Meeting Minutes

To: Clean Water Coalition Team & NDEP **Date:** September 21, 2007

From: Converse Consultants **Project No:** 98-33506-05 Tasks 3 & 6

INFORMATIVE DISCUSSION ON GROUNDWATER QUALITY WITH THE NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

THE POTENITAL INFLUENCE ON DESIGN & CONSTRUCTION PHASES OF THE PROPOSED CWC-SCOP COH FORCEMAIN

Attendees:

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The meeting held on Friday, September 21st, 2007 was a continuation of discussions related to groundwater quality and the potential for dewatering related issues during construction and operation of the Systems Conveyance and Operations Program (SCOP). This meeting was initiated to develop a working relationship between Converse (acting on behalf of the CWC) and the Nevada Division of Environmental Protection (NDEP) in order to prepare for groundwater conditions along the SCOP alignment, specifically those areas along the City of Henderson (COH) Forcemain, which may have the potential to impact design, construction and/or facility operation.

Current Perchlorate Conditions

NDEP provided a brief history of known areas of groundwater contamination, specifically perchlorate plumes along the COH Pumping Station and Forcemain alignments. Currently, Groundwater Characterization Reports have been submitted to the CWC and NDEP for these areas summarizing groundwater quality as encountered in monitoring wells installed by Converse. Converse briefly discussed water quality results in regards to the known areas of contamination (specifically perchlorate) at which time NDEP described current mitigation strategies operated by various entities in the general vicinity of the proposed alignments. A general idea of the approximate total contributions of perchlorate to the Las Vegas Wash as of the Fall of 2007 was summarized as shown below.

Perchlorate Contributions to the LV Wash (lbs/day)	**Possible Source**
~ 35	Tronox Plume
~ <5	AMPAC Plume
~ ≤10	Return flow
~ 10	Groundwater underflow
~ 15	LV Wash Bank Storage
~ 10	Others
Total Perchlorate Loading to the LV Wash = ~ 60 – 90 lbs/day	

Currently, the Las Vegas Wash (Wash) has less than 100 pounds per day of perchlorate loading. In the past, perchlorate loading requirements for return flow related to construction dewatering Temporary Discharge Permits have been based on ~10% of the current perchlorate mass flux in the Wash. Considering this, it may be assumed that future construction dewatering discharges to the wash could not exceed ~10 pounds per day of perchlorate. During the planning stages for construction dewatering, estimates are needed for the timing, duration, volume and concentrations of contaminated water anticipated. With the cooperation of NDEP, Converse will research previous studies conducted specifically

to characterize aquifer conditions near the vicinity of the proposed COH force main. The findings of this literature review will determine if further aquifer testing is required.

NDEP described possible alternatives for the treatment of water containing perchlorate, citing the specific systems currently in use by Tronox (formerly Kerr McGee) and American Pacific (AMPAC). The agreed upon strategy for risk management will be to learn as much as possible about the current treatment systems employed by both Tronox and AMPAC in preparation for the development of a dewatering plan. NDEP agreed to schedule one or two days worth of meetings with the entities at NDEP's office in a timely manner that would allow for discussions to occur independently between the CWC Team, NDEP and the entities including, but not limited to the COH, Tronox, AMPAC and the Southern Nevada Water Authority (SNWA).

Dewatering Discussion Topics

1) One suggestion made by NDEP would be to utilize the COH's rapid infiltration basins (RIBs) during the SCOP dewatering operations, specifically the basins located on the northeastern corner of the RIBs adjacent to the bird viewing area. The COH has two other RIB fields: P2 RIB field located to the east of Pabco Road and the Southern RIB field located 1.5 miles south of the P2 RIBs. NDEP stated that the Southern RIB field has already been taken out of service. The Bird Viewing Area RIB field is located up-gradient of one of Tronox's extraction well fields (Seep Area Well Field) and may represent an opportunity to manage construction dewatering without adversely impacting perchlorate mass flux to the Wash.

In addition to perchlorate, other groundwater contaminants could be treated prior to pumping into the RIBs as necessary. Other strategies could be utilized involving the number and amount of RIBs used. It might be possible to alter the COH's usage schedule to allow for dewatering water to be placed in select ponds, taking advantage of the full potential of the ponds. Currently the COH

does not utilize their RIB fields to full capacity throughout all seasons allowing for the possibility of temporarily diverting treated waste water to other pond fields to accommodate dewatering activities. NDEP stated that once the new Water Reclamation Facility (WRF) is online these RIB fields will be taken off-line; however, the COH will still have to supply water to support the bird sanctuary. Water produced during the SCOP dewatering operations could possibly be used by the COH to supplement water required to support the sanctuary. Later in the meeting there was a brief discussion about the possibility of using the COH wetlands as a long term treatment mechanism by using groundwater instead of or in conjunction with the treated effluent as a water source to support the bird sanctuary.

It was not clear as to when the Birding Area RIB field is scheduled to go off-line. NDEP is under the impression that the RIB field will be off-line by March 2009 when it is Converse's understanding that the CWC would begin construction in March of 2008. Converse stated that the P2 RIB field may not be an optimal site for utilization during dewatering operations because of potential impacts to the surrounding areas (adjacent residential areas to the east) and the proximity to the proposed area of dewatering. Altering the groundwater gradient may capture water from the adjacent ponds making dewatering problematic.

2) Once the RIBs are no longer in use, the groundwater table within the vicinity of the COH force main could rise as a result of residential and commercial development. Therefore, design of the COH force main should include features (e.g. water stops) that prevent preferential flow of contaminated groundwater along the pipeline.

3) Tronox (as Kerr McGee) initially operated an off-site temporary ion exchange (IX) system to remove perchlorate. About 400 gpm of capacity is located near MW-7 and very close to the proposed COH force main alignment. The balance of the system (an additional ~

700 gpm) is located on the Tronox plant site. The off-site IX system was used from 1999 until 2005 when the current fluidized bed biological (FBR) system became operational. Both IX systems are "mothballed" and are not currently in use. The potential for short term use during construction could be explored with Tronox.

Tronox currently discharges by a pipeline from the current on-site FBR perchlorate treatment system into a small drainage where it commingles with COH and Timet discharge waters before entering the wash. The current force main alignment crosses this discharge pipeline and drainage and may raise issues related to continuing operation of these outfalls during construction by CWC. Additionally, Converse stated that the drop points for the reach traversing the wash have not been determined. NDEP indicated that currently Tronox has the capacity to go off-line (i.e. not discharge to the Wash) for a couple of days because of the capacity to store effluent in an on-site line pond (GW-11). NDEP stated that Tronox's discharge point has been relocated once and likely will not be relocated again.

4) NDEP informed us that Tronox's 5 year long NPDES permit, which allows them to discharge 1,000 gpm to the wash will expire in 3 years. Once the permit expires and the proposed COH force main and SCOP pipeline are on-line, the volume of water within the wash will be substantially reduced, altering the water quality of the Wash. Perhaps the CWC could accommodate Tronox's discharge (1,000 gpm) as a tie into the COH's force main portion of the SCOP system. NDEP suggested that a tie in to the SCOP pipeline with an access port would allow for direct sampling of treated water. Any arrangement for comingling of discharges would require NDEP Bureau of Water Pollution Control concurrence and specific agreements regarding responsibility for any violations to protect all parties..

5) The proposed location of the COH force main pipeline potentially impacts several other underground utility lines. Specifically,

several pipelines which transport (1) raw water from Tronox's well field to their plant facility 3 miles to the south, (2) treated water back from the Tronox facility for discharge to the Wash, (3) one or more pipelines for effluent from the COH WRF to discharge to the Wash and (4) Timet/Pitman bypass pipeline. Additional utilities are likely present and may include a COH effluent pipeline to the P2 RIB field.

The following issues will need to be addressed by the COH pipeline design team: Does the current design acknowledge these pipelines and the associated risks of constructing an additional pipeline in its vicinity? Are there options for placement along the right (east) of the road an option? Is the proposed design complete for this portion of the alignment and are the plans for the associated utilities included in the plans?

6) NDEP discussed issues regarding previous dewatering practices used by SNWA during construction of the Bostic Weir grade control structure and other grade control structures. Previously, water produced from dewatering was allowed to infiltrate back into the ground adjacent to the wash (within the coarse grained sediments of the flood plain) in temporary infiltration galleries. During that time the amount of perchlorate loading returned to the Wash through temporary construction dewatering discharge was higher, allowing for the 10% concept to accommodate a larger mass of perchlorate. Dewatering water in excess of the amount that could be discharged to the Wash was managed through these temporary nearby infiltration galleries. Now, current loading options do not allow such a strategy.

7) AMPAC currently operates an in-situ biological treatment system, which was designed by a firm called Geosyntex. A number of pilot studies were run prior to selecting the current operational design. The location of their facility (extraction and injection wells) is west of the proposed alignment. There is less likely to be any direct interference between the AMPAC operations and the proposed COH

force main than with the Tronox operation. It would be appropriate to confirm the exact location of current and any proposed operations with AMPAC. AMPAC and/or their consultant may also have useful information on in-situ treatment as options for the CWC project.

8) Other issues include the amount of TDS that will be encountered in Reach 3. It is anticipated to be very high concentration and relatively low volume. NDEP indicated they are looking into mitigating alternatives but as a practical matter the option is utilizing evaporation as the "treatment". NDEP also recommended seeking advice from SNWA regarding their plans for new construction and dewatering along the wash.

Action Items:

1) Converse to set up an account with Legal Copycats and submit requests to NDEP in order to obtain copies of reports, which include previous studies by various companies regarding perchlorate (and chromium), modeling of the wash and geophysical profiles. Following our meeting several reports were suggested by NDEP as initial steps towards obtaining available data to begin this process. Converse will make an appointment with NDEP to spend possibly a day or two going through files identifying further reference materials for copying. This literature review will determine if the need for aquifer testing is required within the COH Forcemain proposed alignment and aid in the estimation of dewatering volumes.

2) Converse to contact SNWA regarding in-place long term groundwater monitoring programs and/or planned programs specific to the Las Vegas Wash shallow groundwater system in attempt to minimize the duplication of efforts to characterize and monitor groundwater-surface water interactions. Information will aid in the preparation of a Draft Groundwater Monitoring Plan for the SCOP project. Converse will also

discuss current SNWA dewatering strategies and treatment methods associated with on-going grade control structures along the wash for guidance.

3) NDEP offered to schedule talks involving Al Tinney (NDEP) and the CWC Team with several groups including but not limited to: SNWA, COH (Brenda Pohlmann and operations managers), Tronox and AMPAC individually to assess current treatment conditions and the possibility of mutually beneficial treatment practices. A summary of issues to be discussed with various organizations includes:

- SNWA (existing data, overlap with CWC monitoring plan, their plans for managing construction related dewatering)
- Tronox (interface with the current biological treatment system, their infrastructure, existing mothballed ion exchange system, outfall management during construction, possible long term co-operation)
- AMPAC (especially their consultant on in situ treatment information, possible interference with their infrastructure)
- COH (use of RIB ponds, issues related to long term use of water in future for bird viewing wetlands or park, infrastructure interference during construction and dewatering (including outfall).
- NDEP (NPDES/UIC issues, historic Data from various studies, short and long term water management/treatment issues)

4) It is likely that a follow-up meeting will be required with groups of stakeholders depending upon the issues to be resolved. The concept was to set up the initial meetings in the next couple of weeks. Follow-up meetings are likely to require more lead time for NDEP participation. NDEP indicated they typically required several weeks notice and will not be able to meet during the week on Nov 5th, 2007.