

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

FACT SHEET

(pursuant to NAC 445A.236)

Applicant: Southern Nevada Water Authority
1001 S. Valley View Blvd.
Las Vegas, NV 89153

Permit Number: NV0023817

Facility Locations: Alfred Merritt Smith Water Treatment Facility
Latitude 36° 04' 11" N, Longitude 114° 48' 40" W
Section 3, T22S R63 ½ E MDB&M
Clark County, Nevada

Discharge Outfalls: Four outfalls: 001 and 002 on the southeast side and 003 and 004 on the north side:

Outfall 001: Ozone Contactors:	Latitude: 36° 04' 03.31" N Longitude: 114° 48' 38.9" W
Outfall 002: After Aeration Channel:	Latitude: 36° 04' 03.31" N Longitude: 114° 48' 38.9" W
Outfall 003: Before Floc Basins:	Latitude: 36° 04' 19.2" N Longitude: 114° 48' 42.1" W
Outfall 004: Filter Back Wash Well:	Latitude: 36° 04' 19.2" N Longitude: 114° 48' 42.1" W

Drinking Water Protection: The discharge locations are not within a Drinking Water Protection Area or a currently established Wellhead Protection Area for any public water supply wells.

Corrective Actions Sites: There are no Bureau of Corrective Actions (BCA) sites within 1 mile of any Outfall locations.

General: The Southern Nevada Water Authority (SNWA) operates the Alfred Merritt Smith Water Treatment Facility (Facility) at Lake Mead (Lake). Lake Mead is the raw water supply for the Facility. The Facility currently treats approximately 90% of the Las Vegas Valley's drinking water. The Facility uses ozonation as the primary treatment process that destroys bacteria and other microorganisms through an infusion of ozone, a gas produced by subjecting oxygen molecules to high electrical voltages. Subsequent treatment processes include flocculation, filtration and chlorination. Flocculation causes suspended particles to combine into larger particles while the direct filtration system removes turbidity and suspended particles from the water. Chlorine is added during the treatment process to ensure residual disinfection to protect against bacterial growth in the distribution system. The Facility is capable of treating 600 million gallons per day (MGD); current operational flows are approximately 291 MGD. The facility has occasional maintenance and operational issues during which it is necessary to discharge to the Lake via the storm drain system.

Flow: The total maximum discharge rate from all outfalls simultaneously is 32.20 million gallons per day (MGD), and 30-day average monthly discharge from all outfalls discharging daily is 10.30 MGD. Actual discharge rates will vary with daily operations and maintenance requirements, and emergencies.

Outfall 001 –Raw Lake Water: The frequency and quantity of raw lake water discharged will depend on the location of the required maintenance and repair activities within the raw water treatment process. Discharges will vary throughout the year, and will typically last less than one day. Maximum daily discharge is permitted at 7.5 MGD, and the average monthly discharge is permitted at 0.4 MGD.

Outfall 002 –Treated Process Water: The frequency and quantity of treated process water discharged will depend on the location of the required maintenance and repair activities within the treatment process. Discharges will vary throughout the year, and will typically last less than one day. Maximum daily discharge is permitted at 5.67 MGD, and the average monthly discharge is permitted at 0.1 MGD.

Outfall 003 –Treated Process Water: The frequency and quantity of treated process water discharged will depend on the location of the required maintenance and repair activities within the treatment process. Discharges will vary throughout the year, and will typically last less than one day. Maximum daily discharge is permitted at 15 MGD, and the average monthly discharge is permitted at 6.8 MGD.

Outfall 004 –Filter Back-Wash Water: The frequency and quantity of reclaimed filter back-wash water discharged is based upon the Lake Mead water surface elevation, and will typically only occur during emergency conditions. Maximum daily discharge is permitted at 4.0 MGD, and the average monthly discharge is permitted at 3.0 MGD.

Site Groundwater: Within the project area the elevation of the groundwater varies with location, but is generally quite shallow, approximately 10-40 feet below ground surface. The local groundwater flow is towards the Lake. The application identified no public drinking water supply wells within 1 mile of the site. The facility and discharge outfalls are not within a wellhead protection area.

Receiving Water Characteristics: The receiving water is Lake Mead. Discharge will be monitored at each of the outfalls to the Lake to ensure the most restrictive beneficial use criteria is met.

Specific sampling requirements are listed below in Table I, including sampling frequency and location.

Proposed Discharge Limitations:

Table I. Discharge Limits and Sampling and Monitoring Requirements

Parameters & Units		Discharge Limitations	Sampling Locations	Monitoring Frequency	Monitoring Type
Maximum Daily Discharge Flow ¹	MGD	32.20	Total of each Outfall and Sum of all Outfalls	Continuous	Flow meter, calculation
30-Day Average Discharge Flow ¹	MGD	10.30	Total of each Outfall and Sum of all Outfalls	Continuous	Calculation
pH ²	S.U.	8.8	FWA	Daily	Discrete
pH –SV ²	S.U.	≥6.5 and ≤9.0	FWA	Daily	Discrete
TRC ³	mg/l	0.1	FWA	Daily	Discrete
DO –SV ⁴	mg/l	≥ 5.0	001, 002, 003, 004	Daily	Discrete
Total Ammonia as N ⁵	mg/l	⁵	001, 002, 003, 004	Daily	Discrete
TIN ⁶	mg/l	4.5	FWA	Daily	Discrete
TDS –SV ⁷	mg/l	1000	001, 002, 003, 004	Daily	Discrete
Chloride –SV ⁷	mg/l	400	001, 002, 003, 004	Daily	Discrete

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Sulfate –SV ⁷	mg/l	500	001, 002, 003, 004	Daily	Discrete
TSS –SV ⁷	mg/l	25	001, 002, 003, 004	Daily	Discrete
Iron –SV ⁸	mg/l	1.0	001, 002, 003, 004	Monthly	Discrete

NOTES:

1. Monitor all discharges from all Outfalls and report quarterly, in MGD, the maximum and 30-day average flows, for each Outfall, and for the total of all Outfalls.
2. Monitor daily and report quarterly, the daily flow-weighted average pH for each outfall’s daily discharges. 95% of the sample single values may not exceed 8.8 SU, and the measured single values must fall between the given limits.
3. Monitor daily and report quarterly, the maximum daily Total Residual Chlorine concentration from all discharges.
4. Sample daily and report quarterly, the minimum DO concentration from each of the Outfalls’ daily discharges.
5. For each sample event, formula terms contained in A and B below shall have the following meaning: **pH and T are field measurements of facility discharge** taken at the same time and location as the water sample destined for the laboratory analysis of ammonia.

A. The chronic criteria of water quality with regard to the concentration of total ammonia are subject to the following:

- (a) The facility discharge Monthly chronic concentration of total ammonia, in milligrams of nitrogen per liter, shall be calculated by the NAC 445A.118 Table 2 chronic concentration by **value from table matrix of temperature and pH or by formula** for the 30-Day average for each discharge sample event as follows:

$$\left[\frac{0.0577}{1 + 10^{7.688 - pH}} \right] + \left[\frac{2.487}{1 + 10^{pH - 7.688}} \right] \times \text{MIN} [2.85, 1.45 \times 10^{0.028 \times (25 - T)}]$$

where : MIN = lesser of comma separated values; T = temp. Celsius deg.; x = multiply

- (b) The concentration of total ammonia, in milligrams of nitrogen per liter, expressed as a 30-day average must not exceed the applicable chronic criterion as calculated more than once every 3 years on average, and the highest 4-day average within the 30-day period must not exceed 2.5 times the applicable chronic criterion.

Measurement frequency of once per 30-day (Monthly) is an acceptable indicator for evaluating total ammonia chronic criterion and may be used in reporting to demonstrate compliance of discharge event calculated limit. However, if a sample analysis exceeds the allowed calculated chronic limit in part (a), the **measurement frequency** must be increased to a minimum of 4 consecutive days within the 30-day period so that chronic criterion part (b) can be applied for determining permit compliance.

B. The acute criteria for water quality with regard to the concentration of total ammonia are subject to the following:

- (a) The facility discharge Daily Maximum acute concentration of total ammonia, in milligrams of nitrogen per liter, for **warm water fisheries** shall be calculated by the NAC 445A.118 Table 1 acute concentration by **value from table matrix of pH and fishery water type or by formula** for the 1-hour average for each sample event as follows:

$$\left[\frac{0.411}{1 + 10^{7.204 - pH}} \right] + \left[\frac{58.4}{1 + 10^{pH - 7.204}} \right]$$

- (b) The concentration of total ammonia, in milligrams of nitrogen per liter, must not exceed the applicable acute criterion as calculated more than once every 3 years on average.

Measurement frequency for evaluating total ammonia acute criterion as daily maximum shall utilize the same **measurement frequency** required for that of evaluating the chronic criteria of water quality defined in A above. The total ammonia concentration determined by laboratory analysis for each sample event shall be compared to the same event’s calculated acute criterion limit.

6. Monitor daily and report quarterly, the daily flow-weighted average TIN concentration for each of the outfalls' daily discharges. 95% of the sample values may not exceed the permit limit.
7. Sample daily and report quarterly, the maximum single value concentration from each of the Outfalls' daily discharges.
8. Sample monthly and report quarterly, the maximum single value concentration from each of the Outfalls' daily discharges.

gpm: gallons per minute
M&R: Monitor and Report
TRC: Total Residual Chlorine
DO: Dissolved Oxygen
SV: single value
TIN: Total Inorganic Nitrogen
FWA: Flow-weighted average of each Outfall's daily discharges

MGD: Million gallons per day
S.U.: standard pH units
mg/l: milligrams per liter
TDS: Total Dissolved Solids
TSS: Total Suspended Solids

Rationale for Permit Requirements: The Division has established the monitoring requirements in Table 1 above to ensure that the receiving water, Lake Mead, is not degraded as a result of facility discharges. Limits are established per Nevada Administrative Code.

Flow: The rationale for the 30-day average discharge was explained in the Flow section of this fact sheet. Discharges are maintenance and operations issues or emergencies, and the permit requires that the total flow rate from all discharge outfalls will not exceed the total maximum daily flow rate.

pH: This daily range of 6.5 to 9.0 S.U. is based on the requirements listed in NAC 445A.195 set to protect beneficial uses. The 30-day average for pH requires that 95% of sample single values \leq 8.8 S.U. The facility has demonstrated compliance with this limit in the past.

Total Residual Chlorine: 0.1 mg/L is a Division policy. Because the Facility uses chlorination as the primary treatment process, dechlorination is required, necessitating monthly monitoring to be protective of aquatic life. The facility has demonstrated compliance with this limit in the past.

DO: The daily minimum (level) limit of 5.0 mg/l is based on the warm water fisheries requirement listed in NAC 445A.195.

Total Ammonia as N: This limit is based on the requirement cited in NAC 445A.195 to meet provisions for this parameter as cited in NAC 445A.118. Provision is made for meeting a Daily Maximum value (acute concentration) and a Monthly average (chronic concentration) to be protective of aquatic life.

TIN: The daily maximum limit of 4.5 mg/l is based on the requirement cited in NAC 445A.195 set to protect beneficial uses. The 30-day average for total inorganic nitrogen requires that 95% of samples be less than or equal to 4.5 mg/l concentration. The facility has demonstrated compliance with this limit in the past.

TDS: The daily maximum limit of 1000 mg/l TDS is based on the requirements cited in NAC 445A.195 set to protect designated beneficial uses. The State Environmental Commission (SEC), through NAC 445A.143, has adopted the standards criteria and policy recommended by the Colorado River Basin Salinity Control Forum for addressing TDS loading to the Colorado River.

Chloride: The daily maximum limit of 400 mg/l is based on the requirements cited in NAC

445A.195.

Sulfate: The daily maximum limit of 500 mg/l is based on the requirements cited in NAC 445A.195.

TSS: The daily maximum limit is set at 25 mg/l per the requirements cited in NAC 445A.195. Past facility performance has demonstrated capability of meeting the limit established in the permit.

Iron: The daily maximum limit is set at 1.0 mg/L per the requirements cited in NAC 445A.144. The permit requires monitoring for Iron because the Facility uses an iron compound in the treatment process.

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:

- The Permittee shall achieve compliance with the effluent limitations upon issuance of the permit.
- Within 90 days of the permit effective date (**MM DD, 2010**), the Permittee shall submit to the Division, for review and approval, an updated **Operations and Maintenance (O&M) Manual** for the proposed maintenance activities requiring discharge, including the associated discharge methods and locations. The O&M Manual shall also include a section on Sampling and Analysis. The O&M Manual shall be prepared in accordance with the Division's WTS-2 guidance: *Minimum Information Required for an Operations and Maintenance Manual*. The Manual shall describe the Best Management Practices (BMPs) used at the Facility to minimize the introduction of contaminants/pollutants into the stormdrain system. **This document shall be wet stamped and signed by a Nevada Professional Engineer (P.E.)**. Before implementing changes to an approved O&M Manual, the Permittee shall submit proposed changes to the Division for review and approval.

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

Procedures for Public Comment: The Notice of the Division's intent to issue a NPDES permit authorizing this facility to discharge into the Las Vegas Wash for a five-year period, 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 **August 24, 2010 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.

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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: July 2010

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