CHINO BASIN WATERMASTER
FISCAL YEAR 2019/20

Progress and Estimated Cost at Completion for the Period
July 1, 2019 through September 30, 2019
6906 – Optimum Basin Management Program: General Engineering

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6906.31 - Pool, Advisory, Watermaster Meetings

Task Description
The Watermaster General Manager and/or the Watermaster Board may direct the consultant to prepare for and attend the following meetings:

- Watermaster Advisory Committee and Board meetings
- Watermaster Pool meetings (Appropriative, Agricultural, and Overlying Non-Agricultural)

For each meeting, the Consultant will prepare engineering updates with supporting maps, charts, tables, handouts, and PowerPoint presentations, as appropriate.

Milestones and Accomplishments

- Prepared for and attended the monthly Pool, Advisory, and Watermaster Board meetings, as requested, during the period July through September 2019.
- Participated in conference calls for agenda preparation for the Watermaster process meetings in the period July through September 2019.

6906.32 - Other General Meetings as Requested

Task Description
The Watermaster General Manager and/or the Watermaster Board directs the consultant to prepare for and attend the other general meetings. For each meeting, the Consultant will prepare engineering updates with supporting maps, charts, tables, handouts, and PowerPoint presentations, as appropriate.

Milestones and Accomplishments

- Prepared for and participated in weekly coordination conference calls and ad hoc meetings with Watermaster staff and counsel to discuss all current Watermaster initiatives.
- Prepared for and attended meetings of the Basin Monitoring Program Task Force on: September 18, 2019. Prepared written meeting summaries for Watermaster/IEUA staff on watershed and Basin Plan issues being worked on by the Task Force and its consultants.
• Prepared for and attended a meeting with Regional Board staff, Watermaster staff and IEUA staff on August 13, 2019 to update the Regional Board on all activities in the Chino Basin relevant to the Regional Board.
• Prepared for and attended the quarterly CBWM-IEUA coordination meeting at Watermaster on August 26, 2019.

6906.74 - Material Physical Injury Requests, Others

Task Description
This task provides outside engineering services to assist Watermaster staff in the evaluation of transfer, storage, and recharge applications. Occasionally, Watermaster staff require outside engineering services in the evaluation of such transfers. Analyses of these applications include:

• Projected changes in groundwater levels and related impacts.
• Projected redirection of known contaminant plumes, and impacts on TDS, nitrate, arsenic concentrations and other contaminants of interest.
• Projected recycled water contribution at wells.
• Projected impacts on the state of hydraulic control.

Milestones and Accomplishments
• Completed an MPI assessment for recharge of supplemental water by the Jurupa Community Services District and the San Antonio Water Company.

6906.71 - Miscellaneous Data Requests GM/WM Staff

Task Description
The Watermaster General Manager and/or Watermaster staff may direct the consultant to perform specific technical analyses and/or respond to miscellaneous data requests from Watermaster staff.

Milestones and Accomplishments
• Fulfilled requests for data, information, and recommendations as requested by the CBWM general manager and/or staff, including:
  • Assisted Watermaster staff with preparation of the 2019-1 semi-annual status reports to the Court.
  • Assisted Watermaster staff with the preparation of a Staff Report on the occurrence of 1,2,3-trichloropropane in the Chino Basin
  • Prepared a map of the Chino, Cucamonga and Six Basins and their tributary areas.
• Prepared a map showing the overlying non-agricultural wells and Chino Basin groundwater management zones.

• Reviewed Public Hearing Notices and environmental documents for three new developments in the City of Chino and began to prepare comments on recommendations to preserve wells or other important matters for Watermaster.

• Coordinated with various professionals and performed research on potential chemical studies to identify the source 1,2,3-trichloropropane in groundwater

• Reviewed the Orange County Water District’s draft Environmental Impact Report for the Prado Basin Ecosystem Restoration and Water Conservation Study and prepared draft comments

• Prepared a summary table of all requests made by WEI to parties to collect data and information related to Chino Basin management.

6906.72 - Miscellaneous Data Requests-Non CBWM Staff

Task Description

The Watermaster General Manager and/or Watermaster staff may direct the consultant to perform specific technical analyses and/or respond to miscellaneous data requests from Watermaster parties, non-Watermaster staff, and non-Watermaster entities.

Milestones and Accomplishments

• Provided information to the Regional Board on Watermaster’s monitoring program near the South Archibald plume and contact information for the Agricultural Pool

• Assisted Watermaster with a Chino Basin Desalter Authority (CDA) data request for groundwater-level data for private wells near future well II-12.

• Compiled and reviewed well, groundwater-quality and groundwater-level data for Regional Board data request for Watermaster data collected at private wells near the South Archibald plume from 2010-2018.

• Assisted the CDA with a request from the Regional Board for water quality and well information for private wells near future CDA production well II-12 to assist with the design of zone testing intervals at the monitoring well near II-12

• Assisted the IEUA, City of Ontario, and City of Upland with a request from the Regional Board for additional monitoring at private wells in the vicinity of the South Archibald plume.
6906.22 – Annual Streamflow Monitoring Report for Water Rights Permit 21225

Task Description
This task includes engineering services to prepare a specialized hydrologic assessment of the relative impacts of the diversions of storm water to recharge by Watermaster pursuant to the Watermaster’s permit issued by the State Water Resources Control Board. The deliverable is the Annual Streamflow Monitoring Report for Water Rights Permit 21225, FY 2018/19, which Watermaster and its attorney will review and forward to the State Water Resources Control Board by October 1, 2019.

Milestones and Accomplishments
- WEI submitted the draft Annual Streamflow Monitoring Report for FY 2018/19 to Watermaster and General Counsel on September 16, 2019.
- WEI submitted the final Annual Streamflow Monitoring Report for 2018/19 to Watermaster and General Counsel on September 23, 2019.

6906.23 - SGMA Reporting Requirement

Task Description
This task is for preparing annual reporting requirements for the Chino Basin pursuant to the recently enacted Sustainable Groundwater Management Act (SGMA) as described in CA Water Code Section 10720.8(f). The annual reporting summarizes water levels, production, total water use, surface water availability, and change in groundwater storage for the reporting period of water year 2018 (October 1, 2018 through September 30, 2019). A memorandum will be prepared for Watermaster explicitly documenting the information to be submitted on the DWR’s online Adjudicated Basin Annual Reporting System. The annual reporting requirements must be submitted by Watermaster to the DWR on April 1, 2020.

Milestones and Accomplishments
- No activity in the first quarter.

6906 - Project Management

Task Description
This task is for routine project management and the preparation of quarterly estimated-cost-at-completion reports.
- Update the Integrated Schedule Budget Management (ISBM) system.
- Analyze staffing requirements and make assignments for various tasks.
Review the schedules of deliverables.

Prepare the Estimated Cost at Completion (ECAC) and Earned Value (EV) estimates.

Milestones and Accomplishments

- Performed monthly and ad hoc review of staffing requirements and made assignments for project tasks.
- Performed monthly and ad hoc review of the status of the individual task progress and budget.

6906.1 - Watermaster Model Update and Required Demonstrations

Task Description

Watermaster updated its groundwater model by updating the Chino Basin hydrogeologic conceptual model, building a numerical model, calibrating it over the period FYs 1961 through 2011 and developing projected groundwater pumping and recharge estimates for the period of July 1, 2011 through June 30, 2030. Watermaster applied the model in FY 2012/13 through FY 2014/15 to estimate net recharge, the state of hydraulic control and to support the safe yield recalculation. Between FY 2014/15 and FY 2017/18, WEI extended the historical hydrology of the model from the original calibration period of July 1961 through June 2011 to July 1961 through September 2018. In FY 2017/18 Watermaster staff updated the groundwater pumping and recharge projections in its work to develop a storage framework.

Other activities historically performed in this task have included the evaluation of the balance of recharge and discharge; and the evaluation of the cumulative effects of transfers. The evaluations of the cumulative effect of transfers and the balance of recharge and discharge will be done with the recalculation of 2020 safe yield during FY 2019/20.

Each year since 2012, a technical assessment of the adequacy of supplemental water recharge capacity was completed and reported to the Watermaster pursuant to Section 7.3 of the Peace II agreement. The work required in FY 2019/20 includes preparation of the annual letter report regarding substantial compliance with Section 7.3 of the Peace II agreement. The specific task includes:

- Reviewing recent planning information
- Testing the adequacy of existing wet-water recharge capacity to meet future replenishment obligations
- Preparing a letter report to document substantial compliance as required by Section 7.3 of the Peace II agreement.

Milestones and Accomplishments

- No activity in the first quarter.
6906.24 – Compliance with SWRCB Regulations Regarding Measurement and Reporting Diversion of Surface Water (Title 23 Chapters 2.7 and 2.8)

Task Description

Watermaster holds three diversion permits, issued by the SWRCB, that provide authorization to Watermaster to divert and recharge storm and dry-weather discharge. Presently, the amount of water diverted is estimated by the IEUA and reported to the Watermaster. Watermaster subsequently reports the amount of water recharged to the SWRCB pursuant to its permits and SWRCB regulations in Title 23, Chapter 2.7.

SB88 was signed into law by Governor Brown on June 24, 2015. Sections 15 through 18 of that law add new measurement and reporting requirements for a substantial number of diverters, including the Chino Basin Watermaster. Pursuant to the new regulations, Watermaster must annually report the following in addition to prior reporting requirements:

- Information on the device or method used to calculate the amount of water diverted
- Water diversion measurement, either direct diversion or diversion to storage, including the type of device(s) used, additional technology used, who installed the device(s), and any alternative method(s) used in measuring water diversion.

Pursuant to the new regulations, Watermaster is required to provide a description of its measuring scheme, determine if it meets the specific accuracy requirements provided for in the regulations, and if it can’t meet the accuracy requirements, to implement an improved diversion measuring scheme.

Milestones and Accomplishments

- No activity in the first quarter.

6906.26 – 2019 OBMP Update

Task Description

Watermaster began to process to update its Optimum Basin Management Program (OBMP) in FY 2018/19. The process will continue and conclude in FY 2019/20. This work involves: preparation for and attendance at stakeholder listening sessions to obtain feedback on the OBMP Update, preparation of draft and final technical memorandums documenting the OBMP Update, updating and documenting a new Storage Management Plan (SMP), and supporting Watermaster staff in the development of agreements to implement the updated OBMP, and Court submittals.

Milestones and Accomplishments

- Prepared for and attended two OBMP Update Listening Sessions at Watermaster:
  - Listening Session #5 on July 31, 2019
  - Listening Session #6 on September 11, 2019
• Completed and submitted Parts 1 and 2 of the Draft 2020 OBMP Scoping Report (Technical Memorandum Number 1 [TM1]) on July 23, 2019 and August 22, 2019, respectively.

• Submitted the final Storage Management Plan White Paper, including responses to comments on the draft, on July 16, 2019.

• Updated the water supply plans of the Chino Basin Appropriators, including projections for use of Chino Basin storage through 2040, to support the development of the SMP.

• Prepared for and attended one SMP workshop:
  • SMP Workshop #2 on July 18, 2019
  • Completed and submitted the draft 2020 Storage Management Plan on August 26, 2019.

6906.73 – 2021 Safe Yield Recalculation

Task Description

The 2020 Safe Yield recalculation involves the following: updating the hydrogeological conceptual model of the Chino Basin to incorporate new information and to build in land subsidence modeling capability; updating of the historical hydrology to support the calibration of the updated hydrogeological model; the application of the Safe Yield methodology, utilizing forward projections of the basin response to planned management activities; attendance at meetings and workshops; preparation of draft and final reports; supporting Watermaster staff in the development of agreements to implement the recalculated Safe Yield; and Court submittals.

Milestones and Accomplishments

• Completed construction of the model geometry and streamflow routing packages for groundwater model.
• Prepared for and presented colleague/peer review meeting on July 23, 2019 at WEI.
• Completed surface water model work to estimate DIPAW, subsurface inflow, stormwater recharge in unlined channels and basins.
• Constructed and tested input files for model build.
• Continued development of InSAR-based calibration targets for subsidence model calibration.
• Continued development of planning period hydrology that includes:
  • Development of a draft TM summarizing planning alternatives.
  • Conducted research and refined riparian ET estimates for calibration and planning periods.
  • Projected monthly distribution of groundwater pumping by wells for AP parties.
6906.28 – Agriculture Production and Estimation

Task Description

This work involves providing as-requested technical support to Watermaster staff in their efforts to estimate overlying non-agricultural pool pumping.

Milestones and Accomplishments

- No activity in the first quarter.

6906.81 – Assist Watermaster in Preparing the 42nd Annual Report (FY 2018/19)

Task Description

This task includes support services to assist Watermaster staff in the preparation of the Watermaster's 42nd Annual Report documenting Watermaster's activities and water data accounting for Fiscal Year 2018/19. The consultant will work closely with Watermaster staff and their contractor Martin Rauch to provide as-requested support to collect the data and prepare the content for the Annual Report.

Milestones and Accomplishments

- Prepared for and attended the kick-off conference call for the 42nd Annual Report with Watermaster Staff on July 9, 2019.
- Reviewed and commented on the guidance documents to outline the suggested topics and specific content for inclusion in the front end of the 42nd Annual Report.
- Developed content for the front end text of the 42nd Annual Report.
- Prepared for and attended a conference call on the 42nd Annual Report with Watermaster Staff and RCC Staff on August 1, 2019.
- Reviewed and edited the first draft text for the front end of the 42nd Annual Report.
- Collected and compiled all required documents for inclusion in Appendices I, J, and K to the 42nd Annual Report.

6906.17 – Planning Study Analysis (compare projected pumping to actual from 2000 to present)

Task Description

This work involves comparing historical pumping projections to actual pumping and to assess the need to create alternative planning projections that can be used with parties pumping projections for future planning investigations (e.g., safe yield recalculations and recharge master plan updates).
Milestones and Accomplishments

- No activity in the first quarter.

6906.15 – Integrated Model Meetings and Technical Review – 50% IEUA Cost Share

Task Description

This work involves as-requested attendance at ISARM meetings and workshops, the review ISARM reports and preparation of comments, and other as-requested tasks.

Milestones and Accomplishments

- Reviewed the Geoscience/VD response to Chino Basin Watermaster and IEUA ISARM comments that were prepared by WEI.
- Prepared for and attended the July 10, 2019 ISARM modeling subgroup meeting to discuss CBWM/IEUA comments and Geoscience/VD responses.
- Prepared email note to Bob Tincher regarding what was agreed and not agreed to regarding CBWM/IEUA comments.
- Attended the July 25, 2019 conference call regarding the ISARM status update.
- Participated in the September 17, 2019 conference call on ISARM project status.

6906.16 – CBP Evaluation and Conceptual Design Support – 100% IEUA Cost Share

Task Description

This work involves as-needed groundwater modeling assistance to IEUA to support their development of the Chino Basin Program (CBP) preliminary design report (PDR) and CEQA documentation. The anticipated tasks include the following: assisting IEUA and PDR consultant in converting a CBP alternative description into a detailed description that can modeled; developing model input files, getting the model to run and debugging the model to ensure that the alternative has been correctly modeled. Conducting iterative simulations to converge on net recharge and replenishment; post processing final simulation results to develop a final water budget table, assess state of hydraulic control, preparation of groundwater elevation and groundwater elevation change maps; reviewing the simulation results with IEUA and PDR consultant staffs; and preparing a report documenting the evaluation of CBP alternatives.

Milestones and Accomplishments

- Prepared for and attended a meeting on July 2, 2019 with Sylvie Lee to discuss watershed issues related to CBP.
- Updated map deliverables for first CBP concept sensitivity analysis.
- Prepared for and attended a conference call on July 26, 2019 to discuss the results of the first CBP concept sensitivity analysis.
- Coordinated with Brown and Caldwell on the development of the second CBP concept sensitivity analysis.
- Prepared for and attended a meeting at IEUA on August 7, 2019 to figure out how the CBP planning interfaces with the OBMPU and SMP.
- Attended the September 12, 2019 conference call to coordinate CBP alternatives analysis and test cases.
- Conducted a second CBP concept sensitivity analysis. This involved reviewing sensitivity test requirements, using Watermaster’s model to evaluate basin response and potential for MPI and loss of hydraulic control analogous to that done in the SFI. Reported results verbally with exhibits to Brown and Caldwell.
- Started work on third CBP concept sensitivity analysis.

### 6906.27 – HCP Meetings and Technical Review – 50% IEUA Cost Share

**Task Description**

This work involves as-requested attendance at HCP-related meetings and workshops, the review of HCP reports and preparation of comments, and other as-requested tasks.

**Milestones and Accomplishments**

- No activity in the first quarter.

### 6906.18 – OCWD and Army Corps of Engineers Prado Dam FS/EIS/EIR Review, Response and Monitoring - 50% IEUA Cost Share

**Task Description**

This work involves providing as-needed technical support to Watermaster and IEUA in the evaluation of: the OCWD and U.S. Army Corps of Engineers Prado Basin Ecosystem Restoration and Water Conservation Study and OCWD’s permit renewal for maintenance at the Prado Constructed Wetlands.

**Milestones and Accomplishments**

- No activity in the first quarter.
7103.3 – PE1: Groundwater Quality and Surface Water Monitoring Program

Purpose

The groundwater quality and surface water data collected for this program are required for the triennial ambient water quality update mandated by the Basin Plan and for the Hydraulic Control Monitoring Program – a maximum benefit requirement in the Basin Plan. The data are also used to support the preparation of the Biannual State of the Basin Report, the Groundwater Model update and calibration, material physical injury assessments, the evaluation of non-point source groundwater contamination and plume associated with point-source discharge, estimating influent water quality to desalter wells, and evaluation of groundwater/surface water interaction near riparian habitat in the Prado Basin.

Watermaster obtains groundwater quality and surface water data through field sampling for the regulatory monitoring requirements of the Hydraulic Control Monitoring Program (HCMP) and the Prado Basin Habitat Sustainability Program (PBHSP), and from the routine collection of data from all Appropriators and cooperators in the basin.

Task Description

Obtain groundwater-quality data routinely from about 1,100 wells from all Appropriators and cooperators in and adjacent to the Chino Basin. This represents about 125,000 records that are added annually to Watermaster’s database. Subtasks include:

- Phone calls and meetings with water-quality staff from Appropriators and cooperators
- Upload data from hardcopy, spreadsheet, and laboratory electronic data deliverables to Watermaster’s database.
- Upload new well information into Watermaster’s database and maintain updated well information for all wells in the Chino Basin.

Collect and analyze groundwater-quality samples from about 50 private production wells and monitoring wells. Subtasks include:

- Annual re-evaluation of the key-well program due to abandoned and destroyed wells.
- Select the wells to be sampled.
- Coordinate and schedule with Watermaster staff who is performing the fieldwork, and with the analytical laboratory.
- Process, upload, and review for QA/QC, field and laboratory data to Watermaster’s database.
- Provide as-needed field support as directed by Watermaster to assist with sampling.
- The field work follows the standard operating procedures (SOPs) and the Quality Assurance Project Plan (QAPP) defined in the 2014 Maximum Benefit Work Plan.
Collect and analyze annual groundwater-quality samples from the 21 HCMP monitoring wells. Subtasks include:

- Schedule field work and coordinate with the analytical laboratory.
- Perform field work.
- Process, upload, and review for QA/QC, field and laboratory data to Watermaster’s database.
- The field work follows the standard operating procedures (SOPs) and the Quality Assurance Project Plan (QAPP) defined in the 2014 Maximum Benefit Work Plan.

Collect and analyze quarterly-grab surface water-quality samples at two surface-water stations in the Santa Ana River, and near-river groundwater-quality samples from the two NAWQA wells and two SARWC wells for the Maximum Benefit Monitoring Program. Subtasks include:

- Schedule field work and coordinate with the analytical laboratory.
- Perform field work.
- Process, upload, and review for QA/QC, field and laboratory data to Watermaster’s database.
- The field work follows the standard operating procedures (SOPs) and the Quality Assurance Project Plan (QAPP) defined in the 2014 Maximum Benefit Work Plan.

Collect and analyze quarterly-grab surface water-quality samples at two surface-water stations in Chino Creek, and near-creek groundwater-quality samples from the four PBHSP monitoring wells, for the PBHSP monitoring program. Subtasks include:

- Setting up monitoring program
- Schedule field work and coordinate with the analytical laboratory.
- Perform field work.
- Process, upload, and review for QA/QC, field and laboratory data to Watermaster’s database.

Routinely collect, compile, check, upload, and review for QA/QC, discharge data (flow and water quality) from POTWs tributary to Prado Dam and flow data at USGS gaging stations along the Santa Ana River and other tributaries within the Chino and Temescal Basins.

Perform specific technical analyses to characterize groundwater-quality conditions and trends as directed by Watermaster staff.

**Milestones and Accomplishments**

- Performed annual re-evaluation of the key-well program due to abandoned and destroyed wells.
- Selected the key wells to be sampled during 2019.
- Designed and coordinated the 2019 Key Well Groundwater Quality Monitoring Program.
- Processed, uploaded into the database, and reviewed for QA/QC, the 60 percent of the groundwater-quality data from Eaton Analytical Laboratories and 100 percent of the field water-
quality parameters for the 2019 Key Well Groundwater Quality Monitoring Program sampling performed by Watermaster between July and September 2019.

- Collected, processed, uploaded into the database, and reviewed for QA/QC, 80 percent of the groundwater-quality data collected from all Appropriators and cooperators in and adjacent to Chino Basin for January 2019 through June 2019.

- Collected quarterly groundwater-quality samples at four near-river wells (NAWQA and SARWC wells) and quarterly grab surface-water quality samples at two stations in the Santa Ana River in July 2019 for the Maximum Benefit Monitoring Program. Samples were sent to Eaton Analytical Laboratories.

- Processed, uploaded into the database, and reviewed for QA/QC, the surface-water and groundwater quality data from Eaton Analytical Laboratories, and field water-quality parameters for the Maximum Benefit Monitoring Program quarterly sampling event in July 2019.

- Collected annual groundwater-quality samples at the 21 HCMP monitoring wells in August and September 2019. Samples were sent to Eaton Analytical Laboratories. The laboratory analysis included the addition of the emerging contaminants PFAS and 1,4-dioxane.

- Installed new monitoring probes that measure and record EC, temperature, and levels at two sites in Chino Creek for the surface water monitoring program for the PBHSP.

- Collected quarterly grab surface water-quality samples at two sites along Chino Creek and four nearby PBHSP monitoring wells for the PBHSP quarterly sampling event in September 2019. Samples were sent to Eaton Analytical Laboratories. The laboratory analysis included the addition of the emerging contaminants PFAS and 1,4-dioxane.
7104 – PE1: Groundwater-Level Monitoring Program

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**Purpose**

Obtain groundwater level information in and adjacent to Chino Basin. These data are required for the triennial ambient water quality update mandated by the Basin Plan and for the Hydraulic Control Monitoring Program – a maximum benefit requirement in the Basin Plan. The data are also used to prepare the Biannual State of the Basin report, land-subsidence monitoring, Groundwater Model development and recalibration, material physical injury assessments, the periodic assessment of Safe Yield, the estimation of storage change, evaluating the impacts of desalter production on nearby private wells, the California Statewide Groundwater Elevation Monitoring (CASGEM) Program, and the monitoring of water levels near riparian habitat in Prado Basin to evaluate potential impacts from Peace II Agreement activities.

**Task Description**

Measurement of groundwater levels from about 100 wells. Subtasks include:

- Annual re-evaluation of the key well program due to abandoned and destroyed wells.
- Schedule field work. Perform field work: transducer data are downloaded quarterly at 100 wells.
- Installation of transducers and direct-read cables
- Process, review for QA/QC, and upload transducer data to Watermaster’s database.
- Provide as-needed field support as directed by Watermaster to assist with transducer downloads.
- Field work follows the SOPs and the QAPP defined in the 2014 Maximum Benefit Work Plan.

Routinely collect, process, review for QA/QC, and upload water-level measurements for about 300 wells to Watermaster’s database that were compiled by CBWM staff on a quarterly basis from all Appropriators in and adjacent to Chino Basin.

Routinely collect, process, reviewed for QA/QC, and upload transducer data from about 33 wells downloaded in the field by CBWM staff on a quarterly basis.

Collect, process, reviewed for QA/QC, and upload manual water-level measurements from about 70 wells measured in the field by CBWM staff, on a monthly basis.

Twice per year, submit all water-level data measured at the 46 representative wells in the Chino Basin for the DWR’s Statewide Groundwater Elevation Monitor Program (CASGEM).

Perform specific technical analyses to characterize groundwater-level conditions and trends as directed by Watermaster staff.
Milestones and Accomplishments

- Downloaded, processed, reviewed for QA/QC, and uploaded into the database the quarterly transducer downloads from approximately 100 monitoring wells for the 2019 third quarter downloads performed during July through September 2019.

- Processed, reviewed for QA/QC, and uploaded into the database 210 monthly manual water levels for 70 wells measured by Watermaster staff during July through September 2019.
Purpose

Program Element 4 of the OBMP states that land subsidence and ground fissuring in MZ-1 are not acceptable and, to the extent that the cause is pumping in MZ-1, should be managed to tolerable levels. Watermaster conducts a ground-motion monitoring program to support Program Element 4 per the requirements of the Peace Agreement, the subsequently developed Court-approved MZ-1 Subsidence Management Plan (MZ-1 Plan) and its revisions (2015 Chino Basin Subsidence Management Plan), and the monitoring and mitigation requirements of the Peace II California Environmental Quality Act (CEQA) Supplemental Environmental Impact Report (SEIR).

Task Description

Setup and Maintenance of Monitoring Network. Subtasks include:

- Perform monthly site visits to manually measure and record groundwater levels at piezometers and extensometer readings and collect and process data from backup pressure transducers.
- Maintain equipment at the Ayala Park and Chino Creek Extensometer facilities and across entire monitoring network.

Aquifer System Monitoring and Testing. Subtasks include:

- Collect and organize groundwater-level, groundwater-production, and extensometer data from production wells and piezometer and extensometer facilities in the MZ-1 monitoring network.

Ground Level Surveys. Subtasks include:

- Coordinate with Guida Surveying, Inc. to conduct the spring 2020 ground-level surveys in the Areas of Subsidence Concern.

Ground Level Surveys - Outside Pro. Subtasks include:

- Conduct spring 2020 ground-level survey and EDM survey in the Northwest MZ-1 Area.
- Conduct spring 2020 ground-level survey in the Northeast Area.
- Replace destroyed benchmarks, as necessary.
- Former surveyor (WSP USA) to provide as-needed assistance for the spring 2020 ground-level surveys.

InSAR. Subtasks include:

- Coordinate timing of InSAR collection across western Chino Basin for the time-period between March 2019 and March 2020.
Review InSAR for the time-period between March 2019 and March 2020.

InSAR – Outside Pro. Subtasks include:

- Prepare InSAR maps for the western Chino Basin for the time-period between March 2019 and March 2020.

**Milestones and Accomplishments**

- Performed monthly routine maintenance, data collection, and verification at the Ayala Park and Chino Creek Extensometer facilities from July to September 2019.
- Performed quarterly collection, checking, and storing of piezometric and aquifer-system deformation data from monitoring wells and extensometers from the Ayala Park and Chino Creek extensometer facilities in July and September 2019.
7108.31, 7108.6 – Prado Basin Habitat Monitoring, Data Analysis and Reporting-50% IEUA Cost Share:

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**Purpose**

The monitoring and mitigation requirements of the Peace II CEQA SEIR (Biological Resources/Land Use & Planning—Section 4.4-3) call for the IEUA, Watermaster, and the Orange County Water District to form the Prado Basin Habitat Sustainability Committee (PBHSC). The purpose of this committee is to ensure that the Peace II Agreement actions will not significantly or adversely impact the Prado Basin riparian habitat. The PBHSC is to develop and implement an adaptive monitoring program and to prepare annual reports that include recommendations for ongoing monitoring and any adaptive management actions required to mitigate any measured loss or prospective loss of riparian habitat that is attributable to the Peace II Agreement. The monitoring program will be implemented as described in the Adaptive Management Plan, and in subsequent Annual Report recommendations.

**Task Description**

- Conduct the Prado Basin Habitat Sustainability Program (PBHSP) monitoring program. The monitoring program consists of the following:
  - Collect, compile, check, and upload climatic data
  - Collect, compile, and review the following data riparian habitat monitoring program data in 2019:
    - High-resolution air photo of the Prado Basin region in 2019
    - Water year 2018/19 Landsat data in the Prado Basin region
    - Conduct ground-based vegetation surveys at 38 sites in Summer 2019
  - Analyze data and prepare a draft and final 2019 Annual Report of the PBHSC.
  - Prepare for and attend meetings of the PBHSC.
  - Prepare Scope and Budget for FY2020/21.

**Milestones and Accomplishments**

- Performed a custom flight to collect a high-resolution air photo of the Prado Basin Area in July 2019.
- Perform ground-based vegetation surveys in Prado Basin in September 2019 at 38 sites. Field work was performed by the USBR.
# 7109 – Recharge and Well Monitoring Program – Engineering Services

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## Purpose
IEUA prepares reports related to the Chino Basin Groundwater Recycled Water Recharge Program. Watermaster performs technical review of the reports.

## Task Description
- Review Quarterly and Annual Reports for Chino Basin Recycled Water Groundwater Recharge Program
- Review Start-Up Reports and other reports as needed.

## Milestones and Accomplishments
- At the request of Watermaster, reviewed and provided comments on the draft 2019 Second Quarterly Report prepared by IEUA.
7202.2 – PE2: Comprehensive Recharge Program

Purpose
The purposes of this task are to provide engineering and institutional support to the Watermaster in the implementing of the 2013 amendment to the 2010 Recharge Master Plan Update (RMPU) as directed by the Court and the Watermaster Board.

Task Description
The services anticipated in FY 2019/20 include technical support (numerical model simulations, hydraulic calculations, project refinement, etc.) to assist Watermaster and the IEUA in RMPU implementation. At Watermaster’s request, the consultant will attend GRCC meetings.

- Attend GRCC and other meetings with Watermaster and IEUA staffs.
- Perform as-requested technical support for RMPU implementation.

Milestones and Accomplishments
- Prepared for and attended RIPCom meetings on July 18, 2019.
- Attended the GRCC meeting on September 4, 2019.
- Participated in monthly conference calls regarding recharge-related capital improvement projects with IEUA and Watermaster staff on August 26, 2019 and September 18, 2019.
- Prepared the Fiscal Year 2018/2019 MS4 data request letter and data request Forms A and B for all appropriators.

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**Task Description**

The purpose of this task is to develop specifications to improve the measurement of stormwater and dry-weather flow diversions and ensure continued compliance with SB88 regulations.

The services anticipated in FY 2019/20 include:

- Review existing information and identify data and methodological challenges. The data and methods will be analyzed to determine the accuracy of the methodology and develop recommendations for improvement. Data that will be collected and reviewed include:
  - Elevation-Area-Storage (EAS) curves
  - Water-level sensor information (installation date, manufacturer, date, model, etc.)
  - IEUA’s stormwater capture calculations
  - Hourly water-level sensor data
- Summarize findings and recommendation in a technical memorandum
- Prepare an addendum to the Operations Manual, summarizing the engineering information at each recharge basin (inlet and outlet design capacity, elevation, and rating curve; spillway design capacity and rating curve; etc.).

**Milestones and Accomplishments**

- Identified data needs for the project and began communications with IEUA for collaboration.
7303 – PE3/5: Water Supply Plan: Desalters

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Purpose
The purpose of this task is to provide technical support for the CDA, and oversight for the Watermaster Board, on the design, construction, and operational activities associated with the desalter program.

Task Description
Subtasks may include:

- Attend meetings as requested by the Watermaster.
- Support Chino Desalter Authority (CDA) Consultant in the desalter expansion design process.
- Review well siting.
- Review CDA consultant design and construction of production wells for consistency with the OBMP.
- Provide groundwater flow modeling support to assess the effects of planned desalter well field operations, including the addition of new wells.
- Other tasks as requested by the Watermaster.

Milestones and Accomplishments
- No activity for this reporting period.
7402 & 7403 – PE4: Management Zone Strategies

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**Purpose**

1) To verify the protective nature of the current MZ-1 Plan with regard to permanent land subsidence and ground fissuring in the Managed Area.

2) To develop pumping and recharge plans to minimize the risk of future land subsidence and ground fissuring in Northwest MZ-1.

**Task Description**

PE4/MZ-1: Data Analyses and Reports. Subtasks include:

- Analyze production, recharge, piezometric, extensometer, ground-level survey, horizontal strain, InSAR, and seismic data.

PE4/MZ-1: Meetings and Administration. Subtasks include:

- Prepare for and attend Ground-Level Monitoring Committee meetings.
- Project administration and financial reporting.
- Develop a scope of work and cost-estimate for FY 2020/21.

Implement the Work Plan to Develop a Subsidence Management Plan for Northwest MZ-1.

**Subsidence Management Plan for Northwest MZ-1. Subtasks include:**

- Conduct the initial monitoring and testing program.
- Install and equip the Pomona Extensometer piezometers with pressure transducers and cable extensometers and test the pressure transducers and cable extensometer data loggers.

**Milestones and Accomplishments**

- Prepared for and attended two Ground-Level Monitoring Committee meetings and one ad-hoc meeting during the reporting period.
• The June 5, 2019 meeting was an ad-hoc meeting to discuss status of the PX piezometer construction and development, and to discuss recommended next steps to complete development of piezometer PX1-1.

• The August 22, 2019 meeting agenda included the following items:

• The September 26, 2019 meeting agenda included the following items:
  • Development of a Subsidence Management Plan for Northwest MZ-1.

• Worked to conduct the Northwest MZ-1 monitoring program by:
  • Working with City of Pomona and MVWD to download or collect pressure data from wells equipped with pressure transducer data loggers (City of Pomona only) or pressure transducers connected to SCADA (MVWD only).
  • Analyzing hydraulic head data collected via pressure transducers from City of Pomona and MVWD wells for the time-period between July through September 2019.
  • Cascade Environmental, Inc. (Cascade) drilled and constructed the Pomona Extensometer’s two dual-nested piezometers. Cascade successfully drilled, constructed, and developed three of the four piezometers (PX1-2, PX3-2, and PX2-4). Piezometer PX1-1 was further developed in July and August 2019.
7502 – PE6/7: Cooperative Efforts/Salt Management

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Purpose

In the Judgment, Watermaster is provided with discretionary powers to address water quality issues in the basin. “Watermaster, with the advice of the Advisory and Pool Committees, is granted discretionary powers in order to develop an optimum basin management program for Chino Basin, including both water quantity and quality considerations.” In the Implementation Plan of the Peace Agreement, Watermaster committed to certain responsibilities under Program Elements 6 and 7:

1. Identify water-quality anomalies through monitoring;
2. Assist the Regional Board in determining sources of the water quality anomalies;
3. Establish priorities for clean-up jointly with the Regional Board; and
4. Remove organic contaminants through regional groundwater treatment projects in the southern half of the Basin.”

Attachment D to the Peace II Agreement further defines water quality commitments for the MZ-3 monitoring program (now a part of the Groundwater Quality Monitoring Program), the Ontario International Airport (OIA) volatile organic chemical (VOC) plume (now called the South Archibald VOC plume), the Chino Airport plume, the General Electric (GE) Flat Iron Remediation, and TDS and nitrogen monitoring, pursuant to the Basin Plan.

The Watermaster prepares the Maximum Benefit Annual Report pursuant to the maximum-benefit commitments in the Basin Plan. The maximum benefit commitments are salt management requirements of the Watermaster and IEUA for the application of less-stringent TDS and nitrate-nitrogen objectives. The Basin Plan states: “If the Regional Board determines that the maximum benefit program is not being implemented effectively in accordance with the schedule shown in Table 5-8a, then maximum benefit is not demonstrated, and the ‘antidegradation’ TDS and nitrate-nitrogen objectives for the Chino 1, 2, and 3 and Cucamonga Management Zones apply.” In this situation, the Regional Board will require mitigation for TDS and nitrate-nitrogen discharges to these management zones that took place in excess of the limits, based on the ‘antidegradation’ objectives and applied retroactively to January 2004.

Task Description

These tasks address special water-quality issues that impact Chino Basin:

1. Program Element 6 – Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management. Program Element 7 – Salt Management Program.
2. [Link to Basin Plan document](http://www.swrcb.ca.gov/santaana/water_issues/programs/basin_plan/docs/chapter5.pdf)
• As-needed consulting for the Chino Airport, South Archibald, and other point-source contaminant plumes.

• South Archibald VOC Plume. Subtasks include:
  • Coordination with PRPs and other stakeholders
  • Prepare semi-annual status reports on historical and recent activities for the Watermaster Pools, Advisory Committee, and Board Meeting agenda packages.
  • Review reports and data generated by the PRPs and their consultants.

• Chino Airport VOC Plume. Subtasks include:
  • Coordinate with Chino Airport PRP and other stakeholders, including the CDA.
  • Prepare semi-annual status reports on historical and recent activities for the Watermaster Pools, Advisory Committee, and Board Meeting agenda packages.
  • Review reports and data generated by the PRP and their consultants.

• Other plumes of interest include but are not limited to, the General Electric (GE) Flatiron and Test Cell plumes, the Stringfellow National Priority List (NPL) plumes, the Rialto-Colton perchlorate plume, the Alumax plume, the Kaiser Steel Mill plume, and the CCG Ontario contamination. Subtasks could include:
  • Prepare annual status reports on historical and recent activities for the Watermaster Pools, Advisory Committee, and Board Meeting agenda packages.
  • Provide technical oversight and review of plume investigation and remediation reports.
  • Analyze groundwater elevation and quality data.
  • Review potential impacts to Chino Basin water quality
  • Develop revised plume delineations
  • Prepare as-needed technical exhibits

These tasks address the Maximum Benefit Annual Report requirements for 2018:

• Analyze and interpret the data and compare with metrics. All data required for reporting in the 2019 Maximum Benefit Annual Report shall be analyzed by the consultant and used to support the demonstration of compliance with the Maximum-Benefit commitments contained in the Basin Plan.

• Prepare the 2019 Maximum Benefit Annual Report. A draft 2019 Maximum Benefit Annual Report will be prepared and submitted to Watermaster and the IEUA for review. Comments will be incorporated, and the consultant shall prepare the final 2018 Maximum Benefit Annual Report for submittal to the Regional Board. The consultant will respond to comments from the Regional Board, the Orange County Water District, and other stakeholders, as necessary.
• Ad-hoc meetings. Prepare for and attend meetings with Watermaster staff, IEUA staff, and/or Regional Board staff, as requested, to present the draft and final 2019 Maximum Benefit Annual Reports.

Milestones and Accomplishments

• Prepared draft semi-annual status reports on the Chino Airport VOC Plume and South Archibald VOC Plume for the Watermaster Pools, Advisory Committee, and Board for October 2019.

• Prepared draft annual status reports for the Watermaster Pools, Advisory Committee, and Board for October 2019 for the following plumes: Stringfellow NPL site plumes, GE Flatiron plume, GE Test Cell plume, former Kaiser Steel Mill plume, Chino Institution for Men plume, and Millikin Landfill plume.
Purpose

Watermaster and the IEUA developed a salt and nutrient management plan and proposed to the Regional Board to change the TDS and nitrate objectives for the Chino-North groundwater management zone based on SWRCB executive order 68-16 and water code sections 13241. The proposed changes created assimilative capacity for TDS and increased the nitrate objective to enable the cost-efficient reuse of recycled water. Watermaster and the IEUA made certain maximum-benefit commitments to the Regional Board in exchange for the increase in TDS and nitrate objectives.

The discharge, reuse, and recharge of recycled water are regulated under two permits held with the Regional Board. Additionally, the reuse of recycled water is regulated by the Basin Plan as part of the maximum-benefit commitments for the Chino Basin. In 2015, the TDS concentration in recycled water produced by the IEUA approached, but did not reach the regulatory limits that would require the IEUA and Watermaster to submit a plan and schedule to manage recycled water TDS concentrations. Although the TDS concentration declined from the 2015 peak before exceeding the regulatory limit, it was an important indicator that the TDS concentration of recycled water is likely to approach or exceed the discharge limitation and trigger the planning for recycled water quality improvements during the next prolonged dry period, or even sooner. Given the potential cost of implementing recycled water quality improvements for what might only be short-term exceedances of the 12-months running average limitation, the IEUA and Watermaster are interested in modifying the recycled water permits and the Basin Plan to allow for a longer-term averaging period for TDS concentrations.

To obtain approval from the Regional Board for these permit and Basin Plan modifications, the IEUA and Watermaster must perform a detailed evaluation of the TDS and nitrate concentration impacts to Chino Basin groundwater. The objective of the analysis is to compare the relative water quality and economic impacts of the existing and proposed regulatory compliance strategies. The primary objectives of the scope of work to support the permit and Basin Plan modifications are: to develop and use updated modeling tools to evaluate the TDS and nitrate concentrations of the Chino Basin, to define planning scenarios and perform an antidegradation analysis, to use the results to develop a regulatory compliance strategy that includes a longer-term average period for recycled water TDS concentrations, to support the negotiation of a final compliance strategy with the Regional Board, and to provide required assistance to the Regional Board to prepare a Basin Plan amendment.

The work is a multi-year project that began in FY 2017/18 and is anticipated to be completed in FY 2019/20.

Task Description

The following are the tasks:

- Develop Planning Data
• Develop Baseline Planning Scenario
• Develop Solute Transport Model Based on the 2017 Chino Basin Watermaster Model and Evaluate Baseline Planning Scenario
• Develop Alternative Planning Scenarios
• Evaluate Planning Scenarios
• Develop Salinity Management Proposal
• Provide Support to IEUA/ Watermaster in Communicating the Salinity Management Proposal to Their Stakeholders
• Provide Technical Support to IEUA/ Watermaster in Negotiating the Salinity Management Proposal with the Regional Board
• Support Development of a Basin Plan Amendment to Formalize the Salinity Management Proposal
• Meetings and Project Management

Milestones and Accomplishments in (FY 2017/18 - 2019/20)
• Completed the development of the proposed technical approach and planning assumptions and technical approach for approval by the Regional Board.
• Completed the development of the planning data and baseline planning scenario.
• Completed the development of computer codes and a process to automate the integration and running of them. This will enable more rapid iteration of each planning scenario to reach convergence and will reduce the amount of time it takes to re-run planning scenarios, if necessary.
• Completed the development of the vadose zone initial TDS and nitrate conditions based on loading from 1978 through 2017 and the aquifer initial TDS and nitrate concentrations based on 2012-2017 water quality conditions.
• Used the models to run and analyze the baseline scenario. Documented the results in tables and charts and reviewed them with Watermaster and IEUA. Review with the Regional Board is pending.
• Prepared for and led three project status and technical review meetings with the Regional Board on February 22, 2018; May 31, 2018; December 10, 2018.
• Participated in project progress conference calls and meetings with WEI, Watermaster and IEUA staffs.
Purpose
This work involves as-requested support to the Watermaster and IEUA related to the programs and projects implemented by the Basin Monitoring Program Task Force (Task Force), including: attendance at Task Force meetings and workshops, preparing meeting summaries, review and preparation of comments on deliverables and reports prepared for the Task Force by its consultants, and other as-requested tasks.

Milestones and Accomplishments
- Monthly coordination with Joshua Aguilar (IEUA) and Edgar Tellez-Foster regarding the Task Force meeting agenda topics and the project deliverables that require technical review.
- Reviewed the following technical reports and deliverables produced by consultants to the Task Force and submitted draft comments to Watermaster and IEUA on the dates indicated:
  - WLAM Task Memo #5 – August 15, 2019
  - WLAM Task Memo #6 – August 22, 2019
- Participated in one Task Force meetings and prepared meeting summary notes: September 18, 2019.
7512 – PE6/7: Triennial Recomputation of AWQ for GW Management Zones - 50% IEUA Cost Share

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**Purpose**

This task is to perform the 2018 Recomputation of Ambient Water Quality, which is required by the maximum benefit SNMP for the Chino and Cucamonga Basins. The task was included in the event that Watermaster and the IEUA elected to perform the ambient water quality computations on their own and not as a participant in the Santa Ana Watershed’s Basin Monitoring Program Task Force (Task Force) efforts to update the entire Santa Ana Watershed. Watermaster and IEUA elected to participate in the Task Force work and this task is not needed. All as-needed support to review the Task Force’s progress on the Ambient Water Quality project will be covered under Task 072 (see above).