

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

FACT SHEET

(pursuant to NAC 445A.236)

Applicant: American Pacific Corporation
3883 Howard Hughes Parkway, Suite 700
Las Vegas, NV 89169

Permit Number: NV0024112

Physical Address: AMPAC AGTS
901 Wiesner Way, Henderson, Clark County, NV
Latitude: 36° 04' 30" N Longitude: 115° 00' 17.3" W
Section 36, T21S, R62E MDB&M

Discharge Outfalls: Outfall 001: Las Vegas Wash
Latitude: 36° 05' 12" N Longitude: 114° 59' 13" W
Outfall 002: Athens Channel
Latitude: 36° 04' 42" N Longitude: 115° 00' 42" W

Only one of the two permitted outfalls will be utilized at a time.

General: Pacific Engineering and Production Company of Nevada (PEPCON), a former subsidiary of the American Pacific Corporation (AMPAC), formerly manufactured perchlorate-based chemicals from 1955 to 1988 at the Henderson, Nevada location. From 1988 to 1995, the plant site was investigated for the presence of contaminants in the soil and groundwater. The two primary contaminants of concern, lead and PCB, were successfully remediated through closure by the NDEP in 1995.

In 1997, a method to detect perchlorate at low concentrations, produced identification of perchlorate in the groundwater, causing AMPAC to investigate the groundwater for perchlorate contamination. From 1997 through 2004 over 100 monitoring wells were installed by AMPAC and its consultants in order to assess the perchlorate levels in groundwater in areas near and around the PEPCON site. In areas close to the PEPCON site concentrations as high as 600 mg/l were found in the groundwater. At distances of 1 ½ miles from the site, groundwater perchlorate concentrations were less than 4 µg/l.

In 2004, the NDEP Bureau of Corrective Actions required that AMPAC establish a Mitigation System Area (MSA) and propose a treatment system. The MSA was defined as the aquifers and certain surface waters approximately 3 miles northeast of the former PEPCON site, and bounded by Boulder Highway and Galleria Road (Athens Road) on the west, Ward Drive and Galleria Drive on the east, Galleria Road as the southern boundary, and the northern boundary of Section 36 into Section 15. A plan to use an in-situ biological remediation system (ISB) by extracting groundwater and re-injecting into the aquifer downstream of the extraction was developed that year, and pilot testing began in 2005.

In 2006, AMPAC received a permit for underground injection from NDEP and began operation of six extraction wells that year. Three more injection wells were placed on line later that year. These wells operate by extracting perchlorate loaded groundwater from the shallow

water bearing zone before it enters the Las Vegas Wash. The extracted water is then brought to the ISB facility where it is blended, filtered and re-injected into the aquifer to be reduced by microbes. The ISB ran very well the first year of operation. Over time, however, excessive biomass over a wide area caused the capacity of the re-injection wells to diminish. An alternative method utilizing a deep re-injection trench in the same area, was proposed in 2009, and continues to operate today.

In 2008, AMPAC began modeling the groundwater flow in the area closer to the PEPCON site in order to assess if remediation was necessary in that area. More monitoring wells were installed, and data evaluation caused AMPAC to change its approach in 2009 and launch the program to expand the perchlorate treatment system to include the deep zones in the south of Warm Springs Road (SWS) area. Modeling continued through 2010 and revealed that even higher pumping rates would achieve better hydraulic capture and shorter total remediation time.

This NPDES permit is based on the following guidance: 1) the majority of the perchlorate mass is currently within the middle and deep groundwater zones; 2) upward flow from the perchlorate-containing groundwater in the middle and deep zones into the shallow zone acts as a source of perchlorate in the shallow zone; and, 3) the time required for groundwater migration from Warm Springs Road to Galleria Road in the shallow zone is much shorter than the time required for migration through the middle and deep zones and upward into the shallow zone. Five new extraction wells, known as the Auto Mall Extraction Wells (AMEW), were identified and installed in 2010; all of the wells were screened in the deep and middle zones for maximum impact. The flow rates detailed below are the sum of these 5 wells. AMPAC contracted a hydrogeologist to determine if the proposed rates were sustainable, and would not cause settling in the area of extraction. Discussions with an ex-situ remediation system manufacturer have produced a plan for utilization of a fluidized bed biological reactor (FBR) system to remove the deep and middle groundwater zones containing the majority of the perchlorate. The expanded FBR system is referred to as the AMPAC Groundwater Treatment System (AGTS).

Flow: 1.152 MGD, Daily Maximum, and 30-Day Average.

Corrective Actions Sites: The facility is within one mile of the BMI Complex, the site of a Bureau of Corrective Actions perchlorate remediation case. According to the BCA the AMPAC remediation and discharge activities will not impact the BMI Complex remediation activities.

Well Head and Drinking Water Supply Protection: The treatment facility and the discharge location at the Las Vegas Wash are not within a Drinking Water Protection Area (DWPA) around any public water supply well. A Wellhead Protection Area (WHPA) has not been established for this location.

Expected Discharge Flow Characteristics: Based upon hydrogeological data, modeling, and sampling and analytical data collected from monitoring wells in the vicinity, the following data are reported. Analytes present in the influent that are expected to show increases in the effluent, are chloride and TOC, due to degradation of perchlorate and formation of electron donors in the treatment process, and possibly total suspended solids, due to excess biosolids production. Analytes present in the influent that are expected to show decreases

in the effluent include perchlorate, chlorate, nitrate, nitrite, chloroform and tetrachloroethylene.

Table 1. Expected Discharge Characteristics

Parameter		Proposed Permit Limit	Influent Average (mg/l)	Expected Effluent (mg/l)	Expected Effluent Loading (lbs/day)
Flow	30-Day Average (MGD)	1.152	---	---	---
	Daily Maximum (MGD)	1.152	---	---	---
BOD ₅	30-Day Average (mg/l)	25	<150	<45	---
	30-Day Average (lbs/day)	254	---	---	93.80
Perchlorate	30-Day Average (µg/l)	18	145,000	<10	---
	30-Day Average (lbs/day)	M&R	---	---	<0.0063
Temperature	30-Day Average (° Fahrenheit)	M&R	70	55-75	---
pH	Single Value (Standard Units)	6.5-9.0	7.1	6.9-7.85	---
TSS	30-Day Average (mg/l)	135	5.0	<135	<1300
DO	7-Day Average (mg/l)	M&R	0-6	0-6	---
TDS	95% of Samples (mg/l)	3,000	2,600	<3,000	28,823
TOC	30-Day Average (mg/l)	M&R	<1.5	<5	48.04
Chloride	30-Day Average (mg/l)	M&R	710	780	7495
Chlorate	30-Day Average (mg/l)	M&R	15	<0.005	<0.0031
Sulfate	30-Day Average (mg/l)	M&R	730	730	456.5
Sulfide	30-Day Average (mg/l)	M&R	0.0179	0.0179	---
Nitrate as N	30-Day Average (mg/l)	M&R	7	<1	<0.0063
Nitrite as N	30-Day Average (mg/l)	10	<0.5	<0.1	<0.3127
Ammonia	30-Day Average (mg/l)	M&R	<2	<2	---
TIN	95% of Samples (mg/l)	20	<9.5	<3.1	<0.5
Total (as P) Phosphorus	30-Day Average (mg/l)	20	0.03	<0.5	<5
Priority Pollutants	30-Day Average (µg/l)	M&R	---	---	---
Profile I	30-Day Average (mg/l)	M&R	---	---	---

lbs/day: pounds per day
 µg/L: micrograms per liter
 M&R: Monitor & Report
 TOC: Total Organic Carbon
 TIN: Total Inorganic Nitrogen
 Profile I: All Nevada Profile I parameters (metals to be total recoverable)

TSS: Total Suspended Solids
 mg/L: milligrams per liter
 TDS: Total Dissolved Solids
 N: Nitrogen
 Priority Pollutants: select 65 Volatile Organic Compounds

Receiving Water Characteristics: The receiving water is the Las Vegas Wash, with reach designated from Telephone Line Road to the confluence of discharges from the City of Las

Vegas and the Clark County Wastewater Treatment Facilities. Beneficial uses for this reach of the Las Vegas Wash are listed in NAC 445A.198 and water quality standards for the are listed in NAC 445A.199. The requirements to maintain existing higher quality waters apply.

Proposed Discharge Limitations and Special Conditions: Discharge samples and measurements taken in compliance with the monitoring requirements specified in Table 2 shall be taken after treatment and prior to the confluence with the Las Vegas Wash, at the locations specified below:

- a. **INF** = influent at the intake to the treatment train;
- b. **EFF** = effluent from treatment systems prior to discharge to Outfall 001;
- c. **001** = Outfall 001, discharge at end of pipe to Las Vegas Wash, approximately 6. 5 miles upstream of confluence of the Las Vegas Wash with Lake Mead; or,
- d. **002** = Outfall 002, discharge at end of pipe to Athens Drainage Channel; and,
- e. **LW0.55** = conditional sampling point located in the Las Vegas Wash, 0.55 mile upstream of the confluence of the Las Vegas Wash with Lake Mead.

The discharge shall be limited and monitored by the Permittee as specified in Table 2.

Table 2. Discharge Limitations, Sampling and Monitoring Requirements

Parameters	Units	Discharge Limitations			Monitoring Requirements		
		30-Day Average	Daily Maximum	30-Day Avg Load (ppd)	Sampling Locations	Monitoring Frequency	Monitoring Type
Flow Rate	MGD	1.152	1.152	---	EFF	Continuous	Flow meter
BOD ₅ (inhibited)	mg/l	M&R	M&R	M&R	INF	Monthly	Discrete
		45	M&R	190	EFF		
Perchlorate	µg/l	M&R	M&R	---	INF	Daily discrete samples composited weekly	
		18	M&R	0.17	EFF		
pH -SV	S.U.	6.5 - 9.0	---	---	EFF	Weekly	Discrete
DO	mg/l	M&R	M&R	M&R	EFF	Weekly	Discrete
TOC	mg/l	M&R	---	48.04	EFF	Quarterly	Discrete
TSS	mg/l	135	M&R	1,300	EFF	Monthly	Discrete
TDS	mg/l	M&R	---	M&R	INF	Monthly	Discrete
		3,000	M&R	M&R	EFF		
		M&R	---	M&R	001 or 002		
Chloride	mg/l	M&R	---	M&R	INF	Monthly	Discrete
		M&R	---	M&R	EFF		
Chlorate	mg/l	M&R	---	M&R	INF	Monthly	Discrete
		M&R	---	M&R	EFF		
Sulfate	mg/l	M&R	---	M&R	INF	Monthly	Discrete
		M&R	---	M&R	EFF		
Sulfide	mg/l	M&R	---	M&R	INF	Monthly	Discrete
		M&R	---	M&R	EFF		
Nitrate as N	mg/l	M&R	---	M&R	INF	Monthly	Discrete
		M&R	---	M&R	EFF		
Nitrite as N	mg/l	M&R	---	M&R	INF	Monthly	Discrete

		10	---	M&R	EFF		
TIN as N	mg/l	M&R	---	M&R	INF	Monthly	Discrete
		20	---	M&R	EFF		
Total Ammonia as N	mg/l	M&R	---	40 **	EFF	Monthly	Discrete
		** If the load in the Wash exceeds 970 ppd from 04/01-09/30, the Permittee shall negotiate an IWLA, or other approved method which ensures the WQS will be met.			LW0.55	Monthly	Discrete
Total Phosphorus as P	mg/l	M&R	---	M&R	INF	Monthly	Discrete
		M&R	---	20 *	EFF		
		* If the total load (including non-point sources) in the Wash exceeds 434 ppd from 03/01-10/31, the Permittee shall negotiate an IWLA, or other approved method which ensures the WQS will be met.			LW0.55	Monthly	Discrete
Priority Pollutants (Attachment A)	mg/l, µg/l, or ppd	M&R	---	M&R	EFF	Quarterly	Discrete
		Permittee shall demonstrate no increase in concentration or loading of "other" constituents as a result of discharge. Permittee shall only be responsible for utilizing results which are >PQL. However, all data above MDL shall be reported.			LW0.55	Quarterly	Discrete
Profile I	mg/l	---	M&R	---	EFF	Annually	Discrete

Definitions:

MGD: million gallons per day BOD₅: 5-day biological oxygen demand M&R: Monitor and Report
 mg/l: milligrams per liter DO: Dissolved Oxygen µg/l: micrograms per liter
 S.U.: Standard pH units as N: as nitrogen TSS: Total Suspended Solids
 TDS: Total Dissolved Solids IWLA: Individual Waste Load Allocation as P: as phosphorus
 TIN: Total Inorganic Nitrogen PQL: Practical Quantification Limit WQS: water quality standards
 ppd: pounds per day MDL: Method Detection Limit
 Profile I: all Nevada Profile I parameters (metals shall be total recoverable); Sample in 4th quarter annually.

Up-Gradient Groundwater Monitoring Requirements: Groundwater samples taken in compliance with the monitoring requirements specified in Table 3 shall be taken at the following location, **MW-AL**, located in Section 14, T22S, R62E, MDB&M, approximately at:
 Latitude: 36° 01' 44" N Longitude: 115° 01' 48" W

Table 3. Groundwater Sampling and Monitoring Requirements

Parameters	Units	Single Value	Monitoring Location	Frequency	Monitoring Type
pH	S.U.	M&R	MW-AL	Quarterly	Discrete
Perchlorate	mg/l	M&R	MW-AL	Quarterly	Discrete
Chlorate	mg/l	M&R	MW-AL	Quarterly	Discrete
Nitrate	mg/l	M&R	MW-AL	Quarterly	Discrete
TDS	mg/l	M&R	MW-AL	Quarterly	Discrete
Attachment A Priority Pollutants	mg/l, µg/l	M&R	MW-AL	Quarterly	Discrete

Rationale for Permit Requirements: The monitoring requirements and permit limits in Table 2 have been established to ensure that the Las Vegas Wash is not degraded from the discharge of treated groundwater. The requirements are consistent with similar groundwater remediation system discharge permits. Individual parameters are discussed below. Up-gradient groundwater monitoring and reporting is also required at one well.

Flow: Flow limitations for this permit are based on the design capacity of the treatment system.

BOD₅: Limits are based on the design capacity of the treatment system.

Perchlorate: Based on the December 2008 USEPA “Interim Drinking Water Health Advisory for Perchlorate”, statistical review of all data collected from UIC treatment and other treatment systems nearby, and Best Professional Judgment (BPJ) criteria, NDEP has set the perchlorate permit limit at 18 µg/L for the 30-Day Average. The 30-Day average was used to calculate the load limit in pounds per day. NDEP intends to use the proposed limits until the EPA promulgates a water quality standard for perchlorate.

pH: Limited pursuant to NAC 445A.199.

Dissolved Oxygen: Monitor & Report pursuant to NAC 445A.199.

Total Suspended Solids: Limited pursuant to NAC 445A.199. The load limit is based on the water quality standard for this reach of the Wash, and the 30-day average flow limit.

Total Dissolved Solids (TDS): The Permittee is required to meet the 3,000 mg/l limit standard for beneficial uses at the end of pipe. The requirements to maintain existing higher quality (RMHQ) (1,900 mg/l) are applied in the Wash at LW0.55. Because the shallow groundwater with naturally occurring elevated TDS levels would flow to the Wash if not intercepted by the dewatering system, and because the flow-weighted average and maximum expected concentrations indicate no potential to exceed the RMHQ and beneficial use single value limit, no TDS discharge limits are established for the permit. Monitoring is required to ensure that the RMHQ limit continues to be met.

Nitrate, Nitrite, Total Inorganic Nitrogen: Limited pursuant to NAC 445A.199.

Phosphorus and Ammonia: Waste Load Allocation (WLA) for Discharges into Las Vegas Wash: The Permittee is authorized to discharge the waste loads listed in Table 2 for Total Phosphorus as P (total load counting non-point sources) and Total Ammonia as N, to the Las Vegas Wash. This permit condition constitutes a cooperative agreement between the City of Las Vegas, Clark County Water Reclamation District, and City of Henderson, and City of North Las Vegas, to allow discharge flexibility.

Attachment A -Priority Pollutants: This attachment to the permit includes a select group of 65 Volatile Organic Compounds from the list of Priority Pollutants, which are required to be sampled by the permit. Monitor & Report.

Profile I parameters (Metals and Inorganics): No limits are imposed; Monitor and Report requirements for all parameters.

Other Parameters: TOC, Chlorate, Chloride, Sulfate, and Sulfide are monitored because they act as either electron donors or acceptors in the remediation system and/or they may increase or decrease in concentration. Monitor and Report, for information purposes only.

Schedule of Compliance: The Permittee shall implement and comply with the provisions of the schedule of compliance after approval by the Administrator, including in said implementation and compliance, any additions or modifications which the Administrator may make in approving the schedule of compliance. Submit all items to the following address:

Nevada Division of Environmental Protection
Bureau of Water Pollution Control
901 South Stewart Street, Suite 4001
Carson City, NV 89701
Attn: Compliance Coordinator

- a. Upon issuance of this permit, the Permittee shall achieve compliance with discharge limitations as described in this permit and in observance of prescribed schedules of compliance;
- b. By **MMM DD, 2012 (within 180 days of permit issuance)**, the Permittee shall submit to the Division for review and approval two copies of an Operations & Maintenance (O&M) Manual, prepared in accordance with appropriate sections of Guidance Document WTS-2, "Minimum Information Required for an Operation and Maintenance Manual for a Wastewater Treatment Plant". The O&M shall address the fluidized bed reactor system, as well as discharge system, and shall be wet-stamped by a Professional Engineer licensed in the State of Nevada.
- c. By **MMM DD, 2012 (within 60 days of permit issuance)**, the Permittee shall submit to the Division for review and approval two copies of the as-built plans.
- d. **Total Dissolved Solids (TDS) (NAC 445A.143):** Nothing in this permit condition shall alleviate the responsibility of other parties under consent agreement to the Bureau of Corrective Action for the groundwater issues at the BMI complex. Any work pertaining to TDS must recognize that the water quality standard for TDS (NAC 445A.199) must be maintained. **Prior to treating and discharging groundwater other than groundwater from the chromium treatment system,** the Permittee shall obtain approval from the Division and shall comply with and report the following information:
 - i. The Permittee shall continue to participate in regional solutions to the TDS issues in the Las Vegas Wash.
 - ii. The Permittee shall submit a quarterly report in accordance with I.B.1. which includes any progress made on reducing the TDS loading to the Wash either in directly reducing the loading to the wash from the discharge or regional projects the Permittee has participated in which reduce the loading off-site in the same watershed.

- iii. The Permittee shall fully cooperate in good faith with any persons required by NDEP to treat the discharge subsequent to treatment by the Permittee.

Proposed Determination: The Division has made the tentative determination to renew the permit for a period of five (5) years.

Procedures for Public Comment: The Notice of the Division's intent to issue a renewal NPDES permit for a five-year period, authorizing this facility to discharge into the Las Vegas Wash, subject to the conditions contained within the permit, is being sent to the **Las Vegas Review-Journal** for publication. The Notice is being mailed to interested persons on our mailing list. Anyone wishing to comment on the proposed permit can do so in writing for a period of thirty (30) days following the date of publication of the public notice in the newspaper. The comment period can be extended at the discretion of the Administrator. The deadline date and time by which all comments are to be submitted (via postmarked mail or time-stamped faxes, e-mails, or hand-delivered items) to the Division is **December 23, 2011 by 5:00 P.M.**

A public hearing on the proposed determination can be requested by the applicant, any affected State, any affected interstate agency, the Regional Administrator or any interested agency, person or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted.

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings must be conducted in accordance with NAC 445A.238.

The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.605.

Prepared by: Jeryl R. Gardner, P.E.
Date: November, 2011