NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

FACT SHEET
(Pursuant to NAC 445A.236)

Permittee Name: Minden-Gardnerville Sanitation District

Permit Number: NEV40027

Location: Minden-Gardnerville Wastewater Treatment Facility
U.S. Highway 395
Minden, Douglas County, Nevada 89423

Latitude: 38°57'56" North
Longitude: 119°46'52" West

Flow: Design Daily Maximum: 3.1 Million Gallons per Day (MGD)
Design 30-Day Average: 2.8 MGD

Wellhead Protection Area
The Minden-Gardnerville Sanitation District (MGSD) Wastewater Treatment Facility and irrigation reuse fields are wholly within the 3000' Drinking Water Protection Area (DWPA) around Minden Water Company supply well, Well 4. The WWTF and portions of the southern reuse field are within the 1000' DWPA of Well 4. The southernmost portion of the facility and south reuse field are within 5- and 10- year wellhead capture zone.

General:
The Minden-Gardnerville Sanitation District (MGSD) operates a 3.1 million-gallon per day (mgd) wastewater treatment facility in Douglas County, Nevada. Wastewater from residences and commercial or industrial facilities serviced in the Minden/Gardnerville area is treated to meet secondary treatment standards, partially denitrified, and is disinfected.

Wastewater entering the headworks is screened on parallel FMC® travelling bar screens, with grit removed in an aerated Pista® grit chamber. Screened wastewater is discharged to three parallel 45' diameter primary clarifiers. Primary clarified effluent is then split and treated in parallel , attached-growth trickling filters packed with cross-flow plastic media for biological treatment. From the trickling filters, effluent is then mixed with return activated sludge (RAS) from the secondary clarifiers in aerated contact basins, to further enhance CBOD5 and nitrification. The mixed liquor is then discharged to three secondary clarifiers for final clarification before disinfection. Effluent is disinfected using sodium hypochlorite in two chlorine contact basins.

Sludge from the primary and secondary clarifiers is digested in two anaerobic digesters, operated in series. Sludge is subsequently treated at 95° F for 90 days, producing Class B biosolids. Recovered methane gas from the digestion process is used to maintain proper digester temperature, as well as to heat the plant buildings. Digested sludge is thickened with polymer additives, and is dewatered using a belt filter press. Biosolids are currently sent to the Lockwood Landfill for disposal. At the writing of this permit renewal, plans are being finalized for future use of the biosolids as a beneficial soil amendment.

Because commercial and residential developments have encroached into the area surrounding the

treatment plant, MGSD has installed a number of measures to control odors. MSGD uses a chemical scrubber to treat odorous gases from the headworks. Primary clarifiers are either partially (#1 & #2) or fully (#3) covered for odor capture, and the air is discharged through a biofilter for biological treatment of the odor causing compounds. Air is also down-drafted through the trickling filters for odor capture, and the pulled air vented through the odor neutralization beds. MGSD has been proactive in implementing odor control measures.

Following disinfection, all effluent is discharged for irrigation reuse. There is no direct discharge of effluent to ground or surface waters. Treated effluent is either discharged for storage in two (2), clay-lined reservoirs (Outfall 001) or discharged for irrigation on approximately 28 acres owned and cultivated by MGSD (Outfall 002). The storage reservoirs have a cumulative holding capacity of 550 acre-feet and are located northwest of the treatment plant, across Muller Lane. Treated wastewater is released from the reservoirs on an as-needed basis for reuse irrigation on property owned and cultivated for forage crops by Galeppi Land & Livestock, Park Cattle Company, and Bently Agrowdynamics. Treated wastewater discharged for off-site reuse irrigation is designated as Outfall 003. Off-site reuse of treated effluent is administered by each entity under Groundwater Discharge Permits NEV2000501 (Park Cattle), NEV2002513 (Galeppi) and NEV2002514 (Bently)

The proposed permit renewal includes specific provisions to permit: (1) wastewater treatment plant operation; (2) on-site reuse irrigation; and (3) distribution of biosolids meeting Class B treatment standards for land application uses. Site-specific permits for either reuse irrigation or land application of biosolids must be applied for and obtained by those receiving and using these treated products.

Discharge Characteristics

During the period from 2003 to 2007, the following discharge effluent characteristics were reported:

Parameter		Permit Limit	Average	Minimum	Maximum
Flow (MGD)	30-Day Avg	***2.8***	1.89	1.64	2.10
	Daily Maximum	***3.1***	2.09	1.8.	4.04
CBOD5 (mg/l)		***30***	7.44	4.6	13.0
Total Suspended Solids (TSS) (mg/l)		***30***	10.94	6.0	19.0
Removal Efficiency (%)	CBOD5 (mg/l)	***85***	97	95	98
	TSS (mg/l)	***85***	93	86	97
Fecal Coliform (CFU/100 ml)	30-Day Geometric Mean	***200***	5.0	<2.0	127.0
	Daily Maximum	***400***	8.3	2.0	540
pH (Standard Units)		***6.0 – 9.0***	7.28	6.6	7.78
Irrigation Reuse Monthly Total* (Million Gallons)	Outfall 002	***Monitor & Report***	2.69	0	9.93
	Outfall 003	***M&R***	41.61	0	142.8
Effluent Total Nitrogen (mg/l)		***M&R***	18.41	7.5	27.9
Effluent Nitrate as N (mg/l)		***Monitor & Report***	12.99	2.5	20

* In months when reuse discharge occurred

Receiving Water Characteristics:

Prior to the 2003 permit renewal, groundwater below the effluent reuse areas was monitored in 6 monitor wells, MW2 through MW7. Because of increasing groundwater nitrogen levels observed in some of the monitor wells, NDEP required investigation into the cause of the increasing nitrogen. It was determined that many of the wells (installed in the early 1980s) had failed, resulting in contamination of the well bores by infiltration of more nitrogen rich surface soils. MGSID undertook the replacement of all monitoring wells, and all wells were replaced by the permit renewal in 2003. Additionally, two monitor wells, MW8 and MW9, were installed in early 2005, and monitor well MW10 was installed in August 2007.

Groundwater monitoring results from August 2003 through December 2007 for the nine (9) currently monitored wells are given in the following table

Well	Location	Parameter	Average	Minimum	Maximum
MW2	Upgradient of Storage Reservoir	Total Nitrogen (mg/l)	0.92	0.2	1.8
		Nitrate as N (mg/l)	0.57	<0.5	1.3
		TDS (mg/l)	556	430	700
		Chloride (mg/l)	24.8	17	36
MW3	Downgradient of Storage Reservoir	Total Nitrogen (mg/l)	0.4	0.11	0.65
		Nitrate as N (mg/l)	0.08	<0.05	0.25
		TDS (mg/l)	439	210	870
		Chloride (mg/l)	21.4	5.7	52
MW4	Downgradient of Storage Reservoir	Total Nitrogen (mg/l)	0.44	0.17	1.0
		Nitrate as N (mg/l)	0.07	<0.05	0.25
		TDS (mg/l)	764	460	1100
		Chloride (mg/l)	60.7	22	99
MW5	Genoa Lane Well	Total Nitrogen (mg/l)	0.51	0.15	1.0
		Nitrate as N (mg/l)	0.11	<0.05	0.25
		TDS (mg/l)	466	370	560
		Chloride (mg/l)	30.3	11	48
MW6	Tail Water Area Well	Total Nitrogen (mg/l)	0.45	0.15	0.85
		Nitrate as N (mg/l)	0.04	<0.05	0.25
		TDS (mg/l)	652	460	850
		Chloride (mg/l)	52.4	20	80
MW7	North Well, Upgradient of Storage Reservoir	Total Nitrogen (mg/l)	2.04	0.73	4.5
		Nitrate as N (mg/l)	1.76	0.63	4.3
		TDS (mg/l)	699	650	760
		Chloride (mg/l)	24.5	18	37
MW8	Downgradient of Galeppi Land & Livestock Reuse Area	Total Nitrogen (mg/l)	0.46	0.1	0.75
		Nitrate as N (mg/l)	0.16	<0.05	0.4
		TDS (mg/l)	486	410	610
		Chloride (mg/l)	19.3	14	25
MW9	Downgradient of Galeppi Land & Livestock Reuse Area	Total Nitrogen (mg/l)	0.68	0.25	1.15
		Nitrate as N (mg/l)	0.03	<0.05	0.05
		TDS (mg/l)	680	590	760
		Chloride (mg/l)	40.3	31	46
MW10	Downgradient of Park Cattle Company Reuse Area	Total Nitrogen (mg/l)	0.25	0.25	0.25
		Nitrate as N (mg/l)	0.05	0.05	0.05
		TDS (mg/l)	345	310	380
		Chloride (mg/l)	19.5	16	23

Because the effluent is not completely denitrified, the renewed permit will continue the requirement for

monitoring of effluent nitrogen species and calculation of annual nitrogen loading of the MSGID reuse site. Total nitrogen application (applied effluent and any fertilizers/soil amendments) will be limited to no more than 110% of the estimated uptake of nitrogen by irrigated crops. Nitrogen species will also be reported for exported effluent, so that off-site users may calculate nitrogen loading due to applied effleunt.

Proposed Limitations:

Effluent Discharge Limitations: During the period beginning on the effective date of this permit and lasting until the permit expires, the Permittee is authorized to discharge from:

- Outfall 001: To the storage reservoirs
- Outfall 002: To the MGSD irrigation fields
- Outfall 003: To off-site reuse irrigation locations (Galeppi, Park, and Bently)

The discharge, effluent reuse, and groundwater shall be limited and monitored by the Permittee as specified in Table1, Table 2, and Table 3, below:

i. Influent: At the intake Parshall flume (flow) or Influent pump station wet well (laboratory samples)
ii. Outfall 001: At the discharge from the chlorine contact tank
iii. Outfall 002: At the discharge of the chlorine contact tank prior to MGSD field application
iv. Outfall 003: At the discharge from the storage reservoir(s)

Table 1: Treatment Plant Operation and Effluent Discharge

PARAMETER		MONITORING OR SAMPLING LOCATION	DISCHARGE LIMITATION		MONITORING REQUIREMENT	
			30-Day Avg	Daily Max.	Monitoring Frequency	Sample Type
Influent Flow (MGD)		i	2.8	3.1	Continuous	Flow Meter
$CBOD_5$ (mg/L)	Influent	i	M & R	M & R	Weekly	Composite
	Effluent	ii	30	45	Weekly	Composite
	Efficiency	---	>85%	---	Monthly	Calculate
TSS (mg/L)	Influent	i	M & R	M & R	Weekly	Composite
	Effluent	ii	30	45	Weekly	Composite
	Efficiency	---	>85%	---	Monthly	Calculate
Fecal Coliform (CFU/100 mL)		ii	200	400	Weekly	Discrete
pH (Standard Units)		ii	6.0 to 9.0		Weekly	Discrete
Total Phosphates (mg/L)		ii	M & R		Quarterly	Discrete
Priority Pollutants [1]		ii	---	M & R	Annually	Discrete

M & R: Monitor and Report
CFU/100 mL: Colony forming units per milliliter
$CBOD_5$: 5-day carbonaceous biochemical oxygen demand
MGD: Million gallons per day
mg/L: Milligrams per liter
TSS: Total Suspended Solids

Footnotes:

1: Priority Pollutants listed in Attachment A.

Table 2: Effluent Reuse Limitations and Monitoring Requirements

PARAMETER	MONITORING OR SAMPLING LOCATION	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS	
		30-Day Average	Daily Maximum	Monthly Total	Monitoring Frequency	Sample Type
Flow (MGD)	iii, iv	--	---	M&R	Monthly	Flow Meter
Total Nitrogen (mg/L)	iii, iv	M&R	---	---	Monthly During Reuse	Composite
Nitrate as N (mg/L)	iii, iv	M&R	---	---	Monthly During Reuse	Composite
Application Volume (1) (Acre Feet/Acre)	iii	M&R (2)			Monthly During Reuse	Calculation
Actual Nitrogen Loading (lbs/acre/quarter)	iii	M&R (3,4) (Less than the allowable Nitrogen Loading Value Listed in EMP)			Quarterly	Calculation
Cumulative Annual Nitrogen Loading to Date (5) (lbs/acre/year)	iii	M&R (3,4) (Less than the allowable Nitrogen Loading Value Listed in EMP)			Quarterly	Calculation
Allowable Nitrogen Loading (5) (lbs/acre/year)	iii	Report (6)			Quarterly (7)	Calculated in EMP

M&R: Monitor & Report
lbs/year: Pounds per year
EMP: Effluent Management Plan

Footnotes:

1: The annual application volume applied only to those fields managed by MGSD.

2: Acre-Feet (AF x 3.069 = Million Gallons). Volume determined for/from Consumptive Use Balance.

3: Mass determined in accordance with guidance document *WTS-1B: General Criteria for Preparing an Effluent Management Plan* for fields managed by MGSD.

4: The total annual nitrogen applied (lbs/acre/year) shall not be greater than 110% of the total annual nitrogen uptake (lbs/acre/year). Calculations and monitoring data (submitted quarterly) shall use the **total nitrogen** in the applied wastewater (monitored by the treatment facility), total nitrogen from fertilizer applications, nitrogen uptake by crops or vegetation, evapotranspiration rate, precipitation rate, and fraction of applied nitrogen removed by denitrification and volatilization. Quarterly calculations shall be used to reconcile available nitrogen balance, prorated based on the allocated limitation (lbs/acre/year) defined in the EMP, and an annual report shall be submitted for the fourth quarter of every year demonstrating compliance with the Annual Nitrogen Balance limitation.

5: For each reporting year.

6: Calculated in the required EMP for irrigation fields managed by MGSD and incorporated by reference as the effluent limitation for the allowable application of nitrogen mass in units of pounds per year per acre. The amount of nitrogen applied shall not exceed 110% of the amount of nitrogen consumed by irrigated crops.

7: The calculated Annual Nitrogen Loading value included in the EMP must be reported on each quarterly Discharge Monitoring Report.

Monitor Wells MW-2 through MW-10 shall be monitored and limited according to the following:

Table 3: Groundwater Monitoring

PARAMETER	REQUIREMENTS	SAMPLE FREQUENCY	SAMPLE TYPE
Depth to Groundwater (feet)	Monitor & Report	Quarterly	Field Measurement
Groundwater Elevation (feet AMSL)	Monitor & Report	Quarterly	Calculate
Nitrate as Nitrogen (N, mg/L)	Monitor & Report	Quarterly	Discrete
Total Nitrogen as N (mg/L)	10	Quarterly	Discrete
Chlorides (mg/L)	Monitor & Report	Quarterly	Discrete
Total Dissolved Solids (TDS), (mg/L)	Monitor & Report	Quarterly	Discrete

mg/L: Milligrams per liter

The detection of concentrations of Total Nitrogen in groundwater samples invoke, at a minimum, the following limitations and response requirements:

i. If the Total Nitrogen concentrations increase to 7.0 milligrams per liter (mg/L), the Permittee shall notify the Division and submit a plan for the reduction of nitrogen in groundwater.

ii. If the Total Nitrogen concentration in groundwater increases to 9.0 mg/L, the Permittee shall begin implementation of the plan for the reduction of nitrogen loading to groundwater.

iii. If the Total Nitrogen concentration increases to 10.0 mg/L, the discharge to groundwater must cease.

Rationale for Effluent Discharge Limitations:

The rationale for the proposed monitoring conditions is as follows:

- *Flow*: The treatment system is designed/rated for operation at a 30-day average of 2.8 mgd (HDR Engineering, Inc.), with a daily maximum capacity of 3.1 mgd.

- *MGSD Irrigation Volume:* This reporting requirement is included for tracking nitrogen application to irrigation fields.

- *5-Day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$):* The 30-day average limitation is based on "secondary treatment standards" cited under Nevada Administrative Code (NAC) 445A.275. A minimum treatment efficiency of 85% is required between the influent and effluent concentration per NAC445A.275.

- *Total Suspended Solids (TSS)*: These limitations are based on secondary treatment standards required under 40 Code of Federal Regulations (CFR) §133.102. A minimum treatment efficiency of 85% is required between the influent and effluent concentration per NAC445A.275.

- *Fecal Coliform:* The proposed limitations are set at the limits for Reuse Category D (200 and 400 cfu/100 mL for the 30-day average and daily maximum, respectively), as proscribed in NAC 445A.2768. Access to the site is controlled. MGSD uses flood irrigation on reuse crop fields.

- *pH:* This limitation is based on reuse requirements and secondary treatment standards per NAC445A.275.

- *Priority Pollutants:* An annual monitoring requirement for priority pollutants is used to confirm the absence of industrial pollutants in the treated discharge.

- *Total Nitrogen as Nitrogen:* This reporting requirement is included to account for the total mass of nitrogen applied to irrigation fields.

- *Nitrate as Nitrogen:* This reporting requirement is included to evaluate the proportional distribution of nitrogen compounds in the treated effluent discharge.

- *Application Volume:* This reporting requirement is included to track the total amount of treated effluent discharged for reuse on MGSD irrigation fields.

- *Actual Nitrogen Loading, Allowable Nitrogen Loading:* These reporting requirement is included to verify the total amount of nitrogen applied to MGSD irrigation fields (treated effluent, fertilizers, and other nitrogen bearing supplements, etc.), and for tracking of compliance with the Effluent Management Plan.

Schedule of Compliance:

The Permittee shall implement and comply with the provisions of the permit upon issuance and the following schedule of compliance, after approval by the Administrator, including in said implementation and compliance, any additions or modifications the Administrator may make in approving the schedule of compliance. The Permittee shall implement and/or execute the following scheduled compliance requirements:

a. The Permittee shall achieve compliance with all discharge limitations upon issuance of the permit;

b. **By MMM DD, 2008,** the Permittee shall submit any revisions to the Effluent Management Plan (EMP) prepared in accordance with guidance document *WTS-1B: General Criteria for*

Preparing an Effluent Management Plan. The revisions must be stamped by a Professional Engineer licensed in the State of Nevada.

c. **By MMM DD, 2008,** the Permittee shall submit any revisions to the Operations and Maintenance (O&M) Manual, prepared in accordance with guidance document *WTS-2: Minimum Information Required for an Operation and Maintenance Manual for a Wastewater Treatment Plan.* The revisions other than staff changes, etc, must be stamped by a Professional Engineer licensed in the State of Nevada.

Proposed Determination:

The Division has made the tentative determination to issue (renew) the proposed permit for a 5-year period.

Procedures for Public Comment:

Notice of the Division's intent to issue a permit authorizing the facility to discharge to ground water of the State of Nevada, subject to the conditions contained within the permit, is being sent to **The Record Courier** (Douglas County legal notices) for publication. Notice is also 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 30 days following the date of the public notice, and must be postmarked, faxed, or E-mailed by 5:00 p.m. on **June 13, 2008**. 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 reason(s) why a hearing is warranted.

Any public hearing determined by the Administrator to will be conducted in the geographical area of the proposed discharge or any other area the Administrator determined to be appropriate. All public hearings will 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.

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