

LOS OSOS GROUNDWATER BASIN, BASIN MANAGEMENT COMMITTEE

NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that the Los Osos Groundwater Basin, Basin Management Committee Board of Directors will hold a **Regular Board Meeting at 1:30 P.M. on Wednesday, October 19, 2022** at the **Los Osos Community Services District Boardroom**, located at 2122 9th Street, Suite 106, Los Osos, CA 93402 Members of the public may participate in this meeting in person or via teleconference and/or electronically.

For quick access, go to <https://us04web.zoom.us/j/778762508>

(This link will help connect both your browser and telephone to the call)

If not using a computer, dial 1 (669) 900-6833 or 1 (346) 248-779 and enter **778 762 508**

All persons desiring to speak during any Public Comment can submit a comment by:

- Email at danheimel@ConfluenceES.com by 5:00 PM on the day prior to the Committee meeting.
- Teleconference by phone at 1 (669) 900-6833 and enter **778 762 508**
- Teleconference by phone at 1 (346) 248-7799 and enter **778 762 508**
- Teleconference meeting at <https://us04web.zoom.us/j/778762508>
- Mail by 5:00 PM on the day prior to the Committee meeting to:
Attn: Dan HeimeI (Basin Management Committee)
2122 9th St.
Suite 110
Los Osos, CA 93402

Directors: Agenda items are numbered for identification purposes only and may not necessarily be considered in numerical order.

NOTE: The Basin Management Committee reserves the right to limit each speaker to three (3) minutes per subject or topic. In compliance with the Americans with Disabilities Act, all possible accommodations will be made for individuals with disabilities, so they may participate in the meeting. Persons who require accommodation for any audio, visual or other disability in order to participate in the meeting of the BMC are encouraged to request such accommodation 48 hours in advance of the meeting from Dan HeimeI at danheimel@ConfluenceES.com.

BASIN MANAGEMENT COMMITTEE BOARD OF DIRECTORS AGENDA

1. CALL TO ORDER

2. ROLL CALL

3. PLEDGE OF ALLEGIANCE

4. BOARD MEMBER COMMENTS

Board members may make brief comments, provide project status updates, or communicate with other directors, staff, or the public regarding non-agenda topics.

5. SPECIAL PRESENTATION

None

6. CONSENT AGENDA

The following routine items listed below are scheduled for consideration as a group. Each item is recommended for approval unless noted and may be approved in their entirety by one motion. Any member of the public who wishes to comment on any Consent Agenda item may do so at this time. Consent items generally require no discussion. However, any Director may request that any item be withdrawn from the Consent Agenda and moved to the "Action Items" portion of the Agenda to permit discussion or to change the recommended course of action. The Board may approve the remainder of the Consent Agenda on one motion.

- a. **2022 Budget Update and Invoice Register**
- b. **Approval of Minutes from September 21, 2022 BMC Meeting**

7. PUBLIC COMMENTS ON ITEMS NOT APPEARING ON THE AGENDA

The Basin Management Committee will consider public comments on items not appearing on the agenda and within the subject matter jurisdiction of the Basin Management Committee. The Basin Management Committee cannot enter into a detailed discussion or take any action on any items presented during public comments at this time. Such items may only be referred to the Executive Director or other staff for administrative action or scheduled on a subsequent agenda for discussion. Persons wishing to speak on specific agenda items should do so at the time specified for those items. The presiding Chair shall limit public comments to three minutes.

8. EXECUTIVE DIRECTOR'S REPORT

9. ACTION ITEMS

- a. **Calendar Year 2023 Sustainable Yield Estimate**

Recommendation: Receive information on the Sustainable Yield calculations and approve the proposed Sustainable Yield estimate of 2,380 AFY for Calendar Year 2023; or provide alternate direction to staff.

- b. **Phase 2 Lower Aquifer Nitrate Investigation**

Recommendation: Approve funding for Cleath-Harris Geologists to perform additional Nitrate Source Investigation; or provide alternate direction to staff.

- c. **Funding & Organization Study Follow-Up**

Recommendation: Receive requested follow-up information on cost, timing and decision points for establishing a more formal governance and funding structure for the BMC.

- d. **Draft Calendar Year 2023 Budget and Water Recycling Funding Program Facilities Planning Study Grant**

Recommendation: Receive information on potential items for BMC Calendar Year (CY) 2023 Budget and provide direction to staff for how to proceed with the CY 2023 Budget and the Water Recycling Funding Program Facilities Planning Study Grant.

10. ADJOURNMENT

TO: Los Osos Basin Management Committee

FROM: Daniel Heimel, Executive Director

DATE: October 19, 2022

SUBJECT: Item 6a & b – Approval of Budget Update/Invoice Register and Meeting Minutes

Recommendations

Staff recommends that the BMC review and consider approval of Budget/Invoice Register and Meetings Minutes or provide alternate direction to Staff.

Discussion

BMC Staff has prepared a summary of costs incurred as compared to the adopted budget and a running invoice register for Calendar Year 2022 and Meeting Minutes from previous BMC Meetings (see Attachments).

Attachment 2: Invoice Register for Los Osos BMC for Calendar Year 2022

Vendor	Invoice No.	Amount	Month of Service	Description	Budget Item	Date Executive Director Approved	Date BMC Chairperson Approved	Date BMC Approved
CHG	20211203	\$6,490.00	Dec-21	Annual Report Preparations	6	Jan-22		
CHG	20211204	\$2,534.40	Dec-21	Groundwater Monitoring	5	Jan-22		
CHG	20211205	\$5,076.40	Dec-21	Rating Curve Development	11	Jan-22		
ConfluenceES	1011	\$5,100.00	Jan-22	BMC Executive Director Services	1		Feb-22	
CHG	20220103	\$20,495.00	Jan-22	Annual Report Preparations	6	Mar-22		
CHG	20220104	\$1,319.40	Jan-22	Groundwater Monitoring	5	Mar-22		
CHG	20220105	\$2,327.00	Jan-22	Rating Curve Development	11	Mar-22		
CHG	20220204	\$15,400.00	Feb-22	Annual Report Preparations	6	Mar-22		
CHG	20220205	\$320.00	Feb-22	Technical Support - Data Request Response	4			Apr-22
ConfluenceES	1018	\$5,700.00	Feb-22	BMC Executive Director Services	1		Mar-22	
CHG	20220303	\$10,740.00	Mar-22	Annual Report Preparations	6	Apr-22		
CHG	20220304	\$1,740.00	Mar-22	Groundwater Monitoring	5	Apr-22		
CHG	20220305	\$1,440.00	Mar-22	Technical Support - Monitoring Well Invest.	4			May-22
ConfluenceES	1026	\$4,050.00	Mar-22	BMC Executive Director Services	1		Apr-22	
CHG	20220405	\$2,545.00	Apr-22	Annual Report Preparations	6	May-22		
CHG	20220406	\$11,370.00	Apr-22	Groundwater Monitoring	5	May-22		
ConfluenceES	1031	\$7,450.00	Apr-22	BMC Executive Director Services	1		May-22	
CHG	20220501	\$3,200.00	May-22	Technical Support - Program C Evaluation	4	Jun-22		
CHG	20220503	\$2,772.00	May-22	Groundwater Monitoring	5	Jun-22		
CHG	20220502	\$1,600.00	May-22	Annual Report Preparations	6			Jun-22
ConfluenceES	1037	\$8,493.75	May-22	BMC Executive Director Services	1		Jun-22	
CHG	20220610	\$1,280.00	Jun-22	Technical Support - Monitoring Well Invest.	4			Jul-22
CHG	20220611	\$640.00	Jun-22	Annual Report Preparations	6			Jul-22
ConfluenceES	1043	\$5,837.50	Jun-22	BMC Executive Director Services	1		Jul-22	
CHG	20220705	\$1,510.00	Jul-22	Technical Support - Monitoring Well Invest.	4			Sep-22
ConfluenceES	1046	\$6,250.00	Jul-22	BMC Executive Director Services	1		Aug-22	
CHG	20220805	\$1,597.50	Aug-22	Technical Support - ITRC Coordination, LA6	4			Sep-22
ConfluenceES	1050	\$3,900.00	Aug-22	BMC Executive Director Services	1		Sep-22	
CHG	20220905	\$5,128.00	Sep-22	Groundwater Monitoring	5	Sep-22		
	2022 Total	\$146,305.95						To be approved

BASIN MANAGEMENT COMMITTEE BOARD OF DIRECTORS

Agenda Item 6b: Minutes of the Meeting of September 21, 2022

The following is a summary of the actions taken at the Basin Management Committee Board of Directors Meeting.
The official record for the meeting is the recording that can be found at:

<https://slo-span.org/static/meetings-LOBMC.php>

Agenda Item	Discussion or Action
1. Call to Order	Chair Ochylski called the meeting to order at approximately 1:30 PM.
2. Roll Call	Daniel Heimel, Executive Director, called roll to begin the meeting. Director Gibson, Director Zimmer, Chair Ochylski
3. Pledge of Allegiance	
4. Board Member Comments	None
5. Special Presentation	None
9a. S&T Mutual Water Company BMC Director Change	<p>Recommendation: Receive letter from S&T Mutual Water Company regarding change in BMC Director and Alternate Director positions.</p> <p>Public Comment (7:43) None</p> <p>Board Direction Welcome Beth Reineke as the BMC Director representing S&T Mutual Water Company</p>
6. Consent Agenda 6a. 2022 Budget Update and Invoice Register 6b. Approval of Minutes from July 28, 2022 BMC Meeting	<p>Public Comment (8:53) Patrick McGibney Linde Owen</p> <p>Board Action 6a and 6b (13:17) Approve Consent Agenda Motion: Director Gibson Second: Director Zimmer Ayes: Director Reineke, Director Gibson, Director Zimmer, Chair Ochylski Nays: None Abstain: None Absent: None</p>
7. Public Comments on Items Not Appearing on the Agenda	<p>Public Comment (14:37) Jeff Edwards Patrick McGibney Becky McFarland Linde Owen Emily Miggins Ronny Giron</p>
8. Executive Director's Report	<p>Public Comment (47:35) Jeff Edwards Patrick McGibney Becky McFarland Terry Simons Linde Owen</p>

9. Action Items	
9b. Recommendation for selection of RWG Law to provide Contract Legal Counsel Services for the BMC	<p>Recommendation: Receive recommendation and approve the selection of RWG Law to provide Contract Legal Counsel Services for the BMC or provide alternate direction to staff.</p> <p>Public Comment (1:14:57) Jeff Edwards Terry Simons Linde Owen Becky McFarland</p> <p>Board Action (1:29:22) Approve selection of RWG Law to provide Contract Legal Counsel Services for the BMC. Motion: Director Gibson Second: Director Zimmer Ayes: Director Reineke, Director Zimmer, Director Gibson, Chair Ochylski Nays: None Abstain: None Absent: None</p>
9c. BMC CY 2022 Budget Re-Allocation Recommendations	<p>Recommendation: Receive recommendations to modify current budget allocations and contingencies to alternate tasks to leverage ability to utilize anticipated unused CY 2022 BMC Budget funds or provide alternate direction to staff.</p> <p>Public Comment: (1:38:20) Terry Simons Linde Owen</p> <p>Board Action (1:59:52) Direct staff to utilize anticipated unused CY 2022 BMC Budget funds to the following tasks: Ferrell Well (LA13) Modifications and Los Osos Basin Well Database. Motion: Director Gibson Second: Chair Ochylski Ayes: Director Reineke, Director Gibson, Chair Ochylski Nays: Director Zimmer Abstain: None Absent: None</p>
10. Adjournment	Meeting adjourned at approximately 3:40 pm. The next regularly scheduled meeting is Wednesday, October 19 th , 2022, at 1:30 PM.

TO: Los Osos Basin Management Committee

FROM: Dan Heimerl, Executive Director

DATE: October 19, 2022

SUBJECT: Item 8 – Executive Director’s Report

Recommendations

Staff recommends that the Committee receive and file the report and provide staff with any direction for future discussions. Sections of the Executive Director’s Report that have been updated or significantly changed from the previous meeting’s version are underlined.

Discussion

This report was prepared to summarize administrative matters not covered in other agenda items and to provide a general update on staff activities.

Presentations

10/14/2022 – The Executive Director provide a presentation to the Regional Water Quality Control Board to provide an update on the condition of the Los Osos Basin.

Funding and Financing Programs to Support Basin Plan Implementation

SGM Implementation Grant: Applications for Round 2 of the Sustainable Groundwater Management (SGM) Implementation Grant are anticipated to be due in October 2022. This grant program is administered by the California Department of Water Resources (DWR) to provide funding for projects that encourage sustainable management of groundwater resources that support Sustainable Groundwater Management Act (SGMA) and/or invest in groundwater recharge projects for surface water, stormwater, recycled water, and other conjunctive use projects. Round 1 funding was provided to Critically Overdrafted (COD) Basins and final awards were recently announced. Round 2 solicitation is anticipated in September 2022. Eligible applicants for this funding include Groundwater Sustainability Agencies or agencies within adjudicated basins that were adjudicated after January 1, 2015. However, applicants must also be located in Medium, High and COD basins. The Los Osos Basin is currently prioritized as Very Low priority as a result of conditions being met under sub-component C of the Draft SGMA 2019 Basin Prioritizations (i.e. non-adjudicated pumping is less than 9,500 acre-feet per year).

Prop 1 GWGP: The Prop 1 GWGP Round 3 solicitation was released on July 6th, 2021 with Concept Proposals due September 7th, 2021. However, as indicated in the January 2018 BMC meeting, the State Board confirmed that seawater intrusion mitigation projects under Program C are eligible for low interest loans but are not currently eligible for grants under the Proposition 1 Groundwater Grant

Program (GWGP). New wells in the upper and lower aquifer are viewed as aquifer management, not aquifer clean-up as defined by the State, therefore we will need to look for future funding rounds and other opportunities. Aquifer clean-up projects (e.g. Community Nitrate Facility, Upper Aquifer Capture and Treatment) could be considered for pursuing grant funding through this program. Unfortunately, this is the 3rd and last round for this Program and they are only looking to fund implementation projects (i.e. projects that have design, CEQA and other planning components completed and are ready for construction), not planning projects.

IRWM: The Program A upper aquifer well at 8th Street was submitted by Los Osos CSD to the local IRWM process in 2019 as part of the Round 1, Prop 1 Implementation Grant cycle and was subsequently selected to be a part of the application for the current funding opportunity. The application for this grant was submitted in December 2019 and the Project was included in the Department of Water Resource's July 2020 Final Funding Award List for the full grant request (\$238,000). Prop 1, Round 2 Implementation grant cycle has been initiated and the Call for Projects opened on April 7th, 2022 and closed April 28th, 2022. The BMC did not submit any projects as it was determined that there were not projects that were sufficiently far enough along to be competitive for this grant opportunity.

Prop 1 SWGP: The concept of urban storm water recovery at 8th and El Moro was ranked in the County Stormwater Resource Plan. The Project is labeled as "Capture and Reuse of Storm Water" and listed as a Los Osos Community Services District project. The Stormwater Resource Plan can be found here: <https://www.slocounty.ca.gov/Departments/Public-Works/Committees-Programs/Stormwater-Resource-Plan.aspx>. The Project is additionally described in the following locations:

- It is **described** here in our SWRP Appendix 4B under "Capture and Reuse of Storm Water" at 9th and El Morro: <https://www.slocounty.ca.gov/Departments/Public-Works/Forms-Documents/Committees-Programs/Stormwater-Resource-Plan/Documents/SWRP-Appendix-4-B-Identified-Project-and-Program-D.pdf>
- It is **ranked** here on our SWRP website on the **SWRP Project List** link under "Capture and Reuse of Storm Water": <https://www.slocounty.ca.gov/Departments/Public-Works/Forms-Documents/Committees-Programs/Stormwater-Resource-Plan/Documents/SWRP-Program-Master-Project-Info-2020-04-16.pdf>
- It is also on the **IRWM Project list** under "Capture and Reuse of Storm Water": [https://www.slocounty.ca.gov/Departments/Public-Works/Forms-Documents/Committees-Programs/Integrated-Regional-Water-Management-\(IRWM\)/Current-IRWM-Full-Project-List_20220322.pdf](https://www.slocounty.ca.gov/Departments/Public-Works/Forms-Documents/Committees-Programs/Integrated-Regional-Water-Management-(IRWM)/Current-IRWM-Full-Project-List_20220322.pdf)

Grant funding may be available through the Prop 1 Storm Water Grant Program (SWGP). However, the application period for Round 2 of SWGP funding has closed. Information about the Storm Water Grant Program can be found here:

https://www.waterboards.ca.gov/water_issues/programs/grants_loans/swgp/prop1/

WRFP: The State Water Resource Control Board (SWRCB) increased the amount for Water Recycled Program Planning (WRFP) grants from \$75k to \$150k. This could provide a grant funding opportunity to advance Basin Plan initiatives, with a reduced cost to the community of Los Osos, through preparation of a Recycled Water Facilities Planning Study (RWFPS). Potential scope items for the RWFPS could include:

- Transient Groundwater Model Development
- Soil Aquifer Treatment (SAT) Assessment
- Broderson/Creek Discharge Scenario Analysis
- Stormwater and Perched Water Recovery Project – Feasibility Study
- Adaptive Management Groundwater Modeling
- RWFPS Report Development

Recent communication with the SWRCB Representatives confirmed that this funding program is still fully funded and WRFP grants are available. On 2/11/2022 the Los Osos Community Services District (Los Osos CSD) submitted an application for a WRFP grant to develop a transient model and analyze recycled water and supplemental water projects to improve the sustainability of the Los Osos Basin (WRFP Study) and is still waiting for notification. At its May 5th, 2022 Meeting the Los Osos CSD approved the RFP for the WRFP Study and is waiting on approval of the grant before releasing it. The LOCSO was recently contacted by the SWRCB representatives asking if they would like to resubmit their application for a larger grant amount. The SWRCB is increasing the grant award amount from \$150k to \$250k. Accessing this additional grant funding would provide the BMC with an opportunity to improve the quality of the model and further analyze recycled water and other supplemental water supply opportunities. LOCSO and BMC Staff are recommending that the BMC modify its grant application to request additional grant funding and this is further discussed in item Agenda Item 9d of this Agenda Packet.

Status of BMC Initiatives

Sustainable Yield: At its October 27th, 2021 Meeting, the BMC unanimously approved a Sustainable Yield estimate of 2,380 AFY for Calendar Year 2022 and these actions will be documented in the 2021 Annual Report. Prior to the beginning of Calendar Year 2023, the BMC is tasked with establishing a Sustainable Yield estimate for 2023. BMC Staff is recommending that the BMC retain the current Sustainable Yield estimate of 2,380 AFY for CY 2023 for the following reasons: 1) No new infrastructure, not already considered in the 2022 Sustainable Yield Estimate, has been constructed; 2) estimates for the development of the Broderson Mound and long-term average rainfall were updated and incorporated into the CY 2022 Sustainable Yield Estimate and are not anticipated to change significantly on a year-over-year basis; 3) no significant hydrogeologic investigations have been conducted that would warrant an update to the steady-state groundwater model utilized to develop the Sustainable Yield Estimate. Additional information on the methodology and assumptions utilized to calculate the CY 2022 Sustainable Yield Estimate can be found in the October 27th, 2021 BMC Meeting Agenda Packet. Recommendations regarding the CY 2023 Sustainable Yield Estimate are included in Agenda Item 9a of this Agenda Packet.

Lower Aquifer Transducer Installation: In March, Cleath-Harris Geologists (CHG) initiated requests for permission to access and install transducers in several County monitoring wells, a private well, and a purveyor well. The purveyor well (LA 9) was equipped with a transducer. Due to the uncertainty in accessing County wells, two additional purveyor monitoring wells (LA 40 and LA41) were equipped with transducers. Permission was subsequently received to access County wells, and four County monitoring wells have been equipped with transducers (LA11, LA14, LA16, and LA19). This completes the planned transducer expansion program, with 7 added units.

Basin Metric Evaluation: Analysis of potential modifications to the Basin Metric's is currently on hold. Proposed modifications to the metrics were provided to BMC Party Staff for review. However, BMC Party Staff requested that potential improvements to the existing BMC Monitoring Program (i.e. modifications to an existing wells or a new monitoring well) be evaluated prior to modifying the Basin Metrics. Recommendations regarding potential improvements to the Basin Monitoring Network will be brought to the BMC at a future meeting, followed by potential modifications to the Basin Metrics.

Transient Groundwater Model: At its October 27th, 2021 Meeting, the BMC authorized the preparation of a Water Recycling Funding Program Grant Application and to request access to the \$150,000 of funding that the County budgeted for a transient groundwater model for Los Osos. The Los Osos CSD will be the lead agency for the grant on behalf of the BMC. The grant application was submitted to the SWRCB by Los Osos CSD on 2/11/2022 for \$150k in grant funds and the County approved providing \$150k to the Los Osos CSD for a Transient Model for the Los Osos Basin. After receiving approval from the SWRCB, the Los Osos CSD will solicit proposals from consulting firms through an RFP process to procure the necessary services to develop the model and complete the WRF Study. See update under WRF Grant above.

Wellhead Survey: At its October 27th, 2021 Meeting, the BMC authorized Twin Cities Surveying to survey additional wells in Los Osos Basin and for BMC Staff to request that the County survey the wells in their monitoring program. Both Twin Cities Surveying and the County completed their wellhead surveys in November and December. BMC monitoring network wellhead elevations are now up to date.

Lower Aquifer Monitoring Evaluation: At its October 27th, 2021 Meeting, the BMC authorized CHG to evaluate the feasibility and cost of modifying existing wells or construction a new monitoring well(s) to improve monitoring of Zone E water quality. BMC Party Staff evaluated the potential to fund a new monitoring well in 2022, but there is not sufficient budget. BMC Party Staff will target including a new monitoring well in the Calendar Year 2023 Budget. At the September 21st, 2022 BMC Meeting the BMC authorized funding modifications to LA 13 to improve its ability to monitor seawater intrusion in Zone E and that work will be completed by then end of the year.

Program C Adaptive Management: At its April 20th, 2022 Meeting, the BMC approved CHG to evaluate the re-inclusion of the 3rd Well into Program C. Additional detail regarding the history of the 3rd Program C Well is available in the April 20th, 2022 BMC Agenda Packet. CHG is currently evaluating the anticipated increase in the Sustainable Yield that the 2nd and 3rd Program C Wells would provide utilizing the criteria

for calculating the Sustainable Yield approved by the BMC at their October 27th, 2021 Meeting. Results from this evaluation will be presented to BMC Party Staff and then to the BMC at a future meeting.

Status of Basin Plan Implementation and Funding Plans

The BMC has requested an integrated funding plan for project implementation and BMC monitoring and administration. BMC Staff and BMC Party Staff have formed a Funding and Organizational Working Group to identify and evaluate potential future funding and organization structures for the BMC and implementation of the Basin Plan. Consistent with the Basin Plan, the Working Group is identifying and evaluating funding and organizational structures that will provide a long-term mechanism for funding BMC Administration and Basin Plan Implementation costs and that allocate costs equitably amongst all who benefit from the Basin’s water resources.

The Working Group reviewed previously completed analysis on BMC funding and organization structures, documenting the different alternatives and identifying data/information gaps that may require outside technical support. At its October 27th, 2021 Meeting, the BMC approved a proposal from SCI Consulting Group to provide an updated funding options analysis and assessment evaluation. SCI has prepared a draft Technical Memorandum (TM), that includes their evaluation of funding alternatives and findings from the funding model. The draft TM was shared with the BMC at the July 27, 2022 Meeting and the BMC requested that Staff return with additional information on the BMC’s options for moving forward. BMC Staff worked with SCI to develop a Work Plan and Budget to assist the BMC in understanding the key decision points, timeline and costs for establishing a more formal organizational and funding structure and that information is included in Agenda Item 9c of this Agenda Packet.

JPA Formation: Staff level discussions continue to focus on the need for, and benefits of, forming a JPA, see table below, to assist with implementation of the Basin Plan.

Table 1. JPA Formation Considerations

Pros	Cons
• Common ownership of basin assets	• Complexity and community perception
• Ability to contract for services as an entity	• Potential for difficulty in formal proceedings - less nimble
• GSWC can participate as a director	• More difficult to exit/change if needed
• Could cover entire limits of basin for funding	
• If carefully done, incremental costs could be limited to insurance and up-front legal expenses	
• Ability to carry-over funds from one budget year to another	

As indicated in previous meetings, it was determined that GSWC could serve as an appointed JPA director without forming a separate Mutual Water Company entity, which would simplify the process.

Discussions with BMC Party Staff indicate that the BMC Parties would like to execute the Implementation Plan initiative to first develop a roadmap for the BMC and then evaluate the potential formation of a JPA or other governance structure once there is a more defined plan for future BMC initiatives.

BMC Legal Counsel – At the December 15, 2021 BMC Meeting, the BMC included in the authorization of the Calendar Year 2022 Budget \$20,000 for Legal Counsel Contingency to be included in Executive Director’s Budget. The BMC additionally authorized the Executive Director to utilize up to \$5,000 before requiring BMC approval and for the Executive Director to provide updates on legal counsel spending in the Executive Director’s Report. A Request for Qualifications (RFQ) was approved by the BMC at its April 20th, 2022 Meeting and subsequently released to solicit legal counsel representation for the BMC. BMC Staff received seven Statements of Qualifications (SOQs) and BMC Party Staff interviewed four legal firms. At the September 21st, 2022 BMC Meeting the BMC approved selection of RWG Law to provide contract legal services for the BMC.

Program B Implementation Process and Funding: The existing nitrate removal facility owned by GSWC is intended to serve existing development, so it is likely that a Program B facility intended for future development would be jointly owned by either a JPA or by one of the public agencies.

- Likely next steps for the implementation of Program B projects include:
 - Technical Studies to validate and update cost estimates
 - Siting Studies to identify project locations
 - AB 1600 analysis to evaluate funding options relative to future development in coordination with the Los Osos Community Plan
 - Environmental Review (CEQA)
 - Land Use Permitting (e.g. Coastal Development Permits, etc.)

Land Use Planning Process Update

Guide to Planning Information for Development in Los Osos:

This website is intended to provide planning information outlining what type of development is currently allowed within <https://www.slocounty.ca.gov/Departments/Planning-Building/Grid-Items/Community-Engagement/Communities-Villages/Los-Osos.aspx>.

Topics covered include but are not limited to:

- Which types of permit applications are currently being accepted for processing
- Status of the building moratorium and waitlist for undeveloped parcels in the sewer service area (still in place)
- Status of the Communitywide Habitat Conservation Plan

Los Osos Retrofit-to-Build Program (Title 19 Water Offset Requirement) Update:

Maddaus Water Management Inc. is preparing a study to update water usage estimates for urban and rural residences sourcing water from the Los Osos Groundwater Basin, propose new water conservation measures for the retrofit-to-build program, and estimate remaining water savings potential for the community. They are currently processing data and working with County Planning staff on the first deliverable. Scheduling updates will be posted at:

<https://www.slocounty.ca.gov/Departments/Planning-Building/Grid-Items/Community-Engagement/Active-Planning-Projects/Los-Osos-Water-Offset-Study.aspx#:~:text=Los%20Osos%20Water%20Offset%20Study%20The%20County%20has,is%20anticipated%20to%20be%20completed%20in%20March%202022.>

Los Osos Community Plan:

The Los Osos Community Plan is being reviewed by the California Coastal Commission and a hearing date has not yet been scheduled. In the meantime, the County is meeting with BMC staff to discuss potential policy changes considering ongoing basin monitoring and Basin Plan program implementation efforts. On December 15, 2020, the County Board of Supervisors adopted the Los Osos Community Plan ("LOCP") update and Final Environmental Impact Report ("FEIR"). The LOCP policies are still subject to change based on California Coastal Commission review. The LOCP and FEIR considered by the Board on December 15 are available at: <https://www.slocounty.ca.gov/LosOsosPlan-1.aspx>.

Background

The Board authorized preparation of this update on December 11, 2012. A series of community outreach meetings to unveil the Community Plan were conducted in the Spring of 2015. The plan was prepared to be consistent and coordinated with the draft groundwater basin management plan and the draft Habitat Conservation Plan ("HCP"). The draft Environmental Impact Report was released on September 12, 2019; comments were due December 11, 2019. A Community Meeting on the Draft Environmental Impact Report for the LOCP, HCP, and associated Environmental Documents was held on October 28, 2019. The Final Environmental Impact Report and Public Hearing Draft were released on June 8, 2020. The Planning Commission held hearings on July 9, 2020, August 13, 2020, and October 8,

2020. At the October 8, 2020 hearing, the Planning Commission recommended approval of the Plan to the Board of Supervisors.

Coastal Zone Accessory Dwelling Unit (ADU) Ordinance:

On May 17, 2022, the County Board of Supervisors continued to a date certain the hearing to consider accepting the California Coastal Commission’s suggested modifications to the Coastal ADU Ordinance, including not allowing ADUs within the Los Osos Groundwater Basin boundary and/or within the Los Osos Groundwater Basin Plan Area. At the August 9, 2022 hearing date, County Staff requested that the hearing for the Ordinance be continued and that request was approved. Coastal Commission’s suggested modifications approved at their February 11, 2022 meeting are available at:

<https://www.coastal.ca.gov/meetings/agenda/#/2022/2> (Agenda Item # 16a).

Los Osos Vacation Rental Ordinance:

On June 7, 2022, the County Board of Supervisors held a hearing and adopted a resolution to accept the California Coastal Commission’s suggested modifications to the Los Osos Vacation Rental Ordinance. On July 14, 2022 the Coastal Commission certified the Los Osos Vacation Rental Ordinance, as part of the Local Coastal Plan.

The Los Osos Vacation Rental Ordinance includes a standard to encourage reducing water usage: “A minimum of one water conservation sign shall be posted in each restroom and kitchen of the dwelling. Water conservation signs shall encourage occupants to reduce water usage by stating (a) the importance of conserving water in Los Osos and (b) ways in which occupants can reduce the amount of water used during the stay. Water conservation signs shall be created and posted utilizing County approved language.” Coastal’s suggested modifications approved at their February 11, 2022 meeting are available at: <https://www.coastal.ca.gov/meetings/agenda/#/2022/2> (Agenda Item # 16b).

Los Osos Wastewater Project Flow and Connection Update

The following table summarizes flows from the LOWRF based on the available data. Past flows have been revised. The plant has a complicated method of calculating effluent flows, which has been confusing and they are in the process of correcting.

LOWRF Wastewater and Recycled Water Flows

Year	Month	Influent	Broderson	Bayridge	Sea Pines	Giacomazzi	Construction Water	Ag Users	Discharge/ Recycled Water Delivery Total (AF)
2022	Jan	45	46	1.2	1.3	0.0	0.0	0.0	48
2022	Feb	41	34	1.3	5.8	0.0	0.0	0.1	41
2022	Mar	45	32	1.5	4.0	0.0	0.0	0.2	38
2022	Apr	43	38	1.4	4.7	0.0	0.0	0.2	44
2022	May	45	29	1.7	9.1	0.0	0.0	0.3	40
2022	Jun	43	27	1.6	11	0.0	0.3	0.3	40
2022	Jul	44	41	1.6	10.8	0.0	0.0	0.4	45
2022	Aug	45	39	1.8	7.8	0.0	0.0	0.4	42
2022	Sept	43	35	1.6	4	0.0	0.0	0.3	45
2022	Oct								
2022	Nov								
2022	Dec								
Total									

Enforcement: A list of properties that were not connected were transferred to County Code Enforcement and Notice of Violations were issued last year in Feb. 2019. That list was about 70 properties. As of 5/12/2021, the sewer service area has a 99.4% connection status with a total of 36 properties not yet connected. Of those, one is not required to connect because there is no structure (demolished), 18 have expired building permits, and the rest have an open Code Enforcement case.

The County has assigned staff in code enforcement to Los Osos. Expired permits did not receive a Code Enforcement case because those properties have their own noticing process through the Building Department which, if not corrected, could result in a Notice of Violation.

Recycled Water Connections: The County approved \$350,000 in funding from the American Rescue Plan Act of 2021 for connecting new users to the LOWRF Recycled Water System. Additional funding was approved for improvements at the LOWRF and the Broderson Leach field.

Water Conservation Update

Rebate Update: Average indoor water usage for 2019 was estimated to be 40 gpd per person and remains at that number currently.

The Sustainable Groundwater Management Act (SGMA)

SGMA Overview: SGMA took effect on January 1, 2015.¹ SGMA provides new authorities to local agencies with water supply, water management or land use responsibilities and requires various actions be taken in order to achieve sustainable groundwater management in high and medium priority groundwater basins. Los Osos Valley Groundwater Basin (Los Osos Basin) was subject to SGMA based on the 2014 Basin Prioritization by the California Department of Water Resources (DWR) that listed the Los Osos Basin as high priority and in critical conditions of overdraft.²

Basin Prioritization: On December 18, 2019, DWR released the SGMA 2019 Basin Prioritizations. Basins or subbasins reassess to low or very low priority basins or subbasins are not subject to SGMA regulations. A summary of DWR's Final SGMA Prioritizations for the Los Osos Area Subbasin and Warden Creek Subbasin are listed below:

- Los Osos Area Subbasin is listed as **very low** priority for SGMA³ and in critical conditions of overdraft⁴
- SGMA does not apply to the portions of Los Osos Basin that are adjudicated provided that certain requirements are met (Water Code §10720.8).
- Warden Creek Subbasin is listed as **very low** priority for SGMA³

For more information on DWR's basin boundary modification and prioritization process, please visit: <https://water.ca.gov/Programs/Groundwater-Management/Basin-Prioritization>

Additional Attachments:

1. Updated Status of Basin Plan Programs

¹ On September 16, 2014, Governor Jerry Brown signed into law a three-bill legislative package, composed of [AB 1739 \(Dickinson\)](#), [SB 1168 \(Pavley\)](#), and [SB 1319 \(Pavley\)](#), collectively known as SGMA

² SGMA mandates that all groundwater basins identified by DWR as high- or medium-priority by January 31, 2015, must have groundwater sustainability agencies established by June 30, 2017. The act also requires that all high- and medium-priority basins classified as being subject to critical conditions of overdraft in Bulletin 118, as of January 1, 2017, be covered by groundwater sustainability plans, or their equivalent, by January 31, 2020. Groundwater sustainability plans, or their equivalent, must be established for all other high- and medium-priority basins by January 31, 2022.

³ As noted by DWR, the priority for the subbasin has been set to very low (0 total priority points) as a result of conditions being met under sub-component C of the Draft SGMA 2019 Basin Prioritizations.

⁴ Critical conditions of overdraft have been identified in 21 groundwater basins as described in Bulletin 118 (Water Code Section 12924). Bulletin 118 (updates 2003) defines a groundwater basin subject to condition of critical overdraft as: "A basin is subject to critical conditions of overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts."

Update on Status of Basin Plan Infrastructure Projects

Program Name	Project Name	Parties Involved	BMC Budgeted Amount	Funding Status	Anticipated Planning/Pre-Construction Cost	Anticipated Capital Cost	Status/Notes
Program A – Shift groundwater production from Lower Aquifer to Upper Aquifer	Water Systems Interconnection	LOCS D/GSWC	NA	NA	NA	NA	Completed
	Upper Aquifer Well (8 th Street)	LOCS D	NA	Fully Funded	NA	\$307,000	<u>The 8th St. Upper Aquifer Well equipping is complete and the well has received permit approval from the Division of Drinking Water.</u>
	South Bay Well Nitrate Removal	LOCS D	NA	NA	NA	NA	Completed
	Palisades Well Modifications	LOCS D	NA	NA	NA	NA	Completed
	Blending Project (Skyline Well)	GSWC	NA	NA	NA	NA	Completed
	Water Meters	S&T	NA	NA	NA	NA	Completed
Program B - Shift groundwater production from Lower Aquifer to Upper Aquifer	LOCS D Wells (Upper Aquifer)	LOCS D		Not Funded	TBD	BMP: \$2.7 mil	Project not initiated
	GSWC Wells (Upper Aquifer)	GSWC		Not Funded	TBD	BMP: \$3.2 mil	Project not initiated
	Community Nitrate Removal Facility	LOCS D/GSWC/S&T	TBD	Partial, GSWC portion funded	TBD	GSWC: \$1.23 mil	GSWC’s Program A Blending Project might be capable of expanding to be the first phase of the Program B Community Nitrate Removal Facility.
Program C - Shift production within the Lower Aquifer from the Western Area to the Central Area of the Basin	Expansion Well No. 1 (Los Olivos)	GSWC	NA	NA	NA	NA	Completed
	Expansion Well No. 2 (Lower Aquifer)	LOCS D		LOCS D	TBD	BMP: \$2.5 mil	<u>The well construction and development activities are complete and the contractor will be demobilizing the week of October 17th, 2022. A contract for the pipeline design phase has been awarded and design is anticipated to be completed by December 2022. Completion of all phases of the project is estimated to be June 2024.</u>
	Expansion Well 3 (Lower Aquifer) and LOVR Water Main Upgrade	GSWC/LOCS D		Cooperative Funding	TBD	BMP: \$1.6 mil	This project has been deferred under Adaptive Management.
	LOVR Water Main Upgrade	GSWC		May be deferred	TBD	BMP: \$1.53 mil	Project may not be required, depending on the pumping capacity of the drilled Program C wells. It may be deferred to Program D.
	S&T/GSWC Interconnection	S&T/GSWC		Pending	TBD	BMP: \$30,000	Currently on hold pending further evaluation of the project.

Program Name	Project Name	Parties Involved	BMC Budgeted Amount	Funding Status	Anticipated Planning/Pre-Construction Cost	Anticipated Capital Cost	Status/Notes
Program D - Shift production within the Lower Aquifer from the Western Area to the Eastern Area of the Basin							Currently being considered for deferment through Adaptative Management. BMC to review on an annual or semi-annual basis.
Program M – Groundwater Monitoring Plan	New Zone D/E lower aquifer monitoring well in Cuesta by the Sea	All Parties	NA	NA	NA	NA	Completed
Program U - Urban Water Reinvestment Program	Creek Discharge Program	All Parties				TBD	These activities are currently on hold.
	8 th and El Moro Urban Storm Water Recovery Project	All Parties				TBD	These activities are currently on hold.

TO: Los Osos Basin Management Committee

FROM: Dan Heimel, Executive Director

DATE: October 19, 2022

SUBJECT: Item 9a – Calendar Year 2023 Sustainable Yield Estimate

Recommendations

Receive information on the Sustainable Yield calculations and approve the proposed Sustainable Yield estimate of 2,380 AFY for Calendar Year 2023; or provide alternate direction to staff.

Discussion

Background

In the Stipulated Judgement (SJ) and the Basin Plan, the BMC Parties agreed on a framework and methodology for estimating and updating the Sustainable Yield for the Los Osos Basin (Basin), referred to as Sustainable Yield_x, where “X” represents the Sustainable Yield estimate for that year. The SJ and Basin Plan require the BMC to annually evaluate, confirm and set the Sustainable Yield_x based on the best available data and evidence.

On October 27th, 2021 the BMC established a Sustainable Yield Estimate for CY 2022 of 2,380 AFY for the Los Osos Basin. This estimate was based on updated criteria for calculating the Sustainable Yield Estimate, which is outlined below:

1. **Seawater Intrusion Threshold** - Utilizing the Adaptive Method for limiting the extent of seawater intrusion does not allow seawater to intrude farther inland during the calculation of the Sustainable Yield for the Basin. This approach establishes that further degradation of the Basin is an undesirable affect and basin pumping should be managed to, at a minimum, not further degrade the basin and with the goal (Basin Yield Metric 80 pumping target) of reversing seawater intrusion and pushing the seawater intrusion front back toward the Bay.
2. **Broderson Mound** - Sustainable Yield calculations should be performed based on the actual estimates of the development of the Broderson Mound. Based on the best available information that we have, it is estimated that the Broderson Mound is approximately 50% developed and incorporating this assumption into the Sustainable Yield calculation helps identify the amount of pumping that can be sustainably achieved under current conditions.
3. **Available Infrastructure** – The calculation of Sustainable Yield Estimate should account for currently available infrastructure and infrastructure that is anticipated to be available for the majority of the upcoming year.
4. **Precipitation** – BMC Staff reviewed the rainfall assumptions in the Sustainable Yield calculation and recommends utilizing 17.3 inches per year as the long-term average rainfall for the basin.

This recommendation is based on an evaluation of two different datasets using the latest available rainfall data for the basin. Additional information on the rainfall evaluation is provided in Item 8b of the 9/29/2021 BMC Agenda Packet.

Additional information on the methodology and assumptions utilized to calculate the CY 2022 Sustainable Yield Estimate can be found in Agenda Item 9a of the October 27th, 2021 BMC Meeting Agenda Packet (attached).

Calendar Year 2023 Sustainable Yield Estimate

Prior to the beginning of Calendar Year 2023, the BMC is tasked with establishing a Sustainable Yield estimate for 2023. For Calendar Year 2023 BMC Staff is recommending that the BMC retain the current Sustainable Yield estimate of 2,380 AFY for 2022 for CY 2023 for the following reasons: 1) No new infrastructure, not already considered in the 2022 Sustainable Yield Estimate, has been constructed; 2) estimates for the development of the Broderson Mound and long-term average rainfall were updated and incorporated into the CY 2022 Sustainable Yield Estimate and are not anticipated to change significantly on a year-over-year basis; 3) no significant hydrogeologic investigations have been conducted that would warrant an update to the steady-state groundwater model utilized to develop the Sustainable Yield Estimate.

Attachments

Agenda Item 9a – October 27th, 2021 BMC Meeting

TO: Los Osos Basin Management Committee

FROM: Dan Heimel, Executive Director

DATE: October 27, 2021

SUBJECT: Item 8a – Sustainable Yield_x Methodology Review and Recommendations

Recommendations

BMC Staff recommends that the BMC: 1) receive information on the updated Sustainable Yield_x calculations and approve the proposed Sustainable Yield estimate of 2,380 AFY for Calendar Year 2022 based on the findings provided below; or 2) provide alternate direction to staff.

BMC Staff proposes establishing the Sustainable Yield estimate for Calendar Year 2022 (Sustainable Yield₂₀₂₂) as 2,380 AFY, based on the following justification:

1. Seawater Intrusion Threshold - Utilizing the Adaptive Method for limiting the extent of seawater intrusion does not allow seawater to intrude farther inland during the calculation of the Sustainable Yield for the Basin. This approach establishes that further degradation of the Basin is an undesirable affect and basin pumping should be managed to, at a minimum, not further degrade the basin and with the goal (Basin Yield Metric 80 pumping target) of reversing seawater intrusion and pushing the seawater intrusion front back toward the Bay.
2. Broderson Mound - Sustainable Yield calculations for 2022 should be performed using the assumption that the Broderson Mound is only 50% developed. Based on the best available information that we have, it is estimated that the Broderson Mound is approximately 50% developed and incorporating this assumption into the Sustainable Yield calculation helps identify the amount of pumping that can be sustainably achieved under anticipated conditions in 2022.
3. Available Infrastructure – The calculation of Sustainable Yield₂₀₂₂ accounts for currently available infrastructure and infrastructure that is anticipated to be available for the majority of 2022.
4. Precipitation – BMC Staff reviewed the rainfall assumptions in the Sustainable Yield calculation and recommends utilizing 17.3 inches per year as the long-term average rainfall for the basin. This recommendation is based on an evaluation of two different datasets using the latest available rainfall data for the basin. Additional information on the rainfall evaluation is provided in Item 8b of the 9/29/2021 BMC Agenda Packet.

Discussion

Background

In the Stipulated Judgement (SJ) and the Basin Plan, the BMC Parties agreed on a framework and methodology for estimating and updating the Sustainable Yield for the Los Osos Basin (Basin), referred

to as Sustainable Yield_x, where “X” represents the Sustainable Yield estimate for that year. The SJ and Basin Plan require the BMC to annually evaluate, confirm and set the Sustainable Yield_x based on the best available data and evidence. At the July 21, 2021 BMC Meeting, the BMC directed staff to review the Sustainable Yield estimate and to bring back recommendations for how to calculate the Sustainable Yield_x. At the September 29th BMC Meeting, the BMC directed staff to calculate Sustainable Yield₂₀₂₂ estimates using the Historic Method threshold for seawater intrusion—which allows seawater to intrude farther inland before stabilizing—and proposed Adaptive Method threshold for seawater intrusion—which limits seawater intrusion in the Sustainable Yield calculations to current extents—and provide them to the BMC for consideration. Additional information on the seawater intrusion threshold criteria and other key assumptions in the Sustainable Yield calculations are provided in Item 8b of the 9/29/2021 BMC Agenda Packet.

Based on the direction provide by the BMC, BMC Staff developed updated Sustainable Yield calculations, which are described below. During the development of the updated Sustainable Yield calculations, BMC Staff identified a methodology that allows for a more accurate representation of the development of the Broderson Mound, a critical component of the Basin Plan strategy for stopping and pushing back seawater intrusion in the basin. To help illustrate the impact that the Broderson Mound has on the Sustainable Yield estimate, multiple scenarios were run that represent a Broderson Mound that is 50% (current estimated level of development), 75% and 100% developed. The table below provides a summary of the Sustainable Yield scenarios and the Sustainable Yield estimates and Basin Yield Metric values associated with each scenario.

Table 1. Sustainable Yield Scenario Summary

Scenario	Seawater Intrusion Front ¹	Rainfall ²	Broderson Mound	Available Infrastructure ³	Sustainable Yield (AFY)	Basin Yield Metric ⁴
1	Historic Method	17.3 inches per year	100% Developed	2022 Infrastructure	2,650	0.76
2	Adaptive Method	17.3 inches per year	100% Developed	2022 Infrastructure	2,510	0.80
3	Adaptive Method	17.3 inches per year	75% Developed	2022 Infrastructure	2,450	0.82
4	Adaptive Method	17.3 inches per year	50% Developed	2022 Infrastructure	2,380	0.84

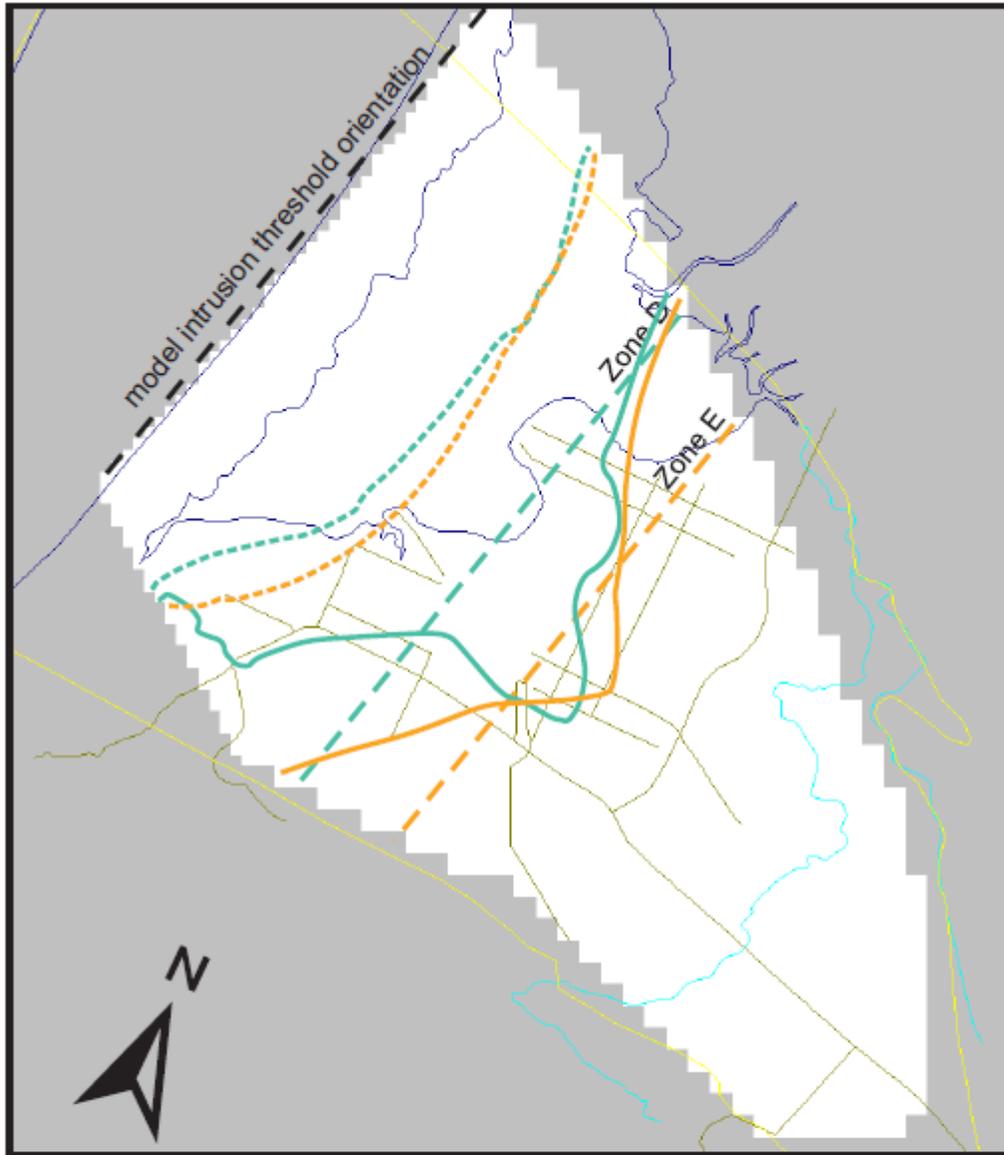
¹Historic Method allows seawater to intrude farther inland before stabilizing. Adaptive Method restricts the intrusion of seawater in the basin to current extents for purposes of calculating the Sustainable Yield

²Rainfall assumption based an updated evaluation of rainfall for the Los Osos Basin, additional information is provided in Item 8b of the 9/29/2021 BMC Agenda Packet.

³Available infrastructure represents the infrastructure anticipated to be available in Calendar Year 2022 (e.g. the Los Osos Community Services District’s 8th Street Upper Well is assumed to be available in 2022 as it is anticipated to be online in Q1 2022).

⁴Basin Yield Metric calculated using basin production estimate of 2,010 AFY (2020 Annual Monitoring Report)

Additionally provided are figures that illustrate the modeled location of the seawater intrusion front under the various scenarios. Figure 1 illustrates the estimated location of the seawater intrusion front, using the Historic Method threshold for seawater intrusion (i.e. allowing seawater to intrude farther inland than current extents) for Zones D and E, as well as the anticipate location of the seawater intrusion front if pumping within the Basin was limited to 80% of the Sustainable Yield estimate (i.e. BYM 80). It should be noted that when pumping is limited to 80% of the Sustainable Yield the model predicts the seawater intrusion front will be pushed back toward the Bay.



Scale 1" = 4000 feet

- Zone D 250 mg/L isochlor
- Intrusion Front Threshold
 - BYM100 (2,650 AFY)
 - ... BYM80 (2,120 AFY)
- Zone E 250 mg/L isochlor
- Intrusion Front Threshold
 - BYM100 (2,650 AFY)
 - ... BYM80 (2,120 AFY)

Figure 1

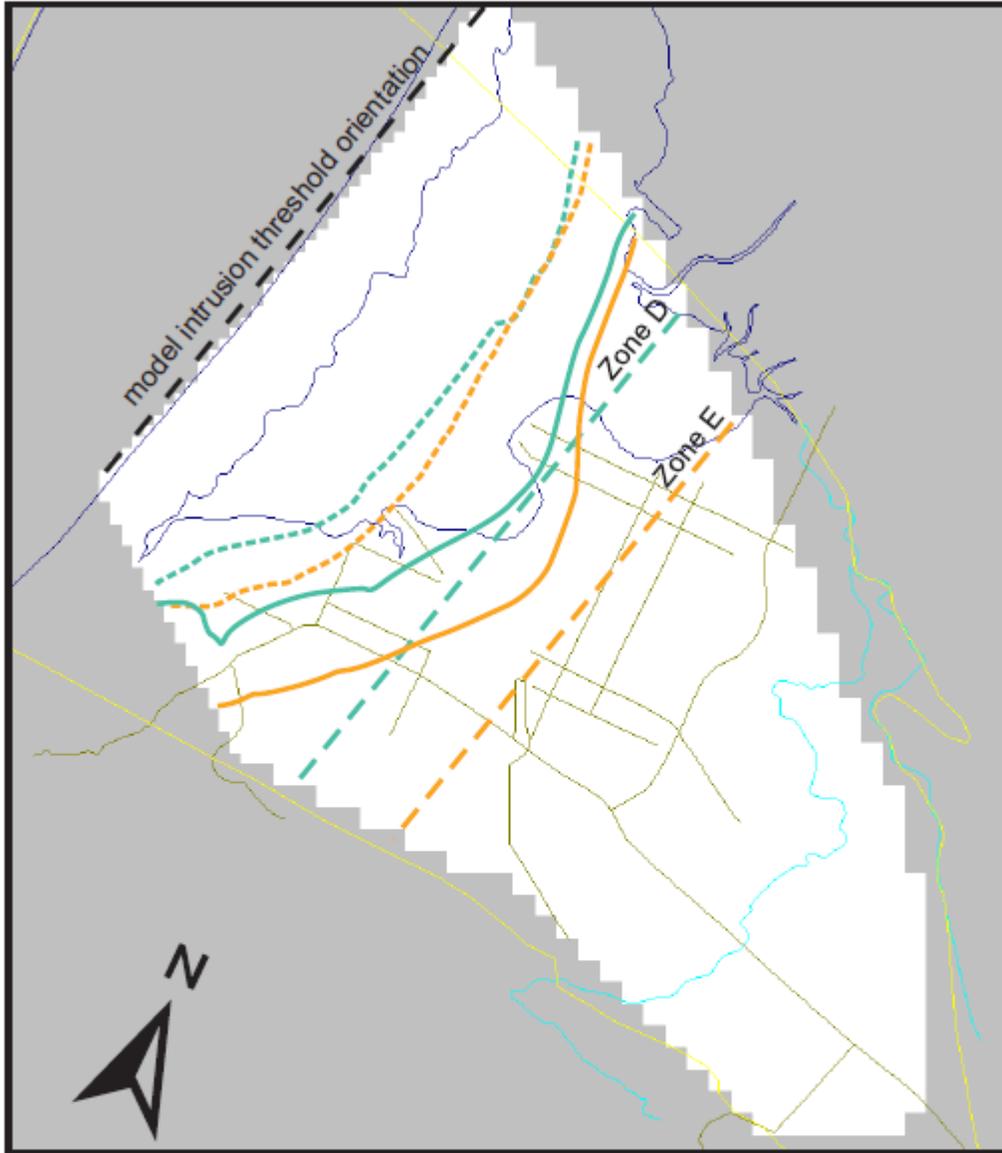
Seawater Intrusion
2022 Sustainable Yield
Historical Method
Broderson 100%

Cleath-Harris Geologists

Figure 1. Historic Method Sustainable Yield Calculation (100% Broderson Mound development)

Figure 2 illustrates the estimated location of the seawater intrusion front, using the Adaptive Method threshold for seawater intrusion (i.e. limiting intrusion to current extents) for Zones D and E, as well as

the anticipate location of the seawater intrusion front if pumping within the Basin was limited to 80% of the Sustainable Yield estimate (i.e. BYM 80).



Scale 1" = 4000 feet

- Zone D 250 mg/L isochlor
- — — — — Intrusion Front Threshold
 - — — — — BYM100 (2,380 AFY)
 - · · · · BYM80 (1,904 AFY)
- Zone E 250 mg/L isochlor
- — — — — Intrusion Front Threshold
 - — — — — BYM100 (2,380 AFY)
 - · · · · BYM80 (1,904 AFY)

Figure 2

Seawater Intrusion
2022 Sustainable Yield
Adaptive Method
Broderson 50%

Cleath-Harris Geologists

Figure 2. Adaptive Method Sustainable Yield Calculation (50% Broderson Mound development)

Based on review of these results and extensive discussion with BMC Party Staff, BMC Staff recommends that the BMC establish the Sustainable Yield for the year 2022 (Sustainable Yield₂₀₂₂) as 2,380 AFY (Scenario 4), based on the following reasons:

1. Seawater Intrusion Threshold - Utilizing the Adaptive Method for limiting the extent of seawater intrusion does not allow seawater to intrude further inland during the calculation of the Sustainable Yield for the Basin. This approach establishes that further degradation of the Basin is an undesirable affect and basin pumping should be managed to at a minimum not further degrade the basin and with the goal (Basin Yield Metric 80 pumping target) of reversing seawater intrusion and pushing the seawater intrusion front back toward the Bay.
2. Broderson Mound - Sustainable Yield calculations for 2022 should be performed using the assumption that the Broderson Mound is only 50% developed. Based on the best available information that we have, it is estimated that the Broderson Mound is approximately 50% developed and incorporating this assumption into the Sustainable Yield calculation helps identify the amount of pumping that can be sustainably achieved under anticipated conditions in 2022.
3. Available Infrastructure – The calculation of Sustainable Yield₂₀₂₂ accounts for currently available infrastructure and infrastructure that is anticipated to be available for the majority of 2022.
4. Precipitation – BMC Staff reviewed the rainfall assumptions in the Sustainable Yield calculation and recommends utilizing 17.3 inches per year as the long-term average rainfall for the basin. This recommendation is based on an evaluation of two different datasets using the latest available rainfall data for the basin. Additional information on the rainfall evaluation is provided in Item 8b of the 9/29/2021 BMC Agenda Packet.

Proposed Sustainable Yield Update Process

To meet the requirements of the SJ to determine the Sustainable Yield_x on an annual basis the following process is proposed for updating the Sustainable Yield.

1. Beginning in July of a given year, BMC Staff will evaluate the Sustainable Yield_x for the upcoming year based on changes in Basin Plan infrastructure, groundwater inflow or outflow parameters, the understanding of hydrogeologic or geologic features in the basin or other factors.
2. BMC Staff will then provide a recommendation to the BMC on Sustainable Yield_x for the upcoming year and the reasoning for that recommendation.
 - a. If the recommendation is to modify the Sustainable Yield_x, then recommendations for which parameters to modify from the previous Sustainable Yield_x will be provided.
 - i. If the BMC approves the recommended modifications to the Sustainable Yield_x, BMC Staff will perform the updated Sustainable Yield_x calculations and bring the results back to the BMC for consideration and approval.
 - ii. If the updated Sustainable Yield_x results are unanimously approved by the BMC then the updated Sustainable Yield_x will be documented in the Annual Report for that Year and used for calculation of the Basin Yield Metric, Basin Development Metric and Purveyor Pool for the upcoming year.

- b. If the recommendation is to not modify the Sustainable Yield_x and the BMC agrees, then the Sustainable Yield_x will remain the same as the previously approved Sustainable Yield_x by the BMC.
- c. If the BMC cannot come to unanimous agreement of whether or not to modify the Sustainable Yield_x then the Sustainable Yield_x will remain the same as the previously approved Sustainable Yield_x and the BMC will provide direction to Staff on how to proceed.

An example timeline for the envisioned process of updating the Sustainable Yield_x and incorporating it into the BMC monitoring, management and Annual Monitoring Report processes is outlined below:

1. July 2021 BMC Staff begins evaluation of Sustainable Yield₂₀₂₂
2. BMC Staff presents recommendations for Sustainable Yield₂₀₂₂
3. Before January 2022 BMC approves Sustainable Yield₂₀₂₂
4. Sustainable Yield₂₀₂₂ used to establish Purveyor Pool for 2022
5. Sustainable Yield₂₀₂₂ incorporated into Basin Yield and Basin Development Metric calculations for 2022 Annual Monitoring Report (AMR)
6. Sustainable Yield₂₀₂₂ described in 2021 AMR

It is additionally recommended that, if the BMC agrees upon a Sustainable Yield₂₀₂₂ estimate, that a Sustainable Yield₂₀₂₁ estimate be calculated utilizing the same methodology and key assumptions for use in the 2021 AMR Basin Yield Metric and Basin Development Metric calculations.

TO: Los Osos Basin Management Committee

FROM: Dan HeimeI, Executive Director

DATE: October 19, 2022

SUBJECT: Item 9b – Phase 2 Lower Aquifer Nitrate Investigation

Recommendations

Approve funding for Cleath-Harris Geologists to perform additional Nitrate Source Investigation; or provide alternate direction to staff.

Discussion

S&T Mutual Water Company (S&T) is measuring elevated nitrate (NO₃-N) concentrations in their LA8 water supply well. In 2021, Cleath-Harris Geologist completed a Nitrate Source Investigation to assist S&T in better understanding the source of the nitrates. The conclusion of the investigation was that septic discharges from Cabrillo Estates appears to be the primary source of increasing nitrate concentrations in Lower Aquifer groundwater produced by well LA8, although there are other potential sources, see attached Technical Memorandum.

S&T presented their findings to the Regional Water Quality Control Board, which requested that S&T perform additional investigations to further determine the source of the nitrates. BMC Staff is requesting that the BMC authorize utilization of anticipated unused Calendar Year (CY) 2022 BMC Budget to assist in funding the additional investigations. The anticipated costs to perform the additional nitrate investigations is \$8,500, see attached proposal. BMC Staff anticipates having approximately \$40,000 in unused budget at the end of CY 2022. BMC Staff recommends the approval of these funds to improve the BMC's understanding of the source of nitrates in the Lower Aquifer, as this is an issue affecting wells for all of the Los Osos Water Purveyors. Collection of the samples described in the proposal will require additional approvals by the owners of the wells and BMC Staff will work to obtain these approvals if the funding is authorized by the BMC.

Attachments

Nitrate Source Investigation at S&T Lower Aquifer Well LA8 Technical Memorandum

Additional Nitrate Source Investigation Proposal



Technical Memorandum

Date: September 24, 2021 (revised 10/5/21)

From: Spencer Harris, HG 633

To: Charlie Cote, System Operator
S&T Mutual Water Company

SUBJECT: Nitrate Source Investigation at S&T Lower Aquifer Well LA8, Los Osos Groundwater Basin.

Dear Mr. Cote:

Cleath-Harris Geologists (CHG) has completed an investigation into the source of increasing nitrate-nitrogen ($\text{NO}_3\text{-N}$) concentrations in groundwater produced by Lower Aquifer well LA8 within the Los Osos groundwater basin (Basin). Well LA8 is the water supply well for S&T Mutual Water Company (S&T). The investigation included an evaluation of similar conditions at nearby Lower Aquifer well LA9, a water supply well operated by Golden State Water Company (GSWC). The purpose of the investigation was to identify sources of $\text{NO}_3\text{-N}$ loading in the vicinity of these wells and to evaluate which source is likely to be the primary contributor to the trend of increasing $\text{NO}_3\text{-N}$ concentrations over time in groundwater at well LA8. This memorandum presents the results of the investigation.

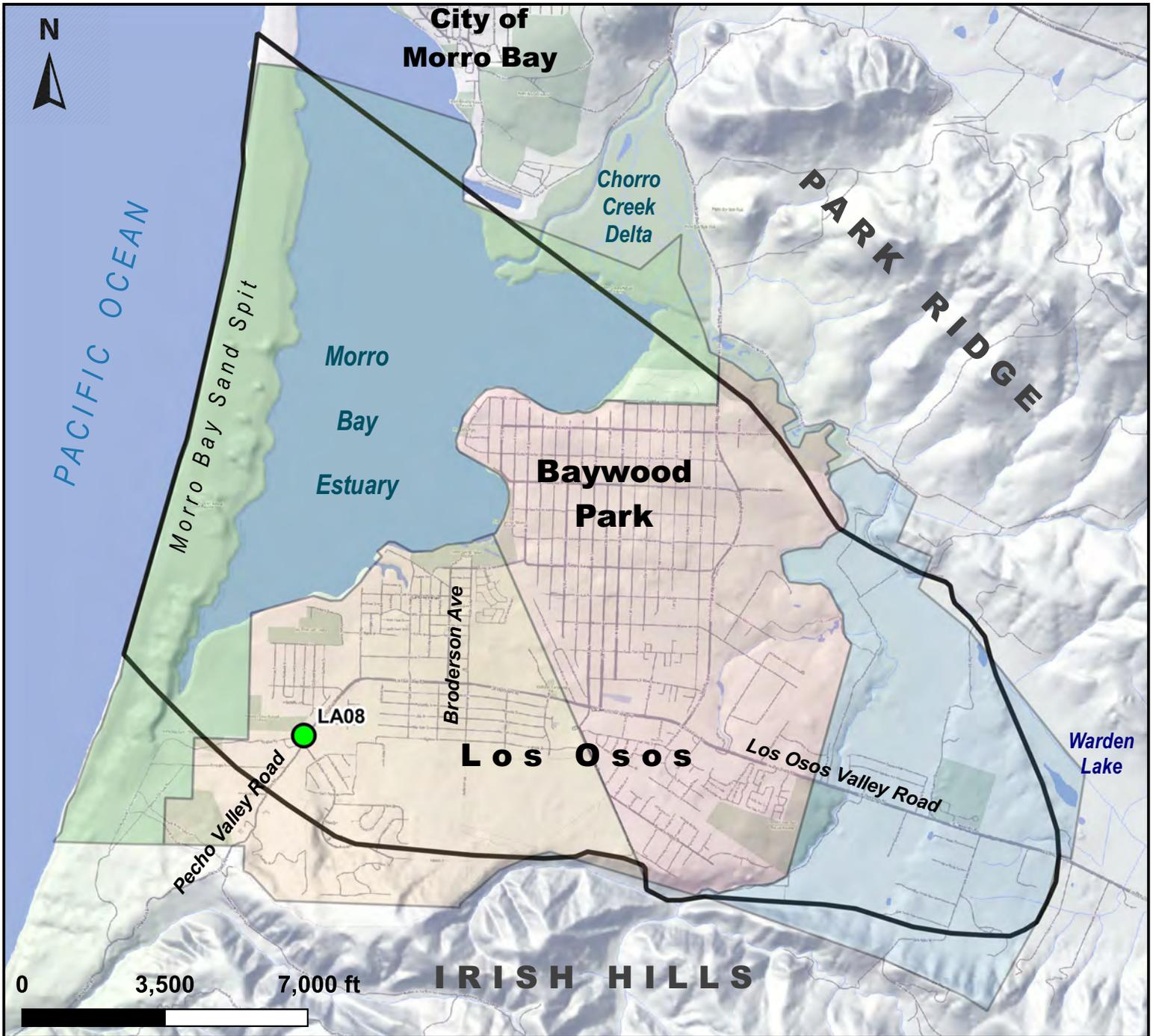
BACKGROUND

LA8 and LA9 are Lower Aquifer wells located in the Western Area of the Basin (Figure 1). $\text{NO}_3\text{-N}$ concentrations in groundwater produced by these two wells have been increasing over time. Unless this trend changes, nitrate concentrations have been projected to exceed the drinking water standard within the next 20 years at LA8, and within the next 30 years at LA9, although fluctuations from the average trend may significantly shorten these projected timelines¹.

S&T relies on LA8 (system name S&T #5) to provide water service to approximately 591 customers and has requested the assistance of the Central Coast Regional Water Quality Control Board in protecting the community water system from continued groundwater degradation². GSWC well LA9 (system name GSWC Cabrillo) is one of several active public supply wells that serve GSWC customers, and was included in this investigation due to its proximity to LA8 and similarity in $\text{NO}_3\text{-N}$ concentration trends in groundwater produced by the two wells.

¹CHG, 2019, *Lower Aquifer nitrate concentration trends review and LA11 seawater intrusion evaluation*, TM prepared for the Los Osos BMC dated November 6, 2019.

²S&T, 2020, Correspondence to the Central Coast Regional Water Quality Control Board dated September 24, 2020.



Explanation

-  Basin Boundary From Los Osos Plan
-  S&T Supply Well

Basin Plan Areas

-  CENTRAL AREA
-  DUNES AND BAY AREA
-  EASTERN AREA
-  WESTERN AREA

**Figure 1
Site Vicinity**

**Nitrate Source
Investigation
S&T Mutual Water Co.**

Cleath-Harris Geologists



Historical NO₃-N loading from most of the septic systems in the Basin has been mitigated, beginning in 2016, through sewage collection and treatment at the Los Osos Water Recycling Facility (LOWRF) as part of the Los Osos Wastewater Project. This investigation primarily characterizes historical conditions prior to completion of the wastewater project, since the trend of increasing NO₃-N concentrations in groundwater over time appears at LA9 beginning in the mid-1980's³. Investigation into current conditions is limited to updating the NO₃-N concentration trend at LA8 through Spring 2021 and identifying the local areas of sewage collection and treatment.

CONDUCT OF WORK

The following tasks were completed by CHG as part of the conduct of work:

- Reviewed hydrogeologic setting for LA8 and LA9 in the Western Area of the Basin.
- Reviewed and updated the NO₃-N concentration trend at LA8.
- Identified and characterized potential sources of NO₃-N mass loading to groundwater in the Western Area.
- Collected groundwater samples for analytic testing from LA8 and LA9. Constituents tested included NO₃-N, isotopes ($\delta^{15}\text{N}$ and $\delta^{18}\text{O}$ of NO₃⁻, $\delta^{18}\text{O}$ and $\delta^2\text{H}$ of H₂O), and sucralose.
- Used the Basin Model to develop general observations on hydraulic capture zones.
- Analyzed and interpreted hydrogeologic conditions, sources of NO₃-N loading, water quality results, and Basin Model observations with respect to the primary source of increasing NO₃-N concentrations in groundwater at LA8.

HYDROGEOLOGIC SETTING

Wells LA8 and LA9 are located in the Western Area of the Basin (Figure 1). At ground surface, the Western Area is mostly covered by dune sand, beneath which are interbedded sands, gravels, and clays extending several hundred feet in depth. Basin sediments rise in elevation from sea level along the edge of the Morro Bay Estuary to approximately 500 feet above sea level along the southern Basin boundary, which is defined by the Los Osos Fault.

The principal aquifers in the Western Area are the Upper Aquifer (Zone C), and the Lower Aquifer (Zones D and E). The Upper Aquifer is unconfined and receives recharge from percolating rainfall/runoff, various return flows, and (beginning in 2016) from recycled water disposal at the Broderon community leach field. The base of the Upper Aquifer is defined by a laterally extensive clay layer that acts as a regional aquitard (also referred to as the AT2 Clay).

³CHG, 2019, *Lower Aquifer nitrate concentration trends review and LA11 seawater intrusion evaluation*, TM prepared for the Los Osos BMC dated November 6, 2019.



Contours on the base of the Upper Aquifer are shown in Figure 2, and form a syncline (trough) with a fold axis that runs northwest to southeast through the middle of the Basin.

Beneath the regional aquitard is the Lower Aquifer, which is divided into Zones D and E. The Lower Aquifer is generally semi-confined to confined and receives recharge from Upper Aquifer by leakage through the regional aquitard, from subsurface inflow from the Central Area to the east and from the ocean to the west (seawater intrusion). Prior work concluded, through analysis of water quality, radiocarbon age-dating, tritium isotope analysis, and groundwater modeling, that the Upper Aquifer is the primary source of recharge to the lower aquifer, particularly in the Western Area⁴. The Upper Aquifer is also known to have historically elevated NO₃-N concentrations⁵.

Figure 3 shows the Spring 2015 groundwater elevation contours for the Upper Aquifer in the Western Area (prior to the use of the Broderson site for recycled water disposal). Groundwater is inferred to be moving to the northwest past LA8 and LA9, although the aquifer becomes effectively unsaturated south of LA9. This is because the regional aquitard rises steeply along the southern limb of the Basin syncline and rises above the elevation of the Upper Aquifer water table. Historically, the direction of flow in the Upper Aquifer in the vicinity of LA8 and LA9 has also been to the northwest^{6,7}. The edge of the Perched Aquifer is shown in Figure 3, from which groundwater spills to the west into the Upper Aquifer (Perched Aquifer groundwater elevations not shown).

Subsurface conditions are shown in geologic cross-section J-J' (Figure 4). Figure 4 is a northwest-southeast section that includes LA8 and LA9. Both wells are completed in Lower Aquifer Zone D. Figure 4 illustrates the inferred structural control mechanism whereby percolating water near the southern Basin boundary is directed downslope along the regional aquitard and into the Upper Aquifer.

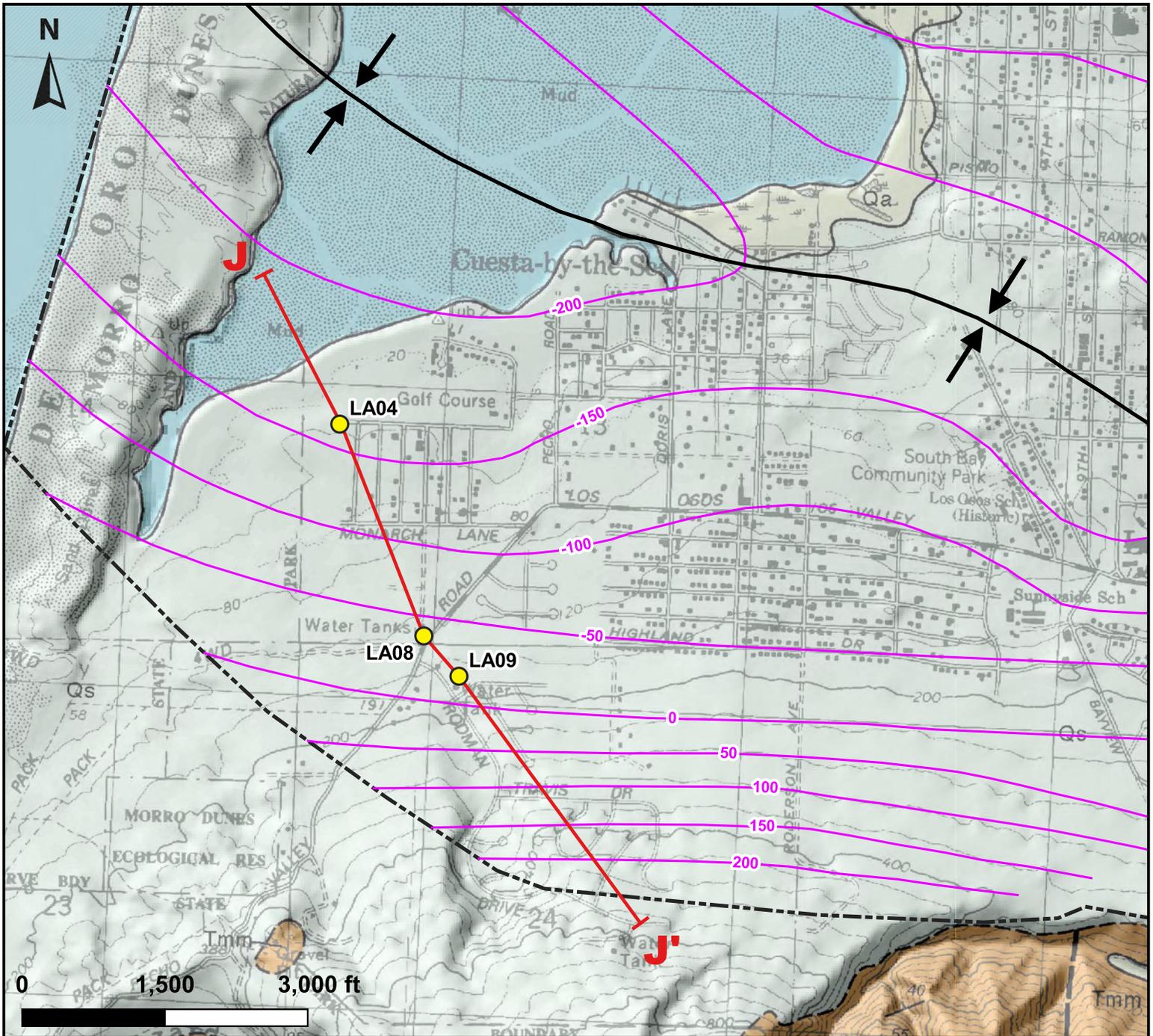
Figure 5 combines the elevation contours from the base of the Upper Aquifer along the southern Basin boundary with the Upper Aquifer groundwater elevations, illustrating the general flow path for Upper Aquifer groundwater, which receives percolating water and return flow from potential sources of NO₃-N in the vicinity of LA8 and LA9. South of the limits of Upper Aquifer saturation, the regional aquitard intercepts percolating water from rainfall/runoff and return flows and directs this recharge downslope as perched subsurface flow along the top of the clay layer and into the Upper Aquifer. Local neighborhoods and other historical sources of NO₃-N mass loading to the Basin west of Broderson Avenue are shown in Figure 5 for reference.

⁴Cleath & Associates, 2005, *Sea Water Intrusion Assessment and Lower Aquifer Source Investigation of the Los Osos Valley Groundwater Basin*, October 2005.

⁵Updated Basin Plan for the Los Osos Groundwater Basin, January 2015.

⁶Cleath & Associates, 2005, *Sea Water Intrusion Assessment and Lower Aquifer Source Investigation of the Los Osos Valley Groundwater Basin*, October 2005

⁷Brown & Caldwell, 1974, *Preliminary Groundwater Basin Management Study*, October 1974.



Basemap: Dibblee, 2006, Geologic Map of the Morro Bay South Quadrangle (DF-214)

Explanation

- Cross-section Wells
- Elevation of Base of Upper Aquifer
- Cross-section Alignment
- Basin Boundary

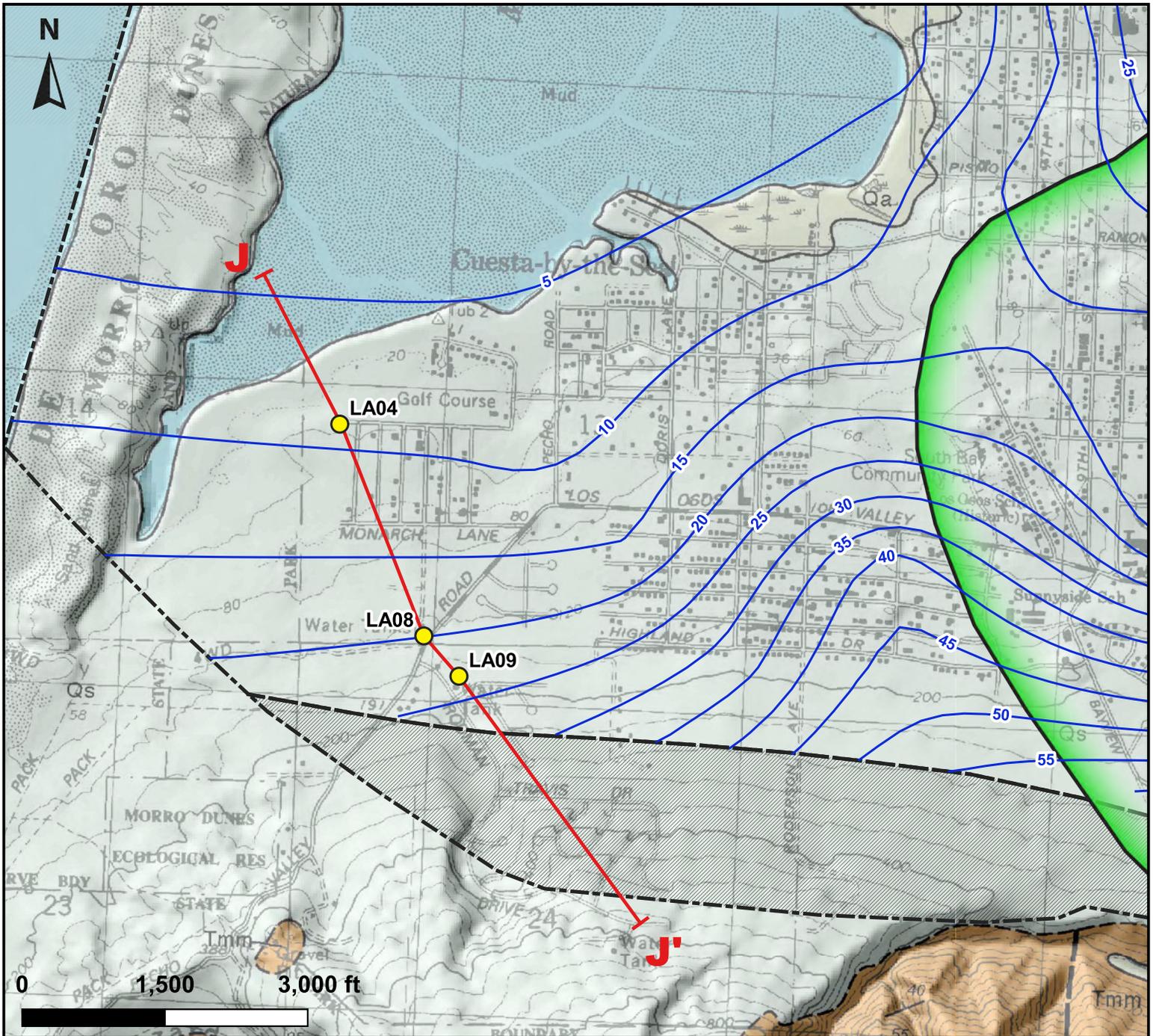
Geologic Key

- Qa - Alluvium
- Qs - Dune Sand
- Tmm - Monterey Fm.
- ↑
↑
↑ Synclinal Axis

Figure 2
Elevation Contours on
Base of Upper Aquifer

Nitrate Source
Investigation
S&T Mutual Water Co.

Cleath-Harris Geologists



Basemap: Dibblee, 2006, Geologic Map of the Morro Bay South Quadrangle (DF-214)

Explanation

- Cross-section Wells
- Spring 2015 Upper Aquifer Groundwater Elevation Contours
- Cross-section Alignment
- Perched Aquifer Boundary

Basin Boundary

- Saturated Upper Aquifer Zone
- Unsaturated Upper Aquifer Zone

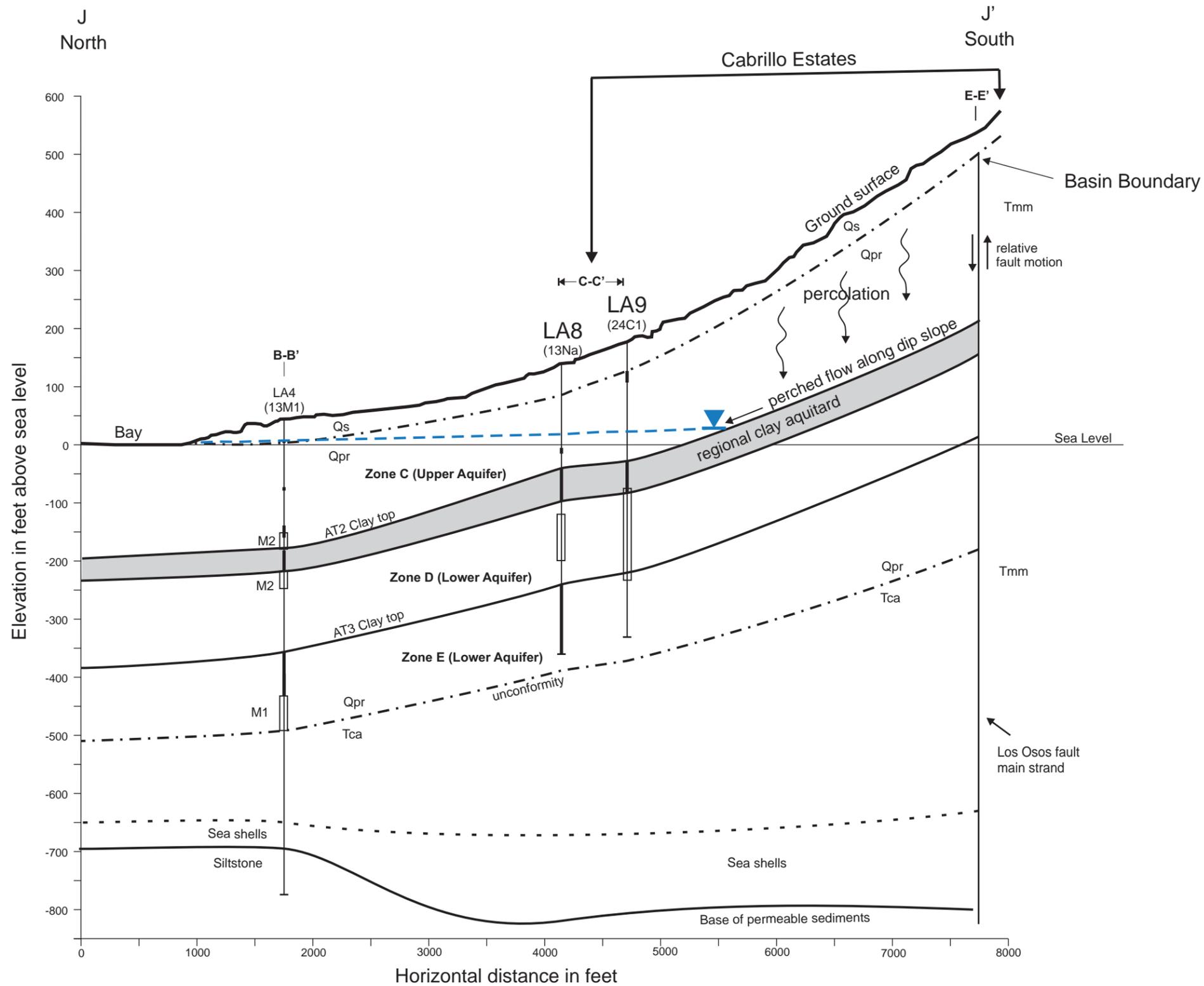
Geologic Key

- Qa - Alluvium
- Qs - Dune Sand
- Tmm - Monterey Fm.

Figure 3
Spring 2015
Groundwater Elevation
Contours

Nitrate Source
Investigation
S&T Mutual Water Co.

Cleath-Harris Geologists



Aquifer Zones:
 Zone C - Upper Aquifer
 Zone D - Lower Aquifer (shallow)
 Zone E - Lower Aquifer (deep)

Well data point
 LA4 (13M1) Well ID
 ← Clay layer
 ← Well screen

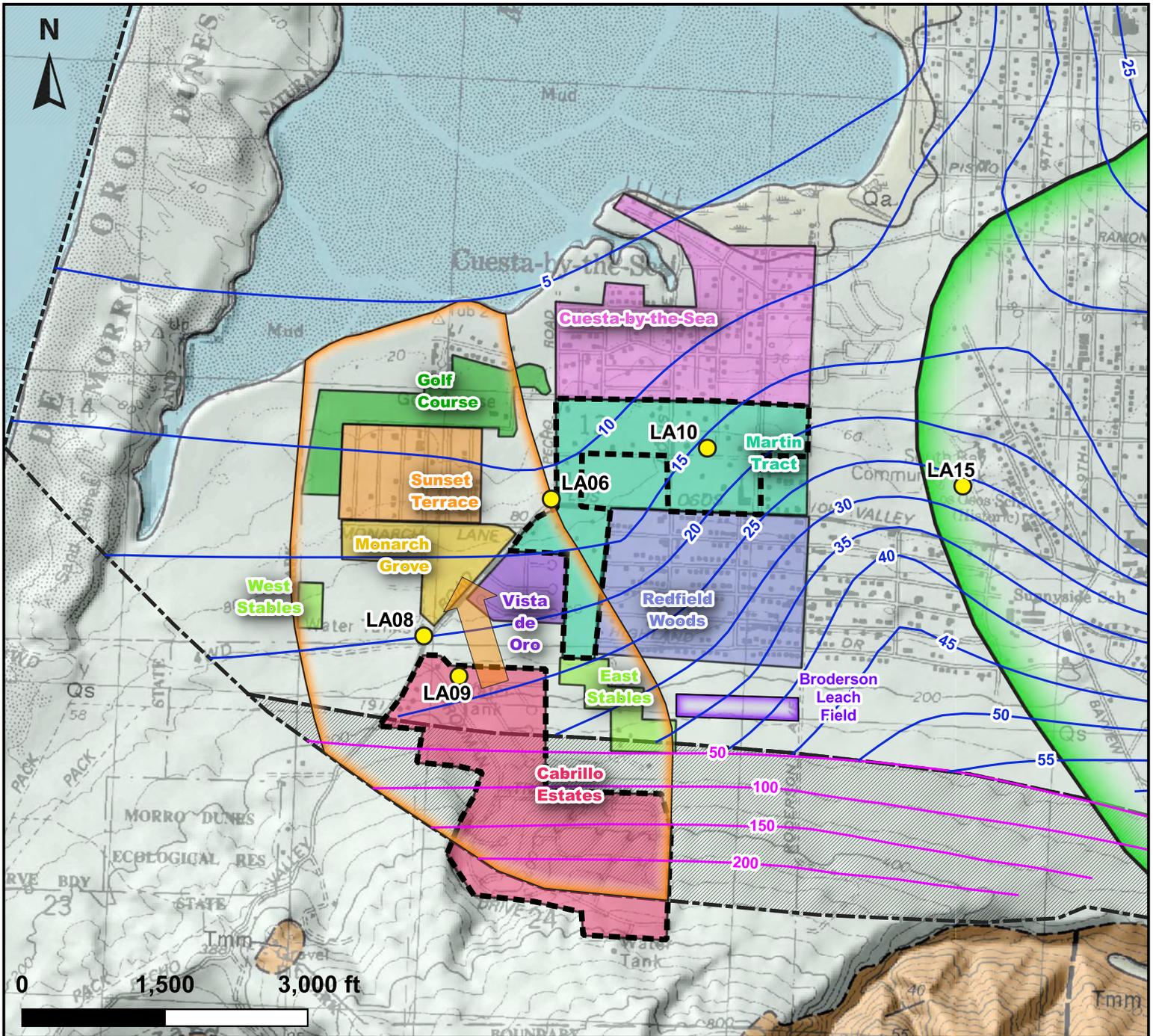
Formation:
 Qs - dune sand
 Qpr - Paso Robles Formation
 Tca - Careaga Formation
 Tmm - Monterey Formation

E-E' | Intersection with other Basin Cross-Section
 Spring 2015 groundwater elevation

Figure 4

Cross-Section J-J'
 Nitrate Source Investigation
 S&T Mutual Water Company

Cleath-Harris Geologists



Basemap: Dibblee, 2006, Geologic Map of the Morro Bay South Quadrangle (DF-214)

Explanation

- Selected Lower Aquifer Well Locations
- Spring 2015 Upper Aquifer Groundwater Elevation Contours
- Elevation of Base of Upper Aquifer
- Historical Nitrate Loading Source Area in the Vicinity of LA08 and LA09
- Perched Aquifer Boundary
- Neighborhood Areas Not Connected to Sewer
- General Groundwater Flow Direction

Basin Boundary

- Saturated Upper Aquifer Zone
- Unsaturated Upper Aquifer Zone

Geologic Key

- Qa - Alluvium
- Qs - Dune Sand
- Tmm - Monterey Fm.

Figure 5
Nitrate-Nitrogen
Mass Loading Sources

Nitrate Source
Investigation
S&T Mutual Water Co.

Cleath-Harris Geologists



UPDATED LA8 NITRATE-NITROGEN TREND

NO₃-N concentrations in groundwater produced by LA8 were described in prior work as increasing at an average rate of approximately 0.12 mg/L per year since 2004, and measured 7.2 mg/L in April 2019. Updated NO₃-N concentration data for LA8, including historical quarterly measurements provided by S&T, were added to the LOBP monitoring program data set. The resulting updated NO₃-N concentration trend at LA8 through Spring 2021 is shown in Figure 6. The updated trend indicates NO₃-N concentrations are increasing at a rate of 0.1 mg/L per year. The most recent NO₃-N concentration was 7.4 mg/L in May 2021, which lies just above the linear regression line (Figure 6). At 0.1 mg/L of increased NO₃-N concentration per year, the regression line would reach the 10 mg/L MCL in 27 years. Considering that there are fluctuations above the regression line of up to approximately 1 mg/L in NO₃-N concentrations (standard deviation for the data set is 0.7 mg/L), the MCL may be exceeded in 20 years or less based on the historical trend.

Neighborhoods in the Western Area, except for Cabrillo Estates and portions of the Martin Tract, have been connected to the community sewer and are no longer discharging to septic systems (Figure 5). In addition, recycled water with low NO₃-N concentrations (typically close to 2 mg/L)⁸ is now being disposed of at the Broderon community leach field (Figure 5). These changes reduce the NO₃-N load to the Basin and are expected to mitigate elevated NO₃-N concentrations long-term, but may not prevent local concentrations at LA8 or LA9 from reaching the MCL before declining⁹.

It is noteworthy that the NO₃-N concentrations in recycled water from LOWRF have been reduced significantly since plant start-up, when they were 6.6 mg/L¹⁰. If recycled water NO₃-N concentrations are maintained closer to the current 2 mg/L level, the beneficial impacts of the Los Osos Wastewater Project on mitigating elevated long-term NO₃-N concentrations in Basin groundwater would be even greater than projected.

POTENTIAL SOURCES OF NO₃-N

Potential sources of NO₃-N mass loading to Basin groundwater were investigated in 1995 and updated in 2019^{11,12}. A summary of the mass load from potential sources based on the prior work is presented in Table 1 and discussed below.

⁸San Luis Obispo County Public Works, 2021, *2020 Los Osos Water Recycling Facility Annual Report*, February 2021.

⁹CHG, 2019, *Lower Aquifer nitrate concentration trends review and LA11 seawater intrusion evaluation*, TM prepared for the Los Osos BMC dated November 6, 2019.

¹⁰San Luis Obispo County Public Works, 2018, *Salt/Nutrient management Plan for the Los Osos Groundwater Basin*, prepared in association with Cleath-Harris Geologists, January 2018.

¹¹Metcalfe & Eddy, 1995, *Task F – Sanitary Survey and Nitrate Source Study*, March 1995.

¹²San Luis Obispo County Public Works, 2018, *Salt/Nutrient management Plan for the Los Osos Groundwater Basin*, prepared in association with Cleath-Harris Geologists, January 2018.

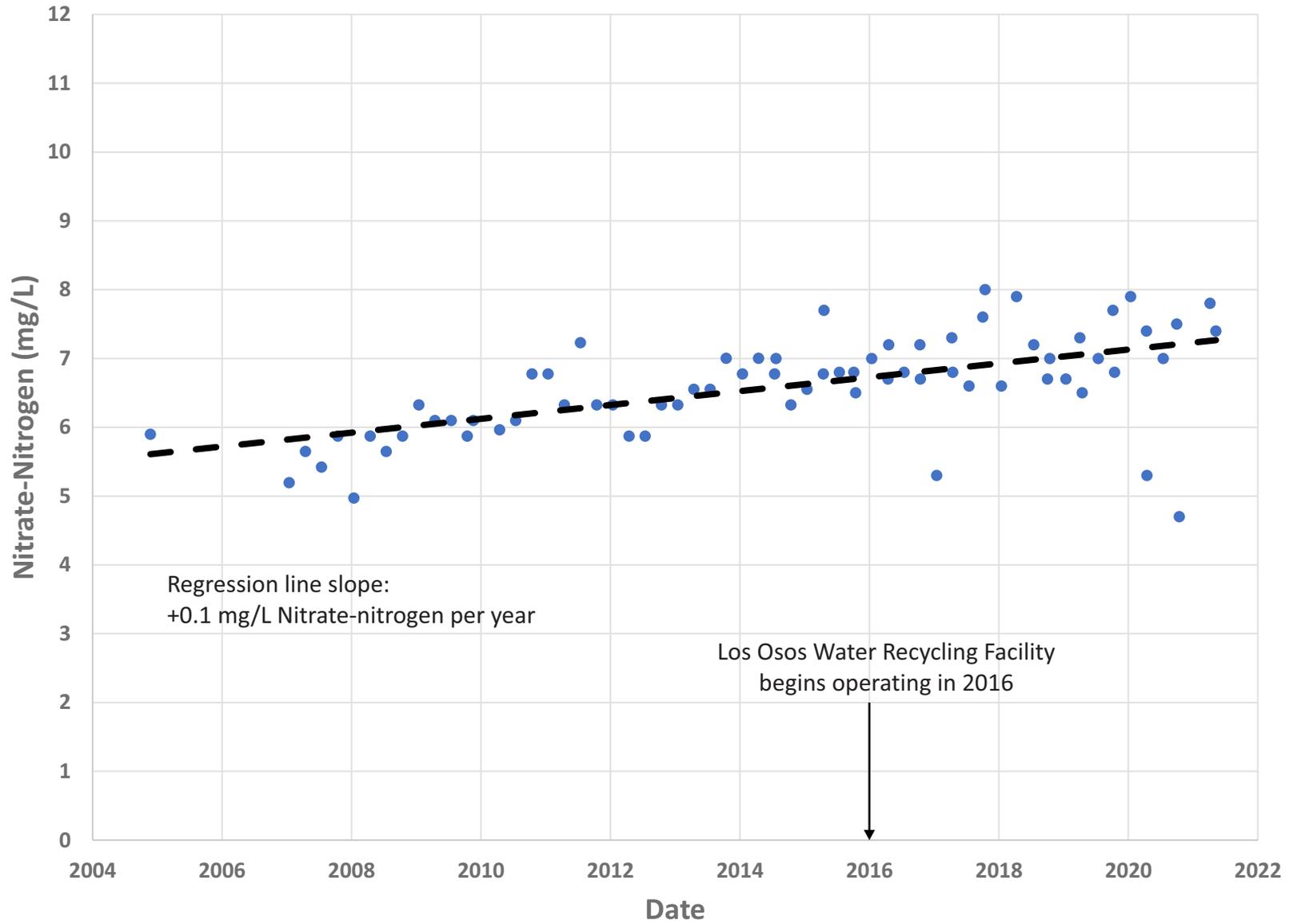


Figure 6

Explanation

- LA8 groundwater sample data point
- - - (linear regression trend line)

LA8 Nitrate-Nitrogen Concentration Trend
Nitrate Source Investigation
S&T Mutual Water Company

Cleath-Harris Geologists



Table 1. NO ₃ -N Loading Factors				
Source	Total Units (Baseline)	NO ₃ -N (lbs/year)		
		Gross per unit load (lbs/year)	Attenuation (loss)	Net per unit load (lbs/year)
Natural	Acre	3.1	(incorporated)	3.1
Septic Tank Discharge	Acre-foot	152	41%	90*
Agriculture/Turf Fertilizer	Acre	150	68%	48
Residential Landscape/Turf Fertilizer	Acre	45	80%	9
Animal Waste	Horse	110	79%	23**
	Dog	2.9	92%	0.2
	Cat	1.4	92%	0.1

Source: Modified from 2018 Salt/Nutrient Management Plan, Table 4-2

lbs/year= pounds per year

*NO₃-N loading rate per residence estimated at 9.3-9.9 lbs/year (see text and Table 3)

**Assumes manure remained on-site under historical conditions

Natural Sources

Natural sources of NO₃-N loading include contributions from soils, native vegetation, and wildlife. The historical background NO₃-N concentration ranged from 0.4 mg/L in the Lower Aquifer to 1.9 mg/L in the Perched and Upper Aquifer, and a nitrogen load of 12,500 pounds per year was necessary to produce similar background concentrations in the analytical model developed for the Salt/Nutrient Management Plan. Spread over approximately 4,000 acres of basin inland of the bay, the natural nutrient load was estimated at 3.1 pounds nitrogen per acre per year (lbs N/acre-year).

Agricultural Sources

Fertilizer is the main source of nitrogen loading from agricultural operations. Values of nitrogen loading for agricultural fertilizer in Los Osos was estimated at approximately 150 lbs N/acre-year, with an attenuation factor of 80 percent, mostly due to volatilization and plant uptake¹³. A review of literature during Salt/Nutrient Management Plan preparations confirmed an average typical application rate for crops of 150 lbs N/acre-year with an average nitrogen removal during harvest of 90 lbs N/acre-year¹⁴. The remaining 60 lbs N/acre-year left in the field was assumed to undergo an additional 20 percent loss from denitrification prior to loading groundwater for a net 68 percent total attenuation of applied nitrogen (48 lbs N/acre net loading).

¹³Metcalf& Eddy, 1995, *Task F – Sanitary Survey and Nitrate Source Study*, March 1995.

¹⁴San Luis Obispo County Public Works, 2018, *Salt/Nutrient management Plan for the Los Osos Groundwater Basin*, prepared in association with Cleath-Harris Geologists, January 2018.



Residential Sources

Residential sources of NO₃-N include nutrients associated with sewage, residential fertilizer, and domestic pet waste (discussed below with Animal Waste). The bulk of these nutrients historically entered the Basin via septic return flows at an estimated mass loading factor of 152 lbs N/acre-foot. Residential landscape and turf fertilizers add an estimated 45 lbs N/acre-year. Attenuation of loads for septic system discharges can vary significantly due to site conditions, with an average 41 percent net removal estimated for the septic nitrogen load due to subsurface denitrification processes, and an average 80 percent removal of residential landscape/turf fertilizer associated with plant uptake and subsurface denitrification processes¹⁵.

The unit of measurement for septic tank NO₃-N loading in Table 1 is acre-feet of discharge. In order to estimate the average historical septic discharge per residence for this investigation, an average sewer inflow volume per dwelling unit was needed. Current (2020) inflow to LOWRF is approximately 500,000 gallons per day (560 acre-feet per year) for a service area population of 12,500¹⁶. Using the estimated population density of 2.2 persons per dwelling unit¹⁷, the resulting inflows to LOWRF in 2020 were 560 acre-feet per year from an estimated 5,680 residences, or 0.1 acre-feet per year per residence. The corresponding NO₃-N loading from septic discharges per residence is estimated at 9 lbs N/year (90 lbs N/acre-foot * 0.1 acre-feet/year).

Residential fertilizer use per residential parcel has been estimated based on a nominal 20 percent landscaping for three average lot sizes¹⁸. For smaller lot sizes (Sunset Terrace, Vista de Oro, Redfield Woods), the NO₃-N load from fertilizer is estimated at 0.3 lbs N/year per parcel (9 lbs N/acre * 0.16 acres/parcel * 20% landscaped). For medium sized lots (Cabrillo Estates), the NO₃-N load from fertilizer is estimated at 0.5 lbs N/year per parcel (9 lbs N/acre * 0.25 acres/parcel * 20% landscaped), while for the larger lots (southernmost portion of Martin Tract), the NO₃-N load from fertilizer is estimated at 0.9 lbs N/year per parcel (9 lbs N/acre * 0.5 acres/parcel * 20% landscaped). Adding these loads to the base load from septic discharges results in estimated loading rates per residence of 9.3-9.9 lbs N/year.

Animal Waste

Animal waste includes urine and manure generated at horse boarding operations, and more diffuse nitrogen sources associated with urine and uncollected feces from household pets. In 1995 there were an estimated 200 horses, 4,400 dogs, and 6,600 cats within the Basin, according to San Luis Obispo County Health Department records for communal stables and dog registration, with adjustments for unregistered pets¹⁹. The number of horses boarded at stables in

¹⁵San Luis Obispo County Public Works, 2018, *Salt/Nutrient management Plan for the Los Osos Groundwater Basin*, prepared in association with Cleath-Harris Geologists, January 2018.

¹⁶San Luis Obispo Co. Public Works, 2021, *2020 Los Osos Water Recycling Facility Annual Report*, February 2021.

¹⁷San Luis Obispo Co. Department of Planning and Building, 2020, *Los Osos Community Plan*, December 15, 2020.

¹⁸Yates and Weise, 1988, *Hydrogeology and Water Resources of the Los Osos Valley Ground-Water Basin, San Luis Obispo County, California*, U.S. Geological Survey Water-Resources Investigation Report 88-4081.

¹⁹Metcalfe & Eddy, 1995, *Task F – Sanitary Survey and Nitrate Source Study*, March 1995.



the Western Area were estimated, for this investigation, based on the approximate number of stalls visible in aerial imagery. After attenuation, the animal waste would create an estimated annual mass load of 23 lbs N/horse, 0.2 lbs N/dog, and 0.1 lbs N/cat in the Basin (Table 1).

NO₃-N loading from horses may vary based on site-specific manure management programs, such as manure collection and hauling for off-site disposal, which would significantly reduce on-site loading. The estimate of historical NO₃-N loading to groundwater from horses was based on the assumption that horse waste was deposited on the ground (on-site) and was not immediately removed to a landfill or some other treatment facility²⁰.

NITRATE ISOTOPE ANALYSIS

Isotope tracer studies are based on the principal that naturally occurring elements can have different atomic weights based on the number of neutrons the atom contains (isotopes). These isotopes can be either long-lived (stable) or short-lived (unstable/radioactive). For each element that has stable isotopes, there is a global mean value that represents the ratio of the various elemental weights. Naturally occurring processes (biological, geological, meteorological, etc.) preferentially concentrate (enrich) or deplete isotopes, relative to global mean, within a localized reservoir (for example a plant, an animal, a watershed, etc.). This depletion or enrichment is called fractionation. The types of isotopes impacted by fractionation depend on the natural process in question. The degree of fractionation is measured as relative to global mean (a reference sample), and is expressed in units of delta (δ) per mil (‰). The value is calculated as:

$$\delta_{\text{sample}} (\text{‰}) = [(R_{\text{sample}} - R_{\text{standard}}) / R_{\text{standard}}] * 1000$$

where R is the ratio of the two isotopes in questions (heavy over light) for both the sample and the reference standard. A positive δ value indicates enrichment of the heavy fraction of the isotope relative to the global mean and a negative value indicates a depletion of the heavy fraction of the isotope. A δ value of 0 indicates the sample matches the mean (reference sample) and has no enrichment or depletion.

For purposes of investigating nitrate (NO₃⁻) contamination, nitrogen and oxygen isotope ratios have been found to be useful, mainly in distinguishing between fertilizer and sewage/manure sources of pollution. Nitrogen isotope enrichment refers specifically the ratio of isotopes ¹⁴N and ¹⁵N. For isotopic evaluation of oxygen, the enrichment of ¹⁶O/¹⁸O ($\delta^{18}\text{O}$) is most commonly used for nitrate studies. Oxygen in the atmosphere²¹ has $\delta^{18}\text{O}$ values of +23.5 ‰, while Los Osos groundwater²² has $\delta^{18}\text{O}$ values (of H₂O) typically between -5 ‰ and -6 ‰, both of which influence nitrification processes.

²⁰ Ibid.

²¹ Kendall, C. 1998. *Tracing sources and cycling of nitrate in catchments*. In: Kendall C., McDonnell, J.J., (Eds), *Isotope Tracers in Catchment Hydrology*. Elsevier, Amsterdam, pp. 519-576.

²² Cleath & Associates, 2005, *Sea Water Intrusion Assessment and Lower Aquifer Source Investigation of the Los Osos Valley Groundwater Basin*, October 2005



The primary potential sources of NO₃-N loading to groundwater include ammonium and nitrate fertilizers, manure, and sewage. There is considerable literature on individual studies of isotope fractionation ranges for these sources²³. Figure 7 shows a conceptual model of the distribution of both δ¹⁵N and δ¹⁸O for various potential sources of NO₃-N loading.

Synthetic ammonium and nitrate fertilizers use atmospheric nitrogen (N₂) during production, and synthetic nitrate fertilizers also use atmospheric oxygen. The resulting δ¹⁵N values for fertilizers are typically between -6 ‰ to +6 ‰, with δ¹⁸O values in synthetic nitrate fertilizers typically between +17 ‰ and +25 ‰²⁴ (Figure 7). Fertilizers that undergo biological nitrification derive oxygen from both groundwater (irrigation water) and the atmosphere²⁵. Research indicates the ratio of oxygen isotopes in nitrate from nitrification prior to any fractionation is²⁶:

$$\delta^{18}\text{O}(\text{NO}_3) = 2/3 \delta^{18}\text{O}(\text{H}_2\text{O}) + 1/3 \delta^{18}\text{O}(\text{O}_2)$$

Using values of +23.5 ‰ δ¹⁸O (air) and -6 ‰ δ¹⁸O (Los Osos groundwater), the resulting δ¹⁸O for nitrate originating from the nitrification of ammonium, anhydrous ammonia, and urea-based fertilizer application would be approximately +4 ‰. Commercial fertilizer mixtures often include ammonium nitrate (NH₄-NO₃), which provides a portion of the nitrogen for immediate plant uptake (as nitrate) and a portion for delayed uptake (as ammonium). Values of δ¹⁸O (NO₃⁻) for ammonium nitrate would be close to +14 ‰ (+23.5 ‰ from the synthetic nitrate portion and +4 ‰ from the ammonium portion following nitrification).

Fractionation during microbial denitrification results in enrichment of both δ¹⁵N and δ¹⁸O in the residual NO₃⁻. The process of enrichment is concurrent for the dual isotopes and can be diagnostic of denitrification taking place in the subsurface²⁷. The general slope of the enrichment trend is shown in Figure 7.

Groundwater Sample Analytical Results

Groundwater samples from LA8 and LA9 were collected for laboratory analyses of isotope ratios (fractionation), NO₃-N concentration, and sucralose concentration. Analytical results are presented in Table 2. Laboratory reports are attached.

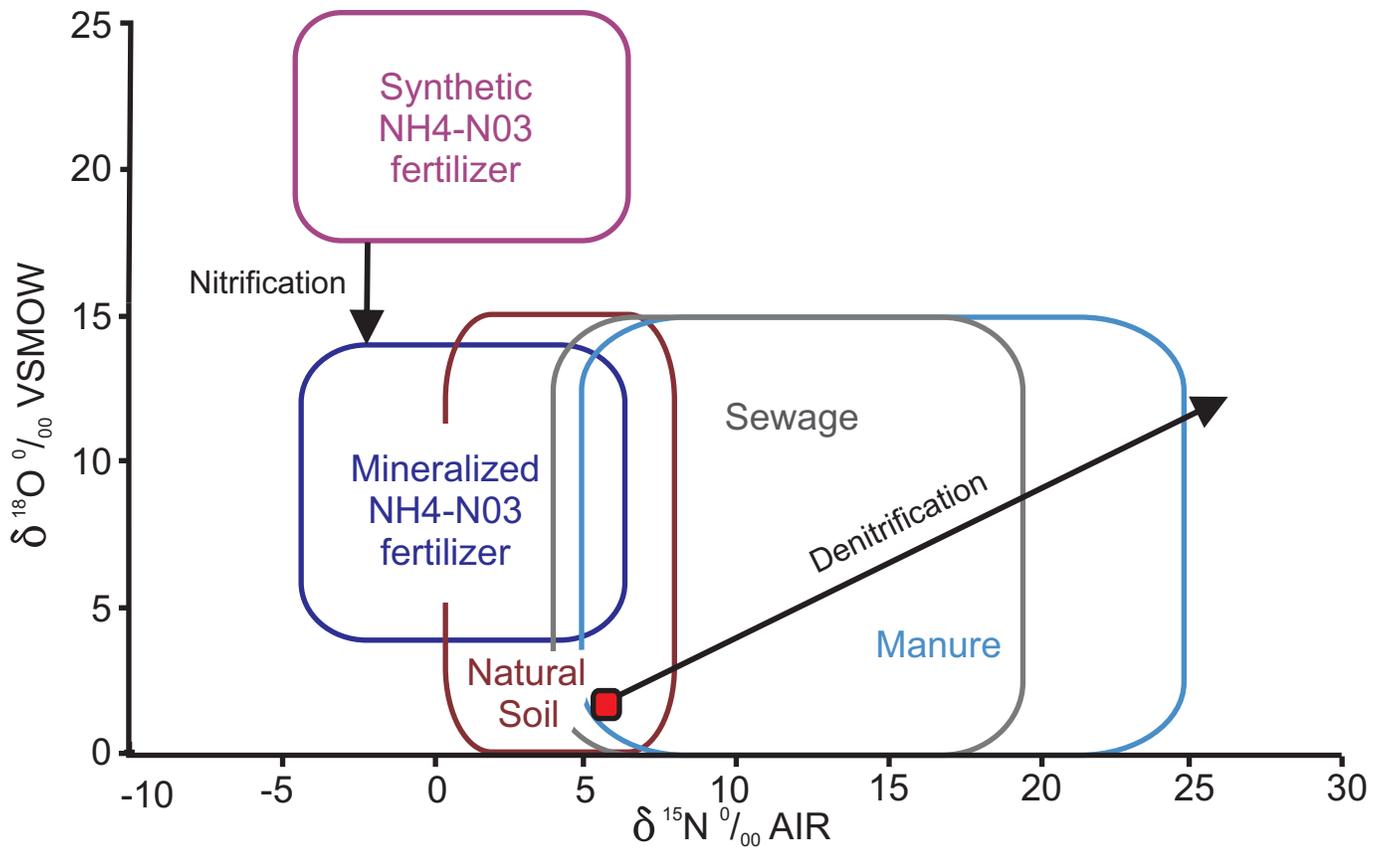
²³Xue, D, Botte, J., De Baets, B., Accoe, F., Nestler, A., Taylor, P., Van Cleemput, O., Berglund, M., Boeckx, P., 2009, *Present limitations and future prospects of stable isotope methods for nitrate source identification in surface- and groundwater*, Water Research 43 1159-1170, January 2009.

²⁴Ibid.

²⁵Hollocher, T. C., 1984, *Source of the oxygen atoms of nitrate in the oxidation of nitrite by Nitrobacter agilis and evidence against a P-O-N anhydride mechanism in oxidative phosphorylation*, Archives of Biochemistry and Biophysics, 233: 721-727.

²⁶Kendall, C., 1998. *Tracing sources and cycling of nitrate in catchments*. In: Kendall, C. McDonnell, J.J. (Eds.), *Isotope Tracers in Catchment Hydrology*. Elsevier, Amsterdam, pp. 519-576.

²⁷Clark I.D., and Fritz, P., 1997, *Environmental isotopes in Hydrogeology*, CRC press.



Modified from Clark and Fritz (1997) based on Xue et al. (2009)

Explanation

■ LA8 and LA9 results

Range of potential values between the 10-percent and 90-percent confidence interval from the compiled results of multiple studies (Xue et al. 2009).

Figure 7

Nitrate Isotope Data Interpretation
 Nitrate Source Investigation
 S&T Mutual Water Company

Cleath-Harris Geologists



Table 2. Analytical Results						
Field ID	Sample Date	Isotope Ratio (‰)			NO ₃ -N [mg/l]	Sucralose [ng/l]
		NO ₃		H ₂ O		
		δ ¹⁵ N	δ ¹⁸ O	δ ¹⁸ O		
LA 8 (S&T #5)	5/10/2021	+5.00	+1.14	-5.83	7.4	ND (<20)
LA 9 (GSWC Cabrillo)	4/29/2021	+5.56	+2.00	-5.89	6.3	ND (<20)

Notes: mg/L = milligrams per liter; ng/L = nanograms per liter; ND = not detected above minimum reporting limit.

Isotope ratio results from the samples collected show that δ¹⁵N and δ¹⁸O Nitrate values are slightly enriched relative to the global mean/reference standard and δ¹⁸O H₂O values are slightly depleted. Figure 7 shows the typical range for δ¹⁵N and δ¹⁸O of nitrate for various sources, along with the analytical results for LA8 and LA9. Measured isotope values for δ¹⁵N for both well LA8 and LA9 show enrichment values which are within the range that would typically be expected for all the potential sources (Figure 7).

Measured isotope values for δ¹⁸O were only slightly enriched for both sampled wells. The values of +1.14 ‰ for the LA8 and +2.00 ‰ for LA9 are below the range that would be expected for nitrates sourced from fertilizer, however, they are in the range for other sources. When coupled with the δ¹⁵N values, the isotope ratio results indicate that the source of nitrates could be associated with septic systems, animal manure, or natural soils, and that source has undergone limited bacterial denitrification (Figure 7).

Natural sources would not produce the elevated NO₃-N concentrations detected at LA8 and LA9, based on estimated background (pre-development) concentrations of 1.9 mg/L NO₃-N for the Upper Aquifer, with no detectable NO₃-N in the Lower Aquifer²⁸. The isotope analysis is interpreted to indicate that the main source of NO₃-N concentrations in groundwater produced by LA8 and LA9 is from sewage and/or animal sources, and not from fertilizer (or natural sources). As mentioned previously, this differentiation is considered the most useful application of dual isotope testing. The apparent lack of significant microbial denitrification of the NO₃-N source(s) suggests that there was much more nitrification than denitrification taking place between the NO₃-N source(s) and groundwater.

NO₃-N concentrations in the water samples were detected at 7.4 mg/L in LA8 and 6.3 milligrams per liter in LA9. These values are consistent with current trends and indicate the samples submitted for isotope ratio and sucralose analyses are representative of the NO₃-N loading to groundwater being investigated.

²⁸San Luis Obispo County Public Works, 2018, *Salt/Nutrient management Plan for the Los Osos Groundwater Basin*, prepared in association with Cleath-Harris Geologists, January 2018.



Water samples collected at the wells were also tested for sucralose. Sucralose is an artificial sweetener and food additive that is considered an indicator compound associated with wastewater influence²⁹. Groundwater samples from LA8 and LA9 were both not detected for sucralose above the minimum reporting limit of 20 nanograms per liter. The presence of detectable sucralose would have supported wastewater influence in groundwater. However, the absence of sucralose does not preclude a wastewater source for the NO₃-N concentrations at LA8 and LA9. Sucralose has been shown to attenuate in the subsurface³⁰.

HYDRAULIC CAPTURE ZONE CONSIDERATIONS

A capture zone is a three-dimensional area of hydraulic containment within which groundwater moves toward a pumping well, such as a treatment well used to control the movement of a contaminant plume. The Basin Model provides some general observations with respect to the potential hydraulic capture zones and Upper Aquifer recharge associated with Lower Aquifer wells in the Western Area. The Model utilizes U.S. Geological Survey model code (SEAWAT) and is a management tool developed for evaluating seawater intrusion and sustainable yield³¹. The model is steady-state with respect to flow parameters, and historical pumping in the Western Area has changed significantly over time³², so associated hydraulic capture zones for individual wells may also have changed over the years.

There are five wells that historically have accounted for most of the Lower Aquifer water pumped in the Western Area: LA6, LA8, LA9, LA10, and LA15 (Figure 5). Out of these five, LA6, LA10, and LA16 potentially capture Upper Aquifer leakage that recharges the Lower Aquifer from beneath, or hydraulically downgradient of, Cuesta-by-the-Sea, Martin Tract, Redfield Woods, Sunset Terrace, and the Golf Course. LA8 potentially captures Upper Aquifer recharge from beneath, or hydraulically downgradient of, Cabrillo Estates, Vista de Oro, Sunset terrace, and the West Stables area. LA9 potentially captures Upper Aquifer recharge from beneath, or hydraulically downgradient of, Cabrillo Estates and the East Stables area. The volumes of recharge as Upper Aquifer leakage from beneath NO₃-N source areas is variable but can exceed half of the Lower Aquifer production volumes, and is the primary source of recharge to the Lower Aquifer^{33,34}.

²⁹State Water Resources Control Board Science Advisory Panel, 2010, *Final Report: Monitoring Strategies for Chemicals of Emerging Concern (CECs) in Recycled Water*, June 25, 2010.

³⁰Van Stempvoort, D.R., Robertson, W.D., Brown, S.J., 2011, *Artificial Sweeteners in a Large Septic Plume*, Ground Water Monitoring and Remediation 31(4):95 – 102, July 2011.

³¹Updated Basin Plan for the Los Osos Groundwater Basin, January 2015.

³²Ibid.

³³Cleath & Associates, 2005, *Sea Water Intrusion Assessment and Lower Aquifer Source Investigation of the Los Osos Valley Groundwater Basin*, October 2005.

³⁴Updated Basin Plan for the Los Osos Groundwater Basin, January 2015.



HISTORICAL NO₃-N LOADING IN VICINITY OF LA8 AND LA9

The historical sources of NO₃-N loading to the Upper Aquifer in the vicinity of LA8 and LA9 are shown in Figure 5. A historical source area is drawn to enclose potential NO₃-N loading sources within flow lines that follow the Upper Aquifer hydraulic gradient and encompass the general hydraulic capture zone of LA8 and LA9 for Upper Aquifer recharge into the Lower Aquifer (Figure 5). A comparison of the estimated NO₃-N mass loading to the Upper Aquifer from sources within this area is presented in Table 3.

TABLE 3. Historical NO₃-N Loading to Basin in Vicinity of LA8 and LA9¹				
Sources²	Mass Loading Unit	Number of Units³	Estimated NO₃-N Load (lbs/unit-year)	Estimated NO₃-N Load⁴ (lbs/year)
Cabrillo Estates	Residence	239	9.5	2,270
East Stables ⁵	Horse	85	23	1,960
Sunset Terrace	Residence	153	9.3	1,420
Golf Course (turf)	Acres	20	48	960
Vista de Oro	Residence	73	9.3	680
West Stables ⁵	Horse	15	23	350
Redfield Woods	Residence	12	9.3	110
Martin Tract	Residence	5	9.9	50
Monarch Grove	(Wastewater historically treated and recycled on Golf Course)			

Notes: ¹Within historical source area shown in Figure 5.

²Neighborhood sources listed in **Bold** have been connected to the sewer

³Approximate based on aerial image review.

⁴Excludes dogs and cats.

⁵Loading from horses assumes manure remained on-site under historical conditions.

With respect to the NO₃-N loading in the historical source area, Cabrillo Estates has the greatest estimated loading potential and is the only source directly hydraulically upgradient of LA8 and LA9 (Figure 5). Therefore, NO₃-N mass loading from Cabrillo Estates had the greatest potential for increasing NO₃-N concentrations in Upper Aquifer groundwater in the vicinity of LA8 and LA9.

Upper Aquifer leakage through the regional aquitard and into the Lower Aquifer is the primary source of recharge to the Lower Aquifer in the Western Area, and explains the rising NO₃-N concentrations at LA8 and LA9. While there are other sources of NO₃-N loading in the vicinity of these wells (Table 3), Cabrillo Estates septic system discharges appear to be the primary source of increasing NO₃-N concentrations in Lower Aquifer groundwater produced by well LA8, due to the general direction of Upper Aquifer groundwater flow. Cabrillo Estates and portions of the Martin Tract (Figure 5) are not connected to the sewer and remain on septic systems.



CONCLUSION

The purpose of this investigation was to identify the primary source of increasing $\text{NO}_3\text{-N}$ concentrations in Lower Aquifer groundwater produced by well LA8. The approach included reviewing the hydrogeologic setting, water quality testing ($\text{NO}_3\text{-N}$, isotope ratios, and sucralose), $\text{NO}_3\text{-N}$ source characterization, and $\text{NO}_3\text{-N}$ mass loading estimates for a historical source area encompassing the general hydraulic capture zones at LA8 and LA9 for Upper Aquifer recharge into the Lower Aquifer. Based on the results of the investigation, septic system discharges from Cabrillo Estates appear to be the primary source of increasing $\text{NO}_3\text{-N}$ concentrations in Lower Aquifer groundwater produced by well LA8, although there are other potential sources.



ATTACHMENTS

Laboratory Results



May 25, 2021

Lab ID : CC 2181479-001
Customer ID : 8-514

Cleath-Harris Geologists

Attn: Spencer Harris
75 Zaca Lane
Suite 110
San Luis Obispo, CA 93401
Description : LA8 S & T #5
Project : S & T Nitrates Source

Sampled On : May 10, 2021-10:45
Sampled By : Andrea Berge
Received On : May 10, 2021-11:44
Matrix : Ground Water

Sample Result - Inorganic

Constituent	Result	PQL	Units	Note	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
Wet Chemistry								
Nitrate Nitrogen	7.4	0.2	mg/L		4500NO3F	05/11/21:205196	4500NO3F	05/11/21:206979

ND=Non-Detected. PQL=Practical Quantitation Limit. * PQL adjusted for dilution.



May 5, 2021

Lab ID : CC 2181321-002

Customer ID : 8-514

Cleath-Harris Geologists

Attn: Spencer Harris

75 Zaca Lane

Suite 110

San Luis Obispo, CA 93401

Description : LA9 (GSWC Cabrillo)

Project : S&T Notrates Source

Sampled On : April 29, 2021-11:10

Sampled By : Bryce Pfeifle

Received On : April 29, 2021-12:17

Matrix : Ground Water

Sample Result - Inorganic

Constituent	Result	PQL	Units	Note	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
Wet Chemistry								
Nitrate Nitrogen	6.3	0.2	mg/L		4500NO3F	04/30/21:204754	4500NO3F	04/30/21:206395

ND=Non-Detected. PQL=Practical Quantitation Limit. * PQL adjusted for dilution.

NITRATE SOURCE INVESTIGATION
S&T MUTUAL WATER COMPANY

CLEATH-HARRIS GEOLOGISTS

US GEOLOGICAL SURVEY
RESTON LABORATORY

ISOTOPE RESULTS (from Spreadsheets):

NITRATE (NO₃⁻) ANALYSES

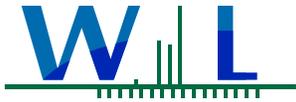
Lab ID: G-29030
Field ID: LA8 (S&T #5)
Delta N-15: 5.00 per mil
Collection Date: 5/10/21
Delta O-18: 1.14 per mil

Lab ID: G-29029
Field ID: LA9 (GSWC Cabrillo)
Collection Date: 4/29/21
Delta N-15: 5.56 per mil
Delta O-18: 2.00 per mil

GROUNDWATER (H₂O) ANALYSES

Our Lab ID: W-17086
Field ID: LA8 (S&T #5)
Collection Date: 5/10/21
Delta 2H: -35.81 per mil
Delta O-18: -5.83 per mil

Lab ID: W-17086
Field ID: LA9 (GSWC Cabrillo)
Collection Date: 4/29/21
Delta 2H: -35.46 per mil
Delta O-18: -5.89 per mil



WECK LABORATORIES, INC.

Cleath-Harris Geologists, Inc.
75 Zaca Lane, Suite 110
San Luis Obispo, CA 93401

Certificate of Analysis

FINAL REPORT

Project Number: S&T Nitrate Source Study

Reported:

07/01/2021 14:48

Project Manager: Spencer Harris

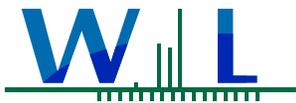
Sample Results

Sample: LA8 (S&T #5)

Sampled: 05/10/21 10:45 by Andrea Berge

1E11063-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
PPCPs - Pharmaceuticals by LC/MSMS-ESI+						
Method: EPA 1694M-ESI+		Instr: LCMS03				
Batch ID: W1E1018		Preparation: EPA 3535/SPE		Prepared: 05/19/21 09:35		Analyst: jna
Sucralose	ND	20	ng/l	1	05/27/21	



WECK LABORATORIES, INC.

Cleath-Harris Geologists, Inc.
75 Zaca Lane, Suite 110
San Luis Obispo, CA 93401

Certificate of Analysis

FINAL REPORT

Project Number: S&T Nitrate Source

Reported:

07/01/2021 15:45

Project Manager: Spencer Harris

Sample Results

Sample: L9 (GSWC Cabrillo)
1D30058-02 (Water)

Sampled: 04/29/21 11:10 by Bryce Pfeifle

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
PPCPs - Pharmaceuticals by LC/MSMS-ESI+						
Method: EPA 1694M-ESI+		Instr: LCMS03				
Batch ID: W1E1018		Preparation: EPA 3535/SPE		Prepared: 05/19/21 09:35		Analyst: jna
Sucralose	ND	20	ng/l	1	06/09/21	

Cleath-Harris Geologists, Inc.
75 Zaca Lane, Suite 110
San Luis Obispo, CA 93401
(805) 543-1413



October 17, 2022

Los Osos Basin Management Committee
c/o Mr. Daniel Heimel, P.E.
Confluence Engineering Solutions, Inc.
P.O. Box 7098
Los Osos, CA 93412

SUBJECT: Proposal for Phase 2 Nitrate Source Investigation at Lower Aquifer well LA8, Los Osos Groundwater Basin.

Dear Mr. Heimel:

As requested by S&T Mutual Water Company (S&T), Cleath-Harris Geologists (CHG) proposes to perform additional investigation into the source of nitrates in groundwater produced by S&T water supply well LA8. The purpose of the additional investigation is to refine the assumptions used for nitrate loading to groundwater from horse stables, and to perform additional water quality testing per discussion with the Regional Water Quality Control Board. This proposal for hydrogeologic services includes a brief background, scope of work, schedule, and estimated cost.

BACKGROUND

LA8 is a Lower Aquifer Zone D well located in the Western Area of the basin and constructed in 1999. Nitrate concentrations in groundwater produced by LA8 (and nearby well LA9) have been increasing over time. Unless this trend changes, nitrate concentrations are projected to exceed the drinking water standard at LA8 within the next 10-20 years.

A nitrate source investigation was previously conducted by CHG in 2021. The investigation concluded that septic system discharges from Cabrillo Estates appear to be the primary contributor to the trend of increasing nitrate concentrations in groundwater at LA8. Results of the investigation were subsequently discussed with Regional Water Quality Control Board staff and, based on that discussion, a second phase (Phase 2) of the investigation was planned.

S&T staff resampled LA8 for Pharmaceuticals and Personal Care Products (PPCPs) in June 2022. The results of this resample will be included in the Phase 2 reporting.

SCOPE OF WORK

The following tasks are proposed to complete the scope of work:



- Review and update nitrate mass loading assumptions for the local horse stables, based on information provided by others on historical manure management practices.

The estimated nitrate loading to groundwater from horse stables (for comparison to other potential sources of nitrate loading) was based on the stated assumption that manure remained on-site under historical conditions. This assumption will be reviewed and updated as appropriate.

- Collect additional groundwater samples for analytical testing from LA8 (**S&T completed this portion of the scope of work in June 2022**) and LA9, and from an Upper Aquifer well in the vicinity of LA8. Constituents to be tested include nitrate-nitrogen, and Pharmaceuticals and Personal Care Products (PPCP POS and PPCP NEG tests).

Additional water quality testing to evaluate wastewater influence at LA8 is recommended due to the lack of sucralose detection in the first phase of investigation. Literature indicates Acesulfame K is an artificial sweetener that is generally reported to be environmentally persistent and is less susceptible to microbial degradation compared to other sweeteners, including sucralose. Water quality testing at an Upper Aquifer well in the vicinity of LA8 can provide documentation and support for associating the source of nitrate concentrations at LA8 with the Upper Aquifer and a local wastewater influence.

CHG also reviewed the results of Upper Aquifer water quality testing in Los Osos (Task 3 - Los Osos Upper Aquifer Water Quality Characterization, June 2006) which identified carbamazepine (anticonvulsant, detected in three out of five wells tested) and sulfamethoxazole (antibiotic, detected in five out of five wells tested) as locally persistent contaminants of emerging concern (CECs) associated with septic discharges. The PPCP suite includes these two CEC's, along with others, some of which have also been found to persist in groundwater and which were not part of the 2006 Upper Aquifer study (e.g. organophosphates TCEP and TCPP).

- Prepare a draft report updating the nitrate source investigation to include the results of the additional investigation tasks, with interpretation. Address any comments and prepare final report.

SCHEDULE

CHG estimates the updated draft report can be completed within three months of proposal acceptance, provided access is available for groundwater sampling at the Upper Aquifer well within 2-3 weeks of authorization. The final report would be available approximately two weeks following receipt of comments on the draft.



FEES AND CONDITIONS

CHG proposes to perform the above scope of work on an hourly rate plus expenses basis in accordance with the hourly rates schedule and attached terms of fees and conditions. The estimated cost for hydrogeologic services to complete the scope of work is estimated at \$6,000. The estimated cost for laboratory analytical services for water samples collected from the Upper Aquifer well, including shipping, is \$2,500; total cost for the nitrate source investigation is estimated to be **\$8,500**.

SCHEDULE OF HOURLY RATES

Principal Hydrogeologist	\$187
Senior Hydrogeologist	\$173
Project Geologist	\$157
Environmental Scientist	\$140
GIS Specialist	\$140
Staff Geologist II	\$140
Staff Geologist I	\$125

EXPENSES

Mileage	\$0.70/mile
Other expenses at cost plus 10 percent handling	

AGREEMENT

If the above scope of work and fees and conditions for CHG services are acceptable, this proposal will serve as the basis for agreement.

Respectfully submitted,

CLEATH-HARRIS GEOLOGISTS, INC.

Spencer J. Harris, President

attachment



TERMS OF FEES AND CONDITIONS

1. Invoices will be submitted monthly. The invoice is due and payable upon receipt.
2. In order to defray carrying charges resulting from delayed payments, simple interest at the rate of ten percent (10%) per annum (but not to exceed the maximum rate allowed by law) will be added to the unpaid balance of each invoice. The interest period shall commence 30 days after date of original invoice and shall terminate upon date of payment. Payments will be first credited to interest and then to principle. No interest charge would be added during the initial 30 day period following date of invoice.
3. The fee for services will be based on current hourly rates for specific classifications and expenses. Hourly rates and expenses included in the attached schedule are reevaluated on January 1 and July 1 of each year.
4. Documents including tracings, maps, and other original documents as instruments of service are and shall remain properties of the consultant except where by law or precedent these documents become public property.
5. If any portion of the work is terminated by the client, then the provisions of this Schedule of Fees and Conditions in regard to compensation and payment shall apply insofar as possible to that portion of the work not terminated or abandoned. If said termination occurs prior to completion of any phase of the project, the fee for services performed during such phase shall be based on the consultant's reasonable estimate of the portion of such phase completed prior to said termination, plus a reasonable amount to reimburse consultant for termination costs.
6. If either party becomes involved in litigation arising out of this contract or the performance thereof, the court in such litigation shall award reasonable costs and expenses, including attorney's fees, to the party justly entitled thereto.
7. All of the terms, conditions and provisions hereof shall inure to the benefit of and be binding upon the parties hereto and their respective successors and assigns, provided, however, that no assignment of the contract shall be made without written consent of the parties to the agreement.

TO: Los Osos Basin Management Committee

FROM: Dan Heimerl, Executive Director

DATE: October 19, 2022

SUBJECT: Item 9c – Funding & Organization Study Follow-Up

Recommendations

Receive requested follow-up information on cost, timing and decision points for establishing a more formal governance and funding structure for the BMC.

Discussion

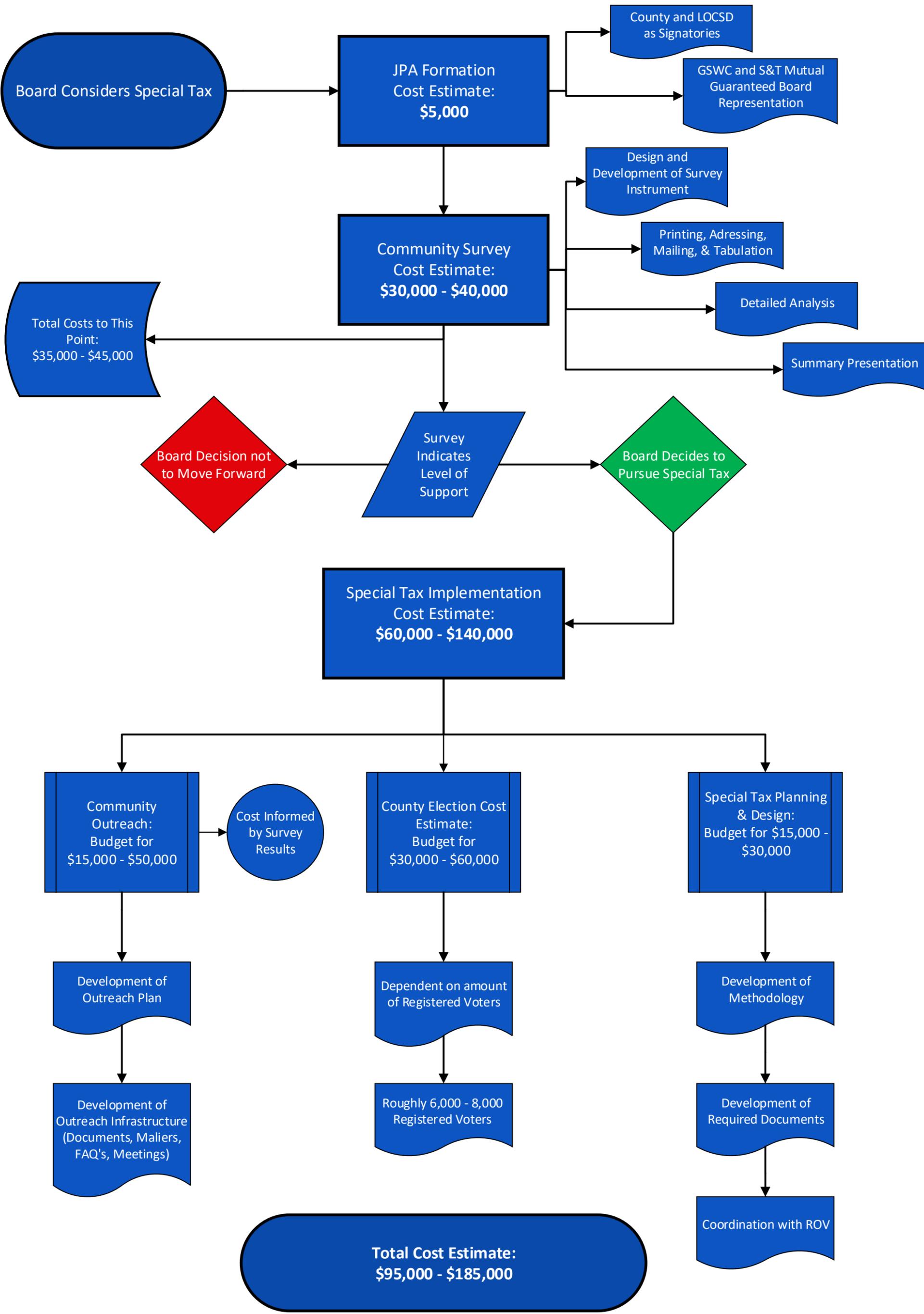
It was envisioned in the Stipulated Judgement that a formal funding mechanisms (e.g. Special Tax, Zone of Benefit, etc.) would be established to fund the administrative or monitoring and management activities of the Basin Management Committee (BMC). However, to-date there has not been a formal funding mechanism established and the BMC is funded through contributions from each of the parties. To assist in better understanding the alternatives and process for establishing a more formal governance and funding structure, the BMC retained the SCI Consulting Group (SCI) to prepare an updated evaluation for the different organizational and funding options that would be available to the BMC. SCI additionally developed a financial model to evaluate the impact of the different funding mechanisms on the groundwater users within the Los Osos Groundwater Basin (Basin) (e.g. evaluating the number and types of parcels, wells, water use and other related characteristics and the magnitude of fee or assessment that would be required to fund ongoing monitoring and management activities and/or construction and operation of Basin Plan Programs).

Through close coordination with BMC Staff and BMC Party Staff, SCI completed their funding options evaluation and prepared a draft Technical Memorandum (TM) that describes the available funding options and includes preliminary funding models. The draft TM was shared with the BMC at the July 27, 2022 Meeting and the BMC requested that Staff return with additional information on the BMC's options for moving forward with the recommendations in the TM. BMC Staff worked with SCI to develop a Work Plan and Budget to assist the BMC in understanding the key decision points, timeline and costs for establishing a more formal organizational and funding structure and that information is provided as an attachment for the BMC's consideration.

Attachments

BMC Joint Powers Authority/Special Tax Flow Chart

Los Osos Basin Management Committe - JPA/Special Tax Flow Chart



TO: Los Osos Basin Management Committee

FROM: Dan Heimerl, Executive Director

DATE: October 19, 2022

SUBJECT: Item 9d – Draft Calendar Year 2023 Budget and Water Recycling Funding Program Facilities Planning Study Grant

Recommendation

Receive information on potential items for BMC Calendar Year (CY) 2023 Budget and provide direction to staff for how to proceed with the CY 2023 Budget and the Water Recycling Funding Program Facilities Planning Study Grant.

Discussion

As outlined in the Basin Management Committee (BMC) Rules and Regulations, the BMC is directed to adopt the annual budget for the following year at the first Basin Management Committee Meeting following December 1st of the current year.

To assist the BMC in preparation for adopting a budget for Calendar Year (CY) 2023, a preliminary CY 2023 Budget has been provided for the BMC's review and input. It is anticipated that the Final CY 2023 BMC Budget will be brought back to the BMC for consideration at the November or December 2022 BMC Meeting.

In addition to the Baseline Service (Budget Items 1-6), there are additional items described in the following table for consideration by the BMC for inclusion in the CY 2023 BMC Budget.

Potential CY 2023 BMC Budget Item	Anticipated Costs	Description
New "Skyline" Monitoring Well	\$85,000	Construction of a new monitoring well on Skyline Drive to replace the LA 10 (Rosina Well) in the Chloride Metric. The National Estuary Program budgeted \$75k in Fiscal Year 2023 (10/1/22 - 9/30/2023) to provide funding support to the BMC for the construction of a new Monitoring Well. \$160k is estimated to be sufficient budget to complete the project.
Los Osos Creek Stream Gage Rating Curve	\$17,000	Development of a rating curve for the Los Osos Creek Stream Gage to better quantify the amount of water flowing in Los Osos Creek. Currently there is no rating curve for the Los Osos Creek gage and an improved understanding of flow rates in the creek is an essential component for the development of the transient groundwater model.
Funding and Organizational Study Polling	\$40,000	Design, printing, distribution and analysis of a survey to assess the community's support for a Special Tax or other funding mechanism to fund BMC Monitoring/Management and implementation of Basin Plan Programs.
Lower Aquifer Well Modifications (LA 16)	\$33,382	Modifications to LA 16 (LOVR Production Well) to improve ability to monitor Zone E of the Lower Aquifer
Lower Aquifer Well Modifications (LA 14)	\$44,707	Modifications to LA 14 (Palisades Monitoring Well) to improve ability to monitor Zone E of the Lower Aquifer

BMC Staff prepared a proposed CY 2023 BMC Budget for the BMC’s consideration and it is included as Attachment 1. The proposed budget would allow for the construction of a new monitoring well, development of a rating curve for the Los Osos Creek Stream Gage (key input for the Transient Model) and provide sufficient match funding to request an additional \$50k in grant funding for the Water Recycling Funding Program Facilities Planning Study. BMC staff requests that the BMC review the potential available initiatives and provide direction to Staff regarding how to proceed with the development of the CY 2023 BMC Budget.

Historic BMC approved budgets are provided in the table below for reference.

Historic BMC Budget Summary

Calendar Year	Budget	Budget w/ Contingency	Notes
2016	\$286,000	\$314,600	\$120k for Funding measure including initial feasibility report, final report and Prop 218 process
2017	\$264,000	\$290,400	\$100k for Funding measure including Prop 218 process
2018	\$268,000	\$294,800	\$115k for Cuesta by Sea (Lupine) Monitoring Well
2019	\$319,700	\$335,685	\$115k for Cuesta by Sea (Lupine) Monitoring Well
2020	\$175,500	\$193,050	Baseline Budget Only
2021	\$285,500	\$314,050	Updated Sustainable Yield Estimate, Basin Metric Review, Funding & Organization Study, Implementation Initiative Evaluation
2022	\$280,500	\$308,550	BMC Legal Counsel, Transient Model Peer Review, Lower Aquifer Monitoring Improvements, LO Creek Stream Gage Rating Curve

Water Recycling Funding Program Facilities Planning Study Grant

The Los Osos Community Services District (LOCSO) submitted an application on behalf of the BMC for a WRFPS grant to develop a transient groundwater model and analyze recycled water and supplemental water projects to improve the sustainability of the Los Osos Basin (WRFPS Study). The LOCSO was recently contacted by the State Water Resources Control Board (SWRCB) representatives asking if they would like to resubmit their application for a larger grant amount. The SWRCB is increasing the grant award amount from \$150k to \$250k. Accessing this additional grant funding would provide the BMC with an opportunity to improve the quality of the model and further analyze recycled water and other supplemental water supply opportunities.

BMC Staff is recommending that the BMC/LOCSO modify its grant application to request additional grant funding. A breakdown of the originally submitted and the proposed modified budget for the WRFPS Study is shown in the table below. The proposed modified budget would leverage funding approved by the BMC for other BMC initiatives to match the additional grant funds request. If approved by the BMC, BMC Staff will submit the proposed modified budget for the WRFPS Study to the SWRCB Staff for their review and consideration.

WRFP Study Scope	Description	Initial Fee Estimate	Update Fee Estimate
Project Management	Project Team Meetings, Schedule Management, Invoicing, Technical Advisory Committee Coordination	\$ 20,000	\$ 20,000
Transient Model	Development and calibration of a Transient Groundwater Model to assist with basin understanding, predictive modeling, Recycled Water and Basin Plan project implementation analysis, and cost/benefit evaluations for future projects	\$ 150,000	\$ 175,000
Scenario Analysis	Utilization of transient model to evaluate benefits of implementing Recycled Water, Basin Plan programs and other water resource management actions	\$ 50,000	\$ 65,000
Model Development Peer Review	3rd Party Hydrogeologist review of development of the model, calibration and scenario analysis	\$ 30,000	\$ 30,000
Supplemental Supply Alternatives Evaluation	Preliminary engineering analysis and development of updated costs estimates for implementing Recycled Water, Basin Plan programs and other water resource management actions	\$ 50,000	\$ 60,000
Report Development	Development of WRFP Study Report for submission to Water Recycling Funding Program	\$ 30,000	\$ 30,000
Los Osos Basin Well Database (Already approved and funded by the BMC)	GIS Database of well in the Los Osos Basin		\$ 20,000
Total		\$ 330,000	\$ 400,000
Anticipated County Funding Contribution		\$ 150,000	\$ 150,000
Anticipated BMC Funding Contribution		\$ 30,000	\$ 50,000
Anticipated WRFP Grant Contribution		\$ 150,000	\$ 200,000

Attachments

Draft Calendar Year 2023 BMC Budget

