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TECHNICAL MEMORANDUM

DATE: March 1, 2023

Project No.: 941-80-22-18
SENT VIA: EMAIL

TO: Prado Basin Habitat Sustainability Committee

FROM: Chino Basin Watermaster Engineer

SUBJECT: Recommended Scope and Budget of the Prado Basin Habitat Sustainability Program for Fiscal Year 2023/24

BACKGROUND AND PURPOSE

Pursuant to the Mitigation Measure 4.4-3 of the Peace II Subsequent Environmental Impact Report (SEIR), the Chino Basin Watermaster (Watermaster) and the Inland Empire Utilities Agency (IEUA) implement an Adaptive Management Plan (AMP) as a contingency measure to ensure that the riparian habitat in the Prado Basin will not incur significant adverse impacts associated with implementation of the Peace II Agreement. The AMP is implemented under the guidance and supervision of the Prado Basin Habitat Sustainability Committee (PBHSC), which is composed of representatives from all interested Prado Basin stakeholders.

The AMP calls for the implementation of a monitoring and reporting program called the Prado Basin Habitat Sustainability Program (PBHSP). The PBHSP is an effort to monitor the extent and quality of the riparian habitat, and all of the factors that could affect the riparian habitat which include, but are not limited to: changes in groundwater levels, changes in surface-water discharge, weather events, climatic changes, pests, and wildfire. The most likely factor that may be associated with the implementation of the Peace II Agreement is the lowering of groundwater levels.

The AMP calls for annual data analysis and reporting. The annual report describes the results and interpretations of the monitoring data and makes recommendations for adjustments to the monitoring program for the following fiscal year (FY), if appropriate.

This memorandum describes the recommended activities for the PBHSP for FY 2023/24 in the form of a proposed scope-of-work and budget. Members of the PBHSC are being asked to:

1. Review this memorandum by March 8, 2023.
2. Attend meeting of the PBHSC at 2:00 pm on March 8, 2023 to discuss the proposed scope-of-work and budget for FY 2023/24.
3. Submit comments and suggested revisions on the scope-of-work and budget for FY 2023/24 by March 29, 2023.

The final scope-of-work and budget recommended by the PBHSC will go through the IEUA and Watermaster budgeting processes for approval. The final scope-of-work, budget, and schedule for FY

2023/24 will be included in the *Annual Report for Prado Basin Habitat Sustainability Committee for Water Year 2022* that will be finalized in June 2023.

RECOMMENDED SCOPE OF WORK AND BUDGET – FY 2023/24

The proposed scope-of-work and budget is shown in Table 1 as a line-item cost estimate for Tasks 1 through 6. The costs of the PBHSP are shared between Watermaster and IEUA per a 2016 Agreement.[1] Watermaster is responsible for the costs associated with Tasks 1 and 2; IEUA and Watermaster split costs equally for Tasks 3 through 6. The Orange County Water District (OCWD) also is a cost-sharing partner for sub-task 4.1.

Thus far the monitoring and analysis of the riparian habitat, groundwater levels, precipitation, temperature, and surface-water discharge has been successful in identifying: (i) changes in the health and extent of the riparian habitat (ii) changes in groundwater levels in the Prado Basin, and (iii) relationships between the riparian habitat and the factors that influence it. The monitoring of the riparian habitat and changes in groundwater levels remain as the most critical components of the PBHSP. Since monitoring began in 2015, groundwater levels have declined to historical lows below the model-predicted levels for the Peace II that are assumed to not impact the habitat in the northern portions of Mill Creek and the Santa Ana River; groundwater levels have declined 8 feet near the riparian habitat in the northern portion of Mill Creek, and two feet near the riparian habitat in the northern portion of the Santa Ana River. Most of the observed decline in groundwater levels occurred since 2019. Thus far, the monitoring of riparian habitat using remote sensing data and air photos does not indicate a notable decrease in the vegetation greenness since 2019 in these areas where groundwater levels have declined. The continuation of the monitoring and analyses as done in previous fiscal years is necessary to continue to identify potential changes in the riparian habitat and groundwater levels, and the specific causes of those changes during the implementation of the Peace II Agreement. If mitigation measures are ever determined to be necessary, the PBHSP results will assist in their development. The proposed budget for FY 2023/24 continues to incorporate cost savings due to efficiencies in conducting this monitoring and reporting program over the years.

The monitoring and analysis proposed for FY 2023/24 for the PBHSP is generally the same scope as the previous year, except: i) it does not include the periodic field vegetation surveys that are done every three years in Task 4; ii) it does not include the pilot monitoring program for surface water and groundwater that has been performed since FY 2018/2019 (See Task 2 for description); and iii) it includes the addition of processing, checking, and uploading to the database the high-frequency temperature data collected at the PBHSP monitoring wells in Task 1 to help with the evaluation of groundwater/surface water interactions .

The proposed scope of work is described below by task:

Task 1. Groundwater Monitoring Program

[1] Agreement Between Chino Basin Watermaster and Inland Empire Utilities Agency Regarding Reimbursement of the Peace II Subsequent Environmental Impact Report Mitigation Measure 4.4.5 (Prado Basin Habitat Sustainability Program). Signed September 2016.

The monitoring of groundwater levels in the Prado Basin is a key component of the PBHSP because declining groundwater levels could be a factor related to Peace II implementation that adversely impacts riparian vegetation. Sixteen monitoring wells were installed specifically for the PBHSP in 2015. These wells, plus monitoring wells HCMP-5/1 and RP2-MW3, are monitored for groundwater levels. Figure 1 shows these 18 PBHSP monitoring wells located at nine sites in the Prado Basin along the fringes of the riparian habitat. The 18 monitoring wells are equipped with integrated pressure-transducers/data-loggers (herein referred to as transducers) that measure and record water-level measurements and temperature readings every 15 minutes. This task includes quarterly field visits to all 18 PBHSP monitoring wells to download the data from the transducers, and the processing, checking, and uploading of the water level and temperature data to the PBHSP database. The scope of this task is different than the previous fiscal years in that it expands the processing, checking, and uploading of the transducer data to include the temperature data that is being collected by the transducers in addition to the water level data. The inclusion of the high-frequency temperature data is a recommendation from the evaluation of the pilot monitoring program as discussed in Task 2 below.

Task 2. Surface-Water Monitoring Program

Surface-water discharge data from the Santa Ana River and the tributaries that cross Prado Basin are evaluated to characterize the influence of surface-water discharge on the riparian habitat.

Task 2.1 includes the annual collection of the surface water data from publicly-available data sets which include: the United States Geological Survey (USGS) daily discharge measurements at six sites along the Santa Ana River and its tributaries; daily discharge and water-quality data from Publicly-Owned Treatment Works (POTWs) that are tributary to Prado Basin; US Army Corps of Engineers (ACOE) daily measurements of reservoir elevation and releases from the reservoir at Prado Dam; and Watermaster's quarterly surface-water-quality monitoring at two sites along the Santa Ana River. The locations of these surface-water monitoring sites are shown on Figure 1. The USGS, POTW, and ACOE data for water year 2022 will be collected, processed, checked, and uploaded to the PBHSP database. This sub task does not include the processing, checking, and uploading of the Watermaster-collected Santa Ana River data, which is performed for another Watermaster task. The scope of this sub task is consistent with the work performed for the previous fiscal year.

During FY 2018/19, a pilot monitoring program was initiated at two surface water sites in Chino Creek where transducers were installed that that measure and record electric conductivity (EC), temperature, and water levels at 15-minute intervals. The same high-frequency monitoring was initiated at four nearby monitoring wells at the two locations along Chino Creek (PB-7 and PB-8). Additionally, during the first two years of the pilot monitoring program, surface water and groundwater-quality samples were collected to support the high-frequency data. The purpose of the pilot monitoring program is to determine if the high-frequency data enhances and better reveals the interpretation of groundwater/surface-water interactions previously studied for the PBHSP from earlier general mineral water-quality sampling. There were monitoring challenges with the surface water monitoring component of the pilot monitoring program; periodically, the transducers within the creek were lost during large storm events, and the casing that houses the transducer experienced the accumulation of mud which compromised the accuracy of the EC data and required there to be frequent field visits to check and clean the transducer probes.

Analysis of the data collected thus far as a part of the pilot monitoring program provides more support for the characterization of groundwater/surface water interactions at these locations and will be discussed in more detail in the next Annual Report for Water Year 2022. Key conclusions from the analysis of the pilot monitoring program data are that: i) the high-frequency temperature data is a good indicator of surface water/groundwater interactions, and the high-frequency EC data is not; ii) it is no longer necessary to continue the pilot monitoring program; and iii) the high-frequency temperature data that is already being collected by the transducers installed in all of PBHSP monitoring wells to measure groundwater levels near the surface water reaches in Prado Basin should be utilized to evaluate surface water and groundwater relationships. Thus, it is recommended that the high-frequency temperature data be processed, checked, and uploaded to the PBHSP database along with the high-frequency water-level data. Task 1 for FY 2023/24 includes the processing, checking, and upload to the database of the high-frequency temperature data already being collected at all the PBHSP monitoring wells. The annual report prepared in Task 5 will include an analysis of groundwater/surface water interactions using temperature data.

Task 2.2 is to continue to download the transducer installed in Chino Creek near well PB-8 and process, check and upload the high-frequency temperature and level data to the database. This is the only remaining surface water transducer installed for the pilot monitoring program, and the data can continue to be useful to provide background temperature measurements for surface water and indicate storm events. The effort to do this download is minimal since the surface water transducer can be visited in the field at the same time as the nearby monitoring wells. All data will be checked and uploaded to the PBHSP database.

Task 3. Climate Monitoring Program

Climatic data are evaluated in the vicinity of the Prado Basin to characterize trends, and to determine if these trends contribute to impacts on the riparian habitat. The climate monitoring program utilizes two types of publicly available, spatially-gridded datasets. Task 3 includes the annual collection of the spatially-gridded datasets for water year 2023 (October 2022 – September 2023), and the checking and uploading of the data to the PBHSP database. The scope of this task is consistent with the work performed for the previous fiscal year.

Task 4. Riparian Habitat Monitoring Program

Monitoring the extent and quality of the riparian habitat in the Prado Basin is a fundamental component of the PBHSP to characterize how the riparian habitat changes over time. To characterize the impacts of Peace II implementation on the riparian habitat (if any) it is necessary to understand the long-term historical trends of its extent and quality and the factors that have affected it. The current riparian habitat monitoring program consists of both regional and site-specific components. The proposed riparian habitat monitoring program for FY 2023/24 is described in the subsections below.

Regional Monitoring

The regional monitoring of riparian habitat is performed via two independent methods that complement each other: mapping and analysis of the riparian habitat using (i) air photos and (ii) the normalized distribution vegetation index (NDVI) derived from the Landsat remote-sensing program. Tasks 5.1, 5.2, and 5.3 are for the collection and compilation of the regional monitoring data, including:

- Perform a custom flight (via outside professional services) to acquire a high-resolution air photo (three-inch pixel) of the Prado Basin during summer 2023. The cost for the air photo is shared with OCWD.
- Catalog and review the 2023 high-resolution air photo in ArcGIS and digitize the extent of the riparian habitat.
- Collect, review, and upload the Landsat NDVI data for water year 2023.

Site-Specific Monitoring

The site-specific monitoring of the riparian habitat consists of periodic field surveys of the riparian vegetation at selected locations. These surveys provide an independent measurement of vegetation quality that can be used to "ground truth" the regional monitoring of the riparian habitat. The United States Bureau of Reclamation (USBR) along with the OCWD[2] has conducted field surveys once every three years at approximately 36 sites. The most recent triennial field survey was conducted in the summer of 2022, and it included two new sites along the northern portion of Mill Creek to increase monitoring at this location where there is potential for impacts to the riparian habitat from the observed decline in groundwater levels. The next field survey is scheduled for the summer of 2025. There is no scope or budget proposed for site-specific monitoring for FY 2023/24.

Task 5. Prepare Annual Report of the PBHSC

This task involves the analysis of the data sets collected by the PBHSP through water year 2023. The results and interpretations generated from the data analysis will be documented in the *Annual Report for Prado Basin Habitat Sustainability Committee for Water Year 2023*. This task includes the effort to prepare an administrative draft report for Watermaster and IEUA staff review, a draft report for the review by the PBHSC, and a final report including comments and responses. A PBHSC meeting will be conducted in May 2024 to review the draft report and facilitate comments on the report. The scope of this task is consistent with the work performed for the previous fiscal year.

Task 6. Project Management and Administration

This task includes the effort to prepare the PBHSP scope, schedule, and budget for the subsequent fiscal year. A draft *Technical Memorandum Recommended Scope and Budget of the Prado Basin Habitat Sustainability Program for FY 2024/25* will be submitted to the PBHSC in February 2024. A PBHSC meeting will be conducted in March 2024 to review the draft recommended scope and budget and facilitate comments. Also included in this task is project administration, including management of staffing and monthly financial reporting. The scope of this task is consistent with the work performed for the previous fiscal year.

Attachments:

Table 1. Work Breakdown Structure and Cost Estimate – Prado Basin Habitat Sustainability Program – Fiscal Year 2023/24

[2] OCWD staff provides assistance to the USBR in the field as in-kind services.

Figure 1. Prado Basin Habitat Sustainability Program Monitoring Sites – Fiscal Year 2023/24

Table 1. Work Breakdown Structure and Cost Estimate
Prado Basin Habitat Sustainability Program - Fiscal Year 2023/24

	Task Description	Notes	No. of sites	Task Rep Multiplier	Labor Total: Person Days	Labor Total: Total, dollars	Other Costs, dollars: Travel	Equipment Rental	Outside Pro	Equipment	Total	Notes	Totals, dollars: Recommended Budget 2023/24	Budget Prior FY 2022/23	Varience from Prior FY	IEUA Share 2023/24	CBWM Share 2023/24
Task 1. Groundwater Monitoring Program					**20.4**	**27,901**					**650**		**28,551**	**22,986**	**5,565**	-	**28,551**
1.1	Collect Transducer Data from PBHSP Wells (Quarterly)		17	4.5	11.0	13,900	500	150			650		14,550	12,117			
1.2	Process, Check and Upload Water Level and Temperature Transducer Data from PBHSP Wells (Quarterly)		17	4	9.4	14,002					0		14,002	10,869			
Task 2. Surface Water Monitoring Program					**5**	**7,159**					**0**		**7,159**	**14,477**	**-7,318**	-	**7,159**
2.1	Collect, Check, and Upload Surface Water Discharge and Quality Data from POTWs, USGS; and Dam Level data from the ACOE (Annual)			1	2.0	3,004					0		3,004	3,532			
2.2	Collect, Check, and Upload High-Frequency Probe Data for Chino Creek from Pilot Monitoring Program (Quarterly)		1	4	2.8	4,155					0		4,155	10,945			
Task 3. Climate Monitoring Program					**1.3**	**2,426**					**250**		**2,676**	**2,177**	**499**	**1,338**	**1,338**
3.1	Collect, Check, and Upload Climatic Data (Annual)			1	1.3	2,426			250		250		2,676	2,177			
Task 4. Riparian Habitat Monitoring Program					**14.0**	**27,212**					**13,000**		**40,212**	**83,832**	**-43,620**	**20,106**	**20,106**
4.1	Perform a Custom Flight to Acquire a High-Resolution 2023 Air Photo of the Prado Basin			1	1.3	2,870			13,000		13,000	(a)	15,870	16,000			
4.2	Catalog, and Review the Extent of the Riparian Vegetation in the 2023 Air Photo of the Prado Basin			1	3.0	6,096					0		6,096	6,350			
4.3	Collect, Check, and Upload 2023 Landsat NDVI Data to the PBHSP Database			1	9.8	18,246					0		18,246	16,664			
Task 5. Prepare Annual Report of the PBHSC					**51.3**	**91,280**					**100**		**91,380**	**87,140**	**4,240**	**45,690**	**45,690**
5.1	Analyze Data and Prepare Admin Draft Report for CBWM/IEUA			1	38.3	66,068					0		66,068	64,756			
5.2	Incorporate CBWM/IEUA Comments and Prepare Draft Report: Submit Draft Report to PBHSC			1	4.8	8,754					0		8,754	8,244			
5.3	Meet with PBHSC to Review Draft Report			1	4.8	9,482	100				100		9,582	6,202			
5.4	Incorporate PBHSC Comments and Finalize Report			1	3.5	6,976					0		6,976	7,940			
Task 6. Project Management and Administration					**9.8**	**22,148**					**100**		**22,248**	**20,224**	**2,024**	**11,124**	**11,124**
6.1	Prepare Scope and Budget for FY 2023/24			1	3.5	7,878					0		7,878	7,774			
6.2	Meet with PBHSC to Review Scope and Budget for FY 2023/24			1	3.3	7,478	100				100		7,578	6,618			
6.3	Project Administration and Financial Reporting			12	3.0	6,792					0		6,792	5,832			
	Totals				**101**	**$ 178,126**	**$ 700**	**$ 150**	**$ 13,250**	**$ -**	**$ 14,100**		**$ 192,226**	**$ 230,836**	**$ (38,610)**	**$ 78,258**	**$ 113,968**

(a) This is half of the cost for the outside professional. OCWD will pay the other half.

117°40'0"W

34°0'0"N

San Antonio Creek at Riverside
Chino Creek at Schaefer
IEUA Carbon Canyon
IEUA RP-5
PB-9
Chino Creek @ RP2
PB-8 and RP2-MW3
PB-7
Chino Creek @ Euclid
IEUA RP-1 Prado
PB-6
PB-5
Chino Hills
IEUA RP-1 Cucamonga
Cucamonga Creek Near Mira Loma
Chino Airport
PB-2 and HCMP-5/1
PB-1
PB-3
PB-4
WRCRWA
SAR at River Road
Butterfield Drain
Corona 1B
Prado Dam
SAR Below Prado Dam
SAR at Etiwanda
SAR at MWD Crossing
Riverside RWQCP
Temescal Creek at Main
Jurupa Mountains
La Sierra Hills
Mission Blvd
Riverside Dr
Edison Ave
Kimball Ave
Pine Ave
Chandler St
Limonite Ave
Schleisman Rd
Bellegrave Ave
6th St
5th St
4th St
2nd St
Ramona Ave
Central Ave
Cypress Channel
Euclid Ave
Grove Ave
Archibald Ave
Hamner Ave
Cucamonga Creek
Day Creek
Mill Creek
Hellman Ave
Santa Ana River
Temescal Wash
El Prado Rd
San Sevaine
60
71
15
91

Groundwater and Surface Water Monitoring Sites

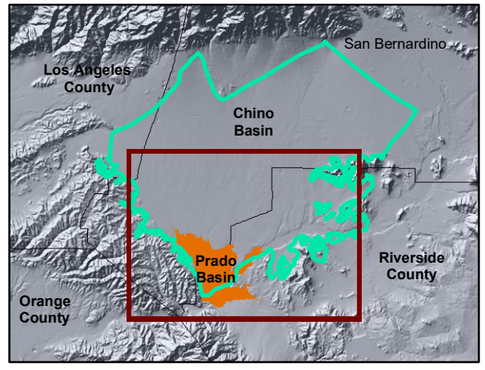
- PBHSP Well Site (High-Frequency Groundwater Levels and Temperature)
- POTW Discharge Outfall (Discharge and Surface Water Quality)
- USGS Stream Gage Station (Discharge)
- Watermaster Santa Ana River Sites - Maximum Benefit Monitoring (Surface Water Quality)
- PBHSP Surface Water Site on Chino Creek for the Pilot MOnitoring Program (High-Frequency Temperature, EC, and Levels)

Vegetation Field Survey Sites

- Active Survey Location Last Monitored in 2022

Other Features

- Prado Basin Management Zone (Prado Basin)
- Chino Basin Desalter Authority Well
- Concrete-Lined Channels
- Unlined Rivers and Streams



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Prepared by:
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Prado Basin Habitat Sustainability Committee
Fiscal Year 2023/24 Scope and Budget

Prepared for:
CHINO BASIN WATERMASTER
Partners in Basin Management

Prado Basin Habitat Sustainability Program
Monitoring Sites - Fiscal Year 2023/24

Figure 1