

# STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

Brian Sandoval, Governor

Leo M. Drozdoff, P.E., Director

Colleen Cripps, Ph.D., Administrator

May 11, 2012

Steve Kubacki, Project Mgr.  
Veolia Water Co.  
P.O. Box 90578  
Henderson, NV 89009

**RE: Inspection Report for the Veolia Water Treatment Plant – # NV0023060**

Dear Mr. Kubacki:

Enclosed is a copy of the inspection report for this facility. At this time, the DMR review and inspection walkthrough find your facility to be operating within the permit conditions and no follow up response is needed at this time. If you should have any questions, please feel free to contact me at (775) 687-9424.

Sincerely,

Mark A. Kaminski, P.E.  
Technical, Compliance & Enforcement Branch  
Bureau of Water Pollution Control

**Enclosure:** Inspection Report

**cc (w/enclosure):**

Russell Speckin, Maintenance Supervisor, Veolia Water Co., P.O. Box 90578, Henderson, NV 89009

Susan Crowley, C.E.M., Crowley Environmental, LLC, 366 Esquina Dr., Henderson, NV 89014

James Hutchens, P.E., Sr. Mgr., Environ International Corp., 175 N. Corporate Dr., Ste. 160, Brookfield, WI 53045

Kenneth Greenberg, WTR-7, U.S. EPA Region 9, 75 Hawthorne St., San Francisco, CA 94105

Sylvia Dahl

David Haile, P.E.



## COMPLIANCE EVALUATION INSPECTION REPORT

Nevada Division of Environmental Protection  
Bureau of Water Pollution Control

FACILITY PERMIT: Nevada Environmental Response Trust (NERT) –  
NV0023060

DESCRIPTION: Perchlorate Removal Facility

OUTFALL: Las Vegas Wash  
Latitude: 36° 05' 13.8"N, Longitude: 114° 59' 13.1"W  
Elevation: 1,544 ft. above sea level

FACILITY LOCATION: Veolia Water Treatment Plant (4<sup>th</sup> St. – BMI Complex)  
8000 W. Lake Mead Dr., Henderson, NV 89015  
Perchlorate Removal Facility:  
Latitude: 36° 02' 52.9"N, Longitude: 115° 00' 17.6"W  
Elevation: 1,764 ft. above sea level

DATE OF INSPECTION: Wednesday, April 18, 2012 @ 1:00 P.M.

ATTENDEES: Mark Kaminski, P.E., NDEP  
Steve Kubacki, Veolia Water  
Russell Speckin, Veolia Water  
Susan Crowley, C.E.M., Crowley Environmental  
Jim Hutchens, P.E., Environ Corp.

CURRENT DISCHARGE: 1.35 MGD

PERMITTED QTY: 1.45 MGD

DATE OF REPORT: May 11, 2012

## FACILITY OVERVIEW

In 2011, NPDES Permit # NV0023060 was transferred from Tronox, LLC to NERT. This permit authorizes the discharge of treated effluent from a groundwater remediation facility operating in the BMI Industrial Complex in Henderson. Key groundwater contaminants removed at the BMI Complex include perchlorate and hexavalent chromium using an anoxic biodegradation process supported in fluidized bed reactors (FBRs). Prior to the FBRs, groundwater remediation at BMI occurred for a brief period using a now decommissioned (idled) ion exchange (IX) process. BWPC staff previously inspected this facility in 2007 when it was under Tronox, LLC authority.



Fig. 1 – Influent (FBRs) & Effluent (Wash Outfall)

## DISCHARGE MONITORING REPORTS

A synopsis of the 2011 effluent DMR data was reviewed with the inspection attendees prior to the facility walkthrough (see page 4). For this review period, the system's operator met all the effluent limitations recording no exceedances.

Flow: The system was operated at 93% of its available capacity to maximize the pumping of the groundwater plume.

Perchlorate (ClO<sub>4</sub>): 45 wells are pumped from On-Site, Athens/Galleria, and Wash locations. Influent perchlorate level averaged 129 mg/l. Perchlorate removal was to a non-detection level at > 99.9% efficiency. Last year, 265 tons of perchlorate salt was removed from the effluent, which would have otherwise migrated to and recharged the wash. The FBRs also remove chlorate (ClO<sub>3</sub>) and nitrate (NO<sub>3</sub>). The NDEP perchlorate limit for this facility was established based on the available treatment technology and best professional judgment.

Chromium (Cr): The on-site groundwater is pre-treated for chrome removal. The pre-treatment system converts chrome from the hexavalent to trivalent state and then precipitates the chrome in a rust matrix.

CBOD: Ethanol is added as supplementary carbon for microbiological reduction.

TSS: The gravity filter was added in 2007 to remove the suspended solids carryover from Dissolved Air Flotation (DAF).

Phosphorus and Ammonia Waste Load Allocation (WLA): The Permittee is assigned a WLA for phosphorus and ammonia, since nitrogen and phosphorus are provided to the reactor microbes in a nutrient packet since these micronutrients are deficient in the influent feed.

TDS (Effluent): The effluent's salinity (TDS) level is not limited (M&R). Groundwater encountered in this area is brackish, and the TDS is not treated at NERT (e.g. no R.O.).

TDS (Mixing Zone): The downstream control point limit for TDS sampling at a location on the Lower Las Vegas Wash (LW5.5) is 2,400 mg/l. The 4<sup>th</sup> Quarter 2011 sampling for TDS at LW5.5 indicated 1,400 mg/l of TDS level and was within the mixing zone allowance. The mixing zone control point is located on the wash 5.5 miles upstream of the confluence of the Las Vegas Wash with Lake Mead.

TIN (Mixing Zone): The downstream control point limit for TIN or Total Inorganic Nitrogen at a location on the Lower Las Vegas Wash (LW5.5) is 17 mg/l. The 4<sup>th</sup> Quarter 2011 sampling for TIN at LW5.5 indicated 12 mg/l of TIN level and within the mixing zone allowance.

NERT Perchlorate Removal System

Mon-Yr	Flow	CBOD	ClO <sub>4</sub>	ClO <sub>4</sub>	ClO <sub>4</sub>	pH	Cr <sup>16</sup>	Cr
Jan-11	1.35	3.4	142	0.5	0.01	6.5	< 0.001	0.016
Feb-11	1.24	6	140	0.5	0.01	6.7	< 0.001	0.015
Mar-11	1.38	4.2	143	1.1	0.01	6.9	< 0.001	0.010
Apr-11	1.43	3.8	143	0.5	0.01	7	< 0.001	0.006
May-11	1.39	1.6	143	0.3	0.00	7.2	< 0.001	0.009
Jun-11	1.37	2.4	140	0.3	0.00	7.2	< 0.001	0.007
Jul-11	1.37	1.5	98	0.3	0.00	7.1	< 0.001	0.009
Aug-11	1.40	1.8	130	0.3	0.00	7.1	< 0.001	0.006
Sep-11	1.29	1	120	0.2	0.00	7.2	< 0.001	0.003
Oct-11	1.33	1.4	122	0.3	0.00	7.1	< 0.001	0.007
Nov-11	1.29	1	113	0.3	0.00	7.1	< 0.001	0.006
Dec-11	1.33	4.8	113	0.3	0.00	7	< 0.001	0.010
Ave.	1.35	2.7	129	0.4	0.005	7.0	< 0.001	0.009
Limits	1.45 MGD	25 mg/l	M&R mg/l	18 µg/l	0.22 lb/d	6.5 - 9.0 SU	0.01 mg/l	0.1 mg/l

Mon-Yr	TSS	Fe	Mn	P	NH <sub>3</sub>	TDS	Cl	ClO <sub>3</sub>
Jan-11	16.4	2.4	0.7	3.1	18.4	5,500	2,000	< 0.01
Feb-11	22.8	4.4	-	2.1	4.1	-	-	< 0.01
Mar-11	9.4	3.3	-	3.2	2	-	-	< 0.01
Apr-11	9.9	2.8	1	2.7	4.7	5,900	2,100	0.02
May-11	12.2	2.4	-	3.7	4.8	-	-	0.04
Jun-11	14.0	3.3	-	4.8	1.8	-	-	0.03
Jul-11	21.3	4.1	0.7	8.1	2.9	5,400	1,900	0.03
Aug-11	11.4	1.8	-	4.2	7.2	-	-	0.02
Sep-11	9.5	0.9	-	1.5	1.2	-	-	0
Oct-11	11.8	2.4	0.8	3.4	3.3	6,000	2,000	0.01
Nov-11	8.3	1.8	-	2.3	0.8	-	-	0.01
Dec-11	16.0	3.0	-	4.2	2.3	-	-	0.03
Ave.	13.6	2.7	0.8	3.6	4.5	5,700	2,000	0.02
Limits	135 mg/l	10 mg/l	5 mg/l	20 lb/d	40 lb/d	M&R mg/l	M&R mg/l	M&R mg/l

NV0023060  
DMR REVIEW of CY 2011

## FACILITY WALKTHROUGH

Veolia Water Co. staffs the treatment plant on a daily basis. Crowley Environmental manages the DMR reporting. Environ Corp. is the property trust's (NERT) environmental consultant. Russell Speckin, Maintenance Supervisor provided a two-hour tour for the inspection attendees. Within the BMI Complex, the Veolia Water Co. entrance gate is located at the north end of 4<sup>th</sup> St. The treatment system is fenced and gated.

Groundwater: Groundwater collected from the extraction well collection areas is combined in Pond GW-11, authorized under NEV2001515. This double-lined EQ basin holds 70 Million Gallons. The perchlorate level in the groundwater plume is highest in the on-site wells.



Fig. 2 – Athens/Galleria Well



Fig. 3 – Pond GW-11 (background)

Pretreatment: Chromium pretreatment from the onsite wells (26) includes aeration and ferrous sulfate addition. Hexavalent chrome is reduced to the trivalent form and precipitated out with ferric oxide (rust). The precipitate is dewatered and landfilled.



Fig. 4 – Pretreatment Plant



FBRs: There are five front-stage (sand bed) and four back-stage (carbon or GAC bed) anoxic, fluidized bed biological reactors with most of the perchlorate removal occurring in the front-stage reactors. Denitrifying (e.g. *Pseudomonas*) bacteria, sourced from other denitrifying facilities, are sustained in the bed media with the addition of ethanol and micronutrients (N and P). The bacteria reduce preferentially: nitrate (1<sup>st</sup>), chlorate (2<sup>nd</sup>), perchlorate (3<sup>rd</sup>), and then sulfate (last). After the FBRs, hydrogen peroxide is added to the effluent to oxidize the corrosive and odorous sulfides back to the sulfate form for effluent odor control. Excess microbial floc is wasted through the cone separators on each reactor pair to the DAF for thickening and later dewatering. GAC air scrubbers control the gaseous sulfide emissions emanating from the FBRs. During the walkthrough, a slight sulfide odor was only detectable while on top the service catwalk.



Fig. 5 – Front Stage FBRs



Fig. 6 – Back Stage FBRs



Fig. 7 – GAC Odor Control for Gaseous Emissions

DAFs: Parallel DAF units are used for thickening the waste floc, which is then dewatered using a plate and frame filter press. The DAF effluent appeared visibly clear although it is additionally filtered. The filter cake has a dull grey color and no noticeable odor. When completed in fall 2012, the AMPAC (American Pacific) FBR Treatment

Plant for remediation of a separate perchlorate plume (i.e. PEPCON plume) under authorization of NPDES Permit # NV0024112 is planned for a period of time to haul its waste floc to the Veolia Water Co. at BMI for final dewatering. The AMPAC treatment facility will be located two miles north of the Veolia Water Treatment Plant.



Fig. 8 – DAF Solids



Fig. 9 – DAF Effluent (to filter)



Fig. 10 – Dewatered Floc

Filtration: The sand-media gravity filter, an add-on unit to this design in 2007, polishes the effluent prior to the final outfall. Veolia staff removed a safety grating panel on top to allow a view of the clear, odorless effluent.



Fig. 11 – Filter (side view)

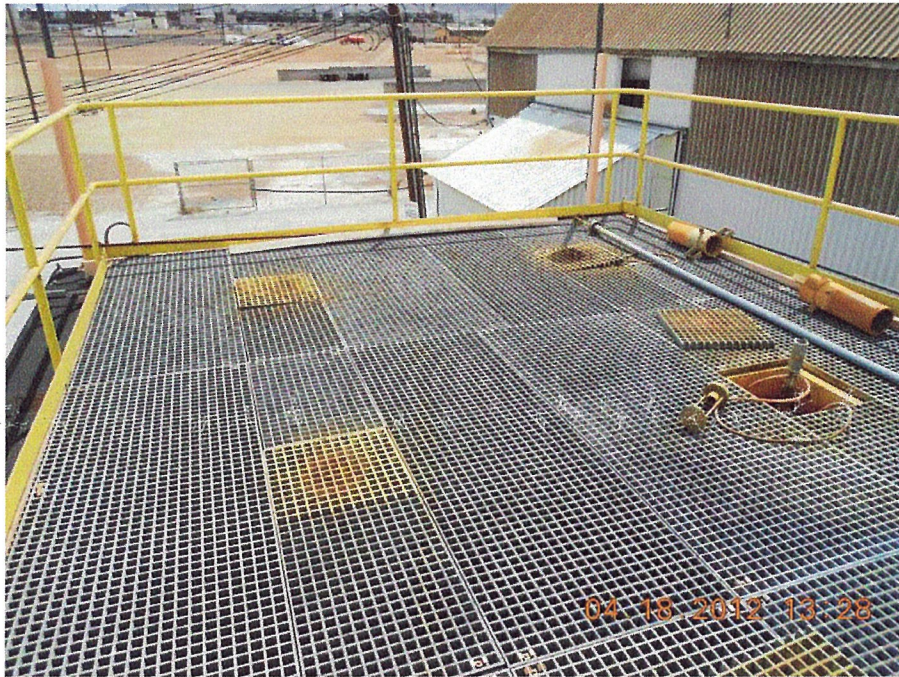


Fig. 12 – Filter (top view)

Outfall: The NERT outfall is located on the Las Vegas Wash, 3 miles NNW of the Veolia Water Treatment Plant. The outfall is located just upstream of the Pabco Rd. Weir, and the NERT effluent merges into the wash just downstream of another BMI outfall discharging effluent from the Tronox and Timet facilities. The NERT outfall structure has been painted to denote “Non-Potable Water”. The footpath to this outlet is similarly stenciled since it is located in a habitat restoration area of the publicly accessible county’s wetlands park. Habitat restoration at this outfall includes removal of invasive tamarisk (salt cedar) and planting of native species including bulrush, cattails, salt brush, and alkali sacaton grass.



Fig. 13 – NERT Outfall



Fig. 14 – Footpath Marking

## INSPECTION FINDINGS

The DMR review and facility walkthrough indicated that this facility is operated in a manner consistent with the permit limitations and conditions. The Veolia Water operations staff provided a courteous facility tour for BWPC and adequately addressed all questions from the inspector to allow this report's preparation. At this time, no written response is required from the Permittee to complete this site inspection.







