STATEMENT OF BASIS

The Lodge at Mount Rushmore
Pennington County, South Dakota

Large Capacity Septic System
SD52416-11992

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This Statement of Basis gives the derivation of site-specific UIC permit conditions and reasons for them. Referenced sections and conditions correspond to sections and conditions in SD52416-11992 (Permit).

EPA UIC permits regulate the injection of fluids into underground injection wells so that the injection does not endanger underground sources of drinking water (USDWs). EPA UIC permit conditions are based upon the authorities set forth in regulatory provisions at 40 CFR parts 2, 124, 144, 146 and 147, and address potential impacts to underground sources of drinking water. In accordance with 40 CFR § 144.35, issuance of this Permit does not convey any property rights of any sort or any exclusive privilege, nor authorize injury to persons or property or invasion of other private rights, or any infringement of other federal, state or local laws or regulations. Under 40 CFR § 144 Subpart D, certain conditions apply to all UIC Permits and may be incorporated either expressly or by reference. General permit conditions for which the content is mandatory and not subject to site-specific differences (40 CFR parts 144, 146 and 147) are not discussed in this document. Regulations specific to South Dakota injection wells are found at 40 CFR part 147 Subpart QQ.

DESCRIPTION OF FACILITY AND BACKGROUND INFORMATION

The Lodge at Mount Rushmore
24075 Highway 16A
Keystone, South Dakota 57751

hereinafter referred to as the "Permittee," applied for an Underground Injection Control (UIC) Program permit for an injection well or wells located at:

The Lodge at Mount Rushmore
24075 Highway 16A
Pennington County, South Dakota

The application, including the required information and data necessary to issue or modify a UIC permit in accordance with 40 CFR parts 2, 124, 144, 146 and 147, was reviewed and determined by EPA to be complete.

The Winona Inn Limited Partnership (Applicant) purchased the Lodge at Mount Rushmore (Lodge) in 2008. The contact is Mark Arend, General Partner of the Winona Limited Partnership. The Lodge is a 50-room resort destination in the Black Hills, 4.5 miles from Mount Rushmore National Monument. It has an indoor pool, hot tub and other guest services.

Previous site activities resulted in failure of former leach Field #2 that was part of the large capacity septic system. On March 31, 2016, EPA informed Mr. Arend that his Class V wells were no longer rule authorized and that he was prohibited from injecting effluent into the drain fields. EPA ordered Mr. Arend to abandon and plug the Lodge's failed septic systems or apply for a permit in order to continue to operate the large capacity septic system. Mr. Arend did not comply with federal, state and county laws even after repeated requests to do so. On July 3, 2017, the U.S. Environmental Protection Agency Region 8 made a final decision to deny a Class V Permit for The Lodge at Mount Rushmore. The former OWTS was successfully remediated, plugged and abandoned on December 12, 2019.

On April 22, 2020, Mr. Arend submitted a new Class V permit application proposing to operate a new large capacity septic system to dispose commercial sanitary wastewater from the hotel facility. The new OWTS can be constructed if a Class V Permit is issued by EPA. If issued, compliance with the Class V permit conditions will ensure the Lodge at Mount Rushmore's new OWTS will operate so that USDWs supplying local wells near the hotel and downgradient from the new OWTS are protected.

REQUIRED INFORMATION FOR THE PERMIT

The Lodge at Mount Rushmore has submitted all the required information and data necessary for Permit issuance in accordance with Title 40 Code of Federal Regulations (40 CFR), Parts 144, 146 and 147. A Draft Permit was prepared, and Public Notice Announcement of the Draft Permit has been published in *Rapid City Journal*. The 30-day Public Notice Announcement will be posted on EPA's website at www.epa.gov/uic/underground-injection-control-epa-region-8-co-mt-nd-sd-ut-and-wy.

Authorization to inject is issued for ten (10) years from the effective date of the Final Permit (40 CFR, Section 144.36) unless the Permit is terminated (per Part III, Section B of the Permit). In the event primary enforcement authority (primacy) for the UIC program is delegated to the State of South Dakota,

this Permit may be modified, reissued or terminated by the State. In the absence of such modification, reissuance or termination, all requirements of this Permit remain in full force and effect. Should this program be so delegated, EPA UIC Director will notify the Permittee of the name and address of the State UIC Program Director and the date that primacy is effective.

This Statement of Basis gives the site-specific Permit conditions and reasons for them. Part III of the Permit includes general Permit conditions, for which the content is mandatory and not subject to site-specific differences (based on 40 CFR, Parts 144, 146 and 147); the general Permit conditions are not included in this discussion.

REASON FOR THE PERMIT

The UIC Program, created under the authority of the Safe Drinking Water Act (SDWA), is a preventive program tasked with protecting underground sources of drinking water (USDWs). Shallow disposal systems that discharge certain types of fluids into the subsurface are known as Class V wells. These disposal systems consist of subsurface fluid distribution systems defined as an assemblage of perforated pipes, drain tiles or other similar mechanisms intended to distribute fluids below the surface of the ground (40 CFR Section 144.3). Class V wells with waste streams potentially containing constituents with Primary Drinking Water Standards or Health Advisories that have the potential to contaminate or degrade groundwater are required to operate under a permit. Permit requirements generally include monitoring the concentrations of contaminants of concern in waste fluids being released into the subsurface. The Permit also includes Best Management Practices designed to restrict or minimize the volume of contaminants released into the subsurface.

According to the Safe Drinking Water Act, Title 42 Chapter 6A Subchapter XII Part C § 300h(d)(2), underground injection endangers drinking water sources if such injection may result in the presence in underground water which supplies or can reasonably be expected to supply any public water system of any contaminant, and if the presence of such contaminant may result in such system's not complying with any national primary drinking water regulation or may otherwise adversely affect the health of persons. In order to demonstrate compliance with Permit limits, analytical results of fluid samples must verify that all the analyzed constituent concentrations do not exceed the values established by permit limits. The Permit limits have been established using Primary Drinking Water Standards and Health Advisories to prevent endangerment to USDWs. These constituents are included in Appendix B of the Permit.

BEST MANAGEMENT PRACTICES

To reduce contamination of the wastewater, The Lodge at Mount Rushmore will use best management practices, as defined in Part II, Section D.5 of the Permit. The new large capacity septic system shall be inspected monthly to ensure that it is accessible and operational. Maintenance and monthly inspections records shall be kept on site. While not required, the septic tanks should be pumped each year to sustain the OWTS's operational life. When the tanks are pumped, the outflow side should be pumped first. The inflow side should be pumped last. No person should attempt to enter any of the septic tanks or dosing tanks when they are empty because the fumes can be deadly.

A monthly inspection is needed to ensure the following:

1. There is no evidence of structural damage to the LCSS.
2. There is no septic odor coming from the LCSS.

3. There is no ponding near the drain field.
4. There is no burnt out grass or ground staining over the drain field.
5. There are no heavy objects or evidence from such objects in the vicinity of the soil absorption system.

Maintenance and monthly inspections records shall be kept on site. These best management practices will significantly reduce the amount of contaminants migrating into the groundwater.

AREA HYDROLOGY

A USDW is defined by UIC regulations as an aquifer, or a portion thereof, which contains less than 10,000 milligrams per liter total dissolved solids, and which is being used or could be used as a source of drinking water. The Lodge at Mount Rushmore is located in the Black Hills area. Depth to groundwater in the hotel area lies at approximately 180 feet below ground surface (ft bgs) and flows west/southwest.

The Black Hills are located within the Great Plains physiographic province in western South Dakota. The Black Hills strongly influence the hydrology of western South Dakota. Many streams in western South Dakota originate in the Black Hills, and major bedrock aquifers are recharged along outcrop areas in the Black Hills. Ground and surface water interact extensively in the Black Hills, and both streamflow and aquifer recharge are influenced by climatic conditions.

Groundwater originating in the Black Hills area is used for municipal, industrial, agricultural and recreational purposes throughout much of western South Dakota. The Black Hills are an area of "recharge," which means that some of the precipitation that falls here soaks into the ground and follows porous rock layers downhill away from the Black Hills. Numerous layers of sandstone and limestone carry groundwater beneath many northern plains states that originally fell in the Black Hills.

The drinking water wells that are near the proposed large capacity septic system are set at depths of 220 feet (ft.) and 280 ft. in Pre Cambrian rock. The lithology indicates 0-10 bgs is broken schist material underlain by a more competent mica schist from 10-280 feet bgs. The metamorphic rock is a metamorphosed conglomerate and is gray to grayish brown, with conglomeratic biotite phyllite, siliceous biotite phyllite, mica schist, quartzite and iron-formation mineralogy. The distribution, orientation and interconnection of the porosity/permeability in the fractures are difficult to predict, so the possibility of impacts does exist. Vulnerable geology, combined with septic system problems and drinking water wells in the vicinity, can be a cause for concern. There are private wells in the vicinity and other well logs near the system indicate the same lithology of little to no topsoil with the wells being directly into the metamorphic rock.

ERATHEM	SYSTEM	ABBREVIATION FOR STRATIGRAPHIC INTERVAL	GEOLOGIC UNIT	THICKNESS IN FEET	DESCRIPTION
CENOZOIC	QUATERNARY & TERTIARY (?)	QTac	UNDIFFERENTIATED ALLUVIUM, TERRACES AND COLLUVIUM	0-50	Sand, gravel, boulders, and clay.
	TERTIARY	Tw	WHITE RIVER GROUP	0-300	Light colored clays with sandstone channel fillings and local limestone lenses.
		Tui	INTRUSIVE IGNEOUS ROCKS	--	Includes rhyolite, latite, trachyte, and phonolite.
MESOZOIC	CRETACEOUS	Kps	PIERRE SHALE	1,200-2,700	Principal horizon of limestone lenses giving teepee buttes. Dark-gray shale containing scattered concretions. Widely scattered limestone masses, giving small teepee buttes. Black fissile shale with concretions.
			NIOBRARA FORMATION	[1]80-300	Impure chalk and calcareous shale.
			CARLILE SHALE	[1]350-750	Light-gray shale with numerous large concretions and sandy layers. Dark-gray shale.
			GREENHORN FORMATION	225-380	Impure slabby limestone. Weathers buff. Dark-gray calcareous shale, with thin Orman Lake limestone at base.
			GRANEROS GROUP: BELLE FOURCHE SHALE	150-850	Gray shale with scattered limestone concretions. Clay spur bentonite at base.
			GRANEROS GROUP: MOWRY SHALE	125-230	Light-gray siliceous shale. Fish scales and thin layers of bentonite.
			GRANEROS GROUP: MUDDY SANDSTONE / NEWCASTLE SANDSTONE	0-150	Brown to light-yellow and white sandstone.
			GRANEROS GROUP: SKULL CREEK SHALE	150-270	Dark-gray to black siliceous shale.
		Kik	INYAN KARA GROUP: FALL RIVER FORMATION	10-200	Massive to thin-bedded, brown to reddish-brown sandstone.
			INYAN KARA GROUP: LAKOTA FORMATION	35-700	Yellow, brown, and reddish-brown massive to thinly bedded sandstone, pebble conglomerate, siltstone, and claystone. Local fine-grained limestone and coal.
	JURASSIC	Ju	MORRISON FORMATION	0-220	Green to maroon shale. Thin sandstone.
			UNKPAPA SS	0-225	Massive fine-grained sandstone.
			SUNDANCE FORMATION	250-450	Greenish-gray shale, thin limestone lenses. Glauconitic sandstone; red sandstone near middle.
			GYPSUM SPRING FORMATION	0-45	Red siltstone, gypsum, and limestone.
	TRIASSIC	TrPs	SPEARFISH FORMATION	375-800	Red silty shale, soft red sandstone and siltstone with gypsum and thin limestone layers. Gypsum locally near the base.
PALEOZOIC	PERMIAN	Pmk	MINNEKAHTA LIMESTONE	[1]25-65	Thin to medium-bedded, fine grained, purplish-gray laminated limestone.
		Po	OPECHE SHALE	[1]25-150	Red shale and sandstone.
		PPm	MINNELUSA FORMATION	[1]375-1,175	Yellow to red cross-bedded sandstone, limestone, and anhydrite locally at top. Interbedded sandstone, limestone, dolomite, shale, and anhydrite. Red shale with interbedded limestone and sandstone at base.
	PENNSYLVANIAN				
	MISSISSIPPIAN	MDme	MADISON (PAHASAPA) LIMESTONE	[1]<200-1,000	Massive light-colored limestone. Dolomite in part. Cavernous in upper part.
	DEVONIAN		ENGLEWOOD FORMATION	30-60	Pink to buff limestone. Shale locally at base.
	ORDOVICIAN	Ou	WHITEWOOD (RED RIVER) FORMATION	[1]0-235	Buff dolomite and limestone.
			WINNIPEG FORMATION	[1]0-150	Green shale with siltstone.
	CAMBRIAN	OCd	DEADWOOD FORMATION	[1]0-500	Massive to thin-bedded brown to light-gray sandstone. Greenish glauconitic shale, flaggy dolomite, and flat-pebble limestone conglomerate. Sandstone, with conglomerate locally at the base.
PRECAMBRIAN		pCu	UNDIFFERENTIATED IGNEOUS AND METAMORPHIC ROCKS		Schist, slate, quartzite, and arkosic grit. Intruded by diorite, metamorphosed to amphibolite, and by granite and pegmatite.

[1] Modified based on drill-hole data

Modified from information furnished by the Department of Geology and Geological Engineering, South Dakota School of Mines and Technology (written commun., January 1994)

Figure 1. Stratigraphic column for the Black Hills.

SAMPLING INFORMATION AND REPORTING OF RESULTS

The Permit requires that the first samples be collected from the second chamber of the septic tank prior to entering the drain field within 30 days of the effective date of the Permit. Waste fluid samples shall be collected by the Permittee, or his representative, quarterly at three (3) month intervals from the last accessible containment prior to entering the drain field. Such sampling techniques shall be utilized so that the fluid sample is representative of the injectate released to the subsurface, and so the sample can be analyzed with EPA approved drinking water or equivalent methods. The analyzing laboratory shall utilize EPA methods indicated in the Draft Permit Appendix B, Tables 1 and 2 (or other methods that have been approved by the Director) to evaluate the concentrations of nitrates, nitrites and chlorine.

The Permittee shall notify the Director in advance of any modifications in procedures that might result in changes in chemical components of the fluid waste stream. After reviewing the proposed changes, the Director may add additional monitoring requirements as deemed necessary for the protection of underground sources of drinking water.

Whenever there is a change in the composition of injection fluids, another fluid sample shall be collected within thirty (30) days and analytical results shall be submitted to the Director no later than one (1) week after the Permittee receives the analytical results from the laboratory.

Records of any monitoring activity required under this Permit shall include:

(a) The date, exact place and the time of fluid sampling;
(b) The name of the individual(s) who performed the fluid sampling;
(c) A certification by the individual(s) who performed the sampling as to the date, exact place and the time of the sampling;
(d) The name and address of the laboratory that performed the analysis of the fluid;
(e) The exact sampling method(s) used to take the samples;
(f) The date the fluid sample was sent to the laboratory;
(g) The date(s) laboratory analyses were performed;
(h) The name of the individual(s) who performed the analyses;
(i) The analytical techniques or methods and quality control used by laboratory personnel; and
(j) The results of the analyses.

The Permittee shall report analytical results of samples collected and analyzed according to Part II, D.3 quarterly (at three [3] month intervals). The first sampling report is due January 1, 2021. The report of the fluid analyses shall be sent to the Director no later than one week after the Permittee receives the analytical results from the laboratory. Subsequent reports are due no later than January 1, April 1, July 1 and October 1 of each year.

The report of analytical results from sampling performed within thirty (30) days of an approved change in waste stream components shall be submitted to the Director no later than one week after the Permittee receives the analytical results from the laboratory.

The Permittee shall also submit all monitoring reports from sampling its Public Water System (PWS ID# SD4602217) as required by South Dakota's Drinking Water program to the EPA Director on a quarterly basis. This includes all sampling results for Total Coliform (TC) and any other contaminants required by the State. This may also include follow-up sampling results for fecal coliforms, *E. Coli,* or other contaminants depending on the results of the initial sampling.

STATE AND LOCAL GOVERNMENT CONSULTATION

To help ensure EPA's permit requirements align with state and county requirements to protect local USDWs, EPA consulted with the SD DENR on the construction details and sampling requirements of this proposed Class V well between September 9, 2020 and October 21, 2020 via email correspondence. EPA also consulted with the Pennington County Planning and Zoning Department on these construction details and sampling requirements of this well from September 9, 2020 to September 11, 2020 via email correspondence.

CONCLUSION

Because of the potential for total coliform, nitrates, nitrites and chlorine to enter the OWTS and migrate into groundwater, EPA Region 8 has determined that the OWTS will be regulated under a UIC Class V permit. The Permit also requires that the operator call EPA Region 8 to report any exceedances of Permit limits.