8 April 2019

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REVIEW OF THE CALIFORNIA RICE COMMISSION'S 2018 ANNUAL MONITORING REPORT

Thank you for submitting the 2018 Annual Monitoring Report (AMR) for Sacramento Valley Rice Growers on 20 December 2018 as required by the Monitoring and Reporting Program for General Order R5-2014-0032 (Order). The AMR covers the reporting period from 1 November 2017 through 31 October 2018. The Central Valley Water Board staff review of the AMR is provided in the attached memorandum.

Staff identified requirements that were not met in the 2018 AMR submittal including: consistent reporting of data, trend evaluation of available surface water data, and sampling of all scheduled monitoring locations. Of these items, the first requires a revision to the 2018 AMR or submittal of a technical memorandum that includes corrected dissolved oxygen data. The second item should be addressed in the 2019 AMR with a revision of the trend evaluation to include additional data from 2011 and forward for all constituents monitored under the Order. The third item is discussed below. Additional details are provided in the attached staff review memorandum.

The 2018 reporting period was the second year that groundwater quality trend monitoring was completed under the Order. The California Rice Commission sampled ten wells scheduled for groundwater quality monitoring in 2018. Unfortunately, the California Department of Water Resources did not sample the six additional wells in Yuba County added to the trend monitoring network to address the Yuba County data gap. The California Rice Commission proposed to reevaluate the groundwater monitoring network in the 2020 Groundwater Quality Assessment Report update.

If you have any questions or comments regarding this review, please contact Ashley Peters at 916-464-4857 or Ashley.Peters@waterboards.ca.gov.

Original signed by

Sue McConnell, Chief
Program Manager
Irrigated Lands Regulatory Program

Original signed by

Susan Fregien
Senior Environmental Scientist
Irrigated Lands Regulatory Program

cc: Roberta Firoved, California Rice Commission

Enclosure: Staff review of California Rice Commission's 2018 Annual Monitoring Report

TO: Susan Fregien
Senior Environmental Scientist
IRRIGATED LANDS REGULATORY PROGRAM

FROM: Ashley Peters, P.E.
Water Resource Control Engineer
IRRIGATED LANDS REGULATORY PROGRAM

DATE: 3 April 2019

SUBJECT: REVIEW OF THE WASTE DISCHARGE REQUIREMENTS FOR SACRAMENTO VALLEY RICE GROWERS 2018 ANNUAL MONITORING REPORT

On 20 December 2018, the Central Valley Water Board received the 2018 Annual Monitoring Report (AMR) from the California Rice Commission (CRC) as required by the Monitoring and Reporting Program (MRP) for General Order R5-2014-0032 (Order). The AMR covers the reporting period from 1 November 2017 through 31 October 2018. The AMR was reviewed by staff for compliance with the Order and MRP.

In this memorandum, staff provides a brief summary of the surface water and groundwater monitoring activities conducted by the CRC during the 2018 reporting period, followed by comments on reporting requirements that were not met. The item numbers used in the review of reporting requirements are the same as those used in the AMR Checklist (see attached) derived from the Order and used to document compliance. Requirements that are not discussed have been met by the CRC.

2018 Program Summary – Surface Water
The CRC performed core monitoring of surface water for field parameters and pesticides in 2018 at four primary monitoring sites:

- Colusa Basin Drain #5 (CBD5);
- Colusa Basin Drain above Knights Landing (CBD1);
- Butte Slough at Lower Pass Road (BS1); and
- Sacramento Slough Bridge near Karnak (SSB).

The CRC submitted exceedance reports for every surface water sampling event in which water quality triggers or objectives were exceeded. Exceedances were observed for dissolved oxygen (DO), conductivity, and pH. Two exceedances of the pH water quality objective (WQO) were measured on 22 May 2018 at sites CBD5 (8.65) and CBD1 (8.91). The pH exceedances measured did not trigger a management plan. No exceedances were observed for any other surface water constituents monitored during the reporting period.

A management plan for DO was submitted by the CRC in May 2015 based on exceedances of the DO objective that occurred in 2014. Staff will provide feedback on the DO management plan

and request revisions, if needed, for compliance with the requirements of the MRP. The CRC is an active participant in the CV-SALTS Salinity Coalition, which satisfies the management plan requirements triggered by the conductivity exceedances.

The CRC monitored for penoxsulam, bensulfuron-methyl, benzobicyclon, and metabolite B in in 2018. No water quality objectives or numeric standards exist for these pesticides. Penoxsulam was detected below the Aquatic Life Benchmark (3 micrograms per liter [ug/L]) published by the U.S. Environmental Protection Agency Office of Pesticides Program. Bensulfuron-methyl and benzobicyclon were not detected. Metabolite B was detected below the method reporting limit at sites CBD1 and CBD5 during the June and July sampling events. In 2019, the CRC plans to monitor for bispyribac-sodium and continue monitoring for penoxsulam.

The first trend evaluation for surface water was completed in 2018 and included field data from 2015 through 2018 and nutrient data from 2015 and 2016. Pesticides, toxicity, total organic carbon, and grain size were not evaluated because the CRC determined that there were too few data points available. Based on the evaluation, no trends of surface water quality degradation attributable to rice agriculture were identified.

2018 Program Summary – Groundwater

The CRC commenced groundwater quality trend monitoring in 2017. The 2018 groundwater sampling results show that groundwater quality remains consistent with the concentrations identified in the CRC's Groundwater Quality Assessment Report (GAR) (2013). Most of the constituents monitored are below the respective maximum contaminant levels (MCLs). Salinity was high at two wells, possibly resulting from the upwelling of connate water in areas of the Sacramento Valley, as discussed in the GAR.

The nitrate concentration at well 020N002E35J002M was measured at the MCL of 10 mg/L in 2018 and has increased from the concentration detected at this well in 2017 (7.92 mg/L). This is the second year of sampling at this well since it was re-drilled in 2013, 50 feet east of the original well location. CRC reviewed the location of the well and found that it is not located within or adjacent to rice fields.

In addition to the ten wells in the groundwater quality trend monitoring program, six additional wells were selected for inclusion by CRC to fulfill the Yuba County data gap identified in the CRC's Groundwater Trend Monitoring Workplan and Data Gap Assessment Plan (Groundwater Workplan) (2016). The California Department of Water Resources (DWR) had previously sampled these data gap wells on a bi-annual basis. However, DWR did not sample the data gap wells in 2018 and is currently reevaluating their groundwater sampling program. The CRC proposes to reassess the groundwater monitoring network in its 2020 GAR update and make recommendations for monitoring moving forward.

2018 Staff Review

Checklist Item 10.3 Previously reported exceedances match exceedances identified in the AMR
The AMR reports different DO results for the 29 May monitoring event in Table 7-3, the 30 May exceedance report, and the field sheets.

Staff requested a correction of these values from the CRC on 11 January. The CRC reported back that there were discrepancies in the data reported by their contractor and stated that the field sheet values should be used for reporting purposes. A correction to the submitted report should be provided in the form of a revision or an additional technical memorandum documenting the correct DO results.

Checklist Item 10.4 All required constituents for each site have reported results
There are six wells in Yuba County that were scheduled for monitoring in 2018 in the Groundwater Workplan to fulfill the Yuba County data gap. DWR was expected to sample these wells with the CRC reporting the results in the AMR, but DWR did not complete the sampling.

Staff recommends that the CRC reevaluate the groundwater monitoring network in the 2020 GAR update and provide a list of wells that are both representative of rice and that will be reliably sampled.

Checklist Item 16.3.1 Discussion of affects of failed QA/QC results on reported data
No discussion was provided to identify the effects, if any, of the failed QA/QC results identified in the AMR on the validity of the reported data.

Staff recommends that the CRC state the effects, or lack thereof, that failed QA/QC results may have on data validity and whether it can be reliably used to characterize the water monitored. It is unclear if reported data is reliable when it fails QA/QC and data reliability is not discussed.

Checklist Item 16.4 Calculation of overall project completeness
Overall project completeness was not determined.

Staff recommends that the CRC include a calculation of overall project completeness in the AMR in addition to their determination of field and laboratory completeness. Both field and laboratory completeness exceeded 90 percent in 2018, so overall project completeness should have met this criterion as well.

Checklist Item 18.1 Identification of potential trends and patterns in surface water and groundwater quality.
Surface water data for field parameters and nutrients from 2015-2018 were evaluated for trends. Additional data and constituents required for monitoring under the Order were not included in the evaluation.

Staff recommends that the CRC include all data available from 2011 forward for the constituents required for monitoring under the Order in a revised trend evaluation. The revised trend evaluation may be submitted with the 2019 Annual Monitoring Report.

2018 Staff Recommendation
Staff identified multiple items in the 2018 AMR that should be addressed. The discrepancies in reported DO data should be corrected with a revision to the 2018 AMR or submittal of an additional technical memorandum. The revised surface water trend evaluation, submittal of groundwater data in an appropriate electronic format, and a complete discussion of QA/QC results should be provided in the 2019 Annual Monitoring Report. Staff recommends that the CRC address the outstanding items as discussed above and reevaluate the groundwater monitoring network in the 2020 GAR update.

Attachment 1: 2018 Annual Report Review Checklist

Report Name: Waste Discharge Requirements for Sacramento Valley Rice Growers 2018 Annual Monitoring Report							Reviewer Name: Ashley Peters	
Submittal Date: 12/20/2018							Review Date: 4/3/2019	
Item No.			AMR Component Name	Item meets requirement	Incomplete item/ Not included	Not applicable	Page # (Section #)	Comments
1	**Signed Transmittal Letter**							
	1.1		Penalty of Perjury Statement	✓			3 (Trans. Letter)	
	1.2		Signature of Authorized Coalition Representative	✓			3 (Trans. Letter)	
	1.3		Dated	✓			1 (Trans. Letter)	
	1.4		Submitted on time	✓			1 (Trans. Letter)	
2	**Title page**							
	2.1		Report title	✓			Title Page	
	2.2		Date of the report	✓			Title Page	
	2.3		Monitoring date range covered by the report	✓			Title Page	
	2.4		Coalition Group name	✓			Title Page	
3	**Table of contents**							
	3.1		List of sections/chapters, tables, figures, appendices/attachments with page numbers	✓			i-v	
4	**Executive Summary**							
	4.1		Summary of key results and activities	✓			ES-1 - ES-2	
	4.2		Brief summary of conclusions and recommendations	✓			ES-1 - ES-2	
5	**Description of the CRC geographical area**							
	5.1		General description of relevant geographic features of the Coalition area, such as location and extent of area, major landforms, land uses, vegetation types, crop types, climate patterns, key waterways, and cities	✓			2-1 - 2-2	
6	**Monitoring objectives and design**							
	6.1		Brief description of monitoring objectives (references to section and page numbers in Monitoring Plan or QAPP, as appropriate)	✓			3-1	
	6.2		Monitoring design aligns with Monitoring Plan, any deviations from Monitoring Plan or QAPP are described (references to section and page number in Monitoring Plan or QAPP, as appropriate)	✓			3-3 - 3-5	
		6.2.1	Assessment Monitoring: sites, parameters, schedule	✓			3-3 - 3-5	
		6.2.2	Core Monitoring: sites, parameters, schedule	✓			3-3 - 3-5	
		6.2.3	Special monitoring (Management Plan, TMDL, source identification): sites, parameters, schedule			✓		

Attachment 1: 2018 Annual Report Review Checklist

Item No.			AMR Component Name	Item meets requirement	Incomplete item/ Not included	Not applicable	Page # (Section #)	Comments
7	**Sampling site/monitoring well descriptions and rainfall records for the time period covered under the Annual Monitoring Report (AMR)**							
	7.1		Sampling site name and description (e.g. geographic area, watershed, and drainages that the site represents), or unique information about the site or surrounding area	✓			4-1 - 4-2	
	7.2		Rainfall records in graphic or narrative form (in inches of precipitation)	✓			4-3	
8	**Location maps(s) of sampling sites/monitoring wells, crops and land uses**							
	8.1		Location maps show sampling sites/monitoring wells, crops, and land use with informative level of detail	✓			5-1 - 5-3	
		8.1.1	Datum identified on map (must be WGS 1984 or NAD 1983)	✓			5-2 - 5-3	
		8.1.2	Source and date of all data layers identified on map	✓			5-2 - 5-3	
	8.2		A list or table indicates: site name, ID/well number, CEDEN site code (if applicable), and GPS coordinates (latitude and longitude in decimal degrees to at least five decimal places)	✓			4-1 - 4-2	
	8.3		Accompanying GIS shapefile or geodatabase that identifies parcels covered by the CRC.			✓		GIS information submitted in 2016 AMR. Updates required every 3 years, or whenever rice acreage varies by 20% from the latest submittal. Acreage change from 2016 to 2017 was 10%.
		8.3.1	The data that the GIS information is based on must be no greater than one (1) year old.			✓		
		8.3.2	This information shall be updated at least every three years, or whenever rice acreage varies by 20% from the latest submitted GIS information.			✓		
9	**Summary of pesticides used on rice, including pounds of active ingredient applied and acreage, as well as any changes in label requirements**							
	9.1		List the pesticides used on rice, the pounds of active ingredient applied, the acreage covered, and summarize any changes in label requirements.	✓			6-1 - 6-6	
10	**Tabulated results of all analyses arranged in tabular form so that the required information is readily discernible**							
	10.1		Data are in tabular form, clearly organized and readily discernible	✓				
	10.2		Tabulated results agree with the electronically submitted data	✓			7-1 - 7-16	
	10.3		Previously reported exceedances match exceedances identified in the AMR		✓		7-4	DO values in Table 7-3, the field sheets, and the exceedance report for 30 May do not match.
	10.4		All required constituents for each site have reported results		✓		3-6	DWR did not monitor Yuba Country data gaps wells in 2018.
	10.5		All necessary re-sampling completed and results reported			✓		

Attachment 1: 2018 Annual Report Review Checklist

Item No.			AMR Component Name	Item meets requirement	Incomplete item/ Not included	Not applicable	Page # (Section #)	Comments
	*10.6**		*Time concentration charts for groundwater monitoring included for all sampled wells*	✓			7-14	
11	**Discussion of data relative to water quality objectives/trigger limits, and water quality management plan milestones, where applicable**							
	11.1		Results discussed in text agree with tabulated data	✓			7-1 - 7-16	
	11.2		Discussion illustrates compliance with the WDRs, or if a required component was not met an explanation of missing data or a reason for non-compliance is included	✓			7-1 - 7-16	
	11.3		Results are compared to WDR requirements, water quality standards and trigger limits; toxicity results, TIE's and possible causes of toxicity are discussed	✓			7-1 - 7-16	
12	**Proposed pesticide monitoring**							
	12.1		Evaluate previous years' monitoring results, whether changes in the pesticide usage has occurred, and the most recent rice pesticide evaluation (MRP Order R5-2014-0032 Section III.C.1).	✓			8-1	
	12.2		In the 2015 AMR, and every five (5) years thereafter, provide an updated evaluation of rice pesticides relative to potential effects on surface water quality.			✓		
		12.2.1	Consider use information (e.g., pounds applied, acres treated, timing of application, product formulation, method of application, application rate, hold times, requirements associated with drift or discharge to surface waters)			✓		
		12.2.2	Consider physical and chemical properties of the pesticide (e.g., degradation rate, adsorption coefficients)			✓		
		12.2.3	Consider the pesticide's toxicity to aquatic life and risk to human health (e.g., through review of relevant toxicity studies, benchmarks or criteria established for human health or aquatic life protection)			✓		
		12.2.4	Consider newly registered or cancelled pesticides that are registered for use on rice fields			✓		
	12.3		Propose the pesticides to be monitored and provide the rationale for the proposal.	✓			8-1	
13	**Electronic data submittal**							
	13.1		An Excel workbook containing an export of all data records uploaded and/or entered into the CEDEN comparable database (surface water data). The work book shall contain, at a minimum, those items details in the QAPP Guidelines.	✓			App. E	
	13.2		The most current version of the CRC's eQAPP.	✓			App. E	
	13.3		Electronic copies of all field sheets.	✓			App. B, D	

Attachment 1: 2018 Annual Report Review Checklist

Item No.			AMR Component Name	Item meets requirement	Incomplete item/ Not included	Not applicable	Page # (Section #)	Comments
	13.4		Electronic copies of photos obtained from all surface water monitoring sites, clearly labeled with CEDEN comparable station code and date.	✓			App. A	
	13.5		Electronic copies of all applicable laboratory analytical results on a CD.	✓			App. B, D	
	13.6		For toxicity reports, all laboratory raw data must be included in the analytical report (including data for failed tests), as well as copies of all original bench sheets showing the results of individual replicates, such that all calculations and statistics can be reconstructed. The toxicity analyses data submittals must include individual sample results, negative control summary results, and replicate results. The minimum in-test water quality measurements reported must include the minimum and maximum measured values for specific conductivity, pH, ammonia, temperature, and dissolved oxygen.			✓		Not required in Core Year.
	13.7		For chemistry data, analytical reports must include, at a minimum, the following:	✓			App. B, D	
		13.7.1	A lab narrative describing QC failures	✓			App. B, D	
		13.7.2	Analytical problems and anomalous occurrences	✓			App. B, D	
		13.7.2	Chain of custody (COC) and sample receipt documentation	✓			App. B, D	
		13.7.4	All sample results for contract and subcontract laboratories with units, RLs and MDLs	✓			App. B, D	
		13.7.5	Sample preparation, extraction and analysis dates	✓			App. B, D	
		13.7.6	Results for all QC samples including all field and laboratory blanks, lab control spikes, matrix spikes, field and laboratory duplicates, and surrogate recoveries	✓			App. B, D	
14	**Electronic groundwater data provided as specified by the Executive Officer**							
	14.1		The CRC shall submit the prior year's groundwater monitoring results as an Excel workbook containing an export of all data records in a format specified by the Executive Officer.	✓			App. G	
	14.2		If any data are missing from the report, the submittal must include a description of what data are missing and when they will be submitted to the Central Valley Water Board.	✓			7-16	DWR did not monitor Yuba Country data gaps wells in 2018.

Attachment 1: 2018 Annual Report Review Checklist

Item No.			AMR Component Name	Item meets requirement	Incomplete item/ Not included	Not applicable	Page # (Section #)	Comments
15	**Sampling and analytical methods used**							
	15.1		Description of sampling methods used (e.g. type of collection, collection containers, sample preservation, transportation, handling, field measurements), with references to SOP's if appropriate	✓			10-1 - 10-4	
	15.2		Description of analytical methods used (references to SOP's and QAPP as appropriate); any deviations from the QAPP are described and explained	✓			10-1 - 10-4	
16	**Summary of QA Evaluation results (as identified in the most recent version of the CRC's approved QAPP for Precision, Accuracy and Completeness)**							
	16.1		Acceptance criteria for all field and laboratory QA/QC measurements identified and in agreement with most recent approved QAPP; any adjustments to acceptance criteria documented and discussed	✓			11-1 - 11-2	
	16.2		Summary of accuracy (lab control spike and matrix spike recovery) and precision (RPD for field duplicate, LCS/LCSD and MS/MSD pairs) included for all constituents and tests	✓			11-1 - 11-13	
	16.3		QA/QC results that did not meet acceptance criteria identified in a table or narrative description that is prepared by the Coalition (not laboratories)	✓			11-1 - 11-13	
		16.3.1	Discussion of how the failed QA/QC results affect the validity of the reported data		✓		11-1 - 11-13	Discussion of failed QA/QC results affects on reported data not discussed.
		16.3.2	Corrective actions for QA/QC results that did not meet acceptance criteria are described, laboratory exception reports are included when samples are reanalyzed due to exceedance of the linear range	✓			11-1 - 11-13	
	16.4		Both field and laboratory completeness are calculated and reported; overall Project completeness is determined		✓		11-10 - 11-12	Overall project completeness is not determined. Field and Lab completeness both greater than 90 percent.
17	**Specification of the method(s) used to obtain estimated flow at each surface water monitoring site during each monitoring event**							
	17.1		The method used to obtain flow measurement at each monitoring site during each monitoring event is listed	✓			10-1	

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Item No.			AMR Component Name	Item meets requirement	Incomplete item/ Not included	Not applicable	Page # (Section #)	Comments
18	**Required every three years, an evaluation of monitoring data to identify spatial trends and patterns (begins 2018)**							
	18.1		Identification of potential trends and patterns in surface and groundwater quality		✓		12-1 - 12-9	Trend evaluation for surface water includes only data from 2015-2018 for field and nutrient data. Additional data is available for these constituents, as well as others required for monitoring under the Order that were omitted because they had too few data points available for evaluation when considering data only back to 2015. The trend evaluation should be revised to include all data available for required consituents back through 2011. Fig. 12-1 and 12-2 would be helpful to include line for ambient air temp since report states that water temps track with ambient air. Fig. 12-3 does not show the SE1 exceedances for pH at CBD1 and CBD5 reported in table 7-4.
		18.1.1	Determination whether there are any trends in degradation that may threaten applicable beneficial uses		✓		12-9	See above.
		18.1.2	Incorporation of pesticide use information, as needed, to assist in data evaluation.		✓			See above.
	18.2		Analyze monitoring data to determine if additional sampling locations are needed. Propose schedule for additional monitoring or source studies		✓		12-6	See above.
	18.3		Tables and/or graphs are utilized to illustrate and summarize the data evaluation		✓		12-1 - 12-9	See above.
19	**Electronic or hard copies of photos obtained from all monitoring sites, clearly labeled with site ID and date**							
	19.1		Photos are included for each monitoring site, either electronically of in hardcopy	✓			App. A	
	19.2		Each photo is clearly labeled with CEDEN comparable station code and date	✓			App. A	
	19.3		Photos are descriptive and useful	✓			App. A	
20	**Summary of exceedances of water quality objectives/trigger limits occurring during the reporting period and related pesticide use information**							
	20.1		Summary of all Exceedance Reports submitted during the AMR period is included	✓			13-1 - 13-2	
	20.1		Pesticide use data for all pesticide and toxicity exceedances occurring during the AMR time period (unless under a Management Plan): all chemicals applied within the monitoring site subwatershed during the four weeks prior to the measured exceedance			✓		
21	**Actions taken to address exceedances that have occurred, including but not limited to, revised or additional management practices implemented**							

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Item No.			AMR Component Name	Item meets requirement	Incomplete item/ Not included	Not applicable	Page # (Section #)	Comments
	21.1		Discussion of actions taken to address water quality exceedances during the time frame of the AMR is included	✓			13-2	
	21.2		Updates or additional management practices implemented			✓		
22	**Status update on preparation and implementation of all Management Plans and other special projects**							
	22.1		Brief update on status of all Management Plans and special projects that are in preparation or being implemented	✓			14-1	
23	**Summary of Management Practice Information collected as part of Farm Evaluations**							
	23.1		Aggregate and summarize information collected from Farm Evaluations once every three years beginning in 2015.	✓			15-1 - 15-6	
		23.1.1	Include quality assessment of the collected information by township (e.g., missing data, potentially incorrect/inaccurate reporting).	✓			15-6	
		23.1.2	Description of corrective actions to be taken	✓			15-6	
	23.2		Provide individual data records used to develop summary in electronic format, compatible with ArcGIS to at least township level.	✓			App. F	
24	**Summary or updates of mitigation monitoring**							
	24.1		Report on CEQA mitigation measures reported by rice growers to meet the provisions of the Order and any mitigation measures the CRC has implemented on behalf of its growers.			✓		
	24.2		Identify the mitigation measure implemented, the potential impact the measure addressed, the location of the mitigation measure (township range, section), and any steps taken to monitor the success of the measure.			✓		
25	**Summary of education and outreach activities**							
	25.1		Location, dates, and reason for activities.	✓			17-1 - 17-2	
	25.2		Summary of the content at each session.	✓			17-1 - 17-2	Report text references App. E, but should be App. F.
26	**Summary of nitrogen management plan reporting, if applicable**							
	26.1		Aggregate information from Nitrogen Management Plan Summary Reports to characterize the input, uptake, and loss of nitrogen fertilizer application by specific crops.			✓	No HVA	
27	**Conclusions and recommendations**							
	27.1		Conclusions are supported by the data presented in the AMR	✓			19-1 - 19-2	

Attachment 1: 2018 Annual Report Review Checklist

Item No.			AMR Component Name	Item meets requirement	Incomplete item/ Not included	Not applicable	Page # (Section #)	Comments
	27.2		Recommendations are appropriate and adequately detailed	✓			19-1 - 19-2	Plans to address DWR wells in Yuba County not sampled in 2018 not discussed here, but 7.2.4 states wells will be reevaluated in 2020 GAR update.
Notes:								
* Item 10.6 added for groundwater per reporting requirements identified in MRP section IV.B.3.								