TENTATIVE
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM
ORDER NO. R5-2005-____
FOR
COALITION GROUPS
UNDER
ORDER NO. R5-2005-____
COALITION GROUP CONDITIONAL WAIVER OF
WASTE DISCHARGE REQUIREMENTS
FOR
DISCHARGES FROM IRRIGATED LANDS

Tentative

As stipulated by the *Coalition Group Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands Order No. R5-2005-____* (Coalition Group Conditional Waiver), Coalition Groups shall develop and implement a monitoring program to assess the sources and effects on water quality of waste discharged from irrigated lands, and where necessary, to track progress of existing or new management practices implemented to reduce the amount of waste discharged that affects the quality of waters of the State and their beneficial uses.

The California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) adopts this Monitoring and Reporting Program (MRP) pursuant to California Water Code (Water Code) Sections 13267 and 13269. The Coalition Groups represent Dischargers who discharge waste to waters of the State. The reports required by this MRP are necessary to evaluate the effects on water quality of waste discharges to waters of the State and to determine compliance with the terms and conditions of the Coalition Group Conditional Waiver. The Central Valley Water Board Executive Officer may revise the MRP as appropriate. Coalition Groups shall comply with the MRP as revised by the Executive Officer.

This MRP describes the minimum reporting requirements to include in an acceptable Coalition Group MRP Plan. The purpose of the MRP Plan is to monitor the discharge of wastes in irrigation return flows and stormwater from irrigated lands that are enrolled with the Central Valley Water Board's Irrigated Lands Conditional Waiver Program (Program) under the Coalition Group Conditional Waiver. The Coalition Group shall prepare and submit to the Central Valley Water Board, for review and approval by the Executive Officer, a MRP Plan that meets the minimum requirements of this MRP and includes proposed monitoring sites, frequency of monitoring, parameters to be monitored, and documentation of monitoring protocols. The MRP Plan will be reviewed to determine if it meets or exceeds the minimum requirements of this MRP. The submittal of an acceptable MRP Plan is a condition of the Coalition Group Conditional Waiver.

The development of a science-based water quality monitoring program is critical to determine actual and potential effects on water quality of waste discharges from irrigated lands on beneficial uses of water in the Central Valley Region. Determining the existing ecological conditions of agriculturally-dominated water bodies is a critical goal of a water quality monitoring program and should be achieved by multiple assessment tools such as toxicity, chemical monitoring, and bioassessments, as necessary. The MRP Plan is a part of the Central Valley Water Board Program to assess the effects on water quality of these discharges on waters of the State.

I. MONITORING REQUIREMENTS

The Coalition Group shall submit to the Central Valley Water Board a detailed MRP Plan that supports the development and implementation of a monitoring plan and demonstrates the effectiveness of the Coalition Group to comply with conditions of the Coalition Group Conditional Waiver.

The MRP Plan shall be designed to achieve the following objectives as a condition of the Coalition Group Conditional Waiver:

a. Assess the effects on water quality of waste discharges from irrigated lands to waters of the State;
b. Determine the degree of implementation of management practices to reduce discharge of specific wastes that degrade water quality in watersheds, subwatersheds, or drainage areas where water quality problems have been identified through monitoring;
c. Determine the effectiveness of management practices and strategies to reduce discharges of wastes that degrade water quality;
d. Determine concentration and load of waste in these discharges to surface waters; and
e. Evaluate compliance with receiving water limitations to determine if implementation of additional management practices is necessary to improve and/or protect water quality.

In order to focus the monitoring effort in a cost effective and efficient manner, the monitoring process needs to use various assessment tools (i.e. chemical monitoring, toxicity testing, and bioassessments). A conference sponsored by the California Water Institute entitled "*Understanding Surface Water Monitoring Requirements*" provides excellent guidance on the use of various assessment tools (California Water Institute, 2002).

A. Historical Data

Historical water quality data have been used to list various water bodies as impaired under Clean Water Act Section 303(d). Therefore, synthesis and statistical analysis of all historical data by site and date is a critical first step to design a science-based monitoring program in a watershed. Historical analysis will provide a benchmark for measuring change (progress) in reducing concentrations of wastes due to management practices and will provide rationale for the monitoring site selection process (i.e. continue to monitor sites with extensive temporal data for wastes or water quality parameters). It is also possible that spatial analysis of historical data will reveal sites where data are lacking and that should be monitored in the future. Coalition Groups shall collect and review historical data for all wastes in the various watersheds in advance of developing monitoring designs. This critical initial step in developing a MRP Plan will focus the study, provide rationale for the monitoring site selection process, and reduce costs.

B. Monitoring Sites

The MRP Plan shall describe the study area, monitoring sites, GPS coordinates, crops and land use in the watershed, and the chemicals being used. The numbers and locations of sites must be sufficient to characterize water quality for the watershed, based on specific watershed characteristics, and supported by a detailed discussion of these characteristics.

Monitoring sites shall be selected for watersheds based on varying sizes and flows of water bodies and land use (e.g., agricultural activities and pesticide use) focusing on diversity across the watershed. Monitoring sites must be established on the water bodies that are carrying agricultural drainage into natural water bodies. Monitoring sites should not include main-stem water bodies already on the Clean Water Act Section 303(d) List. These sites should be evaluated only to determine the degree of implementation of management practices needed to reduce discharge of constituents of concern (COCs) listed on the 303(d) List. The MRP Plan shall include a detailed map showing the monitoring sites and crop and land use.

C. Monitoring Seasons

Monitoring shall be conducted during the irrigation and storm seasons. The storm season coincides with dormant spray applications. In general, the irrigation season is March through August, but may start as early as February and extend to October. The storm season is December through February, but may include November and March. The MRP Plan shall describe the irrigation and storm seasons, propose specific irrigation and storm season monitoring periods for the region, and discuss when peak irrigation and storm discharges are likely to occur.

D. Assessment Monitoring

The MRP Plan shall include a Long-Term Monitoring Strategy, as described in Section III.A *MRP Plan* that shall provide a schedule for proposed assessment monitoring including monitoring sites, sampling start date, time of the year, when field studies will take place (begin and end), and frequency of sampling. Timing, duration, and frequency of sampling should be based on the complexity, hydrology, size, and flows of the water bodies. Historical data must be reviewed to assist with determining some of these factors.

Water quality and flow monitoring shall be used to assess the sources of wastes and loads in discharges from irrigated lands to surface waters and to evaluate the effectiveness of management practice implementation efforts. Water quality is evaluated by both field measured parameters and laboratory analytical data. Field measured parameters shall include, at a minimum, flow, pH, electrical conductivity, temperature, and dissolved oxygen. Laboratory analytical data must include, but not be limited to, the list of constituents, parameters, and tests in Table 1 of this MRP. Flow, dissolved oxygen, and temperature are listed in Table 1, but are field measured parameters and are not required for analysis by a laboratory.

Monitoring data shall be compared to receiving water limitations. Representative flow measurements shall be obtained at each sample location during each sampling event. The presence or absence of flow at each sample site shall be noted at a sufficient frequency to determine the total quantity discharged during the irrigation season. The MRP Plan shall include specifications to record the time, date, and location of each flow measurement or observation (for no flow) on field data sheets. An example field data sheet is provided in **MRP Attachment A**. Discharge flow monitoring shall be conducted and reported in cubic feet per second.

Tentative

Bioassessment monitoring protocols are at the developing stage and there are no Basin Plan requirements or standards addressing the results of bioassessment monitoring at this time. Coalition Groups are encouraged to conduct bioassessments to collect data that may be used as reference sites and provide information for scientific and policy decision making in the future. Bioassessments may serve monitoring needs through three primary functions: 1) screening or initial assessment of conditions; 2) characterization of impairment and diagnosis; and 3) trend monitoring to evaluate improvements through the implementation of management practices. Bioassessment data from all wadeable impaired water bodies may serve as an excellent benchmark for measuring both current biological conditions and success of management practices. Bioassessment monitoring shall not be done at the expense of required MRP water quality monitoring.

Activities within the Coalition Group area and the discharge to receiving waters must be evaluated using aquatic toxicity testing. The purpose of the toxicity testing is to: 1) evaluate compliance with the narrative toxicity water quality objective; 2) identify the causes of toxicity observed (e.g., sediment, pesticides, salt, etc.); 3) evaluate any additive toxicity or synergistic effects due to presence of multiple constituents; and 4) determine the sources of the toxicants identified.

Acute toxicity testing shall be conducted using the invertebrate *Ceriodaphnia dubia* (water flea) and the larval fathead minnow *Pimephales promelas* according to standard USEPA acute toxicity test methods[a]. In addition, to identify toxicity caused by herbicides, 96-hour toxicity tests with the green algae *Selenastrum capricornutum* shall be conducted[b]. The water column toxicity testing will be used as an indicator for wastes that are water-soluble. Sediment toxicity testing using the invertebrate species *Hyalella azteca* or *Chironomus tentans* according to USEPA methods[c] shall be conducted for hydrophobic (sediment bound) wastes that are present in the water body.

For this initial screening, 100% (undiluted) sample shall be tested. If, during the initial toxicity screening, a 50% or greater difference in test organism mortality is detected at any time between an ambient sample (i.e., from a stream site) and the laboratory control during an acceptable *Ceriodaphnia dubia* or *Pimephales promelas* test, or a 50% or greater reduction in test organism growth is detected between an ambient sample (i.e., from a stream site) and the laboratory control at the end of an acceptable *Selenastrum capricornutum* test, then a Toxicity Identification Evaluation[d] (TIE) and chemical monitoring shall be conducted on that same sample. The Coalition Groups shall instruct the laboratory to immediately begin the TIE once a 50% or greater mortality or difference in growth is observed in the toxicity sample. At a minimum, a Phase I TIE[e] should be conducted to determine the general class (i.e., metals, non-polar organics such as pesticides, surfactants, etc.) of the chemical causing toxicity. This

[a] USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. Office of Water, Washington, D.C. EPA-821-R-02-012.
[b] USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition. Office of Water, Washington, D.C. EPA-821-R-02-013.
[c] USEPA. 1994. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates. Office of Research and Development, Washington, D.C. EPA-600-R-94-024.
[d] A TIE is a set of sample manipulation procedures designed to identify the specific causative agent(s) responsible for the observed toxicity.
[e] USEPA. 1998. Methods for Aquatic Toxicity Identification Evaluations. Phase I Toxicity Characterization Procedures. Office of Research and Development, Duluth, MN. EPA-600-3-88-034.

minimum TIE effort will determine the type of chemical monitoring necessary to identify the specific agents causing toxicity. Phase II[f] TIEs may also be utilized to identify specific toxic agents.

If at any point during the initial toxicity screening the mortality reaches 100%, a multiple dilution test is required. A multiple dilution test on the same sample must include a minimum of five (5) sample dilutions. The TIE will be conducted to determine the cause of toxicity and the multiple dilution tests will determine the magnitude of the toxic response. Sites identified as toxic (statistically different from the laboratory control) in the initial screen shall be re-sampled to estimate the duration of the toxicant in the water body. Additional samples collected upstream of the original site shall be collected, as specified in Section I.E *Compliance Monitoring* for toxicity sampling schedule and timing for required re-sampling, to determine the potential source(s) of the toxicant in the watershed. .

Monitoring shall include, at a minimum, sampling two major storm events during each storm season, sampling monthly during each irrigation season, and evaluation of data, unless otherwise approved by the Executive Officer. The Coalition Group shall monitor each sampling site for a minimum of two years with a minimum of two samples for all the constituents listed in Table 1 of Section I.F *Minimum Analytical Monitoring Requirements* each year. If a monitoring site has an exceedance during the two years, the Coalition Group shall continue to sample the monitoring site beyond the initial two years and continue sampling until receiving written approval from the Executive Officer to discontinue sampling at the monitoring site.

The assessment monitoring of the Long-Term Monitoring Strategy must consider watershed specific requirements such as watershed COCs based on the characteristics of the Coalition Group area and the receiving water quality conditions. Some Coalition Group areas may need to conduct more extensive toxicity testing or increase the number of monitoring sites to identify sources, if toxicity or exceedances of receiving water limitations have been documented by previous monitoring. Watershed specific requirements will include follow-up analyses on specific COCs, such as specific metals or pesticides.

The assessment monitoring of the Long-Term Monitoring Strategy shall:

- Focus on diversity of monitoring sites across the Coalition Group area (hydrology, size, and flow);
- Evaluate different types of water bodies for assessment;
- Include a sufficient number of sampling sites to assess the entire Coalition Group area and all drainages;
- Propose a systematic approach, including timing, to sample initial monitoring sites and sites upstream of initial monitoring sites until the Coalition Group area is fully characterized and assessed;
- Include sampling sites in areas of known water quality impairments that is not a Clean Water Act Section 303(d) listed water body;
- Provide scientific rationale for the site selection process based on historical and/or on-going monitoring, drainage size, and land use;
- Discuss the criteria for the selection of initially proposed monitoring sites;

[f] USEPA. 1998. Methods for Aquatic Toxicity Identification Evaluations. Phase II Toxicity Identification Procedures. Office of Research and Development, Duluth, MN. EPA-600-3-88-035.

- Conduct initial focus of the monitoring on water bodies that carry agricultural drainage or are dominated by agricultural drainage;
- Identify priorities with respect to work on specific watersheds, subwatersheds, and water quality parameters; and
- Include the requirements provided in Table 1 of Section I.F *Minimum Analytical Monitoring Requirements*.

The assessment monitoring must include a sufficient number of monitoring sites based on acreages and watershed characteristics, flow monitoring, and frequency of sample collection to allow for the calculation of load discharged for every parameter monitored and include the use of proper sampling techniques and laboratory procedures to ensure a sample is representative of the site and is performed in the laboratory using approved methodologies.

Coalition Groups should review the on-going monitoring within their Coalition Group area and coordinate monitoring efforts to avoid duplication. All coordinated monitoring data will need to be included in Coalition Group monitoring reports. The use of coordinated monitoring information for Coalition Group compliance data will require the approval of the Executive Officer.

E. Compliance Monitoring

Compliance monitoring is the sampling required to follow-up on an exceedance of a receiving water limitation or water quality objective or any reason that the data from the assessment monitoring does not meet the requirements of the Coalition Group Conditional Waiver and MRP. As part of the compliance monitoring, the Coalition Group shall re-sample the monitoring site(s) where the exceedance was reported for each constituent that exceeds a receiving water limitation or water quality objective and sample two or more sites upstream of the monitoring site with the exceedance (a total of three or more samples) within 72 hours of submittal of the Exceedance Report (see Section III.B.1 for Exceedance Report requirements). The Coalition Group shall request the laboratory to analyze the samples for the constituent(s) representing the exceedance in the original sample and any parameter needed to compare the results with the receiving water limitations (i.e., hardness). The Coalition Group will continue this re-sampling strategy for each detection that is an exceedance in the re-sampling results, until re-sampling results are below the receiving water limitation that implements the appropriate Basin Plan's water quality objectives. The Coalition Group shall provide the GPS coordinates for each of the sampling locations.

In addition to compliance monitoring re-sampling, the Coalition Group shall collect and evaluate information from Dischargers located in a Coalition Group area where a receiving water limitation exceedance has been found. The Coalition Group will determine the geographic areas within their areas that may be the potential source of the exceedance through follow up monitoring, the County Agricultural Commissioners' offices, or other information that may be available. The Coalition Group will contact Dischargers or other appropriate entities in the identified areas. The contact will include an explanation of the exceedance that occurred, the likely cause of the exceedance, and an explanation of the need to determine management practices that are being implemented in the area and possible management practices that can be used to minimize and/or eliminate the exceedance. Information must be collected from Dischargers on the type of management practices that are being used, the degree to

which they are being used within the Coalition Group area, and how effective they are in protecting waters of the State. The contact should also provide information on any management practices being developed through research projects.

Part of identifying the potential source area will include gathering information on the timing of pesticide applications, the application rates, the amounts of pesticide applied, and the points of application (all of these factors can be referred to as "use pattern"). This information can be found in the pesticide use reports submitted by the applicators to the County Agricultural Commissioners and Department of Pesticide Regulations. Changes in pesticide concentrations at specific monitoring sites in the water bodies shall be compared to pesticide use patterns in land areas upstream of the monitoring sites. By comparing these changes, it may be determined how changing the pesticide use patterns could affect water quality. Changing pesticide use patterns can also provide an indicator of the degree of implementation of certain management practices.

The Coalition Group shall take affirmative steps to identify appropriate management practices. Such steps may involve conducting management practices workshops and/or developing a management practices worksheet questionnaire to determine the management practices being used in the identified areas. The Coalition Group may conduct such outreach efforts or develop the workshops and worksheets with the assistance of the County Agricultural Commissioners, U.C. Cooperative Extension, Natural Resources Conservation Service, Resource Conservation District, or other appropriate groups or agencies. Management practice data shall be collected in four broad areas: 1) pesticide mixing, loading, and application practices; 2) management practices; 3) management practices to address wastes other than pesticides (salt, sediment, nitrogen, etc.); and 4) irrigation and cultural practices. With this information, the Coalition Group will determine the effectiveness of management practices in reducing loading of COCs and in protecting waters of the State. This determination of effectiveness will take into account ongoing pilot projects being implemented to develop additional management practices.

F. Minimum Analytical Monitoring Requirements

Table 1 lists the minimum requirements for the constituents to be monitored by the Coalition Group. The constituents, parameters, and tests listed in the table are based on known problems and pesticide use information in the Central Valley Region along with tests and parameters needed to effectively evaluate water quality and to characterize agricultural discharges.

Table 1. Minimum Analytical Monitoring Requirements

Constituents, Parameters, and Tests	CAS #	Analytical Methods	Maximum PQL(a)	Reporting Unit
Physical Parameters				
Flow		Calculated	1	cfs
pH		SM 4500 H+B or EPA 150.1	0.1	pH units
Electrical Conductivity		EPA 9050A or EPA 120.1	100	µmhos/cm
Dissolved Oxygen		SM 4500	0.1	mg O_2/L
Temperature		SM 2550	0.1	° Celsius
Color		SM 2120B	5	Color Unit
Turbidity		SM 2130B or EPA 180.1	1	NTUs
Total Dissolved Solids		SM 2540C or EPA 160.1	10	mg/L
Total Organic Carbon		SM 5310C or EPA 415.1	0.5	ug/L

Constituents, Parameters, and Tests	CAS #	Analytical Methods	Maximum PQL(a)	Reporting Unit
Drinking Water				
fecal coliform		SM 9221B/F or SM 9223	2	MPN/100ml
Total Organic Carbon		SM 5310C or EPA 415.1	0.5	ug/L
Toxicity Test (b)				
Algae Toxicity		EPA-821-R-02-013	NA	% Growth
Water Column Toxicity (2 species)		EPA 821-R-02-012	NA	% Survival
Sediment Toxicity (c)		EPA 600-R-99-064	NA	% Survival
Pesticides				
Carbamates				
Aldicarb	116-06-3	EPA 8321 or EPA 632	0.5	ug/L
Carbaryl	63-25-2	EPA 8321 or EPA 632	0.5	ug/L
Carbofuran	1563-66-2	EPA 8321 or EPA 632	0.5	ug/L
Methiocarb	2032-65-7	EPA 8321 or EPA 632	0.5	ug/L
Methomyl	16752-77-5	EPA 8321 or EPA 632	0.5	ug/L
Oxamyl	23135-22-0	EPA 8321 or EPA 632	0.5	ug/L
Organochlorines				
DDD	72-54-8, 53-19-0	EPA 608 or EPA 8081A	0.02	ug/L
DDE	72-55-9, 3424-82-6	EPA 608 or EPA 8081A	0.01	ug/L
DDT	50-29-3, 789-02-6	EPA 608 or EPA 8081A	0.01	ug/L
Dicofol	115-32-2	EPA 608 or EPA 8081A	0.1	ug/L
Dieldrin	60-57-1	EPA 608 or EPA 8081A	0.01	ug/L
Endrin	72-20-8	EPA 608 or EPA 8081A	0.01	ug/L
Methoxychlor	72-43-5, 30667-99-3	EPA 608 or EPA 8081A	0.05	ug/L
Organophosphorus				
Azinphos-methyl	86-50-0	EPA 8141A or EPA 614	0.1	ug/L
Chlorpyrifos	2921-88-2	EPA 8141A or EPA 614	0.02	ug/L
Diazinon	333-41-5	EPA 8141A or EPA 614	0.02	ug/L
Dichlorvos	62-73-7	EPA 8141A or EPA 614	0.1	ug/L
Dimethoate	60-51-5	EPA 8141A or EPA 614	0.1	ug/L
Dimeton-s	126-75-0	EPA 8141A or EPA 614	0.1	ug/L
Disulfoton	298-04-4	EPA 8141A or EPA 614	0.1	ug/L
Malathion	121-75-5	EPA 8141A or EPA 614	0.1	ug/L
Methamidophos	10265-92-6	EPA 8141A or EPA 614	0.2	ug/L
Methidathion	950-27-8	EPA 8141A or EPA 614	0.1	ug/L
Parathion-methyl	298-00-0	EPA 8141A or EPA 614	0.1	ug/L
Phorate	298-02-2	EPA 8141A or EPA 614	0.2	ug/L
Phosmet	732-11-6	EPA 8141A or EPA 614	0.2	ug/L
Pyrethroids				
Biphenthrin	82657-04-3	EPA 1660 or EPA 8081A	0.05	ug/L
Cyfluthrin	68359-37-5	EPA 1660 or EPA 8081A	0.05	ug/L
Cypermethrin	52315-07-8, 66841-24-5	EPA 1660 or EPA 8081A	0.05	ug/L
Esfenvalerate	66230-04-4	EPA 1660 or EPA 8081A	0.05	ug/L
Lambda-Cyhalothrin	91465-08-6	EPA 1660 or EPA 8081A	0.05	ug/L
Permethrin	52645-53-1, 54774-45-7, 51877-74-8	EPA 1660 or EPA 8081A	0.05	ug/L

Tentative

Constituents, Parameters, and Tests	CAS #	Analytical Methods	Maximum PQL(a)	Reporting Unit
Herbicides				
Atrazine	1912-24-9	EPA 619 or EPA 507	0.5	ug/L
Cyanazine	21725-46-2	EPA 619 or EPA 507	0.5	ug/L
Diuron	330-54-1	EPA 8321 or EPA 632	0.5	ug/L
Glyphosate	1071-83-6	EPA 547	5	ug/L
Linuron	330-55-2	EPA 8321 or EPA 632	0.5	ug/L
Molinate	2212-67-1	EPA 634 or EPA 507	0.5	ug/L
Paraquat dichloride	1910-42-5, 4685-14-7	EPA 549.1	0.5	ug/L
Simazine	122-34-9	EPA 619 or EPA 507	0.5	ug/L
Thiobencarb	28249-77-6	EPA 634 or EPA 507	0.5	ug/L
Metals				
Arsenic	7440-38-2	EPA 200.7, 200.8, or 206.3	1	ug/L
Boron	7440-42-8	EPA 200.7 or 200.8	10	ug/L
Cadmium	7440-43-9	EPA 200.7, 200.8, or 213.2	0.1	ug/L
Copper	7440-50-8	EPA 200.7, 200.8, or 220.2	0.5	ug/L
Lead	7439-92-1	EPA 200.7, 200.8, or 239.2	0.5	ug/L
Nickel	7440-02-0	EPA 200.7, 200.8, or 249.2	1	ug/L
Selenium	7782-49-2	EPA 200.7, 200.8, or 270.3	1	ug/L
Zinc	7440-66-6	EPA 200.7, 200.8, or 289.2	1	ug/L
Nutrients (d)				
Total Kjeldahl Nitrogen		EPA 351.2 or 351.3	500	ug/L
Nitrate as Nitrogen		EPA 300.1 or 353.2	50	ug/L
Nitrite as Nitrogen		EPA 300.1 or 353.2	50	ug/L
Ammonia	7664-41-7	EPA 350.3 or SM4500 NH3	100	ug/L
Hardness		SM 2340 or EPA 130.1	10,000	ug/l
Total Phosphorous		EPA 365.1, 365.4, or SM 4500-P	50	ug/L
Soluble Orthophosphate		EPA 300.1, 365.1, or SM 4500-P	50	ug/L
		SEDIMENT SAMPLING (c)		
Pesticides – Pyrethroids (e)				
Biphenthrin	82657-04-3	EPA 1660 or EPA 8081A	1.0	ug/kg
Cyfluthrin	68359-37-5	EPA 1660 or EPA 8081A	1.0	ug/kg
Cypermethrin	52315-07-8, 66841-24-5	EPA 1660 or EPA 8081A	1.0	ug/kg
Esfenvalerate	66230-04-4	EPA 1660 or EPA 8081A	1.0	ug/kg
Lambda-Cyhalothrin	91465-08-6	EPA 1660 or EPA 8081A	1.0	ug/kg
Permethrin	52645-53-1, 54774-45-7, 51877-74-8	EPA 1660 or EPA 8081A	1.0	ug/kg

a The methods and PQLs are reasonable goals in terms of laboratory availability and capability, and Coalition Groups should strive to meet them. If the Coalition Group contract laboratory proposes alternative methods or PQLs, the proposed alternatives and rationale for the changes must be detailed in the QAPP. Any alternative PQL must be approved by the Executive Officer prior to use.

b In addition to TIEs, sites identified as toxic in the initial screening shall be re-sampled (as required in Section I.F *Minimum Analytical Monitoring Requirements*) to estimate the duration of the toxicant in the water body. Additional samples upstream of the original site should also be collected to determine the potential source(s) of the toxicant in the watershed. The sampling volume submitted to the laboratory shall be twice the volume needed for the toxicity test. The chain-of-custody form sent to the laboratory shall include a note that the additional volume of sample is for the TIE, if results show TIE is required.

c Sediment Monitoring frequency is one sample during the irrigation season and one sample during the storm season.

d Alternative methods may be used for analysis of nutrients provided the methods are approved by the National Environmental Laboratory Accreditation Program. Alternative methods must be included in the Coalition Group's QAPP and are subject to approval by the Executive Officer.

e Laboratory shall report values between the PQL and method detection limit as estimated and flag with a "j" qualifier.

PQL	Practical Quantitation Limit	MPN	Most Probable Number	cfs	cubic feet per second
NTU	Nephelometric turbidity unit	mg/L	milligrams per liter	ug/L	micrograms per liter
ml	milliliters	mg	milligrams	µmhos/cm	micromhos per centimeter
H+B	Hydrogen ion analysis, Section B	NA	Not applicable	CAS	Chemical Abstract Service

Method detection limits and practical quantitation limits shall be reported. All peaks detected on chromatograms shall be reported, including those that cannot be quantified and/or specifically identified. The Coalition Group shall use USEPA approved methods, provided the method can achieve method detection limits equal to or lower than analytical methods practical quantitation limits specified in this MRP.

Data collected must be submitted to the Executive Officer for review and approval and must include a sufficient number of monitoring sites and surface water flow monitoring for each monitoring site to allow calculation of the load discharged for every parameter monitored. All data must be submitted electronically to Program staff in Surface Water Ambient Monitoring Program (SWAMP) comparable format to the Central Valley Water Board.

II. QUALITY ASSURANCE PROJECT PLAN (QAPP)

To create a sound and consistent watershed or regional MRP Plan, it is important to develop monitoring protocols and a monitoring plan to evaluate the water quality data. The Coalition Group must develop a QAPP to include watershed and site-specific information, project organization and responsibilities, and quality assurance components of the monitoring program. A QAPP specific to the Coalition Group's geographical area is required to be submitted with the MRP Plan. The SWAMP QAPP is a comprehensive quality assurance plan that includes many of the elements required under this MRP. **MRP Attachment B** presents the MRP QAPP requirements and the outline for development of the Coalition Group QAPP. The QAPP includes the laboratory and field requirements to be used for data evaluation. Coalition Groups may use elements of the SWAMP QAPP as an available resource to build the foundation of the Coalition Group QAPP. The addition of site-specific requirements and other elements that are required under this MRP will be necessary to build a comprehensive Coalition Group QAPP applicable to this program.

III. REPORTING REQUIREMENTS

Pursuant to Water Code Section 13267, the following technical reports are required to be submitted to the Central Valley Water Board by a time schedule established by the Executive Officer.

A. MRP Plan

The MRP Plan must include the components of the monitoring program as stated in this MRP, including the Long-Term Monitoring Strategy. At a minimum, the MRP Plan must clearly demonstrate: 1) compliance with all monitoring requirements as described in this MRP; 2) sufficient number of monitoring sites based on watershed characteristics, flow monitoring, and frequency of sample collection to allow for the calculation of load discharged for each parameter monitored; and 3) the use of proper sampling techniques and laboratory procedures to ensure a sample is representative of the site and is performed in the laboratory using approved methodologies.

The MRP Plan shall specify all quality assurance elements including the USEPA test methods and method detection limits for the required constituents as specified in the QAPP. At a minimum, the MRP Plan shall include the following elements:

1. Description of the Coalition Group geographical area including characteristics relevant to the monitoring;
2. Summary of the historical data and on-going monitoring;
3. Monitoring sites;
4. Land use description;
5. Map(s) of Coalition Group area showing irrigated lands (including crop type), sampling locations, drainage and discharge locations. Maps or discussion shall provide details of the Coalition Group areas showing which fields are served by each drain;
6. Color aerial photos submitted electronically;
7. Information on crops grown in the watershed or subwatershed area, chemicals used, and application methods (including timing of application) within the Coalition Group area and other factors that may affect the quality of discharges;
8. Describe irrigation and storm seasons, propose specific irrigation and storm season monitoring, and discuss when peak irrigation and storm discharges are likely to occur;
9. Documentation of existing receiving water quality data and quality of typical irrigation discharges;
10. Known and potential water quality impairments and water quality limited water bodies;
11. Discussion of practices in use and available programs to mitigate problems from irrigated agricultural discharges e.g. tailwater return systems, irrigation efficiency improvements, U.C. Cooperative Extension and NRCS grower outreach, etc.
12. Monitoring periods, including description and frequencies of monitoring events;
13. Parameters to be monitored including minimum and site specific requirements;
14. A Coalition Group QAPP consistent with the requirements described in **MRP Attachment B**;
15. Documentation of monitoring protocols including sample collection methods and Laboratory Quality Assurance manual;
16. Long Term Monitoring Strategy;
17. Implementation Plan;
18. Coalition Group contact information; and
19. Signed Transmittal letter.

To achieve the objectives of this MRP, at a minimum, the Coalition Group shall conduct the types of monitoring, including assessment and compliance monitoring described in this MRP. The Coalition Group shall be responsible for monitoring the effectiveness of identified management practices through the MRP Plan.

The MRP Plan shall include a Long-Term Monitoring Strategy, which shall be provided as an addendum by Coalition Groups that have already submitted a MRP Plan for Central Valley Water Board Executive Officer approval. The purpose of the Long-Term Monitoring Strategy is to form and outline an on-going monitoring schedule to assess the Coalition Group areas in a systematic manner. The Long-Term Monitoring Strategy shall discuss assessment monitoring to characterize water quality for the watersheds and compliance monitoring to sample sites with an exceedance(s).

The Coalition Group shall also develop an Implementation Plan to include as an attachment to the MRP Plan to identify and track the progress of management practices to protect water quality within the watershed when a receiving water limitation exceedance is found. This plan may address water quality issues related to the discharge of irrigation return flows separately from stormwater discharges and shall include a schedule for implementation of management practices that may include, but is not limited to, grower education, and technical and financial assistance. The Implementation Plan shall summarize strategies to respond to possible exceedance scenarios.

Based on the information available, the Coalition Group shall identify its priorities with respect to monitoring and management practice development at specific locations within the Coalition Group area and water quality parameters that will need to be considered. The Coalition Group shall also identify follow-up monitoring sites that will be utilized, if exceedances are found during any of the monitoring events. The follow-up monitoring locations shall be identified on a map and a rationale for the site selection shall be provided.

B. Technical Reports Based on Receiving Water Limitation Exceedances

The Coalition Group shall provide technical reports if monitoring results show exceedances of receiving water limitations. The following reports are designed to notify Central Valley Water Board staff of the exceedance, identify the next steps to be taken and a schedule to address the exceedance, and evaluate management practices to determine their effectiveness in preventing future exceedances.

1. Exceedance Report

   When the Coalition Group determines that a receiving water limitation is or water quality objective exceeded at a monitoring location(s), the Coalition Group shall submit an Exceedance Report to the designated Central Valley Water Board staff assigned to the Coalition Group by email or fax (916-464-4780) within the next business day describing the exceedance, the follow-up monitoring, and analysis or other actions the Coalition Group may take to address the exceedance. The Coalition Group determination of a receiving water limitation exceedance shall occur no later than five (5) business days after receiving the laboratory analytical report.

2. Communication Report

   The Coalition Group shall submit a Communication Report within 45 business days of the Exceedance Report. The Communication Report will describe the follow-up monitoring and analyses that were conducted, what actions were taken to identify the source of the exceedance, complete analytical laboratory results, and a time schedule to identify and implement management practices as described in Section I.E. *Compliance Monitoring* of this MRP and/or other measures to correct the exceedance, and to submit an Evaluation Report.

3. Evaluation Report

The Evaluation Report shall be submitted in accordance with the time schedule submitted in the Communication Report, or as directed by the Executive Officer. The Evaluation Report shall pertain to the constituents that exceeded the receiving water limitation or water quality objective and include, at a minimum, description of management practice(s) or other measures implemented, target chemical(s), reasons for implementing the specific practice or measure, methodology for evaluating the effectiveness of the practice or measure (including sampling and quality assurance/quality control plans), and involvement by stakeholders and agencies in developing, implementing and evaluating the practice or measure.

C. Monitoring Reports

The monitoring reports shall be submitted by **30 June** (Storm Season Monitoring Report), covering the period of 1 November through 30 April, and **31 December** (Irrigation Season Monitoring Report), covering the period of 1 May through 31 October, of each year. Each monitoring report shall include the following components:

1. Title page;
2. Table of contents;
3. Description of the Coalition Group geographical area;
4. Monitoring objectives;
5. Sampling site descriptions;
6. Location map(s) of sampling sites and land use;
7. Tabulated results of all analyses arranged in tabular form so that the required information is readily discernible (example table is included in **MRP Attachment C)**;
8. Discussion of data to clearly illustrate compliance with the Coalition Group Conditional Waiver;
9. Sampling and analytical methods used;
10. Copy of chain-of-custody forms;
11. Associated laboratory and field quality control samples results;
12. Summary of laboratory precision and accuracy;
13. Pesticide use information;
14. Data interpretation including assessment of data quality objectives;
15. Summary table presenting results;
16. Calculation of the load discharged for appropriate parameters;
17. Summary of management practices used;
18. Actions taken to address water quality impairments identified, including but not limited to, revised or additional management practices implemented;
19. Summary of Exceedance, Communication, Evaluation, and follow-up reports submitted during the reporting period;
20. Conclusions and recommendations; and
21. Signed Transmittal letter.

Tentative

Copies of all field documentation and laboratory original data must be included in the monitoring reports as attachments. The monitoring reports need to provide information on field conditions at sampling times including a description of the weather, rainfall, temperature, stream flow, color of the water, odor, and other relevant information that can help in data interpretation. The monitoring reports must also document the results of water quality monitoring, describe actions taken to correct water quality impairments and nuisance conditions, and identify future actions necessary to improve and protect water quality.

In reporting monitoring data, the Coalition Groups shall arrange the data in tabular form so that the required information is readily discernible. An example table for providing tabulated monitoring results is provided in **MRP Attachment C**. The data shall be summarized in such a manner to clearly illustrate compliance with the Coalition Group Conditional Waiver.

Electronic submittal of the corresponding field and laboratory data shall be included within each monitoring report. The data must be submitted in a SWAMP comparable format. The data must include all sample results as well as field and laboratory quality control results, including toxicity analysis replicates and in-test water quality parameters. Prior to submission, the data shall be reviewed by the Coalition Group and determined to be free of errors and meeting the project quality assurance acceptance guidelines outlined in the Coalition Group QAPP.

A transmittal letter shall accompany each report. This letter shall include a discussion of any violations of the Coalition Group Conditional Waiver found during the reporting period, and actions taken or planned to correct noted violations, such as operational, field or facility modifications. If the Coalition Group has previously submitted an Exceedance, Communication, or Evaluation Report describing actions and/or a time schedule to implement corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall be signed and contain a penalty of perjury statement by the Coalition Group, or the Coalition Group's authorized agent. This statement shall state:

> *"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 knowingly submitting false information, including the possibility of fine and imprisonment for violations."*

The Executive Officer may request the Coalition Group and/or its member Dischargers to take additional actions if monitoring data shows exceedances of receiving water limitations in surface waters. The Executive Officer may also increase the monitoring requirements where monitoring results, pesticide use patterns, or other indicators suggest that the increase is warranted.

Based on results of the monitoring program after a minimum of one year, the Coalition Group may submit a revised MRP Plan and/or Long-Term Monitoring Strategy requesting a reduction in the constituents monitored and/or sample frequency. If such reductions are warranted, the revised MRP Plan may be approved by the Executive Officer.

The Coalition Group, on behalf of its member Dischargers, shall implement the above monitoring program in accordance with the date provided in the Notice of Applicability (NOA). For Coalition Groups that have already received a NOA, the above monitoring program shall be implemented within 120 days of the date of this MRP.

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

_____
(Date)

MRP Attachment A – Example field data sheet
MRP Attachment B – Quality Assurance Project Plan
MRP Attachment C – Example Table For Providing Tabulated Monitoring Results

MRP Attachment A Example Field Data Sheet (Water Chemistry Samples & Probe)		One sheet per Monitoring Location per Sampling Event	Pg of Pgs
Monitoring Location Name:	Date (mm/dd/yyyy):	Season: (Irrigation or Dormant)	**Irrigated Lands Conditional Waiver Program**
Coalition or Individual Name (Abbreviations are OK)	Sample Time:	Sampling Crew Names (First Initial. Last Name)	

Field Observations	Circle Your Observations	WADEABILITY: YES / NO	BEAUFORT SCALE:		WIND DIRECTION (from):	N W E S	**PHOTOS** (File Names..If sent to Regional Water Board) (RB=Right Bank US=Upstream)
DOMINANTSUBSTRATE:	Concrete,Cobble,Gravel,Sand,Mud,Other_____,unk						1: (RB / LB / BB / US / DS / ##)
SITE ODOR:	None,Sulfides,Sewage,Petroleum,Mixed,Other_____	SKY CODE:	Clear, Partly Cloudy, Overcast, Fog, Hazy				2: (RB / LB / BB / US / DS / ##)
OTHERPRESENCE:	Vascular,Nonvascular,OilySheen,Foam,Trash,Other___	PRECIPITATION:	None, Foggy, Drizzle, Rain, Snow				3: (RB / LB / BB / US / DS / ##)
WATERODOR:	None, Sulfides, Sewage, Petroleum, Mixed, Other____	PRECIPITATION (last 24 hrs):	Unknown, <1", >1", None				
WATERCLARITY:	Clear (see bottom), Cloudy (>4" vis), Murky (<4" vis)	WATERCOLOR:	Colorless, Green, Yellow, Brown				
OBSERVED FLOW:	NA, Dry Waterbody Bed, No Observed Flow, Isolated Pool, 0.1 - 1cfs, 1 - 5 cfs, 5 - 20 cfs, 20 - 50 cfs, 50 - 200 cfs, >200cfs						
Comments:							

EVENT TYPE:	Chem,Chem & Tox, Tox, Observations	SAMPLE TYPE:	Grab / Integrated	**Sample ID (If Used):**		
OCCUPATION METHOD:	Walk-in, Bridge, R/V _____, Other _____	STARTING BANK:	LB / RB/ NA	GPS/DGPS	**Lat (dd.ddddd)**	**Long (dd.ddddd)**
SAMPLINGEQUIPMENT:	Indiv bottle by hand, By pole, Teflon tubing, Kemmer, Pole & Beaker, Other _____			**Target:**		-
SAMPLE LOCATION:	Bank, Thalweg, Midchannel, Open Water	HYDROMODLOC(to sample):	US / DS / NA	***Actual:**		-
HYDROMODIFICATION:	None, Bridge, Pipes, Concrete Channel, Grade Control, Culvert, Other _____			GPS Model:		Datum:
Point of Sample (Integrated; -88 in dbase)	*StreamDepth (m):	*StreamWidth (m):		Distance from Bank (m):		Accuracy (ft / m):

Samples Taken (# of containers filled)	**Field Duplicate** (SampleType = FieldBLDup):	YES / NO	Duplicate Sample ID: ___ ___ ___ ___ ___ ___ ___ ___

Type (ex: TSS)													
# of Containers Filled													

Probe Measurements

	Discharge (CFS)	pH	Electrical Conductivity (uS/cm)	O_2 (mg/L)	Water Temp (°C)	Turbidity (ntu)	*Air Temp (°C)						
SUBSURFACE													
Instrument:													
Calib. Date:													

COMMENTS: (* Indicates Optional)

QUALITY ASSURANCE PROJECT PLAN

1.0 INTRODUCTION

A Quality Assurance Project Plan (QAPP) shall be developed by the Discharger and shall include site-specific information and field and laboratory quality assurance requirements. This document identifies the major elements of the quality assurance and quality control (QA/QC) components that need to be described in the QAPP. The QAPP shall be submitted to the Central Valley Water Board for review and approval.

2.0 OBJECTIVE

The objective of this document is to identify the QA components that should be included in the QAPP for the Discharger monitoring. A QAPP contains the requirements and criteria for the field and laboratory procedures used during planning and implementation of the monitoring program. These requirements and criteria shall be presented as a set of procedures to assure that the data collected during a monitoring program represents, as closely as possible, *in situ* conditions of the water body. This objective will be achieved by using accepted methodology (e.g., USEPA) to collect and analyze water, sediment, and biota samples. The program's ability to meet this objective will be assessed by evaluating the laboratory results in terms of detection limits, precision, accuracy, comparability, representativeness, and completeness. This document provides a description of major elements of the field and laboratory QA components.

3.0 WHAT SHOULD BE INCLUDED IN THE QAPP

A monitoring QAPP should include Project Management information e.g., project organization and responsibilities, project schedule, and the QA components of the field and laboratory activities. The elements described in this document will provide the framework for developing a QAPP. These elements describe the field and laboratory elements of a QAPP and the requirements that are set forth by the Central Valley Water Board. QAPP for the Discharger monitoring must include all the required components as listed in Table No. 1.

Table No.1. Components of Monitoring QAPP

SECTION NUMBER	SECTION NAME	SECTION DESCRIPTION
1.0	PROJECT MANAGEMENT	This section explains the overall project management.
1.1	TITLE PAGE AND APPROVAL	Description of Project Title, organizations, and responsible staff.
1.2	TABLE OF CONTENTS	Table of Contents list the sections and sub-sections included in the QAPP.
1.3	CONTRACT INFORMATION	List the contact staff, organization, and phone numbers.
1.4	PROJECT ORGANIZATION AND RESPONSIBILITY	Identify the project organization and the responsible entities who will ensure the QAPP procedures will be followed.
1.5	PROJECT OBJECTIVES AND APPROACH	Describe the objective based on the goal defined in the Conditional Waiver. Describe the approaches to meet the objectives.
1.5.1	*Measurement*	Describe the constituents that will be monitored.
1.5.2	*Project Schedule*	Identify when field studies will take place, the frequency of sampling, and when the field studies end.
1.6	QUALITY OBJECTIVES AND CRITERIA FOR DATA MEASUREMENT	Describe the quality objectives and criteria for data measurement. Refer to Quality Control Requirements listed in this document.
1.7	TRAINING AND CERTIFICATION	Describe the procedures for training field and laboratory staff.
1.8	DOCUMENTATION AND RECORDS	Describe the documentation procedure and record keeping for the monitoring program.
1.8.1	*Data to be Included in Reports*	List the laboratory and field data that will be included in the report.
1.8.2	*Reporting Format*	Explain what type of data will be included in the final report. Describe how the data that didn't meet the quality objectives will be qualified (e.g., estimated, usable, unusable).
2.0	DATA ACQUISITION	This section describes the sampling design and sample collection criteria
2.1	SAMPLING DESIGN	Describe the sampling design.
2.2	RATIONALE FOR THE DESIGN	Describe the purpose of the study. State if the design is based on a statistical or judgmental data collection method.
2.2.1	*Procedure for locating and Selecting Environmental Samples*	Describe procedures for locating and selecting the monitoring site/location(s).
2.2.2	*Classification of Measurements as Critical*	All measurements shall be classified as critical. Describe the process that will ensure that data will undergo closer scrutiny during data review.
2.2.3	*Validation of any Nonstandard methods*	List the non-standard methods that will be used and describe the procedures to validate the method.
3.0	FIELD PROCEDURES	Describe the field procedures for the elements listed below. Refer to the Field Procedures (Section 3.0) to meet the requirements for this monitoring program.
3.1	SAMPLE COLLECTION METHODS	See Section 3.0 for criteria. Describe the project specific methods.
3.1.1	*Sample Storage, Preservation and Holding Times*	See Section 3.0 for criteria. Describe the project specific procedures.
3.1.2	*Sample Identification Scheme*	See Section 3.0 for criteria. Describe the project specific procedures.
3.1.3	*Field Measurements*	See Section 3.0 for criteria. Describe the project specific methods of field measurement.
3.1.4	*QC Sample Collection*	See Section 3.0 for criteria. Describe the project specific quality control samples.
3.1.5	*Field Instrument Calibration*	See Section 3.0 for criteria. Describe the project specific methods of calibration.
3.1.6	*Decontamination Procedures*	See Section 3.0 for criteria. Describe the project specific documentation procedure.
3.1.7	*Field Documentation*	See Section 3.0 for criteria. Describe the project specific field documentation procedure.
3.2	SAMPLE CUSTODY AND DOCUMENTATION	This section describes the sample custody and documentation procedures.
3.2.1	*Documentation Procedures*	Describe the field documentation procedures.
3.2.2	*Chain-of-Custody Procedures and Form*	See Section 3.0 for criteria. Describe the Chain-of-Custody procedures.
3.2.3	*Sample Shipments and Handling*	See Section 3.0 for criteria. Describe the sample shipment procedure. How the samples will be delivered from the field to the laboratory.
3.2.4	*Laboratory Custody Procedures*	See Section 3.0 for criteria. Describe the project laboratory custody procedures.
4.0	ANALYTICAL METHOD REQUIREMENTS	This section describes the analytical method requirements.
4.1	CHEMISTRY ANALYSIS	Describe the chemistry analyses procedure, reference the published method, and identify the quantitation procedures.
4.2	TOXICITY TESTING	Describe the toxicity testing method and procedure, species, and reference the published methods being followed.
4.3	DETECTION AND QUANTITATION LIMITS	Describe the detection and quantitation limits for all constituents. See Section 4.0 for requirements.
4.4	LABORATORY STANDARDS AND REAGENTS	Describe the reagents used in the laboratory and how they are checked for the quality.
4.5	SAMPLE PREPARATION PROCEDURES	Describe the sample preparation procedure and the reference method for each analytical method used and every constituent being monitored
5.0	QUALITY CONTROL REQUIREMENTS	This section describes the laboratory and field quality control. Laboratory and field sampling SOP should be provided to include the detailed information.
5.1	DATA QUALITY OBJECTIVES AND QUALITY	Describe the precision, accuracy, comparability, and completeness criteria for

SECTION NUMBER	SECTION NAME	SECTION DESCRIPTION
	ASSURANCE OBJECTIVES	this project. See Section 5.0 for required information.
5.2	DEVELOPMENT OF PRECISION AND ACCURACY	Provide information on how the precision and accuracy will be developed for this project. See Section 5.0 for required information.
5.3	INTERNAL QUALITY CONTROL SAMPLES	Describe and list the internal QC samples, the frequency and acceptance criteria.
5.4	FIELD QUALITY CONTROL SAMPLES	Describe and list the type of field QC samples, the frequency of collection, and the acceptance criteria.
5.5	LABORATORY QUALITY CONTROL SAMPLES	Describe the laboratory QC samples and the frequency of analyses.
6.0	INSTRUMENTATION AND EQUIPMENT PREVENTATIVE MAINTENANCE	This section describes the instrumentation and preventive maintenance.
6.1	SAMPLE EQUIPMENT CLEANING PROCEDURES	Describe the sampling equipment cleaning procedures.
6.2	ANALYTICAL INSTRUMENT AND EQUIPMENT TESTING PROCEDURES AND CORRECTIVE ACTIONS	List the analytical instrument, manufacturer, maintenance procedure, and corrective actions when instruments are not operating within the required operating limits.
6.3	INSTRUMENT CALIBRATION AND FREQUENCY	This section describes the instrument calibration procedures and frequency of calibration
6.3.1	*Analytical Procedures and Calibration*	Describe the calibration procedure and frequency for each analytical method used in this monitoring program. Refer to Section 6.0 to follow the required procedure.
7.0	DATA MANAGEMENT	Describe the data management procedure. Where the original data will be kept, who will receive the copy of the data, and who is responsible for maintaining the database.
7.1	DATA ASSESSMENT PROCEDURES	How the data will be assessed and what tools will be used to assess the data.
7.1.1	*Training and Certification*	Describe the training requirements for the field and laboratory staff.
7.1.2	*Data to be included in the Report*	Specify the data that will be included in the monitoring report. See Section 7.0 for requirements
8.0	DATA VALIDATION AND USABILITY	This section describes the data validation and usability.
8.1	LABORATORY DATA REVIEW. VERIFICATION AND REPORTING	Describe the laboratory procedure for data review and validation prior to release of the data.
9.0	REFERENCES	List all the references used to prepare the QAPP.
	ATTACHMENTS	List and enclose the attachments required. (e.g., Laboratory Quality Assurance Manual and SOPs).

In order to provide some technical information in preparing the QAPP, Sections 3.0 through 8.2.3 of the QAPP listed in Table No.1 are discussed in more detail below.

These sections focus primarily on the QA/QC components of the field and laboratory procedures. The section numbers provided below correspond to the Table No. 1 section numbers and section titles for ease of use.

SECTION 3.0 FIELD PROCEDURES

Surface water and sediment samples will be collected for chemical analyses and biological toxicity testing. While the primary focus will be the collection of samples for toxicity and pesticide analyses, other constituents will be required as listed in the Monitoring and Reporting Program.

Section 3.1 Sample Collection Methods

Proper sampling techniques must be used. Sampling procedure must be documented.

Section 3.1.1 Sample Storage, Preservation and Holding Times

Sample containers must be pre-cleaned and certified to be free of contamination according to the USEPA specification for the appropriate methods.

Section 3.1.2 Sample Identification Scheme

All samples must be identified with a unique number to ensure that results are properly reported and interpreted. Samples must be identified such that the site, sampling location, matrix, sampling equipment and sample type (i.e., normal field sample or QC sample) can be distinguished by a data reviewer or user.

Section 3.1.3 Field Measurements

For all water bodies sampled, water quality parameters including pH, specific conductance, flow, dissolved oxygen, and temperature must be measured in the field prior to collecting samples for laboratory analyses.

Section 3.1.4 QC Sample Collection

Field blanks and duplicates must be collected at a frequency of about 1 per event or 1 per 20 normal samples whichever is more frequent. Sufficient sample volume for matrix spikes will be collected as normal samples at a frequency of 1 per event to allow for laboratory preparation and analysis at a frequency of one per batch. Sample water collected for matrix spikes will be spiked at the laboratory prior to sample preparation.

Section 3.1.5 Field Instrument Calibration

Routine field instrument calibration must be performed at least once per day prior to instrument use to ensure instruments are operating properly and producing accurate and reliable data. Calibration should be performed at a frequency recommended by the manufacturer, if more frequent than once per day. The calibration should be recorded within a field calibration log or directly on the corresponding field sheet.

Section 3.1.6 Decontamination Procedures

All field and sampling equipment that will come in contact with field samples must be decontaminated after each use in a designated area.

Section 3.1.7 Field Documentation

All field activities must be adequately and consistently documented to ensure defensibility of any data used for decision-making and to support data interpretation. Pertinent field information, including (as applicable), the width, depth, flow rate of the stream, the surface water condition, location of the tributaries, and the actual GPS coordinates where the sample was taken must be recorded on the field sheets, along with field measurements described in Section 3.1.3.

Section 3.2 Sample Custody and Documentation

Sample custody must be traceable from the time of sample collection until results are reported. Sample custody procedures provide a mechanism for documenting information related to sample collection and handling.

Section 3.2.1 Documentation Procedures

A field activity coordinator must be responsible for ensuring that the field sampling team adheres to proper custody and documentation procedures. A master sample logbook or field datasheets shall be maintained for all samples collected during each sampling event.

Section 3.2.2 Chain-of-Custody Form

A chain-of-custody form must be completed after sample collection and prior to sample shipment or release. The chain-of-custody form, sample labels, and field documentation must be crossed checked to verify sample identification, type of analyses, number of containers, sample volume, preservatives and type of containers.

Section 3.2.3 Sample Shipments and Handling

All sample shipments are accompanied with the chain-of-custody form, which identifies the contents. The original chain-of-custody form accompanies the shipment and a copy is retained in the project file.

All shipping containers must be secured with chain-of-custody seals for transportation to the laboratory. The samples must be placed with ice to maintain the temperature between 2-4 degrees C. The ice packed with samples must be sealed in zip lock bags and contact each sample and be approximately 2 inches deep at the top and bottom of the cooler. Samples must be shipped to the contract laboratories according to Department of Transportation standard.

Section 3.2.4 Laboratory Custody Procedures

The following sample control activities must be conducted at the laboratory:

- Initial sample login and verification of samples received with the chain-of-custody form;
- Document any discrepancies noted during login on the chain-of-custody;
- Initiate internal laboratory custody procedure;
- Verify sample preservation (e.g., temperature);
- Notify the project coordinator if any problems or discrepancies are identified; and
- Proper sample storage, including daily refrigerator temperature monitoring and sample security.

SECTION 4.0 ANALYTICAL REQUIREMENTS

Section 4.1 Chemistry Analyses

Pesticide analyses must be conducted on unfiltered (whole) fractions of the samples. Prior to the analysis of any environmental samples, the laboratory must have demonstrated the ability to meet the minimum performance requirements for each analytical method. Initial demonstration of laboratory capabilities includes the ability to meet the project specified quantitation limits (QL), the ability to generate acceptable precision and recoveries, and other analytical and QC parameters as stated in this Guide. Analytical methods used for chemistry analyses must follow a published method and document the procedure for sample analyses in a laboratory standard operation procedure (SOP) for review and approval.

Section 4.2 Toxicity Testing

The ambient water toxicity test results must provide a reliable qualitative prediction of impacts to in stream biota. At a minimum the toxicity testing will need to include the 4-day static renewal procedures described in *Method for Measuring Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (USEPA, 2002).

Section 4.3 Detection and Quantitation Limits

Method Detection Limit Studies

Each laboratory performing analyses under this program must routinely conduct method detection limit (MDL) studies to document that the MDLs are less than the project-specified QLs. If any analytes have MDLs that do not meet the project QLs, the following steps must be taken:

1. Perform a new MDL study using concentrations sufficient to prove analyte quantitation at concentrations less than the project-specified QLs per the procedure for the Determination of the Method Detection Limit presented in Revision 1.1," 40 Code of Federal Regulations 136, 1984.
2. No samples may be analyzed until the issue has been resolved. MDL study results must be available for review during audits, data review, or as requested. Current MDL study results must be reported at the beginning of every project for review and inclusion in project files.

An MDL is developed from seven aliquots of a standard containing all analytes of interest spiked at five times the expected MDL, which are taken through the analytical method sample processing steps. The data are then evaluated and used to calculate the MDL. If the calculated MDL is less than three times below the spiked concentration, another MDL study must be performed using a lower concentration.

Project Quantitation Limits

Laboratories generally establish QLs that are reported with the analytical results; these may be called reporting limits, detection limits, reporting detection limits, or other terms. These laboratory limits must be less than or equal to the project QLs. Project QLs must be lower than the proposed or existing numeric water quality objectives by the Central Valley Water Board. The laboratories must have documentation to support quantitation at the required levels.

Laboratories must report analytical results between the MDL and QL. These results must be reported as numerical values and qualified as estimates. Reporting as “trace” or “<QL” is not acceptable. Sample results less than MDLs will be reported only for GC/MS analyses if the mass spectral fingerprint can prove positive identification; these results must be qualified as estimated values by the laboratory.

Section 4.4 Laboratory Standards and Reagents

All stock standards and reagents used for extraction and standard solutions must be tracked through the laboratory. The preparation and use of all working standards must be recorded in bound laboratory notebooks that document standard tractability to U.S. EPA, A2LA or National Institute for Standards and Technology (NIST) criteria. Records must have sufficient detail to allow determination of the identity, concentration, and viability of the standards including any dilutions performed to obtain the working standard. Date of preparation, analyte or mixture, concentration, name of preparer, lot or cylinder number, and expiration date, if applicable, must be recorded on each working standard.

Section 4.5 Sample Preparation Methods

Surface water and sediments samples will be prepared in solvent or via other extraction techniques prior to sample analyses. All procedures must follow a published method. The sample preparation procedure must be documented and included in the monitoring plan for review and approval.

SECTION 5.0 QUALITY CONTROL REQUIREMENTS

The types of QC assessments required in the monitoring program are discussed below. Detailed procedures for preparation and analysis of QC samples must be provided in the analytical method documents or Standard Operating Procedures (SOP) by the analytical laboratories for approval.

Section 5.1 Quality Assurance Objectives (QAOs)

QAOs are the detailed QC specifications for precision, accuracy, representativeness, comparability, and completeness. The QAOs are then used as comparison criteria during data quality review by the group that is responsible for collecting data to determine if the minimum requirements have been met and the data may be used as planned.

Section 5.2 Development of Precision and Accuracy Objectives

Laboratory control spikes (LCSs) are used to determine the precision and accuracy objectives. The laboratory fortifies the LCSs with target compounds to monitor the laboratory precision and accuracy. Field duplicates measure sampling precision and variability for comparison of project data. Acceptable relative percent difference (RPD) is less than 25 for field duplicate analyses. If field duplicate sample results vary beyond these objectives, the results are qualified.

Section 5.3 Internal Quality Control

Internal QC is achieved by collecting and/or analyzing a series of duplicate, blank, spike, and spike duplicate samples to ensure that analytical results are within the specified QC objectives. The QC sample results are used to quantify precision and accuracy and identify any problem or limitation in the associated sample results. The internal QC components of a sampling and analyses program will ensure that the data of known quality are produced and documented. The internal QC samples, frequency, acceptance criteria, and corrective action must meet the minimum requirements presented in the following sections.

Section 5.4 Field Quality Control

Field QC samples are used to assess the influence of sampling procedures and equipment used in sampling. They are also used to characterize matrix heterogeneity.

For basic water quality analyses, QC samples to be prepared in the field will consist of field blanks, field duplicates, and matrix spikes (when applicable). The number of field duplicates and field blanks are set to achieve an overall rate of at least 5% of all analyses for a particular parameter. The external QA samples are rotated among sites to achieve the overall rate of 5% field duplicate samples and 5% field blanks (as appropriate for specific analyses).

Field Blanks

A field blank is designed to assess potential sample contamination levels that could occur during field sampling and sample processing. Field blanks are taken using deionized water in the field, transferred to the appropriate container, preserved (if appropriate), and otherwise treated the same as the corresponding sample type during the course of a sampling event. Field blanks are to be collected using deionized water which is taken to the field and passed through sampling devices into containers at 1 per event for the following constituents: trace metals in water (including mercury), VOA samples in water and sediment, DOC samples in water, and bacteria samples. Field blanks for other media and analytes should be conducted upon initiation of sampling, and if field blank performance is acceptable, further collection and analysis of field blanks for these other media and analytes need only be performed on an as-needed basis, or during field performance audits.

Travel Blanks

The purpose of the travel blank is to determine if there is any cross contamination of volatile constituents between sample containers. One VOA sample vial with deionized water free of volatile contaminants is transported to the site, handled like a sample (but never opened up), and returned to the laboratory for analysis. One travel blank for each batch of VOA samples shipped to the laboratory is required. Travel blanks are not required for other analytes, but are encouraged to be utilized for other analytes as possible and appropriate.

Field Duplicates

Field duplicates will be collected at the rate of one per sampling event, and analyzed along with the associated environmental samples. Field duplicates will be collected at the same time as environmental samples or of two grab samples collected in rapid succession. If the RPD of field duplicate results is greater than 25% and the absolute difference is greater than the RL, both samples should be reanalyzed.

Section 5.5 Laboratory Quality Control

For basic water quality analyses, QC samples prepared in the contract laboratory will typically consist of method blanks, laboratory control samples, laboratory duplicates, and surrogate added to each sample (organic analysis). If the results of the analysis of laboratory quality control samples falls outside of the Central Valley Water Board approved quality control acceptance criteria then the entire sample batch must be reanalyzed with new laboratory quality control samples.

Method Blanks

Method blanks will be prepared and analyzed by the contract laboratory at the rate of one per sample batch. If any analyte is detected in the blank, the blank and the associated samples must be re-extracted and re-analyzed.

Laboratory Control Samples and Surrogate Spiking

Laboratory control samples (LCS) will be analyzed at the rate of one per sample batch. A surrogate may be added to samples for organic analyses. Laboratory acceptance criteria for surrogate or control sample recovery must be submitted to Central Valley Water Board staff within the quality assurance control plan for review and approval.

Matrix Spikes and Matrix Spike Duplicates

Matrix spikes and matrix spike duplicates will be analyzed at the rate of one pair per sample batch. Matrix spike samples are collected at the same time as the environmental samples and are spiked at the laboratory. Matrix spiking must be performed on actual project samples with each batch. Laboratory acceptance criteria should be submitted within the quality assurance control plan to the Central Valley Water Board staff for review and approval.

SECTION 6.0 INSTRUMENTATION AND EQUIPMENT PREVENTIVE MAINTENANCE

Section 6.1 Sample Equipment Cleaning Procedures

Equipment used for sample collection must be cleaned according to the specific procedures documented in each sampling SOP. Sampling SOP will be prepared by the group responsible for sampling and will be submitted to Central Valley Water Board for review and approval as part of the monitoring plan and quality assurance project plan..

Section 6.2 Analytical Instrument and Equipment Testing Procedures and Corrective Actions

Testing, inspection, maintenance of analytical equipment used by the contract laboratory, and corrective action shall be documented in the QA manuals for each analyzing laboratory. Laboratory Quality Assurance Manual must be submitted to Central Valley Water Board for review and approval prior to start of sampling and analyses.

Section 6.3 Instrument Calibrations and Frequency

Section 6.3.1 Analytical Procedures and Calibration

This section briefly describes analytical methods and calibration procedures for samples that will be collected under this monitoring program.

Analytical methods that will be used in this program will need to follow the general guidance of any of the following methods, although specific method modifications may be approved by the Executive Officer of the Central Valley Water Board if sufficient justification is provided.

- *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA-600/4-85- 054)
- *U.S. EPA Methods for Chemical Analysis of Water and Wastes* (EPA-600/4-79-020, third edition, 1983)
- *Methods for Determination of Organic Compounds in Drinking Water* (EPA-600/4-88/039)
- *Standard Methods for the Examination of Water and Wastewater*
- *USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. Office of Water, Washington, D.C. EPA-821-R-02-01*
- *USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition. Office of Water, Washington, D.C. EPA-821-R-02-013*
- *USEPA. 1994. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates. Office of Research and Development, Washington, D.C. EPA-600-R-94-024.* Modifications to the procedure for *Hyallela Azteca* with respect to the growth endpoint may be requested.

For this program, only linear calibration with either an average response factor or a linear regression is acceptable for organic analyses. Non-linear calibration is not allowed since using this calibration option creates a potential for poor quantitation or biased concentrations of compounds at low or high concentrations (near the high and low ends of the calibration range.

Laboratories shall prepare an initial 5-point calibration curve, where the low level standard concentrations is less than or equal to the analyte quantitation limits.

SECTION 7.0 RECORD AND DATA MANAGEMENT

Copies of field logs, a copy of chain-of-custody forms, original preliminary and final lab reports, and electronic media reports must be kept for review by the Central Valley Water Board Staff. The field crew must retain original field logs. The contract laboratory shall retain original chain-of-custody forms. The contract laboratory will retain copies of the preliminary and final data reports.

Concentrations of chemicals and toxicity endpoints, and all numerical biological parameters shall be calculated as described in the referenced method document for each analyte or parameter, or laboratory operating procedures. The data generated shall be converted to a SWAMP comparable database format maintained by the responsible party and available for electronic data submission to the Central Valley Water Board staff. After data entry or data transfer procedures are completed for each sample event, data should be inspected for data transcription errors, and corrected as appropriate. After the final QA checks for errors are completed, the data should be added to the final database Quality assurance checks shall be preformed at a project level prior to submission within monitoring reports and electronic data submittals.

Section 7.1 Data Assessment Procedures

Data must be consistently assessed and documented to determine whether project QAOs have been met, quantitatively assess data quality, and identify potential limitations on data use. Assessment and compliance with QC procedures should be under taken throughout the project to ensure the accuracy of sample collection, laboratory analysis, exceedances communications, and the submitted monitoring reports. Data communicated to Central Valley Water Board staff will be considered draft until the reception of the monitoring report of which the specific data is formally reported.

Section 7.1.1 Training and Certification

All staff performing field, laboratory, data entry, and data quality assurance procedures shall receive training to ensure that the work is conducted correctly and safely as applicable. At a minimum, all staff shall be familiar with the field guidelines and procedures and the laboratory SOP included in the project QAPP.

Section 7.1.2 Data to be Included in Data Reports

For each sampling event, the field team or monitoring agency shall provide the Project Lead Staff with copies of the field data sheets (relevant pages of field logs) and copies of the chain-of-custody forms for all samples submitted for analysis. At minimum, the following sample-specific information must be provided for each sampling event to the Central Valley Water Board staff:

- Sample Identification
- Monitoring location
- Sample type, e.g. grab or composite type (Cross-sectional, flow-proportional, etc.)
- QC sample type and frequency
- Date and time(s) of sample collection
- Requested analyses (specific parameters or method references)
- Results of samples collected and all laboratory QC samples (calibrations, blanks, surrogates, laboratory spikes, matrix spikes, reference materials, etc.) and the identification of each analytical sample batch

- Results for tests run prior to toxicity analyses, such as dissolved oxygen, temperature, electrical conductivity, hardness, and ammonia
- Any anomalies regarding sample condition noted by the laboratory
- Report of any adjustments made to samples prior to running toxicity tests, such as for dissolved oxygen, alkalinity, dechlorination, or other

Section 7.1.3 Reporting Format

All results meeting data quality objectives and results having satisfactory explanations for deviations from objectives shall be reported on the Laboratory Final Report to the Project Manager. The final results shall include the results of all field and laboratory QC samples requested through the original chain-of-custody forms. Original laboratory data and reports shall be retained by the Project Management and copies shall be submitted to the Central Valley Water Board when required. In addition to the paper laboratory reports, the Project Manager may have the option to request the results of all field and laboratory QC samples within an electronic format. It would be the dual responsibility of the laboratory and Project management to ensure that the data was free from errors. The Project management shall have the overall responsibility of meeting the formatting guidelines for all electronic data for submission to the Central Valley Water Board.

SECTION 8.0 DATA VALIDATION AND USABILITY

Section 8.1 Laboratory Data Review, Verification, and Reporting

The quality assurance project plan must be used to accept, reject or qualify the data generated by the laboratory. The Project Manager shall convey the quality assurance acceptance criteria to the laboratory management. The laboratory management will be responsible for validating the data generated by the laboratory.

The laboratory personnel must verify that the measurement process was “in control” (i.e., all specified data quality objectives were met or acceptable deviations explained) for each batch of samples before proceeding with analysis of a subsequent batch. In addition, each laboratory will establish a system for detecting and reducing transcription and/or calculation errors prior to reporting data.

Only data, which have met data quality objectives, or data, which have acceptable deviations explained will be submitted by the laboratory. When QA requirements have not been met, the samples will be reanalyzed when possible and only the results of the reanalysis will be submitted, provided they are acceptable. The Project Manager will be responsible for determining if the validated laboratory data meets the project quality assurance acceptance criteria.

Section 8.2 Data System Audits

The Central Valley Water Board staff may audit laboratories during conducting sample analyses for this program.

Section 8.2.1 Technical System Audit:

A technical system audit is a quantitative review of a sampling or analytical system. Qualified technical staff members perform audits. The laboratory system audit results are used to review operations and ensure that the technical and documentation procedures provide valid and defensible data.

Section 8.2.2 Performance Evaluation Audits

Performance evaluation audits quantitatively assess the data produced by a measurement system. Performing an evaluation audit involves submitting certified samples for each analytical method. The matrix standards are selected to reflect the concentration range expected for the sampling program Any problem associated with PE samples must be evaluated to determine the influence on field samples analyzed during the same time period. The laboratory must provide a written response to any PE sample result deficiencies.

Section 8.2.3 Field Technical Audits

The contractor should routinely observe field operations to ensure consistency and compliance with sampling specifications presented in this document and QAPP that will be developed later. An audit checklist should document field observations and activities.

SECTION 9.0 REFERENCES

U.S. EPA 2001. Laboratory Documentation Requirements for Data Evaluation (R9QA/004.1)

U.S. EPA. 1983. Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020, third edition

U.S. EPA.1988. Methods for Determination of Organic Compounds in Drinking Water (EPA-600/4-88/039)

USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. Office of Water, Washington, D.C. EPA-821-R-02-012

USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition. Office of Water, Washington, D.C. EPA-821-R-02-013

USEPA. 1994. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates. Office of Research and Development, Washington, D.C. EPA-600-R-94-024

USEPA. 1998. Methods for Aquatic Toxicity Identification Evaluations. Phase I Toxicity Characteristics Procedures. Office of Research and Development, Duluth, Minnesota. EPA-600-3-88-034.

Standard Methods for the Examination of Water and Wastewater, American Public Health Association, American Water Works Association, Water Environment Federation.

USEPA Test Methods for Evaluating Solid Waste, Physical Chemical Methods, SW 846

MRP Attachment C: Example Table for Providing Tabulated Monitoring Results

#	Location	Date	Time	Sample Identification	Constituent	Detection Result	Reporting Limit	Units	Receiving Water Limitation	Lowest LC50 for Fresh Water Organisms (ug/L)	Exceedance Comments
1	Spill A	7/14/04	11:05	Field Parameter	Temperature			C			
3			11:05	Field Parameter	Electrical Conductivity			uS/cm	150		
6			11:05	Field Parameter	Dissolved Oxygen			mg O_2/L	8		High number I)
7			11:05	Field Parameter	pH			units	6.8-8.5		
8			11:15	Equipment Blank	Glyphosate		5	ug/L	700		
9			11:37	WD1	Triclopyr		0.5	ug/L			
10			11:52	HF HS 1	Bromacil		0.5	ug/L			
11			11:52	HF HS 2	Diuron		0.5	ug/L	14		
12			11:56	HF HS 3	Glyphosate		5	ug/L	130		
13			11:59	HF HS 4	Oxyflourfen		0.5	ug/L			
14			12:01	HF HS 5	Triclopyr		0.5	ug/L			
15			12:03	HF HS 6	Pendimethalin		0.5	ug/L			
16			12:05	HF HS 7	TDS		10	mg/L	100		
17			12:05	HF HS 8	Turbidity		0.5	NTU	1		
18			12:07	HF HS 9	TKN		500	ug/L			
20			12:09	HF HS 11	Potassium		500	ug/L			
21			12:11	HF HS 12	TOC		0.30	ug/L			
1	Creek B	7/14/04	12:45	Field Parameter	Temperature			C			
3			12:45	Field Parameter	Electrical Conductivity			uS/cm	150		
6			12:45	Field Parameter	Dissolved Oxygen			mg O_2/L	8		
7			12:45	Field Parameter	pH			Units	6.8-8.5		
8			12:55	WD-2	Pendimethalin		0.5	ug/L			
9			12:56	WD-3	TDS		10	mg/L	100		
10			13:05	HF CM 1	Bromacil		0.5	ug/L			
11			13:05	HF CM 2	Diuron		0.5	ug/L	14		
12			13:06	HF CM 3	Glyphosate		5	ug/L	130		
13			13:07	HF CM 4	Oxyflourfen		0.5	ug/L			
14			13:08	HF CM 5	Triclopyr		0.5	ug/L			
15			13:10	HF CM 6	Pendimethalin		0.5	ug/L			
16			13:12	HF CM 7	TDS		10	mg/L	100		
17			13:12	HF CM 8	Turbidity		0.5	NTU	1		
18			13:14	HF CM 9	TKN		500	ug/L			
20			13:15	HF CM 11	Potassium		500	ug/L			
21			13:17	HF CM 12	TOC		0.30	ug/L			

Exceedances and Commnets

I) High number, check the sampling point, maybe it should be taken before the spill to reduce aeration effect on the sample.