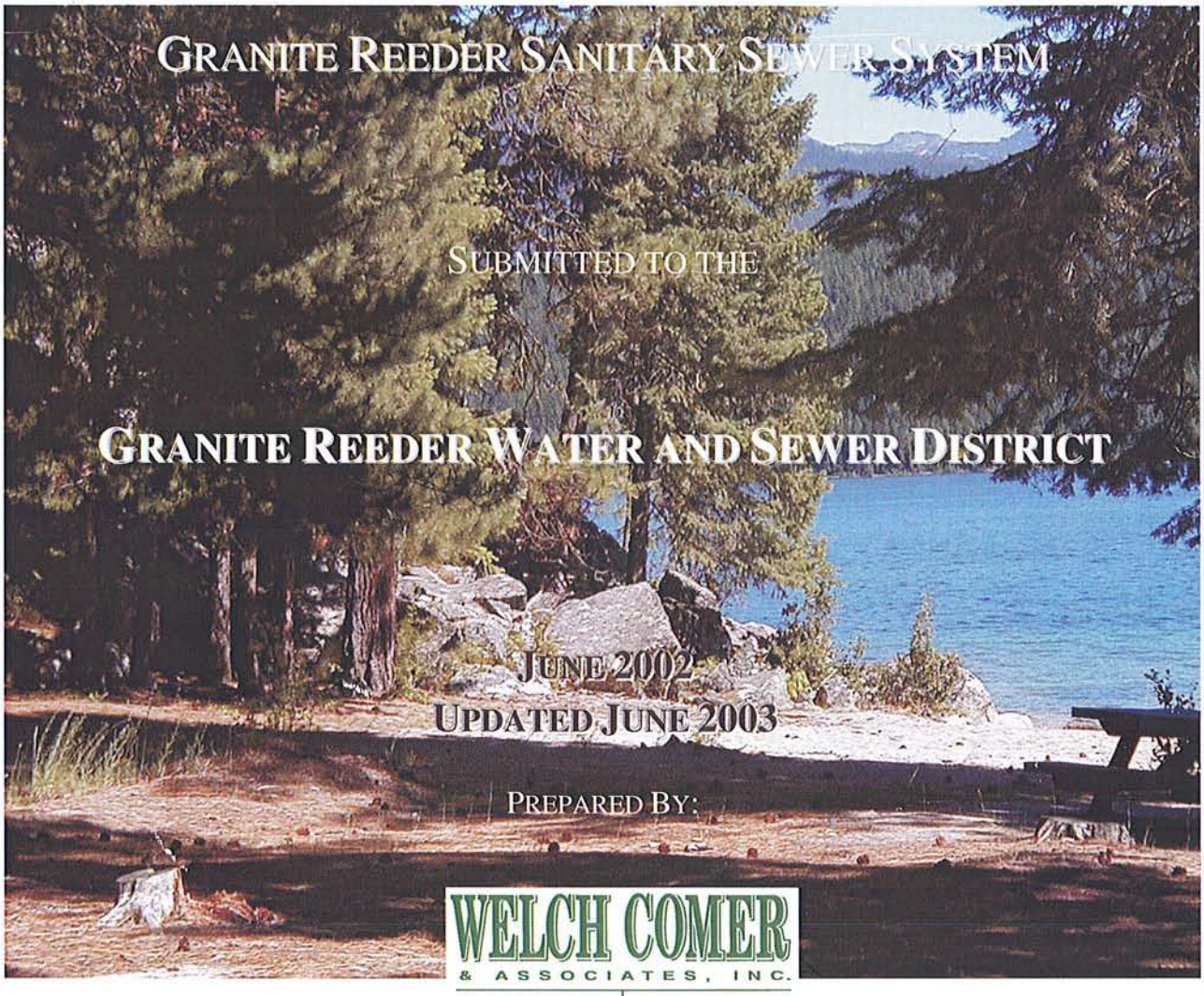
Environmental Assessment



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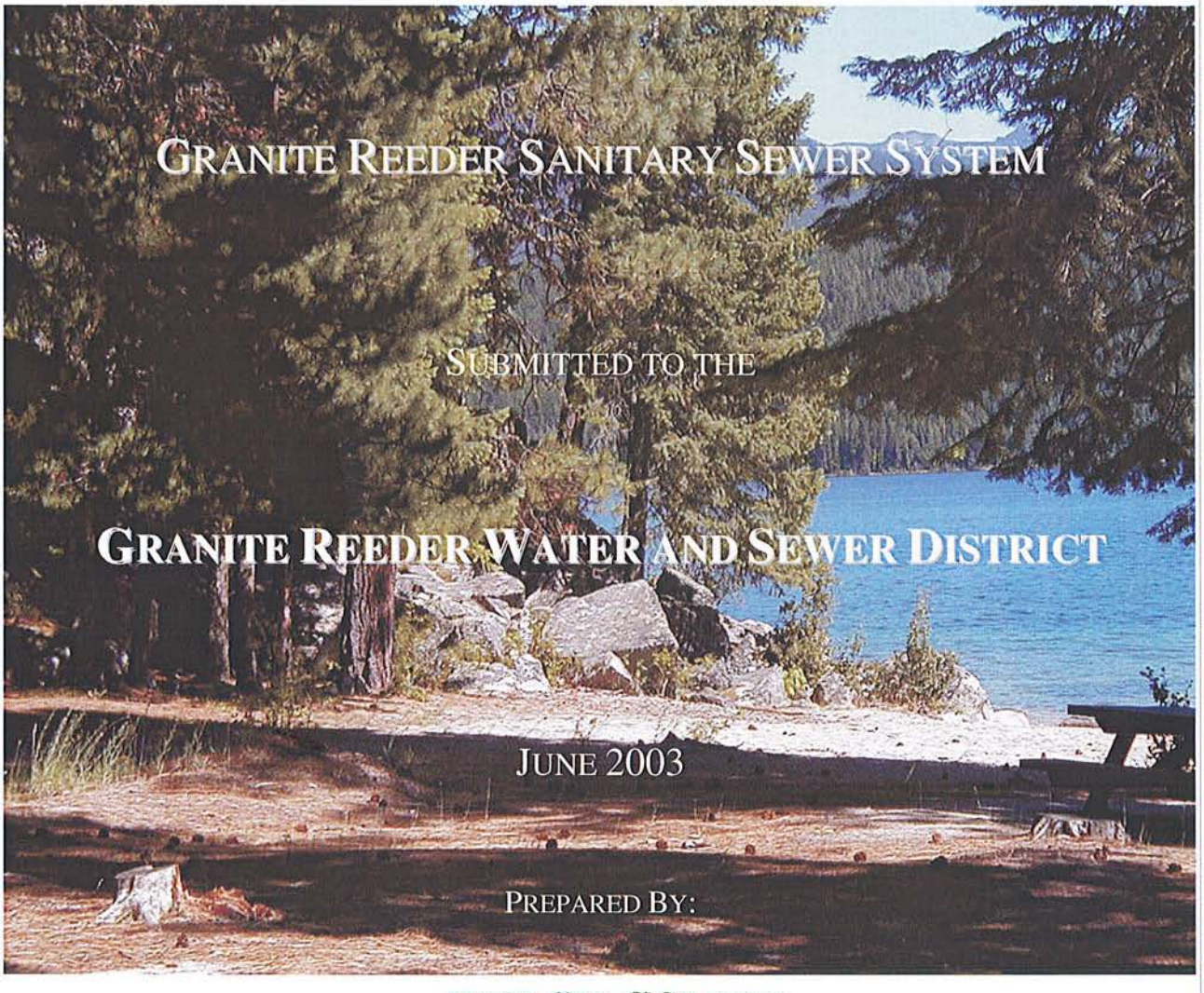
Environmental Assessment
ADDENDUM



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ENVIRONMENTAL ASSESSMENT ADDENDUM

For the Proposed
GRANITE /REEDER SANITARY SEWER SYSTEM
PRIEST LAKE, IDAHO

SUBMITTED TO THE:

GRANITE REEDER WATER AND SEWER DISTRICT

JUNE 2003

PREPARED BY:

WELCH COMER
& ASSOCIATES, INC.
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The LID Hearing (Continuation from 2002) was held June 21, 2003. The meeting was opened for questions from the public, which were fielded by the Board, Engineer, and Bond Counsel. Following the question and answer period, testimony from the public was given with regard to formation of the LID. The minutes from this meeting are included at the back of this document along with the newsletters, which were sent out following the first hearing in 2002.

The Board made a policy decision to send out response cards to the LID formation to each property owner in the District. Each property owner would get one response card and one "vote". The Board would base their final vote for rejection of the LID on a simple majority of responses in opposition to the LID. The Board made it clear to the public in the newsletters, that if a property owner did not return the response card, they would consider that property owner to be in favor of the project. The Board accepted the response cards through the beginning of the LID Hearing.

On Monday, June 23, 2003, the Board reviewed the cards and based on over 60% of the total being for the project (consisting of a yes vote on the card or a no response), the Board passed the formation of the LID for the Granite Reeder Sewer District, 3 to 1, with one abstention.

The purpose of this document is to review and summarize revisions to the proposed project and project costs that occurred since the Wastewater Facilities Plan and Environmental Assessment were published for agency review in June 2002.

1. JUNE 2002 ENVIRONMENTAL ASSESSMENT ADDENDUM

Following the September 2002 LID Hearing, the Granite Reeder Water and Sewer District approved an Amendment to the June 11, 2001 Services Agreement. The purpose of the Amendment was to finalize the June 2002 Facilities Planning Document with new ideas for cost savings for the District. Additionally, the District Board lost a member in early 2003 and picked a new member to replace him. After incorporating the new Board member and reviewing Welch Comer's cost saving ideas, the Board wanted to rerun the LID Hearing. Thus, as part of the Amendment, Welch Comer would provide necessary support through completion of the LID Hearing, which was scheduled for June 21, 2003. As required by IDEQ, public questions and comments would be incorporated to the Facilities Plan before finalization.

1. Identify and summarize the proposed cost saving changes to the project, which were developed after the September 2002 Local Improvement District hearing. These changes shall include:
    a. Potential project income from excess land at treatment site
    b. Credits for existing community sewer systems
    c. Pump basin sharing
    d. Allowing purchase of treatment only shares
2. Identify and summarize new components required for the revised project based on the recommended changes.
3. Identify and summarize potential environmental impacts for the project area based on the recommended changes.
4. Revise the estimated costs resulting from the recommended changes.
5. Revise the estimated LID assessment as a result of the recommended changes.
6. Incorporate public comment and necessary response by the Engineer to the recommended changes following the LID formation.
7. Finalize the June 2002 Facilities Plan with the completed Addendum; each of the following agencies will be provided with the Addendum:
    a. Granite Reeder Water and Sewer District
    b. Idaho Department of Environmental Quality

1.1. POTENTIAL COST SAVING IDEAS

Four potential cost saving ideas were developed based on ideas generated from public comment at the 2002 LID Hearing. These ideas are described below.

1.1.1. POTENTIAL PROJECT INCOME

The existing treatment site #1 has a total of 80 acres. Approximately 20 acres of land is located east of the main road that will be included in the USFS land purchase, since the land is being sold as one parcel. This 20-acre portion of land does not have adequate buffer area to be utilized as part of the treatment facility. This land has good road access, is nicely forested and could potentially be sold in order to generate project income.

The estimated potential revenue that may be generated from this parcel based on current land values in the Priest Lake area is approximately $250,000. Similarly, the market value of any timber, which might be harvested off of the parcel prior to closing of the LID, would be incorporated into the project budget as project income.

1.1.2. CREDITS FOR EXISTING COMMUNITY SEWER SYSTEMS:

Original estimates for the sewer system did not consider the value that existing commercial sewer systems may provide. The estimated on-site cost for a duplex grinder station with 2-2 HP centrifugal units, which can handle anywhere from 2 to 22 ER's is approximately $21,500 per connection. There are 10 existing community collection systems. The original estimated on-site cost for each of these systems was estimated at $3,500 per ER for the existing 112 ER's. Based on these numbers a savings of approximately $174,000 is realized by the District because of the existing community collection systems.

The Board and Welch Comer could develop and formalize a policy that would credit owners of the existing collection systems such as Grandview and Sundance a portion of this savings. For the existing 112 ER's in each of the 10 existing collection systems, the estimated savings of $174,000 is roughly equivalent to $1,550 per ER. The following is an example of how the savings would be applied:

Table 8-1: Example of Community Cost Savings

Community Collection System	Example System A
ER's	10
Estimated Assessment ($7200/ER)	$72,000
Minus Credit ($1550/ER)	$15,500
Total Cost	$56,500

In this example, each existing ER on an existing community collection system is credited $1,550. The total savings for the community system is $15,500.

Owners of existing community collection systems would be responsible for maintenance of their own on-site improvements. This credit would recognize the value of existing community facilities, which the District would not have to construct. In order to receive the community credit, the owner will be responsible for constructing a working connecting from their existing facilities to the duplex grinder units.

1.1.3. PUMP BASIN SHARING:

In many cases, it may be practical for two lots to share a common pump basin. By utilizing common pump basins, the total number of pump basins could probably be reduced by one third. Since the pump basins are the largest cost element of the on-site component of the LID assessment, LID assessment throughout the District may be reduced substantially. There are several logistic and policy issues regarding shared pump basins that would need to be addressed such as power service and pump location. Based on the map of the District, an

estimated 68 shared lift stations may be possible. Approximately 27 of these would require a traffic rated basin configuration.

This idea of shared basins was discussed with an electrical subconsultant and Northern Lights Power Company. From an electrical and hydraulic standpoint this option would be feasible. A schematic of this idea is provided at the back of this addendum. However, the District would need to establish a policy on the shared basins. Electrical service to the shared basins would likely be separate from either home and be owned by the District. A meeting with Northern Lights and District representatives was held in April 2003 to discuss the feasibility of this option. The following details were provided by Northern Lights.

Northern Lights provided the following cost information for each new service:

1. Estimated Costs:

   Construction Set up Fee (Per New Service): $500

   Transformer/Meter Fee (Per New Service): $600

   Service Line Installation (Per Lineal Foot): $7.10

   Minimum monthly service charge: $24/month

2. Northern Lights would allow multiple basins to be connected to one electrical service, in order to reduce the number of District owned services, and minimum monthly charges. However, the service line installation for connection of multiple basins may be cost prohibitive.

Our electrical subconsultant provided us with electrical costs associated with this option. The estimated cost for 8 new, 100 Amp electrical services, which would serve between 4 and 10 shared grinder basins, was $200,000. This did not include the costs outlined above for Northern Lights to extend their existing utilities to these new services. The estimated cost for the Northern Lights work based on the numbers outlined above was $40,000. The following table compares the costs for 68 shared basins with the cost for 136 individual basins:

Table 8-2: Comparison of Shared vs Individual Grinder Costs

Number of Shared Basins	Cost for Shared Grinder Basin	Total Electrical Cost per Shared Grinder ($240,000/68)	Min Month Charge per Home per Electrical Service	Total Up-front Cost for Shared Grinder	20 Year Cost for Shared Grinder with Min Monthly Charge	VS	Number of Homes	Grinder For Each
	$3145 each	$3529 per Grinder	$24 per Service					$3585 each[1]
9	$28,305	$31,761	$1	$60,066	$67,805		18	$64,530
9	$28,305	$31,761	$1	$60,066	$67,805		18	$64,530
9	$28,305	$31,761	$1	$60,066	$67,805		18	$64,530
14	$44,030	$49,406	$1	$93,436	$101,175		28	$100,380
4	$12,580	$14,116	$3	$26,696	$34,435		8	$28,680
5	$15,725	$17,645	$2	$33,370	$41,109		10	$35,850
6	$18,870	$21,174	$2	$40,044	$47,783		12	$43,020

12	$37,740	$42,348	$1	$80,088	$87,827	24	$86,040
Total				**$453,832**	**$515,741**		**$487,560**

1. Includes the estimated cost to upgrade existing electrical connections for each home ($440/home).

As shown in the table, the up-front costs for the 68 shared grinders including installation of 68 grinders and the necessary electrical modifications is estimated at $454,000. The table shows the estimated up-front cost for 136 individual grinders is $488,000, which is approximately $34,000 more. However, the 20-year value of the shared basins, which includes the minimum monthly charge of $24 per service, is approximately $28,200 more than the individual basin option.

This analysis shows that the costs associated with community electrical services for shared grinders is not economical for the District or the users. However, the District will continue to support voluntary pump basin sharing. This will require one of the "sharers" to provide power from their home to the shared basin. Additionally, in order to make this a viable option economically and technically, the following conditions must apply for two residences to share:

- Both lots must be occupied at the time of the LID.
- The lots will be subject to a maximum area requirement and residences must be within a maximum allowable distance of each other.
- No more than 2 ER's will be allowed to share one basin.

If there is interest shown in the shared grinder option with the residents providing power, the District will develop a policy to credit each homeowner sharing a basin. Initial discussions with the District have indicated a credit based on $1550 per ER. This credit is similar to that developed for the existing community systems. Refer to section 1.1.2. For the purposes of estimating the revised LID assessment, it was assumed that no shared grinders would be constructed.

1.1.4. TREATMENT ONLY SHARES:

The District and Welch Comer should evaluate the potential impacts of allowing property owners of multiple vacant lots that might have otherwise been consolidated, to purchase "treatment shares" only. Under this scenario, property owners would be allowed to purchase ER's based only on the treatment component of the project. This would significantly reduce the up front costs to property owners while allowing them to keep their options open. It would also ensure that the treatment facility was sized adequately to accept these future flows. This may reduce the number of consolidations and even encourage property owners to purchase additional ER's, which could increase the denominator in the LID assessment calculation and reduce the amount of the estimated assessments. **Stand-alone vacant lots will still be required to purchase a whole ER.**

The following table gives a summary of ER's based on the updated June 2003 LID role. This was used to revise the estimated assessment and to predict how the purchase of treatment only shares may affect the original estimate.

Table 1-3: Summary of ER's

Occupied	2nd Residences	Vacant	Potential Consolidations	Total Un-Assessable ER Value
335	7	163	77	8

The following is a definition of each category given in the table and assumptions made in order to estimate the revised LID assessment:

- Occupied: This number includes all commercial and residential ER's that are occupied.
- 2nd Homes: This is number represents additional residential ER's found on one residential lot. The number represents additional ER's for any lot that listed two or more residences, excluding condominiums or commercial lots. For the purposes of estimating the assessment it was assumed that 4 out of the 7 would be converted to a non-permanent residence in order to avoid a 2 ER assessment. The remaining 3, 2nd residences would be maintained. Thus a total of 330 occupied ER's was assumed (335 + 3 – 8).
- Vacant: As shown there were 163 total vacant lots. This includes lots that may potentially be consolidated. If all 77 lots consolidate, there would be a total of 86 vacant, stand-alone lots.
- Potential Consolidations: There are an estimated 77 potential consolidations. This number represents the number of consecutive lots owned by the same person. Lots must be side by side in order to be consolidated. Lots cannot be consolidated if a lot owned by someone else or a road separates them.
- Total Un-Assessable ER Value: Because the value of land for some of the lots is below the estimated LID assessment, they cannot be assessed the full value. The total amount that cannot be assessed is approximately $54,000. This is equivalent to approximately 8 ER's. Therefore, the final ER total was reduced by this amount to reflect the value of unassessable land that would be covered by other LID members.
- Assumptions: Until the LID is finalized there is no best way to determine the exact number of ER's that will be sold. Therefore, it was necessary to make some assumptions in order to estimate the LID assessment. The following assumptions were developed conservatively.
    - It was assumed that 2/3 of the 77 potential consolidations (or 51 ER's) would be consolidated into the existing occupied ER's.
    - It was assumed that the remaining 1/3 of the 77 potential consolidations (or 26 ER's) would purchase treatment shares only.
    - All 86 stand alone vacant ER's must purchase a whole ER.
    - It was assumed that the District would sell an additional 20 ER's on top of the existing vacant and occupied's. This additional 20 ER's would be purchased for

future capacity for growth. These 20 ER's would be in the form of treatment shares only.

- **Thus the final estimate assumes 416 whole shares are purchased and 46 treatment only shares are purchased.** Therefore the estimated total ER's at buildout increases from the original 400 estimated in 2002 to 462 ER's. The following is a list of notes on the estimated ER's.
  - The original 400 ER's was based on the assumption that all potential consolidations would be consolidated.
  - Additionally, the original service area included residential lots in the Reeder Bay area. The current costs and estimated ER's do not include service to the Reeder Bay area beyond Elkin's Resort. Residential lots in this area will receive a 0 assessment notice.
  - Also, it should be noted that lots located in Section 19, which are within the District Boundary, are outside the service area and will not be served by this LID. These lots will receive a 0 assessment notice.
  - The following properties do not show up on the current LID role because they are located on US Forest Service Lease Land. ER's for these properties have been included in the final ER tally.
    - Elkin's Resort (22 ER's)
    - Lease Lots on Reeder Bay Road (8 ER's)
    - Reeder Bay Campground (2 ER's)
    - Ledgewood Picnic Area (8 ER's)
  - Annexation of Kaniksu Resort has not been finalized. Kaniksu Resort represents 20 ER's, which have been included in the final ER tally.

1.2. ENVIRONMENTAL IMPACTS

1.2.1. POTENTIAL PROJECT INCOME

The sale of the 20 acre unusable portion of land will not affect the original environmental or historical impact conclusions presented in the original report. The county zoning of this parcel will dictate the ultimate type of land use here.

1.2.2. CREDITS FOR EXISTING COMMUNITY SEWER SYSTEMS

No environmental impacts are anticipated by incorporation of this idea into the project. The purpose of this idea is to redistribute the estimated costs of providing commercial service through the total project cost. By requiring commercial connections to provide their own private collection system, project costs can be reduced, and savings can be distributed through the rest of the District.

1.2.3. PUMP BASIN SHARING

This option was determined to be uneconomical and thus was eliminated from further consideration as part of the final project.

1.2.4. TREATMENT ONLY SHARES

This idea will generate additional cost savings for the District and will not result in adverse environmental impacts. This idea may potentially promote a small amount of growth within the District. This growth will be somewhat limited by the amount of existing open space, however. The cost and size of the treatment facility required to treat 450 versus 500 ER's will not vary by a large amount. It should be noted that the estimated cost of the treatment facility was based on providing treatment for 403 ER's, with a 30% factor of safety. Thus the ultimate number of ER's would be 524. The ultimate sizing of the facility will be dependent on the number of ER's sold. Financing of a larger treatment facility, as needed, will be collected in the number of treatment shares sold.

1.3. REVISED COSTS

The following tables provide the revised project cost breakdowns:

- Table 1-4: Revised Construction and Engineering Costs

The original project costs were revised based on the cost saving measures. The construction costs shown reflect the following revisions:

- On-Site: The revised costs for the on-site component reflect a total reserve of $174,000 which will be given back to each existing community collection system based on the number of active ER's on each.
- Collection: In order to further reduce project costs and increase the cost effectiveness of the collection system per ER's served, the revised LID excludes the small number of residential lots located beyond Elkin's Resort in the Reeder Bay Area. This reduced the original estimated collection system construction cost.
- Treatment: The treatment component was increased slightly by adding a portion of the main collector cost to the estimated lagoon cost. This in turn reduced the original construction cost for the collection system. The purpose of this was to ensure that sufficient funds would be available to finance upsizing of the main collector and treatment facility to ensure sufficient capacity if a large number of treatment only shares were purchased.
- Construction Interest/Interim Financing:

The earlier estimation for construction interest/interim financing was based on an average bank loan of 5% and a construction period of 2.5 years. In order to reduce the accrual of interim interest, DEQ indicated that STAG funds could be used first for payment for land purchase, design and part of the construction. Additionally, rather than receiving interim financing from

Table 1-4: Estimated Project Cost Breakdown for Each Project Component for the Recommended Alternative 1 (Grinder in Road ROW, 1/3 Easements) with Elkins and Cost Saving Measures
Pressure Collection to Treatment Site 1 with Lagoon and Land Application

		Project Component		
		A	B	C
	Project Total	On-Site	Community Collection	Treatment
CONSTRUCTION	$ 4,064,380	$ 1,368,664	$ 1,617,203	$ 1,078,513
ENGINEERING				
Preliminary Engineering				
Study and Report	$ -	$ -	$ -	$ -
Public Communication/Participation	$ -	$ -	$ -	$ -
Environmental Service	$ -	$ -	$ -	$ -
Engineering				
Design Phase Services	$ 483,047.50	$ 162,664.35	$ 192,202.96	$ 128,180.19
Geotechnical Subconsultant	$ 5,000.00	$ 1,683.73	$ 1,989.48	$ 1,326.79
Electrical Subconsultant	$ 20,000.00	$ 6,734.92	$ 7,957.93	$ 5,307.15
Bidding and Construction Phase Services	$ 488,047.50	$ 164,348.08	$ 194,192.44	$ 129,506.98
Construction Staking	$ 20,000.00	$ 6,734.92	$ 7,957.93	$ 5,307.15
LAND ACQUISITION				
Treatment Site				
Administration/Negotiations	$ 5,000.00			$ 5,000.00
Appraisals/Title Reports	$ 7,000.00			$ 7,000.00
Document Preparation	$ 1,000.00			$ 1,000.00
Legal Fees	$ 1,000.00			$ 1,000.00
Purchase/Lease	$ 236,000.00			$ 236,000.00
Recording Fees	$ 200.00			$ 200.00
Records-of-Survey	$ 9,000.00			$ 9,000.00
Total	$ 259,200.00			
Residential On-Site Easements	60			
Administration/Negotiations	$ 21,000.00	$ 21,000.00		
Appraisals/Title Reports	$ 9,000.00	$ 9,000.00		
Document Preparation	$ 10,500.00	$ 10,500.00		
Legal Fees	$ 500.00	$ 500.00		
Recording Fees	$ 540.00	$ 540.00		
Total	$ 41,540.00			
Commercial On-Site Easements	10			
Administration/Negotiations	$ 17,500.00	$ 17,500.00		
Appraisals/Title Reports	$ 1,500.00	$ 1,500.00		
Document Preparation	$ 1,750.00	$ 1,750.00		
Legal Fees	$ 1,000.00	$ 1,000.00		
Recording Fees	$ 90.00	$ 90.00		
Total	$ 21,840.00			
Main Line Easements	40			
Administration/Negotiations	$ 7,500.00		$ 7,500.00	
Appraisals/Title Reports	$ 6,000.00		$ 6,000.00	
Document Preparation	$ 7,000.00		$ 7,000.00	
Legal Fees	$ 1,000.00		$ 1,000.00	
Recording Fees	$ 600.00		$ 600.00	
Total	$ 22,100.00			
FINANCING EXPENSES				
Grant Administration	$ 20,000.00	$ 6,734.92	$ 7,957.93	$ 5,307.15
Bond Attorney	$ 8,000.00	$ 2,693.97	$ 3,183.17	$ 2,122.86
Bond Costs	$ 28,250.00	$ 9,513.08	$ 11,240.58	$ 7,496.34
LID Formation	$ 15,000.00	$ 5,051.19	$ 5,968.45	$ 3,980.36
LID Confirmation	$ 10,000.00	$ 3,367.46	$ 3,978.97	$ 2,653.57
OTHER				
County Bond Fees	$ 3,000.00	$ 1,010.24	$ 1,193.69	$ 796.07
Warranty/Operation and Maintenance Assistance	$ 10,000.00	$ 3,367.46	$ 3,978.97	$ 2,653.57
Construction Interest	$ 88,000.00	$ 29,633.65	$ 35,014.90	$ 23,351.44
Subtotal Allied Costs	$ 1,543,025.00	$ 466,917.97	$ 498,917.41	$ 577,189.62
Total Estimated Project Cost	$ 5,607,405.00	$ 1,835,581.97	$ 2,116,120.41	$ 1,655,702.62

the open bond market at a higher interest rate, the DEQ loan could be activated and used for interim financing as soon as the STAG was exhausted.

The treatment facility is proposed for construction, contingent upon Congressional approval of the land sale, for summer 2003 and the on-site and community collection systems would be constructed in summer 2004. For the purposes of revising the estimated assessments, it was assumed that the District would exhaust the STAG funds within one year of the start of design. Therefore, interim financing would be required in the second year and would be financed as part of the IDEQ loan. The following table summarizes the revised construction interest calculation.

Table 1-5: Construction Interest for the Recommended Alternative

Begin	Phase	Approx Project Cost	Interest Period (months)	Balance	Accrued Interest Earned on Balance
Fall 2003	Complete Design and Construction	$5.61 million			
minus	STAG Grant	$2.23 million			
Total Project Cost with Construction Interest after Grant:		**$3.38 million**	**12**	**$3.38 million**	**$88,000**

The total project cost with construction interest, before the grants is $5.61 million. Note that this cost does not take into account the value of the 20 acre unusable portion of the treatment site. The table shows that the estimated construction interest for the recommended alternative is estimated at $88,000 over one year after the STAG grant. This assumes the IDEQ loan of 3.75% plus an additional 1% for District administration for an annual interest rate of 4.75% is applied to the remaining project cost.

- Table 1-6: Revised Costs Including Potential Project Income
  - The original project costs were reduced based on the STAG and DEQ grants. The original cost did not reflect potential project income based on the value of the unusable 20 acre piece of land. A conservative estimate of $250,000 for the value of this land is shown as project income in Table 1-6, which helps reduce the overall assessment.

1.4. Revised LID Assessment

- Table 1-7: Revised Assessment Based on Revised Project Costs
- Table 1-8: Revised Assessment Breakdown Based on Revised ER's and Potential Treatment Shares

1.5. Newsletters and Public Comment

Table 1-6: Total Project Cost for Recommended Alternative (Grinder in Road ROW, 1/3 Easements) After Grant with Elkins and Cost Savings

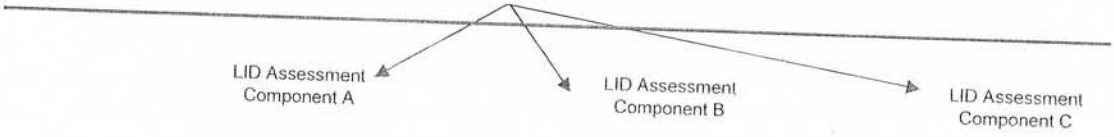
		Project Component		
		On-Site	Community Collection	Treatment
Estimated Project Cost	Total Project	A	B	C
	$ 5,607,405	$ 1,835,582	$ 2,116,120	$ 1,655,703
Percent of Total Project		33%	38%	30%
Grants and Potential Project Income		Project Component		
		A	B	C
STAG Grant	$ 2,226,000	$ 1,753,745	$ 264,951	$ 207,304
Land Value ($250,000)	$ 250,000	$ 81,837	$ 94,345	$ 73,818
Estimated Local Project Share	$ 3,131,405	$ (0)	$ 1,756,824	$ 1,374,581

Table 1-7: Estimated Assessment for Recommended Alternative (Grinder in Road ROW, 1/3 Easements) after Grant with Elkins and Cost Savings

	A	B	C	
ER's	On-Site (354)	Community Collection	Treatment	Total Assessment
Occupied ER's (354)	$ (0)	$ 4,223	$ 2,975	$ 7,198
Vacant ER's (112)	N/A	$ 4,223	$ 2,975	$ 7,198
			Total Assessment (Vacant or Occupied)	$ 7,198

Table 1-8: Estimated Assessment per Lot for Recommended Construction Alternative 1 (Grinders in Road ROW, 1/3 Easements) and Option 2 Grant Allocation with Elkins and Cost Savings

		Funding Allocation Option 2 (Allocation Priority to Component A)	
Component A	On-Site Collection	$0	
Component B	Collection System	$1,756,824	
Component C	Treatment Facility	$1,374,581	
	Total Estimated District LID Project Costs	**$3,131,405**	(LID Assmt Numerator)
Total Estimated Lots, Parcels, and ER's	Existing ER's	330	(LID Assmt Denominator)
	Vacant Lots (Full Share)	86	
	Vacant Lots (Treatment Share)	46	



On Site Grinder Collection Units in Road ROW	Pressure Collection System	Lagoon with Land Application Treatment
$0	$1,756,824	$1,374,581
divide	divide	divide
330	416	462
$0	**$4,223**	**$2,975**
(Covered by Grant)		

By combining the three components of LID assessments based upon the number of lots/parcels/ER's which benefit, results in the following calculations:

LID Assessment Component	Full Share Occupied Lots	Full Share Vacant Lots	Treatment Share Vacant Lots
A	$0	N/A	N/A
B	$4,223	$4,223	N/A
C	$2,975	$2,975	$2,975
Total One Time Assessment per Lot	**$7,198**	**$7,198**	**$2,975**

If Amortized over 20 years at 4.75% Interest (0.07855 Annual Factor), the Annual Installment for LID Payments would be as Follows:

	Full Share **Occupied Lots (per Lot per Year)**	Full Share **Vacant Lots (per Lot per Year)**	Treatment Share **Vacant Lots (per Lot per Year)**
	$565	**$565**	**$234**
plus Annual Operation and Maintenance Cost ($25 per month)	**$300**	**$300**	**$0**
Total Annual Cost	**$865**	**$865**	**$234**
Total Monthly Cost	**$72**	**$72**	**$19**

GENERAL NOTES

14070DEM-SW.DWG, 06-24-02

ARETE ENGINEERING, INC.

WELCH COMER & ASSOCIATES, INC.
ENGINEERS SURVEYORS

GRANITE-REEDER SEWER DISTRICT
PROPOSED UTILTIY SERVICE LOCATIONS

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1 INTRODUCTION

1.1 Funding

The District obtained a grant from the Idaho Department of Environmental Quality (IDEQ) to prepare a facilities plan for wastewater collection and treatment. The District has also secured a State and Tribal Assistance Grant (STAG) from the Environmental Protection Agency (EPA).

The grant will provide approximately $2.3 million in financial assistance for the design and construction of wastewater collection and treatment facilities. The District will pay the remaining project costs. If the District decides to proceed with the project, they intend to propose a local improvement district (LID) to District property owners, which would be used to secure a low interest loan from IDEQ to pay for their share of the costs.

Under the current schedule, the District would hold a series of public meetings and form an LID in the summer of 2002. The project design would begin in the fall of 2002 with construction beginning in the spring of 2003. In the fall of 2004, construction would be completed and the LID closed. A more detailed discussion of the project schedule is included in section 4.3 of this report.

The District has secured a State and Tribal Assistance Grant (STAG) from the Environmental Protection Agency (EPA). The grant will provide approximately $2.3 million in financial assistance for the design and construction of wastewater collection and treatment facilities. The District will pay the remaining project costs.

1.2 Authorization

The Granite Reeder Water and Sewer District authorized Welch Comer & Associates to prepare this Environmental Information Document (EID) for the Granite Reeder Water and Sewer District - Wastewater System Improvement Project in their agreement dated, June 2001. The Wastewater System Improvement Project consists of the following phases:

- Phase IA – Preparation of Facilities Planning Document
- Phase IB – Public Meeting Services
- Phase IC – Environmental and Archaeology Review Services
- Phase ID – LID Formation

The year 2002 draft Facilities Planning Document ("FPD") for this project was submitted to the Idaho Department of Environmental Quality in April 2002. Portions of the information presented in the 2002 FPD in addition to portions of the 1992 Facilities Plan are included herein for completeness.

The scope of this EID document follows the Idaho Division of Environmental Quality, "Checklist for Environmental Information Documents." This document includes the following:

- Project Identification
- Description of Proposed Project
- Project Purpose and Need
- Evaluation of Alternatives
- Description of the Affected Environment
- Environmental Impacts of the Proposed Project
- Means to Mitigate Adverse Environmental Impacts
- Public Participation
- Documentation
- Reasons for Concluding there will be No Significant Impact

1.3 Project Identification

1.3.1 Project Title:

Granite Reeder Water and Sewer District Wastewater System Improvements

1.3.2 Applicant:

Granite Reeder Water and Sewer District
HCO-1 Box 456
Nordman, Idaho 83848

1.3.3 IDEQ Project Number:

Project Number: 112-1-000-1

1.3.4 Project Contact:

Welch Comer & Associates, Inc
1626 Lincoln Way
Coeur d'Alene, Idaho 83814

1.3.5 Estimated Project Costs – Preferred Alternative:

Collection System:	
On-site Grinder Pump and Basin	$2,034,830
Community HDPE Pressure Collection	$2,626,110
Treatment Plant:	
Lagoon with Land Application	$1,187,550
Total Estimated Project Cost	**$5,848,490**

1.3.6 Funding:

IDEQ State Grant for Wastewater Facilities Plan (75% of Preliminary Engineering Fee):	$63,000
EPA STAG Grant:	$2,226,000
Total Funding Available	**$2,289,000**

Table 1-1 summarizes the estimated project costs and distribution of funding for the preferred alternative.

Table 1-1:

Project Cost Summary for Preferred Alternative

Grinder in Road ROW, 1/3 Easements, Pressure Collection to Lagoon and Land Application

		Project Component		
		On-Site	**Community Collection**	**Treatment**
	Total Project	**A**	**B**	**C**
Estimated Project Cost (before grant)	**$5,848,490**	**$2,034,826**	**$2,626,109**	**$1,187,555**
Percent of Total Project		**35%**	**45%**	**20%**
		Project Component		
(Grants, Applied First to On-Site Component)		**A**	**B**	**C**
STAG Grant	**$2,226,000**	$2,012,906	$146,740	$66,360
IDEQ Grant (75% of Preliminary Engineering Fee)	**$63,000**	$21,920	$28,290	$12,790
Estimated Local Project Share	**$3,559,490**	**$ -**	**$2,451,079**	**$1,108,405**

Table 1-1 shows that the STAG Grant was applied to the on-site project component first. The STAG grant was given to the District in order implement new sewer facilities and prevent contamination of Priest Lake and the Granite Reeder area. Because the existing occupied lots pose the largest threat of pollution to the Lake and the area, the Board chose to apply the grant toward improving occupied lots. Because only occupied lots will pay for the on-site component, the grant was applied to this component first.

1.3.7 Estimated User Cost Per Household:

The District does not have any existing public sewer facilities. Therefore, there is no monthly user charge or debt service. This project would result in an estimated user charge for operation and maintenance of $28 per month and a debt service charge of $655 per year or $55 per month, unless the user elected to pay their assessment in one payment of $8,900. The total monthly cost per household after the project is in operation, assuming that the owner elects to use the debt service at 4.00% per year for 20 years, will therefore be $83 per month.

Table 1-2 summarizes the estimated user cost per household for the recommended alternative.

Table 1-2

Summary of Estimated Cost per Household based on the Estimated LID Assessment and Predicted O and M Fees

	One Time LID Assessment		Annual LID Assessment[1]	
	Year 1	Year 2 through 20	Year 1	Year 2 through 20
LID Assessment	$8,900	$ -	$ 650	$12,440
Annual Operation and Maintenance Fees[2]	$340	$9,140[3]	$340	$9,140[3]
Total	$9,240	$9,140	$990	$21,580
Total Cost to Homeowner over 20 years		**$18,380**		**$22,570**

1. If Amortized over 20 years at 4.00% Interest (0.07358 Annual Factor).
2. Assumes that the monthly billing will be similar to the Kalispell Bay Sewer District at $28 per month per user.
3. Includes an average annual inflation of 3%.

Table 1-2 shows that the estimated cost per household, if the user opts to pay the LID assessment all at once would be $18,380 over 20 years, including operation and maintenance fees. If the user opts to amortize the assessment with the 4% IDEQ loan over 20 years, the total cost to the homeowner, with o and m fees over 20 years would be an estimated $22,570.

For comparison, Table 1-3 shows the estimated cost per assessment without the grant.

Table 1-3

Comparison of Estimated LID Assessment with and without Grant Monies

	Occupied ER	Vacant ER
LID Assessment without Grant Monies	$15,610	$9,530
LID Assessment with Grant	$8,900	$8,900
Savings per ER	$6,710	$630

Table 1-3 shows that the estimated assessment without the grant would be $15,600 per occupied ER and $9,530 per vacant ER. The grants result in a savings of $6,710 per occupied ER and $630 per vacant ER.

1.4 Project Area

Refer to Section 6 for Figures 1A and 1B, which show the project area and District Boundaries.

2 PURPOSE AND NEED:

2.1.1 Purpose

The purpose of this project is to construct a wastewater collection system, lagoon, and land application system to treat wastewater from Granite Reeder Water and Sewer District.

2.1.2 Need

The District population is expected to continue to grow within its boundaries. Without implementation of a wastewater collection and treatment facility, developers will continue to institute use of on-site disposal systems that are not monitored, and many of which do not meet the existing requirements of IDEQ and the Panhandle Health District.

In addition to the existing, substandard on-site treatment units pose a potential public health and an environmental risk due to the high groundwater level in the Granite Reeder area in which residents have drinking water wells connected.

2.1.3 Project Goal

The goal of the project is to eliminate environmental and public health risks, which may result from the use of the existing substandard, on-site treatment units or lack of.

2.1.4 National Pollutant Discharge Elimination System Permit Program (NPDES)

The NPDES permit program does not apply to this project. There will be no waste discharge into any surface waters. Treatment of domestic sewage is to be completed using storage lagoons and land application.

3 EVALUATION OF ALTERNATIVES

3.1 General

The purpose of this Environmental Assessment is to analyze three alternatives for the Granite Reeder Water and Sewer District Wastewater Improvement Project. The three alternatives and a brief description of each are as follows:

- **Alternative 1 – No Action Alternative:** Leaving the system in its present condition.
- **Alternative 2 – Preferred Action Alternative:** On-site grinder pump collection units, community pressure collection system with lagoon and land application treatment methods.
- **Alternative 3 – Other Action Alternative:** On-site septic tank collection units, community combination gravity / pressure collection system with lagoon and land application treatment methods.

3.2 Alternative 1 – No Action Alternative:

The no-action alternative is an infeasible option for management of the District's wastewater. District population is expected to continue to grow within its boundaries. Without implementation of a wastewater collection and treatment facility, developers will continue to institute use of on-site disposal systems that are not monitored and may be substandard to IDEQ and PHD requirements. The potential result for these types of facilities may be future risk to public health and environmental pollution.

The following excerpts were taken from the November 1995 IDEQ Priest Lake Management Plan. This Plan was developed by the Priest Lake Planning Team and was submitted to the 1996 session of legislature for amendment, adoption, or rejection. The plan was accepted by the legislature in February 1996 and was enacted through House Bill No. 807. (See Appendix 13.1) The following excerpts were taken from the Plan and address wastewater and the Lake's water quality:

> *A visual effect of nutrient enriched groundwater from septic effluent can be observed when a septic drainfield fails and effluent begins surfacing on the ground. Several of these areas along the shoreline were found during the course of the Priest Lake Project. The stream of water trickling over rocks to the lake has bright green, long filamentous growth of attached algae.*

and more specifically to the Granite/Reeder Area, the Plan states:

With a high water table and sandy soil, treatment of septic effluent phosphorus would be minimal in this area of Granite/Reeder. Nitrogen from effluent would quickly become incorporated into the ground water. Monitoring wells in the area showed some wells with nitrate and chloride levels far beyond what could be attributed as background. The suspicion is that nitrate has been elevated by septic plumes. In addition, there is potential health concern.[1] Wells for drinking water in the area draw water from 35 to 80 feet below the ground with no clay layer separation from the septic systems above.

The Management Plan proposed Action Items to address wastewater issues with respect to protecting the Lake's water quality. These action items include the planning and development of a community wastewater treatment plan. See Appendix 13.1 for the Plan's discussion on wastewater and the complete action item list.

3.3 Alternative 2 – Preferred Action Alternative:

3.3.1 Proposed Improvements

The proposed improvements include construction of a community wastewater treatment system consisting of on-site collection units (positive displacement grinder pumps), a pressure collection system, and a lagoon and land application treatment site to treat residential and commercial sewage from the Granite Reeder Sewer District. Construction of these facilities will aid in the protection and preservation of the local groundwater and surface water systems at Priest Lake. Additionally, this construction will allow the District to comply with the separation requirements of the Panhandle Health District (PHD) and the Idaho Department of Environmental Quality (IDEQ).

3.3.2 Proponents Preferred Wastewater Treatment Site – Site 1

The preferred site of the proposed wastewater treatment is referred to as Treatment Site #1. This site is located on United States Forest Service land, directly north of Reeder Bay in Township 36N, Range 4W, Section 17. Refer to Figure 3-1.

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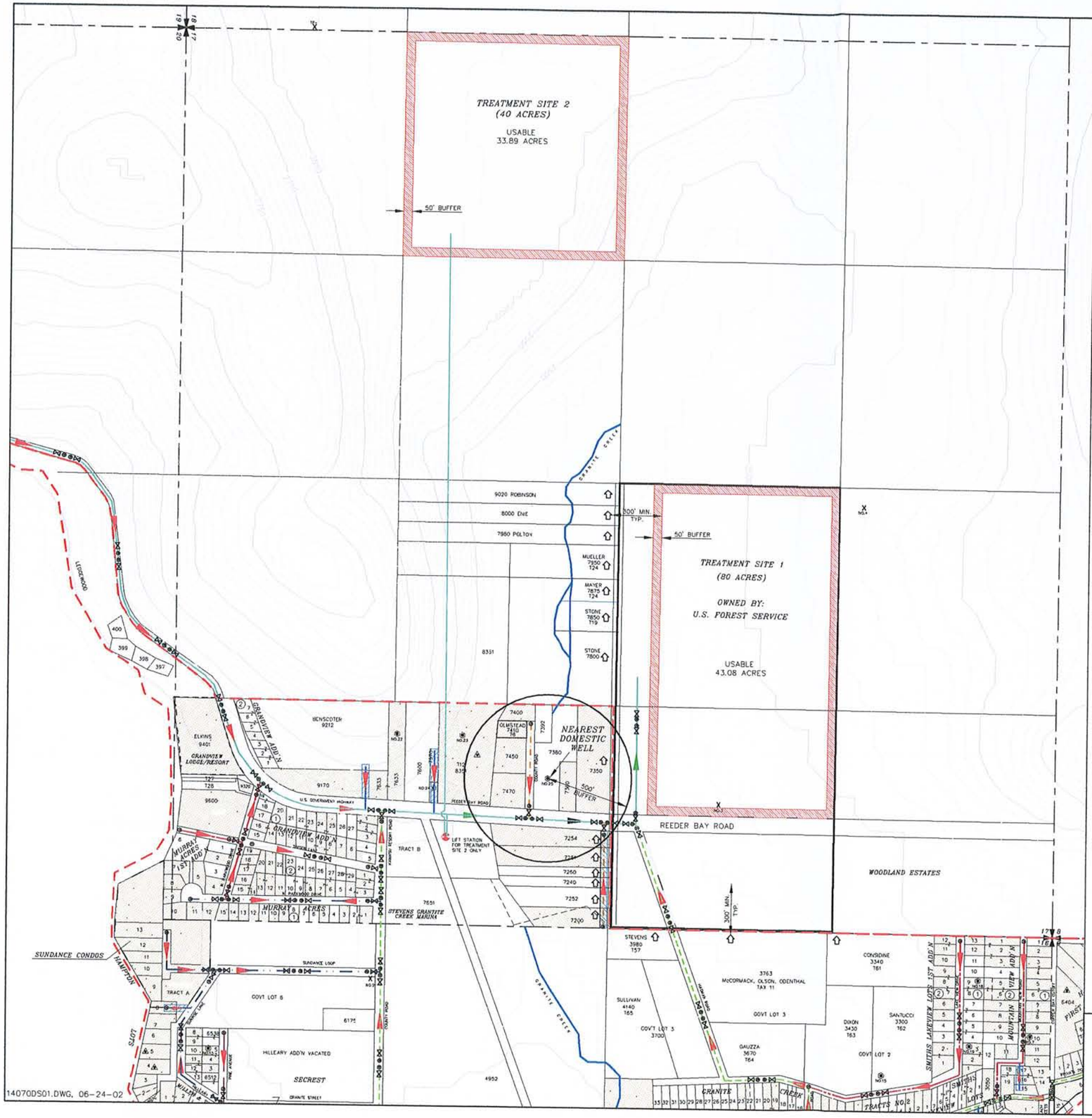
[1] A special note is included in the Plan stating, "Groundwater studies as part of the Priest Lake Project indicate that in some areas background nitrate and chloride levels have been increased by septic effluent, but these results are not conclusive."



NORTH

24x36 SCALE: 1" = 300'
11x17 SCALE: 1" = 600'

GENERAL NOTES

1. PIPE SIZES ARE BASED ON THE MAXIMUM PREDICTED SIMULTANEOUS PUMP OPERATIONS AND A MAXIMUM PUMPING RATE OF 11 gpm ON AVERAGE.
2. LARGE LOTS OR RESORTS ARE MODELED BY THE ESTIMATED ER'S.
3. EASEMENT LOCATIONS ARE APPROXIMATE.
4. PIPES SHOWN ARE LOCATED WITHIN THE DESIGNATED ROAD RIGHT-OF-WAY. HOWEVER, ROADS MAY NOT BE WITHIN THE RIGHT-OF-WAY.
5. CLEANOUT AND SHUTOFF VALVES ARE LOCATED AT EACH INTERSECTION AND AT APPROXIMATELY 600' INTERVALS.
6. SEWER LINE DIAMETER MAY CHANGE BASED ON THE ER'S IN THE FINAL L.I.D. ROLE.
7. TREATMENT AREA BUFFER BASED ON IDEQ GUIDELINES FOR A SECONDARY LEVEL OF TREATMENT.

LEGEND

- NO.5 — DOMESTIC WELLS LOGGED WITH DEPT. OF WATER RESOURCES
- X NO.5 — TEST HOLES 10-27-87
- X TP-1 — TEST PITS
- LOTS WITH 2ND RESIDENCE
- COMMERCIAL DESIGNATION
- MULTIPLE RESIDENTIAL UNITS
- OCCUPIED LOTS WITH IMPROVEMENTS
- DISTRICT BOUNDARY
- POSSIBLE OCCUPIED RESIDENCES
- PROPOSED EASEMENT
- PROPOSED SHUTOFF VALVE/CLEANOUT
- PROPOSED CLEANOUT
- PROPOSED LIFTSTATION
- PROPOSED SEWER SERVICE
- 2" PROPOSED SEWER LINE
- 3" PROPOSED SEWER LINE
- 4" PROPOSED SEWER LINE
- 6" PROPOSED SEWER LINE
- MINIMUM BUFFER DISTANCE AS REQUIRED BY IDEQ

WELCH COMER & ASSOCIATES, INC.
ENGINEERS & SURVEYORS

FIGURE 3-1

GRANITE-REEDER TREATMENT SITE NO. 1 AND NO. 2: REQUIRED BUFFER ZONES

The two potential treatment sites evaluated for this alternative were selected based on their size, location, topography, and existing use. DEQ guidelines for land application require specific buffer zones to publicly accessible areas, as noted in Table 3-1.

Table 3-1: IDEQ Buffer Zone Requirements for Treatment Sites[1,2]

Landmark	Buffer Zone Required from Land Application Site
Inhabited Dwellings (Homes)	300 feet
Areas Accessible to Public (Roads, Public Meeting Places)	50 feet
Domestic Wells	500 feet
Surface Waters[3]	100 feet
Public Wells	1000 feet

1. Taken from the IDEQ Handbook for Land Application of Municipal and Industrial Wastewater, April 1996. Page IV-15, Table 3.
2. The buffer zones described are assumed for a residential area with secondary disinfected treatment level (<23 organisms/100 ml of wastewater).
3. The U.S. Fish and Wildlife Service has required a minimum buffer of 300 feet between land application areas and surface waters known to contain bull trout. Granite Creek, as noted in the Biological Assessment (Appendix 13.6) is known to contain bull trout. Therefore, a minimum buffer of 300 feet will be maintained between the land application area and the Creek.

Figure 3-1 demonstrates the required buffer zones for each treatment site. The figure shows the available area for land application for each site. The designated areas shown in the figure meet all minimum buffer requirements given in Table 3-1.

Treatment Site 1

Treatment Site 1 is an 80-acre parcel at an elevation of approximately 2550 feet. Site 1 is located nearest to the District. Reeder Creek Road and Hagman Road pass through the parcel.

Treatment site 1 is the recommended site due to its size and location nearest to the District. An egress of an estimated 1,000 lineal feet for pipe and site access would be required for site 1 from Reeder Bay Road, whereas an estimated 6,500 lineal feet would be needed for Treatment Site 2. Per the 2002 Caddis Valuation Service appraisal, treatment site 1 has been appraised at $236,000. The summary of the appraisal is given in Appendix 13.2.

The portion of the site which will be used is located west of Reeder Bay Road. This portion was harvested within the last 10 to 12 years as indicated by the 2002 appraisal. See Appendix 13.2. The portion located to the east is currently forested. This eastern portion would be preserved in its existing condition, to allow more distance between the treatment facilities and the District users. Refer to Section 4.2.3.2, Table 4-6 shows that the treatment area, sized for 75 gpd/ER with a 30% factor of safety, would require a total treatment area of approximately 25 acres. Sufficient area is available at either treatment site.

The most desirable feature of Site 1 is the proximity of this site in relationship to the Granite Reeder Water and Sewer District. This would allow easy access for operation and maintenance, as well as construction of the lagoon and land application facility. The location of this site would contribute to lower construction costs, since less piping would be required to access the site.

3.3.2.1 Considerations for Land Acquisition

There are 3 possible ways to obtain U.S.F.S land. These are described below.

Special Use Permit on USFS Land

A special use permit would allow the District to essentially lease the land. Typically, the annual fee would be approximately 5% of the appraised land value. The land would be re-appraised every 5 years. However, the USFS has indicated that they no longer prefer to issue these types of permits.

Land Exchange with USFS

Generally, the USFS is not able to sell public land. However, it is possible for them to exchange a parcel of land for another parcel located adjacent to other USFS land with a similar appraised value. The land exchange can be done privately by the District or through a commercial land exchange service. Commercial land exchange services typically charge a fee of 8% of the land

exchange value. The isolation of site 1 from other USFS land makes it an attractive parcel for exchange from the USFS point-of-view.

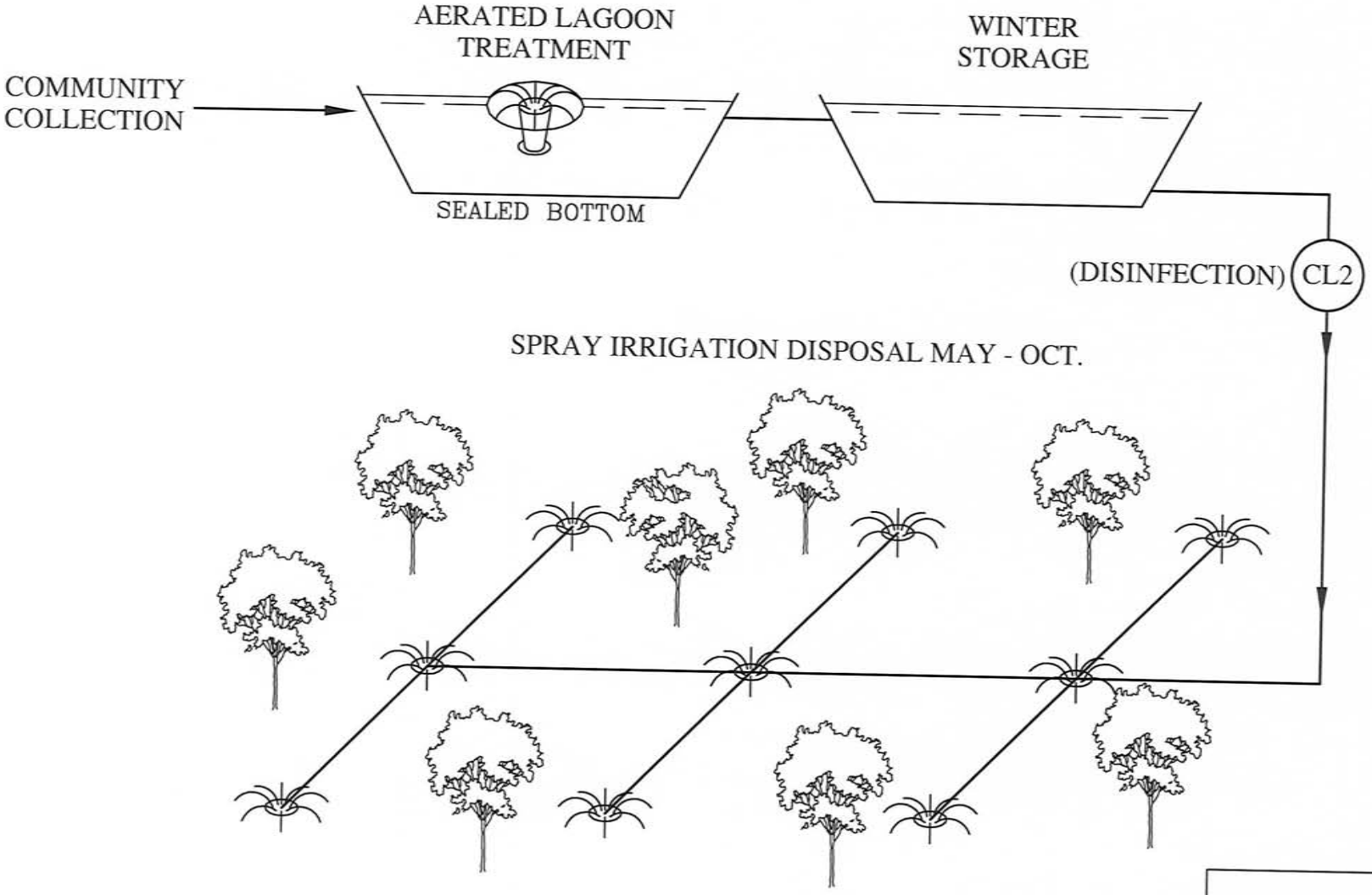
Purchase of Land

Due to the timing of this project and special circumstances with the local USFS office, it may be possible for the District to purchase one of the treatment sites outright. This option is promising at this point. The USFS is currently in the process of drafting legislation for direct sale of this property along with another property in Idaho.

3.3.3 Proponents Preferred Wastewater Treatment Technology – Lagoon and Land Application

Lagoon and seasonal land application provides a common, effective, and low cost technology for sewage treatment and disposal for small communities. Wastewater from the system is collected, treated and stored in a lagoon. During the summer growing season, the effluent is used to irrigate a crop. In winter months the lagoons are used solely for storage. See Figure 3-2. For a system with flows similar to Granite Reeder and the available land area, this is often an economical option. Refer to Table 3-2 for the estimated construction cost for this component.

LAGOON WITH LAND APPLICATION
TREATMENT SCHEMATIC
LAGOON / SPRAY IRRIGATION
FIGURE 3-2



LAGOONS	2 ACRES
IRRIGATION	20 ACRES
TOTAL	22 ACRES (MIN.)

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Table 3-2

Granite Reeder Water and Sewer District
Aerated Wastewater Treatment Lagoons
ENGINEER's OPINION OF PROBABLE CONSTRUCTION COSTS

Prepared By: Dick Walker

Description	Unit	Quantit	Unit Price	Total
Mobilization	LS	1	$50,000.00	$50,000.00
Site Clearning	AC	4.5	$2,200.00	$9,900.00
New Lagoon Earthwork	LS	1	$43,000.00	$43,000.00
Type A-3 Base 3/4"	TN	1380	$25.00	$34,500.00
Type A-6 3" Minus	TN	1125	$25.00	$28,125.00
Processed Bedding for Lining	LS	1	$23,000.00	$23,000.00
Trench Excavation and Backfill 0-5'	LF	9200	$5.50	$50,600.00
Import Pipe Bedding	LF	500	$4.00	$2,000.00
Lagoon Geomembrane Liner	LS	1	$76,000.00	$76,000.00
Inlet Manhole	LS	1	$12,000.00	$12,000.00
Irrigation Manhole	LS	1	$11,000.00	$11,000.00
Junction Tie-in Manhole	LS	1	$6,500.00	$6,500.00
18" PVC C-905	LF	850	$21.00	$17,850.00
10" PVC C-905	LF	860	$11.00	$9,460.00
8" PVC C-905	LF	0	$6.00	$0.00
6" HDPE SDR 17	LF	375	$6.00	$2,250.00
4" HDPE SDR 17	LF	120	$3.50	$420.00
6" HDPE SDR 15.5	LF	925	$6.50	$6,012.50
4" HDPE SDR 15.5	LF	7100	$3.50	$24,850.00
2" HDPE SDR 17	LF	625	$2.50	$1,562.50
10" R.S. Gate Valve	EA	1	$850.00	$850.00
6" R.S. Gate Valve	EA	5	$500.00	$2,500.00
2" Air Release Valve	EA	2	$850.00	$1,700.00
12" CHDPE Culvert	LF	40	$15.00	$600.00
Sprinkler Assembly	EA	75	$375.00	$28,125.00
Irrigation Intake Screen Assembly	EA	2	$2,600.00	$5,200.00
Sump Intake Screen Assembly	EA	2	$1,000.00	$2,000.00
Sampling Tap	EA	1	$400.00	$400.00
Aeration System	LS	1	$15,000.00	$15,000.00
Odor Control Manhole	LS	1	$11,000.00	$11,000.00
8' Chain Link Fence	LF	1300	$13.00	$16,900.00
Warning Signs	EA	64	$30.00	$1,920.00
Highway Access Gate	LS	1	$1,600.00	$1,600.00
Control Building Structure	LS	1	$25,000.00	$25,000.00
Control Building Mechanical	LS	1	$10,500.00	$10,500.00
Irrigation Pump	LS	1	$10,000.00	$10,000.00
Chlorine Injection System	LS	1	$2,000.00	$2,000.00
Sludge Dump Vault	LS	1	$12,000.00	$12,000.00
Electrical	LS	1	$32,500.00	$32,500.00
Access Road Earthwork	LS	1	$15,000.00	$15,000.00
Bond Fee	LS	1	$6,038.25	$6,038.25
2-15 HP Blowers	LS	1	$10,000.00	$10,000.00
Treatment Subtotal				$619,863.25
10% Contingency				$62,000.00
Total Estimated Construction Cost				**$681,900**
with Inflation @ 3% per Year				$702,357.00

The lagoons alone do not provide adequate treatment to allow for direct discharge to surface water. However, the wastewater does receive primary treatment and disinfection before being applied. To ensure that water quality is protected, irrigation rates are designed to be less than what can be used by the crop and evaporation. This minimizes the possibility of wastewater seeping down into the water table or running overland into surface waters. IDEQ requires an annual land application report to be submitted, summarizing wastewater characteristics, total land application, lagoon levels, etc. Some operation is involved with the lagoon and land application alternative, but is relatively simple.

Since Welch Comer and Associates, Inc. (1996) found substantial leaking of lagoon effluent, significantly elevated groundwater nitrate and chloride immediately down-gradient of lagoons at Kalispell Bay Sewer District (IDHW and DEQ, 1997); it is prudent to assess potential for leakage or catastrophic failure of the proposed system for the Granite Reeder Water and Sewer District project. Welch Comer in 1996 identified problems with Kalispell Bay's leaky lagoon system "sealed" with bentonite. The new lagoons constructed in 1996 at Kalispell Bay utilized a 30-millimeter thickness polyethylene liner.

This same liner material will be used for the proposed Granite Reeder treatment facility in order to provide a sealed bottom and prevent leakage of wastewater into the groundwater source.

The following issues were considered in regards to the lagoon and land application treatment alternative.

1. Methods of sludge disposal:

If the preferred alternative, on-site grinder units, is selected, no sludge disposal would be necessary. If septic tanks were the selected alternative, they would periodically have to be pumped. Wastes pumped from septic tanks would be disposed of at an approved disposal site, or could be dumped into the lagoon. If the District chose to accept septic waste, the lagoons would be equipped with a sludge dump vault and screen to remove garbage.

2. Permit requirements:

It is anticipated that the following permits will be required for a lagoon and land application treatment system:

PERMITS	
IDEQ Land Application Permits	IDEQ requires a land application permit for the land application of wastewater. An application for permit must be submitted by the District including the following information: 1. Application site data 2. Site management 3. Chemical analysis of wastewater 4. Application rate 5. Monitoring schedule 6. Treatment Process 7. Storage Structures 8. Emergency Procedures
Conditional Use Permit	Bonner County requires a permit for public utilities such as wastewater treatment facilities. The permit must be completed 3-6 months ahead of construction. A fee of $450 is required along with a land capability report and the IDEQ land application permit.

3.3.4 Proponents Preferred On-Site Wastewater Collection System – Grinder Pump Units

Due to high head requirements at Granite Reeder, only the positive displacement grinder pumps were analyzed for comparison with the septic tank effluent pump system described in section 3.4.3.

A grinder pump contains raw sewage in a holding tank within the unit. When the unit fills, the pump automatically turns on. The sewage is ground into fine slurry and pumped into the collection system. Raw pumps can pump to a gravity or pressurized collection system. A typical grinder pump installation is shown in Figure 3-3. Refer to Table 3-3 for the estimated construction cost breakdown for grinder pumps versus septic pumps.

TYPICAL GRINDER SERVICE DETAIL
FIGURE 3-3

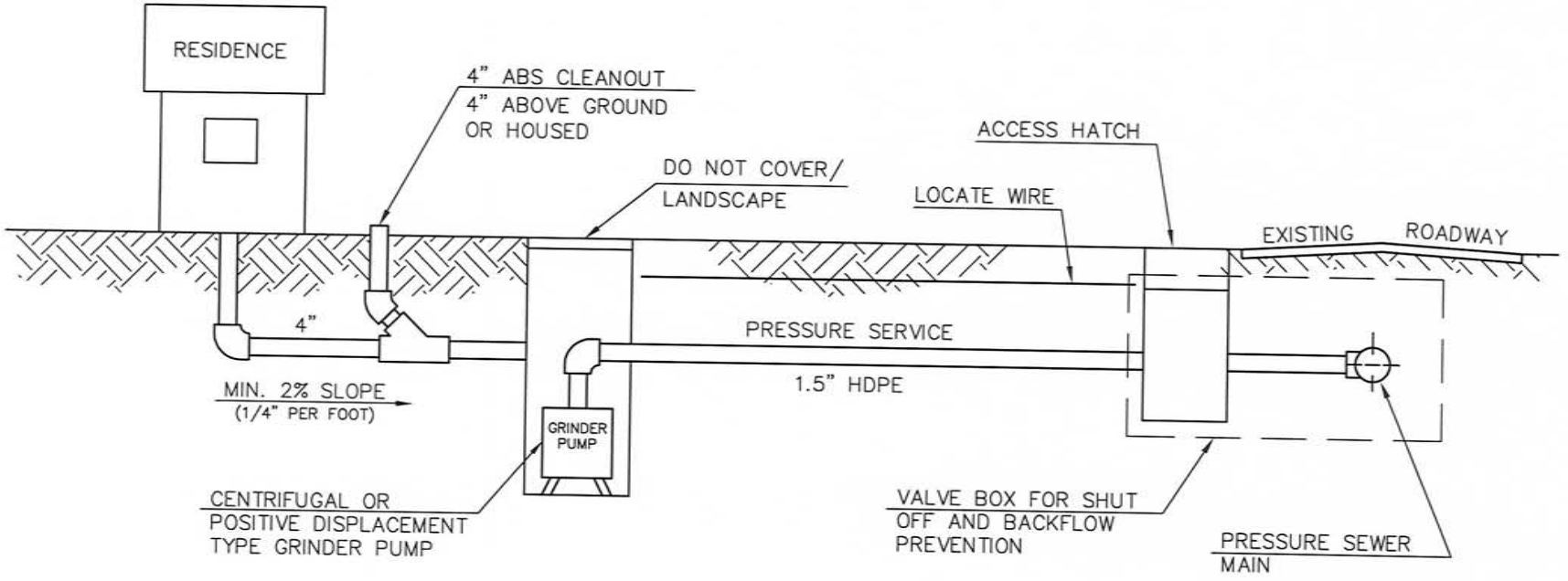

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Table 3-4

Granite Reeder Water and Sewer District
Pressure System to 80 Acre Treatment Site (#1)
ENGINEER's OPINION OF PROBABLE CONSTRUCTION COSTS

Prepared By: DW, NMA	Date:			
Description	Unit	Quantity	Unit Price	Total
Startup				
Mobilization	LS	1	$157,275.00	$157,275
Clearing and Grubbing	LS	1	$5,825.00	$5,825
Site Control Plan	LS	1	$2,912.50	$2,913
Silt Fence	LF	10,500	$1.86	$19,572
Common Collection System				
Distribution Construction				
2" HDPE	LF	11,070	$2.62	$29,017
3" HDPE	LF	11,460	$2.91	$33,377
4" HDPE	LF	7,480	$4.08	$30,500
6" HDPE	LF	8,760	$5.83	$51,027
Future Pressure Service Stub	EA	50	$291.25	$14,563
Trench Excavation & Backfill	LF	39,000	$12.82	$499,785
Rock Excavation	LF	5,900	$15.15	$89,356
Processed Bedding Materials	LF	39,000	$2.91	$113,588
Removal of Unsuitable Materials	CY	225	$13.98	$3,146
Stabilization Material	TN	405	$23.30	$9,437
Trench and Excavation Water Control	LS	1	$58,250.00	$58,250
Exploratory Excavation	HR	30	$163.10	$4,893
Valves & Boxes				
2" Resilient Seat Gate Valves & Boxes	EA	34	$320.38	$10,893
3" Resilient Seat Gate Valves & Boxes	EA	33	$407.75	$13,456
4" Resilient Seat Gate Valves & Boxes	EA	32	$436.88	$13,980
6" Resilient Seat Gate Valves & Boxes	EA	28	$553.38	$15,495
Air Release Valves	EA			
Cast Iron Valve Boxes	EA	127	$145.63	$18,494
Clean Out Assemblies w/Boxes	EA	140	$326.20	$45,668
Special Items				
Creek Crossing 1 (Granite Creek)	LS	1	$5,242.50	$5,243
Creek Crossing 2 (Elkins)	LS	1	$3,029.00	$3,029
Pressure Test System	LF	47,000	$0.87	$41,066
Power to Treatment Site	LF	950	$20.00	$19,000
Clean-up and Restoration				
A3 Base For Roads	TN	7800	$29.13	$227,175
Roadway Restoration	SY	43100	$0.99	$42,680
Asphalt Paving Repair	TN	880	$69.90	$61,512
Hydro Seeding	SY	7000	$1.86	$13,048
Top Soil Material	CY	1500	$23.30	$34,950
Collection Subtotal				$1,688,209.09
10% Contingency				$168,800.00
Total Estimated Construction Cost				**$1,857,000**
with Inflation @ 3% per Year				$1,970,091.30

Granite Reeder Water and Sewer District
On-Site Collection Units
ENGINEER's OPINION OF PROBABLE CONSTRUCTION COSTS

Prepared By: DW, NMA				Grinders	Grinders (with Easements)	Septic Tanks
Description	Unit	Quantity	Unit Price	Total	Total	Total
Onsite Collection Service (Grinder with Easements)						
1 1/2 Poly Hookup including Excavation & Backfill	LF	17,400	$5.83		$101,355.00	
Service Hookup 1 1/2"-4"*	EA	350	$291.25		$101,937.50	
Valving and Meter Box Assembly	EA	350	$174.75		$61,162.50	
Commercial ER's (for Resorts, Tillakum)	EA	90	$3,145.50		$283,095.00	
Single Grinder Pump (Includes All Installation Costs)*	EA	260	$3,145.50		$817,830.00	
Pumping and Removal in Place Septic Tanks	EA	350	$291.25		$101,937.50	
Onsite Collection Service						
1 1/2 Poly Hookup including Excavation & Backfill	LF	7,875	$5.83	$45,872		
Service Hookup 1 1/2"-4"*	EA	0	$291.25	$0		
Valving and Meter Box Assembly	EA	350	$174.75	$61,163		
Commercial ER's (for Resorts, Tillakum)	EA	90	$3,145.50	$283,095		
Single Grinder Pump (Includes All Installation Costs)*	EA	174	$3,145.50	$547,317		
Single Grinder Pump with Traffic Rated Enclosure (Includes All Installation Costs)*	EA	86	$3,961.00	$340,646		
***Alternative Collection Units**						
1 1/2 Poly Hookup including Excavation & Backfill	LF	16,300	$5.83			$94,948
Service Hookup 1 1/2"-4"*	EA	350	$291.25			$101,938
Valving and Meter Box Assembly	EA	350	$174.75			$61,163
Commercial ER's (for Resorts, Tillakum)	EA	90	$4,164.88			$374,839
Step System Package	EA	260	$4,164.88			$1,082,868
Pumping and Removal in Place Septic Tanks	EA	350	$291.25			$101,938
On-site Subtotal				$1,278,092.38	$1,467,317.50	$1,817,691.70
10% Contingency				$127,800.00	$146,700.00	$181,800.00
Total Estimated Construction Cost				**$1,405,900**	**$1,614,000**	**$1,999,500**
with Inflation @ 3% per Year				$1,491,519.31	$1,712,292.60	$2,121,269.55

Benefits: If the District selects treatment site 1, the positive displacement pumps would be capable of pumping direct to the treatment facility, eliminating the need for a community lift station. The positive displacement pumps can pump to a maximum head of about 180 feet. Due to the elevation of treatment site 2, a lift station would be necessary even with use of the positive displacement pumps.

Grinder pump basins take up a smaller footprint than septic tank units. IDEQ does not currently have any restrictions on separation distances between grinder pump stations and domestic water supplies. However, IDEQ has stated that a minimum distance of ten feet will be required between domestic wells and grinder basins.

Drawbacks: Some raw grinder pumps are operated by a float system that can be prone to damage or grease buildup. However, grinder pump units are available, which use a pressure switch or pressure transmitter that is less susceptible to grease buildup. Some proprietary raw grinder pump systems have specialized components. If an equipment failure or malfunction occurs, parts may be expensive to replace, if they are not kept on hand. Additionally, the repair may need to be completed by a specialized operator or maintenance person.

3.3.5 Proponents Preferred Wastewater Collection System – Pressure System

Figures 3-4A and 3-4B show the proposed pressure system layout.

The pressure system utilizes complete pressure piping for mainlines and services. Individual residences will require a STEP or grinder pump to pump sewer into the pressurized mainline. Because STEP and grinder pumps are high head pumps capable of pumping wastewater to high elevations (up to 180 feet), a community lift station would be unnecessary for Treatment Site 1. However, due to elevation, a community lift station would be required to pump flows to Treatment Site 2. Manholes are not required in pressurized systems but clean-outs, which are entry ports that allow the pipes to be flushed in the case of a clogged line, are necessary for maintenance. Refer to the estimated construction cost for this alternative in Table 3-4.

Benefits: This system relies on pressure rather than gravity to function. Therefore, piping can be installed by means of shallow excavations following the topography of the land. Gravity systems require that a constant slope be

maintained and consequently result in deep excavations. Working in ground water or rock is time consuming for contractors and increases construction costs. Shallow excavations will reduce the severity of construction issues associated with groundwater and rock, which is very prevalent in the area. Additionally, muddy water removed from the excavation is difficult to handle and treat and would pose a potential threat of pollution to Priest Lake.

Drawbacks: If a pressurized sewer line is inadvertently broken, there is a potential to flood the immediate area with sewer. Additionally, connecting to a pressurized mainline is more difficult than connecting to a gravity mainline. The installation of air/vacuum release valves is required at high points in pressure systems.

NORTH

24X36 SCALE: 1" = 300'
11X17 SCALE: 1" = 600'

TREATMENT SITE 1
(80 ACRES)

OWNED BY:
U.S. FOREST SERVICE

THIS PIPE WILL NOT BE NECESSARY IF TREATMENT SITE 1 IS CHOSEN.

THIS PIPE WILL NOT BE NECESSARY IF TREATMENT SITE 2 IS CHOSEN.

MATCHLINE

ZONE 29
ZONE 10
ZONE 9
ZONE 8
ZONE 27
ZONE 28
ZONE 26
ZONE 25
ZONE 11
ZONE 16
ZONE 14
ZONE 13
ZONE 24
ZONE 23
ZONE 21
ZONE 18
ZONE 17
ZONE 22
ZONE 12
ZONE 15
ZONE 20
ZONE 19

PRIEST LAKE

LIFT STATION FOR TREATMENT SITE 2 ONLY

WOODLAND ESTATES

SUNDANCE CONDOS

HAGMAN BEACH

HAGMAN BEACH CONDOS

TILLAKUM CONDOS

LEGEND

- DOMESTIC WELLS LOGGED WITH DEPT. OF WATER RESOURCES
- TEST HOLES 10-27-87
- TEST PITS
- LOTS WITH 2ND RESIDENCE
- COMMERCIAL DESIGNATION
- MULTIPLE RESIDENTIAL UNITS
- OCCUPIED LOTS WITH IMPROVEMENTS
- DISTRICT BOUNDARY
- OUT OF DISTRICT
- PROPOSED EASEMENT
- PROPOSED SHUTOFF VALVE/CLEANOUT
- PROPOSED CLEANOUT
- PROPOSED LIFTSTATION
- PROPOSED SEWER SERVICE
- 2" PROPOSED SEWER LINE
- 3" PROPOSED SEWER LINE
- 4" PROPOSED SEWER LINE
- 6" PROPOSED SEWER LINE
- FOREST SERVICE LAND

GENERAL NOTES

1. PIPE SIZES ARE BASED ON THE MAXIMUM PREDICTED SIMULTANEOUS PUMP OPERATIONS AND A MAXIMUM PUMPING RATE OF 11 gpm ON AVERAGE.
2. LARGE LOTS OR RESORTS ARE MODELED BY THE ESTIMATED ER'S.
3. EASEMENT LOCATIONS ARE APPROXIMATE.
4. PIPES SHOWN ARE LOCATED WITHIN THE DESIGNATED ROAD RIGHT-OF-WAY. HOWEVER, ROADS MAY NOT BE WITHIN THE RIGHT-OF-WAY.
5. CLEANOUT AND SHUTOFF VALVES ARE LOCATED AT EACH INTERSECTION AND AT APPROXIMATELY 600' INTERVALS.
6. SEWER LINE DIAMETER MAY CHANGE BASED ON THE ER'S IN THE FINAL L.I.D. ROLE.

14070DEM-SW.DWG, 06-24-02

WELCH COMER & ASSOCIATES, INC.
ENGINEERS & SURVEYORS

FIGURE 3-4A

GRANITE-REEDER TREATMENT SITE NO. 1 AND NO. 2: PRESSURE

TREATMENT SITE 2

ZONE 29

ZONE 8

ZONE 6

ZONE 4

ZONE 3

ZONE 2

ZONE 1

MATCHLINE

PRIEST LAKE

REEDER BAY CAMP

LEDGE WOOD

REEDER CREEK ROAD

REEDER BAY LOTS

DONALD HOLT

POWER LINE ROAD

POOL'S REEDER TRACTS

ELKINS ON PRIEST LAKE, LLC TRACT "A" 7205

ELKINS ON PRIEST LAKE, LLC TAX #2

AL ELKINS (PRIVATE) TRACT "B" 7502

ELKINS

PRIVATE

U.S. GOVT.

OUT OF DISTRICT

IN DISTRICT

TAX #5

TAX #11

TAX #3

TAX #15

H.E.S. NO. 773

THESE ARE TWO ALTERNATIVES FOR CONNECTING THE ELKINS/REEDER TERRACE SUBDIVISION TO THE REST OF THE SYSTEM AND IS DEPENDENT UPON ACQUIRING AN EASEMENT ACROSS THE ELKINS RESORT.

24x36 SCALE: 1" = 300'
11x17 SCALE: 1" = 600'

LEGEND

- DOMESTIC WELLS LOGGED WITH DEPT. OF WATER RESOURCES
- TEST HOLES 10-27-87
- TEST PITS
- LOTS WITH 2ND RESIDENCE
- COMMERCIAL DESIGNATION
- MULTIPLE RESIDENTIAL UNITS
- OCCUPIED LOTS WITH IMPROVEMENTS
- DISTRICT BOUNDARY
- OUT OF DISTRICT
- PROPOSED EASEMENT
- PROPOSED SHUTOFF VALVE/CLEANOUT
- PROPOSED CLEANOUT
- PROPOSED LIFTSTATION
- PROPOSED SEWER SERVICE
- 2" PROPOSED SEWER LINE
- 3" PROPOSED SEWER LINE
- 4" PROPOSED SEWER LINE
- 6" PROPOSED SEWER LINE
- FOREST SERVICE LAND

WELCH COMER & ASSOCIATES, INC.
ENGINEERS & SURVEYORS

FIGURE 3-4B

GRANITE-REEDER TREATMENT SITE NO. 1 AND NO. 2: PRESSURE

14070DSM-SW.DWG, 06-24-02

3.4 Alternative 3 – Other Action Alternative

A second alternative considered for the Granite Reeder Sewer District included on-site collection units consisting of the STEP system, a combination gravity and pressure collection system with lagoon and land application treatment at Treatment Site #2.

Access Trail to Treatment Site 2

3.4.1 Alternative Wastewater Treatment Site– Site 2

The alternative site of the proposed wastewater treatment is located on United States Forest Service land, directly north of Reeder Bay in Township 36N, Range 4W, Section 17. Refer to Figure 3-1.

Treatment site 2 is a 40-acre parcel, located southeast of site 1 at an elevation of approximately 2560 feet.

3.4.2 Alternative Wastewater Treatment Technologies

Due to the economics and feasibility of construction, operation and maintenance of a lagoon and land application facility for a community such as Granite Reeder. This technology was selected as the preferred treatment technology for alternative 3 as well as alternative 2. Several other treatment technologies were reviewed along with the lagoon and land application alternative. A brief summary of alternative technologies analyzed, and why they were not chosen is listed below. Refer to Section 3.5.1 for a full description of these technologies.

1. Treatment at Outlet Bay: The cost for regionalization, construction of a transmission line to the Outlet Bay treatment facility, far exceeds what would be considered "a reasonable cost" for adding a wastewater treatment facility to the existing area.
2. Subsurface Drainfields: This treatment option was eliminated from further discussion due to the high cost of construction, and site conditions of the available treatment sites. For a community system with design flows above 2500 gpd, such as Granite

Reeder, a large-scale absorption system (LSAS) is required. This would require construction of two full sized drainfields, each sized to accept the full design flow, but in no case should one drainfield be sized for more than 10,000 gallons per day. Replacement area for a third full-sized drainfield would also be required. High groundwater and heavy vegetation make this option economically infeasible at Granite Reeder.

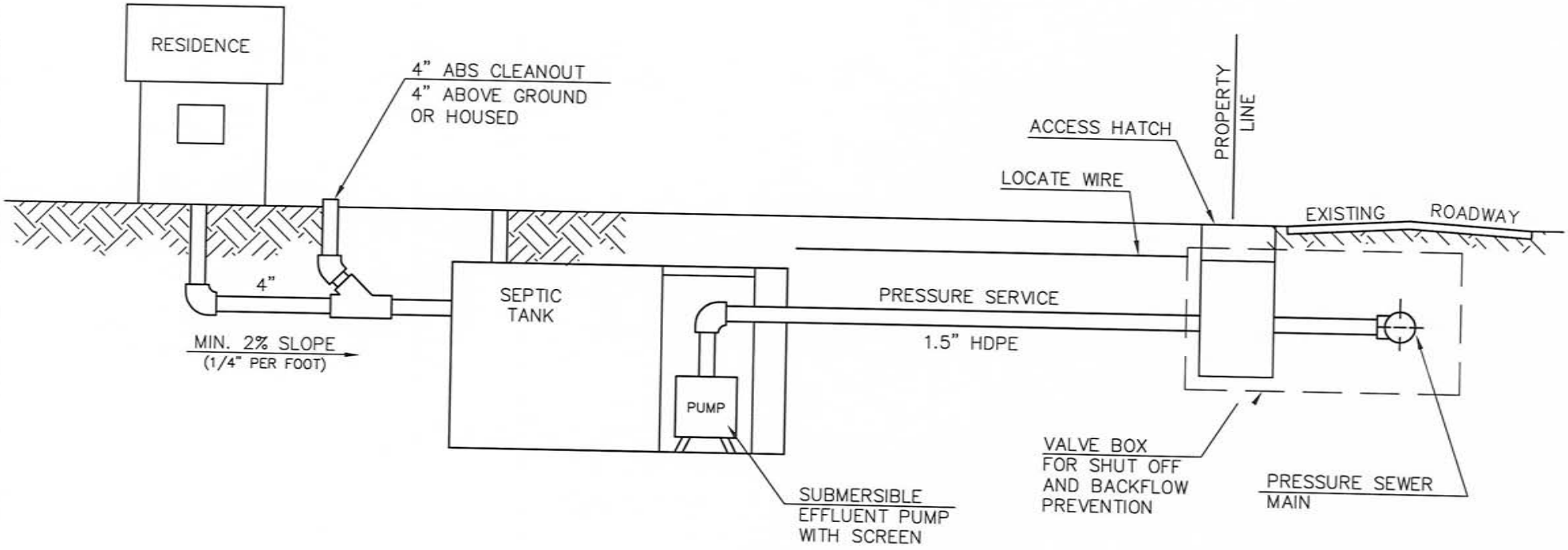
3. Drip Irrigation: Because drip irrigation is a relatively new technology, there is a lack of historical observation data for community systems the size of Granite Reeder. Additionally, there is a lack of historical data regarding the use of these systems in extreme winter climates such as the Priest Lake area. Additionally, as with the subsurface drainfields, heavy vegetation at the available treatment sites makes this option cost prohibitive.

4. Packaged Treatment Plants: Packaged treatment plants require a high level of operator skill, as they are typically operator intensive. Packaged treatment plants are generally more expensive to develop, operate, and maintain, for a smaller community than other technologies such as lagoons with land application and subsurface treatment systems. Therefore this option was eliminated from further analysis.

3.4.3 Alternative On-Site Collection System – Septic Tanks

Description: A STEP system consists of two chambers for a holding tank and a pump. See Figure 3-5. Raw sewage enters the holding chamber where solids and grease settle to the bottom, leaving effluent at the top of the chamber. An opening is provided between chambers to allow effluent to be pulled into the pump chamber. A screen surrounds the pump to prevent any large solids from entering the pump and causing excessive clogging. STEP systems can pump to a gravity or pressurized collection system.

TYPICAL STEP SERVICE DETAIL
FIGURE 3-5



PREPARED BY
WELCH COMER & ASSOCIATES
14070DS02.DWG, 05-24-02

Benefits: STEP systems typically have efficient pumps. These systems only pump effluent, so the treatment facility does not receive as many solids, often resulting in a smaller, less expensive facility. Additionally, these systems are less susceptible to plugging than the raw grinder systems.

Drawbacks: It would be the District's responsibility to pump the individual septic tanks periodically to remove solids build-up. This is generally every 3 to 5 years per tank, although the solids level should be checked every year to ensure proper function. Once solids have been pumped they must be disposed of properly. The District would have the option of purchasing its own pumper truck to pump and haul solids to the lagoon or other authorized disposal site, or the District may choose to contract this work out to a private pumping company or other local Sewer District. Septic sludge management would be a long-term issue for the District.

A reason for concluding septic tanks are not the preferred alternative on-site collection system is due to Idaho regulations listed in IDAPA 58.01.03, "Rules for Individual/Subsurface Disposal Systems," which require a minimum separation distance of 50 feet between septic tanks and domestic water supplies. Many of the lots within the District are narrow and contain an individual domestic well, making the separation difficult or impossible to obtain. IDEQ representatives have stated that a STEP system should not be used if it cannot meet the necessary standards for septic tank/well separation.

Refer to Table 3-3, which compares the estimated construction cost of septic tanks versus grinder units.

3.4.4 Alternative Wastewater Collection System – Gravity and Pressure System

A second type of community collection system was analyzed. This system would consist of a combined pressure/gravity system, where topography allows, an 8-inch gravity collection line would collect sewage from users and allow it to gravity flow to a lift station located at a lower location. Flow collected at the lift station would be pumped either to another lift station or directly to the treatment site, depending on the system's layout. A schematic of this alternative is shown in Figure 3-6 A and B.

The estimated cost for construction of a gravity/pressure collection system to Treatment Site #2 is given in Table 3-5.

NORTH

24x36 SCALE: 1" = 300'
11x17 SCALE: 1" = 600'

MATCHLINE

THIS PIPE WILL NOT BE NECESSARY IF TREATMENT SITE 1 IS CHOSEN.

THIS PIPE WILL NOT BE NECESSARY IF TREATMENT SITE 2 IS CHOSEN.

TREATMENT SITE 1
(80 ACRES)

OWNED BY:
U.S. FOREST SERVICE

ZONE 29
ZONE 10
ZONE 9
ZONE 8
ZONE 27
ZONE 28
ZONE 26
ZONE 25
ZONE 11
ZONE 16
ZONE 14
ZONE 13
ZONE 24
ZONE 23
ZONE 21
ZONE 18
ZONE 17
ZONE 12
ZONE 22
ZONE 20
ZONE 19
ZONE 15

WOODLAND ESTATES

HAGMAN BEACH

HAGMAN BEACH CONDOS

TILLAMUM CONDOS

SUNDANCE CONDOS

PRIEST LAKE

LEGEND

- DOMESTIC WELLS LOGGED WITH DEPT. OF WATER RESOURCES
- TEST HOLES 10-27-87
- TEST PITS
- LOTS WITH 2ND RESIDENCE
- COMMERCIAL DESIGNATION
- MULTIPLE RESIDENTIAL UNITS
- LOTS WITH IMPROVEMENTS
- L.I.D. BOUNDARY
- 8" PROPOSED GRAVITY SEWER LINE
- PROPOSED SEWER SERVICE
- PROPOSED EASEMENT
- PROPOSED SHUTOFF VALVE/CLEANOUT
- PROPOSED CLEANOUT
- PROPOSED LIFT STATION
- PROPOSED MANHOLE
- OUT OF DISTRICT
- FOREST SERVICE LAND
- 2" PROPOSED PRESSURE SEWER LINE
- 3" PROPOSED PRESSURE SEWER LINE
- 4" PROPOSED PRESSURE SEWER LINE
- 6" PROPOSED PRESSURE SEWER LINE

GENERAL NOTES

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3. EASEMENT LOCATIONS ARE APPROXIMATE.
4. PIPES SHOWN ARE LOCATED WITHIN THE DESIGNATED ROAD RIGHT-OF-WAY. HOWEVER, ROADS MAY NOT BE WITHIN THE RIGHT-OF-WAY.
5. CLEANOUT AND SHUTOFF VALVES ARE LOCATED AT EACH INTERSECTION AND AT APPROXIMATELY 600' INTERVALS.
6. SEWER LINE DIAMETER MAY CHANGE BASED ON THE ER'S IN THE FINAL L.I.D. ROLE.

14070PL10.DWG, 06-24-02

WELCH COMER & ASSOCIATES, INC.
ENGINEERS & SURVEYORS

FIGURE 3-6A

GRANITE-REEDER TREATMENT SITE NO. 1 AND NO. 2: COMBINATION GRAVITY / PRESSURE

TREATMENT SITE 2

ZONE 29

ZONE 8

ZONE 6

ZONE 4

ZONE 3

ZONE 2

ZONE 1

REEDER BAY LOTS

DONALD HOLT

IN DISTRICT

TAX #8

TAX #11

TAX #3

POOL'S REEDER TRACTS

POWER LINE ROAD

REEDER CREEK ROAD

ELKINS ON PRIEST LAKE, LLC TRACT "A" 7205

ELKINS ON PRIEST LAKE, LLC TAX #2

ELKINS

PRIVATE

H.E.S. NO. 773

TAX #15

AL ELKINS (PRIVATE) TRACT "B" 7502

WELL

SANDPOINT ROAD

ELKINS-REEDER TERRACE

THESE ARE TWO ALTERNATIVES FOR CONNECTING THE ELKINS/REEDER TERRACE SUBDIVISION TO THE REST OF THE SYSTEM AND IS DEPENDENT UPON ACQUIRING AN EASEMENT ACROSS THE ELKINS RESORT.

U.S. GOVT.

REEDER CREEK

REEDER BAY CAMP

LEDGE WOOD

MATCHLINE

PRIEST LAKE

BENSCOTER 2012

GRANDVI

24x36 SCALE: 1" = 300'
11x17 SCALE: 1" = 600'

LEGEND

- DOMESTIC WELLS LOGGED WITH DEPT. OF WATER RESOURCES
- TEST HOLES 10-27-87
- TEST PITS
- LOTS WITH 2ND RESIDENCE
- COMMERCIAL DESIGNATION
- MULTIPLE RESIDENTIAL UNITS
- LOTS WITH IMPROVEMENTS
- L.I.D. BOUNDARY
- 8" PROPOSED GRAVITY SEWER LINE
- PROPOSED SEWER SERVICE
- PROPOSED EASEMENT
- PROPOSED SHUTOFF VALVE/CLEANOUT
- PROPOSED CLEANOUT
- PROPOSED LIFT STATION
- PROPOSED MANHOLE
- OUT OF DISTRICT
- FOREST SERVICE LAND

WELCH COMER & ASSOCIATES, INC.
ENGINEERS & SURVEYORS

FIGURE 3-6B

GRANITE-REEDER TREATMENT SITE NO. 1 AND NO. 2: COMBINATION GRAVITY / PRESSURE

14070PL10.DWG.DWG, 06-24-02

Granite Reeder Water and Sewer District
Gravity and Pressure System to 40 Acre Treatment Site (#2)
ENGINEER's OPINION OF PROBABLE CONSTRUCTION COSTS

Prepared By: DW, NMA Date:

Description	Unit	Quantity	Unit Price	Total
Startup				
Mobilization	LS	1	$198,050.00	$198,050
Clearing and Grubbing	LS	1	$5,825.00	$5,825
Site Control Plan	LS	1	$2,912.50	$2,913
Silt Fence	LF	9,900	$1.86	$18,454
Common Collection System				
Distribution Construction				
2" HDPE	LF	6,310	$2.62	$16,540
3" HDPE	LF	5,800	$2.91	$16,893
4" HDPE	LF	5,800	$4.08	$23,650
6" HDPE	LF	14,500	$5.83	$84,463
8 inch Schedule 3034 PVC Gravity Line	LF	15,400	$9.32	$143,528
Future Pressure Service Stub	EA	50	$291.25	$14,563
Trench Excavation & Backfill	LF	47,850	$13.98	$668,943
Rock Excavation	LF	6,000	$15.15	$90,870
Processed Bedding Materials	LF	47,850	$2.91	$139,363
Removal of Unsuitable Materials	CY	250	$13.98	$3,495
Stabilization Material	TN	450	$23.30	$10,485
Duplex Lift Station to Treatment Site 2	LS	1	$40,775.00	$40,775
Trench and Excavation Water Control	LS	1	$58,250.00	$58,250
Exploratory Excavation	HR	30	$163.10	$4,893
Valves & Boxes				
Small Lift Station	EA	16	$27,960.00	$447,360
Sewer Manholes	EA	40	$2,097.00	$83,880
Air Release Valves	EA			
2" Resilient Seat Gate Valves & Boxes	EA	10	$320.38	$3,204
3" Resilient Seat Gate Valves & Boxes	EA	11	$407.75	$4,485
4" Resilient Seat Gate Valves & Boxes	EA	16	$436.88	$6,990
6" Resilient Seat Gate Valves & Boxes	EA	36	$553.38	$19,922
Cast Iron Valve Boxes	EA	73	$145.63	$10,631
Clean Out Assemblies w/Boxes	EA	79	$326.20	$25,770
Special Items				
Creek Crossing 1 (Granite Creek) (Pressure and Gravity	LS	1	$10,485.00	$10,485
Creek Crossing 2 (Elkins)	LS	1	$3,029.00	$3,029
Pressure Test System	LF	64,800	$0.87	$56,619
Power to Treatment Site	LF	6,500	$20.00	$130,000
Clean-up and Restoration				
A3 Base For Roads	TN	9570	$19.22	$183,806
Roadway Restoration	SY	53200	$0.99	$52,604
Asphalt Paving Repair	TN	870	$69.90	$60,864
Hydro Seeding	SY	15600	$1.86	$28,996
Top Soil Material	CY	3250	$23.30	$75,509
Collection Subtotal				$2,746,102.98
10% Contingency				$274,600.00
Total Estimated Construction Cost				**$3,020,700**
with Inflation @ 3% per Year				$3,204,660.63

Benefits: There are no immediate benefits observed for this system, since many areas will require a gravity mainline running parallel to pressurized mainline and numerous lift stations. See the drawbacks listed below.

Drawbacks: In some areas of the District, especially near the lake, the topography is very flat. In these areas gravity lines would be buried deep to maintain minimum pipe slope requirements. The high groundwater table would be restrictive to deep trenching and excavation. Therefore, these areas were assumed to be completely pressurized, to allow for shallower installation.

Lift Station at Elkins Resort

Additional drawbacks include a number of lift stations required throughout the District to utilize the gravity system to its fullest capacity. A combination system such as this would be labor intensive. System operators would have to maintain lift stations, pressure and gravity mainlines as well as components such as valves, clean-outs, and manholes.

Approximately 13 small lift stations would be required throughout the system if the pressure/gravity combination option were chosen. These lift stations would be small stations located underground in a waterproofed, concrete wet well. Two pumps should be provided in each station to provide a factor of safety in operation. If one pump goes out, the second may take over, or during peak flow periods, both pumps can operate together. Additionally, the pumps may be cycled back and forth in order to allow for a longer life cycle of use. The pumps required for each lift station will vary depending on the number of connections in each zone and the change in elevation between pump stations. In most cases two, 3 to 5 HP pumps should be sufficient.

If treatment site 2 is chosen, one large community lift station will be required to transfer flows from the community to the treatment site, because it is approximately 100 feet higher in elevation. The community lift station will be a larger scale version of the small local lift stations described above. The community lift station will require at least two pumps, a third pump may be added later if flows begin to exceed the pumping capacity at buildout of the system. The pumps required will have to be designed to pump to a head of 160 feet and meet peak demands. The initial cost estimates were based on 2-20 HP pumps.

It is recommended that a stand-by power source, such as a generator, be provided. This provision would protect Granite Creek and Priest Lake from sewage overflow in the event of a power failure.

3.5 Other Action Alternatives Considered but Rejected from further Analysis:

3.5.1 Treatment

3.5.1.1 Regionalization—Treatment at Outlet Bay

Welch Comer completed a cost analysis to dispose to transport wastewater from Granite Reeder to the Outlet Bay disposal site approximately 14 miles to the south. Disposing of sewage at the Outlet Bay facility is an alternative to constructing a treatment facility. This alternative would consist of three distinct segments as follows:

1. A pumping station. This is required to pump sewage to the Outlet Bay disposal site. The pump station would likely be located near Elkins Resort and be sized with pumps so that a second pump station is not required.
2. A force main between Elkins Resort and the Outlet Bay treatment site. The force main would allow the sewage to be pumped between sites and must be capable of withstanding septic sewage.
3. Individual residences would require a STEP or grinder pump. The positive displacement grinder pumps discussed in section 3.3.4 is capable of pumping sewage from homes directly to the system's lift station; if STEP pumps are utilized the designer should specify that they have pumping capabilities to pump directly to the lift station.

Benefits realized to the Granite Reeder District are:

1. Reduced administration, operation, and maintenance costs realized through shared facilities.
2. No wastewater lagoon located within the Granite Reeder area with potential to negatively impact land use and wildlife habitat.
3. A Bonner County conditional use permit would not be required.
4. Land acquisition costs for the treatment site would be avoided as well as timing issues associated with acquiring the land.
5. An IDEQ Wastewater Land Application Permit would not be required.

The estimated cost for construction for this treatment option is given in Table 3-6.

Granite Reeder Water and Sewer District
Outlet Bay Disposal
ENGINEER's OPINION OF PROBABLE CONSTRUCTION COSTS

Prepared By: Matt Neukom

Description	Unit	Quantity	Unit Price	Total
Transmission Main Construction Costs				
Mobilization	LS	1	$100,000.00	$100,000.00
4" HDPE SDR 11 Sewer Pipe	LF	54000	$3.25	$175,500.00
4" HDPE SDR 17 Sewer Pipe	LF	20000	$3.00	$60,000.00
Sewer Pipe Plowing	LF	64000	$3.25	$208,000.00
Cut Rock 0-6"	LF	4000	$10.00	$40,000.00
Cut Rock 0-12"	LF	1000	$12.00	$12,000.00
Cut Rock 0-18"	LF	1000	$14.00	$14,000.00
Trench Excavation and Backfill 0-5'	LF	10000	$7.50	$75,000.00
Pipe Bedding	EA	10000	$1.00	$10,000.00
Bridge Crossing	EA	4	$10,000.00	$40,000.00
Asphalt Removal	SY	6670	$1.00	$6,670.00
4" Class III Asphalt	SY	6670	$24.00	$160,080.00
3/4" Minus Base Rock 6" Deep	CY	1110	$20.00	$22,200.00
Controlled Density Fill (CDF)	CY	830	$60.00	$49,800.00
Topsoil - 3" Thickness	SY	5000	$1.50	$7,500.00
Hydroseeding	SY	5000	$2.00	$10,000.00
Traffic Control	LS	1	$6,000.00	$6,000.00
Outlet Bay Facility Discharge	LS	1	$5,000.00	$5,000.00
Air Release Valve	EA	14	$2,500.00	$35,000.00
Cleanout	EA	5	$1,500.00	$7,500.00
Lift Station Construction Costs				
Lift Station 10' Diameter Manhole, 12' Deep	LS	1	$20,050.00	$20,050.00
12,000 gallon Overflow Vault	LS	1	$15,000.00	$15,000.00
7.5 hp Effluent Pump	EA	1	$3,800.00	$3,800.00
15 hp Effluent Pump	EA	1	$5,000.00	$5,000.00
Interior Piping/Electrical	LS	1	$3,500.00	$3,500.00
Bioxide Chemical Feed and Storage System at Lift Stati	LS	1	$45,000.00	$45,000.00
Bioxide Chemical Feed and Storage System at Outlet B	LS	1	$40,000.00	$40,000.00
Present Worth of 20 Yrs of Bioxide ($5,000/yr, 20yr, 6%	LS	1	$58,160.00	$58,160.00
Present Worth of Electricity ($4,500/yr, 20yr, 6%)	LS	1	$52,300.00	$52,300.00
Standby Generator	LS	1	$31,500.00	$31,500.00
Northern Lights 3 Phase Electrical Service Fee	LS	1	$6,850.00	$6,850.00
Outlet Bay Related Costs				
WWTP Flow Meter	LS	1	$2,500.00	$2,500.00
Outlet Bay Connection Fee	LS	1	$500,000.00	$500,000.00
Treatment Subtotal				$1,827,910.00
10% Contingency				$182,800.00
Total Estimated Construction Cost				**$2,010,700**
with Inflation @ 3% per Year				$2,071,021.00

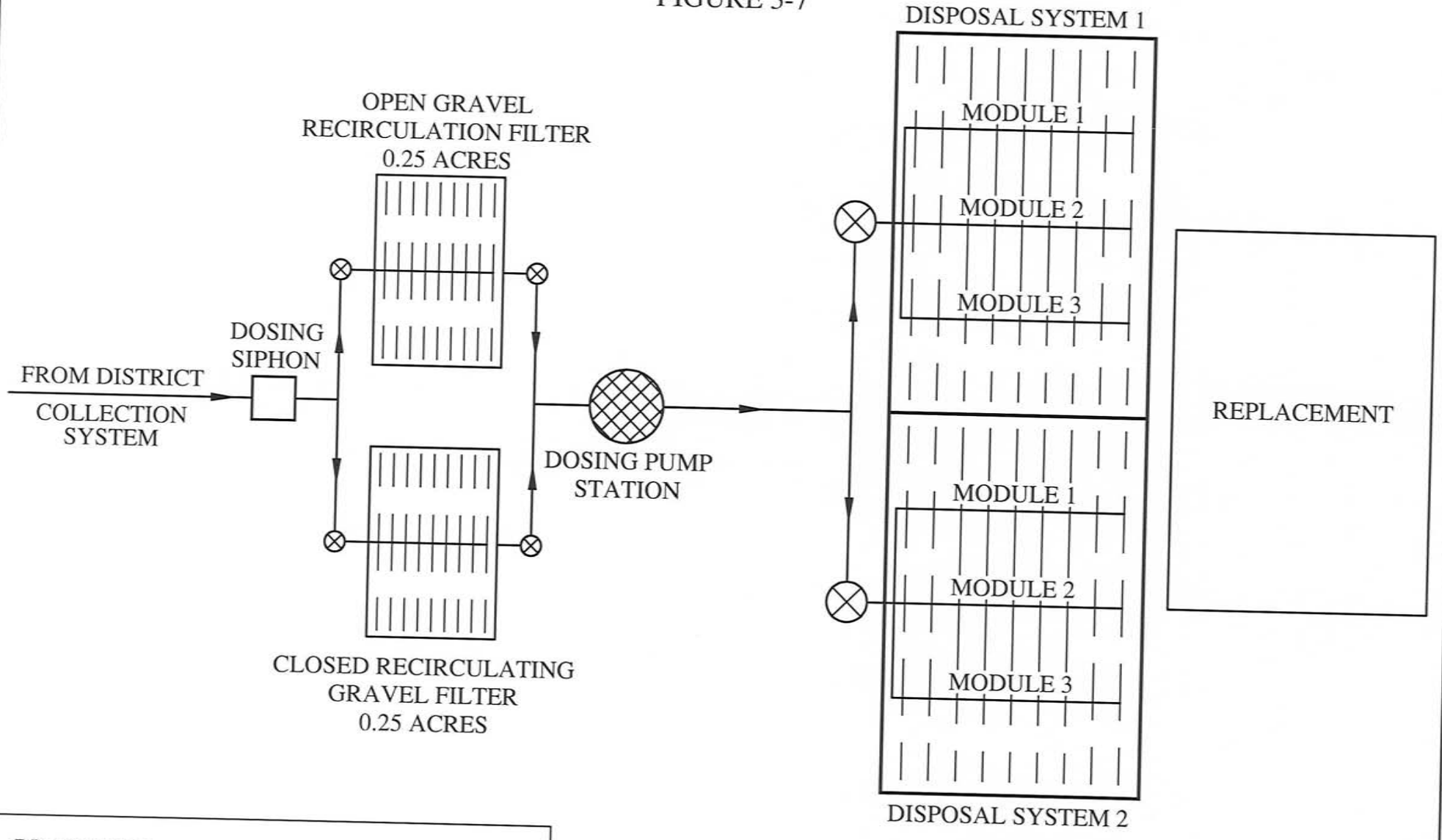
3.5.1.2 Standard Subsurface Drainfield

Subsurface disposal systems utilize conventional treatment technology. If soil properties meet the proper guidelines for absorption, these systems can be an effective way to treat a community's wastewater. Wastewater from the system is collected and sent to a holding tank. Effluent is pumped to the drainfield in doses. The drainfield consists of a distribution network of small diameter perforated pipe located below the ground surface in sand lined trenches. See Figure 3-7.

Grandview Drainfield

Site conditions must meet minimum standards set by the IDAPA 58.01.03 "Rules for Individual/Subsurface Sewage Disposal Systems." Limiting conditions are based on slope, soil type, and separation distances. This option may be expensive, depending on the system's design flow. For a total system flow above 2,500 gallons per day (gpd), IDEQ requires a minimum of 2 complete drainfields (modules), each sized for the full design flow (but not to exceed 10,000 gallons per day per module) and a replacement area sized to treat the design flow of one module. The replacement area is not a fully equipped drainfield, just a back up for an additional drainfield. This option is not recommended for heavily vegetated areas, due to high construction costs associated with this site condition. Due to high groundwater in the Granite Reeder area, it would be difficult to maintain separation distances from the bottom of the trench to groundwater. Additionally, the long-term reliability of community drainfields is questionable. For design flows similar to those predicted for the Granite Reeder area, IDEQ considers drainfields to be less reliable, and less protective of ground water quality, since year-round discharge would be required below the root zone. Therefore, this option was eliminated from the final analysis due to the potential for pollution or contamination to groundwater.

TREATMENT SCHEMATIC
YEAR AROUND SUBSURFACE DRAINFIELD
FIGURE 3-7



DRAINFIELD	3.0 ACRES
GRAVEL RECIRCULATING FILTER	0.5 ACRES
REPLACEMENT FIELD	1.5 ACRES
TOTAL	3.5 ACRES

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3.5.1.3 Subsurface Drip Irrigation

Another low-cost alternative, which is new and still considered "experimental" by IDEQ, is subsurface drip irrigation. This system is an improved version of the standard subsurface drainfield. Effluent from the collection system is treated, often through a gravel recirculation filter to filter out small particles. It is then dosed to a distribution system made of small drip tubing. This tubing is inexpensive to install, since it is plowed in at about 8 inches below the ground surface. Slope and soil conditions are much less of a factor in this alternative than the subsurface drainfields. See Figure 3-8.

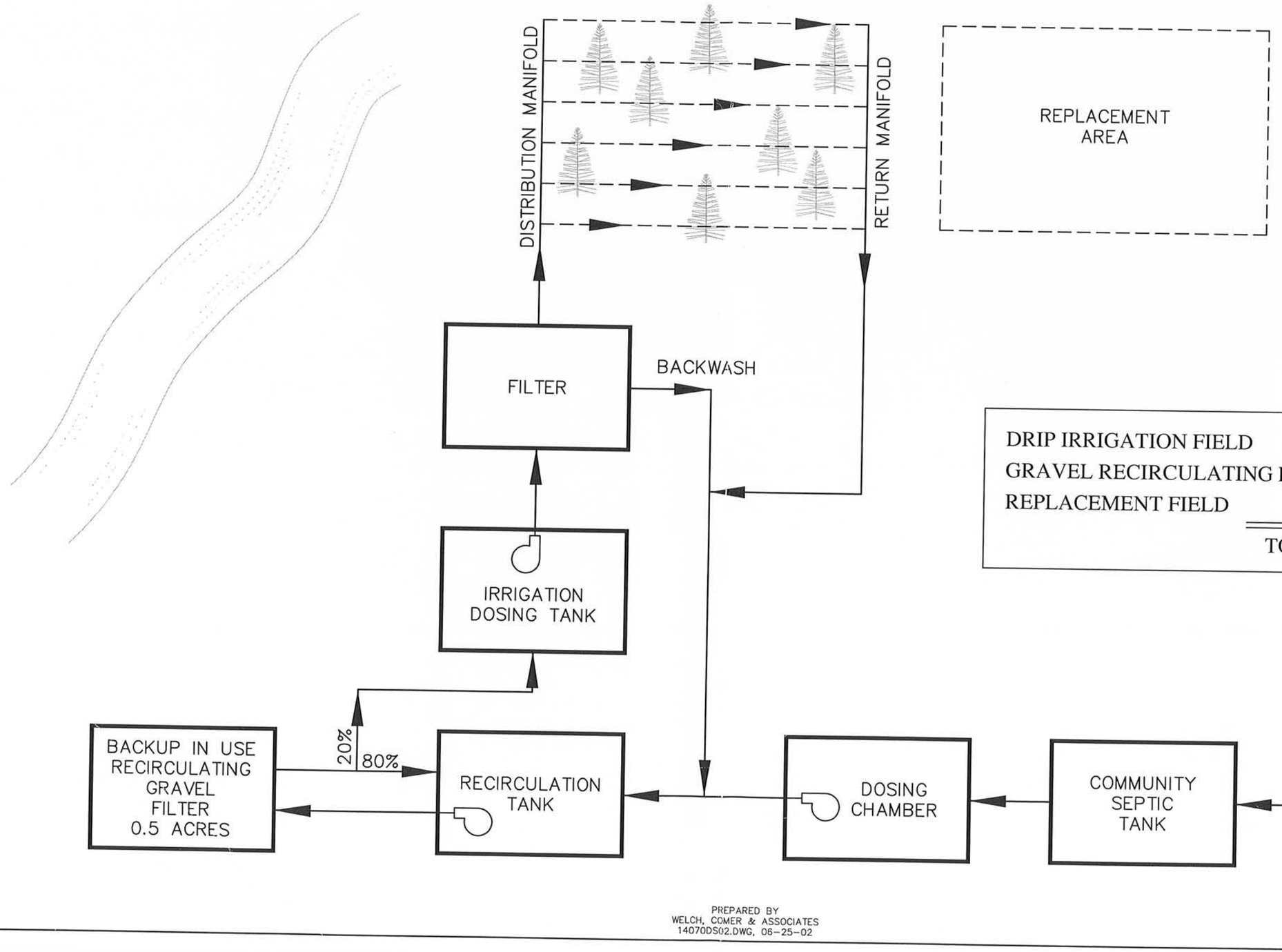
This option was not considered feasible for a system of this size. Drip irrigation systems are a relatively new technology and lack historical observation data. There are very few of these systems in the northwest and even fewer designed for systems the size of Granite Reeder. Observation data on small-scale drip facilities indicate that the systems are able to function in cold winter climates. However, there is no long-term data for systems located in extreme winter climates. Extensive pilot testing for this method would be required before completing a full-scale system. This option would require a large community septic tank to capture solids remaining in the grinder pump slurry. In addition to a septic tank, a gravel recirculation filter would also be necessary to remove small particles, which could potentially clog the drip line emitters. Additional costs would be associated with pumping the community septic tank once or twice a year, and disposing of the solids.

3.5.1.4 Packaged Treatment Plant

This type of treatment technology was reviewed for the Granite Reeder Sewer District for the following reasons:

- Packaged treatment plants can utilize a smaller footprint than conventional treatment technologies.
- Packaged treatment plant can provide a higher level of treatment than traditional technologies, such as drainfields and land application.
- Packaged treatment plants provide a more consistent level of treatment
- Packaged treatment plants can target and meet specific treatment needs

GRAVEL RECIRCULATING FILTER
WITH SUBSURFACE DRIP IRRIGATION
FIGURE 3-8



DRIP IRRIGATION FIELD	1.5 ACRES
GRAVEL RECIRCULATING FILTER	0.5 ACRES
REPLACEMENT FIELD	1.5 ACRES
TOTAL	3.5 ACRES

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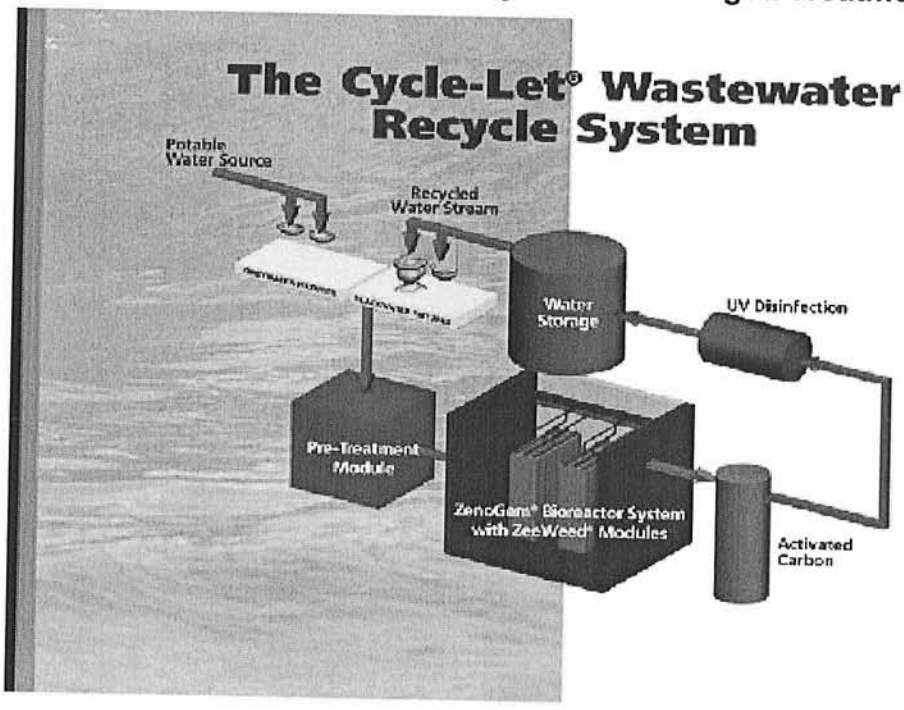
- Due to the high treatment levels provided, discharge may be simplified, such as direct discharge to a surface water

Several packaged treatment plants are available to meet low flow treatment for small communities. Two technologies that were reviewed for the District were membrane filtration and the aerator design.

A specific type of membrane filtration plant, which is manufactured by Zenon Environmental, Inc., is the Zenogem Cycle-Let system. This system fits small design flows. The system is diagramed in Figure 3-9. Flow from the system is collected in a large community septic tank for settling and primary treatment. Effluent is then sent to the membrane unit where it is filtered down through very fine pores in the membrane. Depending on the desired level of treatment, the effluent can be passed through another stage of treatment, final polishing and disinfection. This typically includes passing the filtered effluent through an activated carbon chamber to remove excess color and odor compounds and then through a UV disinfection module for final treatment before discharge. Discharge can be to a small subsurface drainfield, through a land application process or to surface water.

Figure 3-9: Zenogem Cycle-Let Packaged Treatment Plant[i]



In this case the water would be discharged to Granite Creek. This option would be controversial and carry a huge liability, should any malfunction occur in the plant. Discharge into surface water must be secured through permits required by EPA and IDEQ regulating agencies. These permits often include strict monitoring requirements. Additionally, packaged plants can be expensive to maintain and operate, due to the number of controls and components included. It is very doubtful that a discharge permit for Granite Creek would be issued by EPA and IDEQ, since it is a tributary to Priest Lake and is considered "Special Resource Waters." "Special Resource Waters" are protected by IDAPA 58.01.02, "Water quality Standards and Wastewater Treatment Requirements." Under this rule, it is stated as follows:

"Except as noted in Section 400, no new point source can discharge pollutants, and no existing point source can increase its discharge of pollutants above the design capacity of its existing wastewater treatment facility, to any water designated as a special resource water or to a tributary of, or to the upstream segment of a special resource water: if pollutants significant to the designated beneficial uses can or will result in a reduction of the ambient water quality of the

receiving special resource water as measured immediately below the applicable mixing zone."

The Aerator plant consists of a large, open tank with large rotating wheels, located partially outside of the tank. Each wheel is made up of lines of hollow disks. As the wheel rotates, wastewater enters and exits the disks. Aeration is provided during this mixing process and the wheel's large surface area allows for fixed film growth. The wastewater enters a settling zone and then a secondary clarification chamber. Activated sludge that is settled out is returned to the mixing process. A second form of treatment before discharge to a surface water would be required for this plant, as with the membrane filtration plant.

The estimated capital cost for construction of a packaged treatment plant is $2,500 per ER based on an average daily flow of 75 gpd/ER or $1 million for 400 ER's. This does not include annual costs associated with operation and maintenance, which would likely average $20 a month per ER. Due to the potential for controversy over this option and the low potential to obtain a discharge permit, it was eliminated from the final analysis.

3.5.2 Collection System

3.5.2.1 Gravity Sewer

Conventional sewer collection systems use gravity as a means of flow. The proposed gravity system would consist of 8", or larger, PVC (Poly-Vinyl-Chloride) ASTM D3034, SDR 35 collection lines. Residential sewer services utilize a 4" PVC pipe to gravity flow sewage into the main. Gravity services will require a 2% slope to the mainline for adequate flow velocity.

Due to the District's topographic characteristics, the proposed treatment facility elevation and the steep slope of the lots toward the lake, as well as the high groundwater table, a gravity collection system alone would not be possible. A more realistic use of gravity flow is a combination gravity/pressure system.

3.5.3 Other Technologies

The intention of this Plan is to present the most economically feasible and effective treatment options to the District. Another low-cost alternative is the composting toilet. The composting toilet system comes as a unit and consists of

a toilet and a composting chamber. The toilet is connected to the composting chamber located below the toilet. The composting unit may also be located in the basement or in a sheltered area outside the home. According to Clivus Multrum representatives, a composting toilet manufacturer, composting toilets aren't typically used in community systems. The most common use for the system is in individual seasonal use homes such as cabins. Clivus Multrum also offers a gray water treatment system for sink or shower waste. This water is directed to a dosing basin. A pump within the dosing basin is level controlled and pumps gray water as irrigation to planters. The wastewater is treated as it is filtered through the planted vegetation. This option was not analyzed further since installation of the system would have to be within the residence(s) and would not offer a comprehensive solution. This option was excluded from the final analysis in order to prevent potential liabilities to the District with existing utilities or facilities located within private residences.

4 AFFECTED ENVIRONMENT

4.1 Study Area Description:

4.1.1 General

Parkwood Drive

The District boundary is shown in Figures 1-1A and 1-1B. The District is located in Sections 9,16,17, and 20 of Township 61 North, Range 4 West, of the Boise meridian, or more generally between Reeder Bay Road (Reeder Creek Road) and Reeder Bay on the western shore of Priest Lake in northern Idaho. The District includes both residential and commercial users. The residential users are primarily small homes and cabins, which are seasonally occupied. The District has estimated that only 30 percent of the District's population is full time. (Refer to Appendix 13.3 for a detailed summary of policy decisions made by the district regarding commercial users and ER's and design flows.)

Commercial users include the following:

1. Kaniksu Resort: The Kaniksu Resort is outside the District's current boundary. Due to its location with respect to Priest Lake, the Granite Reeder Sewer District will communicate with the Kaniksu owner to encourage them to voluntarily annex and participate in this Sewer District project, in order to protect and preserve the water quality of Priest Lake.
2. Grandview Resort
3. Low's Resort
4. Elkins' Resort
5. Steven's Granite Creek Marina
6. Ledgewood Picnic Area
7. Tillakum Condominiums
8. Hagman's Resort and Condominiums
9. Sundance Condominiums
10. Reeder Bay Campground
11. Ledgewood Picnic Area

4.1.2 Population and ER's

Granite Reeder Sewer District is surrounded primarily by United States Forest Service land and Priest Lake itself. With these geographic restraints, the system is not expected to grow beyond its boundaries and build-out of the system will be assumed to occur over the next 20 years. Build-out occurs when all serviceable lots/ER's within the system's boundaries have been occupied. The following section describes the total number of lots predicted for final occupancy at the District's build-out. Wastewater treatment facilities are to be sized for the District's projected ultimate build-out.

Due to the nature of the District's layout of lots, it was difficult to project exactly where growth may occur. Many of the lots are small. One person may own three adjoining lots with a house placed between lots, or on the lot line. District representatives used a plat overview of the District to plot locations of occupied residences with relation to the lot's boundaries. Refer to Figure 4-1A and 4-1B.

NORTH

24x36 SCALE: 1" = 300'
11x17 SCALE: 1" = 600'

TREATMENT SITE 1
OWNED BY:
U.S. FOREST SERVICE

WOODLAND ESTATES

MATCHLINE

9020 ROBINSON
8000 ENIE
7980 POLTON
MUELLER 7950 124
MAYER 7875 124
STONE 7850 119
STONE 7800
8351

GRANDVIEW ADD'N
ELKINS 840'
GRANDVIEW LODGE/RESORT
BONSCOTER 9212
9170
9600
MURRAY ACRES 1ST ADD
GRANDVIEW ADD'N
U.S. GOVERNMENT HIGHWAY
PEEDEE BAY ROAD
OLMSTEAD 7410
7400
7450
7470
7380
7360
7350
7392
7254
7251
7260
7240
7252
7200
TRACT B
7651
STEVENS CRANTITE CREEK MARINA

SUNDANCE CONDOS
HAMPTON
SUNDANCE LOOP
TRACT A
GOVT LOT 6
6175
HILLEARY ADD'N VACATED
SECREST
GRANITE STREET
SLOT
6530
6512
7030
7000
6990
6993
6923
8900
KANIKSU 6775
KANIKSU 6790
4TH
3RD
2ND
1ST
LOW'S
OUT OF DISTRICT
KANIKSU
4952
COUNTY ROAD
GRANITE CREEK
STEVENS 3980 157
SULLIVAN 4140 165
GOVT LOT 3 3700
3783 McCORMACK, OLSON, ODENTHAL TAX 11
GAUZZA 3670 164
CONSIDINE 3340 161
DIXON 3430 183
SANTUCCI 3300 162
GOVT LOT 2
SMITHS LAKEVIEW LOTS
SMITHS LAKEVIEW LOTS 1ST ADD N
MOUNTAIN VIEW ADD N
HAGMAN BEACH FIRST AND SECOND ADDITION
HAGMAN BEACH
HAGMAN BEACH CONDOS
TILLAKUM CONDOS
GRANITE CREEK
TRACTS NO.2
TRACTS
LAKEVIEW
SMITHS LOTS
GRANITE CREEK MARINA 4953
PETERSON 4641 158
PRIEST LAKE

LEGEND

- NO.5 — DOMESTIC WELLS LOGGED WITH DEPT. OF WATER RESOURCES
- NO.5 — TEST HOLES 10-27-87
- TP-1 — TEST PITS
- LOTS WITH 2ND RESIDENCE
- COMMERCIAL DESIGNATION
- MULTIPLE RESIDENTIAL UNITS
- OCCUPIED LOTS WITH IMPROVEMENTS
- DISTRICT BOUNDARY
- OUT OF DISTRICT
- FOREST SERVICE LAND
- PREDICTED AND EXISTING CONNECTIONS
- EXISTING GUEST HOUSES

WELCH COMER & ASSOCIATES, INC.
ENGINEERS SURVEYORS

FIGURE 4-1A

PREDICTED CONNECTIONS
GRANITE CREEK AREA

14070PL12.DWG, 06-24-02

TREATMENT SITE 2

MATCHLINE

LEDGEWOOD

REEDER CREEK ROAD

REEDER BAY LOTS

DONALD HOLT

IN DISTRICT

TAX #8

TAX #11

TAX #3

OUT OF DISTRICT

POOL'S REEDER TRACTS

TRACT "A" 7205

ELKINS

H.E.S. NO. 773

TAX #15

TRACT "B" 7502 ELKINS (PRIVATE)

TAX #2

RESORT.

U.S. GOVT.

WELL

ELKINS REEDER TERRACE

REEDER BAY CAMP

24x36 SCALE: 1" = 300'
11x17 SCALE: 1" = 600'

LEGEND

- DOMESTIC WELLS LOGGED WITH DEPT. OF WATER RESOURCES
- TEST HOLES 10-27-87
- TP-1 TEST PITS
- LOTS WITH 2ND RESIDENCE
- COMMERCIAL DESIGNATION
- MULTIPLE RESIDENTIAL UNITS
- OCCUPIED LOTS WITH IMPROVEMENTS
- DISTRICT BOUNDARY
- OUT OF DISTRICT
- FOREST SERVICE LAND
- PREDICTED AND EXISTING CONNECTIONS
- EXISTING GUEST HOUSES

WELCH COMER & ASSOCIATES, INC.
ENGINEERS & SURVEYORS

FIGURE 4-1B

PREDICTED CONNECTIONS
REEDER BAY AREA

14070PU12.DWG, 06-24-02

Additionally, the representatives predicted where development might occur on the currently unoccupied lots in the next 20 years. The resorts were assigned ER equivalents based on estimated wastewater flows and IDEQ standards. The following tables summarize the residential and commercial (resort) lot and ER assignments.

Table 4-1: District's Predicted Number of ER's

	ER's			Commercial	Condos	Residential	Vacant
	Total Occupied	Total Vacant	Totals	ER's	ER's	ER's	ER's
Granite Creek	309	50	359	51	29	231	50
Reeder Bay	41	0	41	32	0	9	0
Total	**350**	**50**	**400**	81	29	240	50

1. The total number of ER's counted for the condominium units include Tillakum (9 units), Sundance (14 units) and Hagman Beach (6 units).

Table 4-1 shows that the District has predicted a total of 269 occupied residential ER's on the system. This includes 240 residential units and 29 condominium units and 15 guest homes, which the District has predicted have adequate facilities constituted as a stand-alone unit. A total of 83 commercial ER's, based on policy decisions, were assigned to the District. The total ER's for each commercial user is summarized in Table 4-2.

Table 4-2: Summary of Commercial ER's

		Commercial ER's in District
		Occupied ER's
Granite Creek Area	Granite Creek Resort	7
	Kaniksu Resort	20
	Lowe's Resort	6
	Grandview Resort	18
Reeder Bay Area	Ledgewood	2
	Reeder Campground	8
	Elkin's Resort	22
Commercial Totals		**83**

Welch Comer and Associates, Inc performed a count of lots, based on Bonner County's tax maps of the District boundaries. Table 4-3 summarizes this count.

Table 4-3: Total ER's Based on Bonner County's Tax Maps, without Potential Consolidations

District Area	Commercial	Condos	Residential	Vacant ER's	Occupied	Vacant	Totals
Granite Creek	53	29	211[1]	142	293	142	435
Reeder Bay	30	0	12	7	42	7	49
Total	83	29	223	149	335	149	484

1. This includes 5 secondary residences on lots with a primary homes, which have been recorded by the Assessor as having adequate facilities to be considered a stand-alone residence.

Table 4-3 shows the total number of occupied and vacant ER's in the District based on the total number of lots. There are a total of 293 occupied ER's throughout the District. This total includes residential ER's, commercial ER's, as well as condominium ER's. The vacant lot counts for the District totals 142. This number is much higher than the District's predicted 50 ER's because potential lot consolidations were not considered in the tax map count.

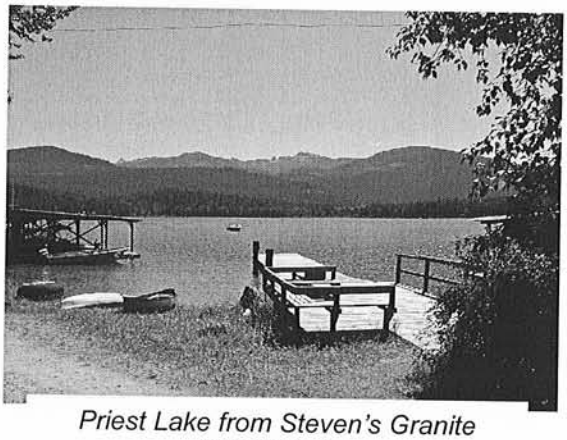
After reviewing the District's count and the tax map count and analyzing lots that would likely be consolidated, such as in the incidence where a home was located on a lot line, a conservative ER count for the assessment was generated. This is shown in Table 4-4 below.

Table 4-4: Predicted ER Summary, with Potential Lot Consolidations

Connection Type	Occupied	Vacant	Total Possible
Commercial	83	0	**83**
Residential	252[1]	65[2]	**317**
Total	335	65	**400**

1 Assuming 84 vacant lots are consolidated (over 1/2)
2 Assuming 10 guest houses not accessed (over 2/3)

The predicted ER summary indicates a total of 335 occupied residential and commercial ER's and 65 vacant lots. Therefore, the projected ultimate development of the District is estimated to be 400 ER's. Depending on the total number of adjoining vacant parcel consolidations, this number may go up or down. However, at this time, this initial estimate is expected to be the most conservative and representative of the District.



Priest Lake from Steven's Granite Creek Marina

It should be noted that several out of district users are located within the overall District boundary. Refer to Figures 4-1A and 4-1B. Within the Granite Creek area, out of district users included the Kaniksu Resort. Annexation of the Resort is planned and was therefore included in the District's ER count. Within the Reeder Bay area, there were several out of district users. These users were not included in the District's lot summary. The system overview maps show the out of district users in green.

4.2 Major Features of the Proposed Project

4.2.1 Collection System

The following table summarizes the proposed collection system:

Table 4-5: Inventory of Proposed Collection System

Diameter (in)	Material	Length (ft)	Type
1.5	HDPE	17,500	Service
2	HDPE	12,050	Collection
3	HDPE	12,720	Collection
4	HDPE	7,480	Collection
6	HDPE	8,740	Collection

The alternative recommended would include a completely pressurized collection system. By utilizing the positive displacement pumps and treatment site 1, no community lift stations would be necessary. The collection system would be placed in the County road right of way. Two creek crossings will be necessary. One located on Reeder Bay Road at Granite Creek and one located southwest of Elkins Resort.

The pressurized collection system would include a clean-out station at every intersection and intervals of approximately 600 feet. Each clean-out station would include a cleanout for every direction, as well as a gate valve. The station would be placed in a sanitary manhole.

4.2.1.1 Construction methods

Gravity sewer collection systems are constructed by open trench excavation. This method of excavation will require a significant amount of surface restoration due to the wide nature of the trench, approximately eight to twelve feet wide depending on depth. The surface restoration will normally be within gravel streets. While gravel streets are less expensive than asphalt to construct, it is a costly form of surface restoration.

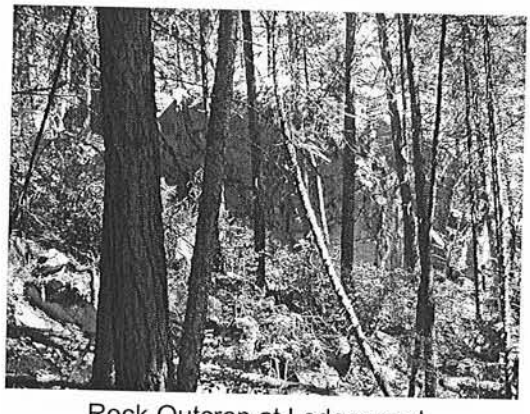
Pressurized sewer line would likely be high-density polyethylene (HDPE) 2" to 6" in diameter. HDPE pipe is connected by heat fusion bonding, which is a process that joins two pieces of pipe by heating the ends and pushing them together. This creates a jointless and virtually leak-free system. The pipe should be

installed a minimum of 4.5 feet deep to prevent freezing. Pressure services should connect to the main with a fused HDPE tee, rather than utilizing a saddle with corporation stop. This will result in a collection system without joints except those at pumps, valves, or clean-outs.

There are two methods to install the pressure pipe in the ground. The first is by open trenching, which requires digging a trench, typically a minimum of 2.5 feet wide, installing the pipe and bedding in the trench and backfilling the trench. This is the conventional method of utility installation.

The alternative method to open trenching is plowing. The plowing technique requires a narrow trench, typically an inch or two wider than the pipe diameter, to be plowed into the ground; the trench is typically out of the roadway. After plowing, the sewer pipe, consisting of one long piece of fused HDPE pipe, is installed in the trench and backfilled with the material removed during the plowing process. This technique has the following drawbacks:

1. Bedding is not placed around the pipe. Large diameter HDPE pipe is typically bedded when installed by open trenching for potable water or sewer applications. However, gas utility companies typically install small diameter HDPE pipe via plowing and do not bed the pipe. Without bedding, sharp rocks may damage the pipe over time.
2. Backfill material is not compacted. Not compacting backfill material provides potential for material over the plowed trench to settle. However, given the narrow trench width in combination with the fact the trench is outside the roadway limits, the settlement is typically of little or no consequence. The construction contractor may need to remobilize to the site to complete minor surface restoration at driveways after the project is complete, which could be included in unit bid prices as part of the contractor's construction contract. Alternatively, the District could hire a local contractor to complete the restorations.



Rock Outcrop at Ledgewood

Plowing is not recommended for the main collection lines at Granite Reeder. The abundance of rock in the area creates adverse conditions for plowing. The plowing technique does not allow for close observation of the line's condition before burial. Consequently, if the line is pressed against rock, it may become dented, collapsed, or fractured during burial, unbeknownst to anyone. Additionally, plowing in the roadway is not recommended. It is difficult to ensure proper compaction of backfill and may result in uneven settlement. Plowing is generally acceptable for service lines, due to their small size and location off the roadway. The cost estimates reflect the use of plowing for services, and open trenching for the main collection lines.

4.2.1.2 Construction Issues

The following are Welch Comer's recommendations for constructing the project:

1. Complete test pits throughout the project area as part of the preliminary design phase. The test pits should be excavated as deep or deeper than the proposed improvements. The test pits should evaluate soil conditions and presence of rock or ground water. This will increase the accuracy of the project cost estimates and provide bidders necessary underground information required to avoid change orders to excessive project costs.

2. Bonner County is not currently planning any paving projects within the project area through 2003. The County will not allow Reeder Bay road to be cut. Therefore, it will be necessary to keep construction work off of Reeder Bay road. Any crossings will have to be bored. The County will require a $50,000 construction bond for construction work in the road ROW. Additionally, a ROW permit will be required. Typically, backfill density compacted to a minimum of 95% density is sufficient for pavement, but a geotechnical engineer should provide a recommendation based on existing soils observed in test pits.

3. A conditional use permit is required by Bonner County for public utility facilities, such as the treatment plant. The permit must be completed by the District and should be submitted at a minimum of 3 to 6 months ahead of construction. A fee of $450 will be required along with a land capability report and the land application permit.

4.2.2 Lagoon and Land Application Site

4.2.2.1 Flow Projections

Forecasting flows for the District was necessary for preliminary design of a wastewater collection system and treatment facility. Figure 4-2 shows the predicted monthly flows into the wastewater treatment facility at build-out of the system. The monthly flows are predicted to range between 449,000 and 2.68 million gallons per month. Choosing a design flow was critical for the design and sizing of the treatment facility.

Figure 4-2:
Monthly Flow Ratios Predicted for Granite Reeder Treatment Facility

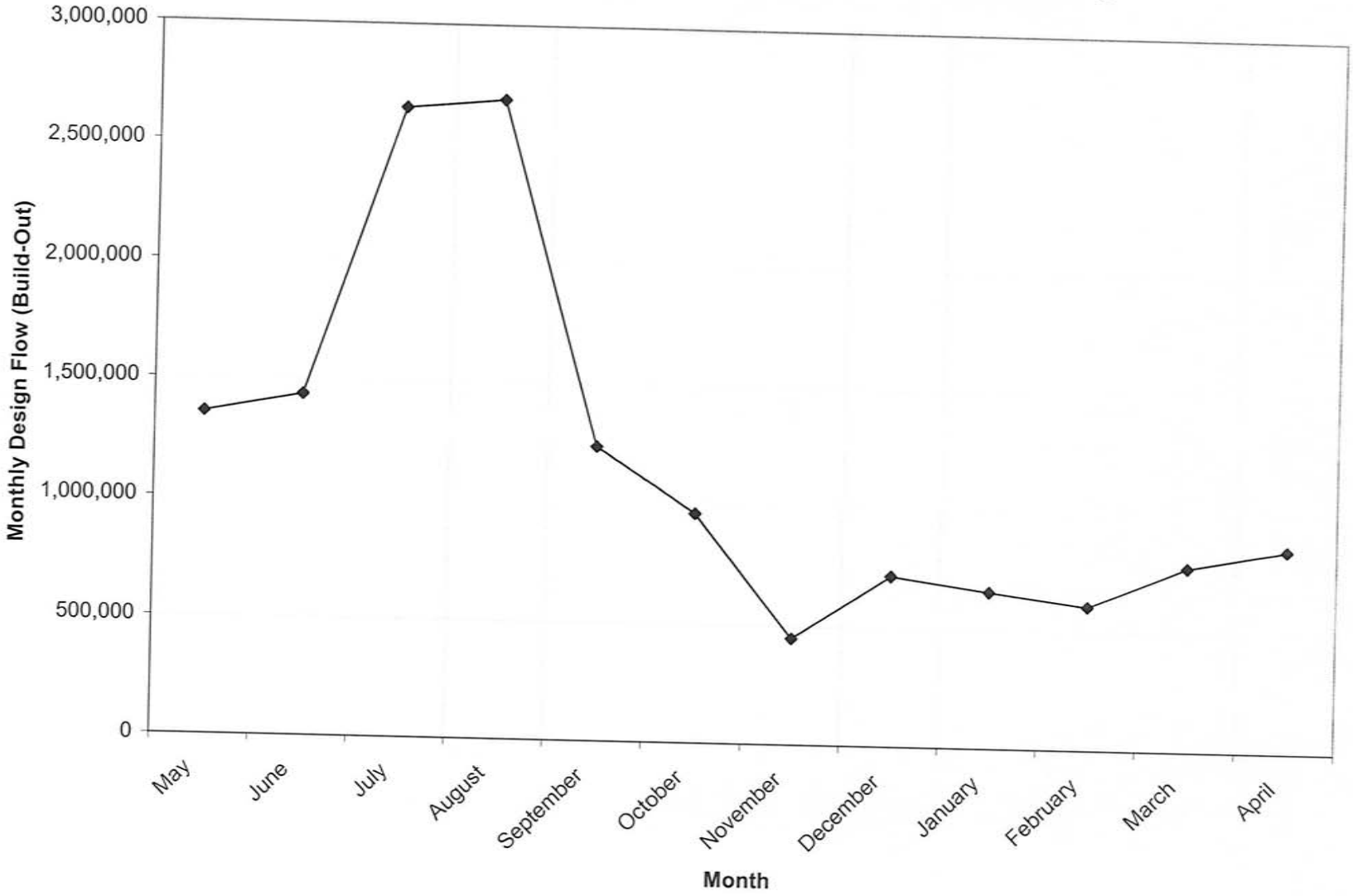


Table 4-6 compares different design flows to the required treatment facility size (assuming a lagoon/land application system). These flows assume that the facility will be constructed for complete build-out of the system within the next 20 years.

Table 4-6: Treatment Facility Sizing and Design Flows[1]

DESIGN FLOW	Gpd/ER[3]	75[5]	90[5]	100[5]	200[5]
Land Application Area[2]	Acres	23	27	30	60
Lagoon Storage Required	MG[4]	6	8	9	17
Lagoon Surface Area	Acres	1.8	2.4	2.6	4.6

1. Sizing is estimated based on a 20-year projection of 400 ERs and no additional annexations into the District.
2. Land application is estimated based on land applying from the middle of May through October 1.
3. gpd/ER is gallons per day per Equivalent Residence (ER)
4. MG is million gallons.
5. A Factor of Safety of 30% has been added to these figures for actual design flows of 98,117,130, and 260 gpd/ER respectively.

Table 4-6 shows that if a design flow of 200 gpd was chosen as the design flow for the wastewater treatment facility, a land application area of 60 acres would be required plus an additional 4.6 acres of storage area for the lagoons. This would eliminate treatment site 2 as an option, since it is only a 40-acre site. However, treatment site 1, consisting of nearly 80 acres, would still be an option.

The District elected to base its design on an average annual flow of 75 gpd/ER. This flow would be adjusted using monthly peaking factors observed at Kalispell Bay. Design of the collection and treatment facilities will include a safety factor of 30% based on flow. A design flow between 70-90 gpd/ER for the treatment facility was recommended since it represents flows observed in similar nearby communities, such as Kalispell Bay and Outlet Bay as previously discussed. Additionally, as shown in Table 4-6, the land application requirement for 70-90 gpd/ER is less than half that required for the 200 gpd/ER.

Sizing the treatment facility for higher design flows will yield larger, more expensive facilities, as well as a facility that may impact utilization and development of adjacent private property. As shown in Table 3-1, DEQ guidelines require that a minimum distance from the land application site to homes, roads, and places accessible to the public, be maintained. Given these requirements, a treatment facility and land application area sized for 200 gpd/ER would require a larger area than what is available given the minimum distance

requirements. As a result, utilization and development of private land along the Treatment site's perimeter would be limited.

4.2.3 On-Site Collection Units

4.2.3.1 Grinder Pump/STEP Considerations

Given the general information presented in sections 3.4.3 and 3.3.4, three on-site collection alternatives were analyzed for the District. A brief description of each alternative is given below.

1. Positive Displacement Grinder Unit Located in the Public Road Right of Way (ROW): This alternative was considered because it would significantly reduce the amount of easements required for the project. Each property owner would be responsible for the work required to abandon their existing treatment units and to connect their home to the District placed grinder unit, located at the property line.
2. Positive Displacement Grinder Unit Located on Private Lots and Parcels: This was the original grinder alternative. This alternative would require the District to obtain an easement for every private lot or parcel where work was to take place. In this alternative, the District would be responsible for the abandonment of the existing, private treatment units and the connection of each home to the grinder unit.
3. Septic Tank Effluent Pump System Located on Private Lots and Parcels: Due to the size of the septic tanks, it would not be feasible to locate them in the public ROW. This alternative would be similar to alternative 2, but septic units would be used in place of grinder units.

The following easement issues should be considered by the District with respect to the on-site treatment alternatives described above.

4.2.4 Right of Way / Easement Issues

4.2.4.1 Easements for sewer services through private property

Easements would be required for the following situations:

- A service line to a residence, which crosses over another private property, will require a legally recorded easement. Any portion of collection line, which is required to cross private property, will also

require a specific easement. These easements have been included in the estimated costs.

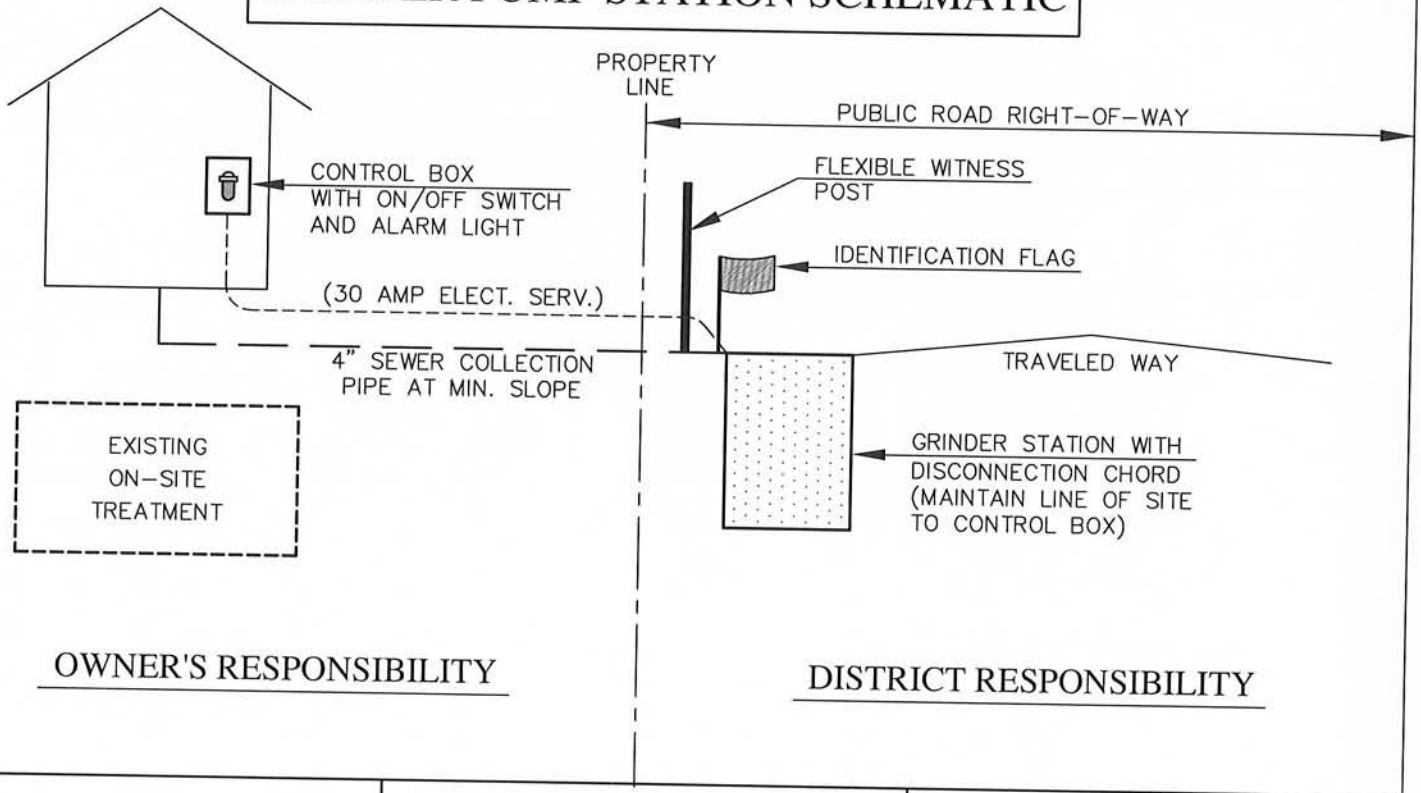
- In order to place septic or grinder systems on private property, an easement would be required for each lot. These easements are necessary for any work occurring on private property and to allow the District on-going access to each on-site unit for operation and maintenance purposes.

Due to the number of lots in the District and the variability of each lot, the easement process for every lot could take over a year to complete and could be cost prohibitive to the proposed project. Therefore, it is recommended that the District consider placing on-site units within the road right of way where feasible. In this scenario, each owner would be responsible for costs associated with the hook-up (30 amp electrical service and 4 inch sewer service) from the residence to the on-site collection unit stub at the property line. A schematic of this scenario is presented in Figure 4-3. Where road right of way is too narrow for the on-site units, an easement would be acquired to place the units on the corresponding lots, or the units would be modified to meet traffic loading requirements and placed within the traveled way.

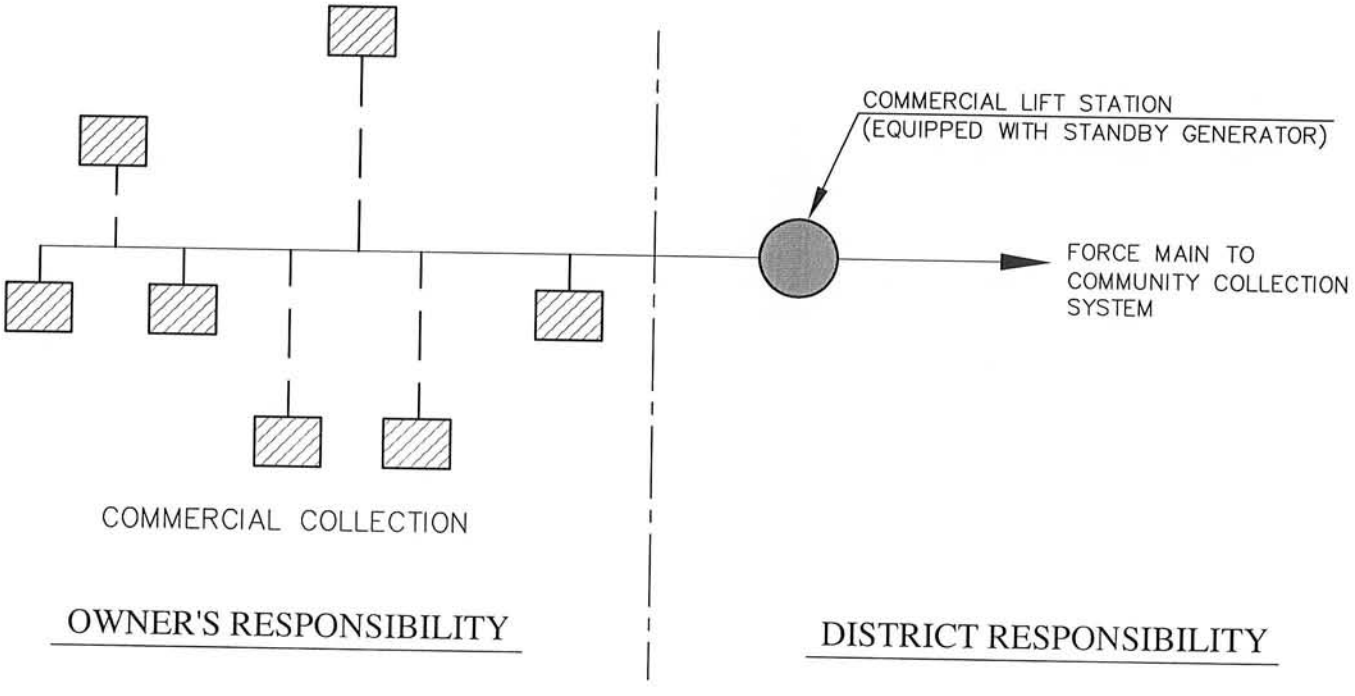
Granite Bay Road

FIGURE 4-3
GRANITE REEDER

RESIDENTIAL ON-SITE GRINDER PUMP STATION SCHEMATIC



COMMERCIAL ON-SITE



PREPARED BY:
WELCH, COMER AND ASSOCIATES
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Due to the size of the STEP units, it would be infeasible to place them in the public road right of way. Therefore, individual easements would be required for the STEP on-site alternative. Because the grinder units are smaller, it would generally be possible to place them within the public road right of way.

Figure 4-3 also showed a schematic of the on-site component for commercial systems. As with residential users, commercial users would be responsible for the relay and hook-up of on-site sewage (electrical and sewer service) from the private facilities to an on-site collection unit (i.e. commercial lift station). It is proposed that the District would be responsible for the collection unit and conveyance (via force main) to the treatment site through the community collection system.

RV Sites at Kaniksu

4.2.4.2 Public Right-of-Way

The following summarizes potential conflicts and liabilities, which may be prevented by placing the units in the public road right of way:

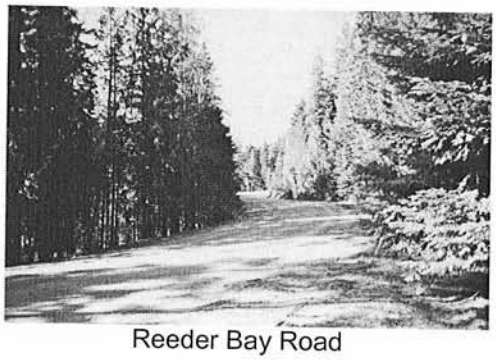
- Easements: By placing the units in the right of way, the number of easements will be reduced. By reducing the number of easements, less negotiations and time-consuming legal paperwork will be required. This will allow the project to begin and be completed in a timely manner.
- Abandonment of existing on-site treatment units: Existing on-site units must be abandoned according to IDEQ regulations. By making this the responsibility of the homeowner, the District may be relieved of potential liabilities associated with the existing, substandard treatment units.
- Disruption of lots: Many of the lots within the District are small. Construction of on-site collection facilities on private lots may be disruptive to the existing lot condition. Potential liabilities on private property from dissatisfied homeowners would be shifted away from the District by placing the units in the public right of way.
- Electrical requirements: This option of placing the units in the public right of way will prevent potential liabilities to the District and potential hidden costs associated with private residences' wiring and electrical systems.

The following is a list of potential conflicts associated with placing the units in the public ROW that should be considered by the District:

- Each owner will be responsible for completing the existing treatment unit abandonment and the collection hook-up to the new on-site grinder unit. (It is recommended that the District establish and implement a procedure for inspecting and permitting all service connections to ensure that they are done properly. This will assure the reliability of the system.)
    - The cost for one homeowner to have the service connection completed will be higher than having several services bid out to a contractor.
    - It may be difficult for the District to monitor and ensure that the private on-site work meets the same standards as the rest of the system. However, this on-site work would be permitted and inspected by the State plumbing and electrical inspectors.
        - For any of the three on-site alternatives chosen, it is recommended that the District to set specific standards, through ordinances, for private collection services to ensure that what goes into the community collection system is not harmful. Grease traps and other necessary devices should be strictly enforced where needed.
- There are several homes in the District that are located lower in elevation than the public ROW, in these cases it would be necessary to obtain an easement and place the grinder unit on the corresponding private lot. If alternative 1 were chosen, the owner would still be responsible for completing the service connection and existing treatment unit abandonment. The estimated cost for the recommended improvement included an allowance for 1/3 of the grinders to require easements.
- In some areas where homes are located below the main collection line, deep excavation of service lines may be necessary in order to maintain the minimum slope requirements for a service from the residence to the grinder unit. Groundwater conflicts associated with deep excavations may result in higher construction costs. Where deep excavation would be required for a lot, it would be recommended that the District obtain an easement to place the grinder unit on the lot, closer to the home.

- Manufacturers of the grinder units have expressed concern with placing the grinder units far from the residence, due to the drop in voltage from the residence to the unit. On large lots or lots where the residence is located at a large distance from the property line, it would be recommended that the District obtain an easement to place the grinder unit on the lot, close to the home.
- There are several private roads in the District, which belong to commercial properties and residential properties as well. In cases where residential grinder units must be placed in the private road ROW, an easement will be required.
- The public road ROW width varies in the District from 20 feet (near the Lake) to 100 feet (Reeder Bay Road). For areas where the ROW is narrow, it will be necessary to modify the grinder units to accommodate traffic loading. The cost estimates given in Section 5 for Alternative 1 reflect 1/3 of the grinders to require traffic rated enclosures. The traffic rating would be obtained by setting a 4-foot manhole section with a traffic rated ring and lid over the grinder unit. It should be noted that construction costs for these two grinder alternatives are similar. However, the time and administrative costs required to obtain easements for each individual lot, would be considerable.

The estimated project costs for alternatives 1 and 2 were essentially the same. The major advantage to the District if alternative 1 is chosen is that the liability for work performed on private property would be greatly reduced. Additionally, project time conflicts would be decreased by reducing the number of negotiations and the amount of paperwork required for easements. Therefore alternative 1 was chosen as the recommended on-site alternative.



Reeder Bay Road

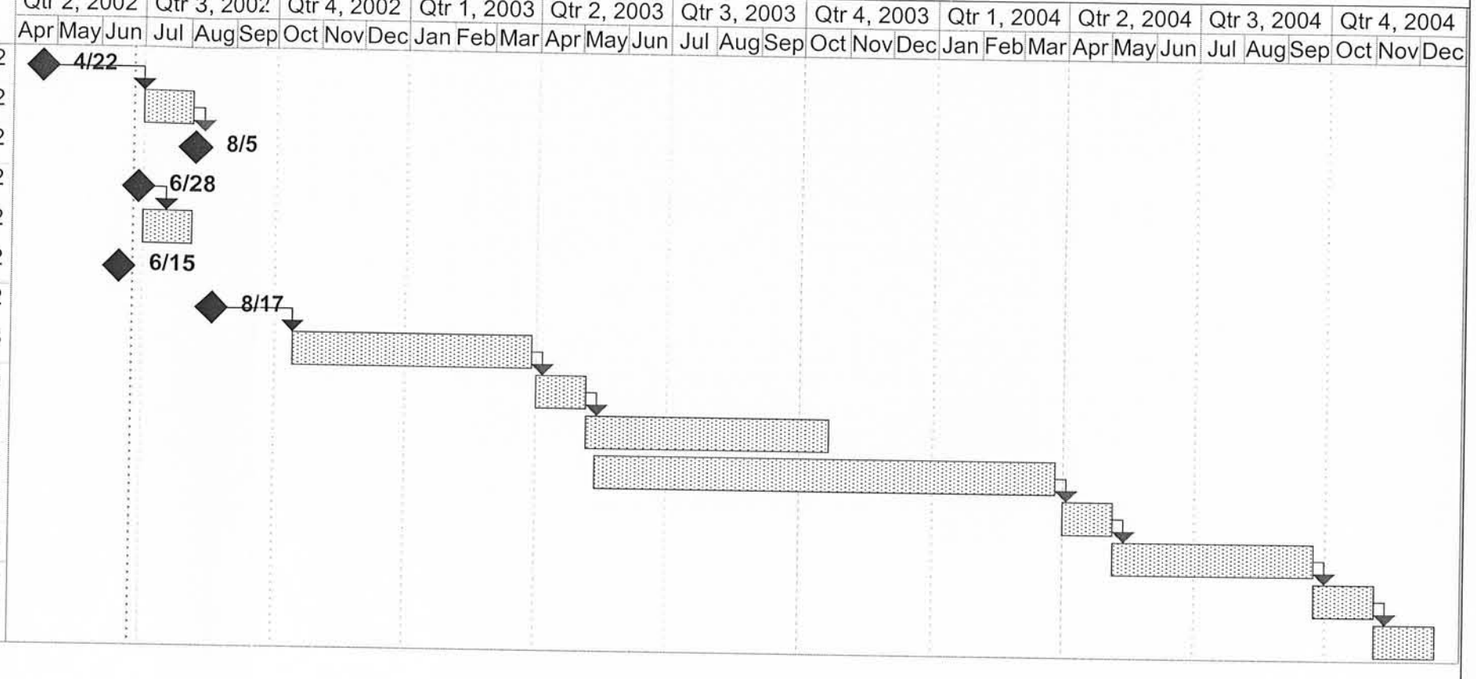
4.3 Project Schedule

This environmental assessment will be submitted to the Idaho Department of Environmental Quality ("IDEQ") and the Granite Reeder Water and Sewer District in June 2002 with an anticipated approval date of August 1, 2002. Once IDEQ has approved the Draft EA, comments from the various regulatory agencies will be incorporated into the Draft EA forming a Final EA. The EA will be submitted to IDEQ for review and publication. If IDEQ issues a Finding of No Significant

Impact ("FONSI") for the project, Welch Comer will proceed under the Districts direction and begin formation of a Local Improvement District for funding of the Preliminary Design. A detailed project schedule is provided on the following page.

Granite Reeder Sewer District
Project Schedule

ID	Task Name	Start	Finish
1	Submit Draft Facilities Plan	Mon 4/22/02	Mon 4/22/02
2	Edit/Finalize Plan	Mon 7/1/02	Fri 8/2/02
3	Plan Accepted	Mon 8/5/02	Mon 8/5/02
4	Submit Environmental Assessment	Fri 6/28/02	Fri 6/28/02
5	Agency Review of EA	Mon 7/1/02	Fri 8/2/02
6	Public Meeting	Sat 6/15/02	Sat 6/15/02
7	LID Formation Hearing	Sat 8/17/02	Sat 8/17/02
8	Treatment System Design	Mon 10/14/02	Fri 3/28/03
9	Bid Treatment System	Tue 4/1/03	Mon 5/5/03
10	Construct Treatment System	Tue 5/6/03	Mon 10/20/03
11	Design Collection System	Mon 5/12/03	Fri 3/26/04
12	Bid Collection System	Thu 4/1/04	Wed 5/5/04
13	Construct Collection System	Thu 5/6/04	Wed 9/22/04
14	Commissioning/Startup	Thu 9/23/04	Wed 11/3/04
15	Close LID	Thu 11/4/04	Wed 12/15/04



Project: sched0610
Date: Mon 6/24/02

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

4.4 Physical Aspects

4.4.1 Topographic Features

Based on the May 1992 Facilities Plan Preliminary Engineering Report Update submitted by Welch Comer and Associates, Inc., the Reeder Bay area is comprised of an alluvial fan resulting from deposits of Granite Creek. This alluvial fan is made up of "free-draining sands and a gravel bench that is approximately 30 feet above Priest Lake sloping upward to the south and west from the south side of Granite Creek." This project will not affect the existing topography and geology. A summary of soil test hole results from the 1992 Plan is included in Appendix 13.4.

4.4.2 Geographic Feature

The Granite Reeder Water and Sewer District is located in Sections 9, 16, 17 and 20 of Township 61 North, Range 4 West of the Boise Meridian in Bonner County, Idaho. The proposed wastewater improvement area is located on the West Side of Priest Lake near Granite Creek and Reeder Bay. Figure 1A and 1B provides the overview of the general area.

4.4.3 Geotechnical and Seismic Considerations

Northern Idaho is considered zone 2-B for seismic consideration. Structures in Zone 2 must consider seismic loading. Determination of the seismic area was made by Section 1600 of the Uniform Building Code.

4.4.4 Geology

A summary of the Priest Lake geology was provided in the IDEQ Phase 1 Diagnostic Analysis 1993-1995. The summary describes two groups of bedrock in the Priest Lake area. The western side of the lake, and thus the Granite Reeder Sewer District, sits on a Precambrian Belt Supergroup series. This series is "made up of mildly metamorphosed sedimentary rocks including argillites, siltites, and quartzites. The oldest and most prevalent of the series is called the Prichard Formation."

4.4.5 Soils

The Bonner County soil survey by the Soil Conservation Service (USDA-SCS 1982) does not include soil mapping on the west side of Priest Lake. A general soil map for the west side of the Lake was included in the IDEQ Phase I

Diagnostic Analysis. This map, which had been provided by the Soil Conservation Service Coeur d'Alene Office, indicates that the Granite Reeder area is composed primarily of Priestlake-Treble soils. This soil type is described in the Analysis as follows:

> Glacial Till Origin. Very deep, well drained, moderately steep to very steep soils: on foothills and mountainsides. Priestlake soils are on the cooler, north facing mountainsides. The surface layer is gravelly sandy loam, subsoil very gravelly sandy loam, and the substratum is very gravelly loamy sand. Treble, high precipitation, soils are at the lower elevations on foothills and the warmer south facing slopes. The surface layer is gravelly sandy loam, the subsoil very gravelly sandy loam, and the substratum very cobbly loamy course sand. Klootch and Kruse soils are also common.

4.5 Climate

The project area lies in the Pacific Northwest in an area that is marginally influenced by a maritime rather than a continental climate. Precipitation in the area is generally in the form of snow from November to February and totals 32 inches annually. The climate in the area is generally subhumid and characterized by warm, dry summers and cold wet winters. Over the year temperatures may range from single digits to triple digits.

4.5.1 Prevailing Winds and Temperature

The average annual temperature is 44 degrees Fahrenheit. Wind through the area typically comes from the south. However, storms from Canada occasionally bring winds from the north. Winds up to 25 mph have been experienced during summer storms.

4.5.2 Air Quality

There is no air quality monitoring stations in the Priest Lake area. Therefore, precise air quality data for the Granite Reeder area was unavailable. Because the District is located right on the lake away from industrial development, air quality is considered very good. A dust control plan and implementation will be required during construction of the system.

4.6 Population

Population of the Granite Reeder area fluctuates seasonally. The District has estimated that approximately 30% of the District is full time residents. The Idaho Department of Commerce's profile on Bonner County shows that the population of the county in 2000 was 36, 835. This marked growth of 38% for the county since 1990.

The Phase 1 Diagnostic Analysis for Priest Lake discusses population fluctuations for the entire Priest Lake area. The analysis states, "The US Census Bureau enumerated 5,351 people for the Priest Lake Division in 1995." The County estimated that the peak annual population inhabiting cabins and second homes was approximately 5,000 people in 1995 for the Lake area. An estimated 2,500 people visited the Priest Lake area between June and September of 1995. Based on information given in the Diagnostic Analysis, there were 1,707 single-family residences and 86 condominium units in the Priest Lake area. Based on this information, the estimated number of persons per residential unit is approximately 2.7. Using this estimate and the total number of occupied residential ER's (252, see Table 4-4) in the District, the District's estimated population would be approximately 680 people.

4.7 Economics and Social Profile

4.7.1 Economics of the Proposed Project

The proposed wastewater improvement project will be funded with a $2.23 million EPA STAG Grant. IDEQ supplied a 75% grant to fund the Wastewater Facilities Plan for the District. The rest of the study will be funded locally.

A low interest loan will be available to members of the Local Improvement District ("LID"), once formed, in which the property owners can either can either pay in full within 30 days or by amortization over a period of time. Funding will be provided by IDEQ at an interest rate of approximately 3.75% (plus 0.25% for administrative expenses) over 20 years. The following table summarizes the direct costs to users within the District.

Table 4-7: Estimated Assessment per Lot for Preferred Alternative (Grinders in Road ROW, 1/3 Easements, Pressure Collection to Lagoon with Land Application)

		Funding Allocation (Allocation Priority to Component A)	
Total Estimated District LID Project Costs		$ 3,559,483	(LID Assmt Numerator)
Total Estimated Lots, Parcels, and ER's	Existing ER's	335	(LID Assmt
	Vacant Lots	65	Denominator)

LID Assessment Component A	LID Assessment Component B	LID Assessment Component C
On Site Grinder Collection Units in Road ROW	Pressure Collection System	Lagoon with Land Application Treatment
$ -	$ 2,451,079	$ 1,108,405
divide 335	divide 400	divide 400
$ -	$ 6,130.00	$ 2,770.00
(Covered by Grant)		

By combining the three components of LID assessments based upon the number of lots/parcels/ER's which benefit, results in the following calculations:

LID Assessment Component	Occupied Lots	Vacant Lots
A	$ -	N/A
B	$ 6,130.00	$ 6,130.00
C	$ 2,770.00	$ 2,770.00
Total One Time Assessment per Lot	**$ 8,900.00**	**$ 8,900.00**

If Amortized over 20 years at 4.00% Interest (0.07358 Annual Factor), the Annual Installment for LID Payments would be as Follows:

Occupied Lots (per Lot per Year)	Vacant Lots (per Lot per Year)
$ 650.00	**$ 650.00**

4.7.2 Social Profile of the Proposed Project

According to the District's officials, only 30% of the Granite Reeder Water and Sewer District's population consists of full time residents. The rest of the population is seasonal, with many property owners residing in larger surrounding cities such as Spokane, Washington and Coeur d'Alene. Due to the large percentage of property owners residing outside of the District, it is difficult to provide precise information on the District's social profile.

The social profile for the full time residents was based on data from the Idaho Department of Commerce for Bonner County. The Idaho Department of Commerce indicates that the largest percentage of the County's population is employed in the retail and service industry. Other forms of subsistence, common in the county include manufacturing, state and local government, construction, finance, insurance and real estate. The proposed project will generally improve the quality of life for the District's users and visitors to the Priest Lake area.

4.8 Land Use

Land within the Granite Reeder Water and Sewer District consists of private residential, commercial resorts and marinas, USFS campgrounds, picnic areas, logging and lease lands.

It is anticipated the proposed wastewater treatment facility will be constructed on the 80-acre USFS parcel located in a non-populated area of Priest Lake Idaho. Surrounding parcels are of similar land values, which are based on timber value. Therefore, the proposed project should not affect the value of the surrounding parcels. In fact, the proposed project may increase the values of property located within the Granite Reeder Water and Sewer District, based on the District's ability to provide wastewater collection and treatment. Construction of the wastewater collection system will be within the County's road right of way and should therefore not affect private land within the District.

4.9 Flood Plain Development

There are no mapped floodplain areas mapped within the project area.

4.10 Wetlands

There are no National Wetland Inventory-mapped wetlands within the project impact limits. The field survey did not identify any wetland areas or creeks at the

proposed treatment sites. Granite Creek flows from west to east across Reeder Bay Road. Several wetland areas were identified in the Elkins Resort area (extreme southern portion of the collection system). These included (1) a small ephemeral creek crossing Reeder Tracts Road, which flows into a swampy, initially well-braided forested area dominated by cedar; (2) a deciduous forested to scrub-shrub thicket with standing pools and ponds just near the entrance to Elkins Resort; and the (3) riparian system associated with Reeder Creek. Using the Cowardin system, they would be classified as palustrine, deciduous, scrub-shrub and forested, wetlands. These wetlands cross resort and/or residence access roads via culverts. They are located outside the actual roadway area; and thus outside the project impact area.

4.11 Wild and Scenic Rivers

There are no wild and scenic rivers within the boundaries of the project area.

4.12 Cultural Resources

The proposed project area may consist of cultural resources. An archaeological and historic survey was completed in the fall of 2001. The findings of the survey show that there are no historic properties in the project area; however, if any cultural resources or archaeological remains are found during construction, the Idaho State Historical Society will be notified immediately. Refer to the Archaeological and historical survey in Appendix 13.5.

4.13 Flora and Fauna

Topographically, the site is located in the Priest River watershed, a relatively mountainous area in the coniferous forest biome. Vegetation varies greatly in this area, being especially susceptible to changes in aspect, slope, topography and soils. The slightly sloping/benchy terrain of the proposed wastewater treatment site is generally underlain by moderately shallow, moderately permeable gravelly sandy loams. Elevations range from 2,550 feet at the proposed treatment site to the lake level at 2,438 feet.

Tom Duebendorfer completed a field survey for wetlands, wildlife habitat, rare plant species, and vegetation descriptions on September 8 and October 24, 2001, and April 18, 19, 2002. The method of survey involved traversing (on foot) the roughly 80-acre proposed treatment facility site, and by car and foot, the collection system roadways and connection areas.

4.14 Vegetation

In general, the dominant vegetation in the area is in the *Tsuga heterophylla* (western hemlock) series (Cooper et al. 1987). The Biological Assessment contains lists of all vascular and non-vascular plant species identified during the September and October 2001, and April 2002 field surveys. The Biological Assessment is included in Appendix 13.6.

At the proposed treatment sites, the vegetation consists of semi-logged coniferous forest (Moist Forest Guild) containing coniferous species including: Douglas fir, western red cedar, grand fir, western white pine, and larch. Many of these trees are saplings or young trees to about 30 feet tall. In the more open areas, the shrub layer is reasonably well-developed, being dominated by redroot, ocean spray, rose, thimbleberry, grouseberry, and snowberry, as well as low growing woody species: box, Oregon grape, twinflower, and kinnikinnick. Herbaceous species include both native species: strawberry, dry sedge, pinegrass, pipsissewa, wintergreen, brackenfern, needlegrass, goldenrod, violet, and pyrola; as well as non-native species typical of logged and otherwise disturbed areas: mullein, bentgrass, thistles, knapweed, and toadflax.

Other portions of the proposed treatment sites consist of minimally disturbed, mature evergreen coniferous forest. Identified also as belonging to the Moist Forest Guild, the dominant tree species is western hemlock. Mature western white pines are also common in this area. Due to canopy cover, sparse undergrowth, and species regeneration, the forest would be classified as "old growth". Other species include grand fir, Douglas fir, and cedar over a very sparse groundcover layer. Woody shrubs are essentially lacking with sparse representation by Oregon grape, box, and twinflower. Herbs are sparse, but include pipsissewa, goldthread, bunchberry, twinflower, Oregon grape, and violet. Moss and lichen cover is high.

In the collection system portion of the project, the sewer pipes would be placed in the existing road ROW. Very little vegetation would have to be removed for the installation of the pipes, though some ruderal and native vegetation along the roadsides may need to be removed. Typical vegetation in the residential and commercial areas is similar to the undisturbed forested areas, with the addition of typical roadside species.

4.15 Existing Wildlife Habitat

The coniferous forest areas (both disturbed and relatively undisturbed) would host an array of vertebrate wildlife species such as deer, bear, moose, elk, and

bobcat. In addition, many passerine birds and small mammals would occupy most of the available habitat. Various raptors may frequent the forested and more open areas. Numerous snags are present in the old growth forests, providing habitat and refuge for woodpeckers. Evidence of activity by pileated woodpeckers was observed. However, the proximity of Reeder Bay Road (as it bisects the proposed treatment site) and human activities in the residential and commercial areas would probably considerably reduce the number of large game and non-game mammals that frequent the area.

4.16 Federal and USFS-Listed Species

A Biological Assessment (BA) for this project has been completed and included in Appendix 13.6. The Fish and Wildlife Service supplied a species list dated March 20, 2002 which contained the following species: gray wolf and Selkirk Mountains woodland caribou (both endangered), bald eagle, Canada lynx, bull trout, grizzly bear, and Ute ladies' tresses (all threatened), and western yellow-billed cuckoo and slender moonwort (both candidate species).

Since the project is partially within lands administered by the US Forest Service, a separate Biological Evaluation for activities on those lands is being prepared. Table 4-8 itemizes all animal species listed by the FWS and those listed as USFS sensitive that are pertinent to this project (list supplied by Tim Layser, USFS 6/6/01). Refer to the Biological Evaluation included in Appendix 13.7 for details of habitat and occurrence potential.

Table 4-8

US Forest Service Listed Animal Species Potentially Occurring within the Project Area

Species	Status	Species/Habitat Present within the Project Area?
Animals		
Gray wolf	federally endangered	yes
Woodland caribou	federally endangered	yes
Bald eagle	federally threatened	yes
Canada lynx	federally threatened	yes
Grizzly bear	federally threatened	yes
Black-backed woodpecker	USFS sensitive	none documented
Boreal toad	USFS sensitive	none documented
Coeur d'Alene salamander	USFS sensitive	no
Common loon	USFS sensitive	none documented, but likely
Fisher	USFS sensitive	none documented, unlikely use
Flammulated owl	USFS sensitive	none documented, unlikely use
Harlequin duck	USFS sensitive	yes; Granite Creek
Northern bog lemming	USFS sensitive	no
Northern goshawk	USFS sensitive	none documented, but likely
Northern leopard frog	USFS sensitive	no
Townsend's big-eared bat	USFS sensitive	none documented, unlikely
White-headed woodpecker	USFS sensitive	none documented, unlikely
Wolverine	USFS sensitive	none documented, unlikely
Fish		
Bull trout	federally endangered	yes
Westslope cutthroat trout	USFS sensitive	yes
Torrent sculpin	USFS sensitive	unknown
White sturgeon	USFS sensitive	no
Burbot	USFS sensitive	no
Interior redband trout	USFS sensitive	no

Plant species lists were obtained from the USFS botanist (Hammet pers. comm. 20021 and 2002). Table 4-9 lists those species are considered for this proposed project.

Table 4-9

USFS Sensitive Plant Species and Habitat*

Status and Species	Common Name	Habitat	Habitat Occurs in Project Area?
Threatened			
Howellia aquatilis	water howellia	vernal pools, aquatic	no
Spiranthes diluvialis	Ute ladies' tresses	deciduous riparian	no
Silene spaldingii	Spalding's catchfly	dry grassland	no
Sensitive			
Andromeda polifolia	bog rosemary	*Sphagnum* bogs	no
Asplenium trichomanes	maidenhair spleenwort	rock seeps in moist/ wet forest	no
Aster junciformis	rush aster	fens and bogs	no
Astragalus microcystis	least bladdery milkvetch	mesic forests	**yes**
Betula pumila	dwarf birch	fens and bogs	no
Blechnum spicant	deer fern	moist/ wet forest	**yes**
Botrychium ascendens	upswept moonwort	wet forest	**yes**
Botrychium crenulatum	Dainty moonwort	wet forest	**yes**
Botrychium lanceolatum	triangle moonwort	wet forest/ moist forest	**yes**
Botrychium minganense	Mingan moonwort	wet forest/ moist forest	**yes**
Botrychium montanum	western goblin	wet forest	**yes**
Botrychium paradoxum	peculiar moonwort	wet forest/ moist forest	**yes**

Botrychium pedunculosum	stalked moonwort	wet forest	**yes**
Botrychium pinnatum	northwestern moonwort	wet forest/ moist forest	**yes**
Botrychium simplex	least moonwort	wet forest/ moist forest	**yes**
Buxbaumia aphylla	bug-on-a-stick lichen	subalpine	no
Buxbaumia viridis	green bug-on-a-stick	soil, subalpine	no
Carex buxbaumii	Buxbaum's sedge	peat bogs, marshes, fens	no
Carex chordorrhiza	string root sedge	peatlands	no
Carex comosa	Bristly sedge	*Sphagnum* bogs	no
Carex flava	Yellow sedge	rich fens, bogs	no
Carex leptalea	bristle-stalked sedge	peatlands, lake margins	no
Carex livida	pale sedge	bogs and fens	no
Carex paupercula	poor sedge	*Sphagnum* bogs, fens	no
Carex xerantica	dryland sedge	subalpine	no
Cetraria subalpina	iceland-moss lichen	cold forest/subalpine	no
Cicuta bulbifera	bulb-bearing water hemlock	marshes, fens, shallow standing water	no
Collema curtisporum	tarpaper lichen	deciduous riparian	**yes**
Cypripedium parviflorum	Yellow lady's slipper	bogs, damp mossy woods, seeps	**yes**
Drosera intermedia	spoon-leaved sundew	*Sphagnum* bogs and fens	no
Dryopteris cristata	crested shield fern	bog margins, fens, wet meadows, wet forested margins of marshes	no
Epilobium palustre	swamp willow-weed	marshes, bogs, and fens	no

Epipactis gigantea	giant helleborine	warm or cold springs, lake margins	**yes**
Eriophorum viridicarinatum	green-keeled cotton grass	cold peatlands	no
Gaultheria hispidula	creeping snowberry	*Sphagnum* bogs, fens, wet forested margins	no
Hookeria lucens	clear moss	cedar forests, wet shaded areas, soil, logs, or swampy areas	**yes**
Hypericum majus	large Canadian St. John's wort	bogs, fens, marshes, mud flats	no
Iris versicolor	blue flag iris	fens	no
Lycopodiella inundata	northern bog clubmoss	*Sphagnum* fens, bogs	no
Lycopodium dendroideum	ground pine	moist mid-seral to mature forest	**yes**
Meesia longiseta	Meesia	bogs	no
Muhlenbergia racemosa	green muhly	*Sphagnum* bogs, fens	no
Petasites sagittatus	arrowleaf coltsfoot	wet to moist areas	**yes**
Phegopteris connectilis	northern beechfern	wet, mature cedar forests, riparian areas	**yes**
Polystichum braunii	Braun's holly fern	very moist, mature cedar/hemlock forests in riparian zones	**yes**
Rhynchospora alba	white beakrush	shrub/*Sphagnum* peatlands, on floating moss	no
Salix candida	hoary willow	wet open sites	no
Salix pedicellaris	bog willow	*Sphagnum* peatlands, boggy meadows	no
Scheuchzeria palustris	pod grass	fens and bogs	no
Scirpus hudsonianus	Hudson's bay bulrush	fens and *Sphagnum* bogs	no

Scirpus subterminalus	water clubrush	shallow boggy margins of ponds, lakes, and sloughs	no
Sphagnum mendocinium	Mendocine peatmoss	*Sphagnum* peatlands	no
Streptopus streptopoides	krushea	mature to old growth forests	**yes**
Triantha occidentalis	short-styled sticky tofieldia	*Sphagnum* bogs	no
Trientalis arctica	northern starflower	*Sphagnum* bogs, fens, wet forested margins	no
Vaccinium oxycoccos	bog cranberry	bogs, fens, and wet forested margins	no

Plant species with a **bolded** "yes" in the fourth column of the above Table could potentially occur in the project vicinity. Since the construction area is limited to the gravel road with a few areas for equipment staging, the plants would likely only occur in the proposed treatment site.

4.17 Noxious Weeds

Noxious weeds are a non-native part of an ecological system. Typically, many weedy species invade freshly cut-over or otherwise disturbed areas. In the treatment sites the following species were observed: tansy, knapweeds, thistles, and toadflax. These species also occur along the roadsides in the collection area.

4.18 Recreation and Open Space

There are several designated wilderness areas surrounding the community. The US Forest Service operates several campgrounds and day use areas. The Reeder Bay Campground (8 ER's) and Ledgewood Picnic Area (2 ER's) are USFS recreation facilities located in the Granite Reeder Water and Sewer District. These areas have drinking water and pit toilets. These toilets are currently pumped by and the waste is hauled to

This project would provide sewer facilities for these recreational use areas. The USFS would be responsible for completing on-site improvements, such as equipping the areas with flush toilets and sinks.

4.19 Agricultural Lands

There are no agricultural areas within the District boundaries and no agricultural land will be affected. Most of the treatment sites are forested, and the majority of the collection system area consists of roads, residences, and recreational facilities.

4.20 Water Quality and Quantity

4.20.1 General

The following table all public water systems located within the District.

Table 4-10: Public Water Systems Located within the District

Public Water System Number	Name	Listing Reference
1090161	USFS Reeder Bay and Ledgewood	CDA Regional Office Public Water Systems
1090040	Elkins on Priest Lake	PHD Public Water Systems
1090044	Grandview Resort	PHD Public Water Systems
1090064	Kaniksu Resort	PHD Public Water Systems
1090081	Low's Resort	PHD Public Water Systems
1090082	Low's Trailer Park	PHD Public Water Systems
1090087	Murray Acres	PHD Public Water Systems
1090003	Sundance Condos	PHD Public Water Systems
1090143	Tillakum Resort	PHD Public Water Systems

In addition to the public wells listed in the table above, there are several domestic wells throughout the system. The wells vary from shallow hand dug wells, driven sand points to drilled and cased deep-water wells. It is also a possibility that residents within the Granite Reeder Water and Sewer District maybe served by raw water from Priest Lake.

Several water quality studies of the Priest Lake area have been performed over the last three decades. These studies are listed below:

- 1987: "Water Quality and Bacteriological Sampling in Granite-Reeder Sewer District Summer and Fall 1987," by John Tindall, Idaho Division of Environmental Quality.
- 1994: "Evaluation of Ground Water Nutrient Loading to Priest Lake," by Kevin M. Freeman, University of Idaho.
- 1995: "Priest Lake Management Plan" by the Idaho Division of Environmental Quality"
- 1997: "Phase I Diagnostic Analysis" by the Idaho Division of Environmental Quality"

The Priest Lake Management Plan and Phase 1 Diagnostic Analysis by the Idaho Department of Environmental Quality provide a complete and thorough analysis of the Lake's water quality. These documents should be referred to for further information regarding this topic. The following sections of this report are intended to provide a brief summary of the current water quality of the Lake. The information provided has been taken from the above documents.

4.20.2 Surface Water Quality

The project area lies within the Priest Lake Basin. The extent of the entire basin exceeds 590 square miles. It can be arbitrarily divided into three sections: Upper Priest Lake, Lower Priest Lake, and the Priest River drainage. Lower Priest Lake is the third largest natural lake in Idaho and second in volume. The outlet to Lower Priest Lake forms into the Priest River. Priest River flows in the Pend Oreille River at the City of Priest River.

The project area lies within the Lower Priest Lake subbasin which extends from Beaver Creek to the south end at Chase Creek. Granite and Reeder Creeks are both tributaries to Lower Priest Lake which are located within the project limits. The Granite Creek subwatershed is the largest in the basin. Its overall gradient is low with many flat areas and associated wetlands. Reeder Creek is a smaller volume creek and may go subterranean late in the season.

Water quality of the lake is generally good—it is an oligotrophic (low-nutrient) system, with excellent water clarity and good dissolved oxygen levels. Nutrients entering the lake from Granite Creek are generally moderate (a relative ranking assigned by results from all tributaries entering Priest Lake). Reeder Creek on the other hand is considered to input the highest relative amounts for phosphorous and organic and inorganic nitrogen—this being attributed to normal spring runoff. The large wetland and agricultural areas in the lower reaches of Reeder Creek produce these levels by natural vegetative decay and the ambient soil characteristics (IDHW and DEQ 1997).

The general water quality of the open waters, based on the studies listed above, is good. The total phosphorus, nitrogen, and chlorophyll a concentrations are low. Water clarity of the lake is good and dissolved oxygen levels are high.

The nearshore zone is defined in the Priest Lake Management Plan as the "shoreline to 10 m depth." The following summary was taken from the Priest Lake Management Plan regarding the nearshore zone:

- Regarding material on rock in the nearshore zone: "In summary, if you dive for a rock at the 1.5 m depth along the East Side Road, one of the denser sites, you will find a thick (about 1 inch) slimy mat of brown and green material.
- Regarding macrophyte growth: "In general, the submersed macrophyte community is indicative of an oligotrophic lake with good community diversity and clean water species. There were some areas with high density, but not sufficient to pose a recreational nuisance. There are some areas of surprisingly low plant diversity offshore from urban development."
- Regarding phosphorous and nitrogen: "Phosphorus and nitrogen concentrations in nearshore waters are no different than that measured in the photic zone offshore."

4.20.3 Ground Water Quality

An unconfined aquifer lies below the project area with glacial deposits nearer the land surface. The bedrock is impervious and lies about 200 feet below the surface. Water levels in wells installed and monitored by DEQ and the Idaho Panhandle Health District have been monitored since 1994. Depths to groundwater are shallow (near the mouth of Granite Creek, 3 feet) and the underlying surface soils are porous, highly permeable sand and gravel. As expected, groundwater flow is to the lake. From Granite Creek south to Grandview Resort groundwater levels are 3 to 5 feet below the surface. This shallow water table was observed to extend to 200 feet inland (IDHW and DEQ, 1997). Groundwater flows north of Granite Creek toward the lake and has a velocity of around 1 to 2 feet/day with an annual flow greater than 1,500 acre-feet; whereas flows south of Granite Creek had a velocity of around 0.3 feet/day with an annual flow of less than 435 acre-feet (Freeman 1994 in IDHW and DEQ, 1997).

Groundwater quality is potentially compromised by human activities, structures, and leakage from sewage lagoons (in 1994, DEQ found that Kalispell Bay, Outlet Bay, and Coolin Sewer Districts sewage lagoon systems were leaking from loss of integrity of the bentonite clay seal). In Kalispell Bay, groundwater nitrate and chloride levels were elevated above background concentrations in samples taken immediately downstream of the lagoons (Welch Comer 1996 in IDHW and DEQ 1997). In the Granite Reeder area, groundwater quality is compromised by poorly situated and/or leaking individual private sewage systems—potentially increasing phosphorous and nitrogen levels.

Generally groundwater nitrogen levels are low to moderate in the Granite Reeder area with one well (located between the Grandview Resort and Lows Resort) demonstrating relatively high levels. Chloride and phosphorous levels in this area are also relatively high—strongly indicating a wastewater plume (IDHW and DEQ 1997). Increased microbial communities in this well possibly correspond to the nitrogen and chloride levels further indicating a wastewater plume.

The following excerpt was also been taken from the Priest Lake Management Plan regarding groundwater:

> Total inorganic nitrogen and dissolved ortho-phosphate concentrations in groundwater next to the lake, and in sediment interstitial waters, are commonly between 2-10 times greater than measured tributaries. Groundwater seepage over rocks in the nearshore area may thus provide a nutrient source to attached algae. Some groundwater wells were determined to have nitrate levels well beyond what could be attributed to background, and there is suspicion that these waters are influenced by septic effluent.

4.21 Public Health

This project will improve public health quality by eliminating many individual sewage disposal systems that do not meet current standards for subsurface sewage disposal systems.

Contamination of drinking water from individual wells located near on-site sewage disposal systems is currently the largest potential threat to public health. Many of the domestic wells are shallow (15 feet) and are located closer than the recommended distance to individual on-site sewage disposal systems because of narrow lot widths. The result is inadequate area for treatment of the wastewater through the free draining gravels before it reaches the source of drinking water.

4.22 Solid Waste / Sludge Management

For the preferred action alternative lagoon with land application and on-site grinder collection units, solid wastes will not be an issue. If the other action alternative for on-site collection, septic tanks were chosen, it would be necessary to periodically (every 1 to 3 years) pump the tanks and haul the solids to an approved disposal site.

The District may consider accepting sewage, pumped from USFS pit toilets located on Kalispell Island in Priest Lake, at the lagoon treatment facility. If the District chooses to do this, it will be necessary to equip the lagoon with a sludge

dump vault and screen in order to remove garbage such as pop bottles and cans from the sewage.

4.23 Energy

Albeni Falls Dam, located approximately 40 miles south of the project area on Priest River, is the nearest energy production source. An increase in energy production for some users, whom were not previously sewered, may be necessary for the operation of the proposed on-site collection units. Increased production for the area will also be necessary for the operation of the wastewater treatment facility.

The average cost per month per user to run each grinder unit is estimated at $0.30 per month. This assumes that each residence will pump approximately 100 gpd (75 gpd * 1.30 Safety Factor), with an average power cost of $0.08 per kwhr with a 1 hp grinder unit running at 75% efficiency. The estimated monthly cost to operate the lagoon with land application treatment facility is estimated at approximately $150 per month based on the power consumption of the Kalispell Bay lagoon treatment facility.

4.24 Land Application

Approximately 20 acres of the treatment site will be used for land application to new growth trees and brush located on the treatment sites. The District must apply for a land application permit from IDEQ. The permit will limit the amount of wastewater that can be applied to the area based on site conditions. The permit will also establish monitoring requirements for the wastewater applied, as well as the soils in the application zone. The land application permit also requires a minimum buffer distance between the land application site and the public, based on the wastewater quality. A chain link fence with warning signs will be required for the perimeter of the site.

4.25 Regionalization

As discussed in Section 3.5.1.1, regionalization would not be an economically feasible option for the Granite Reeder Sewer District. The nearest Sewer District that would be interested in treating waste from Granite Reeder was Outlet Bay. Outlet Bay is located 14 miles south of the District. The construction cost for facilities to transfer waste from Granite Reeder to Outlet Bay is approximately 3 times higher than treating the waste locally.

NORTH

24x36 SCALE: 1" = 300'
11x17 SCALE: 1" = 600'

TREATMENT SITE 1
OWNED BY:
U.S. FOREST SERVICE

WOODLAND ESTATES

MATCHLINE

SUNDANCE CONDOS

HAGMAN BEACH

HAGMAN BEACH CONDOS

TILLAKUM CONDOS

PRIEST LAKE

LEGEND

- DOMESTIC WELLS LOGGED WITH DEPT. OF WATER RESOURCES
- TEST HOLES 10-27-87
- TEST PITS
- LOTS WITH 2ND RESIDENCE
- COMMERCIAL DESIGNATION
- MULTIPLE RESIDENTIAL UNITS
- OCCUPIED LOTS WITH IMPROVEMENTS
- DISTRICT BOUNDARY
- OUT OF DISTRICT
- FOREST SERVICE LAND

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WELCH COMER & ASSOCIATES, INC.
ENGINEERS & SURVEYORS

FIGURE 1-1A

DISTRICT BOUNDARIES
GRANITE CREEK AREA

TREATMENT SITE 2

MATCHLINE

LEDGEWOOD

REEDER BAY LOTS

REEDER CREEK ROAD

DONALD HOLT

IN DISTRICT

TAX #8

TAX #11

TAX #3

OUT OF DISTRICT

POOL'S REEDER TRACTS

REEDER BAY CAMP

U.S. GOVT.

ELKINS

TAX #2

TRACT "A" 7205

H.E.S. NO. 773

TAX #15

TRACT "B" 7502 ELKINS (PRIVATE)

RESORT

WELL

SHOREWOOD DRIVE

ELKINS WEATHER TERRACE

24x36 SCALE: 1" = 300'
11x17 SCALE: 1" = 600'

LEGEND

- NO.5 — DOMESTIC WELLS LOGGED WITH DEPT. OF WATER RESOURCES
- NO.5 — TEST HOLES 10-27-87
- TP-1 — TEST PITS
- LOTS WITH 2ND RESIDENCE
- COMMERCIAL DESIGNATION
- MULTIPLE RESIDENTIAL UNITS
- OCCUPIED LOTS WITH IMPROVEMENTS
- DISTRICT BOUNDARY
- OUT OF DISTRICT

14070PL11.DWG, 06-24-02

WELCH COMER & ASSOCIATES, INC.
ENGINEERS & SURVEYORS

FIGURE 1-1B

DISTRICT BOUNDARIES
REEDER BAY AREA

6 ENVIRONMENTAL IMPACTS OF PROPOSED PROJECT

6.1 Direct Impacts

6.1.1 Surface Disturbance – Geology and Soils

The construction of the proposed wastewater treatment facility will result in some surface disturbance. The construction for each option will require clearing and grubbing, site grading, site excavation and embankment, trench excavation and backfill, and roadway excavation and embankment. After construction, disturbed soil will be re-seeded with native grasses and replanted with native tree species.

6.1.2 Air Quality

Air quality will be slightly reduced during construction, but no long-term impacts are anticipated. Construction watering during site development will decrease construction dust. After construction, the air quality will not be reduced by this project.

6.1.3 Land Use

As a result of construction of the proposed wastewater improvement project, the land use within the area will be improved. This project will prevent the potential for a moratorium on new construction or improvements to existing homes and lots, which have substandard wastewater treatment systems. Additionally, providing a centralized sewer system that meets State health requirements will preserve the resale value of homes and businesses within the area.

It should also be noted that for the preferred Treatment Site #1, the section located east of Reeder Bay Road (approximately 20 acres) will not be developed as part of the treatment facility. The District may choose to sell this land or preserve it for public use.

6.1.4 Floodplain

Since there are no mapped floodplain areas within the project area, there will be no impact to floodplains.

6.1.5 Wetlands

The activities associated with collection system installation in the vicinity of the wetlands (Elkins Area) and the creek crossings (Granite and Reeder Creeks) are minimized or avoided completely by implementation of Best Management

Practices (BMP's) and in the case of the creeks, hanging the pipe from the existing bridges. No direct impacts to wetlands are anticipated. Water quality could be compromised if proper BMP's and safeguards to the piping system are not followed. In the event of a catastrophic failure of the piping system, it is possible that some surface waters could be affected by the sewage; however this event is unlikely for the stream crossings, and the Elkins area wetlands are largely uphill of the access road and collection system (see also Appendix 13.6 - Biological Assessment).

6.1.6 Cultural Resources

The proposed project area may consist of cultural resources. An archaeological and historic survey was completed in the fall of 2001. The findings of the survey show that there are no historic properties in the project are; however, if any cultural resources or archaeological remains are found during construction, the Idaho State Historical Society will be notified immediately. Refer to the Archaeological and historical survey in Appendix 13.5.

6.1.7 Flora and Fauna

6.1.7.1 General

Direct and indirect impacts to plants, animals, and the biotic environment include clearing, noise and disturbance (during and after construction), and habitat degradation (air and water quality). Clearing is covered in vegetation (Section 6.1.7.2), noise and disturbance are covered under specific plants and animals issues (Sections 6.1.7.3 and 6.1.7.4). Air quality is discussed in section 6.1.2. Water quality issues specific to this project are discussed in section 6.1.10.

6.1.7.2 Vegetation

Direct impacts to vegetation as a whole can be divided into clearing and grubbing for the proposed treatment site; and clearing for the roadside collection system installation system.

Treatment Site: An estimated 5 acres of cut-over coniferous forest (estimated current age of 30 years) will be removed for the 2 acre lagoon, equipment, staging, and other associated construction. In addition, 20 acres of cut-over forest may need to be cleared or otherwise affected for installation of the irrigation system for the sprayfield area. A total of 0.46 acres (20,000 sf) of mature "old growth" forest will be removed for the approximately 20 feet wide by 1000 feet long access easement (from Reeder Bay Road into the treatment site).

Collection System: An estimated 5 acres of roadside (ruderal) vegetation will be removed for collection pipe system installation throughout the sewer district area.

Thus a total of 5 acres of cut-over forest (with an estimated current age of 30 years) will be removed for the lagoon area and attendant facilities; 0.46 acres of mature "old growth" forest will be removed for access to the treatment site; and 5 acres of ruderal (roadside vegetation) will be lost through installation of the collection system.

6.1.7.3 Federally Listed Animals and Plants

A Biological Assessment (BA) for this project was completed (Appendix 13.6). The Fish and Wildlife Service supplied a species list dated March 20, 2002 which contained the following species: gray wolf and Selkirk Mountains woodland caribou (both endangered), bald eagle, Canada lynx, bull trout, grizzly bear, and Ute ladies' tresses (all threatened), and western yellow-billed cuckoo and slender moonwort (both candidate species).

Animals

The BA determined that the proposed project would not be likely to adversely affect the gray wolf, woodland caribou, bald eagle, bull trout, grizzly bear, or Canada lynx. These species would not be adversely affected because (1) the project would not alter or adversely affect available habitat; (2) the species is unlikely to occur near or within the project area; (3) the project does not constitute a "migration" barrier; and (4) the project does not affect existing habitat nor the prey base (or food source). Bull trout would not be adversely affected because (1) the project would not alter or adversely affect available habitat; (2) the species uses Granite Creek solely for feeding and migration; (3) the project does not include a "migration" barrier or channel alteration; and (4) the project will not affect existing habitat nor the prey base.

It is unlikely that western yellow-billed cuckoo occurs in the project area. The few Idaho sightings have been much further south in Idaho, is not found in Washington, and habitat with the specific characteristics required for the bird is lacking within the project area. The BA returned a "no jeopardy" determination.

Plants

The proposed project would not affect the Ute ladies' tresses. Ute ladies' tresses would not be affected because it or suitable habitat for its occurrence are not present in the project area.

There has been only one historical sighting of slender moonwort in northern Idaho. It was located about 14 airmiles northwest of the project area and has not been re-located since 1925. No direct impacts are anticipated.

6.1.7.4 USFS Listed Sensitive Animals and Plants

Animals

Since the project is partially within lands administered by the US Forest Service, a separate Biological Evaluation for activities on those lands is being prepared. Table 6-1 itemizes species listed as USFS sensitive and are addressed in this document (list supplied by Tim Layser, USFS 6/6/01). Refer to the USFS Biological Evaluation (in progress) for details of habitat and occurrence potential. Table 6-1 lists the species and identifies the potential for occurrence and/or impacts as a result of the proposed project.

Table 6-1

US Forest Service Listed Animal Species Potentially Occurring within the Project Area

Species	Status	Species/Habitat Present within the Project Area?	Species/Habitat Measurably Affected?	Species Further Analyzed?
Gray wolf	federally endangered	yes	no	yes: discussed in Section 7.1.7.3 and BA
Woodland caribou	federally endangered	yes	no	"
Bald eagle	federally threatened	yes	no	"
Canada lynx	federally threatened	yes	no	"
Grizzly bear	federally threatened	yes	no	"

	threatened			
Black-backed woodpecker	USFS sensitive	none documented	not likely	yes; discussed below
Boreal toad	USFS sensitive	none documented	not likely	yes; discussed below
Coeur d'Alene salamander	USFS sensitive	no	no	no
Common loon	USFS sensitive	none documented, but likely	no	yes; discussed below
Fisher	USFS sensitive	none documented, unlikely use	no	yes; discussed below
Flammulated owl	USFS sensitive	none documented, unlikely use	no	yes; discussed below
Harlequin duck	USFS sensitive	yes; Granite Creek	no	yes; discussed below
Northern bog lemming	USFS sensitive	no	no	no
Northern goshawk	USFS sensitive	none documented, but likely	no	yes; discussed below
Northern leopard frog	USFS sensitive	no	no	no
Townsend's big-eared bat	USFS sensitive	none documented, unlikely	no	yes; discussed below
White-headed woodpecker	USFS sensitive	none documented, unlikely	no	yes; discussed below
Wolverine	USFS sensitive	none documented, unlikely	no	yes; discussed below

Black-backed woodpecker

Black-backed woodpeckers occupy dense coniferous forests, especially in burned, swampy, cutover, or beetle-killed forests where snags are present in high concentrations. The birds excavate nest cavities in trees 8-12 inches diameter at breast height (DBH) in species such as spruce, lodgepole pine, aspen, ponderosa pine, Douglas-fir, and larch. Nest cavities are located 3-16 feet above the ground and are often located near water. The birds are found less frequently in mixed forests, and rarely in deciduous woodlands in winter. Limiting factors for survival include fire suppression and activities that substantially reduce the dead and decaying component in their habitat (USDA 1992). The treatment site area has been logged in the past and harbors few snags. It is possible that black-backed woodpecker could use the treatment area, but neither the CDC nor the USFS reported any documented occurrences of black-backed woodpeckers within six miles of the project area (CDC 2002, Layser pers. comm. 2002), thus impacts to the black-backed woodpecker by the proposed project are not likely.

Boreal toad

Boreal toads are widely distributed in Idaho and can be found in appropriate habitat throughout most of the state. Boreal toads require shallow water in ponds, lakes or slow-moving streams for breeding sites. They lay their eggs in the warmest water available. After the brief spring breeding season, adult toads leave aquatic habitats and travel to a variety of upland habitats. The toads avoid crossing clearcuts and roads, however boreal toads have been documented traveling up to 2.5 miles away. Hence, they are largely terrestrial but can generally be found within a fair proximity to water. Their habitats range from mountain meadows to brushy desert flats. Activity varies seasonally and geographically. At low elevations, individuals are mainly diurnal in late winter and spring, and nocturnal in summer. Depending on conditions, mountain populations are active day or night in summer,. Hibernation occurs in winter in cold climates. The most significant potential barrier to their movements is roads. Since the collection system uses existing roadways, and no creeks, streams, wetlands, or other water bodies occur within the treatment site, and the CDC and USFS do not document any sightings of the toads within six miles of the project area, impacts to the boreal toad are unlikely and not anticipated.

Common loon

In Idaho, common loons prefer large lakes (median 35 surface acres) with large populations of fish. They prefer to nest on islands, but will nest along shorelines. Nests are always within five feet of water. Common loons are not documented in the project area (CDC 2002, Layser, pers. comm. 2002). Priest Lake probably supports nesting loons. Thus since no habitat exists within the project area, no impacts to the common loon are anticipated.

Fisher

Fishers have a primary association with extensive mature coniferous forests. Uneven-aged forests, ecotones, ridges, and riparian areas are also regularly occupied by fishers. They use hollow logs, holes in the ground, snow dens, witches brooms, raptor nests, or squirrel nests for resting dens. Natal dens almost exclusively occur in cavities in large snags, between 20 and 40 feet above the ground. Habitat that offers cover to fishers and their prey in the winter is critical. They will not travel far into large openings and clearcut areas are avoided, especially in winter. They typically utilize ridge lines, riparian areas, and lake shores for movement. Their normal home range area varies from 1,000 to 20,000 acres. Since only a portion of the 80-acre parcel will be affected by the lagoon construction, it is unlikely that any significant effect on the fisher could occur as a result of the proposed project. Neither the CDC nor the USFS reported any documented occurrences of fishers within five miles of the project area (CDC 2002).

Flammulated owl

Mature and old growth ponderosa pine forest (typically 200+ years) with relatively open canopies and above 3,000 feet elevation is preferred habitat. Mixed mature conifer forests with ponderosa pine and Douglas fir and/or grand fir are also occupied by flammulated owls. They require a high level of habitat diversity. Nesting occurs in natural cavities or abandoned woodpecker cavities. Ponderosa pine is not a common occurrence within the project area. Neither the CDC nor the USFS reports any documented occurrences of flammulated owls within five miles of the project area (CDC 2002), thus impacts from the proposed activities are not likely to affect to continued survival of the flammulated owl.

Harlequin duck

During the nesting season, harlequin ducks require fast flowing water with nearby loafing sites (preferably midstream), dense shrub along the banks, and an absence of human disturbance. Nesting typically occurs in remote mountain streams. Roads, trails, and other areas frequented by humans are avoided for nesting. Harlequin ducks that occur in Idaho winter along the Pacific coast and are not present in the project vicinity in the winter. The CDC reports sightings of this species along Granite Creek from its mouth some distance upstream. Since the proposed activity in the vicinity of Granite Creek will be hanging the sewer line along the bridge (on Reeder Bay Road), no significant impacts to harlequin ducks should occur. . Harlequin ducks can also be affected by disturbance within approximately 200 feet of a nesting stream. Thus, in the lower reaches of Granite Creek toward its mouth, proposed collection system installation activities in the area could disturb harlequin ducks temporarily, but since no activities are proposed within or near the creek, impacts which could jeopardize the continued existence or move the harlequin duck toward federal listing are not anticipated.

Northern Goshawk

Northern goshawks are large forest hawks and occur throughout the year in northern Idaho. Goshawks are indicators of mature and old growth forests. Northern goshawks avoid large open areas due to competition from other raptors. Nesting habitat, rather than foraging habitat, appears to limit the numbers of goshawks in the area. The minimal stand size for goshawk nest sites is about 30 acres. In the Lakeshore-Granite analysis area, there are two known territories, however, given the fact that the portion of old growth within the proposed treatment area is relatively small (in reference to normal ranges of the birds), and the old growth section is bisected by Reeder Bay Road, it is unlikely that use in the project area is significant. Neither the USFS nor the CDC has documented any sightings nor nests within six miles of the project area—thus it is unlikely that the proposed activities will have a deleterious effect on the continued existence of the goshawk.

Townsend's big-eared bat

Townsend's big-eared bats require caves for breeding, roosting and hibernation sites. They may also occupy lava tubes, rock outcrops, and abandoned buildings. Temperature and humidity are critical elements affecting habitat

suitability. They are extremely sensitive to disturbance especially at nursery sites. No caves or suitable nesting sites occur in the vicinity of the project. CDC reports no documented occurrences of Townsend's big-eared bats within five miles of the project area (CDC 2002), thus impacts to this species as a result of the proposed activities are not likely.

White-headed woodpecker

Primarily a coastal species, the white-headed woodpecker is locally common in stands of pine or firs. It is resident from south-central British Columbia, north-central Washington and northern Idaho, south through Oregon (east of Cascades) to southern California and west-central Nevada. It inhabits montane coniferous forests (primarily pine and fir) and is usually found at elevations between 3,600-7,400 feet during nesting season, but may descend to lower elevations during winter. In Idaho, species is restricted to mature or old ponderosa pine and mixed coniferous forests. Habitat specific to white-headed woodpecker is present within the proposed treatment area. However, neither the CDC nor the USFS (2002) report any sightings of this species within 6 miles of the project. Thus, no impacts to this species are anticipated.

Wolverine

Wolverines are wide-ranging species that inhabit remote forested areas. Wolverines use lower elevations in the winter and higher elevations in summer. Mortality is associated with human/wolverine interactions and considered a primary limiting factor in wolverine numbers. Population viability of the species can be reduced where there is loss of large areas of habitat with limited human access. The occurrence of wolverines is probably sporadic in the area because of their wide ranging habits. The project area does not include suitable denning habitat, so the risk of disturbance during rearing is not a factor in this project. It is unlikely the project would affect wolverines. Neither the CDC nor the USFS (2002) report any sightings of this species within 6 miles of the project. Thus, no impacts to this species are anticipated.

Fish

Fish species lists were obtained from the USFS and DEQ fisheries biologists (Dekome, 2001, Davis 2002, Rothrock 2002, Mahroney, 2002; all pers. comm). Table 6-2 lists those species considered for this proposed project.

Table 6-2

Fish Species Analyzed

Species	Status	Species/Habitat Present within the Project Area	Species/Habitat Measurably Affected	Species Further Analyzed
Bull trout	federally endangered	yes	no	yes: discussed in Section 7.1.7.3 and BA
Westslope cutthroat trout	USFS sensitive	yes	yes	yes - discussed below
Torrent sculpin	USFS sensitive	unknown	unlikely	yes - discussed below
White sturgeon	USFS sensitive	no	no	no
Burbot	USFS sensitive	no	no	no
Interior redband trout	USFS sensitive	no	no	no

Westslope Cutthroat Trout

Westslope cutthroat trout are listed as "sensitive" by Region 1 of the USFS and listed as "species of special concern" by the State of Idaho. The FWS lists westslope cutthroat trout as a "Species of Concern" under the Endangered Species Act, however, it did not appear on the FWS list of species to be addressed for this project.

Westslope cutthroat trout are native to the Priest Lake watershed. Their preferred habitat is cold, clear streams that possess rocky, silt-free riffles for spawning and slow, deep pools for feeding, resting, and over-wintering. Westslope cutthroat trout are known to occur in Granite Creek and possibly in

Reeder Creek (Rothrock pers. comm. 2002, Davis pers. comm. 2002). The primary cause of the decline appears to be habitat degradation. Within the Priest Lake watershed, cutthroat trout populations have been compromised by the two introduced species; brook trout and lake trout. Brook trout out-compete westslope cutthroat trout in areas where habitat is degraded, and lake trout reduce the survival of adfluvial cutthroat through predation. Granite Creek is important to species persistence to westslope cutthroat.

Since the project will not affect surface waters, nearshore vegetation, channel stability or produce sedimentation, it is unlikely that the proposed activities could have any effect on the continued existence of the westslope cutthroat trout. In the event of a catastrophic leak in the collection system, it is possible that surface water degradation could occur, thus endangering the cutthroat. However, the timing of such a disaster would dictate the severity of the impact to the fish. Although no impacts to this species are anticipated, the determination that in the event of sewer line or lagoon failure, the project may impact individuals but is not likely to trend the species toward federal listing, is forwarded.

Torrent Sculpin

This species occurs in the mainstem Coeur d'Alene River its larger tributary streams. Their preferred habitat is riffle habitat in medium to wide streams and rivers, but can be found in pools. Since the range of torrent sculpin overlaps with both westslope cutthroat and historic bull trout, it is prudent to assume they may be present in the project vicinity. However, this species primarily inhabits large streams and thus could only be affected by the proposed project habitat if larger streams are affected. Otherwise, this species is not known to inhabit this watershed (Rothrock, pers. comm. 2002). It is not likely that the proposed project activities could undermine the continued existence of this species.

Plants

Plant species lists were obtained from the USFS botanist (Hammet pers. comm. 2001 and 2002). Table 6-3 is a subset of the Table (look for it in Section 6.1.7.4) identifies those species that could potentially occur within the project area.

Table 6-3

USFS Sensitive Plant Species and Habitat*

Status and Species	Common Name	Habitat	Habitat Occurs in Project Area
Astragalus microcystis	least bladdery milkvetch	mesic forests	**yes**
Blechnum spicant	deer fern	moist/ wet forest	**yes**
Botrychium ascendens	upswept moonwort	wet forest	**yes**
Botrychium crenulatum	dainty moonwort	wet forest	**yes**
Botrychium lanceolatum	triangle moonwort	wet forest/ moist forest	**yes**
Botrychium minganense	Mingan moonwort	wet forest/ moist forest	**yes**
Botrychium montanum	western goblin	wet forest	**yes**
Botrychium paradoxum	peculiar moonwort	wet forest/ moist forest	**yes**
Botrychium pedunculosum	stalked moonwort	wet forest	**yes**
Botrychium pinnatum	northwestern moonwort	wet forest/ moist forest	**yes**
Botrychium simplex	least moonwort	wet forest/ moist forest	**yes**
Collema curtisporum	tarpaper lichen	deciduous riparian	**yes**
Cypripedium parviflorum	yellow lady's slipper	bogs, damp mossy woods, seeps	**yes**
Epipactis gigantea	giant helleborine	warm or cold springs, lake margins	**yes**
Hookeria lucens	clear moss	cedar forests, wet shaded areas, soil, logs, or swampy areas	**yes**

Lycopodium dendroideum	ground pine	moist mid-seral to mature forest	**yes**
Petasites sagittatus	arrowleaf coltsfoot	wet to moist areas	**yes**
Phegopteris connectilis	northern beechfern	wet, mature cedar forests, riparian areas	**yes**
Polystichum braunii	Braun's holly fern	very moist, mature cedar/hemlock forests in riparian zones	**yes**
Streptopus streptopoides	krushea	mature to old growth forests	**yes**

Field investigations for general habitat and vegetation characteristics were undertaken September 8 and October 24, 2001, and April 18 and 19, 2002. Thus, many of the species listed above that could potentially be present within the treatment site or the old growth area could not be identified if they were present. Most of the species listed in bold as "yes" can only be accurately identified in July and August—thus sensitive plant surveys will be undertaken during the flowering/fruiting/identification period of those species. Depending on occurrence and after completion of the surveys (summer 2002), impacts to these species will be addressed.

6.1.8 Recreation and Open Space

Recreational areas will be positively impacted by this project, once it has been completed. Existing air toilets located at the USFS campgrounds and picnic areas would be replaced by flushing toilets. This would greatly increase the aesthetics of these areas through the elimination of unpleasing odors.

Open space will be unaffected by the project, although a portion of existing USFS land will be replaced by a wastewater facility. Because the chosen sites are not currently designated for recreational use by the USFS, the community should be unaffected by its transformation.

6.1.9 Water Quality

6.1.9.1 Surface Water Quality

Water quality could be temporarily degraded by storm water runoff, if best management practices (BMP's) are not employed. Turbidity and total suspended solids (TSS) would be of primary concern as sediment could erode from cleared, graded, or excavated areas. In addition, substances leaked or spilled from construction equipment could be carried by storm water runoff. These include primarily hydrocarbons from fuel and oil.

Storm water control during construction and as part of the finished project will meet the requirements of the Bonner County Storm Water Ordinance. Also, temporary impacts to surface water will be minimal through implementation of BMP's. BMP guidelines are given in the "State of Idaho, Catalog of Storm Water Best Management Practices for Idaho Cities and Counties." Construction of this wastewater improvement project requires trench excavation and backfill for the collection system, minor site clearing, grubbing and subgrade preparation for the wastewater treatment facility. Construction techniques utilizing BMPs and the time of year will be crucial in minimizing impacts.

6.1.9.2 Ground Water Quality

Ground water quality will not be affected as a result of construction activities. However, the end result of this project should have a positive effect on the groundwater quality, by collecting wastewater from the area and treating it properly.

6.1.10 Public Health

This project will improve public health quality by eliminating many individual sewage disposal systems that do not meet current standards for subsurface sewage disposal systems.

Contamination of drinking water from individual wells located near on-site sewage disposal systems is currently the largest potential threat to public health. Many of the domestic wells are shallow (15 feet) and are located closer than the recommended distance to individual on-site sewage disposal systems because of narrow lot widths. The result is inadequate area for treatment of the wastewater through the free draining gravels before it reaches the source of drinking water.

6.1.11 Noise

Noise from construction activities will be typical to those for this kind of work and will take place between 7 a.m. and 7 p.m. There will be no noise associated with operation of the wastewater treatment plant.

6.1.12 Socioeconomic

The proposed improvements will increase the quality of living in and around the project area due to the Water and Sewer Districts ability to provide proper collection and treatment of the wastewater. The value of property in this area will also be increased by this project.

Through completion of this project, recreational facilities will be improved. Improved recreational areas may bring in more visitors to the area. Therefore the socioeconomic impact is expected to be positive.

6.1.13 Visual Aesthetics

The proposed project will have little effect on the visual aesthetics. The project includes construction of underground utilities and surface restoration, construction of the lagoon and land application system in a remote, timbered area. The total lagoon and land application area will be less than 25 acres and should be concealed from the most populated areas of Granite Reeder area by the existing border of mature trees.

6.2 Indirect and Cumulative Environmental Impacts:

6.2.1 Growth Inducement/Development

Aside from development of the projected 50 vacant lots, this project is not expected to induce growth or development in the Granite Reeder Sewer District. The location of the District is prohibitive of growth, as the District is bounded by the Lake to the east and by USFS land and Reeder Creek road to the north and west.

6.2.2 Urban Sprawl

This topic is not applicable to the Granite Reeder Sewer District. Over half of the population is seasonal and, as indicated in 6.2.1 above, is limited in available areas for growth.

6.2.3 Social and Economic Impacts

The proposed improvements will increase the quality of living in and around the Granite Reeder Water and Sewer District due to the ability to provide a safe wastewater collection and treatment facility and therefore, providing protection of potable water sources. Therefore, adverse social and economic impacts are not likely.

6.2.4 Energy Production and Consumption

An increase in energy production for some users, whom were not previously sewered, may be necessary for the operation of the proposed on-site collection units. Increased production for the area will also be necessary for the operation of the wastewater treatment facility.

The average cost per month per user to run each grinder unit is estimated at $0.30 per month. This assumes that each residence will pump approximately 100 gpd (75 gpd * 1.30 Safety Factor), with an average power cost of $0.08 per kwhr with a 1 hp grinder unit running at 75% efficiency. The estimated monthly cost to operate the lagoon with land application treatment facility is estimated at approximately $150 per month based on the power consumption of the Kalispell Bay lagoon treatment facility.

6.3 Irreversible and Irretrievable Commitment of Resources:

The major resources committed during construction of the project are dollars, fuel, and temporary use of land. Resources committed throughout the project's life are dollars that the District will spend to maintain the system, although this system will provide fewer financial losses than other alternatives. Other than the material and energy used during construction, no resource is anticipated to be lost as a result of the project.

6.4 Short – Term Use of the Environment vs. Maintenance of Long – Term Productivity:

The short-term use of the environment on this project is associated with construction activities typical to the construction of a wastewater collection and treatment facility, verses the long-term productivity of providing a wastewater collection system and treatment facility to a community of over 400 potential homes. The long-term protection of human environment by supplying collection and treatment outweighs the short-term environmental impact from construction activity, small utilization of power, and minimal land disturbance.

7 MEANS TO MITIGATE ADVERSE ENVIRONMENTAL IMPACTS

Long-term adverse impacts are not anticipated-based implementation of Best Management Practices ("BMP's"). Short-term impacts from construction activities as described previously in this report. Environmentally sensitive areas will be fully marked and a log kept of plants to be restored.

7.1 Mitigation Measures

Mitigation measures for erosion control such as immediate re-seeding, placement of straw bales, and plant replacement will be implemented prior to completion of this project. All re-seeding materials shall be in coordination with Bonner County, the State of Idaho and EPA on specific seed mixtures for re-seeding. All re-seeding materials shall be in coordination with Bonner County, the State of Idaho and EPA on specific weed-free seed mixtures. Another measure includes installing a silt fence where necessary, such as surrounding any steep slopes, ditches, or water bodies.

7.1.1.1 Bald Eagle

Disruption to feeding wintering bald eagles by the noise from construction activities could potentially occur if construction occurs during October to March. However, snow is a deterrent to construction during these months and would probably preclude any significant activity that could affect the bald eagle.

7.1.1.2 Bull Trout

Water quality which is important to bull trout could be compromised only if there were pipe failure. Should any disaster or failure occur, the proper authorities including the FWS and DEQ would be immediately alerted, and remediative action taken in consult with the permitting agencies.

7.1.2 USFS Sensitive Species

Since the field surveys did not coincide with proper identification periods for the species likely to occur within the project area (those listed Table 6-1, see Table under Section 6.1.7.4), it is prudent to perform field surveys during their identification periods (mostly July to August) to ascertain its presence or absence. These surveys will be performed in 2002. Should any populations of USFS species be found on USFS-administered lands, appropriate coordination

with USFS staff will be undertaken to evaluate impacts to any listed species and ascertain the proper action.

7.1.3 Noxious Weeds

Throughout project, efforts will be made to reduce the spread of noxious weeds by implementing weed control guidelines per County Weed Board guidelines.

7.2 Permits Required:

The following entities/agencies are likely to have various concerns for the project. Table 7-1 outlines possible permits required and the agencies involved.

Table 7-1

Permits Likely to be Required

Permit/Approval	Agency/ Grantor	Conditions Requiring
Archaeological and Historic (Section 106)	State Historic Preservation Office	Suspected/actual, historic/archaeological properties impacted by project.
Endangered/Threatened Species	US Fish and Wildlife Service	Potential effects to federally-listed endangered or threatened plant or animal species.
Section 404	US Army Corps of Engineers/EPA/USFWS	Dredging, or placing fill material within waters of the US or adjacent wetlands.
Floodplains and floodways	FEMA, or local county	Any structure activity that may adversely affect the flood regime of a stream within the flood zone.
Section 10	US Army Corps of Engineers	Obstruction, alteration, or improvement of any navigable water (?)
NPDES	EPA	Storm Water Discharge Permit
Section 402 – Discharge Permit	US Army Corps of Engineers	Discharging into US waters and wetlands.
Conditional Use Permit	Bonner County	
Building Permit	Bonner County	

8 PUBLIC PARTICIPATION

8.1 Public Meetings and Newsletters

A series of newsletters regarding the status of this project have been sent out to members of the Granite Reeder Water and Sewer District. A copy of these Newsletters are included in Appendix 13.8.

The first public meeting summarizing the Wastewater Facilities Plan was held on June 15, 2002. The LID hearing and Environmental hearing has been tentatively scheduled for August of 2002.

8.2 Federal, State, and Tribal Agency Project Overview:

This Draft Environmental Assessment will be forwarded to the following agencies for review and comment:

- U.S. Environmental Protection Agency
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Idaho Division of Environmental Quality
- Idaho Fish and Game
- Idaho State Historic Preservation Office
- Idaho Parks and Recreation
- Bonner County Planning and Zoning
- Kalispell Tribe

As soon as these agencies provide comment letters, they will be included in a final draft Environmental Assessment (Appendix 13.9), which will be forwarded to the IDEQ Project Manager, John Tindall, and should result in a Finding of No Significant Impact (FONSI). The FONSI will be issued upon completion of Section 7 consultation under ESA.

9 REFERENCES CONSULTED

CDC 2002. Conservation Data Center response letter to Tom Duebendorfer of data requests for rare, sensitive plants and animal species known to occur within Township 61 North and Ranges 4 and 5 West. Obtained via e-mail September 11, 2001, and April 29, 2002.

Cooper, S.V., K. E. Neiman, R. Steele, D.W. Roberts. 1987. Forest Habitat Types of Northern Idaho: A Second Approximation. US Department of Agriculture, Forest Service. Intermountain Research Station. General Technical Report INT-236.

Davis, M. 2002. Personal communication with Matt Davis, Fisheries Biologist, USDA Forest Service, Priest Lake Ranger District. (April 2002).

Dekome, S. 2002. Personal communication with Shanda Dekome, Fisheries Biologist, USDA Forest Service, Priest Lake Ranger District. (April 2002).

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Layser, T. 2002. Personal communication with Tim Layser, Wildlife Biologist, USDA Forest Service, Priest Lake Ranger District. (April 2002).

Mahroney, J. 2002. Personal communication with Joe Mahroney, Fisheries Biologist for the Kalispell Tribe, Usk ,Washington. May 6, 2002.

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Welch Comer 1996. Wastewater facilities plan - improvements to the Kalispell Bay Sewer District, Priest Lake, Idaho. Welch Comer and Associates, Inc., Engineers - Surveyors, Coeur d'Alene, ID. in IDHW and DEQ 1997.

Welch Comer 1992. Wastewater facilities plan-Wastewater Improvements for the Granite Reeder Water and Sewer District, Priest Lake, Idaho. Welch Comer and Associates, Inc. Engineers-Surveyors, Coeur d'Alene, ID.

Welch Comer 2002. Wastewater facilities plan-Wastewater Improvements for the Granite Reeder Water and Sewer District, Priest Lake, Idaho. Welch Comer and Associates, Inc. Engineers-Surveyors, Coeur d'Alene, ID.

10 AGENCIES CONSULTED

This Environmental Impact Document is based upon the draft 2002 Wastewater Facilities Plan prepared by Welch Comer & Associates, Inc. The report is available through the project contact listed at the top of this report.

Tom Duebendorfer (Biologist) conducted preliminary site surveys of the area for environmental documentation and coordinated with agency staff. The following list includes local agencies contacted during the preparation of the Facilities Planning Document and the Environmental Assessment:

Environmental Protection Agency
Mike Silverman, EPA Project Officer
1435 N. Orchard Street
Boise, ID 83706

US Fish and Wildlife
Rick Donaldson
11103 East Montgomery Drive
Spokane, WA 99206

U.S. Forest Service
Kathy Anderson, District Ranger
Priest Lake Ranger District
32203 Highway 57
Priest River, ID 83856

Bonner County Planning and Zoning
123 S. First
Sandpoint, Idaho 83864

Kalispell Tribe
Kevin Lyon, Director
Cultural Resource Program
P.O. Box 39
Usk, WA 99180

State Historic Preservation Office
Suzi Neitzel
210 Main Street
Boise, ID 83702

Idaho Department of Fish and Game
Ray Henneke
2750 Kathleen Avenue
Coeur d'Alene, ID 83814

Idaho Department of Environmental Quality
John Tindall, PE
2110 Ironwood Parkway
Coeur d'Alene, ID 83814

11 MAILING LIST

U.S. Army Corps of Engineers
Coeur d'Alene Regulatory Office
3815 Schreiber Way
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U.S. Fish and Wildlife Service
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Boise, ID 83702

Bonner County Planning and Zoning
123 S. First
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U.S. Forest Service
Kathy Anderson, District Ranger
Priest Lake Ranger District
32203 Highway 57
Priest River, ID 83856

12 REASONS FOR CONCLUDING THERE WILL BE NO SIGNIFICANT IMPACT

It is for the following reasons that the Idaho Department of Environmental Quality should conclude that an Environmental Impact Statement is not necessary and a Finding of No significant Impact (FONSI) should be issued:

1. Improvements will allow the District to protect the ground and surface water quality in and around Priest Lake.
2. Improvements will protect residents and visitors from contamination by existing sub-standard on-site treatment units.
3. The project is strongly supported by the local agencies and the public.
4. The 1995 IDEQ Priest Lake Management Plan specifically set up wastewater treatment action items, which included the plan and development of a community wastewater treatment plan for the Granite Reeder Sewer District.
5. Benefits from this project are overwhelming in comparison with the temporary restorable impacts on the environment. Table 12-1 illustrates the benefits and impacts of the alternatives.
6. Environmental impact on regulated resources is to be avoided: or where unavoidable, reduced, and/or mitigated in compliance with agency regulations and upon contingent upon agency approval.

Table 12-1: Cost to Benefit Matrix

Rating	
-	Least Beneficial
0	Neutral
+	Most Beneficial

	Project Component Alternatives						
	Component A			Component B		Component C	
Issue	Grinder (In Road)	Grinder (with Easement)	Septic (with Easement)	Pressure	Pressure/Gravity	Outlet Bay	Lagoon with Land Application
Construction/Installation Cost	+	-	-	+	-	-	+
Additional Outside Costs to User	-	+	+				
On-Going Administration Costs	0	0	0	0	0	0	0
Functionality	0	0	0	+	-	0	0
Maintenance Expense	+	+	-	+	-	0	0
Easement Needs	+	-	-	+	-	0	0
Accessibility	+	-	-	0	0	0	0
Environmental	+	+	-	+	-	0	0
Groundwater Complications	0	+	0	+	-	-	+
Property Owner Issues	+	-	-	0	0	0	0
Separation Issues	+	+	-	+	-	0	0
Recommended to District?	**yes**	**yes**	no	**yes**	no	no	**yes**

13 APPENDICES

13.1 Excerpts from the Priest Lake Management Plan and Laws Pertaining to the Plan

13.2 Treatment Site 1 Appraisal

13.3 District Policy Decisions—Section 2, Chapter 2 of the April 2002 Draft Wastewater Facilities Plan

13.4 Soil Test Results from 1992 Facilities Plan

13.5 Archaeological Assessment

13.6 Biological Assessment for Section 7 Compliance of Endangered Species by Tom Duebendorfer

13.7 Biological Evaluation by Tom Duebendorfer

13.8 Newsletters, Newspaper Articles

13.9 Consultation and Coordination with Other State and Federal Agencies