

**Call and Notice of Special Meeting of Borrego Springs Watermaster Board**

The undersigned Chairperson of the Borrego Springs Watermaster Board of Directors does hereby call and set a Special Meeting of that Board to occur on February 2, 2022 at 4:00 pm.

The purpose of the meeting is to discuss the Proposition 68 grant application and take action as needed on any Project Review Committee questions or requests of the Watermaster on its submitted projects. The final agenda for the Special Meeting and the direction for the public to access the meeting will be sent to the Watermaster distribution list and posted to the Watermaster website (<https://borregospringswatermaster.com>) at least 24 hours in advance of the meeting.

Dated: 1/31/22



David Duncan, Chairperson  
Borrego Springs Watermaster Board

**Borrego Springs Watermaster  
Special Board Meeting  
February 2, 2022 @ 4:00 p.m.**

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**Instructions for Public Comment – Special Meetings**

The public may address the Board on items that are included on the meeting agenda.

To address the Board on items that are included on the meeting agenda, the Board Chairperson will call for public comments immediately following the agenda item's staff report presentation and prior to Board discussion.

**AGENDA**

- I. Call to Order
- II. Pledge of Allegiance
- III. Roll Call
- IV. Review, modification, and approval of Watermaster-proposed projects for Prop 68 Grant funding (see enclosed memorandum)
  - A. Overview of Watermaster project submissions and requests from the Grant Project Review Committee to
  - B. Public Comment – limited to 3 minutes per speaker
  - C. Board Discussion and action(s)
- V. Adjournment

**Borrego Springs Watermaster  
Board of Directors – Special Meeting  
FEBRUARY 2, 2022  
AGENDA ITEM IV**

**To:** Board of Directors  
**From:** Samantha Adams, Executive Director  
Andy Malone, Technical Consultant  
**Date:** January 31, 2022  
**Subject:** Review, modification, and approval of Watermaster-proposed projects for Prop 68 Grant funding

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<input checked="" type="checkbox"/> Recommended Action	<input type="checkbox"/> Provide Direction to Staff	<input type="checkbox"/> Information and Discussion
<input type="checkbox"/> Fiscal Impact	<input type="checkbox"/> Cost Estimate: \$	

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**Recommended Action(s)**

1. Provide direction to Watermaster staff on modifications to make to the Watermaster-proposed projects for Prop 68 Grant funding following the February 2, 2022 Project Review Committee meeting.
2. Approve the suite of Watermaster-proposed projects, with modifications, for submittal to the Prop 68 Grant Project Review Committee.
3. Provide any additional direction to Watermaster Staff and/or the Watermaster Project Review Committee members to guide decision making during the February 3, 2022 Project Review Committee meeting.

Fiscal Impact: None.

**Background and Previously Related Actions by the Board**

At its December 9, 2021 meeting, the Watermaster Board approved a scope of work and budget for Staff to prepare projects for submission under the Prop 68 SGMA implementation funding opportunity being administered by the CA Department of Water Resources (DWR)<sup>1</sup>. During the month of December, ad hoc meetings of the Watermaster’s Technical Advisory Committee (TAC) and Environmental Working Group (EWG) were held to prepare a list of projects for the Watermaster to submit for grant funding consideration.

On January 10, 2022, the Watermaster held a Special Board meeting to receive information from the Borrego Water District (BWD) on its plan and general steps to procure project submissions, form a

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<sup>1</sup> Although the scope of work and budget was approved at the December 9, 2021 meeting, approval to spend the full budget presented was not given until the January 13, 2022 Regular Board meeting.

Project Review Committee (PRC) to score and select projects for funding, and complete the grant application on behalf of the Borrego Springs Subbasin.

At its January 13, 2022 Regular meeting, Staff gave a presentation on the collaborative work performed to date to prepare project submissions, including an overview of projects that were being prepared by Staff and initial estimates of the project costs. At this regular meeting, the Board also took action to approve a letter for submission to the BWD to express the Board's desire to continue to work collaboratively with the BWD to secure the available \$7.6 million in grant funds for the benefit of the Basin and ask for cooperation in addressing certain requests to secure the Watermaster Board's full support, including representation on the PRC. The requests were based in stated principles that guide the foundations of the Watermaster's actions. Directors Jim Bennet (San Diego County), Mike Soley (Agriculture), and Shannon Smith (Recreation) were subsequently appointed to represent the Watermaster parties on the PRC.

### **Discussion**

On January 20, 2022, three project proposals prepared by Watermaster Staff were submitted to the BWD for review and consideration by the PRC:

- Monitoring, Reporting, and GMP Update for Sustainable Management in the Borrego Springs Subbasin (\$3,684,000 funding request)
- Biological Restoration of Fallowed Lands (\$755,340 funding request)
- Groundwater Dependent Ecosystems (GDE) Monitoring/Assessment Program (\$585,000 funding request)

The project submissions were not reviewed by the Watermaster Board prior to submission to the BWD and PRC due to the short schedule afforded by the DWR to prepare the grant application. The complete project submissions (including exhibits) are enclosed with this memo.

The BWD held a process orientation meeting for the PRC on January 21, 2022 and a project/process Q&A session on January 26, 2022. At the Q&A session, the PRC members discussed asked questions about the various project submissions. As an outcome of the meeting, the project proponents were given the opportunity to submit revised project submissions or provide supplementation information based on the questions and discussion during the Q&A session. Watermaster staff prepared and submitted a supplemental document comparing the approved funds in Watermaster's WY 2022 budget to the requested grant funding. The supplemental document is enclosed with this memo. No changes to the Watermaster projects were submitted to the BWD.

The PRC will hold its next two meetings on February 2, 2022 at 9:00 am to 12:00 pm and February 3, 2022 at 9:00 am to 12:00 pm. The general objectives of these next meetings are to review the project scoring, rank the projects, and compile the selected projects into a \$10 million (minimum) spending plan for submission with the grant application. As part of this meeting process the PRC may ask the project proponents to make changes to the project submissions to reduce costs, increase cost-share contributions, prioritize project components, or other changes. Given that the PRC requests could require substantive changes to the projects, it is necessary for the Watermaster Board to provide

direction to Watermaster staff and the Watermaster PRC members on the appropriate changes to make to the projects.

To ensure the Watermaster is able to address and respond to the PRC requests, the BWD has set up the PRC agenda to ensure that any requested changes to Watermaster projects are made during the February 2, 2022 PRC meeting so that the Board may consider action on these changes at the February 2, 2022 Special Board meeting and provide a final package of projects before the February 3, 2022 PRC meeting.

### **Next Steps**

Following the PRC meeting on February 2, 2022, Watermaster staff will compile a list of the requests made by the PRC and distribute the list to the Board and distribution list. At the 4:00 pm Special Board meeting, Staff will provide an overview of the Watermaster project submissions and the PRC requests. Based on this presentation, Staff recommends the Watermaster Board:

1. Provide direction to Watermaster staff on modifications to make to the Watermaster-proposed projects, based on the PRC requests, or any other reasons.
2. Take action to approve the suite of Watermaster-proposed projects, with modifications, for submittal to the PRC.
3. Provide any additional direction to Watermaster Staff and/or the Watermaster PRC members to guide decision making during the February 3, 2022 PRC meeting.

Following the Special meeting, Watermaster staff will follow the Board direction to ensure a revised package is submitted to the BWD and PRC by 8 am on February 3, 2022.

### **Enclosures**

Project Submission to PRC: *Monitoring, Reporting, and GMP Update for Sustainable Management in the Borrego Springs Subbasin*

Project Submission to PRC: *Biological Restoration of Fallowed Lands*

Project Submission to PRC: *Groundwater Dependent Ecosystems (GDE) Monitoring/Assessment Program*

Supplemental Information Submission to PRC

# Project Information Submittal Form

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**Project Submitter/Owner:** Borrego Springs Watermaster

**Project Name:** Monitoring, Reporting, and GMP Update for Sustainable Management in the Borrego Springs Subbasin

## Contact Information

**Name:** Samantha Adams, Executive Director

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## Project Summary

Please provide a summary of the Project description. Use as much space as you need.

A Stipulated Judgment (Judgment) adjudicating all groundwater rights in the Borrego Springs Subbasin (Basin) of the Borrego Valley Groundwater Basin was entered by the Orange County Superior Court of the State of California on April 8, 2021. The Judgment provides a physical solution for the perpetual management of the Basin to achieve sustainable groundwater management consistent with the substantive objectives of the SGMA and with reasonable and beneficial use pursuant to the California Constitution. The Judgment considered together with the Groundwater Management Plan (GMP; included as Exhibit 1 to the Judgment) constitutes the Physical Solution for the Basin and serves as the technical approach to achieve sustainability. The Physical Solution is intended to provide flexibility and adaptability to allow the Court to use existing and future technological, social, institutional, and economic options to maximize reasonable and beneficial water use in the Basin. The Physical Solution (e.g., the Judgment and GMP) was submitted to the California Department of Water Resources (DWR) as an Alternative to a GSP in June 2021.

The Basin has been, and presently is, in a condition of long-term overdraft and there is no viable means to remedy the overdraft through artificial recharge or other supply augmentation strategies under current Basin conditions and pumping quantities. Therefore, it is necessary to implement the Physical Solution, which provides for an immediate and aggressive rampdown of annual pumping over the next twenty years. The Court deemed that the evidence to support this conclusion is that the Physical Solution appropriately balances competing economic, social, and environmental considerations, and that it will result in the optimal management of the Basin. The Physical Solution will accelerate water-saving actions and provide flexibility and adaptability to maximize the reasonable and beneficial use of the Basin's groundwater and protect against undue economic harm to the Borrego Springs community.

To maintain a viable water supply for current and future beneficial uses and users of groundwater in the Basin, the sustainability goal of the Physical Solution is to ensure that by 2040, and thereafter, the Basin is operated within its Sustainable Yield and does not exhibit Undesirable Results. The Physical

Solution establishes that the initial Sustainable Yield of the Basin is 5,700 acre-feet per year (afy). The Rampdown of pumping is intended to reduce annual pumping from the Baseline Pumping Allocation (BPA) of 24,293 acre-feet per year (afy) to the Sustainable Yield by water year (WY) 2039/40. In each of the first five years of implementation (WY 2020/21 through WY 2024/25), the annual pumping allocation will be reduced by five percent of each pumpers' BPA. The amount and pace of the Rampdown after WY 2024/25 will be through a systematic process that adjusts the Rampdown rate after periodic redeterminations of the Sustainable Yield that consider new data and information obtained through implementation of the GMP. The first refined and specific estimate of the Sustainable Yield must be determined by the Watermaster by January 1, 2025 through a formal Technical Advisory Committee process based on the best available science including the use of the Borrego Valley Hydrologic Model (BVHM) and consideration of all sources of Basin replenishment and outflow. The five-year updates of the GMP are timed to follow each Sustainable Yield redetermination to ensure the plan can be adapted to the latest understanding of Basin conditions.

To support the sustainability goal of the Physical Solution, the GMP established minimum thresholds and measurable objectives for the following sustainability indicators determined to be a current and/or potential future Undesirable Result: chronic lowering of water levels, reductions of groundwater storage, and water-quality degradation. The GMP defines a comprehensive initial groundwater and surface-water monitoring program to collect the data and information needed to track Basin conditions relative to the minimum thresholds and measurable objectives. Additionally, the GMP also identifies data gaps that should be filled. The data gaps include:

- **Metered groundwater pumping.** The initial Sustainable Yield is based largely on estimates of historical pumping and could be improved through the metering of pumping at wells. The Physical Solution requires metering of all non-*de minimis* wells in the Basin and provides for the collection of meter reads of pumping volumes at appropriate frequency to support the update, calibration, and use of the BVHM. It also requires pumpers to perform annual accuracy testing to ensure the accurate calculation of groundwater pumping (Judgment Sections VI.A, IV.E.6).
- **Groundwater elevation.** The current monitoring network should be evaluated annually to ensure representative spatial distribution of wells and address loss of wells over time due to various factors. Construction of new monitoring wells should be considered in areas where data gaps can't be filled with existing wells. The GMP identified that, "multi-completion wells or well clusters screened at discrete intervals in the upper, middle, and lower aquifers would be required to determine the potentiometric surface by aquifer unit".
- **Groundwater quality.** There are limited contemporary data available for private wells located in the North and Central Management Areas of the Basin to delineate nitrate and TDS concentrations laterally and vertically in the upper aquifer. the GMP indicated that, "Multi-completion wells or depth discrete water quality samples would be required to better characterize water quality by aquifer zone and depth in the [Basin]." There are also potential threats to water quality posed by improperly abandoned wells. The Physical Solution addresses these issues as follows:
  - Water quality monitoring is essential to avoiding Undesirable Results and achieving sustainable groundwater management in the Basin. The Physical Solution provides for the development of a Water-Quality Monitoring Plan that can be implemented to characterize and track water-quality trends in the Basin and develop remedies for

significant and unreasonable changes in water quality under the water quality optimization Project and Management Action (Judgement Section VI.B). Construction of new monitoring wells should be considered in areas where data gaps can't be filled with existing wells.

- The Watermaster will cooperate with the County of San Diego in the enforcement of the well abandonment ordinance as improperly abandoned wells have the potential to provide a mitigation pathway of contaminants into the Basin (Judgement Section X.B).
- **Surface water flow.** The primary sources of natural recharge to the basin are mountain-block recharge and infiltration from ephemeral streams entering the Borrego Valley from the adjacent mountain watersheds. These sources of recharge were estimated using data from the regional Basin Characterization Model (BCM). The installation of stream gaging stations in Coyote Creek and other major drainages to the Basin could improve the BCM estimates of runoff to the basin.
- **Aquifer properties.** The results of BVHM calibration and validation indicate a slight bias of the model to underestimate hydraulic heads in certain areas. Aquifer stress testing at wells could provide site-specific and depth-specific estimates of hydraulic conductivity and storage parameters that could then be used to constrain future model calibration efforts and improve model accuracy.

In recognizing the critical role of monitoring and analyzing Basin conditions to ensure achievement of the sustainability goal, the Judgment provides for flexible, adaptive management that mandates the study, refinement, and improvement of the Sustainable Yield estimate based on the best available science, records, and data.

To effectively implement the Physical Solution, the Watermaster must meet regularly to make decisions and take actions to achieve sustainability. The update of the Sustainable Yield and GMP, including all the work performed to support these updates, is enabled by participatory and competent Basin governance through the appointment of a Watermaster Board representing diverse interests in the Basin, including municipal, agricultural, recreation, community, and County representatives. The Judgment prescribes an equitable and transparent decision-making process and provides for perpetual ongoing Court oversight to ensure compliance with the Judgment, to amend the Judgment if ever necessary, and to efficiently resolve conflicts. It also requires the formation of a Technical Advisory Committee (TAC) and an Environmental Working Group (EWG) to provide guidance to the Watermaster Board on subject matters within their purview.

The TAC's responsibilities include making recommendations based on best science and data collected regarding the Water Budget and the avoidance of undesirable results including, without limitation, information generated from BVHM model runs. TAC meetings are open to the public and are an important venue for public comment. Membership of the Technical Advisory Committee is open to experts hired by any Party holding BPA or the County and thus constitutes a diverse decision-making body. The TAC is responsible to endeavor to decide all matters by consensus.

All meetings of the Watermaster, including meetings of the Board, TAC, and EWG, are public outreach opportunities that provide for communication of Watermaster planned actions and a venue to receive public input prior to making decisions. Outreach to the community through these regular meetings is critical to maintain support for the mission of achieving sustainability. The Watermaster maintains a website and an interested stakeholder distribution list to advertise meetings, disseminate

important information, and call for input at Watermaster hearings that are required by the Judgment to be held prior to Board action on key decisions.

As evident by this summary, the implementation of a comprehensive program to monitor, analyze, and report on key hydrogeologic data is paramount to successfully achieving the sustainability goal of the Basin in a manner that complies with the Judgment and seeks input from the local community on a regular basis.

The proposed project for *Monitoring, Reporting, and GMP Update for Sustainable Management in the Borrego Springs Subbasin* is a comprehensive monitoring, analysis, data management and reporting program that will ensure the effective implementation of the pumping rampdown, including filling data gaps identified in the Judgment and GMP, and performing the required redetermination of the Sustainable Yield and GMP update due in 2025.

This project is made up of the following components:

- Task 1 - Groundwater Pumping Monitoring
- Task 2 - Groundwater Level Monitoring
- Task 3 - Groundwater Quality Monitoring
- Task 4 - Surface Water Flow Monitoring
- Task 5 - Construction of New Monitoring Facilities
- Task 6 - Identify and address improperly Abandoned Wells
- Task 7 - Maintain and enhance the Basin Data Management System
- Task 8 - Annual Reporting to DWR and the Court
- Task 9 - Redetermination of the Sustainable Yield by 2025
- Task 10 - Prepare the 2025 GMP Update.
- Task 11 - Stakeholder Outreach
- Task 12 - Project Management and Grant Reporting

The description of each component, including its major sub-tasks are described below.

**Task 1. Groundwater Pumping Monitoring.** The objective of this task to collect, compile, and manage all Basin pumping data to ensure successful compliance with the pumping rampdown. The subtasks include:

- Task 1a - Monthly meter reading and pumping calculations. This involves Watermaster contractors visiting wells with manual read meters to record meter readings, collecting self-reports of meter reads between Watermaster reading events, and downloading meter reads for wells with telemetry systems. Each month, data will be processed, checked for QA/QC, and loaded to Watermaster's Data Management System (DMS).
- Task 1b - Annual meter accuracy testing. This involves performing annual meter accuracy testing at all non-de minimis wells in the Basin. Upon completion of testing, reports will be reviewed, checked for QA/QC, and recorded. Letters requesting corrective action will be sent to any pumper with test results indicating that meters are not accurately reporting production.
- Task 1c - Outreach to existing and new de minimis pumpers to cooperate in pumping monitoring efforts, including collecting well data, and meter reading if applicable. There are

about 50 de minimis wells in the Basin. The Judgment requires Watermaster approval of construction of all new de minimis wells. Installation of meters is a condition of approval and Watermaster will perform semi-annual meter reads at the de minimis wells. Watermaster will also perform outreach to existing de minimis well owners to request voluntary cooperation in Watermaster's pumping and other groundwater monitoring programs.

**Task 2. Groundwater Level Monitoring.** The objective of this task is to implement a comprehensive groundwater-level monitoring program to track changes in Basin conditions (e.g., groundwater levels, storage, and flow directions) and the effectiveness of the Physical Solution. Subtasks include:

- Task 2a - Implement the existing and future expanded groundwater-level monitoring program. This involves semi-annual monitoring events to collect manual water level measurements and download pressure transducers with continuously-recording data-loggers. Following each field event, data will be processed, checked for QA/QC, and loaded to Watermaster's Data Management System (DMS). This task also provides for the purchase and installation of up to fifteen new pressure transducers.
- Task 2b - Expand Monitoring Network through Outreach. This involves performing outreach efforts to the DWR, the Parties, and others to obtain cooperation from well owners in expanding the groundwater-level monitoring network, visiting wells in the field to assess suitability for monitoring, and executing access agreements.
- Task 2c - Prepare monitoring well construction work plan. The Borrego Water District (BWD) and Watermaster are currently working cooperatively with the DWR Technical Support Services (TSS) staff to locate, design, drill, and construct one new multi-completion monitoring well in the North Management Area of the Basin. BWD in cooperation with the Watermaster presented proposed new monitoring well locations to the Watermaster's TAC and have elected to proceed with the TSS grant for one new well. During the well locating task, it was determined that additional monitoring wells will be necessary to replace aging wells and fill data gaps in the monitoring network. The workplan will include a well-siting study and technical specifications for construction of one new multi-depth monitoring well in an area with insufficient monitoring. The well-siting study in this Task 2c could also be designed to address gaps in the groundwater-quality monitoring network identified in Task 3b.
- Task 2d. Aquifer testing. This task would involve development of an aquifer testing work plan in conjunction with the TAC, the field work to perform the aquifer test, data analysis, and preparation of a draft and final report of results and recommendations.

**Task 3. Groundwater Quality Monitoring.** The objective of this task to implement a comprehensive groundwater-quality monitoring program to track changes in Basin conditions and evaluate the need for water quality optimization programs to achieve sustainability. Subtasks include:

- Task 3a - Implement the existing and future expanded groundwater-quality monitoring program. This involves semi-annual monitoring events to collect water quality grab samples at wells. The water samples will be analyzed for constituents identified in the GMP, including arsenic, fluoride, nitrate, sulfate, TDS, and all other major anions and cations. Following each field event, data will be processed, checked for QA/QC, and loaded to Watermaster's DMS.
- Task 3b - Prepare Water-Quality Monitoring Plan (WQMP). The purpose of the plan is to enhance the monitoring network and program. The steps to develop the WQMP include: (i) define the questions that the monitoring plan should answer to comply with the Judgment; (ii) identify the gaps in the interim groundwater-quality monitoring program that should be filled

to comply with the Judgment; and (iii) describe recommended steps and costs to fill the data gaps.

**Task 4. Surface Water Flow Monitoring.** The objective of this task to implement a surface water monitoring program to collect data that can be used in the BVHM to assess Basin recharge and the Sustainable Yield. In the first year of the grant period, this task will involve the current flow monitoring on Coyote Creek described in the GMP and will be expanded after completion of the surface-water discharge station described in Task 5b. The expanded monitoring is described in Exhibit A (Task 5 and Optional Task).

**Task 5. Construction of New Monitoring Facilities.** The objective of this task to design and construct monitoring facilities to fill data gaps identified in the GMP and/or by the TAC and EWG. This work includes acquiring permits, performing CEQA, preparing technical specifications, preparing bid documents, performing construction and oversight, and preparation of facility completion reports. Subtasks include:

- Task 5a. Construct multi- completion monitoring well. This project component provides for design, drilling, and construction of a multi-completion monitoring well pursuant to the workplan completed in Task 2c.
- Task 5b. Construct and equip a surface-water discharge monitoring station in Coyote Creek. Approximately 65% of the surface water inflow to the Borrego Valley comes from Coyote Creek, and the GMP identified monitoring of these flows as a data gap. This project involves installation of a camera (ECAM or equivalent) and staff gauge, surveys, establishing rating curves, and repairs/maintenance of the facility in the event of disturbances during or after high-discharge events. The detailed project approach is described in Exhibit A (Tasks 1 through 4).
- Task 5c. Construct and equip a shallow dual-nested monitoring well facility within the potential groundwater dependent ecosystem near the Borrego Sink. This monitoring well will only be constructed pursuant to a recommendation from the EWG and direction of the Watermaster Board and is expected to support an investigation of rooting-depth and source-water of the Mesquite Bosque.
- Task 5d. Construct and equip a surface-water monitoring station within the potential groundwater dependent ecosystem near the Borrego Sink. This monitoring site will only be constructed pursuant to a recommendation from the EWG and is expected to support an investigation of rooting-depth and source-water of the Mesquite Bosque.

**Task 6. Identify and Address Improperly Abandoned Wells.** The GMP identified abandoned wells as a potential Project and Management Action (PMA). The objective of this task to identify improperly abandoned wells, and if accessible through an easement or other access agreement, the wells will either be properly abandoned or converted to a monitoring well. Subtasks include:

- Task 6a - Outreach. Develop outreach tools to identify improperly abandoned wells and perform outreach to determine access.
- Task 6b - Well Abandonment. Properly abandon up to 3 inactive production wells. An Engineers Estimate was obtained to properly abandon a 16-inch diameter, 500 feet deep well in 2018 dollars in accordance with DWR Bulletin 74-81 and 74-90 (i.e. California Well Standards). It is \$33,500 assuming the well needs to be pressure grouted with cement and

prevailing wage applies. For each additional foot of well depth an additional \$41 should be added to the cost. Costs for narrower diameter wells would be less expensive. The Engineers Estimate to pull a turbine pump installed to a depth up to 500 feet is \$6,800 assuming prevailing wage applies. Thus, the Engineers Estimate to properly destroy wells is approximately \$40,300 per well assuming prevailing wage applies.

- Task 6c - Conversion of Abandoned Wells to Monitoring Wells. Conversion of up to 2 inactive production wells. The task would provide for the removal of the existing pumping equipment, remediation of any down-well turbine fluid, collection of one water quality sample for general minerals and metals, and installation of a pressure transducer to monitor groundwater levels at a sub-daily frequency.

**Task 7. Maintain and Enhance the Data Management System.** The objective of this task to maintain and improve the Watermaster's Data Management System for efficient reporting in compliance with the Judgment and Grant requirements. As part of this task, Watermaster will develop specific reporting tools to efficiently report data to CASGEM, CEDEN, GAMA, or other required platforms. Additional tools may be developed to improve the efficiency of data analysis and report of production, water level, and water quality data.

**Task 8. Annual Reporting to DWR and the Court.** The objective of this task is to prepare the combined annual report of Basin conditions and the Physical Solution implementation progress. The annual report will be prepared pursuant to the requirements of CCR Section 356.2, Section IV.E(5)(b) of the Judgment, and Section 4.2.8 of the Watermaster Rules and Regulations. Each year, a draft report will be reviewed at a public hearing to receive comments and the final report will be completed and submitted to the Court and the DWR no later than April 1<sup>st</sup> following the end of the calendar year. A detailed record of public comments will be included in the final report. Over the grant period, Annual Reports will be prepared for WY 2021 (due April 1, 2022), WY 2022 (due April 1, 2023), WY 2023 (due April 1, 2024), and WY 2024 (due April 1, 2025).

**Task 9 - Redetermination of the Sustainable Yield by 2025.** The Borrego Valley Hydrologic Model (BVHM) and its supporting tools, the Basin Characterization Model (BCM) and the Farm Process (FMP), were originally developed by the USGS<sup>1</sup> and used to estimate of the Sustainable Yield of the Borrego Springs Subbasin (Subbasin) and to evaluate future scenarios of "Rampdown" in groundwater pumping that would eliminate conditions of overdraft. The BVHM was updated by Dudek<sup>2</sup> to characterize the water budget and determine the Sustainable Yield of 5,700 acre-feet per year (afy) which was incorporated into the Judgment. The USGS and Dudek identified several areas of model uncertainty, including private pumping estimates, aquifer properties, and streambed recharge.

Section III.F. of the Judgment states:

- During the first four Water Years (2020-2021 to 2023-2024), the Watermaster will collect additional data and refine the BVHM, using model runs to update the determination of Sustainable Yield in collaboration with the Technical Advisory Committee (TAC).

<sup>1</sup> USGS. 2015. [Hydrogeology, Hydrologic Effects of Development, and Simulation of Groundwater Flow in the Borrego Valley, San Diego County, California.](#)

<sup>2</sup> Dudek. 2019. [Update to USGS Borrego Valley Hydrologic Model for the Borrego Valley GSA \(draft final\).](#)

- The choice to perform specific technical tasks will be informed by considering the value and importance of the work to attain a better understanding of the Basin and the goal of advancing Sustainable Groundwater Management in comparison to the cost of the work.

In WY 2021, the TAC and Watermaster Board agreed upon an incremental approach to updating the BVHM and using it to redetermine the Sustainable Yield. This approach focused on improving model estimates of historical and future pumping, and that other model refinements and model recalibration should be performed for future redeterminations of Sustainable Yield after 2025.

The availability of SGM grant funding provides an opportunity for the Watermaster to perform a more comprehensive update to the BVHM to support the redetermination of Sustainable Yield by 2025. The proposed scope of work includes comprehensive model updates (e.g., updated model versions, model grids, FMP, etc.), model recalibration, development and implementation of a transparent process to use model projections to redetermine the Sustainable Yield, comprehensive reporting, and model documentation. This approach not only provides a more defensible and robust redetermination of Sustainable Yield in 2025, but also provides long-term benefits to the Watermaster Parties by avoiding future expenses associated with model updates and recalibrations.

The Project will occur over an approximate three-year period concluding by June 30, 2025. The major tasks and subtasks are:

- Task 9a: Prepare the Redetermination of the Sustainable Yield Workplan. The Watermaster will prepare a Redetermination of the Sustainable Yield Workplan (Workplan) under the guidance of the TAC and the Watermaster Board. Subtasks include:
  - Using the project description, cost estimates, and schedule proposed in this grant application, Watermaster staff will prepare a draft Workplan. The Workplan will include a detailed description of the steps and costs to perform Tasks 2 through 6.
  - The TAC will provide written comments and suggested revisions to Watermaster staff.
  - Watermaster staff will finalize the draft Workplan based on feedback received from the TAC. The TAC will recommend that the Board adopt the Workplan and authorize grant funds to implement the Workplan.

The Watermaster's Technical Consultant has estimated the likely tasks and subtasks that will be included in the Workplan:

- Task 9b: Model Improvements
  - Refine the finite-difference grid of the BVHM. The model domain is currently defined by a finite-difference grid of uniform cells with each cell being 2,000-feet by 2,000-feet, or approximately 92 acres in area. This relatively coarse cell size is a model limitation. First, hydraulic heads calculated by the model are average values across each model cell. Therefore, model-calculated hydraulic heads can vary considerably from measured heads at specific wells within the cell, which can limit the ability of the model to calibrate to measured heads. Second, the Farm Process Version 3 (FMP3) used in the current model only allows one land use type per cell. Therefore, the coarseness of the model grid may overstate the water demands of certain land-use types, like golf courses, and, consequently, overestimate the amount of groundwater pumped to meet the water demand. The goal of this task is to refine the finite-difference grid of the BVHM to allow for a more accurate spatial representation of land use type and assist in

model recalibration. Subtasks include:

- Refine the discretization of aquifer parameters, such as hydraulic conductivity and specific yield, by splitting each model grid cell into several smaller grid cells. The original value of the larger grid cell will be assigned to the smaller grid cells.
- Rebuild the input files to the MODFLOW packages used by BVHM based on the newly refined grid, including the Flow and Head Boundary, Multi-Node Well 2, Time-Variant Specified Head, Streamflow-Routing, and Unsaturated Zone Flow packages.
- For the input files to FMP3, refine the discretization of the following data by splitting each model grid cell into several smaller grid cells: land use, historical precipitation, potential evapotranspiration, ground surface elevation, designation of farms, and soil types. Update the refined data of land use and farms to better represent the actual spatial extent of land use types.
- Upgrade the current MODFLOW-OWHM Version 1 (MF-OWHM1) model input files to MODFLOW-OWHM Version 2 (MF-OWHM2) model input files. MF-OWHM2 was released by the USGS in 2020 and includes a variety of improvements to all the MODFLOW packages and a complete redevelopment of the Farm Process Version 4 (FMP4). Updates to FMP4 include, but are not limited to, the ability to specify multiple land-use types (crops) within a model cell, the ability to specify additional demand types not associated with land use, a "sand" soil type and bare-soil or fallow land use option, and a complete redesign of the input structure for easy maintenance and calibration. MF-OWHM2 also includes additional features to facilitate easier model updates, faster execution, and better runtime-error messages and reporting. The goal of this task is to take advantage of the improvements and additional features that are included in MF-OWHM2. Since MF-OWHM2 has been designed to maintain backward compatibility with all packages except FMP4, the only major changes to model input files will be those associated with FMP4. This task includes the following subtasks:
  - Create a new FMP4 input file with the new input structure. While the input style of the file will be changed, the information contained in the file will be consistent with the existing data contained in the FMP3 input file.
  - Make any additional changes to model input files necessary to get the newly upgraded MF-OWHM2 model to run.
- Compare the results from the BVHM MF-OWHM1 model to the newly upgraded BVHM MF-OWHM2 model.
- The TAC will review the model results and provide comments and suggested revisions to Watermaster staff.
- Task 9c: Extend the model through September 2022. The simulation period of the current BVHM is from October 1929 through September 2016. The work proposed in this subtask would extend the model simulation period through September 2022, adding six years of data to the model. Subtasks include:
  - Collect the required model input data from October 2016 through September 2022. The required input data includes monthly precipitation, evapotranspiration and runoff data obtained from the Basin Characterization Model (BCM), land use data obtained

from aerial imagery, monthly municipal pumping from Borrego Water District, and the number of current septic systems.

- Extend the model input files from October 2016 through September 2022 using the data collected in Task 3a.
- Run the model.
- The TAC will review the model results and provide comments and suggested revisions to Watermaster staff.
- Task 9d: Conduct Model Recalibration. The aquifer properties in the current BVHM were calibrated using observed water levels from 1945 to 2010. The work proposed in this subtask would include extending the calibration period to include observed water levels from 1945 to 2022. Additionally, newly acquired metered pumping data from October 2020 through September 2022 will be used to calibrate the Farm Process to better estimate the water demands for the various crops and golf courses being irrigated. This will enhance the ability of the BVHM to better estimate historical and future pumping which is essential to future redeterminations of the Sustainable Yield of the Subbasin. Subtasks include:
  - Construct the input data files for PEST.
  - Use PEST to calibrate the model.
  - Prepare a draft Technical Memorandum (TM): Update and Recalibration of the BVHM. This TM will document the results from Tasks 2, 3, and 4.
  - Conduct a meeting with the TAC to review the draft TM. The TAC will provide written comments and suggested revisions to Watermaster staff.
  - Prepare final TM. Watermaster staff will finalize the draft TM based on feedback received from the TAC. This TM will eventually become a chapter in the final report prepared in Task 6.
- Task 9e: Redetermine the Sustainable Yield in 2025. Subtasks include:
  - Prepare a draft TM - Modeling Methods to Redetermine the Sustainable Yield. This TM will describe the process to develop and run projection scenarios, accounting for uncertainty in future pumping, land use changes, and climate change. The TM will also propose various options for interpreting the model results for the redetermination of the Sustainable Yield.
  - Conduct a meeting with the TAC to review the draft TM. The TAC will provide written comments and suggested revisions to Watermaster staff.
  - Prepare a final TM. Watermaster staff will finalize the draft TM based on feedback received from the TAC. The TAC will recommend that the Board adopt the process described in the TM and direct the TAC to proceed with the model simulations of the projection scenarios.
  - Run the model simulations pursuant to the process described in the TM.
  - Conduct a TAC meeting(s) to review the model results and the estimates of the Sustainable Yield. The TAC will provide written comments and suggested revisions to Watermaster staff.

- Task 9f: Prepare Final Report. The Watermaster will prepare a final technical report: Redetermination of the Sustainable Yield of the Borrego Springs Subbasin (2025). The report will include detailed documentation on the process and results of the model improvements, model extension, model recalibration, and use of the model to redetermine the Sustainable Yield. The technical report will include an appendix of detailed model documentation.

**Task 10. Prepare the 2025 GMP Update.** Pursuant to the Physical Solution, the Watermaster will evaluate its GMP at least every 5 years. The evaluation will include the elements of the annual reports and an assessment of the progress toward the sustainability goal. At a minimum, the 5-year evaluation will include the elements required Pursuant to CCR Section 356.4. the assessment will include the following components: current groundwater conditions; implementation progress on the pumping rampdown and other PMAs; evaluation and update (as appropriate) of plan elements such as undesirable results, minimum thresholds, management areas etc.; water budget review; sustainable yield, description of the monitoring network and data gaps; new information; enforcement actions, stakeholder outreach and coordination efforts, and plan amendments. The plan will be presented in a series of workshops for stakeholder input as part of the Watermaster's regular meeting process.

**Task 11. Stakeholder Outreach.** The objectives of this task are to facilitate public outreach and communications of Watermaster planned actions and provide a venue to receive public input prior to making Watermaster decisions. Outreach to the community through regular Watermaster meetings is critical to maintain support for the mission of achieving sustainability.

- Task 11a. Board Meetings. The Board will meet approximately ten times per year to conduct its decision-making process on the implementation of the Physical Solution and GMP. Detailed memos are prepared in support of each meeting on the subject matter and are posted to Watermaster's website and email list for distribution to interested stakeholders. The public is afforded an opportunity to provide comments to the Watermaster on items not on the agenda and on each agenda item. All public input is recorded in meeting minutes. During the grant period, the Watermaster will include a standing agenda item on implementation progress of grant activities. During the grant period the Board will meet 36 times, the budget assumes about two-thirds of these Board meetings will be related to outreach on the Project.
- Task 11b: TAC Meetings. The TAC meets approximately four times per year to review data, review Watermaster's technical activities described in the Judgment, and make recommendations to the Watermaster based on best science and data collected in support of sustainable management. Detailed memos are prepared in support of each meeting on the subject matter and are posted to Watermaster's for distribution to interested stakeholders. The key business of the TAC each year includes: discussion of the redetermination of Sustainable Yield (see Task 9), review of the Watermaster's pumping metering program, development and review of the WQMP, review of the groundwater and surface water monitoring programs. TAC meetings are working meetings critical to the consensus-based advancement of the monitoring and reporting tasks in this program and also represent a key venue for outreach to and input from interested Stakeholders. During the grant reporting period, the TAC will meet 15 times.
- Task 11c. Stakeholder Workshops and Open House. The Watermaster will hold up to two events per year to perform additional outreach to interested stakeholders in the Basin. The events are intended to be an open forum to present relevant information on the latest Watermaster and sustainable management activities and receive stakeholder input to report

to the Board. During the grant period, six Stakeholder Workshops will be held. The intent is to hold the workshops in-person, health and safety permitting. Virtual workshops will be held, if necessary.

- Task 11d. Maintain Website, Distribution List, and Respond to Stakeholder Inquiries. The Watermaster will maintain its website and an interested stakeholder distribution list to advertise meetings, disseminate important information, and call for input at Watermaster hearings that are required by the Judgment prior to Board action on key decisions.

**Task 12. Project Management and Grant Reporting.** Subtasks include:

- Task 12a. Project Management. The objective of this task is to perform monthly project management activities for the program, including coordinating work, tracking task schedules and budget, managing sub-consultants and vendors, reporting progress to the Watermaster Board, TAC and EWG, and taking actions as necessary to address schedule or budget challenges.
- Task 12b. Grant Management and Reporting. The objective of this task is to coordinate with the Borrego Water District to manage grant agreement including compliance with grant requirements, and preparation and submission of supporting grant documents and coordination with the Grantee, Borrego Water District. Prepare invoices including relevant supporting documentation for submittal to DWR via Borrego Water District. This task also includes administrative responsibilities associated with the project such as coordinating with partnering agencies and managing consultants/contractors.

**Describe the project location, current conditions, and the benefitting areas. Please attach, separately, a regional and Project map depicting the site(s) location, current conditions, and benefitting areas.**

The project is located in the Borrego Springs Subbasin (Basin) of the Borrego Valley Groundwater Basin. Exhibit B is a map of the general location of the Basin and Exhibit C is a map that shows the location of the Basin along with time-history charts of groundwater levels at key wells in the three Basin Management Areas (MAs): North, Central and South.

The Basin has been, and presently is, in a condition of long-term overdraft and there is no viable means to remedy the overdraft through artificial recharge or other supply augmentation strategy under current Basin conditions and pumping quantities. Therefore, it is necessary to implement the Physical Solution, which provides for an immediate and aggressive rampdown of annual pumping over the next twenty years. The Court deemed that the evidence to support its conclusion that the Physical Solution appropriately balances competing economic, social, and environmental considerations, and that it will result in the optimal management of the Basin. The Physical Solution will accelerate water-saving actions and provide flexibility and adaptability in order to maximize the reasonable and beneficial use of the Basin's Groundwater and protect against undue economic harm to the Borrego Springs community.

The entire Basin will benefit from the project as it endeavors to implement the key monitoring, analysis, and reporting efforts necessary to ensure the effective implementation of the pumping rampdown which is the cornerstone action in the Physical Solution to achieve sustainability by 2040.

**What is the nexus of the Project to the Sustainability Goal of the Borrego Springs Subbasin Groundwater Management Plan (GMP)? Is the Project listed in the GMP? How does the Project help achieve the goals of the GMP?**

The Judgment which adjudicates all groundwater rights in the Basin provides a physical solution for the perpetual management of the Basin to achieve sustainable groundwater management consistent with the substantive objectives of the SGMA and with reasonable and beneficial use pursuant to the California Constitution. The Judgment considered together with the Groundwater Management Plan (GMP; included as Exhibit 1 to the Judgment) constitutes the Physical Solution for the Basin and serves as the technical approach to achieve sustainability. The Physical Solution is intended to provide flexibility and adaptability to allow the Court to use existing and future technological, social, institutional, and economic options to maximize reasonable and beneficial water use in the Basin. The Physical Solution (e.g., the Judgment and GMP) was submitted to the California Department of Water Resources (DWR) as an Alternative to a GSP in June 2021. Please refer to the Project Description above for a more thorough description of the background and objectives of the Judgment and GMP.

The Project described herein is the implementation plan for the Judgment and GMP. Therefore, implementing the Project will ensure a viable water supply for current and future beneficial uses and users of groundwater in the Subbasin over the planning and implementation horizon of the GMP, and ensure that the Subbasin is operated within its Sustainable Yield and does not exhibit Undesirable Results as defined by California Water Code Section 10721(x).

**What are the specific goals and needs for the Project, and how will the project achieve the goals and meet the needs?**

The goals and needs of the project are to ensure that the Basin achieves its sustainability goal to operate at the sustainable yield by 2040. The implementation of the comprehensive program to monitor, analyze, and report on key hydrogeologic data as provided for by the Physical Solution is paramount to successfully achieving the sustainability goal of the Basin in a manner that complies with the Judgment and seeks input from the local community on a regular basis.

The proposed project for *Monitoring, Reporting, and GMP Update for Sustainable Management in the Borrego Springs Subbasin* is a comprehensive monitoring, analysis, data management and reporting program to that will ensure the effective implementation of the pumping rampdown, including filling data gaps identified in the Judgment and GMP, and performing the required redetermination of the Sustainable Yield and GMP update due in 2025.

The Watermaster is the responsible entity to develop, contract, and carry out Physical Solution activities to ensure this happens. The Board recognizes that some activities may best be implemented in coordination with the Borrego Water District (BWD) or other parties to achieve efficiencies, when doing so is consistent with the Judgment, Physical Solution and established Governance structure for decision making and approval. The Watermaster anticipates implementing components of this project in coordination with the BWD where appropriate to achieve efficiencies, stay on schedule, and obtain support for community outreach efforts.

**What are the quantifiable benefits of the Project (e.g., protect or enhance water quality, water conservation, enhanced understanding of the groundwater basin, etc.)? How will those benefits be quantified and evaluated?**

The benefits of the project are the development of the robust data sets needed to assess if the key elements of the Physical Solution are achieving the desired results including, but not limited to reductions in pumping, decreased rate of water level declines, water quality consistent with drinking water regulations, and refined estimation of water budget components. These benefits can be quantified in a multitude of ways by analyzing the datasets and quantifying changed basin conditions, such as:

- Demonstrating reductions in pumping through groundwater pumping monitoring
- Demonstrating groundwater level trends through groundwater level monitoring
- Demonstrating groundwater level trends through groundwater storage estimations
- Demonstrating groundwater quality trends through groundwater quality monitoring
- Demonstrating improved estimation of sustainable yield through model recalibration

**Please describe the communities served by the Project. Will the Project benefit an Underrepresented Community, a Disadvantaged Community (DAC), and/or a Severely Disadvantaged Community (SDAC)? If so, please provide a map.**

The Project serves the entire Basin including the community of Borrego Springs and the area classified as a SDAC. Exhibit D is a map of the Basin and the area defined as a SDAC.

- The community's water supply is solely dependent on the Basin. The Project ensures that the groundwater basin remains an affordable, high-quality source of water for the community in perpetuity.
- The Watermaster was officially formed in April 2021. Expenses to conduct Watermaster activities are relatively new costs that are ultimately funded by the residents and rate payers within the community. The grant funding will help offset the new costs and provide financial relief to the residents and rate payers.
- A primary driver of the economy in Borrego Springs is ecotourism associated with the Anza-Borrego State Park, dark and clear night skies, and the beautiful flora and fauna of the region. The Project will help maintain or enhance the physical and biological environment within the community, and thereby support economic activity within Borrego Springs.

**Will the Project or Component positively impact issues associated with small water systems or private shallow domestic wells (e.g., groundwater contamination vulnerability, drawdown, etc.)? If so, please provide justification such as water system maps or domestic well census results.**

The Judgment and the GMP addressed the future impacts on private shallow wells by accelerating pumping reductions as compared to what is required by SGMA. Subtasks that accelerate GMP tasks to fill in data gaps will reduce risks associated with water quality and shallow wells, as the Watermaster will have better data to manage the basin sustainably without Undesirable Results.

Does the Project address the needs of the State Water Board's SAFER Program, designed to ensure Californians who lack safe, adequate, and affordable drinking water receive it as quickly as possible, and that the water systems serving them establish sustainable solutions?

The Physical Solution addresses these issues as follows:

- Water quality monitoring is essential to avoiding undesirable results and achieving sustainable groundwater management in the Basin. The Physical Solution provides for the development of a water quality monitoring plan that will be implemented to characterize and track water quality trends in the basin and develop remedies for significant and unreasonable changes in quality under the water quality optimization PMA (Judgement Section VI.B). Construction of new monitoring wells should be considered in areas where data gaps can't be filled with existing wells.
- The Watermaster will cooperate with the County in the enforcement of the well abandonment ordinance as improperly abandoned wells have the potential to provide a mitigation pathway of contaminants into the Basin (Judgement Section X.B).

How does the Project address the Human Right to Water (AB 685 Section 106.3) which states that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes?

As of 2019, the Borrego Water District calculated the human right to water at under 400 afy.

The Physical Solution addresses the human right to water as follows:

- By achieving its sustainability goal, the Physical Solution is intended to protect the long-term beneficial uses and users of groundwater.
- Even after the period of the rampdown of groundwater pumping rights (2040), it is expected that groundwater availability for domestic uses will exceed the calculated human right to water.
- The Judgment allows for *de minimis* pumping (i.e. pumping less than 2 afy) by domestic users.
- Implementation of the Physical Solution explicitly requires ongoing evaluation of water quality and avoidance of undesirable water quality conditions.

Please describe how the project contributes to addressing the risks in the region to water supply and water infrastructure arising from climate change. If possible, please provide the amount of greenhouse gas emissions reduced and carbon sequestered resulting from the project.

The Physical Solution recognizes that climate change enhances the probability, magnitude, and periodicity of extreme precipitation events and that recharge over the 20-year GMP implementation period is an estimation. As such, the interim milestones for chronic lowering of groundwater levels will be closely monitored to determine whether the Basin is on track to achieve its sustainability goals. The Watermaster will annually review actual Basin groundwater extraction, historical and contemporary groundwater-level trends, changes in groundwater storage, and climatic condition (i.e., dry, normal, wet year/period) to determine whether metrics indicate the Basin is on track to achieve its sustainability goals.

The project does not include any measures to reduce greenhouse gas emissions or sequester carbon. However, there are no significant facilities required to achieve the pumping rampdown.

Fallowing could cause reduced carbon sequestration, but the EWG is exploring biological restoration of fallowed lands as a technique to mitigate this potential impact, among other impacts associated with fallowing.

## Work Plan

The Work Plan must contain descriptions of the anticipated tasks necessary to complete the project. Tasks should be organized by the five budget categories, as applicable: (a) Project Administration, (b) Planning/Design/Environmental, (c) Construction/Implementation, (d) Monitoring/Assessment, and (e) Interested Parties Outreach/Education. The Work Plan should also identify the anticipated deliverables for each task.

Add additional tasks and subtasks as needed to provide a detailed work plan. Some examples and suggested language have been provided.

### Budget Category (a): Project Administration

**Task 12. Project Management and Grant Reporting.** Subtasks include:

- Task 12a. Project Management
- Task 12b. Grant Management and Reporting

#### Deliverables:

- Invoices and necessary documentation.

### Budget Category (b): Planning/Design/Environmental

None

### Budget Category (c): Construction/Implementation

**Task 5. Construction of New Monitoring Facilities.** Subtasks include:

- Task 5a. Construct multi- completion monitoring well.
- Task 5b. Construct and equip a surface-water discharge monitoring station in Coyote Creek.
- Task 5c. Construct and equip a shallow duel-nested monitoring well facility within the potential groundwater dependent ecosystem near the Borrego Sink
- Task 5d. Construct and equip a surface-water monitoring station within the potential groundwater dependent ecosystem near the Borrego Sink.

#### Deliverables:

- CEQA determinations and permits
- Well technical specifications
- Well completion reports (draft and final)
- Surface water monitoring station design and completion report

**Task 6. Identify and Address Improperly Abandoned Wells.** Subtasks include:

- Task 6a - Outreach.
- Task 6b - Well Abandonment

- Task 6c - Conversion of Abandoned Wells to Monitoring Wells.

**Deliverables:**

- Documentation of proper abandonment
- Documentation of conversion to monitoring wells

**Budget Category (d): Monitoring/Assessment****Task 1. Groundwater Pumping Monitoring.** Subtasks include:

- Task 1a - Monthly meter reading and pumping calculations.
- Task 1b - Annual meter accuracy testing.
- Task 1c - Outreach to existing and new de minimis pumpers to cooperate in pumping monitoring efforts, including collecting well data, and meter reading if applicable.

**Deliverables:**

- Semi-annual monitoring summary reports
- Annual water rights accounting report

**Task 2 - Groundwater Level Monitoring.** Subtasks include:

- Task 1a - Monthly meter reading and pumping calculations.
- Task 2b - Expand Monitoring Network through Outreach.
- Task 2c - Prepare monitoring well construction work plan.
- Task 2d - Aquifer testing

**Deliverables:**

- Data delivered to CEDEN, GAMA and other platforms requested by DWR
- Semi-annual monitoring summary reports
- Draft and final monitoring well construction work plan
- Draft and final aquifer testing work plan
- Draft and final aquifer testing report

**Task 3 - Groundwater Quality Monitoring.** Subtasks include:

- Task 3a - Implement the existing and future expanded groundwater-quality monitoring program.
- Task 3b - Prepare Water-Quality Monitoring Plan (WQMP).

**Deliverables:**

- Data delivered to CEDEN, GAMA and other platforms requested by DWR

- Semi-annual monitoring summary reports
- Draft and final WQMP

**Task 4 - Surface Water Flow Monitoring.** The objective of this task to implement a surface water monitoring program to collect data that can be used in the BVHM to assess Basin recharge and the Sustainable Yield. In the first year of the grant period, this task will involve the current flow monitoring on Coyote Creek described in the GMP and will be expanded after completion of the surface-water discharge station described in Task 5b.

**Deliverables:**

- Data delivered to CEDEN, GAMA and other platforms requested by DWR

**Task 7. Maintain and Enhance the Data Management System.** The objective of this task to maintain and improve the Watermaster's Data Management System for efficient reporting in compliance with Judgment and Grant requirements. As part of this task, Watermaster will develop specific reporting tools to efficiently report data to CASGEM, CEDEN, GAMA, or other required platforms. Additional tools may be developed to improve the efficiency of data analysis and report of production, water level, and water quality data.

**Deliverables:**

- Data delivered to CASGEM, CEDEN, GAMA and other platforms requested by DWR

**Task 8. Annual Reporting to DWR and the Court.** This task is to prepare the four annual reports that are due to the DWR and Court during the grant period

**Deliverables:**

- Draft and Final Annual Reports for WY 2021, 2022, 2023, and 2024.

**Task 9. Redetermination of the Sustainable Yield by 2025.** Perform a comprehensive update to the BVHM to support the redetermination of Sustainable Yield by 2025. Subtasks include:

- Task 9a: Prepare the Redetermination of the Sustainable Yield Workplan
- Task 9b: Model Improvements
- Task 9c: Extend the model through September 2022
- Task 9d: Conduct Model Recalibration
- Task 9e: Redetermine the Sustainable Yield in 2025
- Task 9f: Prepare Final Report

**Deliverables:**

The following draft and final TMs and reports:

- Redetermination of the Sustainable Yield Workplan

- Update and Recalibration of the BVHM
- Modeling Methods to Redetermine the Sustainable Yield
- Redetermination of the Sustainable Yield of the Borrego Springs Subbasin (2025)

**Task 10. Prepare the 2025 GMP Update.** This task is to prepare and adopt the 2020 GMP Update by June 30, 2025

**Deliverables:**

- Draft and Final 2025 GMP

**Budget Category (e): Interested Parties Outreach/Education**

**Task 11. Stakeholder Outreach.**

- Task 11a. Board Meetings
- Task 11b. TAC Meetings
- Task 11c. Stakeholder Workshops
- Task 11d. Maintain Website, Distribution List, and Respond to stakeholder inquiries

**Deliverables:**

- Meeting agendas and packets; meeting presentations; meeting summaries; Stakeholder outreach materials

## Budget

DWR required budget categories have been included below. Add tasks as applicable; additional rows must be added under the applicable categories to present the cost of each task described in the Work Plan.

**ALL LOCAL COST-SHARE IS PROVIDED BY THE BORREGO SPRINGS WATERMASTER AND REPRESENTS COSTS INCURRED ON THE PROJECT FROM JANUARY 1, 2022 THROUGH MARCH 31, 2022.**

Category		(a)	(b)	(c)	(d)
		Requested Grant Amount	Local Cost Share: Non-State Fund Source*	Total Cost	% Local Cost Share (Col(b))/(Col(c))
(a)	<b>Project Administration</b>				
	Task 12a. Project Management	\$175,000	\$2,500	\$172,500	1%
	Task 12b. Grant Management and Reporting	\$45,000	\$0	\$45,000	0%
(b)	<b>Planning/Design/Environmental</b>				
	<i>none</i>				
(c)	<b>Construction/Implementation</b>				
	Task 5a. Construct multi-completion monitoring well.	\$750,000	\$0	\$750,000	0%
	Task 5b. Construct and equip a surface-water discharge monitoring station in Coyote Creek.	\$89,000	\$0	\$89,000	0%
	Task 5c. Construct and equip a shallow dual-nested monitoring well facility within the potential groundwater dependent	\$100,000	\$0	\$100,000	0%

	ecosystem near the Borrego Sink				
	Task 5d. Construct and equip a surface-water monitoring station within the potential groundwater dependent ecosystem near the Borrego Sink.	\$100,000	\$0	\$100,000	0%
	Task 6a. Outreach.	\$10,000	\$0	\$10,000	0%
	Task 6b. Well Abandonment	\$198,000	\$0	\$198,000	0%
	Task 6c. Conversion of Abandoned Wells to Monitoring Wells.	\$132,000	\$0	\$132,000	0%
(d)	<b>Monitoring/Assessment</b>				
	Task 1a - Monthly meter reading and pumping calculations.	\$95,000	\$7,000	\$102,000	7%
	Task 1b - Annual meter accuracy testing.	\$65,000	\$0	\$65,000	0%
	Task 1c - Outreach to existing and new de minimis pumpers to cooperate in pumping monitoring efforts, including collecting well data, and meter reading if applicable.	\$13,000	\$0	\$13,000	0%
	Task 2a - Implement the existing and future expanded groundwater-level monitoring program.	\$105,000	\$9,000	\$114,000	8%
	Task 2b - Expand Monitoring Network through Outreach.	\$10,000	\$0	\$10,000	0%

Task 2c - Prepare monitoring well construction work plan.	\$25,000	\$0	\$25,000	0%
Task 2d – Aquifer testing	\$65,000	\$0	\$65,000	0%
Task 3a - Implement the existing and future expanded groundwater-quality monitoring program.	\$145,000	\$17,000	\$162,000	11%
Task 3b - Prepare Water-Quality Monitoring Plan (WQMP).	\$35,000	\$0	\$35,000	0\$
Task 4. Surface Water Flow Monitoring.	\$90,000	\$2,000	\$92,000	2%
Task 7. Maintain and Enhance the Data Management System.	\$57,000	\$3,000	\$60,000	5%
Task 8. Annual Reporting to DWR and the Court.	\$125,000	\$35,000	\$160,000	22%
Task 9a: Prepare the Redetermination of the Sustainable Yield Workplan.	\$50,000	\$0	\$50,000	0%
Task 9b: Perform Model Improvements.	\$100,000	\$0	\$100,000	0%
Task 9c: Extend the model through September 2022	\$100,000	\$0	\$100,000	0%
Task 9d: Conduct Model Recalibration	\$150,000	\$0	\$150,000	0%
Task 9e: Redetermine the Sustainable Yield in 2025	\$150,000	\$0	\$150,000	0%
Task 9f: Prepare Final Report.	\$100,000	\$0	\$100,000	0%
Task 10. Prepare the 2025 GMP Update.	\$190,000	\$0	\$190,000	0%

<b>(e) Interested Parties Outreach/Public Education</b>					
	Task 11a. Board Meetings.	\$255,000	\$85,000	\$340,000	25%
	Task 11b: TAC Meetings.	\$105,000	\$15,000	\$120,000	13%
	Task 11c. Stakeholder Workshops and Open House.	\$45,000	\$0	\$45,000	0%
	Task 11d. Maintain Website, Distribution List, and Respond to Stakeholder Inquiries.	\$15,000	\$0	\$15,000	0%
<b>(f)</b>	<b>Grand Total (Sum rows (a) through (d) for each column)</b>	<b>\$3,684,000</b>	<b>\$175,500</b>	<b>\$3,859,500</b>	<b>5%</b>

\* List sources of Local Cost Share funding:

## Schedule

The Schedule must be organized in a manner that is consistent with the Work Plan and Budget that will be contained in the Grant Agreement. The Schedule Table presented below is a template that must be completed for each project in the proposal. The required budget categories have been included below. Add additional rows for each task as described in the Work Plan and Budget.

<b>Categories</b>		<b>Start Date</b> (Earliest Start Date)	<b>End Date</b> (Latest End Date)
<b>(a)</b>	<b>Project Administration</b>	<b>01/01/2022</b>	<b>6/30/2025</b>
	Task 12a. Project Management.	01/01/2022	06/30/2025
	Task 12b. Grant Management and Reporting.	4/30/2022	6/30/2025
<b>(b)</b>	<b>Planning/Design/Environmental</b>	-	-
	None	-	-
<b>(c)</b>	<b>Construction/Implementation</b>	<b>4/1/2022</b>	<b>6/30/2025</b>
	Task 5a. Construct multi- completion monitoring well.	4/1/2022	6/30/2025
	Task 5b. Construct and equip a surface-water discharge monitoring station in Coyote Creek.	4/1/2022	10/1/2023
	Task 5c. Construct and equip a shallow duel-nested monitoring well facility within the potential groundwater dependent ecosystem near the Borrego Sink	4/1/2022	10/1/2023
	Task 5d. Construct and equip a surface-water monitoring station within the potential groundwater dependent ecosystem near the Borrego Sink.	4/1/2022	10/1/2023
	Task 6a. Outreach.	1/1/2022	6/30/2025
	Task 6b. Well Abandonment	1/1/2022	6/30/2025
	Task 6c. Conversion of Abandoned Wells to Monitoring Wells.	1/1/2022	6/30/2025
<b>(d)</b>	<b>Monitoring/Assessment</b>	<b>4/1/2022</b>	<b>6/30/2025</b>
	Task 1a - Monthly meter reading and pumping calculations.	1/1/2022	6/30/2025
	Task 1b - Annual meter accuracy testing.	08/01/2022	12/31/2024
	Task 1c - Outreach to existing and new de minimis pumpers to cooperate in pumping monitoring efforts, including collecting well data, and meter reading if applicable.	1/1/2022	6/30/2025

	Task 2a - Implement the existing and future expanded groundwater-level monitoring program.	1/1/2022	6/30/2025
	Task 2b - Expand Monitoring Network through Outreach.	4/1/2022	6/30/2021
	Task 2c - Prepare monitoring well construction work plan.	11/1/2022	5/1/2023
	Task 2d. Aquifer testing.	10/1/2022	9/30/2023
	Task 3a - Implement the existing and future expanded groundwater-quality monitoring program.	1/1/2022	6/30/2025
	Task 3b - Prepare Water-Quality Monitoring Plan (WQMP).	4/15/2022	4/1/2023
	Task 4. Surface Water Flow Monitoring.	01/01/2022	6/30/2025
	Task 7. Maintain and Enhance the Data Management System.	01/01/2022	6/30/2025
	Task 8. Annual Reporting to DWR and the Court.	1/1/2022	4/30/2025
	Task 9a: Prepare the Redetermination of the Sustainable Yield Workplan	4/1/2022	6/1/2022
	Task 9b: Perform Model Improvements	7/1/2022	11/30/2022
	Task 9c: Extend the model through September 2022	12/1/2023	4/30/2023
	Task 9d: Conduct Model Recalibration	5/1/2023	11/30/2024
	Task 9e: Redetermine the Sustainable Yield in 2025	12/1/2023	7/31/2024
	Task 9f: Prepare Final Report	8/1/2024	12/31/2024
	Task 10. Prepare the 2025 GMP Update.	6/1/2024	7/30/2025
<b>(e)</b>	<b>Interested Parties Outreach/Public Education</b>	<b>01/01/2022</b>	<b>6/30/2025</b>
	Task 11a. Board Meetings.	01/01/2022	6/30/2025
	Task 11b: TAC Meetings.	01/01/2022	6/30/2025
	Task 11c. Stakeholder Workshops and Open House.	06/01/2022	6/30/2025
	Task 11d. Maintain Website, Distribution List, and Respond to Stakeholder Inquiries.	01/01/2022	6/30/2025

January 20, 2022

Samantha Adams

Borrego Springs Watermaster

**Subject:** *Working Draft Proposition 68 Grant Project Support for Borrego Springs Coyote Creek Alternative Stream Monitoring*

Dear Ms. Adams:

Dudek is providing this scope for alternative stream monitoring at Coyote Creek in Borrego Springs as a potential project component of the Proposition 68 Grant Project. This scope provides a first order estimate.

As identified in the GMP, approximately 65% of the surface water inflow to the Borrego Valley comes from Coyote Creek (USGS 1982). The watershed encompasses approximately 180 square miles and is located almost entirely within the boundary of the Anza-Borrego Desert State Park. Streamflow in the Coyote Creek Watershed has been documented by USGS as the number one source of recharge to the Basin via streamflow leakage (i.e., infiltration of surface water runoff). Two historical stream gages were located on Coyote Creek, one of which stopped recording streamflow in 1983, and the other stopped recording flow in 1993. USGS Station Number 1025580 (Upper-Northern) recorded daily discharge data from 1951–1983; at this station, annual average streamflow was measured to be 1,831 AFY (USGS 2017). USGS Station Number 10255805 (Lower-Southern) recorded daily discharge data from 1983–1993; at this station, annual average streamflow was measured to be 1,774 AFY (USGS 2017). Annual variability over the period measured ranges from 326 acre-feet to 10,715 acre-feet. This large annual variability is a function of large annual variability of precipitation falling on the Coyote Creek Watershed. The BWD and Watermaster have been periodically taking manual stream flow measurements along perennial reaches of Coyote Creek since the Spring of 2018.

The BWD, DWR and USGS conducted a site reconnaissance during the GMP preparation to determine if a stream gage could be reactivated along Coyote Creek. Due to the dynamic nature of the braided alluvial fan—high sedimentation and erosion that occurs along Coyote Creek—it was determined by the agencies that Coyote Creek was not a good candidate for a traditional stream gage.

This project provides for installation of camera (ECAM or equivalent) and staff gauge to document high flows in Coyote Creek. The ECAM camera is a standalone, cellular, solar, and battery operated camera that can be accessed 24 hours per day 7 days per week and configured to push images to a website. This infrastructure has successfully been deployed by the Santa Barbara County Flood Control District. It is anticipated that the ECAM will be mounted at the approximate historical location of USGS Station Number 10255805 where the ECAM will likely be mounted on top of an existing metal building or on a standalone tower. This proposed location is also the general location of the San Diego County Flood Control's Coyote Creek Station 27034 rain gauge. The BWD will coordinate with San Diego County Flood Control and Anza-Borrego Desert Research Center to determine whether the ECAM can use existing telemetry infrastructure already deployed in the Basin. In order to calculate stream flow discharge, a survey of the cross-sectional area of Coyote Creek at the proposed location of the staff gauge and upstream and downstream of the staff gauge location will be completed. A rating curve displaying discharge versus stage at the location of the staff gauge will be developed in order to determine stream flow discharge using the staff gauge as recorded by the ECAM. Due to the shifting nature of the stream channel geometry it is anticipated that the Coyote Creek channel will likely need to be resurveyed at least annually and after major flood events. The rating curve would also require updating as part of the channel resurvey. The estimated cost to complete the Coyote Creek streamflow monitoring is **\$160,000**, including contingency for the channel shifting.

Ms. Samantha Adams

Subject: Working Draft Proposition 68 Grant Project Support for Borrego Springs Coyote Creek Alternative Stream Monitoring

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### Task 1 – Survey

A 1-D model will be used to generate the stage-discharge curve. The modeling software that will be used is the River Analysis System developed by the Hydrologic Engineer Center, U.S. Army Corps of Engineers also referred to as HEC-RAS. As part of the model development, terrain data is needed of the channel at the intended installation location. It was assumed that no more than 10 cross-sections will be required when generating the cost estimate. Since the channel has a history of shifting, the cross-sections will cover all visible historical channels in the area of interest. The cost estimate for surveying includes preparation, surveying field work and post-processing the data for input into the model.

**Cost for Task 1 .....** \$22,000.00

### Task 2 – Model Development

A 1D HEC-RAS model will be developed of the channel segment where the stream gage and camera are to be installed. To do this, information about the channel will be entered into the HEC-RAS program, namely, ground elevations and the type of ground cover. The ground cover is important because dense grass affects the river flow more than clear sand. It is assumed that historic data from USGS is available for use in the model, in addition to, the field data collected by Dudek.

**Cost for Task 2 .....** \$23,500.00

### Task 3 – Stage-Discharge Rating Curve

To create the stage-discharge rating curve, the model will be run for various stream flows. The results will provide corresponding water surface elevations. Each water surface elevation and streamflow pair will be one point on the stage-discharge rating curve. Then, as long as the channel conditions remain the same, the curve can be used to estimate streamflow given the height of the water surface on the staff gage.

**Cost for Task 3 .....** \$7,000.00

### Task 4 – Initial Installation of Camera and Staff Gage

This task captures the cost of installing the staff gage and camera at the site.

**Cost for Task 4 .....** \$35,000.00

### Task 5 – Monitoring/Assessment

The site will be monitored for three years. This involves manual measurements, maintenance of the equipment and updating the stage-discharge rating curve as conditions at the site change. It is assumed that a storm large enough to change the channel characteristics will occur about once a year for the two subsequent years after the initial installation. Therefore, the budget includes two additional surveys of the established cross-sections. Then after each re-survey; the model will be updated, re-run and the rating curve will be regenerated. Also included are manual measurements of the water surface elevation and corresponding streamflow each year for a total of three trips.

Ms. Samantha Adams

Subject: Working Draft Proposition 68 Grant Project Support for Borrego Springs Coyote Creek Alternative Stream Monitoring

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**Cost for Task 5 .....**.....\$63,000.00

**OPTIONAL**

The stream has been known to create and shift to a new channel during a large storm. This optional task assumes that this may happen one time during the three-year monitoring duration and includes the cost of moving the equipment to a new location. It is assumed that the equipment is not damaged and remains functional.

**Cost for Optional Task.....\$8,000.00**

Dudek appreciates this opportunity to assist you. If you have any questions or require further discussion, please contact me at 760.415.1425.

Sincerely,



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Trey Driscoll, PG No. 8511, CHG No. 936  
Senior Principal Hydrogeologist

cc: Amy Lynn-Williams, Dudek

**Borrego Valley Groundwater Basin Subbasins**

- █ Borrego Springs Groundwater Subbasin (7-024.01)
- █ Ocotillo Wells Groundwater Subbasin (7-024.02)

**Surface Water Features**

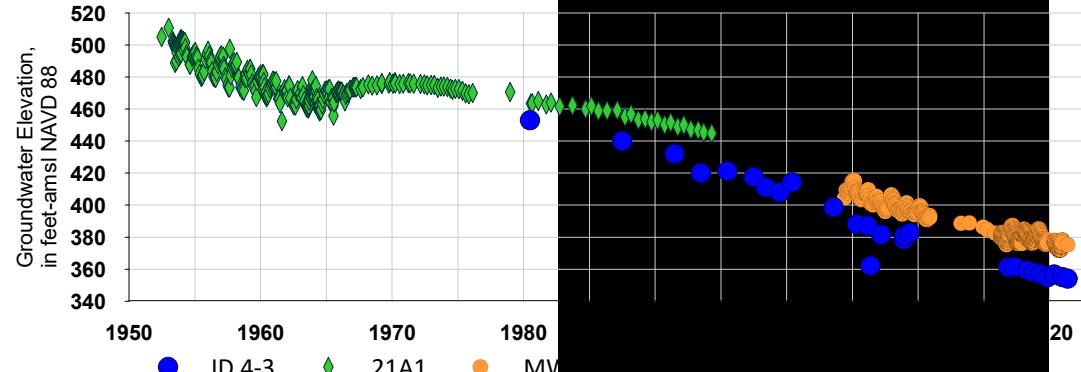
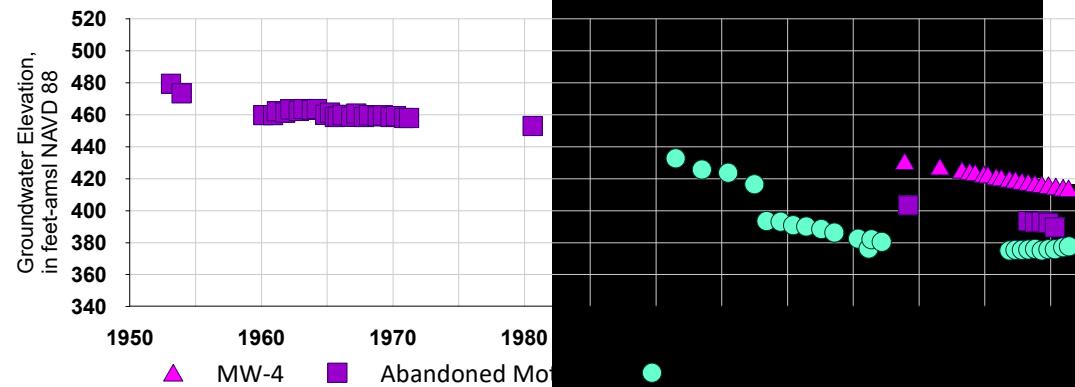
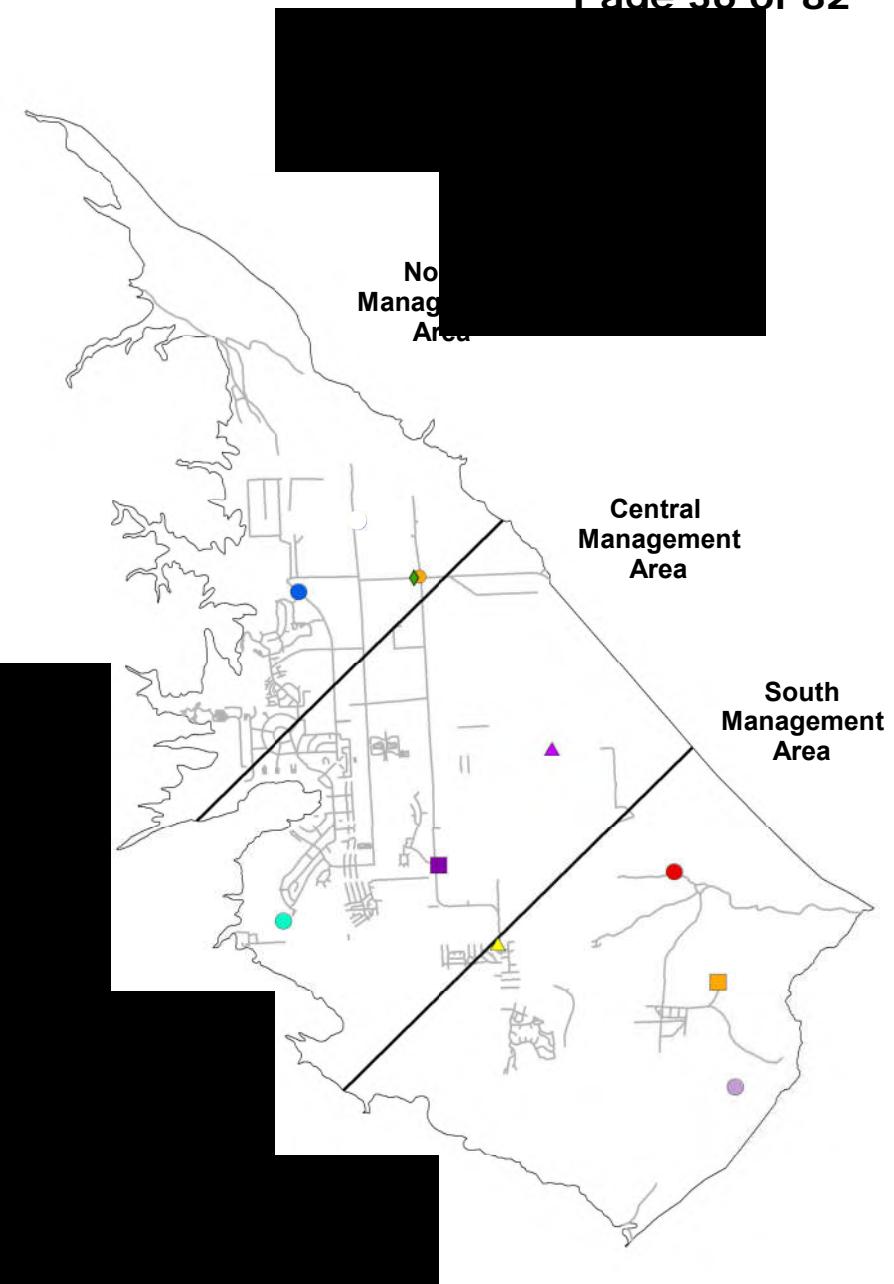
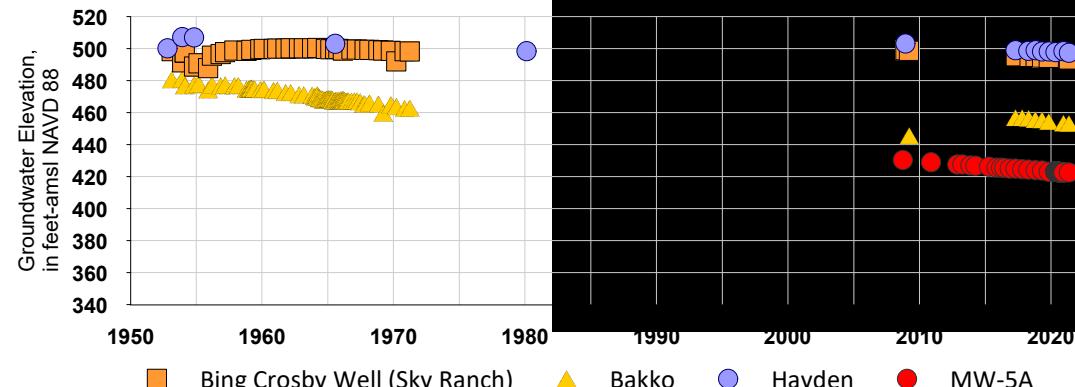
- Streams
- [Dotted pattern] Dry Lake

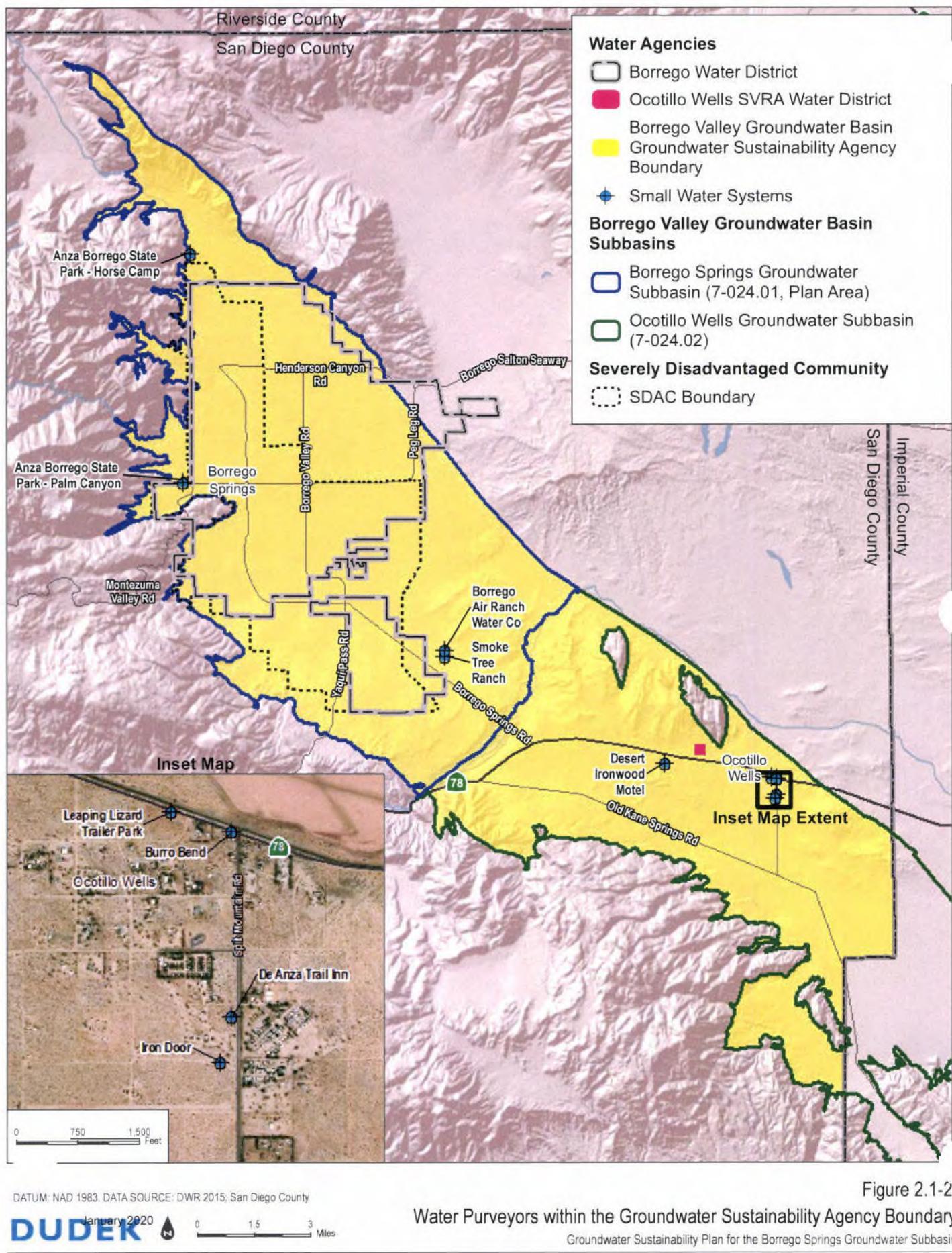


Notes:  
1. Source: Borrego Springs Groundwater Subbasin Annual Report:  
Covering Water Years 2016 through 2019 (Dudek, 2020).

**Figure 1****Borrego Springs Groundwater Subbasin Location Map**

**Borrego Springs Watermaster**  
Borrego Springs Subbasin  
2020 Annual Report

**North Management Area****Central Management Area****South Management Area**



# Project Information Submittal Form

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**Project Submitter/Owner:** Environmental Working Group of the Borrego Springs Watermaster

**Project Name:** Biological Restoration of Fallowed Lands

## Contact Information

**Name:** Andy Malone, PG - Lead Technical Consultant

**Phone:** 949-420-3030

**Email:** amalone@westyost.com

**Address:** Borrego Springs Watermaster, c/o West Yost Associates, 23692 Birtcher Drive, Lake Forest, CA 92630

## Project Summary

Please provide a summary of the Project description. Use as much space as you need.

To maintain a viable water supply for current and future beneficial uses and users of groundwater in the Borrego Springs Subbasin (Basin), the Watermaster's Groundwater Management Plan (GMP) defines a sustainability goal of operating the Basin within its sustainable yield in a manner that does not exhibit undesirable results by 2040. Achieving this goal requires implementation of an aggressive pumping rampdown of approximately 75 percent over the next twenty years. The GMP lists several projects and management actions (PMAs) that are intended to support the reduction of groundwater pumping demands. The GMP recognizes that fallowing of agricultural lands will be a primary tool to reduce groundwater demands, but that there are several adverse impacts that could be associated with land fallowing, including airborne emissions through wind-blown dust, the introduction or spreading of invasive plant species, and changes to the landscape that could adversely affect visual quality.

The Watermaster's Environmental Working Group (EWG) contends that biological restoration of current and future fallowed lands could be a solution for addressing the potential adverse impacts associated with land fallowing, and could be helpful in protecting human health, the environment, and the socioeconomic wellbeing of the Borrego Springs community during GMP implementation. However, the land use changes that have occurred in the past have created various barriers to the establishment of native habitat on fallowed lands, and not all land parcels will have equal habitat value.

The Project proposed herein describes a three-year program to: characterize historical and current conditions; explore the feasibility of various biological restoration/rehabilitation techniques; and develop guidance for future biological restoration projects on current and future fallowed lands within the Subbasin. The goals of restoration/rehabilitation are: reduce water consumption; manage airborne dust emissions; increase natural biodiversity and habitat value; and maintain or enhance values pertinent to the Anza Borrego State Park and the residents of Borrego Springs.

Drawing upon the collective experiences of Land IQ managing dust issues for the Los Angeles Department of Water and Power on Owens Lake and the Imperial Irrigation District on the Salton Sea, and UCI research on ecological restoration and desert ecology, the Project scope-of-work will produce spatially explicit strategies for fallowing retired citrus orchards based upon the potential for rehabilitation given known environmental constraints. Land IQ and UCI have provided a separate scope-of-work that provided the basis for this Project description (attached).

The work will start with gathering and synthesizing existing information resources: utilizing geospatial datasets, the literature, and interviewing industry experts and people knowledgeable in land use management and history in the vicinity of Borrego Springs, including members of the EWG. The existing information will be supplemented with ground and drone measurements stratified across major ecological units based on plant community type and physical properties of the landscape. The potential for rehabilitation and the appropriate methodological approaches across these units will be further informed by measurements of life history stages and microsite characteristics critical to plant recruitment and establishment among a series of successional stages or land use states (e.g., recently fallowed, fallowed 5-10 years, existing natural reference sites, and existing citrus).

A unique challenge presented by the fallowing of citrus orchards is how to manage dust, make use or dispose of dead trees, and facilitate physical and biological processes important to the development of a natural desert landscape. The Project proposes a citrus tree removal strategy that is conducive to both dust management and increasing natural habitat value, while minimizing visual blight in the short term. A case study will be executed to inform the development of best practices and will involve sample "Brush Pile Wildlife Sand Fences" with cut citrus tree material placed strategically to manage wind/dust patterns. The Sand Fences will serve multiple functions including dust control by reducing soil particle velocity, safe sites for native plant recruitment through moisture retention and shading, and wildlife habitat by providing perches and cover. Furthermore, by not mulching the trees there will be a cost savings and avoidance of altered carbon cycles inconsistent with the native ecosystem and plant community succession.

The Project study area will be approximately 3,000 acres and encompass the extent of agriculture land uses in the Subbasin and any appropriate adjacent natural open space suitable for reference conditions for habitat restoration planning. For the farmlands that have the potential for permanent fallowing, a prioritization model will be prepared to assist in strategic planning to select sites for restoration.

The Project will be implemented in a phased approach over a three-year period under the guidance of the EWG and the approval of the Watermaster Board.

**Describe the project location, current conditions, and the benefitting areas. Please attach, separately, a regional and Project map depicting the site(s) location, current conditions, and benefitting areas.**

The Project location will be focused within the agricultural land uses in the northern portion of the Borrego Springs Subbasin. However, the results of the Project will assist with all lands that are currently fallowed in the Basin or may be fallowed during GMP implementation. A map is attached from the GMP that shows the current land uses within the Subbasin. Most of the agricultural and recreational land uses are located within the northern portion of the Subbasin. However, the entire Borrego Valley potentially benefits from the Project via the mitigation of airborne emissions of wind-

blown dust, combatting the spread of invasive plant species, improving the visual quality of the landscape, and restoring natural recharge processes.

**What is the nexus of the Project to the Sustainability Goal of the Borrego Springs Subbasin Groundwater Management Plan (GMP)? Is the Project listed in the GMP? How does the Project help achieve the goals of the GMP?**

The Project is not listed as a standalone project or management action (PMA) in the GMP. However, the project is referenced in some PMAs as a potential supporting activity and will thereby help achieve the Sustainability Goal of reducing groundwater pumping by 75 percent without causing undesirable results. Explanation is described below.

The PMAs listed in the GMP to achieve the Sustainability Goal were developed based the following considerations: (i) there are few opportunities for capture of excess precipitation; (ii) the Subbasin is remote to potential sources of imported water and totally dependent on groundwater for its water supply; (iii) water uses by volume within the Subbasin are primarily for agriculture and recreation; and (iv) the magnitude of the overdraft is estimated to be almost 400% above the Sustainable Yield. For these reasons, several of the PMAs listed in the GMP call for reducing groundwater demands that could involve fallowing of agricultural or recreational lands:

- **PMA No. 1 - Water Trading Program.** The Water Trading Program provides an economic incentive for conserving water by providing the potential to monetize voluntary water conservation or the elimination of water intensive uses. An example is a water trade from high-intensity agricultural water users to other lower-intensity water users, which may involve the fallowing of the agricultural lands.
- **PMA No. 3 - Pumping Reduction Program.** The Pumping Reduction Program is the central tool to implement the Physical Solution and achieve the sustainability goal for the Subbasin. The program involves the gradual Rampdown of groundwater production rights to the Sustainable Yield of the Subbasin by 2040. The Pumping Reduction Program may incentivize high-intensity agricultural or recreational water users to take advantage of the water trading (PMA No. 1) or land fallowing (PMA No. 4) management programs.
- **PMA No. 4 - Voluntary Fallowing of Agricultural Land Program.** The Voluntary Fallowing of Agricultural Land Program will constitute a mechanism to facilitate the conversion of high water use irrigated agriculture to low water use open space, public land, or other development on a voluntary basis.

While the GMP recognizes that fallowing of agricultural lands will be key to achieving the Sustainability Goal, it also recognizes the potential adverse environmental effects of fallowing, including airborne emissions through wind-blown dust, the introduction or spreading of invasive plant species, and changes to the landscape that could adversely affect visual quality.

Section IV.H of the Stipulated Judgment provides that:

*An Environmental Working Group (EWG) will be established to advise the Watermaster on GDE and any other matters approved by the Watermaster.*

The role of the EWG is to advise and further the mission of the Watermaster to implement the Stipulated Judgment and comply with the SGMA by focusing on the protection of human health and

the environment. The activities of the EWG are always approved by the Watermaster Board and always include a nexus between environmental issues and the sustainable use of groundwater in the Borrego Springs Subbasin.

The EWG held its inaugural meetings in February and May 2021 to discuss and prioritize activities that the EWG could engage in pursuant to its purview and duties as defined by the Judgment. Some EWG members contend that biological restoration of current and future fallowed lands could be a solution for addressing potential adverse impacts associated with land fallowing, and is necessary to protect human health, the environment, and the socioeconomic wellbeing of the Borrego Springs community.

The Project proposed herein is intended to explore the feasibility of biological restoration techniques and develop guidance for future biological restoration projects on current and future fallowed lands within the Subbasin. Since land fallowing will be a central tool to reduce groundwater demands and achieve groundwater sustainability, the Project helps achieve the Sustainability Goal by addressing the potential adverse impacts associated with land fallowing.

**What are the specific goals and needs for the Project, and how will the project achieve the goals and meet the needs?**

The main goal of the Project is to develop data, information, and criteria to guide the use of biological restoration as a technique to mitigate the potential adverse impacts associated with the fallowing of lands that is expected to occur within the Subbasin. The Project will achieve these goals through analyses of existing data and information, field reconnaissance, and test cases of biological restoration techniques at existing fallowed lands within the Subbasin. A final technical report will describe and document the results, conclusions, and recommendations of the Project. The final report will describe and document the biological restoration strategies that are expected to be most effective within the Subbasin and a prioritization of land parcels for biological restoration.

The needs of the Project will be met by hiring technical subconsultants with demonstrated expertise in desert ecosystems and restoration ecology and obtaining guidance and review from the technical experts participating on the EWG.

**What are the quantifiable benefits of the Project (e.g., protect or enhance water quality, water conservation, enhanced understanding of the groundwater basin, etc.)? How will those benefits be quantified and evaluated?**

The main benefit of the Project will be the development of guidance criteria for the use of biological restoration as a technique to mitigate the potential adverse impacts associated with the fallowing of lands. Specifically, the Project will develop the following beneficial information: an inventory of all current and prospective fallowed lands in the Subbasin; the types of restoration/rehabilitation strategies that are most effective and on which types of lands; and a prioritization of the fallowed lands that are most appropriate for biological restoration with the highest habitat value. These benefits will be quantified and described in the interim and final deliverables of the project.

**Please describe the communities served by the Project. Will the Project benefit an Underrepresented Community, a Disadvantaged Community (DAC), and/or a Severely Disadvantaged Community (SDAC)? If so, please provide a map.**

A map is attached from the GMP of the Basin and the area defined as a SDAC. While the Project activities will be focus within the northern portions of the Basin, the Project will serve the entire Basin, including the community of Borrego Springs and the area classified as a SDAC, because it is designed to mitigate the physical and biological impacts that may be associated with the progressive reductions in pumping.

- A primary driver of the economy in Borrego Springs is ecotourism associated with the Anza-Borrego State Park, dark and clear night skies, and the beautiful flora and fauna of the region. The Project will help maintain or enhance the physical and biological environment within the community, and thereby support economic activity within Borrego Springs.
- The Watermaster was officially formed in April 2021. Expenses to conduct Watermaster activities are relatively new costs that are ultimately funded by the residents and rate payers within the community. The grant funding will help offset the new costs and provide financial relief to the residents and rate payers.
- The community's water supply is solely dependent on the Basin. The Project is related to the larger project of implementation of the Judgment and GMP, which will ensure that the groundwater basin remains an affordable, high-quality source of water for the community in perpetuity.

**Will the Project or Component positively impact issues associated with small water systems or private shallow domestic wells (e.g., groundwater contamination vulnerability, drawdown, etc.)? If so, please provide justification such as water system maps or domestic well census results.**

Private shallow wells likely exist on current and/or potential future lands that will be fallowed. The Project may include recommendations for the continued use of domestic wells after fallowing to assist in biological restoration.

**Does the Project address the needs of the State Water Board's SAFER Program, designed to ensure Californians who lack safe, adequate, and affordable drinking water receive it as quickly as possible, and that the water systems serving them establish sustainable solutions?**

N/A

**How does the Project address the Human Right to Water (AB 685 Section 106.3) which states that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes?**

N/A

**Please describe how the project contributes to addressing the risks in the region to water supply and water infrastructure arising from climate change. If possible, please provide the amount of greenhouse gas emissions reduced and carbon sequestered resulting from the project.**

Biological restoration could act to sequester carbon through the process of biosequestration, which is the capture and storage of the atmospheric carbon dioxide by creation of natural vegetation and habitat and enhanced biological processes.

## Work Plan

The Work Plan must contain descriptions of the anticipated tasks necessary to complete the project. Tasks should be organized by the five budget categories, as applicable: (a) Project Administration, (b) Planning/Design/Environmental, (c) Construction/Implementation, (d) Monitoring/Assessment, and (e) Interested Parties Outreach/Education. The Work Plan should also identify the anticipated deliverables for each task.

Add additional tasks and subtasks as needed to provide a detailed work plan. Some examples and suggested language have been provided.

### Budget Category (a): Project Administration

**Task 1 – Project Management.** This task includes:

- **Task 1a. Project Management.** The objective of this task is to perform monthly project management activities for the program, including coordinating work, tracking task schedules and budget, managing sub-consultants and vendors, reporting progress to the Watermaster Board and EWG, and taking actions as necessary to address schedule or budget challenges.
- **Task 13b. Grant Management and Reporting.** The objective of this task is to coordinate with the Borrego Water District to manage grant agreement including compliance with grant requirements, and preparation and submission of supporting grant documents and coordination with the Grantee, Borrego Water District. Prepare invoices including relevant supporting documentation for submittal to DWR via Borrego Water District. This task also includes administrative responsibilities associated with the project such as coordinating with partnering agencies and managing consultants/contractors.

**Deliverables:** Invoices and necessary documentation.

### Budget Category (b): Planning/Design/Environmental

n/a

### Budget Category (c): Construction/Implementation

n/a

## Task 2 – Review and Analysis of Existing Data

Task 2.1 – Kick-off Meeting. A kick-off meeting will be held with the EWG and the consultants at Land IQ and UCI to review the proposed scope-of-work and receive EWG input.

Task 2.2 – Literature Review. Literature review; data mining from existing reports; and written summary of relevant information for report.

Task 2.3 – Interviews with Key Stakeholders and Experts. The interviews will be conducted with local experts and subject-matter experts.

Task 2.4 – Project Geodatabase Creation. Creation of Project Geodatabase for relevant land use and environmental thematic layers, including, but not limited to topography, flow accumulation, soil characteristics, and wind patterns.

Task 2.5 – Farmland Water Consumption. Collect water consumption data from BWD; update parcel level Geographic Information System (GIS) data, as necessary; calculate water consumption by parcel, and digitize new data layers, as necessary.

Task 2.6 – Review of Historical Data. Review of historical maps, search of available historical records (e.g., herbarium records and historical accounts); georeference available historical maps and old place name references; synthesize information to describe site specific historical ecology; and include comparison of historical and current vegetation cover densities. Provide guidance on feasible restoration targets.

### Deliverables:

1. Technical Memo Summarizing Existing Data
2. Initial Fallowed Farmland Rehabilitation Opportunities and Prioritization Map.

## Task 3 – Existing Fallowed Farmland and Reference Natural Habitat Field Study

Task 3.1 – Field Observations of a Time Series of Existing Fallowed Farmland. Interviews with past and current BWD staff about experience with fallowed fields, field visits, and data collection of existing conditions.

Task 3.2 – Field Sampling of Reference Natural Habitat to Guide Farmland Restoration Potential. Use GIS layers to stratify landscape in the Valley, including the agricultural land into similar geomorphic features for sampling. Based on this stratification

and information from the time series of fallowed farmland, determine a sampling design to collect more detailed information on plant cover and “greenness” utilizing drones and multispectral imagery over hundreds of acres. Areas of interest will be visited on the ground to compare vegetation composition and plant physiological data that will further help to identify specific areas and species most promising for rehabilitation. Sample cover data, analyze and interpret reference conditions to identify a range of reasonable habitat restoration targets for fallowed farmland.

**Deliverables:**

1. Technical Report of Field Study Results

**Task 4. Brush Pile Wildlife Sand Fence Case Study**

Task 4.1 – Identify Manipulative Sites for Sand Fences. Working on land with BWD access agreements, identify one or multiple sites, based on feasibility, for construction of Sand Fences.

Task 4.2 – Design and Construct Sample Sand Fences. Working directly with crews in the field, identify the most economical method of construction, and build variations on the design, as appropriate. Sand Fences will be compared to control (no action) and mulched fields with chipped orchard tree material.

Task 4.3 – Baseline Observations of Sand Fence Function and Wildlife Value. Take baseline data for comparison to future datasets, and to characterize the habitat and dust control value of the Sand Fences. Utilizing information from Task 2 and initial results from Task 3, establish a pilot study with promising plant species to help understand plant response to Sand Fences.

**Deliverables:**

1. Constructed Sample Sand Fences
2. Technical Report

**Task 5 – Farmland Fallowing Rehabilitation Strategies**

Task 5.1 – Develop Conceptual Models for Key Rehabilitation Processes. Based on literature review, geodatabase indices and analysis, field study results, and expert interviews, develop conceptual models of key processes involved in dust, native recruitment, and habitat restoration of fallowed farmland.

Task 5.2 – Design Rehabilitation Strategies. Develop Rehabilitation Strategies for Fallowed Farmland based on conceptual models, the range of potential for rehabilitation based on site level measurements across the study area, and project goals.

Task 5.3 - Farmland Fallowing Best Practice Recommendations. Recommendations for Best Practice Language for Fallowing of Farmland to be incorporated into the GSP. Identify gaps in knowledge for future monitoring and study to improve best practice adaptively as land begins to be fallowed for water conservation.

**Deliverables:**

1. Draft Rehabilitation Strategies and Best Practice for Fallowing
2. Final Rehabilitation Strategies and Best Practice for Fallowing

**Task 6 - Farmland Fallowing Prioritization**

Task 6.1 - Prioritization Model for Fallowing Farmland Ranked by Benefits of Water Conservation and Rehabilitation Potential. Develop a model for prioritizing farmland for fallowing based on the reduction of water consumption, and likelihood of success of the rehabilitation strategies.

**Deliverables:**

1. Prioritization of Farmland Fallowing Report
2. Prioritization of Farmland Fallowing Map

**Budget Category (e): Interested Parties Outreach/Education**

**Task 7 - Conduct EWG Meetings.** At least two EWG meetings per year will be necessary for the EWG to: receive updates on project progress; receive input from the public and interested stakeholders; provide guidance and input to the Watermaster Technical Consultant and subcontractors; review draft and final project deliverables and make recommendations to the Watermaster Board.

**Deliverables:** Meeting agendas/packets; PowerPoint presentations; summary meeting notes; and memorandums with recommendations to the Watermaster Board. All EWG meeting deliverables will be posted to the Watermaster's website.

## Budget

DWR required budget categories have been included below. Add tasks as applicable; additional rows must be added under the applicable categories to present the cost of each task described in the Work Plan.

	<b>(a)</b> <b>Category</b>	<b>(b)</b> <b>Requested Grant Amount</b>	<b>(c)</b> <b>Local Cost Share: Non-State Fund Source*</b>	<b>(d)</b> <b>Total Cost</b>	<b>% Local Cost Share (Col(b))/(Col(c))</b>
<b>(a)</b>	<b>Project Administration</b>				
	Task 1. Project Management	\$ 50,000		\$ 50,000	0%
<b>(b)</b>	<b>Planning/Design/Environmental</b>				
	n/a				
<b>(c)</b>	<b>Construction/Implementation</b>				
	n/a				
<b>(d)</b>	<b>Monitoring/Assessment</b>				
	Task 2. Review and Analysis of Existing Data	\$ 84,070		\$ 84,070	0%
	Task 3. Existing Fallowed Farmland and Reference Natural Habitat Field Study	\$ 218,750		\$ 218,750	0%
	Task 4. Brush Pile Wildlife Sand Fence Case Study	\$ 220,680		\$ 220,680	0%
	Task 5. Farmland Fallowing Rehabilitation Strategies	\$ 75,220		\$ 75,220	0%
	Task 6. Farmland Fallowing Prioritization	\$ 56,620		\$ 56,620	0%

<b>(e) Interested Parties Outreach/Public Education</b>					
	Task 7 - Conduct EWG Meetings	\$ 50,000		\$ 50,000	0%
<b>(f)</b>	<b>Grand Total (Sum rows (a) through (e) for each column)</b>	\$ 755,340	0	\$ 755,340	0%

\* List sources of Local Cost Share funding:

## Schedule

The Schedule must be organized in a manner that is consistent with the Work Plan and Budget that will be contained in the Grant Agreement. The Schedule Table presented below is a template that must be completed for each project in the proposal. The required budget categories have been included below. Add additional rows for each task as described in the Work Plan and Budget.

	<b>Categories</b>	<b>Start Date</b> (Earliest Start Date)	<b>End Date</b> (Latest End Date)
<b>(a)</b>	<b>Project Administration</b>	<b>7/1/2022</b>	<b>6/30/2025</b>
	Task 1. Project Management	7/1/2022	6/30/2025
<b>(b)</b>	<b>Planning/Design/Environmental</b>		
	n/a		
<b>(c)</b>	<b>Construction/Implementation</b>		
	n/a		
<b>(d)</b>	<b>Monitoring/Assessment</b>	<b>7/1/2022</b>	<b>6/30/2025</b>
	Task 2. Review and Analysis of Existing Data	7/1/22	11/30/22
	Task 3. Existing Fallowed Farmland and Reference Natural Habitat Field Study	1/1/23	12/31/24
	Task 4. Brush Pile Wildlife Sand Fence Case Study	1/1/23	12/31/24
	Task 5. Farmland Fallowing Rehabilitation Strategies	1/1/24	6/30/25
	Task 6. Farmland Fallowing Prioritization	1/1/24	6/30/25
<b>(e)</b>	<b>Interested Parties Outreach/Public Education</b>	<b>7/1/2022</b>	<b>6/30/2025</b>
	Task 7 – Conduct EWG Meetings	7/1/2022	6/30/2025

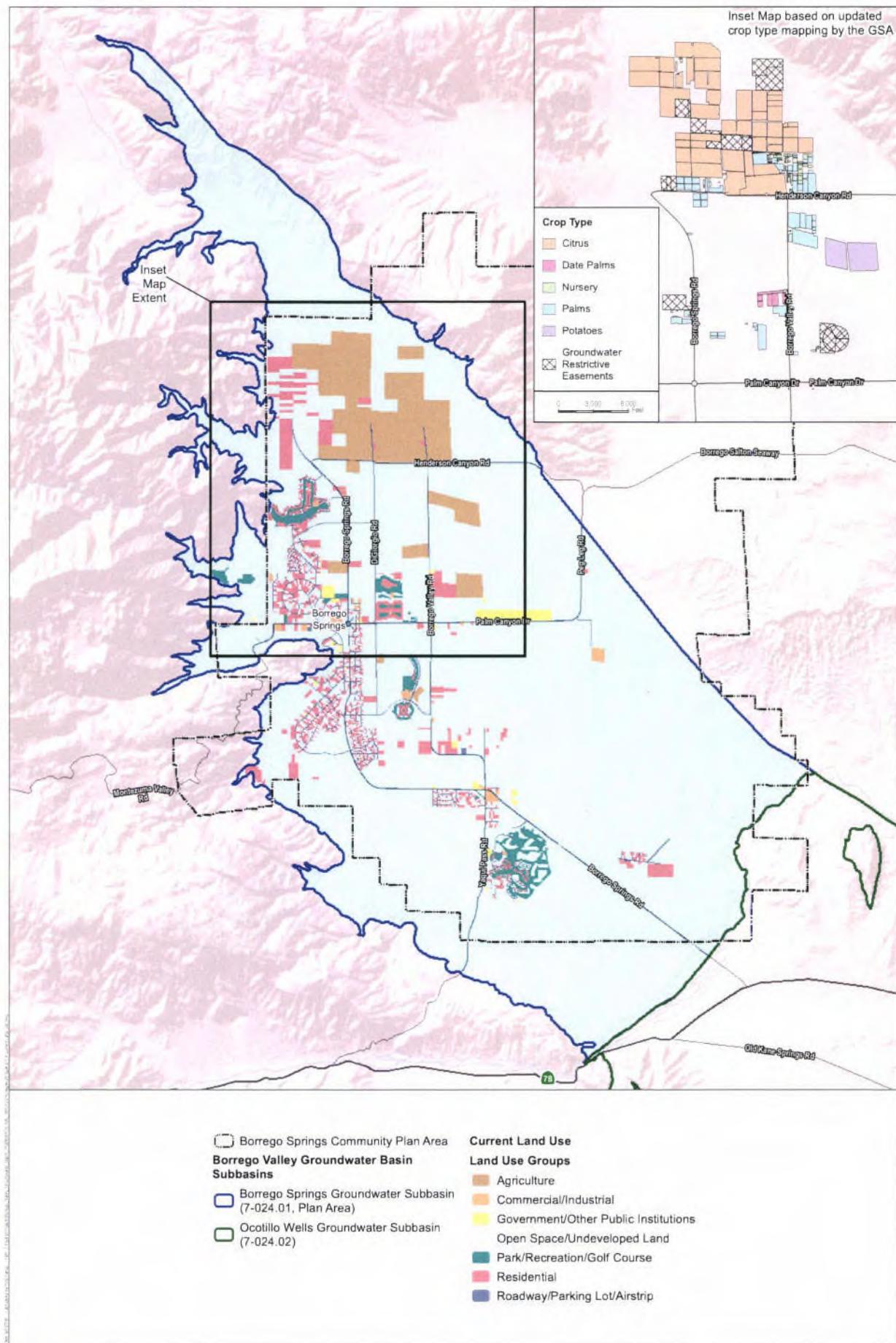
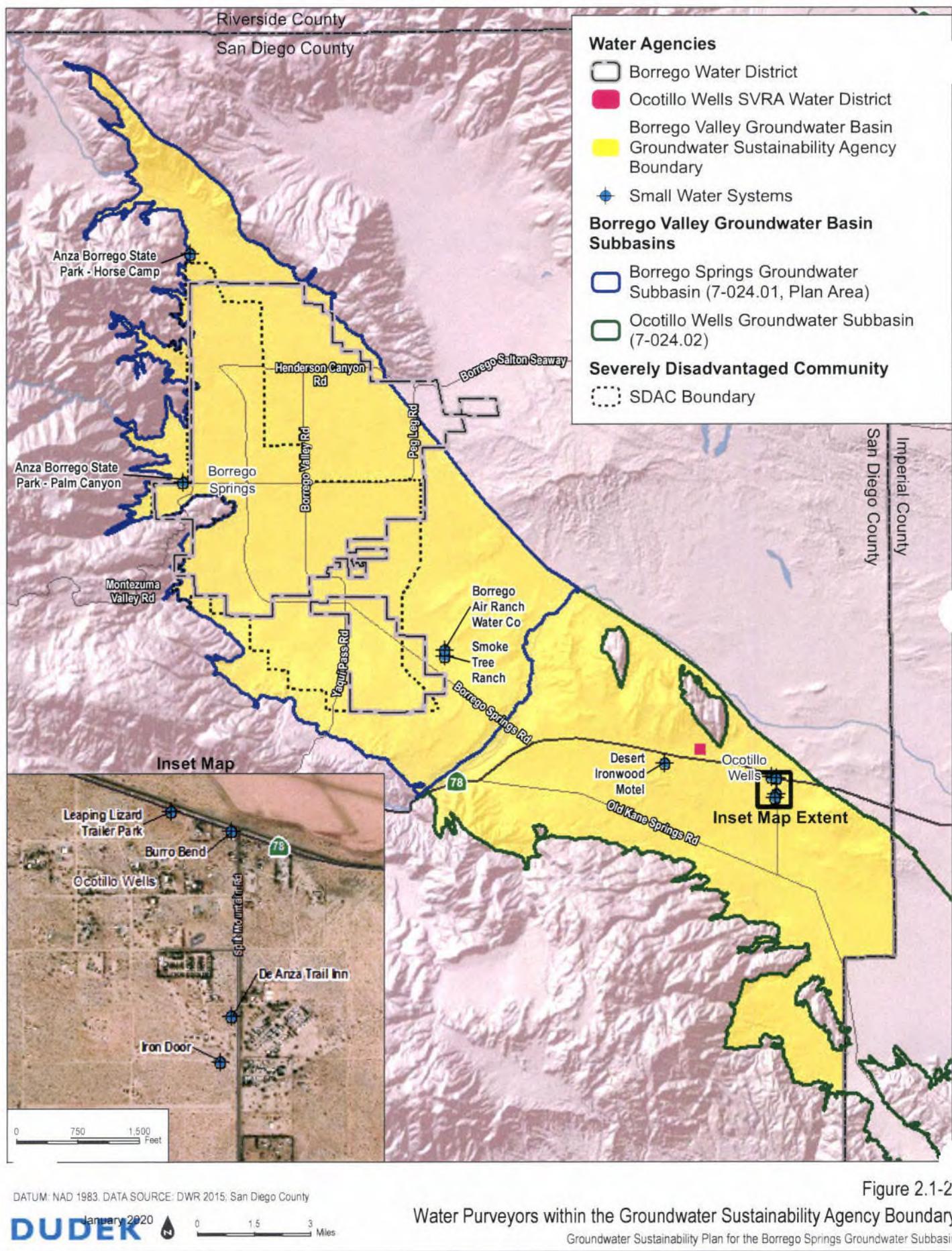


Figure 2.1-4  
Current Land Use

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin





# Technical & Cost Proposal

Concept Feasibility Plan for Rehabilitation of Fallowed Irrigated Agricultural Land in the Borrego Valley Groundwater Basin

## Submitted to:

Environmental Working Group of the Borrego Springs Watermaster

c/o West Yost Associates  
23692 Birtcher Drive • Lake Forest, CA 92630

January 14, 2020

## Submitted by:





January 14, 2022

Environmental Working Group of the Borrego Springs Watermaster  
 c/o West Yost Associates  
 23692 Birtcher Drive  
 Lake Forest, CA 92630

**RE: Letter of Transmittal for a Technical and Cost Proposal—Concept Feasibility Plan for Rehabilitation of Fallowed Irrigated Agricultural Land in the Borrego Valley Groundwater Basin**

Dear Members of the Environmental Working Group,

The Land IQ/UCI Team is pleased to submit our proposal to develop a Concept Feasibility Plan (Plan) to improve fallowing practices for the Borrego Valley Groundwater Basin. The cost for the Project is a not-to-exceed price of \$728,480.

The Land IQ/UCI Team is uniquely qualified to provide the full range of necessary services to meet the goals of the Plan to reduce water consumption, manage dust, and increase natural habitat value in a sustainable manner. Our areas of expertise include agricultural and natural systems, remote sensing, native plant and land systems management, and ecological restoration. This expertise along with technical skills in plant ecology and physiology, research study design, and data analysis, enables our Team to determine optimal solutions to complex problems in our environment.

Our Team has demonstrated experience planning and successfully developing innovative solutions to challenging environmental problems throughout California. Notable experience for this project includes Land IQ's work developing dust mitigation measures on Owens Lake for the Los Angeles Department of Water and Power, and Statewide Crop Mapping product published to the State Department of Water Resources (DWR) Land Use Viewer, which is a resource for land use and water managers, including Groundwater Sustainability Agencies (GSAs). The new web map is viewable here:  
<https://gis.water.ca.gov/app/CADWRLandUseViewer/>.

UC Irvine (UCI) brings experience conducting research, working with land managers, and identifying optimal approaches to restoration and conservation challenges as part of the UCI Environmental Collaboratory. The UCI Environmental Collaboratory integrates three programs at UCI, allowing each program's strengths to work collaboratively to offer excellence in research, education, and land stewardship. These programs are UCI Nature, the Center for Environmental Biology, and the Master's program in Conservation and Restoration Science. Specifically, UCI Nature oversees UCI's natural reserves, including the Steele/Burnand Anza-Borrego Desert Research Center. Over the last few years one of the Environmental Collaboratory projects has included working with Anza Borrego State Park

staff, the Anza Borrego Foundation, and other scientists on the Proposition 1 Sentenac Cienega Ecosystem Restoration Project in Anza Borrego State Park. This project has strengthened working relationships among these organizations, in addition our relationships with the broader community in the area through events that have been offered to inform and involve the public and tribes in the restoration assessment and planning process.

Land IQ staff and UCI have worked together on successful habitat restoration projects, such as the restoration of cactus scrub habitat for the cactus wren on the UCI Nature Reserve. And we are actively integrating monitoring and habitat restoration planning efforts for the Orange County Central-Coastal Natural Community Conservation Plan & Habitat Conservation Plan (NCCP/HCP). We formulate our habitat restoration plans from careful consideration of landscape position, hydrology, and soils to determine the most appropriate habitat enhancement and restoration for each project site based on data analysis of existing information and comprehensive study design in highly complex environments. We generally bring fresh and efficient approaches to planning projects that can result in cost savings without sacrificing ecological function. For example, Land IQ pioneered direct seeding of saltgrass dominated meadows at Owens Lake that provide more efficient use of water to control dust on the lake while balancing open shorebird habitat.

Our Team has the experience to collectively address the scientific and practical challenges of rehabilitating farmland for the benefit of the community and the natural landscape and the professional capacity to carry such a project to completion. Our Team looks forward to working with the Environmental Working Group and its partners on this challenge.

Land IQ is a DGS Certified Small Business (Supplier No. 1748303).

Sincerely,



Mica Heilmann, CPSS  
Land IQ  
Owner | Soil & Agricultural  
Scientist



Travis Brooks  
Land IQ  
Restoration Ecologist



Megan Lulow, PhD  
Executive Director  
UCI Nature



# Table *of* Contents

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**CONFIDENTIALITY:** This proposal approach is considered confidential in nature and is intended for review and consideration only by the Borrego Springs Watermaster, Borrego Springs Water District, and its affiliates. No recreation or use of these proposal components is permitted without consent of Land IQ, LLC.

# Scope of Work

## Task 1

1 Project Management

## Task 2

Review & Analysis of Existing Data

- 2.1 Kick-off Meeting
- 2.2 Literature Review
- 2.3 Interviews with Key Stakeholders and Experts
- 2.4 Project Geodatabase Creation
- 2.5 Farmland Water Consumption
- 2.6 Review of Historical Data

## Task 3

Field Study

- 3.1 Field Observations of a Time Series of Existing Fallowed Farmland Physical and Biological Conditions
- 3.2 Field Sampling of Reference Natural Habitat to Guide Farmland Restoration Potential

## Task 4

Brush Pile Wildlife Sand Fence Case Study

- 4.1 Identify Manipulative Sites for Sand Fences
- 4.2 Design and Construct Sample Sand Fences
- 4.3 Baseline Observations of Sand Fence Function and Wildlife Value

## Task 5

Farmland Fallowing Rehabilitation Strategies

- 5.1 Develop Conceptual Models for Key Rehabilitation Processes
- 5.2 Design Rehabilitation Strategies
- 5.3 Farmland Fallowing Best Practice Recommendations

## Task 6

Farmland Fallowing Prioritization

- 6.1 Prioritization Model for Fallowing Farmland Ranked by Benefits of Water Conservation and Rehabilitation Potential

## Task 7

7 Env. Working Group Meetings

## Approach

Given the significant overdraft of the Borrego Valley Groundwater Basin (BVGB), the Borrego Water District (BWD) has instituted a ‘Water Credit Policy’ that encourages the voluntary reduction of water consumption. One of the most significant means of reducing water consumption will be permanently fallowing irrigated agricultural land in the BVGB. There are serious potential and realized risks to the natural desert landscape and the local community from standard fallowing practice, including dust, invasive plants, visual blight, and barriers to the establishment of native habitat.

To manage those risks and to take advantage of opportunities for rehabilitation of the land, we will develop strategies for fallowing farmland in the BVGB, with the following goals:

- 1) Reduce water consumption
- 2) Manage dust
- 3) Increase natural biodiversity and habitat value
- 4) Maintain or enhance values pertinent to the Anza Borrego State Park mission and Borrego Springs residents (e.g., invasive species control and reducing visual blight)

Rehabilitation or restoration strategies will be the basis for writing best practices for agricultural land fallowing for incorporation into the draft Groundwater Sustainability Plan that is currently in development.

Drawing upon the collective experiences of Land IQ managing dust issues for the Los Angeles Department of Water and Power on Owens Lake, and the Imperial Irrigation District on the Salton Sea, and UCI research on ecological restoration and desert ecology, we have developed a scope of work that will produce spatially explicit strategies for fallowing retired citrus orchard lands based upon the potential for rehabilitation given known environmental constraints.

We will initiate work with gathering and synthesizing existing information resources: utilizing geospatial datasets, the literature, and interviewing industry experts and people knowledgeable in land use management and history in the vicinity of Borrego Springs, including members of the Environmental Working Group. We will build upon this information with ground and drone measurements stratified across major ecological units based on plant community type and physical properties of the landscape. Potential for rehabilitation and methodological approach across these units will be further informed by measurements of life history stages and microsite characteristics critical to plant recruitment and establishment among a series of successional stages or land use states (recently fallowed, fallowed 5-10 years, existing natural reference sites, and existing citrus).

A unique challenge presented by the fallowing of citrus orchards in the BVGB is how to manage dust, make use or dispose of dead trees, and facilitate physical and biological processes important to the development of a natural desert landscape. For this Proposal we have developed a citrus tree removal strategy that is conducive to both dust management and increasing natural habitat value, while minimizing visual blight in the short term. We will conduct a case study to inform the development of best practices and create sample “Brush Pile Wildlife Sand Fences” with cut citrus tree material placed strategically to manage wind/dust patterns. The Sand Fences will serve multiple functions including dust control by reducing soil particle velocity, safe sites for native plant recruitment through moisture retention and shading, and wildlife habitat by providing perches and cover. Furthermore, by not mulching the trees there will be a cost savings and avoidance of altered carbon cycles inconsistent with the native ecosystem, which can impact plant community succession.

The study area will be approximately 3,000 acres and encompass the extent of agriculture in the BVGB and any appropriate adjacent natural open space suitable for reference conditions for habitat restoration

planning. For the farmland that has potential for permanent fallowing, we will develop a prioritization model to assist the BWD in strategic planning to reduce water consumption and rehabilitate the natural landscape.

## Task 1. Project Management

**1 Project Management.** The staffing structure and internal project control procedures will ensure clear lines of communication between the EWG and the technical and scientific staff at Land IQ and UCI. The Project Manager, Travis Brooks, will be the point of contact for EWG communications.

Land IQ has a strong commitment to producing high-quality work products on time and within budget. We accomplish this goal through strong working relationships with our clients, depth of experience, following QA/QC procedures, phased and prioritized project schedules and budget control using up-to-date accounting tools and dedicated budget management staff.

Land IQ's technical document editors, cartographers and geospatial experts are well versed in biological resource management, monitoring and planning. In addition to technical editorial review, deliverables will be reviewed at multiple stages of development by senior staff, including Margot Griswold, Joel Kimmelshue and Megan Lulow, to help safeguard that work is consistent with our legacy of excellent biological resource management and technical analysis.

## Task 2. Review and Analysis of Existing Data

**2.1 Kick-off Meeting.** Kick-off meeting with attendance of key staff.

**2.2 Literature Review.** Literature review; data mining from existing reports; and written summary of relevant information for report.

**2.3 Interviews with Key Stakeholders and Experts.** Interview local and subject matter experts.

**2.4 Project Geodatabase Creation.** Creation of Project Geodatabase for relevant land use and environmental thematic layers, including, but not limited to topography, flow accumulation, soil characteristics, and wind patterns.

**2.5 Farmland Water Consumption.** Collect water consumption data from BWD; update parcel level Geographic Information System (GIS) data, as necessary; calculate water consumption by parcel and, digitization of new data layers, as necessary.

**2.6 Review of Historical Data.** Review of historical maps, search of available historical records (e.g., herbarium records and historical accounts); georeference available historical maps and old place name references; synthesize information to describe site specific historical ecology; and include comparison of historical and current vegetation cover densities. Provide guidance on feasible restoration targets.

## Task 3. Existing Fallowed Farmland and Reference Natural Habitat Field Study

**3.1 Field Observations of a Time Series of Existing Fallowed Farmland.** Interviews with past and current BWD staff about experience with fallowed fields, field visits, and data collection of existing conditions.

**3.2 Field Sampling of Reference Natural Habitat to Guide Farmland Restoration Potential.** Use GIS layers to stratify landscape in the Valley, including the agricultural land into similar geomorphic features for sampling. Based on this stratification and information from the time series of fallowed farmland, determine a sampling design to collect more detailed information on plant cover and “greenness” utilizing drones and multispectral imagery over hundreds of acres. Areas of interest will be visited on the ground to compare vegetation composition and plant physiological data that will further help to identify specific areas and

species most promising for rehabilitation. Sample cover data, analyze and interpret reference conditions to identify a range of reasonable habitat restoration targets for fallowed farmland.

#### Task 4. Brush Pile Wildlife Sand Fence Case Study

**4.1 Identify Manipulative Sites for Sand Fences.** Working on land with BWD access agreements, identify one or multiple sites, based on feasibility, for construction of Sand Fences.

**4.2 Design and Construct Sample Sand Fences.** Working directly with crews in the field, identify the most economical method of construction, and build variations on the design, as appropriate. Sand Fences will be compared to control (no action) and mulched fields with chipped orchard tree material.

**4.3 Baseline Observations of Sand Fence Function and Wildlife Value.** Take baseline data for comparison to future datasets, and to characterize the habitat and dust control value of the Sand Fences. Utilizing information from Task 2 and initial results from Task 3, establish a pilot study with promising plant species to help understand plant response to Sand Fences.

#### Task 5. Farmland Fallowing Rehabilitation Strategies

**5.1 Develop Conceptual Models for Key Rehabilitation Processes.** Based on literature review, geodatabase indices and analysis, field study results, and expert interviews, develop conceptual models of key processes involved in dust, native recruitment, and habitat restoration of fallowed farmland.

**5.2 Design Rehabilitation Strategies.** Develop Rehabilitation Strategies for Fallowed Farmland based on conceptual models, the range of potential for rehabilitation based on site level measurements across the study area, and project goals.

**5.3 Farmland Fallowing Best Practice Recommendations.** Recommendations for Best Practice Language for Fallowing of Farmland to be incorporated into the GSP. Identify gaps in knowledge for future monitoring and study to improve best practice adaptively as land begins to be fallowed for water conservation.

#### Task 6. Farmland Fallowing Prioritization

**6.1 Prioritization Model for Fallowing Farmland Ranked by Benefits of Water Conservation and Rehabilitation Potential.** Develop a model for prioritizing acquisition of farmland for fallowing based on the reduction of water consumption, and likelihood of success of the rehabilitation strategies.

#### Task 7. Environmental Working Group Meetings

**7 Environmental Working Group Meetings.** The Project Manager, Travis Brooks, and other key personnel relevant to the meeting agenda, will attend up to 2 meetings per year, for three years to present findings from each of the tasks in the work plan and seek feedback from EWG members.

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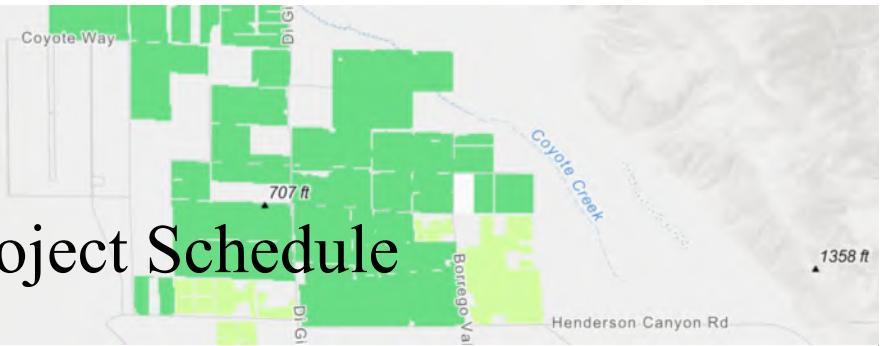
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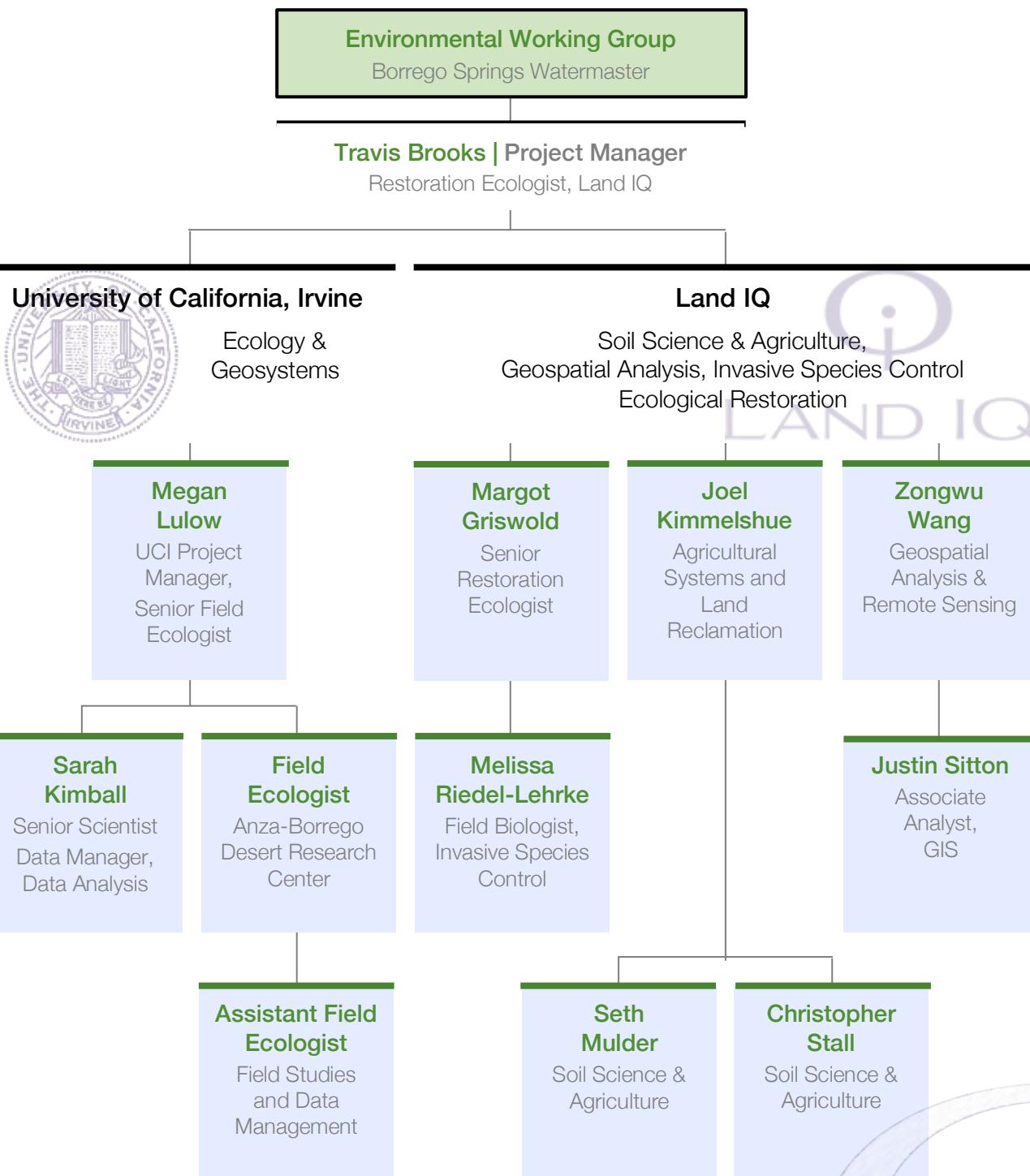
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# Project Schedule

Task	Approx. Time to Complete in Months	Anticipated End Date	Deliverables
Notice to Proceed (NTP)	---	July 1, 2022	
<b>Task 1.</b> Project Management	36	June 30, 2025	Quarterly Status Updates Kick-Off Meeting Technical Memo Summarizing Existing Data
<b>Task 2.</b> Review and Analysis of Existing Data	5	Nov. 30, 2022	Initial Fallowed Farmland Rehabilitation Opportunities and Prioritization Map
<b>Task 3.</b> Existing Fallowed Farmland and Reference Natural Habitat Field Study	24	Dec. 31, 2024	Technical Report of Field Studies
<b>Task 4.</b> Brush Pile Wildlife Sand Fence Case Study	24	Dec. 31, 2024	Constructed Sample Sand Fences Technical Report
<b>Task 5.</b> Farmland Fallowing Rehabilitation Strategies	18	June 30, 2025	Draft and Final Rehabilitation Strategies and Best Practice for Fallowing
<b>Task 6.</b> Farmland Fallowing Prioritization	18	June 30, 2025	Prioritization of Farmland Fallowing Report and Maps
<b>Task 7.</b> Env. Working Group Meetings	36	June 30, 2025	Participation in 6 Meetings

# Project Team Organization





## FIRM INFORMATION

Land IQ is a specialized land-based (agricultural and natural systems) science and remote sensing firm that pairs scientific knowledge of agronomic, native plant and land systems management with advanced remote sensing technologies, custom modeling, and analytical methods to develop powerful and cost-effective client solutions. The Land IQ team has been operating for over 15 years and some of our firm's select certifications and achievements include:

- California Small Business Enterprise (Micro) #1748303
- Women Business Enterprise #13010130
- Sacramento Area Sustainable Business
- 2017 Professional Services Contractor of the Year – Los Angeles Department of Water and Power – Owens Lake Dust Mitigation Science & Regulatory Team

## TECHNICAL EXPERTISE

Land IQ maintains a staff of soil scientists, agronomists, ecologists, and remote sensing and GIS specialists. Our staff average over 14 years professional experience and hold professional certifications including Certified Professional Soil Scientists and Agronomists, Registered Professional Soil Scientists, Biologists, Ecologists, and Certified Professionals in Erosion and Sediment Control Specialists.

The Land IQ Habitat Restoration Group offers a wide range of specialized services in natural resource planning, analysis, restoration, and management. Our achievements in revegetating and reclaiming drastically disturbed landscapes, monitoring for mitigation, and assessing and monitoring exotic species highlight our success in restoration ecology. Land IQ has assessed over 15,000 acres of land for habitat restoration potential and developed specific protocols for resource management plans.

Land IQ has existing working project relationships with a variety of technical experts and universities that may be resources for selected project efforts. We value and welcome cooperative efforts and our relationships include researchers and experts from CSUMB/NASA-Ames, Cal Poly ITRC, UC Davis, Fresno State, UC Irvine, UCLA, USC, and UC Cooperative Extension.

## PROJECT EXPERIENCE

- **Owens Lake Dust Mitigation Program** – Land IQ works with the Los Angeles Department of Water and Power to support the design of irrigation, grading and tillage plans, as well as the development of soil preparation and planting specifications specifically for the purpose of comprehensive dust control on the 100 square mile Owens Dry Lakebed. Land IQ specifically develops appropriate native seed mixes and manages the collection of local species to not only control dust but also enhance habitat value of the dust control areas.
- **Upper Chiquita Canyon Habitat Conservation Area Restoration & Management** - Land IQ is responsible for managing a 1,158-acre conservation easement in southern Orange County that supports important populations of California gnatscatchers and coastal cactus wrens. Land IQ staff has identified restoration opportunities on approximately 500 acres of land disturbed by historic dry-land farming and grazing, and developed efficient techniques for large-acreage restoration areas of cactus scrub, coastal sage scrub, native grassland, oak woodland habitats and rare plant species.
- **Stabilization of Exposed Salton Sea Floor** - Land IQ has consulted with the Imperial Irrigation District (IID) to identify strategies for stabilizing vast expanses of fragile, erodible exposed Sea floor by developing concepts for methods such as planting native cover, roughening surfaces to disrupt wind, or combinations of these approaches.



## **The Environmental Collaboratory**

The UCI Environmental Collaboratory enables three programs at UCI who focus on advancing our understanding and stewardship of natural areas to leverage each other's strengths to provide excellent research and innovative solutions to environmental problems. The Environmental Collaboratory functions through working partnerships to develop knowledge networks, which are opportunities for the academic community, local land managers, policy makers, and conservation organizations to share information and utilize an active adaptive management framework to inform management activities. UCI-Nature facilitates research, education, and public service on the reserves it manages and in partnership with other neighboring land managers. The Center for Environmental Biology (CEB) offers year-long internships in which students are engaged in authentic environmental research and outreach experiences. The Masters in Restoration and Conservation Science Program prepares students to become leaders in the fields of environmental science, conservation, and restoration. Each cohort completes a group capstone project working with a partner sponsor to provide solutions to environmental challenges through an active adaptive management process.

### **Megan Lulow, Ph.D., Executive Director, UCI-NATURE**

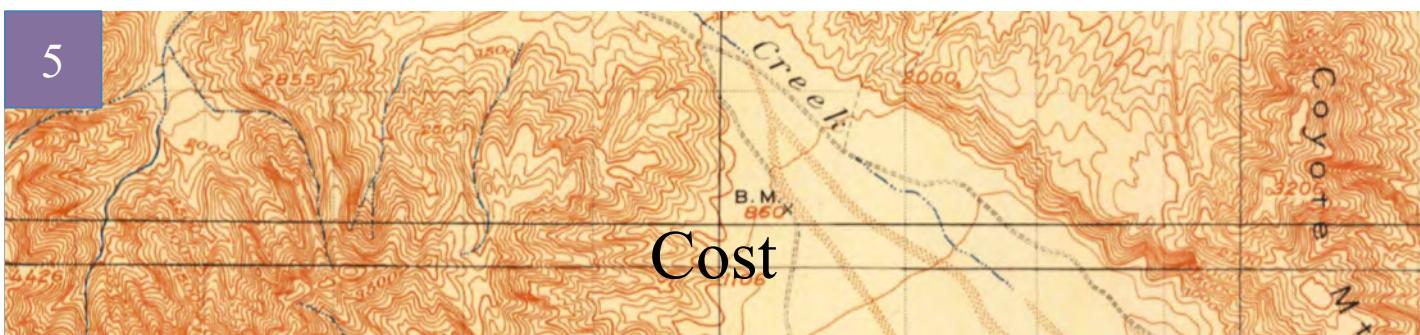
Megan oversees operations and programs for UCI-NATURE, which includes two desert reserves, a freshwater marsh, and an upland coastal reserve. She also teaches Restoration Techniques as part of the MCRS curriculum. She has seventeen years of professional experience in natural lands management as an ecologist and program director and has supervised several restoration projects. UCI Nature is part of the UC Natural Reserve System with reserves throughout California. It is central to the mission of these reserves to not only facilitate research and education on its reserves, but to foster connections between the University and the communities surrounding the reserves. Megan has published several studies in peer-reviewed journals with a focus on restoration ecology.

### **Sarah Kimball, Ph.D., Associate Adjunct Professor & Director, CEB**

Sarah is an ecologist with broad interests, specializing in plants. She determines the research agenda for CEB, collaborating with local land managers to develop research projects that evaluate the effectiveness of conservation and restoration efforts. Sarah mentors students through the process of designing and carrying out ecological experiments. Sarah also teaches Restoration Ecology and Ecology, and serve as an academic advisor for the MCRS program. She has published over 35 studies in peer-reviewed journals, several of which focus on restoration ecology.

## **Selected Projects and Publications**

1. Sentenac Cienega Ecosystem Restoration, Anza Borrego State Park, California Department of Parks and Recreation, CDFW Prop 1.
2. Water Management Improvements under Climate Change at the UC Irvine San Joaquin Marsh. Wildlife Conservation Board, Prop 68, Pacific Flyway Conservation.
3. Ecological Preserve Defensible Space Demonstration Project. Natural Communities Coalition, Natural Reserve of Orange County, Natural Communities Conservation Plan.
4. Drought Net Restoration Study: An Examination of the Effects of Seed Source on Restoration Success in a Changing Precipitation Regime
5. Kimball, S., M. Lulow, Q. Sorenson, K. Balazs, Y. Fang, S. Davis, M. O'Connell, and Travis E. Huxman. 2015. Cost-effective ecological restoration. *Restoration Ecology*. 23(6):800-810.
6. Wilson, K., M. Lulow, J. Burger, Y. Fang, C. Anderson, D. Olson, H. Possingham, M. O'Connell, and M.F. McBride. 2011. Optimal restoration: accounting for space, time, and uncertainty. *Journal of Applied Ecology*. 48(3):715-725.
7. Kimball, S., Long, J. J., Ludovise, S., Ta, P., Schmidt, K. T., Halsch, C. A., . . . Nguyen, L. (2019). Impacts of competition and herbivory on native plants in a community-engaged, adaptively managed restoration experiment. *Conservation Science and Practice*, 1(12). doi:10.1111/csp2.122



Land IQ and UCI strive to provide cost-effective professional services. Based upon the agreed upon Scope of Work, we will make efficient use of staff to carry out tasks under the contract.

The total price for Concept Feasibility Plan for Rehabilitation of Fallowed Irrigated Agricultural Land in the Borrego Valley Groundwater Basin Project is a not-to-exceed price of \$728,480. Cost by Task is provided in the following table.

Task	Cost by Task
<b>Task 1.</b> Project Management	<b>\$ 50,440</b>
<b>Task 2.</b> Review and Analysis of Existing Data	<b>\$ 84,070</b>
<b>Task 3.</b> Existing Fallowed Farmland and Reference Natural Habitat Field Study	<b>\$ 218,750</b>
<b>Task 4.</b> Brush Pile Wildlife Sand Fence Case Study	<b>\$ 220,680</b>
<b>Task 5.</b> Farmland Fallowing Rehabilitation Strategies	<b>\$ 75,220</b>
<b>Task 6.</b> Farmland Fallowing Prioritization	<b>\$ 56,620</b>
<b>Task 7.</b> Environmental Working Group Meetings	<b>\$ 22,700</b>
<b>TOTAL</b>	<b>\$ 728,480</b>

# Project Information Submittal Form

---

**Project Submitter/Owner:** Environmental Working Group of the Borrego Springs Watermaster

**Project Name:** Groundwater Dependent Ecosystems (GDE) Monitoring Program

## Contact Information

**Name:** Andy Malone, PG - Lead Technical Consultant

**Phone:** 949-420-3030

**Email:** amalone@westyost.com

**Address:** Borrego Springs Watermaster, c/o West Yost Associates, 23692 Birtcher Drive, Lake Forest, CA 92630

## Project Summary

Please provide a summary of the Project description. Use as much space as you need.

The technical work that supported the Watermaster's Groundwater Management Plan (GMP) indicated that all existing GDEs within the Borrego Springs Subbasin (Subbasin) have never been, or are no longer, dependent on groundwater in the Subbasin. The major GDE identified as once dependent on the regional aquifer within the Subbasin was a honey mesquite community in the vicinity of the Borrego Sink (Mesquite Bosque).

The Watermaster's Environmental Working Group (EWG) contends that a GDE Monitoring Program is necessary to check/verify the conclusions of the technical work that supported the GMP. For the Project proposed herein, a GDE Monitoring Program will be developed and implemented in a phased approach under the guidance of the EWG and the direction of the Watermaster Board over an approximate three-year period concluding by June 30, 2025. The major tasks and subtasks are:

- **Task 1: Prepare the GDE Monitoring Program Workplan.** The Watermaster will prepare a GDE Monitoring Program Workplan (Workplan) under the guidance of the EWG and the Watermaster Board. Subtasks to prepare the Workplan include:
  - *Task 1a - Review the technical work that supported the conclusions in the GMP.*
  - *Task 1b - Prepare a draft Workplan and distribute to the EWG for review and comment.* The Workplan task will include: (i) a precise articulation of the gaps in the current understanding regarding all potential GDEs within the Subbasin and (ii) the detailed steps and costs to fill the gaps in understanding.
  - *Task 1c - Prepare a final Workplan based on the feedback from the EWG.* The final Workplan will be approved by the Watermaster Board.
- **Task 2: Implement the GDE Monitoring Program.** The Watermaster will implement the GDE Monitoring Program Workplan under the guidance of the EWG and the Watermaster Board. In this grant application, the Workplan is conceptual but will likely include the following

activities:

- *Task 2a - Update the mapping and characterization of the historical GDEs in the Subbasin.* This type of work was previously performed to support the GMP. The work proposed in this subtask will build upon the GMP, and may include:
  - Maps of the extent and health of the potential GDEs using air photos and remote sensing data (e.g., Normalized Difference Vegetation Index [NDVI]) to display the extent and health of GDEs over time.
  - Charts and data graphics that reveal/demonstrate the relationships between changes in GDEs and changes in those factors that could influence the GDEs (e.g., groundwater production, groundwater levels, surface water discharge, and climate).
  - A comparison of the history of GDEs in the Borrego Springs Subbasin to the GDEs in the Ocotillo-Clark Valley Groundwater Basin (which has not experienced the same magnitude of groundwater-level declines).

A task memorandum will be prepared to document the results and conclusions of this subtask and will include recommendations for the subsequent subtasks. The recommendations will be used to update the GDE Monitoring Program Workplan that was prepared in Task 1.

- *Task 2b - Fill gaps in understanding.* In this subtask, the gaps in understanding as identified in the GMP and the GDE Monitoring Program Workplan will be filled. The work proposed in this subtask may include:
  - Field-mapping and photo-documentation of potential GDEs to characterize GDE composition and establish baseline conditions.
  - Investigation of rooting-depth and source-water of the Mesquite Bosque in the Borrego Sink.
  - Construction and equipping of a shallow dual-nested monitoring well facility within the GDE near the Borrego Sink. This monitoring well is expected to support the investigation of rooting-depth and source-water of Mesquite Bosque (second bullet above).<sup>1</sup>
  - Construction and equipping of a surface-water monitoring station in the Borrego Sink. This monitoring site is expected to support the investigation of rooting-depth and source-water of Mesquite Bosque (second bullet above).<sup>1</sup>
- *Task 2c - Conduct interim monitoring program through 2024.* This subtask will include the collection and analysis of data from the monitoring program (e.g., NDVI, groundwater production, groundwater levels, surface-water discharge, and climatic parameters). The maps and data graphics prepared for the technical memorandum in

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<sup>1</sup> Budget for construction and equipping of groundwater and surface-water monitoring facilities are not included herein, but are included in the separate Watermaster Project Submittal for Monitoring, Reporting, and GMP Update.

Task 2a will be updated and shared with the EWG and Watermaster Board.

- **Task 3: Prepare GDE Monitoring Program Report and Recommendations.** The Watermaster will summarize the findings of Task 2 and prepare a technical report that describes the results, conclusions, and recommendations of the GDE Monitoring Program.
  - If the monitoring program indicates that GDE(s) **are dependent** on the regional aquifer within the Subbasin, then the EWG will provide recommendations to the Watermaster Board for revisions to the GMP to protect the environmental beneficial uses of groundwater pursuant to the requirements of the SGMA.
  - If the monitoring program indicates that GDE(s) **are not dependent** on the regional aquifer within the Subbasin, then the GMP will not be modified. Any continuation of GDE monitoring will only be conducted at the recommendation of the EWG and at the discretion of the Watermaster Board.

Describe the project location, current conditions, and the benefitting areas. Please attach, separately, a regional and Project map depicting the site(s) location, current conditions, and benefitting areas.

The project location is the Borrego Springs Subbasin and the potential GDEs that exist or existed within the Subbasin. A "control area" in the Ocotillo-Clark Valley Groundwater Basin is also expected to be included in the project. Exhibit A (attached) is a map from the GMP that shows the potential GDE areas within the Subbasin, particularly the Mesquite Bosque within the Borrego Sink. This potential GDE are the potential environmental users of groundwater, and hence, represent the benefiting areas.

**What is the nexus of the Project to the Sustainability Goal of the Borrego Springs Subbasin Groundwater Management Plan (GMP)? Is the Project listed in the GMP? How does the Project help achieve the goals of the GMP?**

The Project is not listed as a standalone project or management action (PMA) in the GMP. However, the SGMA requires that all beneficial uses and users of groundwater, including GDEs, be considered in the development and implementation of Groundwater Sustainability Plans (GSP) (Water Code § 10723.2). GDEs are specifically defined under the SGMA as "ecological communities of species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" (23 CCR § 351(m)). The GSP Regulations include specific requirements to identify GDEs and consider them when determining whether groundwater conditions are having potential effects on beneficial uses and users.

The Watermaster's Groundwater Management Plan (GMP) is a repurposed GSP that is part of the Physical Solution under the Stipulated Judgment. The GMP is intended to avoid "undesirable results" as defined in the SGMA, such as adverse impacts to environmental uses/users of groundwater within the Borrego Springs Subbasin (e.g., GDEs). The GMP identified and characterized several historical and current GDEs overlying the Subbasin and within the tributaries of the mountain-front watersheds. However, the GMP concluded that all existing GDEs have never been, or are no longer, dependent on the regional aquifer of the Subbasin. The major GDE identified as once dependent on the regional aquifer of the Subbasin was a honey mesquite community in the vicinity of the Borrego Sink.

The main conclusions and recommendations of the GMP regarding GDEs are as follows [Appendix D4: Borrego Springs Subbasin Groundwater Dependent Ecosystems, page 26]:

*"A review of available pertinent spatial datasets, historical data including stream flow and groundwater levels, satellite-derived vegetation metrics, and geology was completed to develop a robust HCM [hydrogeologic conceptual model] to evaluate nexus of GDEs with Subbasin regional groundwater levels. Because of the long-term imbalance of pumping with available natural recharge, an irreversible impact has likely occurred on the honey mesquite community from a decline in groundwater levels, an impact which, based on the best available science, was completed and became permanent sometime prior to 1985. The comprehensive assessment revealed potential GDEs identified within the Subbasin no longer have direct reliance on groundwater emerging from aquifers or on groundwater occurring near the ground surface, and instead are sustained by periodic stormwater flows, soil moisture, and potentially perched groundwater where present. These findings indicate that based on best available data there is no need for the GSP to address minimum groundwater level thresholds with respect to potential GDEs. Detailed mapping of vegetation is lacking for the area in the vicinity of the Borrego Sink. Groundwater level monitoring of wells located in the vicinity of the Borrego Sink should continue."*

Section IV.H of the Stipulated Judgment provides that:

*An Environmental Working Group (EWG) will be established to advise the Watermaster on GDE and any other matters approved by the Watermaster.*

The EWG held its inaugural meetings in February and May 2021 to discuss and prioritize activities that the EWG could engage in pursuant to its purview and duties as defined by the Judgment. Some EWG members contend that more study is necessary to determine if existing GDEs are dependent on the regional aquifer of the Subbasin, or not.

The Project proposed herein is intended to clarify this uncertainty through the development and implementation of a GDE Monitoring Program conducted by the Watermaster under the guidance of the EWG. If the results and conclusions of the monitoring program indicate that GDE(s) are dependent on the regional aquifer of the Subbasin, then the EWG will provide recommendations for revisions to the GMP to protect the environmental beneficial uses of groundwater pursuant to the requirements of the SGMA.

**What are the specific goals and needs for the Project, and how will the project achieve the goals and meet the needs?**

The main objective of the project is to determine if the potential GDEs within the Subbasin are dependent on the regional aquifer of the Subbasin, or not. A GDE Monitoring Program is needed to make this determination. A final technical report will describe the results, conclusions, and recommendations of the GDE Monitoring Program.

The GDE Monitoring Program will be developed and implemented under the guidance of the technical experts participating on the EWG. Technical subconsultants, with demonstrated expertise in surface-water and groundwater hydrology, desert ecology, and GDEs, will likely be needed to execute the monitoring program.

If the monitoring program indicates that GDE(s) *are dependent* on the regional aquifer within the Subbasin, then the EWG will provide recommendations to the Watermaster Board for revisions to the GMP to protect the environmental beneficial uses of groundwater pursuant to the requirements of the SGMA. If the monitoring program indicates that GDE(s) *are not dependent* on the regional aquifer within the Subbasin, then the GMP will not be modified.

**What are the quantifiable benefits of the Project (e.g., protect or enhance water quality, water conservation, enhanced understanding of the groundwater basin, etc.)? How will those benefits be quantified and evaluated?**

The project will enhance the understanding of the groundwater basin, and potentially, will result in revisions to the GMP to protect the environmental beneficial uses of groundwater pursuant to the requirements of the SGMA. These benefits will be quantified and described in the interim and final deliverables of the project.

In addition, there are monitoring facilities, such as monitoring wells, that are expected to be constructed in to support the project. These monitoring facilities will generate data and information to assist the Watermaster with other basin management initiatives, including the periodic Redetermination of the Sustainable Yield, groundwater-level and groundwater-quality monitoring programs, annual reporting to the DWR, etc.

**Please describe the communities served by the Project. Will the Project benefit an Underrepresented Community, a Disadvantaged Community (DAC), and/or a Severely Disadvantaged Community (SDAC)? If so, please provide a map.**

Exhibit B is a map of the Basin and the area defined as a SDAC. While the Project activities will be focus within the primary GDE within the Borrego Sink, the Project will serve the entire Basin, including the community of Borrego Springs and the area classified as a SDAC, because it is designed to better understand and (potentially) protect the natural resources within the Subbasin.

- A primary driver of the economy in Borrego Springs is ecotourism associated with the Anza-Borrego State Park and the flora and fauna of the region. The Project is designed to better understand and (potentially) protect the natural resources within the community, and thereby support economic activity within Borrego Springs.
- The Watermaster was officially formed in April 2021. Expenses to conduct Watermaster activities are relatively new costs that are ultimately funded by the residents and rate payers within the community. The grant funding will help offset the new costs and provide financial relief to the residents and rate payers.
- The community's water supply is solely dependent on the Basin. The Project is related to the larger project of implementation of the Judgment and GMP, which will ensure that the groundwater basin remains an affordable, high-quality source of water for the community in perpetuity.

**Will the Project or Component positively impact issues associated with small water systems or private shallow domestic wells (e.g., groundwater contamination vulnerability, drawdown, etc.)? If so, please provide justification such as water system maps or domestic well census results.**

N/A

Does the Project address the needs of the State Water Board's SAFER Program, designed to ensure Californians who lack safe, adequate, and affordable drinking water receive it as quickly as possible, and that the water systems serving them establish sustainable solutions?

N/A

How does the Project address the Human Right to Water (AB 685 Section 106.3) which states that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes?

N/A

Please describe how the project contributes to addressing the risks in the region to water supply and water infrastructure arising from climate change. If possible, please provide the amount of greenhouse gas emissions reduced and carbon sequestered resulting from the project.

GDEs can act to sequester carbon through the process of biosequestration, which is the capture and storage of the atmospheric carbon dioxide by natural vegetation. The Project is designed to better understand and (potentially) protect the GDEs and their function within the Earth's carbon cycle.

## Work Plan

The Work Plan must contain descriptions of the anticipated tasks necessary to complete the project. Tasks should be organized by the five budget categories, as applicable: (a) Project Administration, (b) Planning/Design/Environmental, (c) Construction/Implementation, (d) Monitoring/Assessment, and (e) Interested Parties Outreach/Education. The Work Plan should also identify the anticipated deliverables for each task.

Add additional tasks and subtasks as needed to provide a detailed work plan. Some examples and suggested language have been provided.

### Budget Category (a): Project Administration

**Task 0 – Project Management.** This task includes: preparation and submission of supporting grant documents and coordination with the Grantee; preparing invoices including relevant supporting documentation for submittal to DWR via the Grantee; tracking project budget and schedule progress; and coordinating with staff, partnering agencies, and consultants/contractors.

**Deliverables:** Invoices and necessary documentation.

### Budget Category (b): Planning/Design/Environmental

**Task 1 – Prepare the GDE Monitoring Program Workplan.** The Watermaster will prepare a GDE Monitoring Program Workplan under the guidance of the EWG and final approval of the Watermaster Board. Subtasks to prepare the Workplan include:

Task 1a – Review the technical work that supported the conclusions in the GMP.

Task 1b – Prepare a draft Workplan and distribute to the EWG for review and comment.

Task 1c – Prepare a final Workplan based on the feedback from the EWG.

**Deliverables:** Draft and final versions of the GDE Monitoring Program Workplan

### Budget Category (c): Construction/Implementation

**Task 2b – Fill gaps in understanding.** In this subtask, the gaps in understanding as identified in the GMP and the GDE Monitoring Program Workplan will be filled. The work proposed in this subtask may include:

Task 2b(iii) – Construct and equip a dual-nested monitoring well in the Borrego Sink.

Task 2b(iv) - Construct and equip a surface-water monitoring station in the Borrego Sink.

**Deliverables:** Draft and final technical specifications for the monitoring sites; contractor bid documents; and final completion reports for the monitoring facilities.

#### Budget Category (d): Monitoring/Assessment

**Task 2a – Update the mapping and characterization of the historical GDEs in the Subbasin.** This type of work was previously performed to support the GMP. The work proposed in this subtask will build upon the GMP, and may include:

- Maps of the extent and health of the potential GDEs using air photos and NDVI to display the extent and health of GDEs over time.
- Charts and data graphics that reveal/demonstrate the relationships between changes in GDEs and changes in those factors that could influence the GDEs (e.g., groundwater production, groundwater levels, surface water discharge, and climate).
- A comparison of the history of GDEs in the Borrego Springs Subbasin to the GDEs in the Ocotillo-Clark Valley Groundwater Basin (which has not experienced the same magnitude of groundwater-level declines).

**Deliverables:** A task memorandum will be prepared to document the results and conclusions of this subtask and will include recommendations for the subsequent subtasks. The recommendations will be used to update the GDE Monitoring Program Workplan that was prepared in Task 1.

**Task 2b – Fill gaps in understanding.** In this subtask, the gaps in understanding as identified in the GMP and the GDE Monitoring Program Workplan will be filled. The work proposed in this subtask may include:

Task 2b(i) - Field-mapping and photo-documentation of potential GDEs to characterize GDE composition and establish baseline conditions.

Task 2b(ii) - Investigation of rooting-depth and source-water of the Mesquite Bosque in the Borrego Sink.

**Deliverables:** Draft and final technical reports to document the investigations and technical work.

**Task 2c – Conduct interim monitoring program through 2024.** This subtask will include the collection and analysis of data from the monitoring program (e.g., NDVI, groundwater production, groundwater levels, surface-water discharge, and climatic parameters).

**Deliverables:** The maps and data graphics that were prepared for the Task 2a technical memorandum will be updated annually and shared with the EWG and Watermaster Board.

**Task 3 – Prepare GDE Monitoring Program Report and Recommendations.** The Watermaster will summarize the findings of Task 2 and prepare a technical report that describes the results, conclusions, and recommendations of the GDE Monitoring Program.

**Deliverables:** Draft and final GDE Monitoring Program Report and Recommendations.

**Budget Category (e): Interested Parties Outreach/Education**

**Task 4 – Conduct EWG Meetings.** At least two EWG meetings per year will be necessary to: receive updates on project progress; provide guidance and input to the Watermaster Technical Consultant and subcontractors; review draft and final project deliverables and make recommendations to the Watermaster Board.

**Deliverables:** Meeting agendas/packets; PowerPoint presentations; summary meeting notes; and memorandums with recommendations to the Watermaster Board. All EWG meeting deliverables will be posted to the Watermaster's website.

## Budget

DWR required budget categories have been included below. Add tasks as applicable; additional rows must be added under the applicable categories to present the cost of each task described in the Work Plan.

	<b>Category</b>	<b>(a)</b>	<b>(b)</b>	<b>(c)</b>	<b>(d)</b>
		<b>Requested Grant Amount</b>	<b>Local Cost Share: Non-State Fund Source*</b>	<b>Total Cost</b>	<b>% Local Cost Share (Col(b))/(Col(c))</b>
<b>(a)</b>	<b>Project Administration</b>				
	Task 0. Project Management	30,000		30,000	0%
<b>(b)</b>	<b>Planning/Design/Environmental</b>				
	Task 1. Prepare the GDE Monitoring Program Workplan	50,000		50,000	0%
<b>(c)</b>	<b>Construction/Implementation</b>				
	Task 2b(iii) – Construct and equip a dual-nested monitoring well in the Borrego Sink <sup>2</sup>				
	Task 2b(iv) – Construct and equip a surface-water monitoring station in the Borrego Sink <sup>2</sup>				
<b>(d)</b>	<b>Monitoring/Assessment</b>				
	Task 2a – Update the mapping and characterization of the historical GDEs in the Subbasin	125,000		125,000	0%
	Task 2b(i) – Field-mapping and photo-documentation of	105,000		105,000	0%

<sup>2</sup> Budget for construction and equipping of groundwater and surface-water monitoring facilities are not included herein, but included in the separate Watermaster Project Submittal for Monitoring, Reporting, and GMP Update.

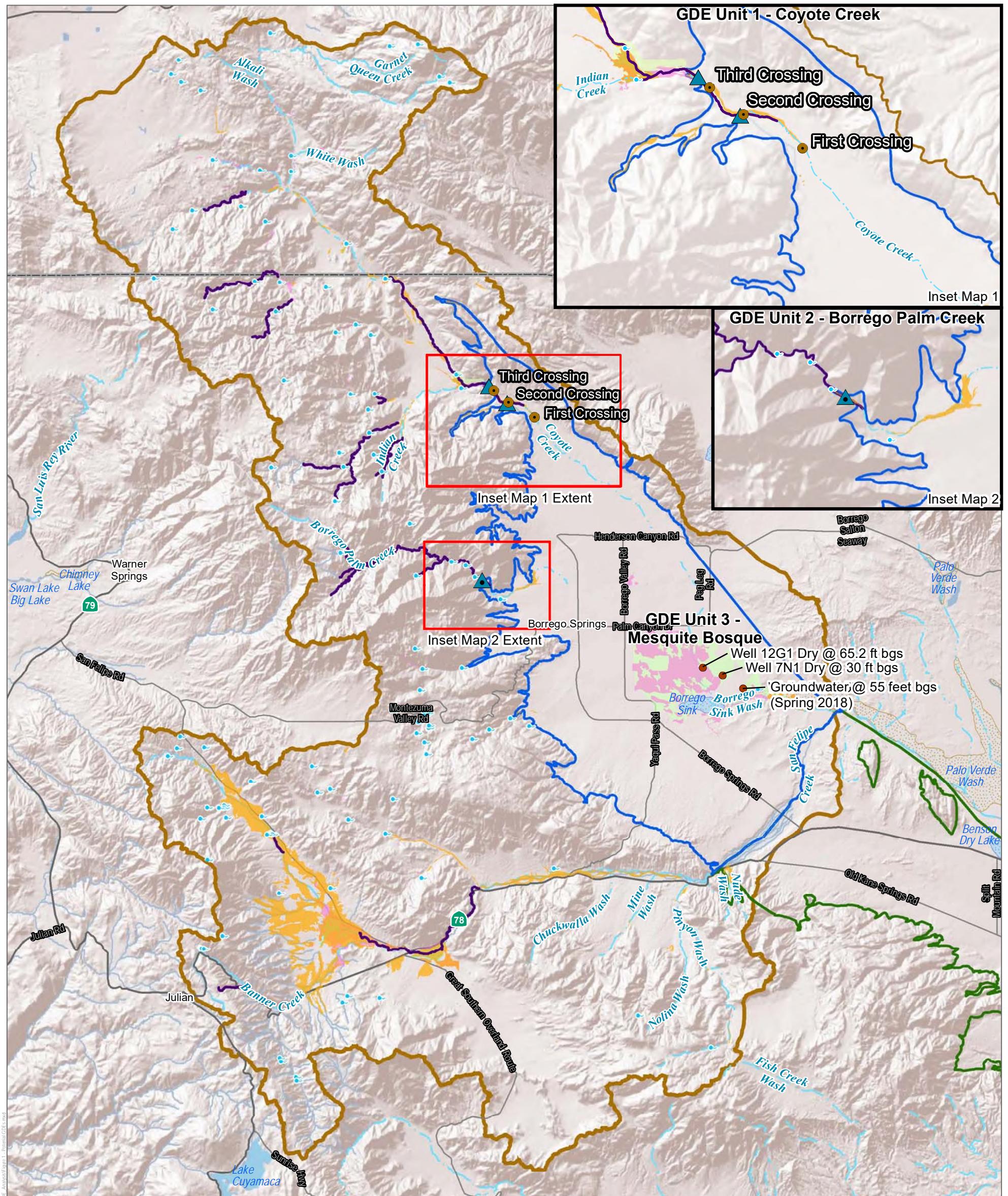
	potential GDEs to characterize GDE composition and establish baseline conditions				
	Task 2b(ii) – Investigation of rooting-depth and source-water of the Mesquite Bosque in the Borrego Sink	105,000		105,000	0%
	Task 2c – Conduct interim monitoring program through 2024	30,000		30,000	0%
	Task 3 – Prepare GDE Monitoring Program Report and Recommendations	90,000		90,000	0%
(e)	<b>Interested Parties Outreach/Public Education</b>				
	Task 4 – Conduct EWG Meetings	50,000		50,000	0%
(f)	<b>Grand Total (Sum rows (a) through (e) for each column)</b>	585,000		585,000	0%

\* List sources of Local Cost Share funding:

## Schedule

The Schedule must be organized in a manner that is consistent with the Work Plan and Budget that will be contained in the Grant Agreement. The Schedule Table presented below is a template that must be completed for each project in the proposal. The required budget categories have been included below. Add additional rows for each task as described in the Work Plan and Budget.

<b>Categories</b>		<b>Start Date</b> (Earliest Start Date)	<b>End Date</b> (Latest End Date)
<b>(a)</b>	<b>Project Administration</b>	<b>4/1/2022</b>	<b>6/30/2025</b>
	Task 0. Project Management	4/1/2022	6/30/2025
<b>(b)</b>	<b>Planning/Design/Environmental</b>	<b>4/1/2022</b>	<b>8/1/2022</b>
	Task 1. Prepare the GDE Monitoring Program Workplan	4/1/2022	8/1/2022
<b>(c)</b>	<b>Construction/Implementation</b>	<b>7/1/2022</b>	<b>10/1/2023</b>
	Task 2b(iii) – Construct and equip a dual-nested monitoring well at the Borrego Sink	4/1/2022	10/1/2023
	Task 2b(iv) – Construct and equip a surface-water monitoring station at the Borrego Sink	4/1/2022	10/1/2023
<b>(d)</b>	<b>Monitoring/Assessment</b>	<b>4/1/2022</b>	<b>6/30/2025</b>
	Task 2a – Update the mapping and characterization of the historical GDEs in the Subbasin	4/1/2022	1/1/2023
	Task 2b(i) – Field-mapping and photo-documentation of potential GDEs to characterize GDE composition and establish baseline conditions	4/1/2022	10/1/2023
	Task 2b(ii) – Investigation of rooting-depth and source-water of the Mesquite Bosque in the Borrego Sink	4/1/2022	10/1/2023
	Task 2c – Conduct interim monitoring program through 2024	1/1/2023	1/1/2025
	Task 3 – Prepare GDE Monitoring Program Report and Recommendations	1/1/2025	6/30/2025
<b>(e)</b>	<b>Interested Parties Outreach/Public Education</b>	<b>4/1/2022</b>	<b>6/30/2025</b>
	Task 4 – Conduct EWG Meetings	4/1/2022	6/30/2025



Date 01/19/2019 - Last saved by dundarrenson - Path: Z:\Yerino\Projects\Borrego Valley\Groundwater Basin\10329\K01\FINAL\MOZDGE\_Analysis\Figure 1 - Potential GDEs.mxd

DRAFT March 2019

DATUM: NAD 1983. DATA SOURCE: DWR 2018; USGS NHD 2017; State Parks 2017; SanGIS 2017

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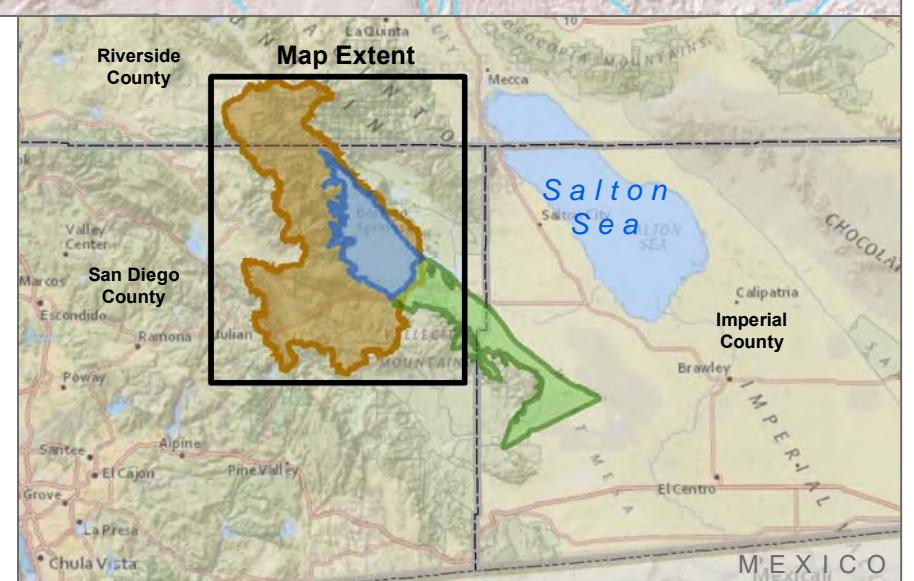
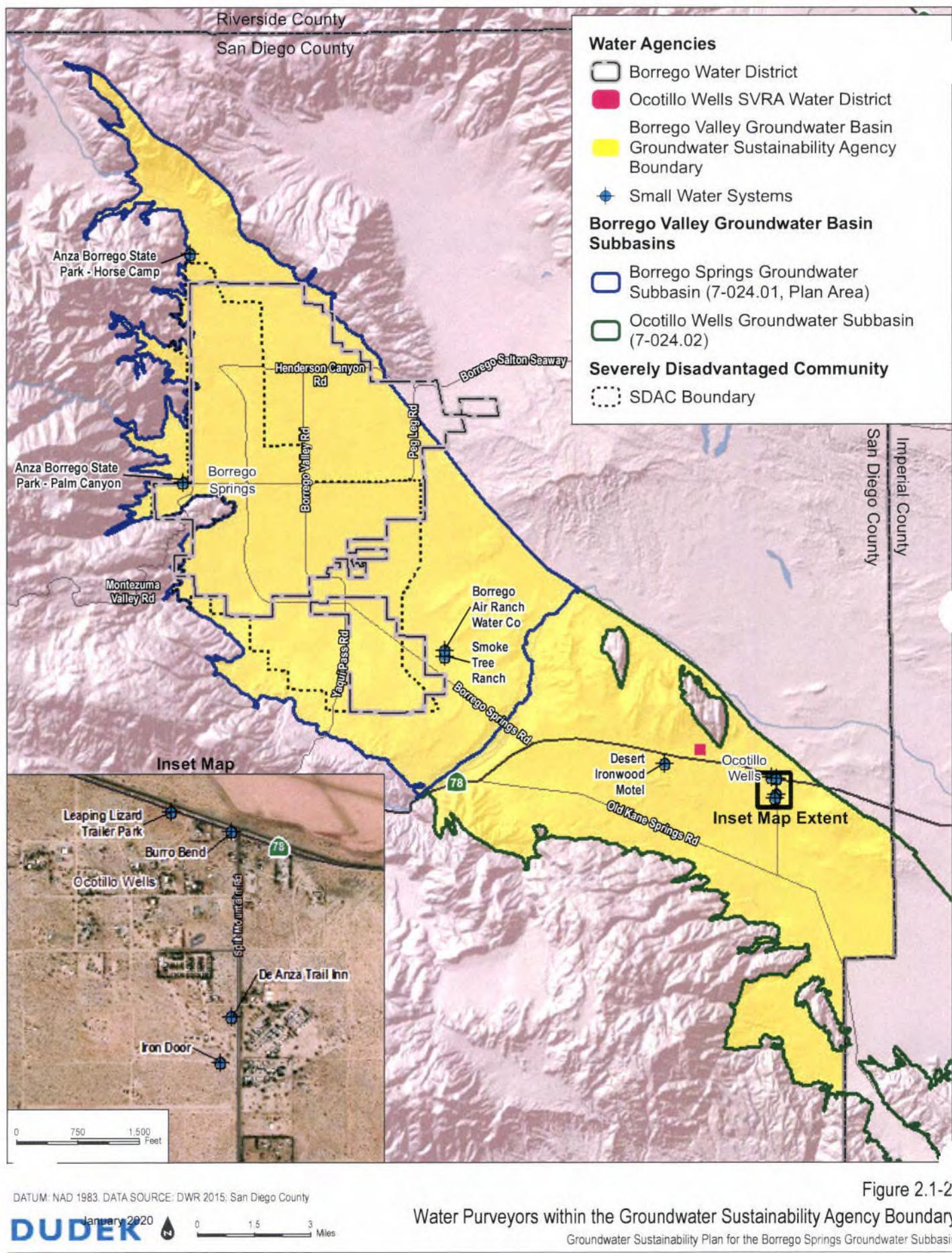


Figure 1  
Borrego Springs Subbasin and Potential Groundwater Dependent Ecosystems

Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems



## Supplemental Information

At the January 26, 2022 PRC Q&A Session, the Watermaster was asked to provide information about the amount of the requested grant funds that is comprised of costs that are already approved and funded by the Watermaster. The enclosed table summarizes these costs by sub-task in each of the following three projects submitted by Watermaster staff:

1. *Monitoring, Reporting, and GMP Update for Sustainable Management in the Borrego Springs Subbasin*
2. *Biological Restoration of Fallowed Lands*
3. *Groundwater Dependent Ecosystems (GDE) Monitoring Program*

Please note the following:

- The enclosed table shows:
  - Column (a) – requested grant amount
  - Column (b) – local cost share
  - Column (c) – total project cost
  - Column (d) – percent of cost that is local cost share
  - Column (e) – project costs included in the Watermaster WY 2022 Budget
- The Grant PSP indicates that “eligible costs” are those incurred after the publication of the final PSP by DWR, which occurred at the end of December 2021.
- The Watermaster’s requested grant funding is only for work performed after December 31, 2021.
- The Watermaster WY 2022 budget covers the period of October 1, 2021 through September 30, 2022.
- Column (e) of the enclosed table are the approved/budgeted costs for Watermaster project activities from January 1, 2022 through September 30, 2021. The costs shown do not include Watermaster costs expended from October 1, 2021 through December 31, 2021.
- For the project titled *Monitoring, Reporting, and GMP Update for Sustainable Management in the Borrego Springs Subbasin*, Watermaster included a local cost-share. The cost-share amounts for most line items represent the estimated costs (rounded) that will be expended by the Watermaster from January 1, 2022 through March 30, 2022, prior to the execution of a grant agreement between BWD and Watermaster. The DWR PSP indicates that project cost expended prior to the execution of grant agreements are eligible cost share.
- The project costs included in the Watermaster WY 2022 Budget as shown in column (e) are **inclusive** of the proposed cost share amounts (e.g. they are not in addition to the cost share)

**Comparison of the Cost of the Watermaster Proposed Grant Funding Request for the January 1, 2022 through June 30, 2025 Period to the Amount of the Request that is Funded in the Water Year 2022 Budget for the January 1, 2022 through September 30, 2022 Period  
(no specific work is approved/funded beyond September 30, 2022)**

Task Name	(a)	(b)	(c)	(d)	(e)
	Requested Grant Amount	Local Cost Share: Non-State Fund Source	Total Cost	% Local Cost Share (Col(b))/(Col(c))	Project Costs Included in BSWM WY 2022 Budget
<b>Monitoring, Reporting, and GMP Update for Sustainable Management in the Borrego Springs Subbasin</b>					
<b>TASK 1 - GROUNDWATER PUMPING MONITORING</b>					
Task 1a - Monthly meter reading and pumping calculations	\$ 95,000	\$ 7,000	\$ 102,000	7%	\$ 19,300
Task 1b - Annual meter accuracy testing	\$ 65,000	\$ -	\$ 65,000	0%	\$ 6,144
Task 1c - Outreach to existing and new de minimis pumpers to cooperate in pumping monitoring efforts, including collecting well data, and meter reading if applicable	\$ 13,000	\$ -	\$ 13,000	0%	\$ -
<b>TASK 2 - GROUNDWATER LEVEL MONITORING</b>					
Task 2a - Implement the existing and future expanded groundwater-level monitoring program	\$ 105,000	\$ 9,000	\$ 114,000	8%	\$ 8,779
Task 2b - Expand Monitoring Network through Outreach	\$ 10,000	\$ -	\$ 10,000	0%	\$ 5,385
Task 2c - Prepare monitoring well construction work plan	\$ 25,000	\$ -	\$ 25,000	0%	\$ -
Task 2d - Aquifer testing	\$ 65,000	\$ -	\$ 65,000	0%	\$ -
<b>TASK 3 - GROUNDWATER QUALITY MONITORING</b>					
Task 3a - Implement the existing and future expanded groundwater-quality monitoring program	\$ 145,000	\$ 17,000	\$ 162,000	10%	\$ 17,201
Task 3b - Prepare Water-Quality Monitoring Plan (WQMP)	\$ 35,000	\$ -	\$ 35,000	0%	\$ 20,258
<b>TASK 4 - SURFACE WATER FLOW MONITORING</b>					
Task 4 Surface Water Flow Monitoring	\$ 90,000	\$ 2,000	\$ 92,000	2%	\$ 2,016
<b>TASK 5 - CONSTRUCTION OF NEW MONITORING FACILITIES</b>					
Task 5a Construct multi-completion monitoring well	\$ 750,000	\$ -	\$ 750,000	0%	\$ -
Task 5b Construct and equip a surface-water discharge monitoring station in Coyote Creek	\$ 89,000	\$ -	\$ 89,000	0%	\$ -
Task 5c Construct and equip a shallow dual-nested monitoring well facility within the potential groundwater dependent ecosystem near the Borrego Sink	\$ 100,000	\$ -	\$ 100,000	0%	\$ -
Task 5d Construct and equip a surface-water monitoring station within the potential groundwater dependent ecosystem near the Borrego Sink	\$ 100,000	\$ -	\$ 100,000	0%	\$ -
<b>TASK 6 - IDENTIFY AND ADDRESS IMPROPERLY ABANDONED WELLS</b>					
Task 6a Outreach	\$ 10,000	\$ -	\$ 10,000	0%	\$ -
Task 6b Well Abandonment	\$ 198,000	\$ -	\$ 198,000	0%	\$ -
Task 6c Conversion of Abandoned Wells to Monitoring Wells	\$ 132,000	\$ -	\$ 132,000	0%	\$ -
<b>TASK 7 - MAINTAIN AND ENHANCE DATA MANAGEMENT SYSTEM</b>					
Task 7 Maintain and Enhance the Data Management System	\$ 57,000	\$ 3,000	\$ 60,000	5%	\$ 11,273
<b>TASK 8 - ANNUAL REPORTING TO THE COURT AND DWR</b>					
Task 8 Annual Reporting to DWR and the Court	\$ 125,000	\$ 35,000	\$ 160,000	22%	\$ 35,000

**Comparison of the Cost of the Watermaster Proposed Grant Funding Request for the January 1, 2022 through June 30, 2025 Period to the Amount of the Request that is Funded in the Water Year 2022 Budget for the January 1, 2022 through September 30, 2022 Period  
(no specific work is approved/funded beyond September 30, 2022)**

Task Name	(a)	(b)	(c)	(d)	(e)
	Requested Grant Amount	Local Cost Share: Non-State Fund Source	Total Cost	% Local Cost Share (Col(b))/(Col(c))	Project Costs Included in BSWM WY 2022 Budget
<b><u>TASK 9 - REDETERMINATION OF THE SAFE YIELD BY 2025</u></b>					
Task 9a: Prepare the Redetermination of the Sustainable Yield Workplan	\$ 50,000	\$ -	\$ 50,000	0%	\$ -
Task 9b: Perform Model Improvements	\$ 100,000	\$ -	\$ 100,000	0%	\$ -
Task 9c: Extend the model through September 2022	\$ 100,000	\$ -	\$ 100,000	0%	\$ 76,072
Task 9d: Conduct Model Recalibration	\$ 150,000	\$ -	\$ 150,000	0%	\$ -
Task 9e: Redetermine the Sustainable Yield in 2025	\$ 150,000	\$ -	\$ 150,000	0%	\$ -
Task 9f: Prepare Final Report	\$ 100,000	\$ -	\$ 100,000	0%	\$ 26,468
<b><u>TASK 10 - PREPARE THE 2025 GMP UPDATE</u></b>					
Task 10 Prepare the 2025 GMP Update	\$ 190,000	\$ -	\$ 190,000	0%	\$ -
<b><u>TASK 11 - STAKEHOLDER OUTREACH</u></b>					
Task 11a Board Meetings	\$ 255,000	\$ 85,000	\$ 340,000	25%	\$ 36,000
Task 11b: TAC Meetings	\$ 105,000	\$ 15,000	\$ 120,000	13%	\$ 21,595
Task 11c Stakeholder Workshops and Open House	\$ 45,000	\$ -	\$ 45,000	0%	\$ -
Task 11d Maintain Website, Distribution List, and Respond to Stakeholder Inquiries	\$ 15,000	\$ -	\$ 15,000	0%	\$ 5,087
<b><u>TASK 12 - PROJECT MANAGEMENT</u></b>					
Task 12a Project Management	\$ 170,000	\$ 2,500	\$ 172,500	1%	\$ 4,980
Task 12b Grant Management and Reporting	\$ 45,000		\$ 45,000	0%	\$ -
<b>TOTAL PROJECT COSTS</b>	<b>\$ 3,684,000</b>	<b>\$ 175,500</b>	<b>\$ 3,859,500</b>	<b>5%</b>	<b>\$ 295,558</b>
<b>Biological Restoration of Fallowed Lands</b>					
Task 1 Project Management	\$ 50,000	\$ -	\$ 50,000	0%	\$ -
Task 2 Review and Analysis of Existing Data	\$ 84,070	\$ -	\$ 84,070	0%	\$ 17,606
Task 3 Existing Fallowed Farmland and Reference Natural Habitat Field Study	\$ 218,750	\$ -	\$ 218,750	0%	\$ -
Task 4 Brush Pile Wildlife Sand Fence Case Study	\$ 220,680	\$ -	\$ 220,680	0%	\$ -
Task 5 Farmland Fallowing Rehabilitation Strategies	\$ 75,220	\$ -	\$ 75,220	0%	\$ -
Task 6 Farmland Fallowing Prioritization	\$ 56,620	\$ -	\$ 56,620	0%	\$ -
Task 7 – Conduct EWG Meetings	\$ 50,000	\$ -	\$ 50,000	0%	\$ 14,000
<b>TOTAL PROJECT COSTS</b>	<b>\$ 755,340</b>	<b>\$ -</b>	<b>\$ 755,340</b>	<b>0%</b>	<b>\$ 31,606</b>
<b>Groundwater Dependent Ecosystems (GDE) Monitoring Program</b>					
Task 0 Project Management	\$ 30,000	\$ -	\$ 30,000	0%	
Task 1 Prepare the GDE Monitoring Program Workplan	\$ 50,000	\$ -	\$ 50,000	0%	\$ 5,469
Task 2a – Update the mapping and characterization of the historical GDEs in the Subbasin	\$ 125,000	\$ -	\$ 125,000	0%	
Task 2b(i) – Field-mapping and photo-documentation of potential GDEs to characterize GDE composition and establish baseline conditions	\$ 105,000	\$ -	\$ 105,000	0%	
Task 2b(ii) – Investigation of rooting-depth and source-water of the Mesquite Bosque in the Borrego Sink	\$ 105,000	\$ -	\$ 105,000	0%	
Task 2c – Conduct interim monitoring program through 2024	\$ 30,000	\$ -	\$ 30,000	0%	
Task 3 – Prepare GDE Monitoring Program Report and Recommendations	\$ 90,000	\$ -	\$ 90,000	0%	

**Comparison of the Cost of the Watermaster Proposed Grant Funding Request for the January 1, 2022 through June 30, 2025 Period to the Amount of the Request that is Funded in the Water Year 2022 Budget for the January 1, 2022 through September 30, 2022 Period**  
*(no specific work is approved/funded beyond September 30, 2022)*

Task Name	(a)	(b)	(c)	(d)	(e)
	Requested Grant Amount	Local Cost Share: Non-State Fund Source	Total Cost	% Local Cost Share (Col(b))/(Col(c))	Project Costs Included in BSWM WY 2022 Budget
Task 4 – Conduct EWG Meetings	\$ 50,000	\$ -	\$ 50,000	0%	
<b>TOTAL PROJECT COSTS</b>	<b>\$ 585,000</b>	<b>\$ -</b>	<b>\$ 585,000</b>	<b>0%</b>	<b>\$ 5,469</b>
<b>GRAND TOTAL</b>	<b><u>\$5,024,340</u></b>	<b><u>\$175,500</u></b>	<b><u>\$5,199,840</u></b>	<b><u>3%</u></b>	<b><u>\$ 332,633</u></b>