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SUBJECT: Completion of Baseline Pyrethroid Monitoring and Commitment to Continue Implementing a Pyrethroid Management Plan

Dear Mr. Pulupa and Mr. Montgomery,

The Contra Costa Clean Water Program (CCCWP) has reviewed your July 30, 2019 letter to all municipal separate storm sewer system (MS4) dischargers in the Central Valley requiring baseline pyrethroid pesticide monitoring and implementation of a pyrethroid management plan. Our permittees in the Central Valley region began conducting baseline pyrethroid monitoring in 2012. They have been implementing the functional equivalent of a Pyrethroid Management Plan since 2010 - first through Provision C.9 of an NPDES stormwater permit issued by the Central Valley Water Board, and currently under Provision C.9 of our stormwater permit issued by the San Francisco Bay Water Board. The CCCWP respectfully submits this letter outlining our pyrethroid monitoring program and management plan on behalf of the Cities of Brentwood, Antioch, and Oakley; the Contra Costa County Flood Control and Water Conservation District (District); and unincorporated Contra Costa County (County) (collectively referred to as the East County Permittees).

Background

The Contra Costa Clean Water Program serves all 19 cities and towns in Contra Costa County, plus the District and the County, in the administration of applicable National Pollutant Discharge Elimination System (NPDES) permits regulating the discharge of urban stormwater. East County Permittees are located entirely or partly within the jurisdiction of the Central Valley Regional Water Quality Control Board (Central Valley Water Board). Watershed plans and policies issued by the Central Valley Water Board that affect NPDES stormwater permits are applicable to East County Permittees.

Prior to 2019, East County Permittees enrolled in coverage under a municipal stormwater permit issued by the Central Valley Water Board – the most recent being Order No. R5-2010-0102. As of January 2019, municipal stormwater discharges from East County Permittees are authorized

under the Municipal Regional Stormwater NPDES Permit (MRP), Order No. R2-2015-0049 as amended in 2019, issued by the San Francisco Bay Regional Water Quality Control Board (San Francisco Bay Water Board). This administrative mechanism recognizes and promotes CCCWP's Countywide approach to monitoring and managing pollutants of concern in urban stormwater.

Baseline pyrethroid monitoring commenced in 2012 in compliance with monitoring provision C.8 in the Central Valley Water Board's Order No. R5-2010-0102. The order required wet season monitoring of stormwater for pyrethroid pesticides and toxicity; monitoring dry weather flows for toxicity; and dry weather monitoring of sediments for pyrethroid pesticides and toxicity. Notably, the order in effect at the time did not require monitoring dry weather flows for pyrethroids.

In 2014 the CCCWP conducted a stressor source identification study (SSID) in Dry Creek (544R0025), a tributary to Marsh Creek in the Brentwood area (CCCWP, 2014). The SSID study included toxicity identification evaluations that confirmed the role of pyrethroid pesticides in causing toxicity to *Hyalella azteca*, as initially suggested by prior chemistry results from stormwater monitoring. The SSID study concluded in 2015 with an assessment of legal consumer pesticide sales and agricultural use in Contra Costa County, confirming that replacement of pyrethroids for now restricted diazinon and chlorpyrifos could account for the pesticide-associated toxicity (CCCWP, 2015). In 2018 CCCWP initiated a study of the causes of fish kills in Marsh Creek. That study included three events when dry weather flows were monitored for pyrethroid pesticides. When East County Permittees were added to the San Francisco Bay Water Board's MRP in 2019, the CCCWP commenced monitoring dry weather flows for pyrethroids and continued monitoring toxicity in dry weather flows and sediments, as well as pyrethroids and toxicity in stormwater.

All pyrethroids and toxicity monitoring conducted on behalf of East County Permittees focused on Marsh Creek and its tributaries. Marsh Creek is the second largest watershed in Contra Costa County and the dominant watershed feature in urbanized eastern Contra Costa County. As such, the CCCWP considers Marsh Creek pyrethroids monitoring to represent conditions of urban stormwater for the East County Permittees' jurisdictions.

Provision C.9 of Order No. R5-2010-0102 and Provision C.9 of the San Francisco Bay MRP currently in effect require implementation of a pesticide control program. The elements of Provisions C.9 are consistent with Central Valley Water Board requirements for a pesticide control program. This is expected because CCCWP understands that the Central Valley Water Board requirements for a pesticide control program were modeled on the San Francisco Bay Water Board's MRP provision C.9.

In summary, through compliance with the prior and existing permit, the CCCWP has monitored pyrethroid pesticides and implemented a Pesticide Control program since adoption of Order No. R5-2010-0102 in 2010. Details of monitoring actions are explained below and in Attachment 1 to show that the value of CCCWP monitoring is equivalent to the baseline pyrethroids monitoring program expected by the Central Valley Water Board. The San Francisco Bay MRP Provision C.9 is provided as Attachment 2 to show the functional equivalence of the CCCWP's pesticide control program.

Functional Equivalence of CCCWP's Baseline Pyrethroids Monitoring

The Central Valley Water Board's requirements for pyrethroid monitoring include:

- A Quality Assurance Project Plan (QAPP), in accordance with the quality assurance/quality control (QA/QC) and other protocols established by the Surface Water Ambient Monitoring Program (SWAMP);
- Environmental Laboratory Accreditation Program (ELAP) - accredited laboratories and methods for chemistry and toxicity testing;
- Analysis of the following pyrethroids: bifenthrin; cyfluthrin; cypermethrin; esfenvalerate; Lambda-cyhalothrin; and permethrin;
- Analysis of dissolved and total organic carbon with water samples;
- Toxicity testing using *Hyalella azteca*; and
- Collection of QA/QC samples for least 20 percent of all samples collected.

The CCCWP’s pyrethroid and toxicity monitoring meet all of the above requirements with the exception of dissolved organic carbon measurements, which were not required by Order No. R5-2010-0102 and are not required by the San Francisco Bay MRP.

The seasonal timing, sample matrices, tests, and frequencies expected by the Central Valley Water Board in a baseline monitoring program are summarized in Table 1 below, which also compares Central Valley Water Board expectations to the number of samples collected by CCCWP for each season/matrix/test.

Table 1. Comparison of Central Valley Water Board Pyrethroid and Toxicity Baseline Monitoring Frequency to the Numbers of Samples Collected by CCCWP

<i>Season</i>	<i>Matrix</i>	<i>Test</i>	<i>Baseline frequency specified by CVRWQCB</i>	<i># Samples Analyzed by CCCWP, 2012 - 2019</i>
Wet	Water	Pyrethroids	3 / year	12
Wet	Water	Toxicity - <i>Hyalella azteca</i>	3 / year	13
Dry	Water	Pyrethroids	1/ year	3
Dry	Water	Toxicity - <i>Hyalella azteca</i>	1/ year	3
Dry	Sediments	Pyrethroids	3 / year	8
Dry	Sediments	Toxicity - <i>Hyalella azteca</i>	1/ year	9

Table 1 shows that the total number of samples collected by CCCWP for each combination of season/matrix/test is equivalent to at least three years’ worth of baseline pyrethroids and toxicity monitoring required by the Central Valley Water Board. The summary shown in Table 1 is for samples collected in Eastern Contra Costa County (i.e., in the Central Valley Region). The samples were collected as part of a larger regional collaborative that has collected over 70 sediment samples and more than a dozen water samples for pyrethroids since 2012. That sampling program followed SWAMP guidance for QAPP development and QA/QC procedures in effect at the time.

In summary, the pyrethroid and toxicity monitoring provided by CCCWP provides at least equivalent – or better – value compared to Central Valley Water Board’s requirements for baseline monitoring. The dissolved organic carbon variance noted above is non-substantive in that it does not affect the finding that pyrethroids exceed water quality standards. The SSID studies added value by (1) providing direct evidence linking *Hyalella azteca* mortality to pyrethroids and (2) demonstrating the potential role of legal pyrethroid use. The CCCWP finds that the data are sufficient to support implementation of a Pyrethroid Management Plan and intends to continue doing so through compliance with provision C.9 of the San Francisco Bay MRP.

Reporting Requirements

We understand Central Valley Water Board requirements include a baseline monitoring report that:

- Summarizes the pyrethroid and toxicity monitoring results;
- Assesses the compliance of the discharge with the conditional prohibition triggers in the Basin Plan established by Resolution R5-2017-0057;
- Summarizes toxicity of water and sediment samples to the test organism *Hyalella azteca*; and
- Summarizes any other pyrethroid monitoring data collected by Discharger during the above period.

That baseline monitoring report is expected by the Central Valley Water Board by September 19, 2022. Although we have previously submitted the above information in our annual Urban Creeks Monitoring Reports, we recognize the convenience of having all pyrethroid and toxicity data compiled in a single location. CCCWP will compile and submit the required information by the September 19, 2022 deadline stipulated for other Central Valley municipal stormwater dischargers.

We hope this information clearly demonstrates compliance with the Central Valley Water Board requirements for municipal stormwater dischargers for monitoring and managing pyrethroids. If you have any questions, please do not hesitate to reach out.

Regards,



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Contra Costa Clean Water Program

cc: Daniel McClure, CVRWQCB
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East County Permittees
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Attachments:

- 1) Details of CCCWP Pyrethroid and Toxicity Monitoring Locations and Timing
- 2) San Francisco Bay MRP Provision C.9

Attachment 1: Details of CCCWP Pyrethroid and Toxicity Monitoring Locations and Timing

Season	Sample Matrix	Test	Location	Station Code	Year(s)	# Samples	Data Reference
Dry	Sediment	Pyrethroids	Dry Creek (tributary to Marsh Creek)	544R00025	2012	1	CEDEN
Dry	Sediment	Pyrethroids	Dry Creek (tributary to Marsh Creek)	544MSH065 and 544MSH062	2014	4	CCCWP (2015)
Dry	Sediment	Pyrethroids	Lower Marsh Creek at Along Sand Creek Trail	544MSH045	2019	1	CEDEN
Dry	Sediment	Pyrethroids	Marsh Creek 30m Southwest of Brentwood Blvd	544R00281	2013	1	CEDEN
Dry	Sediment	Pyrethroids	Marsh Creek Just Upstream of Dainty Ave.	544R01737	2018	1	CEDEN
Dry	Sediment	Toxicity -	Dry Creek	544R00025	2012	1	CEDEN
Dry	Sediment	Toxicity -	Dry Creek (tributary to Marsh Creek)	544MSH065 and 544MSH062	2014	4	CCCWP (2015)
Dry	Sediment	Toxicity -	Lower Marsh Creek at Along Sand Creek Trail	544MSH045	2019	2	CEDEN
Dry	Sediment	Toxicity -	Marsh Creek 30m Southwest of Brentwood Blvd	544R00281	2013	1	CEDEN
Dry	Sediment	Toxicity -	Marsh Creek Just Upstream of Dainty Ave	544R01737	2018	1	CEDEN
Dry	Water	Pyrethroids	Lower Marsh Creek	M2	2018-2019	2	CCCWP (2020)
Dry	Water	Pyrethroids	Sand Creek (tributary to Marsh Cr) at flow source	NA	2018	1	CCCWP (2020)
Dry	Water	Toxicity -	Lower Marsh Creek at Along Sand Creek Trail	544MSH045	2019	1	CEDEN
Dry	Water	Toxicity -	Marsh Creek 30m SW of Brentwood Blvd	544R00281	2013	1	CEDEN
Dry	Water	Toxicity -	Marsh Creek Just Upstream of Dainty Ave.	544R01737	2018	1	CEDEN
Wet	Water	Pyrethroids	Dry Creek (tributary to Marsh Creek)	544MSH065 and 544MSH062	2014	4	CCCWP (2015)
Wet	Water	Pyrethroids	Lower Marsh Creek	LMarCr	2012 - 2014	8	CEDEN
Wet	Water	Toxicity -	Dry Creek (tributary to Marsh Creek)	544MSH065 and 544MSH062	2014	4	CCCWP (2015)
Wet	Water	Toxicity -	Lower Marsh Creek at Fish ladder	LMarCr	2012 - 2014	8	CEDEN
Wet	Water	Toxicity -	Marsh Creek 30m SW of Brentwood Blvd	544R00281	2013	1	CEDEN

California Data Exchange Network (CEDEN). Data downloaded by searching on Contra costa County and specified matrix and parameter group. Available at: www.ceden.org, last accessed 7/28/2020.

Contra Costa Clean Water Program, 2014. Report of Stressor / Source Identification Studies for Dry Creek and Grayson Creek, Part A. Appendix A-3 of CCCWP Integrated Monitoring Report for Water Years 2012 – 2013. Available at: <http://www.cccleanwater.org/userfiles/kcfinderfiles/CCCWP-SSID-Part-A-Report-with-Appendices-FINAL-DRAFT-12-03-14.pdf> (last accessed 7/23/2020)

Contra Costa Clean Water Program, 2020. Marsh Creek Stressor and Source Identification Study: Year 2 Report. Appendix 3C of CCCWP Integrated Monitoring Report for Water Years 2014 – 2019. Available on request.

C.9. Pesticides Toxicity Control

To prevent the impairment of urban streams by pesticide-related toxicity, the Permittees shall implement a pesticide toxicity control program that addresses, within their jurisdictions, their own and others' use of pesticides that pose a threat to water quality and that have the potential to enter the municipal conveyance system.

This provision implements requirements of the TMDL for Diazinon and Pesticide-Related Toxicity for Urban Creeks in the region. The TMDL includes urban runoff allocations for Diazinon of 100 ng/l and for pesticide-related toxicity of 1.0 Acute Toxicity Units (TUa) and 1.0 Chronic Toxicity Units (TUc) to be met in urban creek waters. U.S. EPA phased out urban uses of diazinon in the mid-2000s, and diazinon is no longer detected in urban creeks in the region. Pesticide-related toxicity continues to occur, because State and federal pesticide regulatory programs, as currently implemented, allow pesticides to be used in ways that cause or contribute to aquatic toxicity. In adopting the TMDL implementation plan, the Water Board recognized that (1) Permittees must control their own use of pesticides, but Permittees are not solely responsible for attaining the allocations, because their authority to regulate others' pesticide use is constrained by federal and State law; and (2) because a realistic date for achieving allocations cannot be discerned given the current framework for pesticide regulation, reviewing the implementation strategy every five years, at permit reissuance, is the appropriate timeline. Accordingly, the Permittees' requirements for addressing the allocations are set forth in the TMDL implementation plan and are included in this provision.

Urban-use pesticides of concern to water quality include: diamides (chlorantraniliprole and cyantraniliprole); diuron, fipronil and its degradates; indoxacarb; organophosphorous insecticides (chlorpyrifos, diazinon, and malathion); pyrethroids (metofluthrin, bifenthrin, cyfluthrin, beta-cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, lambda-cyhalothrin, and permethrin); and carbamates (e.g., carbaryl and aldicarb).

C.9.a. Maintain and Implement an Integrated Pest Management (IPM) Policy or Ordinance and Standard Operating Procedures

All Permittees have developed a pesticide toxicity control program for use of pesticides in municipal operations and on municipal property based on the concepts of IPM⁴⁰ and have adopted an IPM policy or ordinance and standard operating procedures to implement the policy or ordinance.

⁴⁰ IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment. IPM techniques could include biological controls (e.g., ladybugs and other natural enemies or predators); physical or mechanical controls (e.g., hand labor or mowing, caulking entry points to buildings); cultural controls (e.g., mulching, alternative plant type selection, and enhanced cleaning and containment of food sources in buildings); and reduced risk chemical controls (e.g., soaps or oils).

- i. **Task Description** – The Permittees shall implement their IPM policies or ordinances and standard operating procedures and update their IPM policies or ordinances and standard operating procedures as needed to ensure their use of pesticides do not cause or contribute to pesticide-caused toxicity in receiving waters.
- ii. **Implementation** - Each Permittee shall require municipal employees and contractors to adhere to its IPM policy or ordinance and standard operating procedures in all the Permittee’s municipal operations and on all municipal property.
- iii. **Reporting**
 - (1) In their Annual Reports, the Permittees shall certify they are implementing their IPM policy or ordinance and standard operating procedures, report trends in quantities and types of pesticide active ingredients used, and explain any increases in use of pesticides of concern to water quality as listed in the introduction section of this Provision. Trends and quantities of pesticide active ingredient usage shall be reported beginning with the September 2017 Annual Report.
 - (2) In their Annual Reports, the Permittees shall provide a brief description (e.g., one or two sentences) of two IPM tactics or strategies implemented in the reporting year. Examples could include non-chemical strategies such as monitoring, mowing weeds, mulching, and redesign of problematic landscapes; preventive actions such as sealing holes and gaps in structures, improving sanitation, and outreach to employees about how their actions contribute to pest presence; and examples of integration of several strategies into a cohesive whole, such as tackling a rat problem by educating building occupants, improving sanitation, trimming trees away from buildings, sealing holes in the structure, and trapping rodents. To the extent possible, different IPM actions should be described each year, so that a range of IPM actions is described over the permit term.
 - (3) IPM policies or ordinances and IPM standard operating procedures shall be submitted to the Water Board upon request.

C.9.b. Train Municipal Employees

- i. **Task Description**– The Permittees shall ensure that all municipal employees who, within the scope of their duties, apply or use pesticides are trained in IPM practices and the Permittee’s IPM policy or ordinance and standard operating procedures. This training may also include other training opportunities such as Bay-Friendly Landscape Maintenance Training & Qualification Program, provided both structural and landscape pest control training are provided.
- ii. **Reporting**
 - (1) In their Annual Reports, the Permittees shall report the percentage of municipal employees who apply pesticides who have received training in their IPM policy or ordinance and IPM standard operating procedures

within the last year. This report shall briefly describe the nature of the training, such as tailgate training provided by a Permittee's IPM coordinator, IPM training through the Pesticide Applicators Professional Association, etc.

- (2) The Permittees shall submit training materials (e.g., course outline, date, and list of attendees) upon request.

C.9.c. Require Contractors to Implement IPM

- i. Task Description** – The Permittees shall hire IPM-certified contractors or include contract specifications requiring contractors to implement IPM, so that all contractors practice IPM on municipal properties. The Permittees shall observe contractor pesticide applications to verify that contractors implement their contract specifications in accordance with the Permittee's IPM policies or ordinance and standard operating procedures. Permittees shall note that contractor certification as a pest control advisor (PCA) alone is not evidence of IPM implementation. Similarly, IPM certifications awarded to a pest control company may not guarantee an individual employee will always use IPM strategies. Thus, periodic Permittee observation of contractor performance is necessary.
- ii. Implementation** – Permittees shall periodically monitor their contractors' activities to verify full implementation of IPM techniques. This shall include, at a minimum, evaluation of lists of pesticides and amounts of active ingredient used.
- iii. Reporting** – In their Annual Reports, the Permittees shall state how they verified contractor compliance with IPM policies and any actions taken or needed to correct contractor performance.

C.9.d. Interface with County Agricultural Commissioners

- i. Task Description** – The Permittees shall maintain communications with county agricultural commissioners to (a) get input and assistance on urban pest management practices and use of pesticides, (b) inform them of water quality issues related to pesticides, and (c) report any observed or citizen-reported violations of pesticide regulations (e.g., illegal handling and applications of pesticides) associated with stormwater management, particularly the California Department of Pesticide Regulation (DPR) surface water protection regulations for outdoor, nonagricultural use of pyrethroid pesticides by any person performing pest control for hire (http://www.cdpr.ca.gov/docs/legbills/rulepkgs/11-004/text_final.pdf).
- ii. Reporting** – In their Annual Reports, the Permittees shall briefly describe the communications they have had with county agricultural commissioners and report followup actions to correct violations of pesticide regulations.

C.9.e. Public Outreach

- i. Task Description** – Permittees shall undertake outreach programs to (a) encourage communities within the Permittee’s jurisdiction to reduce their reliance on pesticides that threaten water quality; (b) encourage public and private landscape irrigation management that minimizes pesticide runoff; and (c) promote appropriate disposal of unused pesticides.
- ii. Implementation** – The Permittees shall conduct each of the following:
 - (1) **Point of Purchase Outreach:** The Permittees shall:
 - Conduct outreach to consumers at the point of purchase;
 - Provide targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control; and
 - Participate in and provide resources for the “Our Water, Our World” program or a functionally-equivalent pesticide use reduction outreach program.
 - (2) **Pest Control Contracting Outreach:** The Permittees shall conduct outreach to residents who use or contract for structural pest control and landscape professionals by (a) explaining the links between pesticide usage and water quality; and (b) providing information about IPM in structural pest management certification programs and landscape professional trainings; and (c) disseminating tips for hiring structural pest control operators and landscape professionals, such as the tips prepared by the University of California Extension IPM Program (UC-IPM).
 - (3) **Outreach to Pest Control Professionals:** The Permittees shall conduct outreach to pest control operators, urging them to promote IPM services to customers and to become IPM-certified by Ecowise Certified or a functionally-equivalent certification program. Permittees are encouraged to work with the Pesticide Applicators Professional Association; the California Association of Pest Control Advisors; DPR; county agricultural commissioners; UC-IPM; BASMAA; EcoWise Certified Program (or functionally equivalent certification program); Bio-integral Resource Center and others to promote IPM to pest control operators.
- iii. Reporting** – In each Annual Report, Permittees shall describe their actions taken in the three outreach categories above. Outreach conducted at the county or regional level shall be described in Annual Reports prepared at that respective level; reiteration in individual Permittee reports is discouraged. Reports shall include a brief description of outreach conducted in each of the three categories, including level of effort, messages and target audience. (The effectiveness of outreach efforts shall be evaluated only once in the Permit term, as required in Provision C.9.f.).

C.9.f. Track and Participate in Relevant Regulatory Processes

- i. Task Description** – The Permittees shall conduct the following activities, which may be done at a county, regional, or state wide level:
- (1) The Permittees shall track U.S. EPA pesticide evaluation and registration activities as they relate to surface water quality and, when necessary, encourage U.S. EPA to coordinate implementation of the Federal Insecticide, Fungicide, and Rodenticide Act and the CWA and to accommodate water quality concerns within its pesticide registration process;
 - (2) The Permittees shall track DPR pesticide evaluation activities as they relate to surface water quality and, when necessary, encourage DPR to coordinate implementation of the California Food and Agriculture Code with the California Water Code and to accommodate water quality concerns within its pesticide evaluation process;
 - (3) The Permittees shall assemble and submit information (such as monitoring data) as needed to assist DPR and county agricultural commissioners in ensuring that pesticide applications comply with WQS; and
 - (4) As appropriate, the Permittees shall submit comment letters on U.S. EPA and DPR re-registration, re-evaluation, and other actions relating to pesticides of concern for water quality.
- ii. Reporting** – In their Annual Reports, the Permittees shall summarize participation efforts, information submitted, and how regulatory actions were affected. Permittees who contribute to a county, regional, or state wide effort shall submit one report at the county or regional level. Duplicate reporting is discouraged.

C.9.g. Evaluate Implementation of Pesticide Source Control Actions

- i. Task Description** – This task is necessary to gauge how effective the implementation actions taken by Permittees are in (a) achieving TMDL targets and (b) avoiding future pesticide-related toxicity in urban creeks. Once during the permit term, Permittees shall conduct a thoughtful evaluation of their IPM efforts, how effective these efforts appear to be, and how they could be improved.
- ii. Implementation** – The Permittees shall evaluate the effectiveness of the pesticide control measures implemented by their staff and contractors, evaluate attainment of pesticide concentration and toxicity targets for water and sediment from monitoring data (collected by Permittees, research agencies, and/or State agencies), and identify additions and/or improvements to existing control measures needed to attain targets, with an implementation time schedule.
- iii. Reporting** – In their 2019 Annual Reports, the Permittees shall submit this evaluation, which shall include an assessment of the effectiveness of their IPM efforts required in Provisions C.9.a-e and g; a discussion of any improvements

made in these efforts in the preceding five years; and any changes in water quality regarding pesticide toxicity in urban creeks. This evaluation shall also include a brief description of one or more pesticide-related area(s) the Permittee will focus on enhancing during the subsequent permit term. Work conducted at the county or regional level shall be evaluated at that respective level; reiteration in individual Permittee evaluation reports is discouraged.