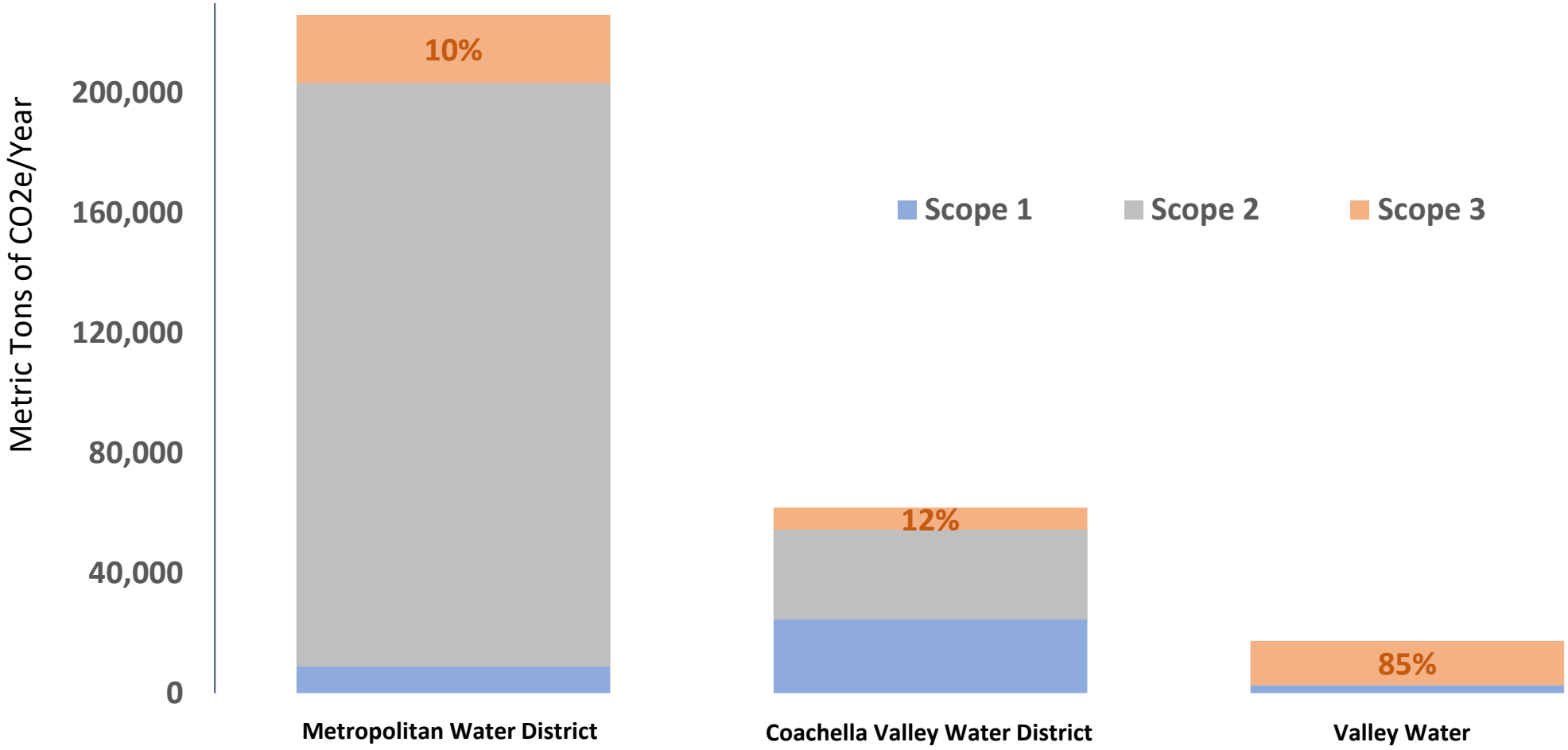
SCOPE 2 **20 MT CO_2e**

- **<1%** FACILITY ELECTRICITY USE

SCOPE 3 **14,700 MT CO_2e**

- **40%** CONSTRUCTION
- **33%** IMPORTED WATER
- **7%** EMPLOYEE COMMUTE
- **2%** WASTEWATER
- **1%** BUSINESS TRAVEL
- **1%** SOLID WASTE
- **<1%** SEDIMENT HAULING

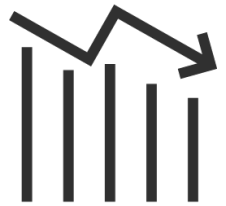
C. Emissions in Context



C. Emissions Forecast

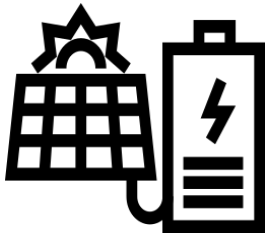
Purpose

- Estimates future GHG emissions through 2045 and determines the emissions reductions necessary to achieve targets

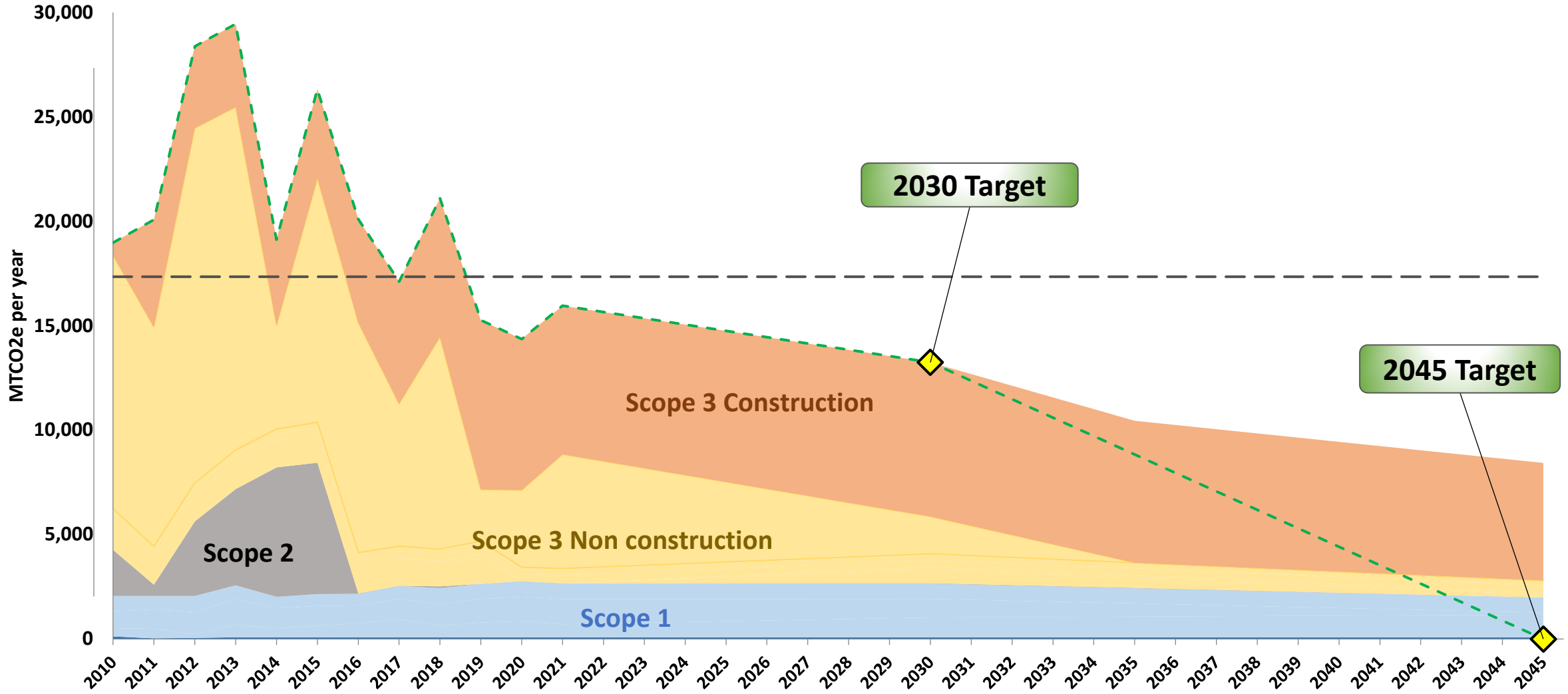


Methodology

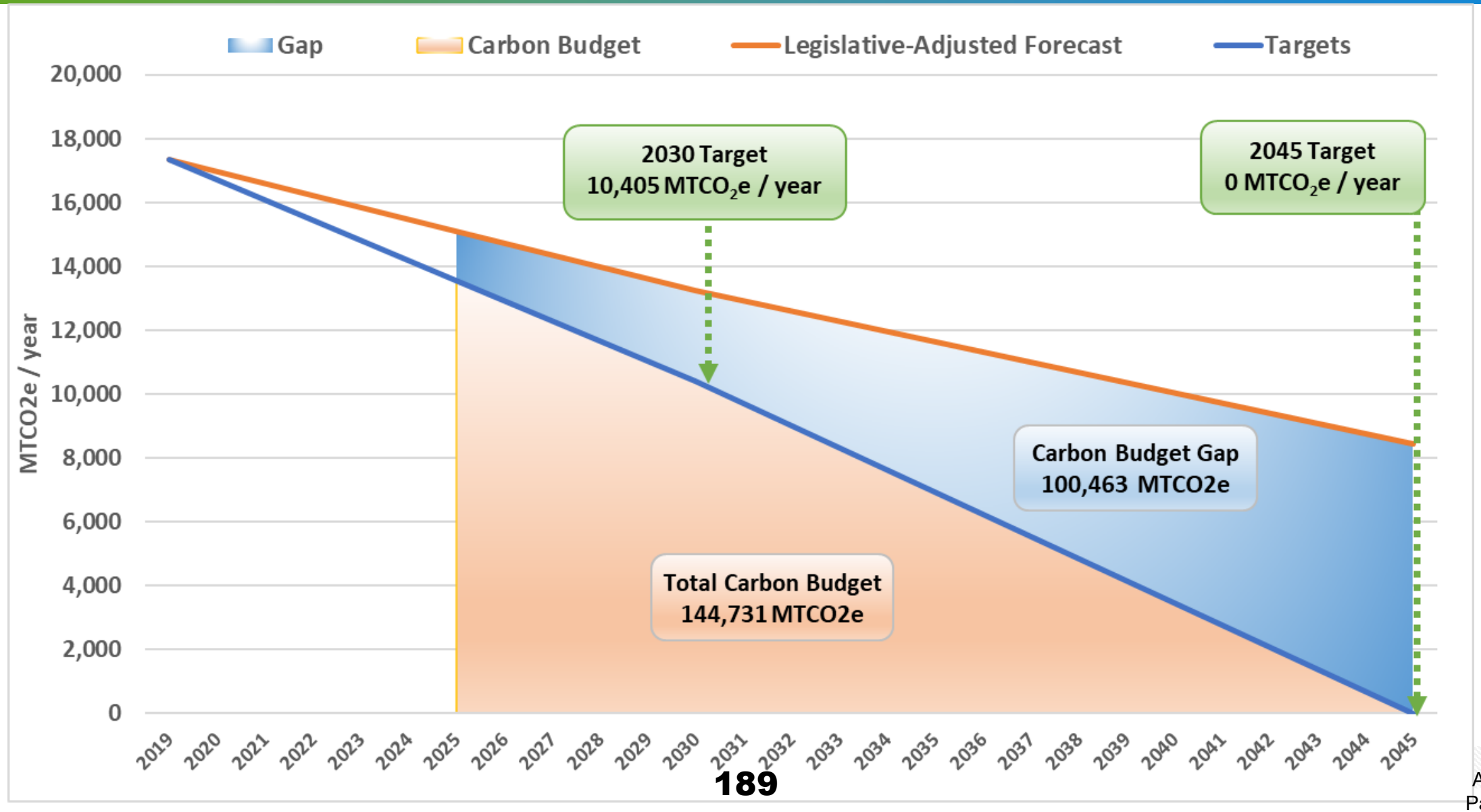
- Continues past trends but accounts for the effect of existing emissions-reducing policies
- Emissions from future projects that commit to net-zero emissions in EIRs not included



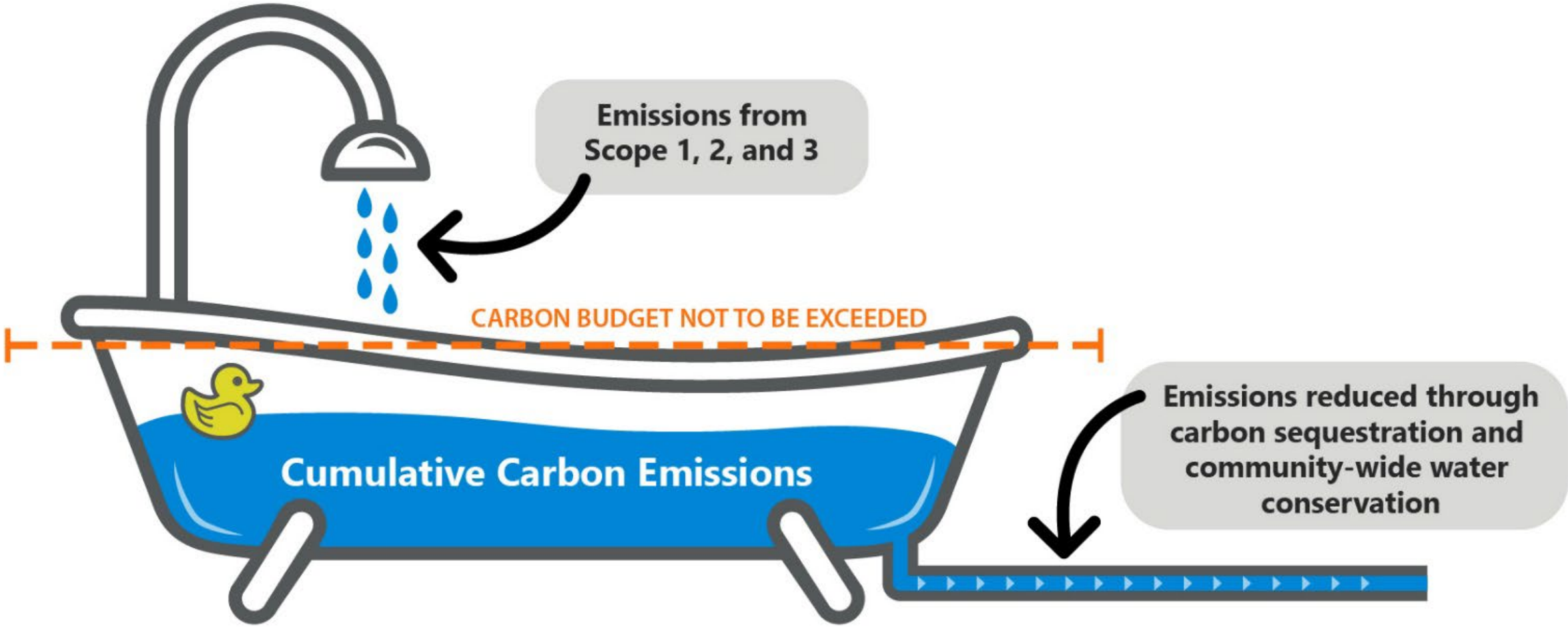
C. Past and Forecast Emissions



C. Emission Target Setting



C. Carbon Budget Concept



C. Construction Emissions Reduction Measures

Measure Name	Measure Description	2025-2030 Cumulative Reduction	2025-2045 Cumulative Reduction
Zero Emission Off-road Equipment (CN-1)	Require the use of zero-emission fuels • 17% by 2030 • 45% by 2045	2,900 MT CO_2e	29,000 MT CO_2e
Zero Emission On-road Vehicles (CN-2)	Require the use of zero-emission fuels • 35% by 2030 • 95% by 2045	300 MT CO_2e	1,200 MT CO_2e

Progress toward these targets will be subject to market availability, operational feasibility, and emerging technologies that meet Valley Water's requirements. This phased approach provides flexibility to adapt to evolving market conditions while advancing sustainability goals.

C. Carbon Sequestration Program

Carbon sequestration: Removal of CO2 from the atmosphere and storage in plants and soils

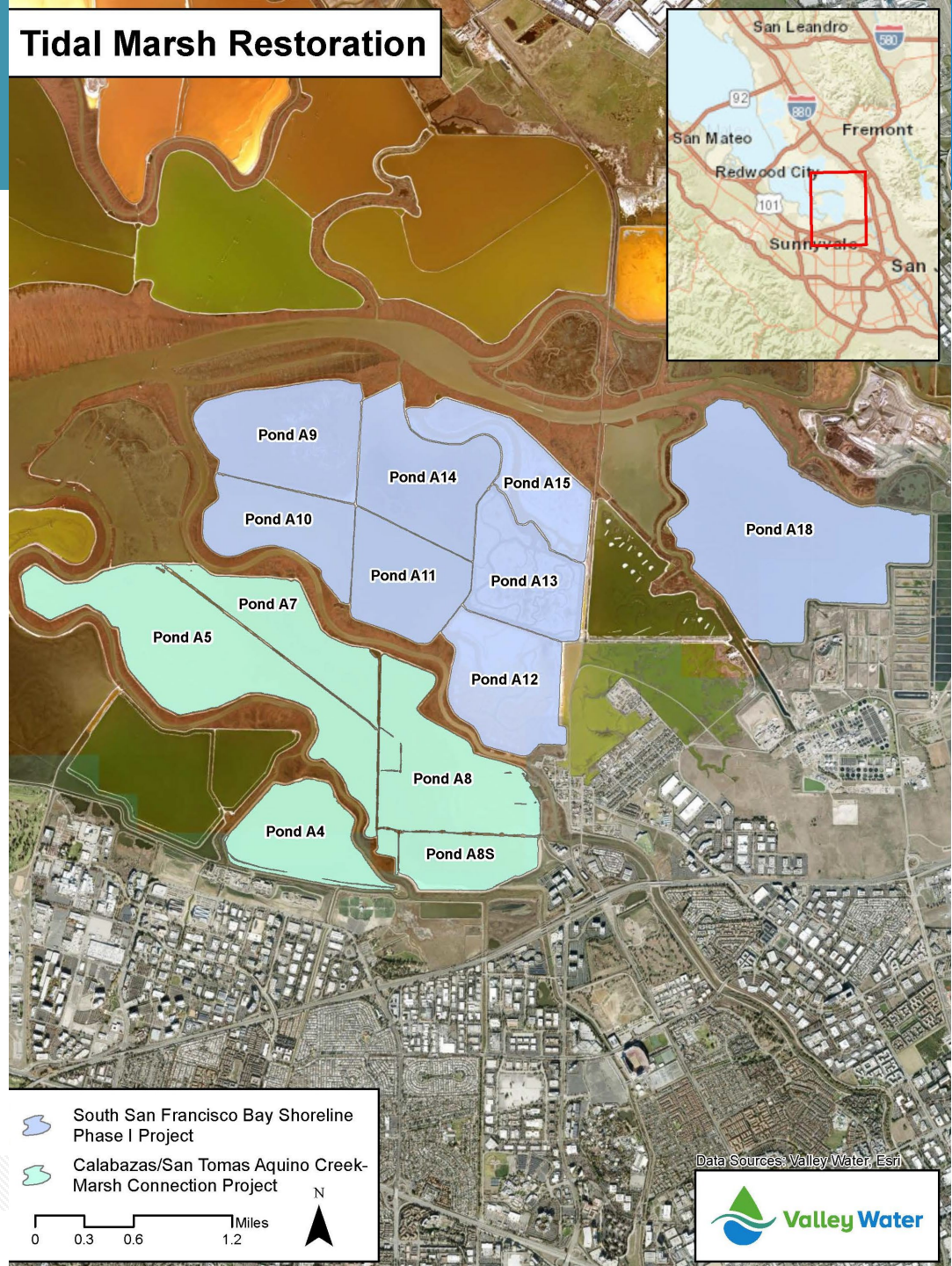
South San Francisco Bay Shoreline Phase I Project

- Restores 2,900 acres of former salt ponds
- Completion in 2025

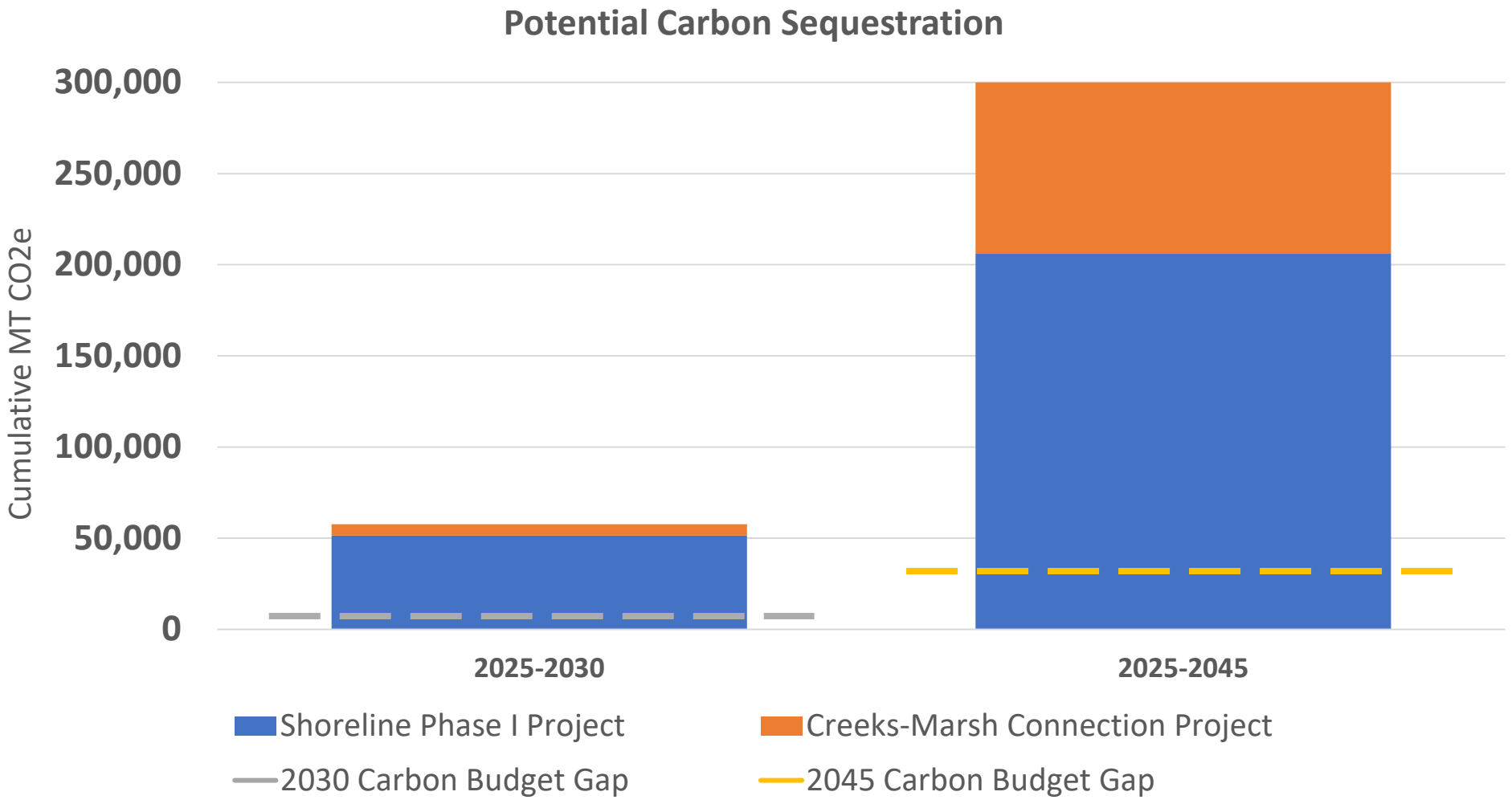
Calabazas/San Tomas Aquino Creeks-Marsh Connection Project

- Restores 1,800 acres of former salt ponds
- Potential implementation by 2028

Other restoration projects will also be considered for Sequestration Program



C. Carbon Sequestration Program



Tidal marsh sequestration:

3.58 MT CO_2e / restored acre / year (Shahan et. al., 2022.)

Percent of planned tidal marsh restoration required to meet carbon budget

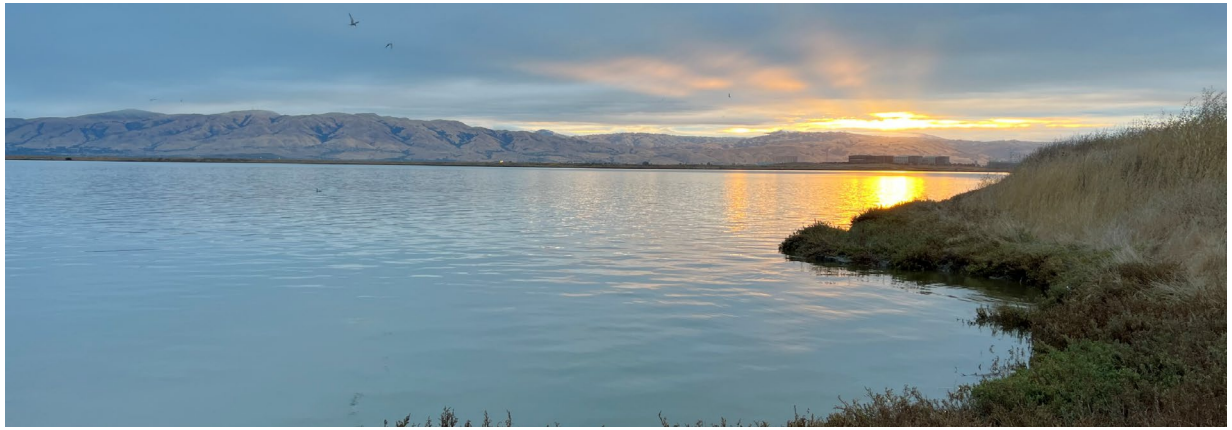
- 6% by 2030
- 11% by 2045

Carbon budget gaps do not include emissions from future projects that commit to net-zero emissions in EIRs

C. Carbon Sequestration Program

Process to Create Sequestration Program

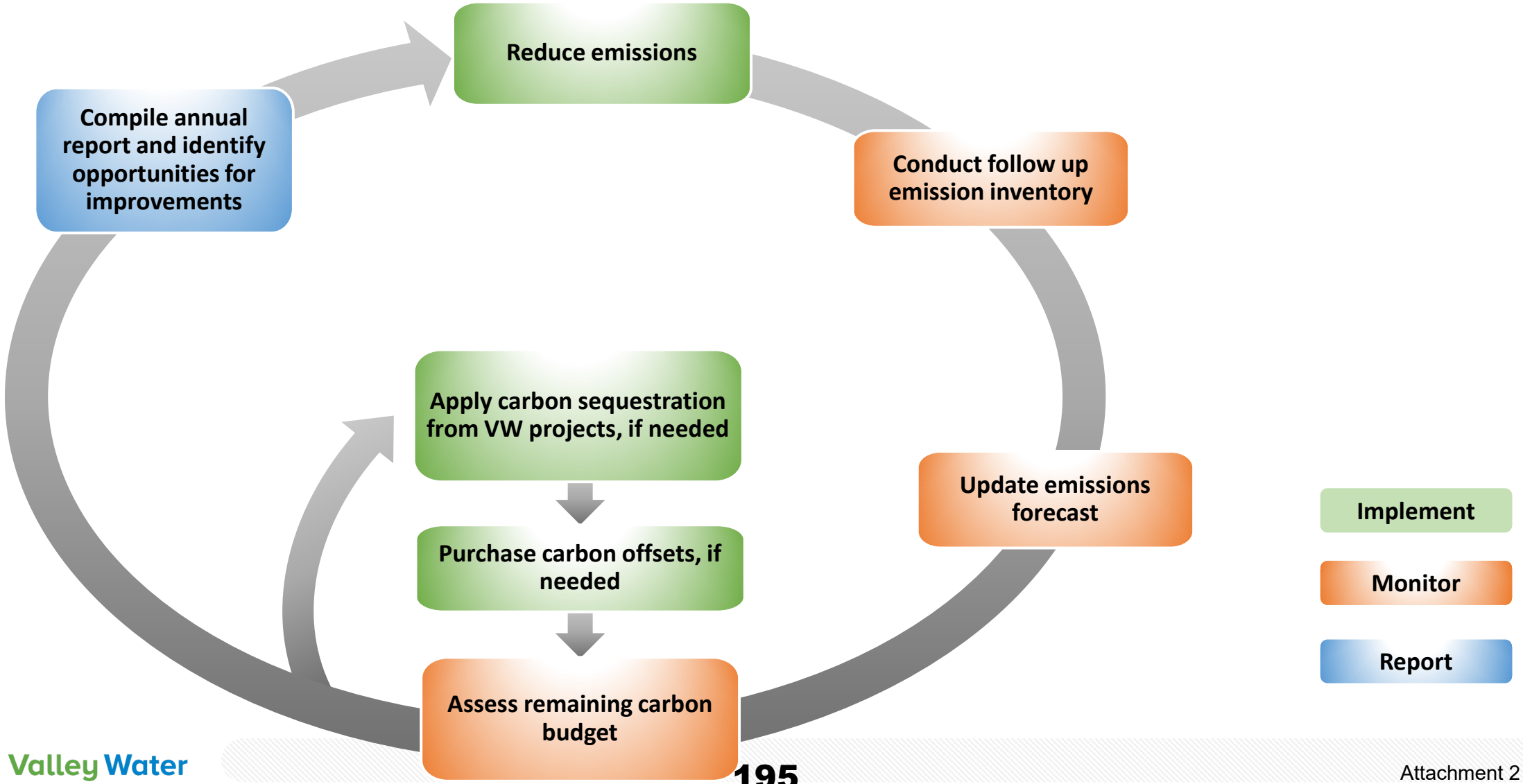
1. Agreements with restoration project partners
2. Estimate baseline sequestration
3. Quantify additional sequestration from restoration
4. Account for net sequestration as emissions reduction
5. Monitor restored tidal marsh



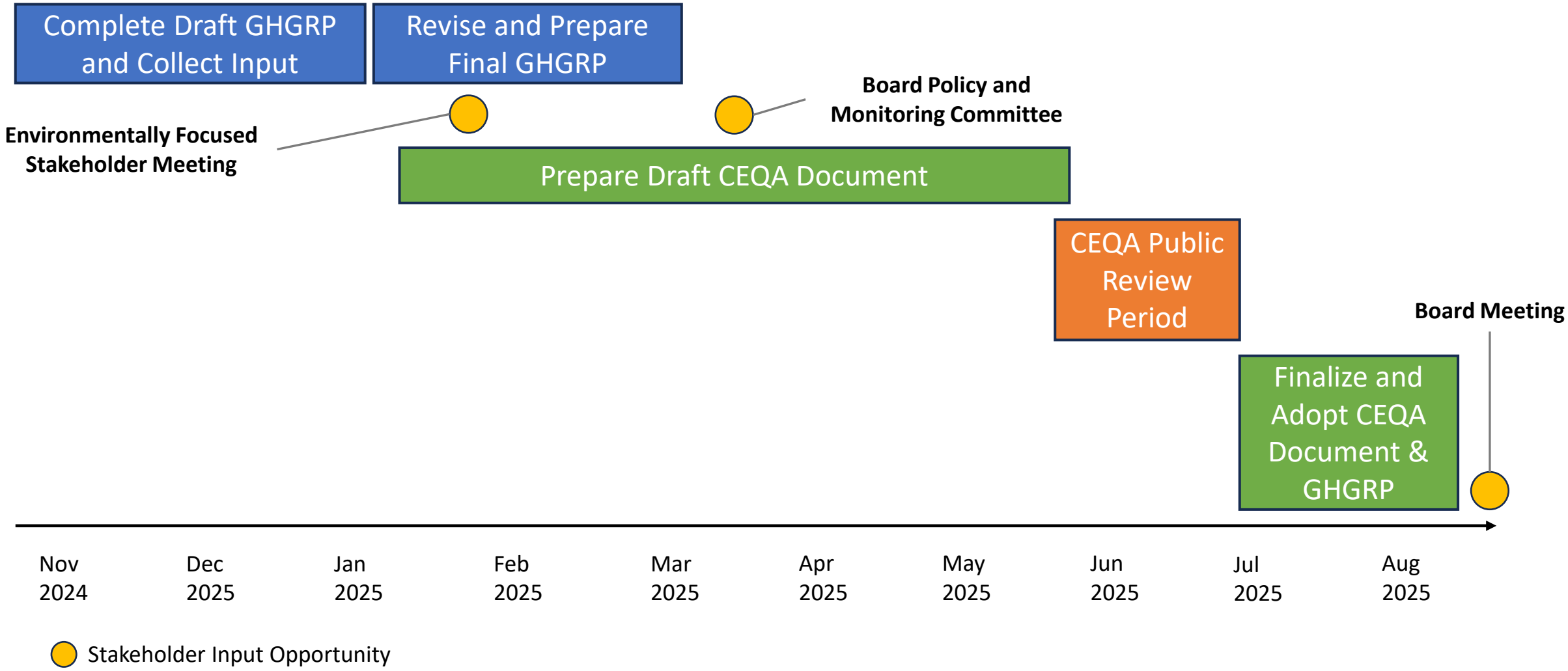
Pond A4 in Sunnyvale, CA

Restored tidal marsh in the South Bay
Courtesy South Bay Salt Pond Restoration Project

C. GHG Emission Reduction Framework



D. Next Steps and Schedule



QUESTIONS

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Santa Clara Valley Water District

File No.: 25-0012

Agenda Date: 1/27/2025
Item No.: 4.3.

COMMITTEE AGENDA MEMORANDUM
Environmental and Water Resources Committee

Government Code § 84308 Applies: Yes ☐ No ☒
(If "YES" Complete Attachment A - Gov. Code § 84308)

SUBJECT:
Review and Approve 2024 Annual Accomplishments Report for Presentation to the Board (Committee Chair).

RECOMMENDATION:

A. Approve the 2024 Accomplishments Report for presentation to the Board; and
B. Provide comments to the Committee Chair to share with the Board as part of the Accomplishments Report presentation pertaining to the purpose, structure, and function of the Committee.

SUMMARY:

The Accomplishments Report summarizes the committee's discussions and actions to prepare Board policy alternatives and implications for Board deliberation throughout 2024. The Committee Chair, or designee, presents the Accomplishments Report to the Board at a future Board meeting.

The Committee may provide feedback to the Committee Chair, at this time, to share with Board as part of the Accomplishments Report presentation pertaining to the purpose, structure, and function of the Committee.

BACKGROUND:

Governance Process Policy-8:
The District Act provides for the creation of advisory boards, committees, or commissions by resolution to serve at the pleasure of the Board.

Accordingly, the Board has established Advisory Committees, which bring respective expertise and community interest, to advise the Board, when requested, in a capacity as defined: prepare Board policy alternatives and provide comment on activities in the implementation of the District's mission for Board consideration. In keeping with the Board's broader focus, Advisory Committees will not direct the implementation of District programs and projects, other than to receive information and

provide comment.

Further, in accordance with Governance Process Policy-3, when requested by the Board, the Advisory Committees may help the Board produce the link between the District and the public through information sharing to the communities they represent.

ATTACHMENTS:
Attachment 1: EWRC 2024 Accomplishments Report

UNCLASSIFIED MANAGER:
Candice Kwok-Smith, 408-630-3193

2024 Accomplishments Report:
Environmental and Water Resources Committee

The annual work plan establishes a framework for committee discussion and action during the annual meeting schedule. The committee work plan is a dynamic document, subject to change as external and internal issues impacting the District occur and are recommended for committee discussion. Subsequently, an annual committee accomplishments report is developed based on the work plan and presented to the District Board of Directors.

ITEM	WORK PLAN ITEM BOARD POLICY	MEETING DATE	ACCOMPLISHMENT DATE AND OUTCOME	
1	**Election of Chair and Vice Chair for 2023.**	January 22	**Accomplished January 22, 2023** The Committee unanimously approved Charles Ice the 2024 Environmental and Water Resources Committee Chair and Arthur Keller as the 2024 Environmental and Water Resources Committee Vice Chair.	
2	**Annual Accomplishments Report.**	January 22	**Accomplished January 22, 2023** The Committee unanimously approved the 2023 Annual Accomplishments Report. *The Board received the Committee's presentation at its March 26, 2024 meeting.*	
3	**Status of Working Groups.**	January 22 April 15 July 15 October 21	**Accomplished January 22, 2024** **Accomplished April 15, 2024** **Accomplished July 15, 2024** **Accomplished October 21, 2024** There were no working group updates.	
4	**Review of Environmental and Water Resources Committee Work Plan, the Outcomes of Board Action of Committee Requests and the Committee's Next Meeting Agenda.**	January 22 April 15 July 15 October 21	**Accomplished January 22, 2024** **Accomplished April 15, 2024** **Accomplished July 15, 2024** **Accomplished October 21, 2024** The Committee received updates and reviewed the 2024 Board-approved Committee work plan and took no action.	

2024 Accomplishments Report:
Environmental and Water Resources Committee

ITEM	WORK PLAN ITEM BOARD POLICY	MEETING DATE	ACCOMPLISHMENT DATE AND OUTCOME
5	**One Water Guadalupe and Upper Pajaro Watershed Plan Priority Actions**	January 22	**Accomplished January 22, 2024** The Committee received the information, took no formal action, and requested that staff report to the Committee with information relating to mine closures, and information regarding collaborations with Monterey County.
6	**Update on the Development of Valley Water's Wildfire Resiliency Plan**	January 22	**Accomplished January 22, 2024** The Committee received update on Valley Water's encampment cleanup operations but could take no action
7	**Valley Water's Water Supply Master Plan 2050**	April 15 October 21	**Accomplished April 15, 2024** The Committee received a presentation on the Master Plan and took no action.
8	**Valley Water Demonstration Garden**	April 15	**Accomplished April 15, 2024** The Committee received a presentation on the Demonstration Garden and took no action.
9	**Direct Potable Reuse (DPR) Regulations and the development of a Potable Reuse project**	July 15	**Accomplished July 15, 2023** The Committee received the information, took no formal action, and requested that staff report to the Committee relating to purified water perception polling.
10	**Valley Water's Habitat Lands Mitigation, Conservation, and Monitoring Efforts**	July 15	**Accomplished July 15, 2024** The Committee received a presentation on mitigation, conservation, and monitoring efforts and took no action.
11	**Receive verbal update on the Anderson Dam seismic retrofit project**	October 21	**Accomplished October 21, 2024** The Committee received information relating to the microtunnel boring machine, pipe installation, lake tap work, and ongoing work inside the tunnel, and took no formal action.

2024 Accomplishments Report:
Environmental and Water Resources Committee

BOARD WORK PLAN GOALS:
1. Integrated Water Resources Management - Goal: Efficiently manage water resources across business areas.
2. Water Supply – Goal: Provide a reliable, safe, and affordable water supply for current and future generations in all communities served.
3. Natural Flood Protection – Goal: Provide natural flood protection to reduce risk and improve health and safety.
4. Environmental Stewardship – Goal: Sustain ecosystem health while managing local water resources for flood protection and water supply.
5. Addressing Encampment of Unsheltered People – Goal: Humanely assist in the permanent relocation of unsheltered people on Valley Water lands along waterways and at water supply and flood risk reduction facilities in order to address the human health, public safety, operational, and environmental challenges posed by encampments.
6. Climate Change – Goal: Mitigate carbon emissions and adapt Valley Water operations to climate change impacts.
7. Business Management – Goal: Promote effective management of water supply, flood protection, and environmental stewardship through responsive and socially responsible business services.

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Santa Clara Valley Water District

File No.: 25-0015

Agenda Date: 1/27/2025
Item No.: 4.4.

COMMITTEE AGENDA MEMORANDUM
Environmental and Water Resources Committee

Government Code § 84308 Applies: Yes ☐ No ☒
(If "YES" Complete Attachment A - Gov. Code § 84308)

SUBJECT:
Review and Receive Updates on the Environmental and Water Resources Committee's Working Groups.

RECOMMENDATION:

A. Review and receive updates on the Environmental and Water Resources Committee's Working Groups, and

B. Provide comments to the Board on implementation of Valley Water's mission applicable to working groups' recommendations.

SUMMARY:
At the Committee's October 2021, meeting, the Committee approved the working groups' structure to align with the issues and policies that the Board of Directors has on their work plan and calendar for the fiscal year.

The Board will continue to keep the Committee informed of the working groups' activities and results.

This will be a standing agenda item.

BACKGROUND:

The District Act provides for the creation of advisory boards, committees, or commissions by resolution to serve at the pleasure of the Board.

Accordingly, the Board has established Board Committees, which bring respective expertise and community interest, to advise the Board, when requested, in a capacity as defined: prepare Board policy alternatives and provide comment on activities in the implementation of the District's mission for Board consideration. In keeping with the Board's broader focus, Board Committees will not direct

the implementation of District programs and projects, other than to receive information and provide comment.

Further, in accordance with Governance Process Policy-3, when requested by the Board, the Board's Committees may help the Board produce the link between the District and the public through information sharing to the communities they represent.

ATTACHMENTS:
Attachment 1: EWRC Working Groups April 2024
Attachment 2: EWRC FINAL Working Group Restructure

UNCLASSIFIED MANAGER:
Candice Kwok-Smith, 408-630-3193

FY 2024-2025 EWRC Working Groups

PLEASE SIGN UP TODAY!

Working Group Number/Title	Member Name	Lead	Total Members
EWRC Oversight Manager: John Bourgeois, jbourgeois@valleywater.org, 1-408-630-2990			
1 INTEGRATED WATER RESOURCES MANAGEMENT:			
Valley Water Staff Liaison: Heidi Williams, heidiwilliams@valleywater.org, 1-408-630-3112	Tess Byler Charles Ice Loren Lewis		3
2 WATER SUPPLY:			
Valley Water Staff Liaison: Jing Wu, jwu@valleywater.org, 1-408-630-2330	Arthur M. Keller, Ph.D. Hon. Patrick S. Kwok Mike Michitaka Jim Piazza		4
3 NATURAL FLOOD PROTECTION:			
Valley Water Staff Liaison: Katie Muller, kmuller@valleywater.org, 1-408-630-2934	Arthur M. Keller, Ph.D. Mike Michitaka Charles Taylor		3
4 ENVIRONMENTAL STEWARDSHIP:			
Valley Water Staff Liaison: John Bourgeois jbourgeois@valleywater.org, 1-408-630-2990	Swanee Edwards Bob Levy Jim Piazza	Bob	3
5 CLIMATE CHANGE:			
Valley Water Staff Liaison: Nick Mascarello, nmascarello@valleywater.org, 1-408-630-3147	Bob Levy Charles Taylor	Bob	2

FY 2024-2025 EWRC Working Groups

PLEASE SIGN UP TODAY!

Working Group Number/Title	Member Name	Lead	Total Members
Lead Member			

SPECIAL NOTES:

See 2021 EWRC Working Group Restructure Guidelines.

Members should limit the number of working groups they participate in because of possible Brown Act Violations (2-3 groups only).

Please Note: You will be sharing your phone number and email address with the other members when signing up for a working group.

When planning meetings, the Group Chair (Lead) should contact Dave Leon via email (daveleon@valleywater.org) and John Bourgeois (jbourgeois@valleywater.org) with meeting date/time and location and how many members are expected to attend.

Environmental and Water Resources Committee

Draft Work Plan Revisions, Working Groups

Originated on August 10, 2021

(Latest revision: October 19, 2021)

The Environmental and Water Resources Committee (EWRC) has a broad mandate that includes all aspects of the Valley Water mission (see attached excerpt from Board Resolution 17-75). However, this broad mandate can at times result in a dilution of purpose. These draft work plan revisions are aimed at focusing the EWRC's efforts in a way that takes better advantage of the resources and experience of a strong and diverse membership, while strengthening the advisory role of the EWRC to the benefit of the Valley Water Board and staff.

The EWRC takes its direction from the Board. Action items as directed by the Board will take top priority in Committee business.

The defined roles of the EWRC are to:

1. Provide input on policy.
2. Provide comment on activities in the implementation of Valley Water's mission.
3. Act as a link between Valley Water and the public.
4. Produce and present an Annual Accomplishments Report.

With these simple guiding principles in mind, to make the committee more directly connected to its stated purpose, we propose the following structure:

Policy and Implementation Input (roles 1 and 2 above)

The formation of 5 Working Groups:

1. **Integrated Water Resources Management** (sample topics: One Water Plan [Integrated Water Resources Master Plan], Flood-MAR [Managed Aquifer Recharge], Green stormwater infrastructure); staff liaison: Senior Water Resources Specialist overseeing One Water (currently Brian Mendenhall)
2. **Water Supply** (sample topics: Anderson Dam Seismic Retrofit project, Purified Water, Pacheco Reservoir Expansion Project); staff liaison: Senior Water Resources Specialist (currently Jing Wu)
3. **Natural Flood Protection** (sample topics: Shoreline Phase 2, Upper Penitencia Creek); staff liaison: Unit Manager (currently Afshin Rouhani)
4. **Environmental Stewardship** (sample topics: FAHCE, habitat connectivity and riparian corridors, fish passage including gravel and LWD); staff liaison: Unit Manger (currently Lisa Porcella)
5. **Climate Change** (sample topics: Climate Change Action Plan [CCAP] Implementation, GHG methodology updates); staff liaison: Senior Water Resources Specialist overseeing CCAP (currently Brian Mendenhall)

Access to the staff liaisons should be used respectfully, with the intent of 1) clarifying questions on specific topics and 2) obtaining access to background information and/or resources being provided to other committees.

Each Working Group will have 4-8 members and will designate a Lead.

Assigned Work: Assigned tasks by the Board will take priority for the EWRC. When input on an issue is desired by the Board, the item will go first to the Working Group (unless time does not permit and the WG feels the item can go straight to the full Committee). The Working Group will then present recommendations to the full committee for action if deemed appropriate.

Proactive Topics: If there are items that the EWRC would like more information on, and they are not an item requested from the Board, we suggest the following process:

- When applicable, EWRC liaison (see below) will attend the relevant Board or Committee where the item is being discussed.
- Discuss the item at the Working Group level to see if there is consensus on whether an item is appropriate to be brought to the entire Committee.
- Bring the item to the full EWRC during the standing agenda item to review the work plan and vote on whether or not to fully agendize the item for discussion at a subsequent meeting. If time is short, the Working Group Lead may bring the item to the Chair and Vice Chair of the EWRC who will consult with staff and may agendize it for the next meeting.
- Questions to consider when voting on an item:
    - Is the item being adequately addressed in another forum (see Standing Items Report for updates)?
    - Will the item, if brought to the EWRC, fall under one of the stated purposes of the Committee?
    - Can the EWRC positively contribute to the item to benefit Valley Water and the community?
    - Is there support from the Board liaisons for spending time on this item?

Board and Committee Liaisons (roles 1 and 2 above)

We recommend that EWRC assign a liaison (plus an alternate) to each Board Committee and that these Committee members briefly report out at each quarterly EWRC (as done under the Working Groups Update, a standing item on the agenda). The Chair will assign at-large appointments, and each Working Group will assign those liaisons for committees designated to that Working Group (see below). Updates will include any items that may be of interest to the EWRC and/or pertinent to the Committee Work Plan.

The Board Committees that we recommend designated liaisons include (with Working Group designation in parenthesis):

- Board Audit Committee (At-Large)
- Board Policy and Planning Committee (At-Large)
- Capital Improvement Program (CIP) Committee (At-Large)
- Diversity and Inclusion Ad Hoc Committee (At-Large)
- Homeless Encampment Committee (Environmental Stewardship)
- Recycled Water Committee (Water Supply)

- Stream Planning and Operations Committee (Environmental Stewardship)
- Water Conservation and Demand Management Committee (Water Supply)
- Water Storage Exploratory Committee (Water Supply)

Roles and responsibilities: The Board Committee liaisons are expected to regularly attend their designated Board Committee meetings, alerting their alternate if they are unable to attend. At those meetings, they will represent EWRC interests, report back to EWRC any items of interest, and elevate recommendations within their Working Groups on any items desired for proactive engagement (see above). The meeting schedule of these committees can be located as part of the regular meeting minutes and ongoing agenda item (Informational Link Reports), as well as at the below links. Typical meeting frequency and duration are listed below but are subject to variances.

https://www.valleywater.org/how-we-operate/committees/board-committees

- Board Policy and Planning Committee (BPPC) (typically 1 meeting per month, 2 hours)
- Stream Planning and Operations Committee (SPOC) (formerly FAHCE Ad Hoc Committee, typically every other month, 2 hours)
- Homeless Encampment Committee (typically every other month, 2 hours)
- Water Storage Exploratory Committee (WSEC) meetings are scheduled as called for by the Committee Chair, but typically 2 hours

https://www.valleywater.org/how-we-operate/committees/board-advisory-committees

- Redistricting Advisory Committee (RAC) this is a special Committee for Redistricting and will be completed by March 2022.
- Water Conservation and Demand Management Committee (WCaDMC) (typically 1 meeting per month, 2 hours)

Stakeholder Engagement (role 3 above)

The EWRC represents a vital cross-section of the Valley Water constituency. We want to emphasize the EWRC's role in being an extension of the larger community. As such, we request that EWRC members perform three vital functions:

1. Communicate relevant Valley Water issues and project updates to your network.
2. Bring to the Committee any environmental and water resources concerns or issues you are hearing in the community.
3. Bring to the Committee any environmental justice concerns or issues you are hearing in the community.

EWRC members have been carefully selected by Board members to represent a broad cross-section of the community. As leaders in the community, the Board values and relies on the EWRC members to assist in two-way communication with stakeholders and residents.

Pertinent excerpts from Board Resolution 17-75 on the functions of advisory committees.

RESOLUTION 17- 75

PROVIDING FOR AND DEFINING THE STRUCTURE AND FUNCTION OF ADVISORY COMMITTEES TO THE SANTA CLARA VALLEY WATER DISTRICT BOARD OF DIRECTORS AND REPEALING RESOLUTION

…

1.2 The Committees are established to assist the Board with policy review and development, provide comment on activities in the implementation of the District's mission for Board consideration, and to identify Board-related issues pertaining to the following:

1.2.2 Environmental and Water Resources Committee: ***water supply***, ***flood protection***, and ***environmental stewardship***.

…

1.3 In accordance with Governance Process Policy-8, the specific duties of the Committees are to:

1.3.1. Provide ***input on policy alternatives*** for Board deliberation.

1.3.2 Provide ***comment on the activities in the implementation*** of the District's mission for Board consideration.

1.3.3 Produce and present to the Board an ***Annual Accomplishments Report*** summarizing the outcomes of the Committee's annual Board-approved work plan.

1.3.4 Further, in accordance with Governance Process Policy-3, when requested by the Board, the Advisory Committees may help the Board produce the ***link between the District and the public*** through information sharing to the communities they represent.

Santa Clara Valley Water District

File No.: 25-0016

Agenda Date: 1/27/2025
Item No.: 4.5.

COMMITTEE AGENDA MEMORANDUM
Environmental and Water Resources Committee

Government Code § 84308 Applies: Yes ☐ No ☒
(If "YES" Complete Attachment A - Gov. Code § 84308)

SUBJECT:
Review Environmental and Water Resources Committee Work Plan, the Outcomes of Board Action of Committee Requests, the Committee's Next Meeting Agenda, and
Recommend the Proposed 2025 EWRC Work Plan to the Board.

RECOMMENDATION:
Review the Committee work plan to guide the committee's discussions regarding policy alternatives and implications for Board deliberation; and recommend the proposed 2025 EWRC Work Plan to the Board.

SUMMARY:
The attached Work Plan outlines the topics for discussion to be able to prepare policy alternatives and implications for Board deliberation. The work plan is agendized at each meeting as accomplishments are updated and to review any work plan assignments by the Board.

BACKGROUND:

Governance Process Policy-8:
The District Act provides for the creation of advisory boards, committees, or commissions by resolution to serve at the pleasure of the Board.

Accordingly, the Board has established Advisory Committees, which bring respective expertise and community interest, to advise the Board, when requested, in a capacity as defined: prepare Board policy alternatives and provide comment on activities in the implementation of the District's mission for Board consideration. In keeping with the Board's broader focus, Advisory Committees will not direct the implementation of District programs and projects, other than to receive information and provide comment.

Further, in accordance with Governance Process Policy-3, when requested by the Board, the

Advisory Committees may help the Board produce the link between the District and the public through information sharing to the communities they represent.

ENVIRONMENTAL JUSTICE IMPACT:
There are no Environmental Justice impacts associated with this item.

ATTACHMENTS:
Attachment 1: EWRC 2024 Work Plan

UNCLASSIFIED MANAGER:
Candice Kwok-Smith, 408-630-3193

2025 Work Plan: Environmental and Water Resources Committee

Updated January 2025

The annual work plan establishes a framework for committee discussion and action during the annual meeting schedule. The committee work plan is a dynamic document, subject to change as external and internal issues impacting the District occur and are recommended for committee discussion. Subsequently, an annual committee accomplishments report is developed based on the work plan and presented to the District Board of Directors.

ITEM	WORK PLAN ITEM BOARD POLICY	MEETING DATE	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
1	**Election of Chair and Vice Chair for 2023**	January 27	•Committee Elects Chair and Vice Chair for 2025. **(Action)**	
2	**Annual Accomplishments Report**	January 27	•Review and approve 2024 Accomplishments Report for presentation to the Board. **(Action)**	
3	**Update Status of Working Groups**	January 27 April 21 July 21 October 20	•Receive updates on the status of the working groups. ***(Action)*** •Submit requests to the Board, as appropriate.	
4	**Review of Environmental and Water Resources Committee Work Plan, the Outcomes of Board Action of Committee Requests and the Committee's Next Meeting Agenda**	April 21 July 21 October 20	•Receive and review the 2025 Board-approved Committee work plan**. (Action)** •Submit requests to the Board, as appropriate.	
5	**Standing Items Report Fiscal Year 2025 Goals and Strategies:**	April 21 July 21 October 20	•Receive quarterly reports on standing items. **(Information)**	

2025 Work Plan: Environmental and Water Resources Committee

Updated January 2025

ITEM	WORK PLAN ITEM BOARD POLICY	MEETING DATE	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
6	**One Water Plan – Lower Peninsula and West Valley Watershed Plans**	April 21	•Receive information on the two draft Watershed Plans. •Provide feedback to staff. **(Action)**	
7	**Water Supply Master Plan Update**	April 21	•Provide feedback on the Water Supply Master Plan 2050 portfolio development and analysis.	
8	**Upper Pajaro Native Ecosystem Enhancement Tool**	July 21	•Receive information on the Upper Pajaro Native Ecosystem Enhancement Tool. •Provide feedback to staff	
9	**Baylands Projects Update**	October 20	Receive an update on the various VW projects occurring along SF Bay.	
10	**Anderson Dam Seismic Retrofit Update**	October 20	Receive an update on the status of the Anderson Dam Seismic Retrofit project.	
11	**Review Fiscal Year 2024-2025 Board Work plan**	October 20	•Review Fiscal Year 2023-2024 Board Work Plan **(Information)**	