

Bryce Canyon National Park

Biological Evaluation
for
Sensitive Plant Species
for the
Bryce Canyon
Wastewater System Rehabilitation
and
Expansion on USFS Lands

Prepared by : _____

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Fletcher Linton
Park Botanist
Bryce Canyon National Park

Introduction

This biological evaluation analyzes the potential effects of this project on sensitive plant species which may occur in Bryce Canyon National Park and on adjacent areas of the Dixie National Forest. The names and status of these species are shown in Table I. The purpose of this biological evaluation is to make a determination regarding the likely effects of the proposal on the status of these species.

Proposed Action

The proposed project is to rehabilitate and expand the existing treatment system relining the three existing cells as necessary to re-establish a controlled seepage rate meeting Utah Code. The project also proposes to construct a fourth cell of sufficient size to meet present flows and future growth (see Figure I). A hydraulic balance that considered increased sewage flows, increased precipitation, and decreased evaporation was used to determine the size of the fourth cell. This design is the preferred treatment process of the Utah Department of Environmental Quality. Total land disturbance is estimated at less than five acres. It must be noted that most of the existing cell three is on USFS Lands and all of the new cell four will also occupy USFS Lands. This alternative identifies those services and regulations that are necessary to sustain present and future park wastewater generation and treatment requirements, improves public and employee health and safety, and provides sound, long-term resource protection and management.

The proposed site provides adequate space for construction of the new cell and construction related activities. This site provides excellent exposure to the sun, possesses good air movement, and is situated such that any lagoon odors would dissipate before reaching the Visitor Center, campground or other public use areas. All improvements would be installed and operated in accordance with Utah Administrative Code Rule R317-3 Design Requirements for Wastewater Collection, Treatment and Disposal Systems.

Purpose and Need

The purpose of this action is to provide a sewage treatment facility adequate to treat existing and 20 year park wastewater volumes in accordance with all federal and state public health regulations. The park must also meet its partnership agreement with the Dixie National Forest to provide sewage treatment generated by vault toilets across the forest.

The existing wastewater treatment and disposal system was constructed in 1964 and was designed to accommodate a visitation/use rate of 400,000 people per year. Since that time, park visitation has increased to as much as 1,700,000 in 1996 (Fig 1). A number of changes in the parks built environment have occurred since the sewage treatment facility was constructed. These changes have led to an increase in wastewater treatment needs.

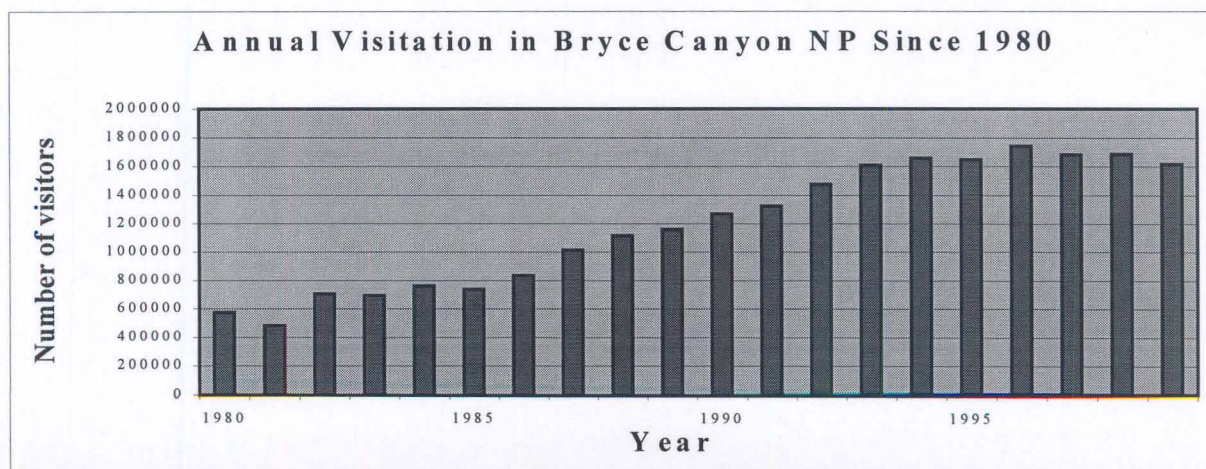


TABLE I

<u>Species</u>	<u>Common Name</u>	<u>Suitable Habitat</u>	<u>Status</u>
Bryce Canyon National Park			
<u>Astragalus wardii</u>	Ward Milkvetch	no	sensitive ¹
<u>Castilleja parvula</u> var. <u>revealii</u>	Reveal Indian Paintbrush	no	sensitive
<u>Cryptantha ochroleuca</u>	Yellow-white Catseye	no	sensitive
<u>Cymopterus minimus</u>	Cedar Breaks Biscuitroot	no	sensitive
<u>Erigeron abajoensis</u>	Abajo Daisy	no	sensitive
<u>Eriogonum aretioides</u>	Widtsoe Wild Buckwheat	no	sensitive
<u>Gentianella tortuosa</u>	Jone's Gentian	possible	sensitive
<u>Haplopappus zionis</u>	Cedar Breaks Goldenbush	no	sensitive
<u>Heterotheca jonesii</u>	Jones Golden-aster	no	sensitive
<u>Ivesia kingii</u>	King's Ivesia	no	sensitive
<u>Ivesia sabulosa</u>	Intermountain Ivesia	no	sensitive
<u>Lesquerella rubicundula</u>	Bryce Bladderpod	no	sensitive
<u>Lomatium minimum</u>	Little Desert Parsely	no	sensitive
<u>Oxytropis oreophila</u> var. <u>jonesii</u>	Jones' Locoweed	no	sensitive
<u>Pediomelum pariense</u>	Paria Breadroot	no	sensitive
<u>Phlox gladiformis</u>	Red Canyon Phlox	no	sensitive
<u>Penstemon bracteatus</u>	Red Canyon Beardtongue	no	sensitive
<u>Penstemon leiophyllus</u> var. <u>leiophyllus</u>	Markagunt Beardtongue	no	sensitive
<u>Physaria lepidota</u> var. <u>lepidota</u>	Mt. Carmel Twinpod	no	sensitive
<u>Physaria lepidota</u> var. <u>membranacea</u>	Red Canyon Twinpod	no	sensitive
<u>Senecio malmstenii</u>	Podunk Groundsel	no	sensitive
<u>Silene petersonii</u>	Peterson Catchfly	no	sensitive
<u>Sphaeromeria capitata</u>	Wyoming Rock-tansy	no	sensitive
<u>Townsendia minima</u>	Least Townsendia	no	sensitive
Dixie National Forest			
<u>Astragalus henrimontanensis</u>	Dana Milkvetch	no	sensitive
<u>Astragalus limnocharis</u> var. <u>limnocharis</u>	Navajo Lake Milkvetch	no	sensitive
<u>Astragalus limnocharis</u> var. <u>tabulaeus</u>	Table Cliff Milkvetch	no	sensitive
<u>Astragalus zionis</u> var. <u>vigulus</u>	Guard Milkvetch	no	sensitive
<u>Botrychium paradoxum</u>	Paradox Moonwort	no	sensitive
<u>Castilleja aquariensis</u>	Aquarius Paintbrush	no	candidate ²
<u>Castilleja parvula</u> var. <u>revealii</u>	Reveal Paintbrush	no	sensitive
<u>Cryptantha ochroleuca</u>	Yellow-white Cats Eye	no	sensitive
<u>Cymopterus minimus</u>	Cedar Breaks Biscuitroot	no	sensitive
<u>Draba sobolifera</u>	Creeping Draba	no	sensitive
<u>Eriogonum aretioides</u>	Widtsoe Buckwheat	no	sensitive
<u>Gilia caespitosa</u>	Rabbit Valley Gilla	no	candidate
<u>Haplopappus crispus</u>	Pine Valley Goldenbush	no	sensitive
<u>Hetrotheca jonesii</u>	Jones Goldenaster	no	sensitive
<u>Jamesia americana</u> var. <u>zionis</u>	Zion Jamesia	no	sensitive
<u>Lepidum montanum</u> var. <u>neesae</u>	Neese's Peppergrass	no	sensitive

1' sensitive' species rare but not rare enough to be listed, or don't have enough information for an ESA listing proposal.

2' candidate' species are those with enough data/information to support an ESA listing proposal.

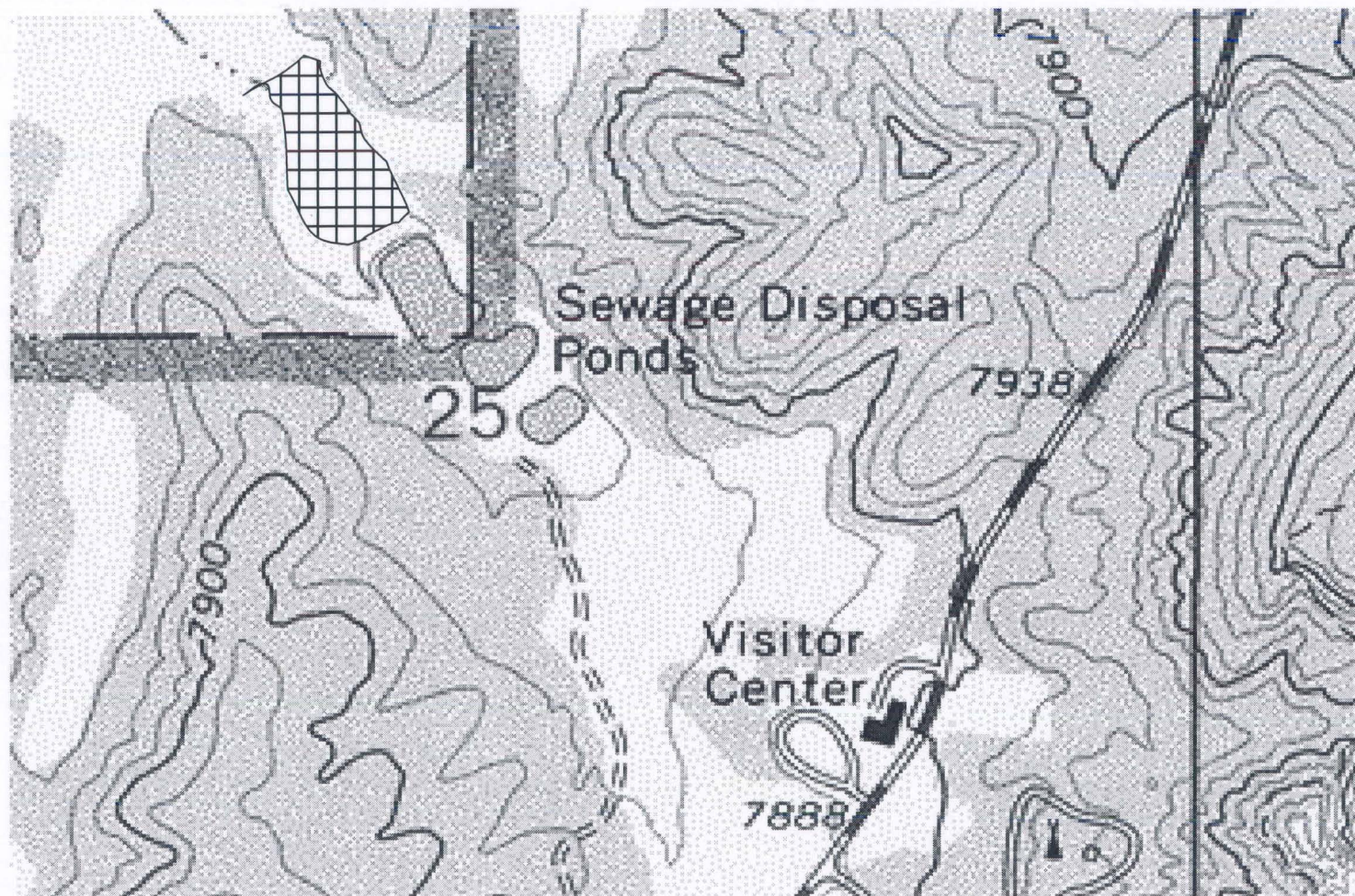


Figure I. Existing Ponds and Proposed Expansion (#) on Dixie NF Land

Changes in Park Facilities that Affect how sewage is treated and the quantity of sewage treated since original construction of the facility

1974 Aeration equipment installed
1980 Installation of grinding station to treat USFS campground vault toilet waste
1986 Expansion of Sunset Point restroom
1988 Lodge and Camperstore restroom, rooms, and shower expansions
1989 Construction of the Sunrise and Sunset motel units
1992 Construction of 8 employee housing units
1994 Maintenance yard restroom expansion and placement of 1 vault toilets
1997 District Ranger office restroom expansion and placement of 2 vault toilets
1999 Expansion of concessioner dorms
2000 Remodel and expansion of Visitor Center

Projected projects:

2002 Expansion of Sunset Point restroom
2003 Remodel of campground restrooms

There are no devices to monitor the sewage quantities flowing into the current facility so estimates of sewage quantities have been derived from two models; metered water production and through staff estimates of sewage production.

Total water production from September 1998 through August 1999 was 19.8 million gallons. However, all water produced at Bryce Canyon does not flow into the lagoons. Losses occur at many locations such as irrigation, vehicle washings, and fire fighting.

An estimate of sewage production was derived based on the following assumptions.

1. Visitors use 5.5 gallons of water per visit on average. (6,600,000 gallons in 1999)
2. Administrative water use is calculated at 2,500 gallons per day (headquarters, maintenance yard and district ranger office). (912,500 gallons in 1999).
3. NPS residential water use is based on 60 gallons/per person/per day.
Summer- 100 residents for 215 days (1,290,000 gallons in 1999)
Winter- 60 residents for 150 days (540,000 gallons in 1999)
4. Lodge, motels, and employee dorms operations is based on 100% of all metered water provided to the concessioner is sent to the treatment system. (7,250,000 gallons in 1999)
5. Horse Ride concession is based on 50% of metered water provided is sent to the treatment system. (250,000 gallons in 1999)

Note: 1-5 total 16,842,500 gallons of sewage in 1999

The Utah State Code allows a percolation rate from lagoons of 6,500 gallons per acre per day (11.86 million gallons per year). Rainfall, evaporation and percolation rates all interact to affect the water level in the lagoons. The capacity of the current system is estimated at 14.7 million gallons per year. Thus, the present system is operating at 114 percent of capacity. The National Park Service engineers

estimate that sewage treatment needs may reach as high as 23.9 million gallons per year by 2020 (160% of the current system treatment capacity).

The park does not know the actual rate of seepage through the bottom of the lagoons. However, it is suspected that seepage is greater than the original design had planned for. Primarily because the system is old and bentonite decays over time, thus losing its ability to seal the lagoon. In addition, the accumulation of sludge causes reduced pond capacity and promotes degradation of bentonite layer.

Species Effects

The only plant species that could occur within the project area is Gentianella tortuosa (Jones's Gentian). This species is listed as 'sensitive' on the Bryce Canyon National Park plant list.

Existing Conditions

This project will severely impact five acres of Daves Hollow on the Dixie National Forest just outside Bryce Canyon National Park. This five acre area is Artemisia nova/Stipa comata (Blacksage/Needle and Thread Grass) potential habitat type. Three out of Five acres of this area is highly disturbed (from past pond construction) and is vegetated with weedy grasses. The remaining two acres are slightly disturbed (from livestock grazing) and support degraded Blacksage/Needle and Thread Grass vegetation. This habitat type is marginal for Jones's Gentian. This plant is usually found in lithic calcareous soils within Pinus longaeva- Pinus ponderosa (Bristlecone Pine-Ponderosa Pine) communities. The nearest known populations of this species are in the southern part of the park associated with Bristlecone Pine at higher elevations. The project area has been surveyed for Jones's Gentian this summer, and none was observed. As such, no populations of Jones's Gentian occur within the project area.

Direct and Indirect Effects

There will be no loss of prime habitat for Jones's Gentian as a result of this project. The wastewater system rehabilitation and expansion on USFS lands will have no effect on Jones's Gentian and will not result in a trend towards federal listing.

Cumulative Effects

Because this project will have no effect on Jones's Gentian, there are no effects that would be cumulative to the effects resulting from other activities in the area.

Mitigation

Construction zones would be identified and fenced with construction tape, snow fencing, or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing. No materials would be stored in areas that would not be otherwise disturbed by construction.

Temporary impacts associated with lagoon construction would occur, such as soil and vegetation disturbance and the possibility of soil erosion. In an effort to avoid introduction of exotic plant species, all construction equipment would be pressure washed prior to entering the park and no hay bales would be used. Hay often contains seed of undesirable or harmful non-native plant species. Therefore, as determined on a case-by-case basis, other materials may be used for any erosion control dams that may be necessary. These include rice straw, straws determined by NPS to be weed-free (e.g., Coors barley straw

or Arizona winter wheat straw), cereal grain straw that has been fumigated to kill weed seed, and wood excelsior bales. Standard erosion control measures such as silt fences and/or sandbags would also be used to minimize any potential soil erosion.

Although soil side-cast during construction would be susceptible to some erosion, placing silt fencing around the excavated soil would minimize such erosion. Most excavated soil would be used in the construction project; excess soil would be stored in approved, previously disturbed areas. Silt fencing fabric would be inspected weekly or after every major storm. Accumulated sediments would be removed when the fabric is estimated to be approximately 75% full. Most construction will occur during winter months, a period during which precipitation is minimal.

Re-vegetation plantings would use native species from genetic stocks originating in the park, or from plants previously removed from the construction area. Re-vegetation efforts would be to reconstruct the natural spacing, abundance, and diversity of native plant species. All disturbed areas would be restored as nearly as possible to pre-construction conditions shortly after construction activities are completed. The principal goal is to avoid interfering with natural processes. Subsequent to project completion, park staff will monitor and remove any invasive species observed. In many areas soils and vegetation are already impacted to a degree by various human and natural activities. Construction would take advantage of these previously disturbed areas wherever possible. Soils within the project construction limits would be compacted and trampled by the presence of construction equipment and workers. Soils would be susceptible to erosion until re-vegetation takes place. When appropriate, vegetation impacts and potential compaction and conserving topsoil in windrows would minimize erosion of bare soils. The use of conserved topsoil would help preserve microorganisms and seeds of native plants. The topsoil would be re-spread in as near an original location as possible, and supplemented, where practical, with scarification, mulching, seeding, and/or planting with species native to the immediate areas. This would reduce construction scars and erosion.

Some petrochemicals from construction equipment could seep into the soil. To minimize this possibility, equipment would be checked frequently to identify and repair any leaks.

Earth disturbing activities would be monitored by park Resource Management staff. Should construction unearth previously undiscovered archeological resources, work would be stopped in that area. The park Superintendent would be notified, and the park would notify the State Historical Preservation Officer, the Utah State Archeologist, and the Advisory Council on Historic Preservation, as necessary, according to 36 CFR 800.13, *Post Review Discoveries*. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.

The National Park Service would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Contractors and subcontractors would also be instructed on procedures to follow in case previously unknown archeological resources are uncovered during construction. Equipment traffic would be minimized in the area of the site. Equipment and materials staging areas would also avoid known archeological resources.

The flow of public vehicle traffic on the main park road would not be impacted as a result of the project location and all construction equipment and vehicles will be routed to the project site via the Dave's Hollow road (USFS). There may be some periods when the weather conditions may make use of these gravel roads impassable. In those situations, vehicle traffic would be permitted on park roads, however, no road delays or closures are expected.

Contractors would coordinate with park staff to reduce disruption in normal park activities. Equipment would not be stored along NPS or USFS roadways without prior approval from Park or Forest management. Construction workers and supervisors would be informed about the special sensitivity of Park and Forest values, regulations, and appropriate housekeeping.