



# STATE OF NEVADA

Department of Conservation & Natural Resources

*Jim Gibbons, Governor*

*Allen Biaggi, Director*

DIVISION OF ENVIRONMENTAL PROTECTION

*Leo M. Drozdoff, P.E., Administrator*

## FACT SHEET

(Pursuant to NAC 445A.236)

**Permittee Name:** Carson City Utilities  
3505 Butti Way  
Carson City, NV 89701-3498

**Permit Number:** NEV90008

**Location:** Carson City Utilities Wastewater Reclamation Facility  
3320 East Fifth Street  
Carson City, NV 89701

Latitude: 39° 09' 45" N

Longitude: 119° 43' 55" W

Township 15N, Range 20E, Section 15

**General:** Carson City's wastewater treatment facility has been modified numerous times since it was first constructed in 1960. At that time, the facility consisted of oxidation ponds, a digester, and chlorination. The treated effluent was discharged to the Carson River via Eagle Valley Creek. A trickling filter and secondary clarifier were added in 1967. A second trickling filter was added in 1972, and reuse of treated effluent for irrigation at Eagle Valley Golf Course also began that year. A parallel process consisting of an aeration basin and another secondary clarifier was added in 1979. The surface water discharge to the Carson River was eliminated in 1987 after construction of the Brunswick Canyon Effluent Storage Reservoir and the installation of reuse pipelines to serve the Nevada State Prison Farm and Darling Ranch (now Empire Ranch Golf Course). Sand filtration was added 1997, sludge drying beds were replaced with a centrifuge in 2000 and reuse facilities have been expanded considerably.

This facility is unique in that it consists of two separate biological treatment trains, one train consists of two trickling filters operating in series, and the other train consists of a mechanically aerated activated sludge system. The trickling filter train receives about 30% of the sewage.

All of the treated effluent generated from this facility is used for reuse and meets Category B reuse standards. The reuse sites include the Empire Ranch Golf Course (1.5 mgd), Eagle Valley Golf Course (2 mgd), Silver Oak Golf Course (1 mgd), NDOC Prison Dairy, Centennial Park, Lone Mountain Cemetery, Governors' Field, the Saliman Street median and the Edmonds Sports Complex.

Currently, preliminary treatment consists of a Parshall flume with an ultrasonic flow meter,

mechanical screen, and an aerated grit chamber. Solids from the grit chamber are disposed of at the landfill. After the grit chamber, three parallel screw pumps lift the wastewater to the splitter box for gravity flow to the primary clarifiers. A storm surge pond stores effluent from the preliminary processes in the event that wet weather flow exceeds the discharge capacity of the plant.

Primary treatment consists of two primary clarifiers in parallel followed by an equalization basin. Solids from the primary clarifiers are pumped to the anaerobic digesters.

Secondary treatment consists of an aeration basin operating in parallel with the trickling filters. The equalization basin allows a steady flow to the secondary processes. The trickling filter train consists of a plastic media filter, intermediate clarifier, rock media filter, and secondary clarifier. Solids from the intermediate clarifier are returned to the primary clarifiers. Solids from the secondary clarifier are brought either to the aeration basin or the primary clarifier. Following clarification, the flows from both the trickling filters and the aeration basin receive sand filtration and chlorination, then discharged to the effluent distribution system. Solids from the aeration basin's secondary clarifiers are thickened by dissolved air flotation prior to undergoing anaerobic digestion and dewatering. The plant has three anaerobic digesters; two are used in parallel while the third is used as a holding tank to control the feed to the process. Dewatering of the digested sludge is accomplished by centrifuge.

During non-irrigation months (November – March), the treated effluent is pumped to the Brunswick Canyon Effluent Storage Reservoir which is located in the Pine Nut Mountains, about 5 miles east of the treatment plant. The reservoir has a capacity of 3,288 acre-feet. Discharge permit NV0023591 was issued for this activity. During the irrigation season, the reuse sites receive treated effluent from the reservoir and/or treated effluent directly from the treatment facility.

Reuse of wastewater for landscape irrigation is authorized under this permit at the treatment plant and the animal control facility. The amount of reuse water that can be applied is limited by the nitrogen requirements of the plants being irrigated and is documented in effluent management plans prepared by Carson City. Reuse for construction purposes (dust control and soil conditioning) is also authorized under this permit. Notification and application procedures have been approved by the Division. Other reuse sites are permitted separately.

The average centrifuge cake (biosolids) sampling results over the time period are well below the discharge limits. The biosolids meet Class B standards. The City changed from drying beds to using a centrifuge to reduce odors. The biosolids are currently being used as cover material at the landfill.

The nitrogen levels in the treated effluent, predominantly ammonia, have been increased from approximately 16 mg/L to 26 mg/L since the digested sludge centrifuge unit came into service in 2000. The centrate return from the centrifuge has led to large loadings of ammonia back into the plant. The treatment facility has also had difficulty nitrifying the ammonia during the warm months. Due to these issues, the Total Nitrogen concentrations in the treated effluent delivered

to the reuse sites are generally above 25 mg/L. Most of the monitoring wells at the reuse sites do not show nitrate levels above 2 mg/L. Carson City is investigating alternatives to aid in the removal of Total-N in the centrate and is looking at other solutions to provide nitrification during warm-weather months.

**Corrective Actions Sites:** There is no Bureau of Corrective Actions remediation site located within a one-mile radius of the permitted site.

**Wellhead Protection Area:** The WWTP lies within a 6,000-foot water supply well Drinking Water Protection Area, but the wells are low to moderately vulnerable to surface contamination.

**Flow:** 6.9 MGD 30-day Average  
9.5 MGD Daily Maximum

**Receiving Water Characteristics:** Variable - reuse water is applied throughout the City.

**Proposed Treated Effluent Discharge Limitations:** Table 1 shows that the discharges from the Carson City WWTF to groundwater of the State shall be limited as follows:

**Table 1. Carson City Wastewater Treatment Facility**

PARAMETERS	EFFLUENT DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	30 Day Ave.	Daily Max.	Measurement Frequency	Sample Type
Flow (MGD)	6.9	9.5	Continuous	Flow Meter
BOD <sub>5</sub> , mg/L	30	45	Quarterly	Composite
TSS, mg/L	30	45	Quarterly	Composite
Total Phosphorous, mg/L	M & R		Quarterly	Composite
Nitrate as N, mg/L	M & R		Quarterly	Discrete
Nitrite as N, mg/L	M & R		Quarterly	Discrete
Ammonia as N, mg/L	M & R		Quarterly	Discrete
Total Kjeldahl Nitrogen as N, mg/L	M & R		Quarterly	Discrete
Total Nitrogen as N, mg/L	M & R		Quarterly	Discrete
Fecal Coliform, CFU/100 mL	2.2	23	Quarterly	Discrete
pH (Effluent), SU	Between 6.0 and 9.0		Quarterly	Discrete

M & R: Monitor and Report  
 Total Nitrogen = Total Kjeldahl Nitrogen + Nitrate + Nitrite  
 CFU: Colony Forming Units

Table 2 outlines the water quality parameters for the treated effluent reuse and Table 3 shows the water quality parameters that must be monitored in the Stewart Pond monitoring well.

**Table 2. Treated Effluent Reuse Monitoring Requirements**

Parameter	Discharge Limitations	Monitoring Requirements <sup>(1)</sup>		
		Sample Location	Measurement Frequency	Sample Type
Daily Application Volume (gallons per day)	monitor & report	(2)	Continuous	Meter
Annual Application Volume, (gallons per year)	1,300,000	(2)	Continuous	Meter
Annual Nitrogen Application Weight, lb/yr <sup>(3)</sup> (Total Nitrogen as N)	303	(2)	continuous <sup>(4)</sup>	Meter
Reuse for Construction Purposes <sup>(5)</sup> (gal/yr)	monitor & report	(6)	Continuous	Meter

- (1) This data shall be reported as part of the fourth quarter discharge monitoring report (See Part I.B.2.b).
- (2) Landscape irrigation at wastewater reclamation plant, animal control facility, and Utility Dept. grounds.
- (3) Total weight of nitrogen applied from effluent and fertilizer
- (4) Irrigation flow is measured continuously. The nitrogen load is determined based on the concentration of the flow plus the amount of fertilizer added.
- (5) Dust control and soil conditioning
- (6) Each construction water take-out point

**Table 3. Stewart Pond Monitoring Well Monitoring Requirements**

Parameter	Limitation	Monitoring Requirements	
		Frequency	Sample Type
Depth to Groundwater	monitor & report	quarterly	field measurement
Groundwater Elevation	monitor & report	quarterly	calculate
Total-N as N (mg/L)	10	quarterly	discrete
Chlorides (mg/L)	monitor & report	quarterly	discrete
Total Dissolved Solids (mg/L)	monitor & report	quarterly	discrete

**Schedule of Compliance:** The Permittee shall implement and comply with the following Schedule of Compliance:

1. The Permittee shall implement and comply with the provisions of the schedule of modifications which the Administrator may make;
2. The Permittee shall achieve compliance with the effluent limitations upon issuance of the permit;

3. A revised Operations & Maintenance (O&M) Manual that follows the requirements of NDEP Publication WTS-2 shall be submitted to NDEP by **Month Day, 2010**, that outlines any changes to the treatment process or operation of the facility;
4. The Permittee, or its representative, shall adequately address any and all updates to the Effluent Management Plan (EMP) as a revision to the EMP **on or before Month Day, 2010**. The revised EMP shall follow the requirements of NDEP Publication WTS-1B and shall be submitted to the Compliance Coordinator at:

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

5. The Permittee, or its representative, shall submit a report for NDEP's review and approval on or before **Month Day, 2010**, that discusses the cause of the odors emanating from the headworks and outline a plan to implement measures to significantly reduce or eliminate odors from the treatment facility;
6. The Permittee, or its representative, shall submit a status report for NDEP's review on or before **MonthDay, 2010**, that discusses alternatives Carson City is considering to aid in the removal of Total-N in the centrate and other solutions to provide nitrification during warm-weather months;
7. The Permittee shall submit an Annual Biosolids Monitoring Report ABMR by **February 19th** of each year for the period covering the previous calendar year. The report shall contain all the required biosolids analytical data, the volume of biosolids generated that year, any volume accumulated from previous years, descriptions of pathogen and vector attraction reduction methods and the required certifications as required by 40 CFR Parts 503.17 and 503.27, the names, mailing and street addresses and telephone numbers of all facilities which received biosolids for storage, disposal, use, treatment, land application or any other use or disposal methods not mentioned and the volume of biosolids taken to each facility;
8. The Permittee shall evaluate the pretreatment program limits to determine if the limits are adequate to achieve the metals concentrations found in Table 3 of 40 CFR Part 503.13. The Permittee shall submit the evaluation conclusions, and any recommended actions to be taken in the pretreatment program. The Report shall be included with the ABMR; and
9. Documentation shall be provided to the Division that the local water purveyor and health agency have been notified prior to the use of effluent for irrigation at a site. The documentation shall describe the plan for complying with the cross connection control requirements of the local water purveyor and shall be submitted prior to the onset of irrigation or disposal.

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

**Rationale for Permit Requirements:** The flow is measured to verify the flow to the treatment plant is consistent with permit limitations, and to determine when design capacity is being approached. Influent and effluent BOD<sub>5</sub> and TSS, and effluent nitrogen are monitored to assess the level of treatment being provided and to verify compliance with permit limitations.

**Procedures for Public Comment:** The notice of the Division's intent to issue a permit authorizing the facility to discharge to the groundwater of the State of Nevada, subject to the conditions contained within the permit, is being sent to the **Reno Gazette-Journal** and the **Nevada Appeal** for publication. The notice is being mailed to interested persons on our mailing list. Anyone wishing to comment on the proposed permit may do so in writing for a period of 30 days following the date of the public notice. All comments regarding this permit must be received or postmarked by **5:00 PM on January 5, 2010**. The comment period can be extended at the discretion of the Administrator.

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 determined to be appropriate. All public hearings must be conducted to 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: Steve McGoff, P.E.  
Staff Engineer III  
December 1, 2009