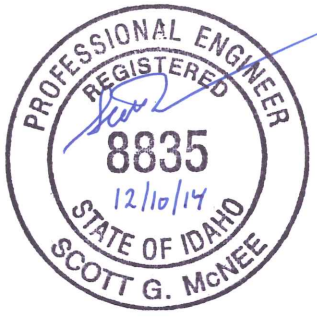
City of Dover, Idaho
Water and Sewer
Connection Fee Analysis

December 10, 2014



T-O ENGINEERS

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EXECUTIVE SUMMARY

The City of Dover has authorized T-O Engineers to conduct an analysis of water and sewer connection fees to determine an equitable buy-in to these systems based on capital improvements installed by the City and others. T-O Engineers utilized previously prepared facilities planning documents; cost information provided by the City; record drawings; and conducted numerous discussions with City staff to prepare this analysis and report.

This analysis of connection fees is based on a determination of the Net Replacement Value of the water and sewer systems as follows:

Net Replacement Value = *Gross Replacement Value (present day)* - *Unfunded Depreciation* - *Outstanding Bond or Loan Principal*

The net replacement value of each capital component is then divided by the design capacity of that component to determine a cost per equivalent residential unit (ERU).

Two (2) alternatives have been considered for this analysis. The first (Alternative A) calculates connection fees for the Dover Bay Development and the remainder of the City (outside of the Dover Bay Development) separately. This alternative was considered for the following reasons.

- The Dover Bay development collection and distribution systems are relatively segregated from the collection and distribution system outside the development.
- The Dover Bay development has a separate irrigation system and does not utilize the potable water system for irrigation.

The following **Table 1** provides a summary of the recommended Water and Sewer Connection fees calculated under Alternative A.

Table 1 – City of Dover Recommended Connection Fees – Alternative A

Description	Connection Fee
Water Connection Fee	
Outside Dover Bay Development	$4,724
Inside Dover Bay Development	$5,279
Sewer Connection Fee	
Outside Dover Bay Development	$5,652
Inside Dover Bay Development	$4,263

At the request of the City, a second alternative (Alternative B) was considered calculating a single rate for the entire City. The following **Table 2** provides a summary of the Water and Sewer Connection fees calculated under Alternative B.

Table 2 – City of Dover Recommended Connection Fees – Alternative B

Description	Connection Fee
Water Connection Fee	$5,392
Sewer Connection Fee	$4,726

WATER CONNECTION FEE

In accordance with the City of Dover's Ordinance Number 131 (2014) water hookup cost is calculated as an equitable buy-in to the system based on capital improvements installed. The Ordinance goes on to say that the calculation of this fee should not be based on any budgetary needs except for the mandate that the water system shall be self-supporting.

A separate Water Service Meter Fee should be assessed to cover direct costs to City for proving and installing meters and other service equipment, when required. The recommended fees in this analysis do not include these direct costs.

Methodology

Eligible costs for calculating the water connection fee include infrastructure necessary for the delivery of water for domestic use and fire protection. These include water treatment, pumping, storage, and distribution mains for identified service areas. Ineligible costs include system expansion beyond the service area, operation and maintenance, and debt service. These costs are typically covered through monthly service rates.

The Alternative A water connection fee calculations can be seen in **Appendix A**. Alternative A calculates a differing fee for those inside the Dover Bay Development and those outside the development. This separate analysis and fee is considered for two reasons:

1. The Dover Bay development water distribution system is relatively segregated from the distribution system outside the development, so these areas have been considered separately to provide the most equitable cost for each.

2. The Dover Bay development has a separate irrigation system and does not utilize the potable water system for irrigation. This is addressed in the analysis with an irrigation adjustment factor, applied to the water treatment and storage

components. This accounts for the fact that those outside of the Dover Bay development place more of a demand on these components through their use of potable water for irrigation. The factor is calculated based on a design unit flow of 400 gpd/ERU for Dover Bay development and 1,000 gpd/ERU for the remainder of the City, as recommended in the October 2013 Water Facility Plan.

As seen in **Appendix A**, separate calculations have been completed for the area outside the Dover Bay development and the area inside the development. All of the water treatment, storage and fire flow looping components are considered as a benefit to both areas, and are included in both lists. The distribution systems for each, however, are considered separately. There is also an irrigation adjustment factor applied to the treatment and storage components to account for the higher demand on these components from the area outside the Dover Bay development.

A single calculation for the entire City is considered in Alternative B. All of the water treatment, storage, distribution and fire flow looping components are considered as a benefit to the entire City and included in the calculation, and no irrigation adjustment factor is applied. This calculation can be seen in **Appendix B**.

Gross Replacement Value

The gross replacement value of each capital component of the water system was determined based on original construction costs, provided by the City, adjusted to current (2014) costs using the Engineering News Record Construction Cost Index (ENR-CCI).

Design Capacity

The design capacity of all water treatment system components is based on the average design ERU from the October 2013 Water Facility Plan. The service area outside the Dover Bay development is assigned a demand of 1,000 gpd/ERU and the Dover Bay Development a demand of 400 gpd/ERU. These are assumed to represent a maximum day demand, which is typically utilized for sizing water treatment a supply infrastructure. The average of the two is therefore 700 gpd/ERU. This is then divided into the treatment system capacity of 288,000 gallons per day, resulting in a capacity of 411 ERUs. A copy of the cited portions of the October 2013 Water Facility Plan can be found in **Appendix C**.

The design capacity of the water storage system components is taken from the October 2013 Water Facility Plan Table 5, page 21, which lists a design capacity of 750 ERUs for the current reservoirs.

The October 2013 Water Facility Plan estimates that the Dover Bay development, will consist of 600 ERUs at build-out. The Plan also estimates that the original City of Dover

boundaries and surrounding areas are capable of providing for an additional 500 ERUs. However, much of the existing City limits, especially the northwest portion, does not have water distribution infrastructure in place. For this analysis, an estimate of the potential build-out of the area where water distribution infrastructure exists was conducted. This is estimated to be 250 ERUs. Thus a combined total of 850 ERUs for the Dover Bay development and the remainder of the City is utilized.

Useful Life

The useful life of the various water system components is based on published data and guidelines collected from the American Water Works Association (AWWA) and the New Mexico Environmental Finance Center (NMEFC). Copies of these documents can be seen in **Appendix D**. The majority of the original and the Dover Bay development water distribution systems consist of PVC pipe, which has a typical useful life of 70 years according to AWWA. The Dover water treatment components were assigned a useful life of 50 years based on the NMEFC's Asset Management: A Guide for Water and Wastewater Systems, 2006 Edition. This publication lists 60-70 years for treatment plant structures and 15-25 years for treatment plant electrical. The Dover water storage components were assigned a useful life of 60 years, based on NMEFC's recommended range of 50-80 years.

Sewer Connection Fee

In accordance with the City of Dover's Ordinance Number 104 (2010) the City shall collect from new users an applicable depreciation fee based on an equitable buy-in to collectors and other system capital improvements installed by previous LIDs, the City or others.

Methodology

Eligible costs for calculating the sewer connection fees include the infrastructure necessary for the collection, treatment and disposal of wastewater. These include sewer collection mains for identified service areas, as well as wastewater treatment and disposal facilities. Ineligible costs include individual septic tanks, system expansion beyond the service area, operation and maintenance, and debt service.

The Alternative A sewer connection fee calculations can be seen in **Appendix A**. Similar to the water analysis, Alternative A calculates a differing sewer connection fee for those inside the Dover Bay Development and those outside. This is due to the fact that the Dover Bay development sewer collection system is relatively segregated from the original City distribution system, so these areas were considered separately. All of the

wastewater treatment and discharge components are considered as a benefit to both areas, and are included in both lists.

A single sewer connection fee calculation for the entire City is considered in Alternative B. All of the wastewater collection, treatment and discharge components are considered as a benefit to the entire City and included in the calculation. This calculation can be seen in **Appendix B**.

Gross Replacement Value

The gross replacement value of each capital component of the sewer system was determined based on original construction costs, provided by the City, adjusted to current (2014) cost using the Engineering News Record Construction Cost Index (ENR-CCI).

The majority of the original SBR treatment facility components have been left in place and are utilized as part of the current MBR treatment facility. Thus, the gross replacement values of both are included in this analysis.

Design Capacity

The assumed design capacity of all wastewater treatment system components (1,000 ERUs) is taken from the City of Dover Wastewater Treatment Plant Facilities Plan Addendum; Revision Number 1.1 Technical Memorandum dated February 1, 2007. A copy of the cited portions of the Wastewater Treatment Plant Facilities Plan Addendum can be seen in **Appendix E**.

The capacity of the original City of Dover sewer collection system (300 ERUs) and Dover Bay Development sewer collection system (600 ERUs) is also taken from the City of Dover Wastewater Treatment Plant Facilities Plan Addendum; Revision Number 1.1 Technical Memorandum dated February 1, 2007.

Useful Life

The existing City of Dover Sewer Ordinance Number 104 describes a detailed methodology for calculating a Sewer System Depreciation Fee. This includes a designated useful life for the collection and interceptor system equal to 50 years and pump stations equal to 20 years. There is no designation in this Ordinance for treatment system components. It is T-O Engineers understanding that the City plans to repeal Ordinance 104 and adopt a new sewer ordinance which will leave the methodology, including determination of appropriate useful life, up to analysis and recommendation by a design professional. For this reason, recommended useful life as described below is utilized instead of those presented in Ordinance 104.

Useful life of the various sewer system components is based on published data and guidelines collected from AWWA and NMEFC. A useful life of 60 years is assumed for the original City collection system. Most of this original system is gravity sewer, so an average for gravity sewer lines (80-100 years) and manholes (20-50 years) was utilized. The Dover Bay development collection system consists of PVC pressure sewer mains, so a useful life of 70 years, consistent with published guidelines for PVC pipe, was utilized.

A useful life of 50 years is assumed for the SBR treatment system components and GeoBag system. This is consistent with NMEFC useful life recommendations for treatment plant structures. A shorter useful life of 40 years is assumed for the MBR system since this system involves more mechanical, electrical and control components.

FUTURE ANALYSIS

The City's Water and Sewer Ordinances require hookup costs to be analyzed on an annual basis with methodology and cost to be adopted by Resolution of the City Council. We recommend annual review of to the connection fee calculations to bring gross replacement value, unfunded depreciation and outstanding bond or loan principal amounts up to date as appropriate.

APPENDIX A

Alternative A Connection Fee Calculations

City of Dover, Idaho

Water Connection Fee Calculation - Alternative A

12-10-2014

City Connection Fee - Outside Dover Bay Development

Current Year 2014

Existing Capital Component Description	Original Installation Cost	Construction Year	Construction Year CCI	Current 2014 CCI	2014 Installation Cost	Design Capacity (ERUs)	Useful Life (years)	Remaining Life (years)	2014 Depreciated Value	Outstanding Bond or Loan Principal	Net Replacement Value	Depreciated Cost per ERU	Irrigation Adjustment Factor	Adjusted Cost per ERU
Original Water Treatment Plant	$236,003	1991	4835	9870	$481,768	411	50	27	$260,155	$93,271	$166,884	$406	1.487	$604
Original Water Distribution System	$255,009	1991	4835	9870	$520,566	250	70	47	$349,523	$0	$349,523	$1,398	1.000	$1,398
Original Lower Storage Tank	$208,559	1991	4835	9870	$425,745	750	60	37	$262,543	$0	$262,543	$350	1.487	$521
Upper Storage Tank (Cedar Ridge)	$42,000	1998	5920	9870	$70,024	750	60	44	$51,351	$0	$51,351	$68	1.487	$102
Water Treatment Plant Upgrade	$325,000	2004	7115	9870	$450,843	411	50	40	$360,675	$0	$360,675	$878	1.487	$1,305
Fire Flow Looping Project	$639,523	2008	8310	9870	$759,578	850	70	64	$694,471	$447,666	$246,805	$290	1.000	$290
Enlarge Lower Storage Tank	$480,845	2008	8310	9870	$571,112	750	60	54	$514,001	$336,592	$177,409	$237	1.487	$352
Tie-in and Valving Between Storage Tanks	$132,661	2010	8799	9870	$148,809	850	70	66	$140,305	$92,863	$47,442	$56	1.000	$56
Fire Flow Looping Project	$80,000	2012	9299	9870	$84,912	850	70	68	$82,486	$0	$82,486	$97	1.000	$97
												City Connection Fee - Outside Dover Bay		**$4,724**

City Connection Fee - Inside Dover Bay Development

Current Year 2014

Existing Capital Component Description	Original Installation Cost	Construction Year	Construction Year CCI	Current 2014 CCI	2014 Installation Cost	Design Capacity (ERUs)	Useful Life (years)	Remaining Life (years)	2014 Depreciated Value	Outstanding Bond or Loan Principal	Net Replacement Value	Depreciated Cost per ERU	Irrigation Adjustment Factor	Adjusted Cost per ERU
Original Water Treatment Plant	$236,003	1991	4835	9870	$481,768	411	50	27	$260,155	$93,271	$166,884	$406	0.595	$242
Original Lower Storage Tank	$208,559	1991	4835	9870	$425,745	750	60	37	$262,543	$0	$262,543	$350	0.595	$208
Upper Storage Tank (Cedar Ridge)	$42,000	1998	5920	9870	$70,024	750	60	44	$51,351	$0	$51,351	$68	0.595	$41
Water Treatment Plant Upgrade	$325,000	2004	7115	9870	$450,843	411	50	40	$360,675	$0	$360,675	$878	0.595	$522
Dover Bay Distribution System	$1,912,750	2005	7446	9870	$2,535,434	600	70	61	$2,209,450	$0	$2,209,450	$3,682	1.000	$3,682
Fire Flow Looping Project	$639,523	2008	8310	9870	$759,578	850	70	64	$694,471	$447,666	$246,805	$290	1.000	$290
Enlarge Lower Storage Tank	$480,845	2008	8310	9870	$571,112	750	60	54	$514,001	$336,592	$177,409	$237	0.595	$141
Tie-in and Valving Between Storage Tanks	$132,661	2010	8799	9870	$148,809	850	70	66	$140,305	$92,863	$47,442	$56	1.000	$56
Fire Flow Looping Project	$80,000	2012	9299	9870	$84,912	850	70	68	$82,486	$0	$82,486	$97	1.000	$97
												City Connection Fee - Inside Dover Bay		**$5,279**

Notes:

1. Original Installation Cost and Outstanding Bond or Loan Principal amounts provided by the City of Dover.
2. Estimated buildout of areas covered by existing water system; Original Dover 250 ERUs plus Dover Bay Development 600 ERUs.
3. Treatment system design capacity based on avg. design ERU from October 2013 Water Facility Plan (700 gpd/ERU) divided into treatment system capacity from Water Facility Plan Table 2 (288,000 gpd).
4. Water storage reservoir capacity (750 ERUs) based on October 2013 Water Facility Plan Table 5 pg. 21.
5. See below for irrigation adjustment factor for Original Dover Bay and Dover Bay Development.

Irrigation Adjustment Factors:

Avg. Unit Flow =	672.7 gpd/ERU	From Water Facility Plan dated October 2013
Avg. Dover Bay Development Unit Flow =	400 gpd/ERU	From Water Facility Plan dated October 2013
Avg. Original Dover Unit Flow =	1000 gpd/ERU	From Water Facility Plan dated October 2013
Dover Bay Development Irrig. Adjustment =	0.595	(400/672.7)
Original Dover Bay Irrig. Adjustment =	1.487	(1000/672.7)

City of Dover, Idaho

Sewer Connection Fee Calculation - Alternative A

12-10-2014

City Connection Fee - Outside Dover Bay Development

Existing Capital Component Description	Original Installation Cost	Construction Year	Construction Year CCI	Current 2014 CCI	2014 Installation Cost	Design Capacity (ERUs)	Useful Life (years)	Remaining Life (years)	2014 Depreciated Value	Outstanding Bond or Loan Principal	Net Replacement Value	Depreciated Cost per ERU
											Current Year	2014
Original Collection System	$840,000	1982	3825	9870	$2,167,529	300	60	28	$1,011,514	$0	$1,011,514	$3,372
SBR Site Development	$68,000	1997	5826	9870	$115,201	1000	50	33	$76,033	$0	$76,033	$76
SBR Treatment System	$445,000	1998	5920	9870	$741,917	1000	50	34	$504,504	$247,760	$256,744	$257
Effluent Discharge System	$125,000	1998	5920	9870	$208,404	1000	70	54	$160,769	$0	$160,769	$161
MBR Treatment System	$5,571,353	2008	8310	9870	$6,617,239	1000	40	34	$5,624,653	$3,899,948	$1,724,705	$1,725
GeoBag System	$62,090	2014	9870	9870	$62,090	1000	50	50	$62,090	$0	$62,090	$62
											City Connection Fee	**$5,652**

City Connection Fee - Inside Dover Bay Development

Existing Capital Component Description	Original Installation Cost	Construction Year	Construction Year CCI	Current 2014 CCI	2014 Installation Cost	Design Capacity (ERUs)	Useful Life (years)	Remaining Life (years)	2014 Depreciated Value	Outstanding Bond or Loan Principal	Net Replacement Value	Depreciated Cost per ERU
											Current Year	2014
SBR Site Development	$68,000	1997	5826	9870	$115,201	1000	50	33	$76,033	$0	$76,033	$76
SBR Treatment System	$445,000	1998	5920	9870	$741,917	1000	50	34	$504,504	$247,760	$256,744	$257
Effluent Discharge System	$125,000	1998	5920	9870	$208,404	1000	70	54	$160,769	$0	$160,769	$161
Dover Bay Collection System	$1,029,942	2005	7446	9870	$1,365,233	600	70	61	$1,189,703	$0	$1,189,703	$1,983
MBR Treatment System	$5,571,353	2008	8310	9870	$6,617,239	1000	40	34	$5,624,653	$3,899,948	$1,724,705	$1,725
GeoBag System	$62,090	2014	9870	9870	$62,090	1000	50	50	$62,090	$0	$62,090	$62
											City Connection Fee	**$4,263**

Notes:

1. Original Installation Cost and Outstanding Bond or Loan Principal amounts provided by the City of Dover.
2. Treatment system design capacity (1,000 ERUs) from Dover Facilities Plan Addendum Revision No. 1.1, February 1, 2007, Membrane Option pg. 23.
3. Original Dover collection system capacity (300 ERUs) from Dover Facilities Plan Addendum Revision No. 1.1, February 1, 2007, pg. 1.
4. Dover Bay collection system capacity (600 ERUs) from Dover Facilities Plan Addendum Revision No. 1.1, February 1, 2007, pg. 1.

APPENDIX B

Alternative B Connection Fee Calculations

City of Dover, Idaho

Water Connection Fee Calculation - Alternative B

12-10-2014

											Current Year	2014
Existing Capital Component Description	**Original Installation Cost**	**Construction Year**	**Construction Year CCI**	**Current 2014 CCI**	**2014 Installation Cost**	**Design Capacity (ERUs)**	**Useful Life (years)**	**Remaining Life (years)**	**2014 Depreciated Value**	**Outstanding Bond or Loan Principal**	**Net Replacement Value**	**Depreciated Cost per ERU**
Original Water Treatment Plant	$236,003	1991	4835	9870	$481,768	411	50	27	$260,155	$93,271	$166,884	$406
Original Water Distribution System	$255,009	1991	4835	9870	$520,566	850	70	47	$349,523	$0	$349,523	$411
Original Lower Storage Tank	$208,559	1991	4835	9870	$425,745	750	60	37	$262,543	$0	$262,543	$350
Upper Storage Tank (Cedar Ridge)	$42,000	1998	5920	9870	$70,024	750	60	44	$51,351	$0	$51,351	$68
Water Treatment Plant Upgrade	$325,000	2004	7115	9870	$450,843	411	50	40	$360,675	$0	$360,675	$878
Dover Bay Distribution System	$1,912,750	2005	7446	9870	$2,535,434	850	70	61	$2,209,450	$0	$2,209,450	$2,599
Fire Flow Looping Project	$639,523	2008	8310	9870	$759,578	850	70	64	$694,471	$447,666	$246,805	$290
Enlarge Lower Storage Tank	$480,845	2008	8310	9870	$571,112	750	60	54	$514,001	$336,592	$177,409	$237
Tie-in and Valving Between Storage Tanks	$132,661	2010	8799	9870	$148,809	850	70	66	$140,305	$92,863	$47,442	$56
Fire Flow Looping Project	$80,000	2012	9299	9870	$84,912	850	70	68	$82,486	$0	$82,486	$97
											Water Connection Fee	**$5,392**

Notes:

1. Original Installation Cost and Outstanding Bond or Loan Principal amounts provided by the City of Dover.
2. Estimated buildout of areas covered by existing water system; Original Dover 250 ERUs plus Dover Bay Development 600 ERUs.
3. Treatment system design capacity based on avg. design ERU from October 2013 Water Facility Plan (700 gpd/ERU) divided into treatment system capacity from Water Facility Plan Table 2 (288,000 gpd).
4. Water storage reservoir capacity (750 ERUs) based on October 2013 Water Facility Plan Table 5 pg. 21.

City of Dover, Idaho

Sewer Connection Fee Calculation - Alternative B

12-10-2014

											Current Year	2014
Existing Capital Component Description	**Original Installation Cost**	**Construction Year**	**Construction Year CCI**	**Current 2014 CCI**	**2014 Installation Cost**	**Design Capacity (ERUs)**	**Useful Life (years)**	**Remaining Life (years)**	**2014 Depreciated Value**	**Outstanding Bond or Loan Principal**	**Net Replacement Value**	**Depreciated Cost per ERU**
Original Collection System	$840,000	1982	3825	9870	$2,167,529	900	60	28	$1,011,514	$0	$1,011,514	$1,124
SBR Site Development	$68,000	1997	5826	9870	$115,201	1000	50	33	$76,033	$0	$76,033	$76
SBR Treatment System	$445,000	1998	5920	9870	$741,917	1000	50	34	$504,504	$247,760	$256,744	$257
Effluent Discharge System	$125,000	1998	5920	9870	$208,404	1000	70	54	$160,769	$0	$160,769	$161
Dover Bay Collection System	$1,029,942	2005	7446	9870	$1,365,233	900	70	61	$1,189,703	$0	$1,189,703	$1,322
MBR Treatment System	$5,571,353	2008	8310	9870	$6,617,239	1000	40	34	$5,624,653	$3,899,948	$1,724,705	$1,725
GeoBag System	$62,090	2014	9870	9870	$62,090	1000	50	50	$62,090	$0	$62,090	$62
											Sewer Connection Fee	**$4,726**

Notes:

1. Original Installation Cost and Outstanding Bond or Loan Principal amounts provided by the City of Dover.
2. Treatment system design capacity (1,000 ERUs) from Dover Facilities Plan Addendum Revision No. 1.1, February 1, 2007, Membrane Option pg. 23.
3. Original Dover collection system capacity (300 ERUs) from Dover Facilities Plan Addendum Revision No. 1.1, February 1, 2007, pg. 1.
4. Dover Bay collection system capacity (600 ERUs) from Dover Facilities Plan Addendum Revision No. 1.1, February 1, 2007, pg. 1.

APPENDIX C

Water Facility Plan Excerpts

CITY OF DOVER

Water System Facility Plan

October 2013

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STATE OF IDAHO
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Sanitary Restrictions

Sanitary restrictions for the remaining 460 lots in the Dover Bay development were implemented by IDEQ in an effort to minimize effects to the water and wastewater systems. The restrictions were added to minimize effects caused by sudden growth and to assure that existing customers had some protection from rapid development. Restrictions for the wastewater portion were released in 2010, however water system restrictions are still in place and holding back the potential growth of the City.

Table: 1 Actual Usage Comparison

2011	Connections	Projected Max Use/ER	Projected 5 Day Max	Actual Max 5 Day Use	Treatment Capacity	Percentage of Capacity Used
City of Dover	95	1,000	475,000	6-Aug		
Dover Bay	87	400	174,000	10-Aug		
Total	182		649,000	655,000	1,440,000	45%
DBD inactive	60	400	120,000			
Total	242		769,000		1,440,000	53%

The above table indicates actual values recorded by the City of Dover in 2011, providing accurate usage information. This table is a summary of peak use to be compared to design values.

Design values are based on 1000 gallons per day for the City of Dover and 400 gallons per day for the Dover Bay Development, and have been derived from actual usage, as shown in Table 1 above. Design flows are based on peak 5 day actual flows averaged over a 365 day calendar year. These flows have been based on guidelines set forth in the Washington State Design Manual.

The future projects listed in this report are to be funded by connection fees and Urban Renewal monies that will be generated from home construction in the Dover Bay Development, however as long as the sanitary restrictions are in place, construction cannot take place, therefore preventing Urban Renewal growth and funding.

The lifting of the sanitary restrictions for the remaining lots in the Dover Bay Development is an important factor in completing future projects for the City of Dover. This report will show that the existing water system can serve up to 482 additional connections in Dover Bay without impacting the existing users. By lifting sanitary restrictions and review of the system through the required sanitary survey requirements, the IDEQ can be assured that water system infrastructure is handling peak water usage periods. Therefore it is recommended that he Sanitary Restrictions be lifted in which will allow continued growth that can provide the funding necessary for the fulfillment of the plan.

per minute. A dedicated treatment line directs treated water to a baffled water treatment reservoir. Distribution lines then deliver the water to individual connections and fire hydrants throughout the distribution system. The current treatment process consists of twelve and a half percent (12.5 %) hypochlorite solution injected by means of an LMI chemical injection pump. Overall, the system is in really good condition, with respect to a few upgrades to help with future growth.

The Dover Bay Development has constructed, as part of its infrastructure, an irrigation water intake system which diverts water from the Pend Oreille River to all of its existing and future lots. This separate irrigation system will no doubt help relieve water system demand issues for the City of Dover.

Storage for the City of Dover has been supplemented by infrastructure occurring from the Dover Bay Development. The total storage capacity is 353,824 gallons. The Cedar Ridge service area includes a 47,000 gallon reservoir that currently serves 5 residences. Water is pumped to the Cedar Ridge tank by booster pumps. Because the population base rests far below the reservoir, the City has no pressure zone problems, only low fire flow areas due to small line sizes.

The City of Dover residents' water usage demand is based on the Washington State Design Manual. Residents of the Dover Bay Development area will be calculated with the design criteria of 400 gallons per day because irrigation is already being supplied.

The City has adopted a cross connection control program as an ordinance and enforces it by means of water termination for non compliance. This ordinance can be found in the Appendix.

The City of Dover expended approximately $104,000 for water system expenses in 2009, or an average of $8,600 per month. The total City revenue for water in 2009 was $121,000 or an average of $10,000 per month. The City needs to recoup this amount plus additional monies each month if they are going to continue to meet monthly water system demands and plan for future upgrades.

Water Use Data

The City of Dover is asking IDEQ to release sanitary restrictions on an additional 482 future water connections in the Dover Bay development. Without release of the sanitary restrictions, additional funds cannot be collected from new construction, therefore preventing connection fees and Urban Renewal from funding proposed system upgrades. This facility plan and all system upgrades are being designed and will be approved and constructed per design criteria of 1000 gallons per day per unit for the City of Dover, and 400 gallons per day for the Dover Bay Development.

Table: 2 Existing/Future Daily Production and Demand

Supply/ One Filter offline	288,000	GPD
Demand – 95 @ 1000 GPD 482 @ 400 GPD	95,000 192,800	GPD GPD
Total	287,800	GPD
Difference	200	GPD

b. Median Resident Age, 45.9
c. Median household income in 2008, $47,459
d. Median house or condo value in 2008, $248,339

14. Maps, Site Plans, Schematics, Tables and Letters
    a. See Appendix

A sanitary Survey was completed by Suzanne Scheidt of the Idaho Department of Environmental Quality in July of 2012 which produced a letter indicating that the system was in substantial compliance. The survey remarked highly on the operation and maintenance efforts completed by the operator and listed some minor items that needed correction to meet full compliance. All of those items have been corrected.

Water quality within the City of Dover is exceptional and they have no pending violations or concerns of water quality being held against them. They have done a remarkable job of staying just ahead of the growth curve while all the while producing clean potable drinking water for their consumers.

Hydraulic Analysis

A hydraulic analysis has been completed for the City of Dover. The process of completing the analysis was to first locate and GPS all existing water lines, facilities, reservoirs, elevations and pumps. The data was entered into our WaterCAD software and then calibrated using existing fire flow data. Once calibrated, different scenarios were run to determine what upgrades have the most positive influence on the City of Dover. Scenario results are detailed later in this report.

Future Conditions

The City of Dover's future hangs in the balance until proposed measures are approved, constructed and put into use. The following topics indicate the suggested forecast of growth and demand for the City.

When forecasting city growth, we did not use population, but rather available ER's. The City of Dover is land locked between the Pend Oreille River, Sandpoint and small homeowner associations. Unless the City is to grow away from the lake and more into the rural confines of Dover, it will not see much growth beyond its present capabilities, however we have set the build out proposed ER total at 1,100. This ER information was derived from both the Sewell & Associates report and data collected from the City on present day connections. The 20 year scope for the City is discussed again later in this report.

Flow Requirements

Before an accurate future flow requirement can be sustained, first there must be a future connection projection. The Dover Bay Development at build out will provide for 600 livable units or ER equivalents. The original City of Dover boundaries and surrounding area are capable of providing for 500 total livable units or ER equivalents, including 10 additional connections in the Cedar Ridge services area. In all, the City of Dover at present could reach 1,100 livable units or ER equivalents without annexation. 1,100 connections have been set as the target for standard design criteria in the City of Dover.

Table: 5 Reservoir Sizing Criteria

Max Daily Flow 131,000 Aug-11

	PHD GPM	PHD Day/ERU	PHD GPM/ERU	ADD
Dover	200	1,000	2.11	332
DBD	85	400	0.98	166
Combined	286	1,400	3.09	

OS= Operational Storage
ES= Equalizing Storage
SB= Standby Storage
FSS= Fire Suppression Storage
ADD= 16,772,000.00 Annual Use

Existing Storage	400,824
Source Supplies/GPM	200
Hourly Supply	12,000

300

Current Active ERU's	ERU's	PHD	PHD GPM/ERU	OS	ES Required	SB Required	FSS Required	Storage Needed
Dover	95	200.29	2.11	19,657		10,503	240,000	
DBD	87	85.36	0.98	19,657		4,809	240,000	
Combined	182	285.65	3.09	19,657	12,848	15,312	240,000	287,817
Current Connected ERU'	**ERU's**	**PHD**	**PHD GPM/ERU**	**OS**	**ES Required**	**SB Required**	**FSS Required**	**Storage Needed**
Dover	95	200.29	2.11	19,657		10,503	240,000	
DBD	160	127.72	0.80	19,657		8,844	240,000	
Combined	255	328.01	2.91	19,657	19,202	19,347	240,000	298,206
Additional 50 ERU's	**ERU's**			**OS**	**ES Required**	**SB Required**	**FSS Required**	**Storage Needed**
Dover	98	205.50	2.10	19,657		10,834	240,000	
DBD	210	155.50	0.74	19,657		11,608	240,000	
Combined	308	361.00	2.84	19,657	24,150	22,443	240,000	306,250
150 Additional ERU's	**ERU's**			**OS**	**ES Required**	**SB Required**	**FSS Required**	**Storage Needed**
Dover	120	236.75	1.97	19,657		13,267	240,000	
DBD	360	232.72	0.65	19,657		19,900	240,000	
Combined	480	469.47	2.62	19,657	40,421	33,167	240,000	333,245
	ERU's			**OS**	**ES Required**	**SB Required**	**FSS Required**	**Storage Needed**
Current Reservoir	200	382.58	1.91	19,657		22,111	240000	
	550	324.94	0.59	19,657		30,403	240000	
		707.53	2.50	19,657	46,129	52,514	240,000	358,300
Full Buildout	**ERU's**			**OS**	**ES Required**	**SB Required**	**FSS Required**	**Storage Needed**
Dover	500	903.42	1.81	19,657		55278	240,000	
DBD	600	347.17	0.58	19,657		33167	240,000	
Combined	1,100	1250.58	2.39	19,657	112,588	88,445	240,000	460,689

Development & Initial Screening of Alternatives

Although the City has increased its water storage capacities in an effort to ease demand issues, the need for additional source water is still an issue due existing raw water intake. Constructing a new intake, prior to upgrading the existing intake and then constructing an additional slow sand filter and upgrading the transmission line, will assure future growth to 1,100 units in and around the City of Dover.

To effectively meet the goal of providing enough water to adequately supply the existing and proposed slow sand filter the raw water system must be upgraded. These plans have been submitted and approved to IDEQ and we are ready to start construction.

APPENDIX D

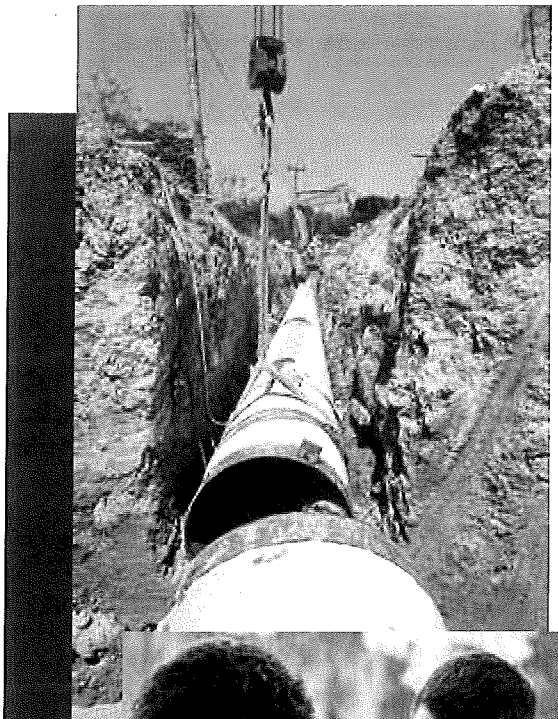
Useful Life Documentation

BURIED NO LONGER:

Confronting America's Water Infrastructure Challenge

American Water Works Association

The Authoritative Resource on Safe Water®



projections of demographic trends allowed the development of infrastructure need profiles for growth through 2050 in each of the regions and utility size categories (for the latter purpose, city size was used as a proxy for utility size).

The study generally assumes that utilities continue efforts to manage the number of main breaks that occur per mile of pipe rather than absorb increases in pipe failures. That is, the study assumes utilities will strive to maintain current levels of service rather than allow increasing water service outages. We assume that each utility's objective is to make these investments at the optimal time for maintaining current service levels and to avoid replacing pipes while the repairs are still cost-effective. Ideally, pipe replacement occurs at the end of a pipe's "useful life"; that is, the point in time when replacement or rehabilitation becomes less expensive in going forward than the costs of numerous unscheduled breaks and associated emergency repairs.

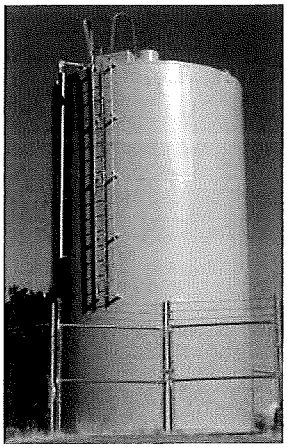
With this data in hand and using the assumptions above, we projected the "typical" useful service life of the pipes in our inventory using the "Nessie Model"™. The model embodies pipe failure probability distributions based on many utilities' current operating experiences, coupled with insights from extensive research and professional experiences with typical pipe conditions at different ages and sizes, according to pipe material. The analysis used seven different types of pipe in three diameters and addressed pipe inventories dating back to 1870. Estimated typical service lives of pipes are

Figure 5: Average Estimated Service Lives by Pipe Materials (average years of service)

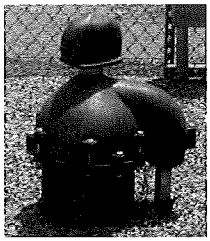
Derived Current Service Lives (Years)	CI	CICL (LSL)	CICL (SSL)	DI (LSL)	DI (SSL)	AC (LSL)	AC (SSL)	PVC	Steel	Conc & PCCP
Northeast Large	130	120	100	110	50	80	80	100	100	100
Midwest Large	125	120	85	110	50	100	85	55	80	105
South Large	110	100	100	105	55	100	80	55	70	105
West Large	115	100	75	110	60	105	75	70	95	75
Northeast Medium & Small	115	120	100	110	55	100	85	100	100	100
Midwest Medium & Small	125	120	85	110	50	70	70	55	80	105
South Medium & Small	105	100	100	105	55	100	80	55	70	105
West Medium & Small	105	100	75	110	60	105	75	70	95	75
Northeast Very Small	115	120	100	120	60	100	85	100	100	100
Midwest Very Small	135	120	85	110	60	80	75	55	80	105
South Very Small	130	110	100	105	55	100	80	55	70	105
West Very Small	130	100	75	110	60	105	65	70	95	75

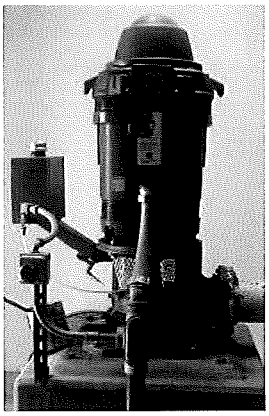
LSL indicates a relatively long service life for the material resulting from some combination of benign ground conditions and evolved laying practices etc.
SSL indicates a relatively short service life for the material resulting from some combination of harsh ground conditions and early laying practices, etc.

Asset Management: A Guide For Water and Wastewater Systems



2006 Edition





Prepared by:
Environmental Finance Center
New Mexico Tech

NEW MEXICO
ENVIRONMENTAL
FINANCE CENTER

Typical Useful Life for Selected Infrastructure Assets

Sample Useful Live (years)		Sample Useful Live (years)	
Roads:		**Wastewater:**	
Pavement Substructure	50-100	Gravity Sewer Lines	80-100
Wearing Surfaces	10-20	Manholes	20-50
Curb and Gutter	50-80	Pumping Station Structures	50
Footpaths	15-50	Pumping Station Electrical	15
Bridges	30-80	Risers	25
Culverts	50-80	Treatment Plant Structures	50
Roadside furniture or signage	10	Treatment Plant Electrical	15-25
Bus shelters	20	**Parks:**	
Bike paths	50	Parks & Gardens	*
Street lighting	20	Fields	*
Traffic Signals	10	Swimming Pools	50
Unsealed roads	-	Plant Nurseries	20
Drainage:		Fountains	50
Drains (underground)	50-80	Cemeteries	*
Culverts	50-80	Public Barbecues	10
Manholes	20-50	Fences	25
Detention Basins	50-100	Play Equipment	25
Pumping Station Structures	50	**Buildings:**	
Pumping Station Electrical	25	Chambers/offices/halls	50-100
Water Supply		Toilet blocks	50-100
Storage tanks	50-80	Houses	50-100
Treatment Plant Structures	60-70	Sports Clubs	50
Treatment Plant Electrical	15-25	**Waste Facilities**	
Water lines	65-95	Landfills	Depends on fill rate
Pumping Station Structures	60-70	Transfer Stations	20
Pumping Station Electrical	25	Garbage collection vehicles	6
		Corporate:	
		Work depots	50
		Vehicles	5
		Office Equipment	5-10
		*Consider each component separately	

APPENDIX E

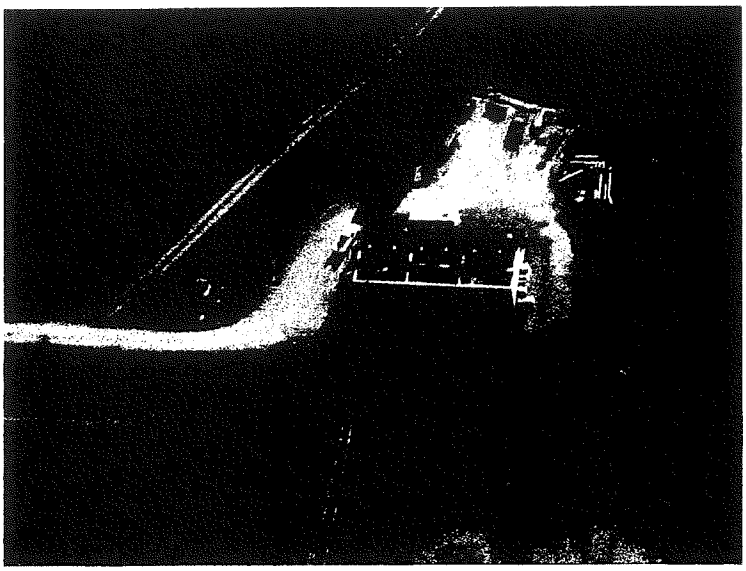
Wastewater Treatment Facilities Plan Excerpts

CITY OF DOVER
BONNER COUNTY, IDAHO

WASTEWATER TREATMENT PLANT

FACILITIES PLAN ADDENDUM
REVISION NO. 1.1
TECHNICAL MEMORANDUM

November 22, 2006
R 1.1 February 1, 2007



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CITY OF DOVER
BONNER COUNTY, IDAHO

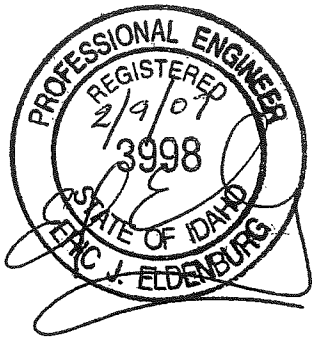
WASTEWATER TREATMENT PLANT

FACILITIES PLAN ADDENDUM
REVISION NO. 1.1
TECHNICAL MEMORANDUM

November 22, 2006
R 1.1 February 1, 2007

This Report was prepared by James A. Sewell & Associates in association with Esvelt Environmental Engineering under contract with Dover Bay Development. It was prepared on behalf of the City of Dover and Dover Bay Development for improvements to the Dover Wastewater System to accommodate development of Dover Bay property. This development and wastewater facilities expansion to meet the needs of Dover Bay Development was provided for under agreements executed and approved at the time of initial construction of the Dover wastewater treatment system.

This Report was prepared by, or under the direct supervision of, one or both of the following engineers licensed in the State of Idaho.



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I. Introduction and Background

A. *City of Dover, Rocky Point Sewer District History*

The City of Dover, located in Bonner County Idaho owns and operates wastewater collection and treatment facilities currently serving the residents within the Syringa Heights development, Rocky Point development, Cedar Ridge development, Canoe Cove development, and the City of Dover. Property owned by Dover Bay Development (DBD) is also a primary beneficiary of the treatment facility through directive at the time of property acquisition of the treatment plant site. Originally the wastewater collection and treatment facilities were owned by the Rocky Point Sewer District (RPSD). Following the failure of the original wastewater treatment/disposal system in the March of 1990, the City of Dover assumed the duties and responsibilities of the RPSD and the RPSD was abolished through a Transfer Agreement dated May 5, 1996.

The original wastewater collection system was installed during the early 1980s. It was at this time that a subsurface treatment and disposal system was also constructed. The treatment/disposal component of the system consisted of two subsurface absorption beds preceded by a dosing tank located approximately 2 miles west of the City of Dover on the north side of State Highway 2. The original absorption beds failed and the IDEQ issued a consent order requiring correction of the failed system by no later than January 30, 1998. As a result, three previous engineering report / facility plans were generated in efforts to correct the problems at hand. None of the three engineering reports generated completely describe the treatment system currently installed.

Since the treatment system is a product of approvals of previous plans, this Revised Facilities Plan Addendum Memorandum is submitted as a modification of the Phased improvement extending the intent of the originally approved plans for the facility. The initial system was designed to treat wastewater from 300 equivalent residential units (ERUs) and consisted of 3 basins, two operable as sequencing batch activated sludge aeration basins and one as a sludge holding tank/aerobic digester. Phase 1 improvements added new sludge holding tanks/aerobic digesters to replace the original sludge holding tank/aerobic digester cell which is intended for conversion to a third aeration basin. The third basin conversion under the Facility Plan addendum would add capacity to the system up to 450 ERUs. A second phase was intended which would construct three (3) additional aeration basins to double the capacity of the system to 900 ERUs. The ultimate system is intended to treat wastewater from a total of 600 ERUs from the proposed Dover Bay Development property, in accordance with agreements executed at the time of property acquisition for the treatment facility, in addition to the original 300 ERUs from the City of Dover collection system.

1. History of Dover Wastewater Treatment System

The existing treatment facilities were constructed under the requirements of a Consent Order in issued in 1997. A Court Stipulation issued in conjunction with the site acquisition process included the Dover Bay Development property as a primary beneficiary of the "permanent alternative" selected. The project included plant construction and design approval for 300 ERUs of capacity, and expansion capability for not fewer than 600 ERUs for the subject site.

An original sewer system construction by the Rocky Point Sewer District (RPSD) discharged to a treatment and land disposal treatment system. It was determined to have failed in 1990, which

V. ALTERNATIVE MEMBRANE TREATMENT PROPOSAL

Subsequent to initiation of construction of Phase 1 facilities, evaluation of alternatives for Phase 2 treatment upgrades was begun. One of the alternatives considered was conversion of the current basins (including the aerobic digester cell) to continuous flow activated sludge basins. New technology, membrane filtration, has been demonstrated, which allows separation of the activated sludge solids from the effluent by filtration through the membranes. This is normally performed by settling of the solids in "clarifiers". An earlier analysis showed that no savings would be available by conversion to a standard or low rate activated sludge system, as the aeration basins would need to be doubled in size and clarifiers would need to be added for solids removal for recycling to the activated sludge basins. However, installation of membranes could result in savings, by eliminating the clarifiers and reducing the volume of aeration basin required.

This alternative includes conversion of the existing SBR basins to continuous flow-thru operation as activated sludge aeration basins, and addition of membrane solids separation. The membrane solids separation would allow mixed liquor solids to operate at a higher concentration, up to 10,000 mg/l (compared to 2,000 to 4,000 mg/l for conventional or low rate activated sludge). This would allow use of the existing basins to achieve greater wastewater load capacity. Additional aeration capacity (blowers and air diffusers addition) would be required to accept the larger BOD loads. These would also have been required for conventional activated sludge, or addition of more SBR basins.

To evaluate the economics of conversion to a flow-through activated sludge system with membrane solids separation (creation of a "Membrane Bioreactor" treatment plant), proposals were solicited from Enviroquip, Zenon, and Memcor companies that manufacture and market membrane systems for this type of application. Enviroquip, which uses flat plate membranes, indicated that their system would not be applicable to the configuration of the Dover treatment plant. Proposals were received from Zenon and Memcor, both of which use hollow fiber membranes in their systems.

An engineer opinion of probable cost for the upgrade of the system to a flow-through activated sludge treatment system with membrane solids separation was performed compared to the probable cost for addition of a second 3-basin SBR system for the added capacity. In addition the current improvement Phase 1 contract will have cost savings due to cancellation of the equipment orders and piping installation contracts. The results are shown on Table V.1.

Based on these costs, it appears that implementation of the MBR solids separation system will cost essentially the same as for implementation of the existing Phase 1 plus Phase 2 biological treatment expansion.

Design Criteria for the activated sludge with membrane solids separation utilizes the complete capacity of the existing aeration basins and will provide substantially complete nitrification during summer months, and nitrification a majority of the time in winter months. The design capacity is shown on Figure V-1. The capacity of the system is about 1,000 ERU. This is compared to a projected need for the City service area through Phase 2 of the Dover Bay Development of 900 ERU (see Table I.1). The membrane system is sized for 1,000 ERU capacity, which is the capacity of the SBR activated sludge aeration basins converted to flow through basins at a MLSS of 10,000 mg/l.