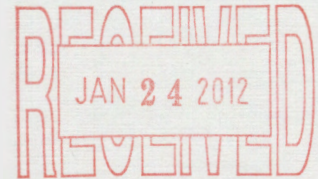




CHEMICAL COMPANY

January 24, 2012

Mary Barnett, Ecologist
Water Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR. 72118-5317



Re: 4th Qtr 2011 Activities Report, Outfalls 006 and 007 TRE
El Dorado Chemical Company
NPDES Permit # AR 00000752; AFIN 70-00040

Dear Ms. Barnett:

As required by the Storm Water Toxicity Reduction Evaluation (TRE) Plan for Outfalls 006 and 007 – rev 2.0 (dated January 25, 2011) and in accordance with ADEQ's approval dated January 27, 2011, this letter provides the quarterly activities report.

TRE activities completed during the period from October 1, 2011 through December 31, 2011 include:

- 1) Continued the baseline whole effluent toxicity (WET) testing and analytical chemistry on a monthly basis when discharge occurred. In addition to the current critical dilutions of 100% effluent and the current 0.75 dilutions series, the WET testing dilution series included the proposed new critical dilutions for Outfall 006 and 007, 22% and 50%, respectively. The proposed new critical dilutions are based on the site-specific flow study submitted to, and approved by, ADEQ;
- 2) Continued the assemblage and tracking of facility discharge data, including flow, total suspended solids (TSS), ammonia nitrogen (NH₃-N), total dissolved solids (TDS), cadmium (Cd), Lead (Pb), Zinc (Zn), sulfate (SO₄), and pH as they may relate to the WET; and
- 3) Continued lime applications to increase alkalinity of watershed soils, with the objective of increasing the buffering capacity of the watershed and to counteract low pH of storm waters discharged from the respective watersheds.

Additional details of the completed activities are provided below:

Continued the Routine Baseline Toxicity Testing and Associated Analytical Chemistry.

During this reporting period (October 2011 through December 2011), the routine WET tests were completed monthly at the first storm event of each month. In addition a second set of water flea tests were completed using effluent samples collected on December 15 due to the control failures that invalidated the first set of December WET tests.

Since the WET test reports have been submitted to ADEQ under separate cover with the DMRs for the period, the full reports are not attached to this status report. The monthly WET tests results for the 4th Quarter 2011 are summarized in the following table, (the results of the previous reporting quarter are also provided for comparison).

Date of test	Date of Sample collection	Storm event (inches)	Outfall 006			Outfall 007		
			Discharge MGD	% NOEC		Discharge MGD	% NOEC	
				Water flea	Fathead minnow		Water flea	Fathead minnow
July 25-27	7/24/11	0.36	1.034	100	100	1.299	100	32
August 15-18	8/14/11	0.41	0.044	100	100	0.262	<32	<32
August 25-28*	8/24/11	1.37	0.677	<22	100	0.608	<50	<32
Sept. 24-26	9/23/11	0.73	0.073	75	100	0.365	<32	<32
October 19-21	10/18/11	0.40	0.2598	100	100	0.9177	75	100
Nov. 9-11*	11/8/11	0.45	0.5752	<32%	32	1.299	<32	<32
December 5-8	12/4/11	1.0	0.4007	NA**	100	0.7562	NA**	100
December*18-20	12/15/11	0.30	0.2598	22%	NA	0.1797	<50	NA

Shaded cells indicate the WET tests that passed at the proposed new critical dilutions (006 at 22% and 007 at 50%) reflecting site runoff to the receiving stream as developed by the ADEQ approved flow study.

*WET tests completed with limited dilution series due to limited availability of test organism in the Lab. Outfall 006 only 22% and control. Outfall 007 only 50% and control.

**NA represents invalid test due to control failure.

The WET test completed during this reporting period continued to demonstrate variable results from month to month but were generally found to pass the WET test endpoints at the critical dilutions proposed in the pending permit renewal. The details of each of the WET tests were evaluated to determine if a potential cause for the test results could be identified. The preliminary assessment of the 4th quarter WET tests analytical data indicate that differences in ammonia concentrations may have contributed to the differences between the two outfalls.

October 2011 WET Tests Results.

The October 2011 WET test was completed on discharge resulting from a 0.40 inch storm event on October 18 that generated flows of 0.26 mgd and 0.92 mgd through Outfall 006 and Outfall 007, respectively. The October acute WET testing passed three of the four monitored endpoints, passing at the maximum exposure of 100% effluent for both species in Outfall 006 and passing the 100% exposure for the fathead minnow

WET test in Outfall 007. The October 2011 Outfall 007 water flea WET test failed in the 100% exposure. However, it passed in the 75% exposure which is well above the 50% critical dilution proposed in the current draft NPDES renewal permit. The October 2011 WET test results were submitted to ADEQ along with the October DMR.

Outfall 006. Although the outfalls are adjacent sub-watersheds, Outfall 006 effluent **passed** in 100% exposure WET tests endpoints with NOEC concentrations greater than the proposed critical dilution of 22% percent effluent dilution. The effects of lime treatment in the watershed during the month of September 2011 were reflected in increased pH of the storm runoff, recorded as 6.53 su.

Outfall 007. The fathead minnow **passed** in the maximum exposure and the water flea **passed** in all but the 100% exposure. The October 2011 WET tests demonstrated improvement in WET performance when compared to the previous August and September results. The historical results have either passed the fathead minnow test and failed the water flea test or failed both. As provided below, the analytical details of the Outfall 007 WET testing may provide a potential cause for the improved results of the Outfall 007 October 2011 tests.

The low dissolved oxygen that had been demonstrated in previous WET test failures was not an issue with the October 2011 WET tests. Therefore, dissolved oxygen levels (and those constituents which exert an oxygen demand) did not seem to be an issue in the October 2011 WET tests.

Also, the pH was maintained in a narrow range between 7.0 su and 7.4 su in the 007 discharge during the October 2011 WET testing period.

Lastly, the conductivity continued to be elevated and may reflect the lime application in the watershed. The range of conductivities measured (1802 uS to 1904 uS) are typically tolerated by the fathead minnow to a greater degree than the water flea.

November 2011 WET Tests Results.

The November 2011 WET tests were completed on a discharge generated during a November 8 storm event (0.45 inches). The flows generated were 0.58 mgd and 1.3 mgd through Outfall 006 and Outfall 007, respectively. Due to limited number of test organisms, the dilution series used in the water flea tests were limited in scope, with the dilution series limited to 100% and 22% in the Outfall 006 WET test and 100% and 50% in the Outfall 007 WET test. The fathead minnow tests were completed using the full complement of dilutions in the prescribed dilution series for both outfalls in November 2011.

The November WET test results represented the lowest NOEC of the reporting period, failing 3 of the 4 test endpoints at the proposed critical dilutions. The November 2011 WET test results were submitted to ADEQ along with the November DMR.

Outfall 006. The November Outfall 006 WET tests failed both the water flea and fathead minnow WET test endpoints in the maximum exposure (100% effluent). This is the 1st time this response has been demonstrated in the discharge from Outfall 006 during the TRE process. A review of the analytical data completed in conjunction with the WET test failed to identify a likely cause for the unique results. The pH of the storm sample was within a narrow range (7.4 su to 7.8 su) and the dissolved oxygen concentrations were maintained above 7.6 mg/L.

Outfall 007. The Outfall 007 WET tests failed both tests (water flea and fathead minnow) in all dilutions of the series, even the 32% exposure. Review of water quality data did not indicate a possible cause for the test failures other than the elevated TSS which was atypically elevated when compared to previous Outfall 007 discharges. This may reflect the characteristics of the storm event (short lived and intense storm generating higher than typical discharge).

December 2011 TEST RESULTS.

The WET test in December were completed on discharges from two storm events in December due to control failures in the initial water flea tests on the December 4 storm event. The initial December WET tests were completed on effluent generated by a 1 inch storm event that occurred on December 4, 2011. That storm event generated a discharge of 0.40 mgd and 0.76 mgd, through Outfalls 006 and 007 respectively. (Note, although the magnitude of the storm event was double the previous events in this reporting period, the discharge volume generated was less than that generated in the November event).

The initial December 2011 water flea WET tests were invalidated due to the control failures (control lethality within 24 hours of test start). Therefore, an additional water flea test was completed on samples collected on December 15(a 0.3 inch storm event resulting in discharge volume of 0.26 mgd through Outfall 006 and 0.18 mgd through Outfall 007). However, due to limited availability of test organisms, the second WET test was completed using only the critical dilutions as proposed in the pending draft NPDES permit (22 % for Outfall 006 and 50% for Outfall 007).

The December WET testing passed the fathead minnow WET tests at the maximum exposure of 100% effluent and the retest of the water flea passed the Outfall 006 exposure (22% effluent) but failed the Outfall 007 exposure (50% effluent).

The replacement water flea WET test (the second December 2011 test series) was limited in scope by the availability of test organisms in the lab. The lab only had sufficient water fleas to complete the test using a single dilution. Due to the critical dilutions proposed in the draft NPDES permit (Outfall 006 at 22% and Outfall 007 at 50%), the lab completed the replacement water flea WET test using those dilutions only (along with a control).

The December 2011 WET test results are being submitted to ADEQ along with the December 2011 DMR. Additional details of each of the December 2011 WET test are provided below.

Outfall 006.

The Outfall 006 effluent **passed** the fathead minnow in the 100% exposure and passed the water flea in the only exposure of the December retests (22% effluent). The NOEC concentrations for both species were greater than the critical dilution proposed in the draft NPDES permit. (22% percent effluent dilution).

Outfall 007.

The December Outfall 007 WET tests were similar to previous results with fathead minnow **passed** with a NOEC 100%% effluent.

Also, the pH of the effluent drift during the tests was from 7.0 su to 7.2 su, indicating the soil pH was not influencing the water quality as had been observed during previous WET tests.

Facility Discharge Data.

In addition to the routine WET testing, collection of additional facility information continues. This information includes, but is not limited to, facility operations, chemical use data, tracking of internal housekeeping records and documentation of activities within the individual outfall sub-basins. During this monitoring period EDCC initiated efforts to verify sources of storm water contributions to the individual watersheds.

Treatment of Watershed Soils.

The routine practice of monitoring the Outfall 006 and Outfall 007 storm water ditches continues after storm events as long as residual storm water is present in drainage ditches. Results of this monitoring have demonstrated that the pH of the residual storm waters in these drainage ditches are approximately 6 su. In response to the pH monitoring of the residual storm waters, lime was again applied with a broadcast spreader to both the 006 and 007 watersheds during the 4th quarter of 2011.

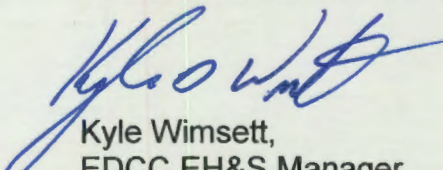
In an attempt to increase the buffering capacity of the watershed as a means to control pH of the storm water runoff, multiple applications of pelletized lime has been applied to both watersheds. Pelletized lime continues to be applied to the watershed with the intent to stabilize pH fluctuation within a range of 1 to 1.5 su. This is a conservative application to control storm water pH fluctuations. The success of the previous lime application has been demonstrated in the 006 sub-watershed. However, Outfall 007 sub-watershed continues to demonstrate elevated conductivities in the routine monitoring of the watershed. These elevated conductivities may be related to the lime application.

Future Activities.

Activities planned for the 1st Qtr 2012 include continuation of the routine monthly storm water WET testing, continued monitoring of effluent constituents, tracking of site storm data (duration and magnitude), and discharge volumes. In addition, the assemblage of facility data, including the monitoring of routine storm water sources and discharge data with particular attention to facility conditions during the WET monitoring periods, will continue. Should the WET tests routinely (back to back) fail at dilutions less than the proposed site specific critical dilutions (i.e., 22% for Outfall 006 and 50% for Outfall 007), additional TRE efforts may be implemented to identify the cause(s) of the WET test failures.

Please do not hesitate to contact me if you have any questions or require additional information regarding the implementation of the Outfall 006/007 TRE.

Respectfully submitted,
El Dorado Chemical Company



Kyle Wimsett,
EDCC EH&S Manager

ECC: Greg Withrow, EDCC General Manager
John Carver, LSB Industries
Roland McDaniel, GBMc & Associates
Chuck Nestrud, CN&J