

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
FACT SHEET
(Pursuant to NAC 445A.236)

Permittee Name: Nevada Department of Corrections
3955 W. Russell Rd.
Las Vegas, NV 89118-2316

Permit Number: NEV87034

Location: Ely Maximum State Prison
4569 N. State Rt. 490, Ely, NV 89301 (White Pine County)
Prison located approx. 10 mi. NNW of the City of Ely
Wastewater Treatment Facility (WWTF):
Latitude: 39° 22' 39"N, Longitude: 114° 56' 11"W
Township 18N, Range 62E, Section 36; and
Township 18N, Range 63E, Section 31; and
Township 17N, Range 62E, Section 1

Wellhead Protection Area: The Ely Prison's WWTF is located within the 3,000 feet, Drinking Water Protection Area 3, of two wells supplying potable water to the prison. These wells are owned and operated by the Nevada Department of Corrections. The wellhead capture zones for these two supply wells have not been delineated (modeled) and input into the NDEP i-Map application.

General: NDEP received an application to modify and renew this discharge permit on 12/14/07. The existing Phase I WWTF at this prison was built in 1989 to serve an inmate population of 1,000 plus correctional staff. The original design included a head works filter screen and two 3-acre HDPE-lined ponds, operated in parallel, facultative mode. Effluent is discharged into four 2-acre RIBs. Capacity of this facultative arrangement was approved at 0.09 / 0.11 MGD. Later, to address capacity and effluent quality issues, two surplus 5-HP pontoon-float aerators were added to each pond by NDOC. This arrangement was insufficient to consistently meet permit flow and effluent limitations, and a planned expansion in inmate population and staff required a system with more capacity and nitrogen removal to address elevated groundwater nitrate levels from effluent disposal. On 8/28/07, NDEP approved the engineer's (AMEC) Phase II WWTF plans to upgrade the head works and construct a submerged fixed-film reactor. The submerged fixed-film reactor with separate anoxic and aerobic zones is unique (first of its kind) to this State. The fixed-film reactor is furnished by Brentwood Industries (Reading, PA) and includes blowers with separate anoxic (denitrification) and aerobic zones (nitrification). Design reactor effluent quality is BOD₅ – 35 mg/l, TSS – 60 mg/l and TN – 13 mg/l. The treatment ponds will remain in-place as polishing ponds to settle microbial growth sloughed off of the fixed-film media similar to operation at a trickling filter or rotating biological contactor (RBC). To demonstrate denitrification to the TN standard of 10 mg/l, lysimeters will be installed in the RIBs with projected effluent quality of BOD₅ - < 10 mg/l, TSS - < 10 mg/l and TN – 8 mg/l. The RIB operating mode includes alternate loading (anoxic) and drying (aerobic) cycles for additional nitrogen removal in the soil strata prior to groundwater percolation. Down gradient of the RIBs are two monitoring wells to demonstrate compliance with the State groundwater requirements. The Phase II design is projected to serve a combined population of 1,750 inmates plus staff. Permitted flow limit increase is from 0.09 / 0.11 MGD

(Phase I) to 0.3 / 0.9 MGD (Phase II).

Flow: Presently, flow is reported at an average level of 0.28 MGD (2nd Quarter '08). Groundbreaking for the Phase II upgrade commenced in fall '07 and completion is expected in winter '08. NDOC budgets water usage at this facility at 125 GPD/inmate.

Receiving Water Characteristics: Average depth to groundwater is 120 ft bgs. The groundwater flow gradient is SW from the RIBs. Groundwater nitrate levels at the disposal area range from 5.2 (MW-2) to 14 mg/l (MW-1).

Five-Year DMR Analysis: The existing pond treatment facility has exceeded during the permit's term influent flow and effluent: CBOD/TSS/pH and groundwater nitrate limits.

- *CBOD:* Influent averaged 179 mg/l. Pond effluent averaged 54 mg/l. Existing limits are 30 / 45 mg/l.
- *TSS:* Influent averaged 90 mg/l. Pond effluent averaged 111 mg/l. The increase in suspended solids from the influent is likely due to insufficient settling and/or pond algae growth. Existing limit is 90 mg/l.
- *pH:* Effluent averaged 8.6 SU indicating algae growth from CO₂ uptake in the ponds. Existing limit is 6.0 to 9.0 SU.
- *NO₃:* The higher observed nitrate level of the two wells peaked around 17 mg/l (now 14 mg/l). NO₃ and TN levels are similar indicating near complete conversion of effluent ammonia.

Rationale for Permit Requirements: Until the fixed-film reactor is operational, the limits in Table 1 will apply for pond effluent quality. Phase II limits in Table 2 will apply after start-up of the fixed film reactor. The operator certification requirement for a fixed-film reactor is a Grade II level as provided in NAC 445A.289 (i.e., bio-filtration process). In practice, a Grade IV certified operator will operate this facility on a contract basis with daily operation of the facilities by the corrections maintenance staff.

Proposed Effluent Limitations and Special Conditions:

Table 1: Phase I Discharge Limitations¹

PARAMETER	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	30-Day Average	Daily Maximum	Measurement Frequency	Sample Type
Flow, MGD (Influent)	0.09	0.11	Continuous	Flow Meter
CBOD, mg/L (Influent)		M&R	Quarterly	Discrete
CBOD, mg/L (Effluent)		45	Quarterly	Discrete

TSS, mg/L (Influent)		M&R	Quarterly	Discrete
TSS, mg/L (Effluent)		90	Quarterly	Discrete
pH, Std. Units (Effluent)		6.0 – 9.0	Quarterly	Discrete
Inmate Population, # of persons		M&R	Quarterly	Population Count

1. Limits in Table 1 apply until the Phase II upgrade is operational.

Table 2: Phase II Plant Discharge Limitations¹

PARAMETER	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	30-Day Average	Daily Maximum	Measurement Frequency	Sample Type
Flow, MGD (Influent)	0.3	0.9	Continuous	Flow Meter
CBOD, mg/L (Influent)		M&R	Quarterly	Discrete
CBOD, mg/L (Effluent)		45 – Pond Outlet	Quarterly	Discrete
		10 - Lysimeter		
TSS, mg/L (Influent)		M&R	Quarterly	Discrete
TSS, mg/L (Effluent)		90 – Pond Outlet	Quarterly	Discrete
		10 - Lysimeter		
Total Nitrogen as N, mg/l (Effluent)		13 – Pond Outlet	Quarterly	Discrete
		10 – Lysimeter		
pH, Std. Units (Effluent)		6.0 – 9.0 (Pond Outlet & Lysimeter)	Quarterly	Discrete
Inmate Population, # of persons		M&R	Quarterly	Population Count

1. Limits in Table 1 apply upon startup of the Phase II upgrade.

Table 3: Groundwater Monitoring (MW-1, 2)¹

PARAMETER	GROUNDWATER LIMITATIONS	MONITORING REQUIREMENTS	
		Measurement Frequency	Sample Type
TDS, mg/L	Monitor & Report	Quarterly	Discrete
Chlorides, mg/L	Monitor & Report	Quarterly	Discrete

Nitrate as N, mg/L	Monitor & Report	Quarterly	Discrete
Total Nitrogen as N, mg/L	10.0	Quarterly	Discrete
Depth to Groundwater, ft	Monitor & Report	Quarterly	Field Measurement
Groundwater Elevation, ft	Monitor & Report	Quarterly	Field Measurement

1. Groundwater samples shall be taken after purging at least three (3) well volumes of groundwater from the monitoring wells.

Schedule of Compliance: The Phase II construction is underway at the time of this documentation preparation with completion anticipated in winter '08. Upon completion of the Phase II upgrade, the following items are required for submittal (**all compliance deliverables shall be addressed to the attention of the Compliance Coordinator, Bureau of Water Pollution Control**):

- The Permittee shall notify the Division in writing not more than fourteen (14) calendar days following fixed-film reactor startup (Phase II).
- Within thirty (30) days of startup of the Phase II upgrade, the Permittee shall submit a copy of the engineer's Construction Quality Assurance (CQA) letter indicating that the treatment facility was installed in accordance with the approved design plans. The CQA letter shall be wet stamped and signed by a Nevada Professional Engineer (P.E.).
- Within thirty (30) days of startup of the Phase II upgrade, the Permittee shall submit a copy of the as-built design plans wet stamped and signed by a Nevada Professional Engineer (P.E.).
- Within ninety (90) days of startup of the Phase II upgrade, the Permittee shall submit an updated copy of the Operations & Maintenance (O&M) Manual, prepared in accordance with the Division's WTS-2 guidance: *Minimum Information Required for an Operations and Maintenance Manual*. The updated O&M Manual shall be prepared by a Nevada Professional Engineer (P.E.) or a Nevada certified wastewater operator (Grade II or higher).

Procedures for Public Comment: The Notice of the Division's intent to issue this renewal and modification discharge permit for the Ely Prison WWTF, subject to the conditions contained within the permit is being sent to the **Ely Times** and **Reno Gazette-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 **Thursday, December 4, 2008 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.

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

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Date: October 27, 2008