

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2015-XXXX

NPDES NO. CAS082597

MONITORING AND REPORTING PROGRAM

CITIES OF CITRUS HEIGHTS, ELK GROVE, FOLSOM, GALT, RANCHO CORDOVA,
SACRAMENTO, AND COUNTY OF SACRAMENTO
STORM WATER DISCHARGES FROM
MUNICIPAL SEPARATE STORM SEWER SYSTEM
SACRAMENTO COUNTY

I. MONITORING AND REPORTING PROGRAM REQUIREMENTS

This Monitoring Reporting Program (MRP) is issued pursuant to the California Water Code Section 13267 and 13383. This MRP is necessary to determine compliance with Order No. R5-2015-XXXX and to determine the effectiveness of the storm water program.

The Permittees shall not implement any changes to this MRP unless and until the Regional Water Board or Executive Officer issues a revised MRP. Attachment A shows the individual Permittee municipal separate storm water system (MS4) limits known as the Sacramento urbanized area, which are covered under this Order. To save time and money, and avoid duplication of efforts, the Permittees shall coordinate their monitoring program with local, state, and federal agencies whenever possible. The Executive Officer may allow revisions appropriate to implement Regional Monitoring Programs and reduce local water quality monitoring requirements.

- A. **Annual Monitoring Plan:** The Permittees shall submit by **1 May** of each year a proposed joint-Permittee Annual Monitoring Plan that includes clearly defined tasks, responsibilities, and schedules for implementation of monitoring activities for the next fiscal year. The Annual Monitoring Plan shall be deemed to be final and enforceable under this Order as of **1 July** of each year unless determined to be unacceptable by the Executive Officer. Each Permittee shall address any comments or conditions of acceptability received from the Executive Officer on the Permittees' Annual Monitoring Plan.
- B. **Annual Report:** The Permittees shall submit, in both electronic and paper formats and no later than **1 October** of each year, an Annual Report documenting the progress of the Permittees' implementation of the Storm Water Quality Improvement Plan (SQIP) and the requirements of this Order. The Annual Report shall discuss each Permittee's status of compliance with

this Order and the SQIPs, including implementation dates for all time-specific deadlines should be included for each program area. If permit deadlines are not met, the Permittees shall report the reasons why the requirement was not met and how the requirements will be met in the future, including projected implementation dates. It shall include a compilation of deliverables and milestones completed during the previous fiscal year, and a discussion of program effectiveness relative to performance standards defined in the SQIPs. In each Annual Report, the Permittees may propose pertinent updates, improvements, or revisions to the SQIPs, which shall be complied with under this Order unless disapproved by the Executive Officer or acted upon in accordance with this Order. A comparison of program implementation results to performance standards established in the SQIP and Order No. R5-2015-XXXX shall be included for each program area. Specific requirements that must be addressed in the Annual Reports are listed below.

1. An Executive Summary discussing the effectiveness of the SQIP to reduce storm water pollution to the maximum extent practicable (MEP) and to achieve compliance with water quality standards in receiving waters;
2. Summary of activities conducted by the Permittees;
3. Identification of best management practices (BMPs) and a discussion of their effectiveness at reducing urban runoff pollutants and flow, where applicable; and
4. Summary of the monitoring data and an assessment of each component of the MRP. To comply with Provisions C.1 and C.2 (Receiving Water Limitations) of this Order the Permittees shall compare receiving water data with applicable water quality standards. The lowest applicable standard from the Basin Plan, California Toxics Rule (CTR), and California Title 22 (Title 22), and constituent specific concentrations limits (e.g., mercury) shall be used for comparison. The Permittees shall provide a summary of monitoring data for the MS4 discharges to assess the effectiveness of BMPs in reducing pollutants in the MS4 discharge and in assessing whether an MS4 discharge may have caused or contributed to an exceedance of water quality standards.

When the data indicate that MS4 discharges are causing or contributing to exceedances of applicable water quality standards or constituent specific concentrations limits, the Permittees shall prepare a Report of Water Quality Exceedance (RWQE), prepared pursuant to Receiving Water Limitations C.3 of this Order, and identify potential sources of the problems, and recommend future monitoring and BMP implementation

measures to identify and address the sources.

Monitoring data collected as part of this MRP shall be submitted in electronic format.

5. Level 1 effectiveness assessment for each program element, as defined in the SQIP, shall be conducted annually, shall be built upon each consecutive year, and shall identify any necessary modifications. The SQIP describes, in detail, the performance standards or goals to use to gauge the effectiveness of the storm water management program. The primary questions that must be assessed for each program element include the following:
 - a. Level 1 Outcome: Was the Program Element or BMP implemented in accordance with the Permit Provisions, SQIP Control Measures and Performance Standards?
 - b. Level 2 Outcome: Did the Program Element or BMP raise the target audience's awareness of an issue?
 - c. Level 3 Outcome: Did the Program Element or BMP change a target audience's behavior, resulting in the implementation of recommended BMPs?
 - d. Level 4 Outcome: Did the Program Element or BMP reduce the load of pollutants from the sources to the storm drain system?
 - e. Level 5 Outcome: Did the Program Element or BMP enhance or change the urban runoff and discharge quality?
 - f. Level 6 Outcome: Did the Program Element or BMP enhance or change receiving water quality?

Annually, the Permittees shall evaluate Water Quality Based Programs and shall include consideration of applicable physical, chemical and biological data water quality data. Such evaluation may include graphs, charts, statistics, modeling, and any other analyses in support of the Permittees' evaluation of the data and conclusions derived from that analysis. Documentation shall include quality assurance and control procedures (QA/QC).

6. Pursuant to 40 CFR 122.42(c)(7), the Permittees shall identify water quality improvements in, or degradation of, urban storm water;

7. For each monitoring component, photographs and maps of all monitoring station locations and descriptions of each location; and
 8. Recommendations to improve the monitoring program, BMPs, Performance Standards, and the SQIP to address potential receiving water quality exceedances and potential pollutant sources, and to meet the MEP standard.
 9. Provide operating data from all pump stations as an appendix in electronic format as necessary and estimate discharge volumes unless other technically defensible means to estimate urban runoff discharge volumes can be substituted. Historically, the Permittees have estimated runoff volumes based on rainfall-runoff volume empirical relationships.
 10. The ROWD at the end of the fourth permit term included:
 - An estimate of total pollutant loads attributable to urban runoff for target pollutants at each discharge monitoring station;
 - An evaluation of the long-term trends in MS4 discharges and receiving water quality. Several factors need to be considered when evaluating trends, such as changes in sample collection methods, data quality differences, and changes in analytical methods.
 - An evaluation of significant correlations of target pollutants with other constituents, such as total suspended solids (TSS).
 11. The SQIP included separate sections for specific program elements, as well as separate sections for Plans required by the Order (i.e., Sediment Monitoring, Mercury Plan).
- C. **Notification of Water Quality Exceedances (NWQE):** The Permittees shall notify the Regional Water Board, in writing, of any exceedance in receiving waters of applicable water quality standards within **90 days** of the monitoring event conducted by the Permittees from which the exceedance was detected. The Permittees shall notify the Regional Water Board electronically within **48 hours** of receiving Water Column Toxicity monitoring data in receiving waters that indicates 50% mortality.
- D. **Certification:** All work plans and reports submitted to the Regional Water Board shall be signed and certified pursuant to federal regulations at 40 CFR 122.41 (k). Each report shall contain the following completed declaration:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility, of a fine and imprisonment for knowing violations."

Executed on the ___ day of, 20 __, at _____.

(Signature)_____ (Title)_____.

The Permittees shall mail the original of each annual report to:

CALIFORNIA REGIONAL WATER QUALITY
CONTROL BOARD – CENTRAL VALLEY REGION
11020 SUN CENTER DRIVE, #200
RANCHO CORDOVA, CA 95670

A copy of the annual report shall also be mailed to:

REGIONAL ADMINISTRATOR
ENVIRONMENTAL PROTECTION AGENCY
REGION 9
75 Hawthorne Street
San Francisco, CA 94105

II. MONITORING PROGRAM

The primary objectives of the Monitoring Program are:

- Assessing compliance with this Order;
- Measuring and improving the effectiveness of the SQIPs;
- Assessing the chemical, physical, and biological impacts on receiving waters resulting from urban runoff;
- Characterization of urban runoff;
- Identifying sources of pollutants; and
- Assessing the overall health and evaluating long-term trends in receiving water quality.

Ultimately, the results of the monitoring requirements should be used to refine the SQIP to reduce pollutant loadings, and to protect and enhance the beneficial uses of the receiving waters in the Sacramento Urbanized Area.

Regional Monitoring Program

The Permittees may elect to participate in a RMP, may request a reduction in some of the local water quality monitoring specified in the MRP of this Order. Participation in a RMP by a Permittee shall consist of providing funds and/or in-kind services to the RMP at least equivalent to discontinued individual monitoring and study efforts.

If the Permittees propose to reduce the local water quality monitoring and instead participate in a RMP, the Permittees shall submit a letter signed by an authorized representative informing the Regional Water Board that the Permittees will participate in a RMP, the date on which local water quality monitoring required under the MRP for this Order would cease, or be modified, and specific monitoring locations and constituent combinations that would no longer be conducted individually. To ensure consistency with this Order and this MRP, reductions in local water quality monitoring require the Executive Officer's prior written approval of the Permittees' request including related SWMP modifications. Approval by the Executive Officer is not required prior to participating in the RMP.

If the Permittees are approved to participate in a RMP and reduce some local water quality monitoring, the Permittees shall continue to participate in a RMP until such time as the Permittees inform the Board that participation in a RMP will cease and all local water quality monitoring will be reinstated. To the extent approved by the Executive Officer, some local water quality monitoring under the Monitoring and Reporting Program, and related monitoring identified in the SWMP, will not be required under this Order so long as the Permittees adequately support a RMP. Data from the RMP may be utilized to characterize the receiving water in the permit renewal. Alternatively, the Permittees may conduct any site-specific receiving water monitoring deemed appropriate by the Permittees and submit that monitoring data with this characterization monitoring. If the Permittees fail to adequately support the RMP, as defined by the RMP Steering Committee, the Permittees shall reinstate local water quality monitoring pursuant to the Monitoring and Reporting Program, upon written notice from the Executive Officer. During participation in the RMP, the Permittees may conduct and submit any or part of the monitoring included in this Monitoring and Reporting Program that is deemed appropriate by the Permittees, provided the modified monitoring program approved by the Executive Officer is conducted at a minimum.

RMP data is not intended to be used directly to represent receiving water quality for purposes of determining if a discharge is causing or contributing to an exceedance of any applicable water quality standards. RMP monitoring stations are established generally as “integrator sites” to evaluate the combined impacts on water quality of multiple discharges; RMP monitoring stations would not normally be able to identify the source of any specific constituent, but would be used to identify water quality issues needing further evaluation. RMP monitoring data, along with local Permittees data, may be used to help establish ambient receiving water quality for a water quality data analysis after evaluation of the applicability of the data for that purpose. RMP data, as with all environmental monitoring data, can provide an assessment of water quality at a specific location and time that can be used in conjunction with other information, such as other receiving water monitoring data, spatial and temporal distribution and trends of receiving water data, point and non-point source discharges, receiving water flowrate and velocity, and to determine a potential source or sources of a constituent that contributed to an exceedance of any applicable water quality standards.

During the period of participation in the RMP, the Permittees shall continue to report any individually conducted local water quality monitoring data in the Annual Report consistent with Provision I.B.4, Monitoring and Reporting Program. In addition, with each submitted Annual Report, the Permittees shall include 1) a statement that the Permittees are participating in the RMP and have reduced some of the local water quality monitoring program required by the permit, and 2) the Permittees shall continue to attach a copy of the letter originally submitted to the Regional Water Board describing the monitoring location(s) and constituents that will no longer be conducted individually.

The monitoring program shall address:

Local Water Quality Monitoring

- Baseline Monitoring
 - Receiving Water Monitoring, including river and urban tributaries
 - Urban Discharge Monitoring
 - Water Column Toxicity Monitoring
- Sediment and Bioassessment Monitoring
- Water Quality Based Programs
 - Pesticide Monitoring
 - Mercury Monitoring

The Permittee shall implement the Monitoring Program as follows:

A. Sampling Protocol

1. Sampling events should be coordinated with monitoring activities such as receiving water monitoring (river and urban tributary), and urban discharge.
2. The Permittee shall collect flow data at the time of sampling for all monitoring stations sampled. Receiving water or urban discharge flow may be estimated using U.S. EPA methods¹ at sites where flow measurement devices are not in place.
3. Sample collection methods shall follow the sample collection protocols required by the analytical methods and the current standards of practice or best practices for urban runoff and receiving water sample collection (e.g., EPA, SWAMP, USGS, etc.).
4. To meet a monitoring requirement, the Permittees may support (financially or otherwise) another agency or monitoring program that will conduct the monitoring.

B. Receiving Water Monitoring

The receiving water monitoring requirements described herein requires the Permittees to maintain monitoring stations, operating procedures, and personnel training as described in the SQIP.

The locations of receiving water monitoring stations for rivers and urban tributaries are provided in the Permittees' SQIP and each year in their Annual Reports. If additional monitoring stations are needed, they shall be established under the direction of Regional Water Board staff. A description of any additional stations shall be attached to this MRP. Receiving water monitoring may be postponed if a given monitoring station cannot be safely accessed.

Each year (annually), samples shall be collected **during three storm events²** and **one monitoring event during the dry season³**. The Permittees shall target monitoring the first rain event of the year forecasted for at least 0.25 inch in a twenty-four hour period that is preceded by at least 30 days of dry weather. The second and third rain events to be monitored shall be selected

¹ NPDES Storm Water Sampling Guidance Document, U.S. EPA 833-B-92-001, July 1992

² Storm Event means any rain event greater than 0.25 inch in 24 hours except where specifically stated otherwise.

³ Dry weather day means a day with a rain event too small to generate runoff (typically 0.1 inches or less) shall be considered a dry weather day.

by the Permittees to fill data gaps for different types of rain events in the region. These rain event selection criteria shall be included in the sampling and analysis plans.

Receiving water monitoring for Rivers and Urban Tributaries shall be consistent with the attached Table B list of constituents of concern, except for pyrethroid pesticides in water.

1. **River Monitoring:** Monitoring of river receiving water stations shall be conducted at: American River at Nimbus, American River at Discovery Park, Sacramento River at Veteran's Bridge, and Sacramento River at Freeport Bridge, as shown on Attachment B. Monitoring shall be conducted in a manner that best measures the maximum anticipated water quality impacts from MS4 discharges. However, because of safety reasons, samples will be collected during daylight hours, only when conditions are safe for boat operations.

Samples collected at the American River at Nimbus location shall be collected as grab samples. All other river samples shall be cross-sectional depth-composite samples, unless a particular parameter analysis requires grab samples, or if flow and safety conditions warrant the collection of grab samples.

2. **Urban Tributary Monitoring:**

- a. Monitoring of urban tributary receiving waters shall be conducted at: Arcade Creek, Willow Creek and Laguna Creek, as shown on Attachment B.
 - i. If a given tributary is dry or has only standing water during a scheduled sampling event, then sampling is not required; however, Permittees shall attempt to sample tributaries at times when water flows are more likely, such as the early part of the dry season.
 - ii. Tributary receiving water samples shall be either grab, time-composited, or flow-composited and collected at mid-depth and mid-stream.
 - iii. Samples shall be taken just upstream of the tributary's confluence with the main stem of creeks or rivers.
 - iv. Sample collection can be limited to daylight hours, when conditions are safe.

- b. Report of Water Quality Exceedance (RWQE) preparation during the previous permit term included development of a work plan to address the cause and nature of dissolved oxygen (DO), pH, and temperature exceedances in several urban tributaries. Multiple steps in the work plan have been completed. The Permittees continued to implement the work plan elements and begin Phase II upon adoption of fourth permit term. Much of the work was performed in Morrison Creek although, other creeks were identified. The work plan and any updates to the plan were included in the SQIP.

3. Urban Discharge Monitoring

The Permittees shall monitor urban discharges from the following monitoring stations: Sump 111, Strong Ranch Slough, and the North Natomas Detention Basin No. 4 (Sump 14), as shown on Attachment B, for those constituents listed in Table B.

Sampling of pyrethroids in water as listed in Table B was performed after evaluating the results and recommendations from the sampling of Permittee discharges currently being conducted by Dr. Donald Weston through Surface Water Ambient Monitoring Program (SWAMP).

In coordination with Receiving Water Monitoring, in two of every three years, samples shall be collected **during three storm events** and **one dry season monitoring event**. The Permittees shall target monitoring the first storm event of the year preceded by at least 30 days of dry weather.⁴ The second and third storm events to be monitored shall be selected by the Permittees to fill data gaps for different types of storm events in the region.

Samples shall be flow-weighted composites collected for the duration of the storm, with a maximum composite period of 24 hours. Because of the inherent difficulty in fully capturing an entire storm event, the Permittees shall report the portion of the storm event "captured" or during which samples were collected.

The Permittees may propose and implement an alternative plan for urban discharge monitoring specified under Provision II.C of the MRP as if submitted as part of their Annual Monitoring Plan submittal for and approved by the Executive Officer approval. In addition to requirements under Provision 1.A of the MRP, the alternative plan shall specify goals and objectives, and modifications to monitoring locations, sampling method and

⁴ A day with a rain event too small to generate runoff (typically 0.1 inches or less) shall be considered a dry weather day.

frequency, and constituents, as applicable. The proposed plan shall be compatible with SWAMP protocols. The Permittees shall implement the alternative plan for urban discharge monitoring once approved by the Executive Officer.

D. Water Column Toxicity

The Permittees conducted short-term toxicity analyses to evaluate the extent and causes of toxicity in receiving waters, and to provide information to support identification of practices that eliminate sources of toxicity or remove them to the MEP. Further water column toxicity monitoring activities will not be required under this Order until the evaluation with recommendations is complete.

The Permittees conducted toxicity testing at each receiving water monitoring station during two of the five fiscal years (July 1 of the current year to June 30 of the following year) in the fourth permit term; this testing was not to be done in consecutive years. Toxicity testing includes (1) analysis of samples from two storm events (including the first storm of the year) and one during the dry season from each receiving water monitoring station; and (2) analysis of at least the following two freshwater test species for each storm event: Fathead minnow (*Pimephales promelas*) and water flea (*Ceriodaphnia dubia*). The testing shall be conducted in accordance with U.S. EPA's method 821-R-02-013 (U.S. EPA 2002, 4th Edition). A modification to this method is allowed for *Pimephales promelas* to address previously observed pathogen interference. A minimum sample volume of 5 gallons for each test species shall be provided with a sample storage (holding time) not to exceed 36 hours.

If 100% mortality to *Pimephales promelas* or *Ceriodaphnia dubia* is detected within 24 hours of test initiation, then a dilution series shall be initiated (0.5x steps) ranging from the undiluted sample (or the highest concentration that can be tested within the limitations of the test methods or sample type) to less than or equal to 6.25 percent of the sample. Further, if statistically significant toxicity is detected and a greater than or equal to 50% increase in *Pimephales promelas* or *Ceriodaphnia dubia* mortality compared to the laboratory control is observed, then TIEs shall be conducted on the initial sample that caused toxicity.

1. Toxicity Identification Evaluations (TIE)

The Permittees shall begin a Phase I TIE immediately on all samples that cause statistically significant toxicity and greater than or equal to 50% increase in *Pimephales promelas* or *Ceriodaphnia dubia* mortality compared to the laboratory control. If mortality of both test species exceeds the 50% trigger, then TIEs shall be conducted using both species. TIEs are required until the cause of toxicity is determined. TIE shall be conducted by qualified personnel.

2. Toxicity Reduction Evaluations (TRE)

- a. A TRE shall be conducted whenever a toxicant is successfully identified through the TIE process. The TRE shall include all reasonable steps to identify the source(s) of toxicity and discuss appropriate BMPs to eliminate the causes of toxicity. Once the source of toxicity and appropriate BMPs are identified, the Permittees shall submit the TRE Corrective Action Plan as part of the Annual Report to the Executive Officer for approval. At a minimum, the TRE shall include a discussion of the following items:
 - i. A description of the investigation and evaluation techniques that would be used to identify potential causes and sources of toxicity;
 - ii. The potential sources of pollutant(s) causing toxicity;
 - iii. A list of Permittees having jurisdiction over sources of pollutant(s) causing toxicity;
 - iv. Recommended BMPs to reduce the pollutant(s) causing toxicity;
 - v. Proposed changes to the SQIP to reduce the pollutant(s) causing toxicity; and
 - vi. Suggested follow-up monitoring to demonstrate BMP effectiveness in reducing the pollutant causing toxicity.
- a. The Permittee's do not need to prepare a TRE if the identified pollutant is already being addressed in the Permittee's Target Pollutant Program. If this is the case, the toxicity found shall be noted and addressed through on-going implementation of that pollutant control strategy.

- b. If TRE implementation for a specific pollutant coincides with Total Maximum Daily Load (TMDL) implementation for that pollutant, the efforts may be coordinated.
- c. Upon approval by the Executive Officer, the Permittees(s) having jurisdiction over sources causing or contributing to toxicity shall implement the recommended BMPs and take all reasonable steps necessary to eliminate toxicity.
- d. The Permittees shall develop a maximum of two TREs per year. If applicable, the Permittees may use the same TRE for the same toxic pollutant or pollutant class in different watersheds or basins. The TRE process shall be coordinated with TMDL development and implementation to avoid overlap.

The Permittees shall include a monitoring plan, which shall include a sampling and analysis plan and an implementation schedule in the SQIP for approval by the Executive Officer. Subsequent information (e.g., all data (electronic format), assessment of the data, conclusions, proposed BMPs to be implemented, and assessment of program effectiveness) shall be included in the Annual Reports as required in this MRP Order.

E. **Sediment Monitoring**

1. Sediment toxicity resulting from pyrethroid pesticides was recently identified in a study performed through Statewide Ambient Monitoring Program (SWAMP) monitoring in the Sacramento area (Roseville, CA) urban tributaries. Monitoring was completed during the fourth permit term, so further sediment monitoring activities will not be required under this Order until the evaluation with recommendations is complete. The Permittees conducted pyrethroid sediment sampling as part of the urban tributary monitoring and as part of any bioassessment sampling. Sampling of sediment shall be consistent with SWAMP Quality Assurance Management Plan (QAMP) protocols. Specifically, **one wet season and one dry season** samples were collected annually at least five years at each of the three urban tributaries. Reporting limits in sediment conformed to Table B. Sediment toxicity sampling is not required under this Order.
2. The Permittees shall review and amend the Pesticide Plan component of the SQIP, if pesticides in sediments are identified as causing or contributing to receiving water impacts.

The Pesticide Plan shall address the following elements:

- a. Identification, development, implementation and assessment of BMPs to address controllable discharges of sediment-bound contaminants that may be linked to sediment toxicity to the MEP;
- b. Development and adoption of policies, procedures, and/or ordinances to implement BMPs;
- c. A time schedule for implementation and assessment.

F. Bioassessment Monitoring

The purpose of this requirement is to fully evaluate biological data collected under the previous MRP in order to assess the biological integrity of receiving waters, detect biological responses to pollution, and identify probable causes of impairment not detected by chemical and physical water quality analysis.

Further bioassessment monitoring activities will not be required under this Order until the evaluation with recommendations is complete, and the monitoring effort is adapted in consultation with SWAMP's bioassessment workgroup. If applicable, an updated bioassessment monitoring plan shall be included in the SQIP.

1. The following results and information were included in the 2008-09 Annual Report:
 - a. All physical, chemical and biological data collected in the assessment;
 - b. Photographs and GPS locations of all stations;
 - c. Documentation of quality assurance and control procedures;
 - d. Analysis that shall include calculation of the metrics used in the CSBP;
 - e. Comparison of mean biological and habitat assessment metric values between stations and year-to-year trends;
 - f. Electronic data formatted to the DFG Aquatic Bioassessment Laboratory for inclusion in the Statewide Access Bioassessment Database; and
 - g. Copies of all QA/QC documents from laboratories.
2. The Permittees shall participate in and coordinate with the SWAMP to identify the most appropriate locations for future bioassessment stations within the Sacramento urbanized area and determine coordinated needs for the initial development of an Index of Biological Integrity for the region.

G. **Water Quality-Based Programs**

The following minimum requirements shall apply to the specified programs:

1. **Additional Pesticide Monitoring.** Additional pesticide monitoring shall be developed to comply with the Basin Plan amendments or TMDLs developed during the Permit term and will be proposed in the Permittees Annual Work Plans submitted to the Regional Water Board.
2. **Additional Total Mercury and Methylmercury Analyses.** Previous monitoring included the analysis of total mercury and methylmercury at a variety of urban tributaries and urban discharge stations during a range of weather conditions and storm events. The Permittees have previously evaluated total mercury and methylmercury data collected under a previous MRP in order to determine average annual methylmercury and total mercury concentrations and loads discharged to the CWA 303(d) Listed mercury-impaired waterways by urban lands in the Sacramento Urbanized Area during a range of wet and dry years. Additional methylmercury or total mercury load assessments may be requested by the Executive Officer.

The following results and information were included in the **2008/2009** Annual Report:

- a. A summary of all total mercury, methylmercury and TSS water column data collected at urban tributaries and urban discharge stations by previous MRPs.
- b. GPS locations of all tributary and urban discharge stations;
- c. Documentation of sample collection and analytical methods;
- d. Documentation of quality assurance and control procedures;
- e. Evaluation of whether the (1) available concentration data represents a range of storm conditions and normal, above- and below-average wet and dry years (as determined by the DWR Water Year Hydrologic Classification Indices⁵ for the Sacramento

⁵ DWR. 2006. Chronological Reconstructed Sacramento and San Joaquin Valley Water Year Hydrologic Classification Indices. DWR California Cooperative Snow Surveys. Sacramento, CA. Available at: <http://cdec.water.ca.gov/cgi-progs/ioidir/WSIHIST>.

River Basin or other comparable methods); and (2) sampling locations represent runoff from urban lands throughout the Sacramento Urbanized Area that contribute discharge to each of the mercury-impaired waterways (Delta, Sacramento River, American River, and Lake Natoma).

- f. Evaluation of available data and methods to estimate dry- and wet-weather discharge volume (flow) from urban lands in the Sacramento Urbanized Area (e.g., LWA, 1996;⁶ Ruby, 2005⁷) that will be needed to calculate the annual average total mercury and methylmercury loads in urban runoff contributed to each of the mercury-impaired waterways. Evaluation shall include the identification of a preferred method for estimating runoff volume, calculation of annual average discharge volumes contributed by urban lands within the Sacramento Urbanized Area to each of the mercury-impaired waterways using the preferred and alternative methods, and identification of any needs for additional data to better estimate annual runoff volumes.
- g. Evaluation of different methods to estimate total mercury and methylmercury loads contributed to each of the mercury-impaired waterways by Sacramento Urbanized Area urban runoff (e.g., Ruby, 2005; Laurenson, 2007⁸; Wood et al., 2008⁹) and identification of a preferred method.
- h. Identification of data gaps and recommendations for additional monitoring or weather-specific sampling events necessary to fully characterize annual average total mercury and methylmercury concentrations and loads in runoff from established urban areas and new urban developments that contribute discharge to each of the mercury-impaired waterways. Recommendations may include a monitoring time schedule (e.g., when the monitoring will begin

⁶ LWA. 1996. Sacramento NPDES Stormwater Discharge Characterization Program 1996 DCP Update Report. Prepared by Larry Walker Associates (LWA) for the County of Sacramento, the City of Sacramento, the City of Folsom, and the City of Galt. September 1996.

⁷ Ruby, A. 2005. Sacramento Urban Runoff Discharge Characterization 2005. Prepared for: The Sacramento Stormwater Quality Partnership. Prepared by: Armand Ruby, Armand Ruby Consulting, in association with Larry Walker Associates Inc. August 2005.

⁸ Laurenson, B.M. 2007. Report of Waste Discharge – Discharge and Receiving Water Characterization. Memorandum and summary statistics prepared by Brian M. Laurenson, P.E. (Larry Walker Associates) for Delia McGrath (City of Sacramento) and Janet Parris (Sacramento County).

⁹ Wood, M.L., C.G. Foe, J. Cooke, S.J. Louie, and D.H. Bosworth. 2008. Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury – Draft Report for Public Review. Central Valley Regional Water Quality Control Board staff report, February 2008.

and its frequency) and will be developed in coordination with TMDL development and implementation for the Delta, Sacramento River, American River, and Lake Natoma.

- i. Estimates of the amount of total mercury and sediment prevented from discharging to receiving waters by existing BMPs in the Sacramento Urbanized Area such as, but not limited to, street cleaning, detention basins, and erosion and sediment controls.
- j. Recommendations for including total mercury and methylmercury monitoring in the design of future BMP studies to estimate the extent to which existing and new BMPs reduce total mercury and reduce and/or increase methylmercury discharges.

The baseline monitoring described in Section II.B of this MRP includes total mercury and methylmercury for three urban tributaries: Arcade Creek, Willow Creek and Laguna Creek. In addition, the monitoring described in Section II.C includes total mercury and methylmercury for three urban discharge stations: Sump 111, Strong Ranch Slough, and North Natomas Sump 14.

In support of the Delta Methylmercury TMDL Phase 1 evaluation, the Permittees submitted a Work Plan to evaluate the effectiveness of low impact development (LID) in removing loads of methylmercury discharged to receiving waters (Control Study). The Work Plan was approved by the Executive Officer on 7 November 2013 and the Permittees are required to provide a progress report on the study by October 2015.

Total mercury and methylmercury monitoring activities may be modified with Executive Officer approval pending the Permittees' evaluation in the October 2015 Phase 1 Delta Methylmercury TMDL Control Study. Any changes to the Monitoring Program will be made in consultation with Regional Water Board MS4 and Mercury TMDL staff, and in coordination with the final Delta TMDL and TMDL development efforts for the American River, Sacramento River, and Lake Natomas. The Executive Officer may require SQIP revisions based on the results of the above mercury-related evaluations and Permittee and Regional Water Board staff recommendations.

Sampling Summary

The monitoring program shall implement the sampling summary shown in Table A.

TABLE A. SAMPLING SUMMARY						
MRP Section Reference	Type	Sites	No. Sites	Constituent List [1]	Management Goals Addressed [2]	Frequency
II.B.1.	River	Sacramento River (2) and American River (2)	4	Table B. No pyrethroids in water column, pending evaluation.	A, F	3 Wet, 1 Dry per year Sites located upstream and downstream of Sacramento urban area.
II.B.2.	Urban Tributary	Arcade Creek, Willow Creek, and Laguna Creek	3	Table B. No pyrethroids in water column, pending evaluation. Sediment monitoring described in MRP section II.E.	A, F	3 Wet, 1 Dry per year The long term Laguna Creek urban tributary monitoring site will be within an existing developed area of the watershed.
II.C.	Urban Discharge Monitoring	Sump 111, Strong Ranch Slough, North Natomas	3	Table B. No pyrethroids in water column, pending evaluation.	C, D, E, G	3 Wet, 1 Dry per year Monitoring shall be collected in two of every three years of monitoring.

TABLE A. SAMPLING SUMMARY						
MRP Section Reference	Type	Sites	No. Sites	Constituent List [1]	Management Goals Addressed [2]	Frequency
II.D.	Water Column Toxicity	Sacramento River (2), American River (2), Arcade Creek, Willow Creek, and Laguna Creek	7	Fathead and Ceriodaphnia	A, E, F, G	2 Wet, 1 Dry per year Monitoring shall be conducted in two out of five years. Targeted TIE triggered based on 50% mortality.
II.E.	Sediment	Urban Tributary Monitoring Sites	3	Pyrethroids	A, E, F, G	1 Wet, 1 Dry per year Wet event to be performed directly following a wet weather urban tributary event, and no later than April
II.F.	Bioassessment	Arcade Creek, Willow Creek, and Laguna Creek	3	None Required. See Notes.	A, C, F, G	May be added at Permittee's discretion.

Notes:

[1] "Table B" refers to the MRP constituent list that includes, among other constituents, total mercury, methyl mercury, and TSS.

[2] Management Goals

- A. What is the existing condition of receiving water quality and is it protective of beneficial uses?
- B. What is the quality of urban discharge in new developed areas?
- C. What is the trend of urban discharge quality?
- D. What is the relative urban runoff contribution to receiving water quality?
- E. What are the sources to urban runoff that affect receiving water quality?
- F. Are conditions in receiving waters getting better or worse?
- G. How can changes in urban water quality affect receiving water quality?

IV. **Standard Monitoring Provisions**

All monitoring activities shall meet the following requirements:

A. **Monitoring and Records [40 CFR 122.41(j)(1)]**

Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

B. **Monitoring and Records [40 CFR 122.41(j)(2)] [California Water Code §13383(a)]**

The Permittees shall retain records of all monitoring information, including all calibration and maintenance of monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the Report of Waste Discharge and application for this Order, for a period of at least five (5) years from the date of the sample, measurement, report, or application. This period may be extended by request of the Regional Water Board or U.S. EPA at any time and shall be extended during the course of any unresolved litigation regarding this discharge.

C. **Monitoring and Records [40 CFR 122.41(j)(3)]. Records of monitoring information shall include:**

1. Date, location, and time of sampling or measurements;
2. Individual(s) who performed the sampling or measurements;
3. Date analyses were performed;
4. Individual(s) who performed the analyses;
5. The analytical techniques or methods used; and
6. Results of such analyses.

D. **Monitoring and Records [40 CFR 122.41(j)(4)]**

All sampling, sample preservation, and analyses must be conducted according to test procedures approved under 40 CFR Part 136, unless otherwise specified in this Order.

E. **Monitoring and Records [40 CFR 122.41(j)(5)]**

The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Order shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than two years, or both. If a conviction is for a violation committed after a first conviction under

- this paragraph, punishment shall be a fine of not more than \$20,000 per day of violation, or by imprisonment for not more than two years, or both.
- F. All chemical, bacteriological, and toxicity analyses shall be conducted at a laboratory certified for such analyses by an appropriate governmental regulatory agency.
- G. For priority toxic pollutants that are identified in the CTR (65 Fed. Reg. 31682), the MLs published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California - 2000 (SIP) shall be used for all analyses, unless otherwise specified. Appendix 4 of the SIP is included in Table B. For pollutants not contained in Appendix 4 of the SIP, the test method and method detection limit (MDL) listed in Table B shall be used for all analyses, and the ML for these parameters shall be lower than or equal to the lowest applicable water quality criteria from the Basin Plan and/or the Inland Surface Waters Plan.
- H. The Monitoring Report shall specify the analytical method used, the MDL and the ML for each pollutant. For the purpose of reporting compliance with numerical limitations, performance goals, and receiving water limitations, analytical data shall be reported with one of the following methods, as appropriate:
1. An actual numerical value for sample results greater than or equal to the ML;
 2. "Not-detected (ND)" for sample results less than the laboratory's MDL with the MDL indicated for the analytical method used; or
 3. "Detected, but Not Quantified (DNQ)" if results are greater than or equal to the laboratory's MDL but less than the ML. The estimated chemical concentration of the sample shall also be reported. This is the concentration that results from the confirmed detection of the substance by the analytical method below the ML value.
 4. For priority toxic pollutants, if the Permittees can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Permittees must submit documentation from the laboratory to the Executive Officer for approval prior to raising the ML for any constituent.

I. Monitoring Reports [40 CFR 122.41(l)(4)(ii)]

If the Permittees monitor any pollutant more frequently than required by the permit using test procedures approved under this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Annual Report.

J. Monitoring Reports [40 CFR 122.41(l)(4)(iii)]

Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order.

K. If no flow occurred during the reporting period, the Monitoring Report shall so state.

L. The Executive Officer or the Regional Water Board, consistent with 40 CFR 122.41, may approve changes to the Monitoring Program, after providing the opportunity for public comment, either:

1. By petition of the Permittees, or by petition of interested parties, after the submittal of the Annual Report (such petition shall be filed not later than 60 days after the Annual Report submittal date), or
2. As deemed necessary by the Executive Officer following notice to the Permittees.

Ordered by _____

PAMELA C. CREEDON, Executive Officer

Date

MONITORING AND REPORTING PROGRAM ORDER R5-2015-XXXX
SACRAMENTO COUNTY AND ASSOCIATED CITIES
MUNICIPAL SEPARATE STORM SEWER SYSTEM
SACRAMENTO COUNTY

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Attachments: Table B – List of Constituents

Attachment A – Permit Area Map

Attachment B – Monitoring Locations Map

Attachment C – Definitions

Attachment D – Standard Provisions and Reporting Requirements

**TABLE B. LIST OF CONSTITUENTS AND ASSOCIATED MINIMUM LEVELS
 (MLs)¹⁰
 FOR THE STORM WATER AND URBAN DISCHARGE
 MONITORING PROGRAM**

CONSTITUENTS	MLs
FIELD/LAB MEASUREMENTS	
Date	mm/dd/yyyy
Sample Time	hr:min (regular time)
Weather	degrees F
Water Temperature	degrees C
pH	0 – 14
Dissolved Oxygen	Sensitivity to 5 mg/L
Turbidity	0.1 NTU
Electrical Conductivity (EC)	µmhos/cm
BACTERIA	
Fecal coliform	<20mpn/100ml
E. coli (fresh waters)	<20mpn/100ml
GENERAL	
	mg/L
Total Petroleum Hydrocarbons	5
Total Suspended Solids	2
Total Dissolved Solids	2
Total Organic Carbon	1
Dissolved Organic Carbon	1
Biochemical Oxygen Demand	2
Chemical Oxygen Demand	20-900
Total Kjeldahl Nitrogen	0.1
Alkalinity	2
Nitrate-Nitrite	0.1
Total Phosphorus	0.05
Total Hardness	2
Methylmercury	0.05 ng/L

¹⁰ For Priority Pollutants, the MLs represent the lowest value listed in Appendix 4 of SIP. Method Detection Limit (MDLs) must be lower than or equal to the ML value. If a particular ML is not attainable in accordance with procedures set for in 40 CFR 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure may be used instead.

CONSTITUENTS	MLs
METALS	µg/L
Copper, Dissolved	0.5
Copper, Total	0.5
Iron, Total	100
Lead, Dissolved	0.5
Lead, Total	0.5
Mercury, Total	0.5 ng/L
Zinc, Dissolved	1
Zinc, Total	1
ORGANOPHOSPHATE PESTICIDES	µg/L
Chlorpyrifos	0.01
Diazinon	0.05
Malathion	0.05
SEMI- AND NON-VOLATILE ORGANICS	µ g/L
Perylene	0.005
Benz[a]anthracene	0.005
Chrysene	0.005
Fluorene	0.005
Benzo[b]fluoranthene	0.005
Benzo[e]pyrene	0.005
Benzo[k]fluoranthene	0.005
Benzo[a]pyrene	0.005
Indeno[1,2,3-c,d]pyrene	0.005
Dibenz[a,h]anthracene	0.005
Benzo[g,h,i]perylene	0.005
Pyrene	0.005
Acenaphthylene	0.005
Acenaphthene	0.005
Naphthalene	0.005
2-Methylnaphthalene	0.005
1-Methylnaphthalene	0.005
2,6-Dimethylnaphthalene	0.005
2,3,5-Trimethylnaphthalene	0.005
Fluoranthene	0.005
Phenanthrene	0.005
Anthracene	0.005
1-Methylphenanthrene	0.005

CONSTITUENTS	MLs
PYRETHROID PESTICIDES IN SEDIMENT	Target Reporting Limit (ng/g)²
Bifenthrin	2
Cyfluthrin	4
Cypermethrin	4
Deltamethrin/Tralomethrin	4
Esfenvalerate/Fenvalerate	2
Fenpropathrin	4
Lambda-cyhalothrin	4
Permethrin	8
The following analysis would only be required if monitoring results from the studies investigating the Pelagic Organism Decline in the Delta indicate these concentrations are present and of concern in Sacramento Permittee discharges	
PYRETHROID PESTICIDES IN WATER³	Target Reporting Limit ppb (ug/L)²
Bifenthrin	0.002
Cyfluthrin	0.004
Cypermethrin	0.004
Deltamethrin/Tralomethrin	0.004
Esfenvalerate/Fenvalerate	0.002
Fenpropathrin	0.004
Lambda-cyhalothrin	0.002
Permethrin	0.005

² Acceptable method should generally be able to meet the minimum level target, however, the method detection limit (MDL) reported should be equal to or less than the listed target.

³ Unfiltered, grab sample using glass jars