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Subject: Water, Wastewater, and Reclaimed Water Rate  
Study 2023 – Capacity Fees and Miscellaneous  
Fees

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## **BACKGROUND AND OBJECTIVES**

Stantec Consulting Services Inc. (Stantec) has conducted a capacity fee analysis (Analysis) and miscellaneous fee update (Update) for the City of Flagstaff, AZ Water Services (Utility) as part of a comprehensive rate study (Study) to create 10-year plans for the water, wastewater, and reclaimed water enterprise funds. The last comprehensive rate study conducted by the Utility was published in 2015 and included a capacity fee analysis and updated capacity fees were implemented in 2016.

The Analysis, Update, and Study aim to accomplish multiple policy strategies including the implementation of fees that are legal, proportional, and equitable; develop long-term financial plans that set forth the funding needs of the Utility; and establish fees that cover the costs of service and meet the Utility's and state of Arizona's regulatory requirements.

## **CAPACITY FEE ANALYSIS**

A capacity fee is a one-time charge paid by a new connection to recover a portion or all of the cost of constructing capacity in water and sewer system infrastructure. The fees are also assessed to existing customers requiring additional water and sewer system capacity. In general, capacity fees are based on the costs of utility infrastructure including, but not limited to, water supply facilities, treatment facilities, transmission mains, wastewater conveyance, and effluent disposal facilities. The infrastructure costs included in capacity fees are large, system-level components and do not include local collection or distribution system improvements or assets less than the City's capitalization policy (assets valued less than \$5,000). Capacity fees serve as the mechanism by which growth can "pay its own way" and minimize the extent to which existing customers must bear the cost of facilities that will be used to serve new customers.

Flagstaff's current water and wastewater capacity fees were developed in accordance with the Arizona Revised Statutes (ARS) 9-511.01 since the Utility provides service to customers outside of its municipal boundaries. ARS 9-463.05 applies to service areas within the boundaries of a municipality, while ARS 9-511.01 applies to both inside and outside city customers. Stantec developed new capacity fees in the Analysis under the same guidelines.

The 2016 capacity fee study notes that all components of the current Flagstaff water and wastewater capacity fees were calculated using the incremental approach with the exception of the wastewater

treatment component, which is calculated under the combined approach. In the Analysis detailed in this technical memorandum, Stantec calculated new water and wastewater capacity fees using the combined approach for all components. The key assumptions and methodology used in the Analysis are detailed in the sections below.

## 1.1 KEY ASSUMPTIONS AND METHODOLOGY

The following subsections detail key assumptions and methodology used to develop the Analysis.

### 1.1.1 Methodology

There are three industry recommended approaches to calculating capacity fees: the buy-in method, the incremental method, and the combined method. Each method includes a dollar valuation in terms of net system value or expansion-related capital costs, a capacity level, and a level of service per equivalent connection to calculate the fee. Each method provides information as to the value of a unit of capacity. It is up to the objectives and policies of the Utility's decision makers as to the preferred methodology for the Utility.

The buy-in method takes into account only existing infrastructure values and capacity, such that the capacity fee calculated under this method reflects the cost of buying into the current system's capacity and asset values and therefore historical investments made in the system. The fee is calculated by dividing the net system value by the existing capacities for water and wastewater and then multiplying the unit-capacity costs by the estimated level of service (LOS) to get a fee per equivalent residential unit (ERU). The asset valuation calculation can be the original cost, book value (original cost less depreciation), replacement cost new (RCN) or replacement cost new less depreciation (RCNLD). This approach excludes donated or contributed assets.

The incremental method uses total future expansion-related capital project costs as the numerator and added capacity from future expansion-related capital projects as the denominator in the unit-capacity cost calculation. The calculated cost per unit of new incremental capacity is multiplied by the estimated level of service to determine the capacity fee per ERU.

The combined method is a hybrid of both existing asset valuation as well as future expansion-related capital costs, and also combines both existing capacity and incremental capacity to calculate capacity fees per ERU. Given direction from City Council and Water Commission, Stantec and the Utility elected to follow the combined method to calculate new water and wastewater capacity fees. This approach captures both the existing value and capacity of the current systems as well as future expansion related capital costs and added capacities related to those capital projects.

### 1.1.2 Level of Service

Capacity fees are typically assessed on a “Service Unit” which represents a unit of measure of system capacity, typically defined as an ERU. Expressing the system capacities in terms of ERUs allows for unit pricing of capacity which is essential for the determination of capacity fees. ERUs are associated with a specific level of service (LOS) used by the local government for system engineering and planning purposes. The City’s current levels of service (design standards) in City Code have not been updated since the 1980s. Since the City Code assumptions have not been updated recently, Stantec calculated an alternative LOS based on actual production data from 2020-2022 and the most recent census data available.

The Utility’s design standards for a water ERU includes the following assumptions:

- 3.5 people per household (pph)
- 100 gallons of water use per capita per day (gpcd)
- 75 gpcd of wastewater usage
- 2.5 maximum day peaking factor for water
- 1.6 maximum day peaking factor for wastewater
- No loadings factor accounted for in design standards LOS for wastewater

Using actual water and wastewater production and usage data for the last three years, the LOS for one ERU for the Utility is calculated and presented in the capacity fee calculations as Actual Use LOS. Actual Use LOS includes the following assumptions:

- 2.4 pph
- 93 gpcd of water use
- 67 gpcd of wastewater use
- 1.5 maximum day peaking factor for water
- 1.6 maximum day peaking factor for wastewater
- 0.67 pounds per day (PPD) per capita of loadings for wastewater

Table 1-1 displays the resulting LOS options under the Design Standards and Actual Use.

**Table 1-1: Level of Service (LOS) Assumptions for Capacity Fee Development**

LOS Type	Water Fund		Wastewater Fund
	<i>Flow (Gallons Per Day)</i>	<i>Flow (Gallons Per Day)</i>	<i>Loadings (Pounds Per Day)</i>
<b>Design Standards (City Code)</b>	875 GPD	420 GPD	N/A
<b>Actual Use</b>	335 GPD	257 GPD	0.67 PPD

### 1.1.3 Reclaimed Water

The Utility does not charge reclaimed water capacity fees because reclaimed water supply is limited and allocated to existing reclaimed water customers. Reclaimed water distribution system investments, however, benefit existing water supply, and therefore are included in the water system capacity fee calculations.

The value of reclaimed water treatment provided at the Utility’s wastewater treatment plants is included in the wastewater system capacity fee calculations.

### 1.1.4 Major Capital Project Alternatives

The Utility is currently reviewing the need for major projects such as future water supply projects and a wastewater treatment plant expansion. While specific details are still being developed and funding sources are uncertain, it is understood that growth is driving a large portion of these costs. Including these future costs as capacity fee options for consideration by the Water Commission and City Council was recommended by the City Manager.

Given that the major capital project needs are still under review, the Analysis includes four total options for water, and eight different options for wastewater (detailed in below sections) for capacity fees based on different LOS assumptions and capital improvement plan (CIP) alternatives.

## 1.2 SOURCE DATA

The following subsections present key source data relied upon to develop the Analysis.

### 1.2.1 System Assets

The Utility's water and wastewater system asset data as of June 30, 2022, were provided by the Utility and used in the Analysis to value existing water and wastewater infrastructure. Each water system asset was allocated across system functions including:

- water resources,
- production,
- storage,
- distribution, and
- reclaimed water distribution.

Each wastewater system asset was allocated across system functions including:

- treatment,
- interceptors,
- collection,
- reclaimed water treatment, and
- loadings (strength of wastewater).

Asset values were estimated in terms of RCNLD and excluded contributed or donated assets.

Administrative assets were split across functions based on the distribution of non-administrative assets for each system. The net asset functional values were then used to inform the buy-in method and combined method of calculating capacity fees. Tables 1-2 and 1-3 summarize the water and wastewater system asset values by function.

**Table 1-2: Water Fixed Asset Allocation by Function (Millions of Dollars)**

<b>Water</b>	<b>RCNLD Value</b>	<b>Contributed or Excluded Assets</b>	<b>Net RCNLD Value</b>	<b>Net Allocated Admin Asset Value</b>	<b>Net Asset Functional Value</b>
<b>Water Resources</b>	\$37.03	(\$6.36)	\$30.67	\$5.04	<b>\$35.71</b>
<b>Production</b>	\$16.63	(\$0.73)	\$15.90	\$2.61	<b>\$18.51</b>
<b>Storage</b>	\$11.67	(\$0.00)	\$11.67	\$1.92	<b>\$13.59</b>
<b>Distribution</b>	\$171.62	(\$74.51)	\$97.11	\$15.95	<b>\$113.06</b>
<b>Reclaimed Water (Distribution)</b>	\$16.57	(\$0.01)	\$16.55	\$2.72	<b>\$19.27</b>
<b>Total Water</b>	<b>\$253.52</b>	<b>(\$81.62)</b>	<b>\$171.90</b>	<b>\$28.24</b>	<b>\$200.14</b>

**Table 1-3: Wastewater Fixed Asset Allocation by Function (Millions of Dollars)**

<b>Wastewater</b>	<b>RCNLD Value</b>	<b>Contributed or Excluded Assets</b>	<b>Net RCNLD Value</b>	<b>Net Allocated Admin Asset Value</b>	<b>Net Asset Functional Value</b>
<b>Treatment</b>	\$20.39	(\$0.71)	\$19.68	\$3.23	<b>\$22.91</b>
<b>Interceptors</b>	\$62.50	(\$26.62)	\$35.88	\$5.89	<b>\$41.77</b>
<b>Collection</b>	\$65.56	(\$29.13)	\$36.43	\$5.98	<b>\$42.41</b>
<b>Reclaimed Water (Treatment)</b>	\$20.38	(\$0.00)	\$20.38	\$3.35	<b>\$23.73</b>
<b>Loadings</b>	\$9.99	(\$0.00)	\$9.99	\$1.64	<b>\$11.64</b>
<b>Total Wastewater</b>	<b>\$178.82</b>	<b>(\$56.46)</b>	<b>\$122.36</b>	<b>\$20.10</b>	<b>\$142.46</b>

### 1.2.2 10-Year Capital Improvement Plan

The Utility’s water and wastewater 10-year CIPs were functionalized, and costs were allocated as expansion-related or non-expansion related. The expansion-related costs were then summarized by function to inform the incremental and combined methods of calculating capacity fees. Tables 1-4 and 1-5 summarize the water and wastewater expansion-related CIPs by function.

**Table 1-4: Water Expansion-Related Capital Improvement Plan by Function**

Water	CIP Costs (Millions of Dollars)	Percent of Total
<b>Water Resources</b>	\$25.71	8.6%
<b>Production</b>	\$16.19	5.4%
<b>Storage</b>	\$2.62	0.9%
<b>Distribution</b>	\$16.00	5.3%
<b>Reclaimed Water (Distribution)</b>	\$9.93	3.3%
<b>Future Water Supply*</b>	\$230.00	76.6%
<b>Total Water</b>	<b>\$300.45</b>	<b>100%</b>

\*Future water supply project is under review and varies across options. This table reflects the CIP including the future water supply costs.

**Table 1-5: Wastewater Expansion-Related Capital Improvement Plan by Function**

Water	CIP Cost (Millions of Dollars)	Percent of Total
<b>Treatment</b>	\$0.02	0.0%
<b>Interceptors</b>	\$6.30	3.9%
<b>Collection</b>	\$1.18	0.7%
<b>Reclaimed Water (Treatment)</b>	\$0.00	0.0%
<b>Loadings</b>	\$92.00	57.2%
<b>Treatment Plant Expansion*</b>	\$122.50	76.2%
<b>Total Water</b>	<b>\$160.75</b>	<b>100%</b>

\*Treatment plant expansion project is under review and varies across options. This table reflects the CIP including the wastewater treatment plant expansion costs.

### 1.2.3 System Capacities

The City’s water and wastewater systems comprise numerous functional components such as water production, wastewater treatment, and transmission/conveyance. Each of the functional components has a physical or regulatory permitted capacity. While treatment, supply, and disposal capacities are readily available and generally accepted to be the physical or regulatory permitted capacity of such facilities, transmission and interceptor system capacities are more difficult to quantify. Stantec obtained the system capacities through reviews and discussions with City staff and references to the City’s system master plans.

The expansion related capital improvement projects identified in the City’s CIP will add capacity to the City’s water and wastewater systems. Incremental increases in capacity for the water and wastewater system projects were obtained from discussions with City Staff.

For some systems, it is common to define the capacity for all functional components (including the transmission and interceptor facilities) based on the system’s total treatment capacity. This approach was followed for the determination of the interceptor system capacities for the City’s wastewater system. The rationale behind this decision is that even if the wastewater interceptors are larger than the wastewater



treatment capacity, the only capacity the system can offer to its users is its total treatment capacity. Table 1-6 below shows the existing and incremental capacities for the water and wastewater systems used in the combined method calculation for capacity fees.

**Table 1-6: Water and Wastewater System Capacities**

	Water Volume	Wastewater Volume	Wastewater Loadings
<b>Existing &amp; Incremental Capacity</b>	86.01 MGD	60.89 MGD	39,810 PPD
<b>Future Water Supply</b>	19.53 MGD	N/A	N/A
<b>Wastewater Treatment Plant Expansion</b>	N/A	9.00 MGD	16,200 PPD
<b>Total Existing &amp; Incremental Capacity</b>	105.54 MGD	69.89 MGD	56,010 PPD

### 1.2.4 Equivalent Residential Units

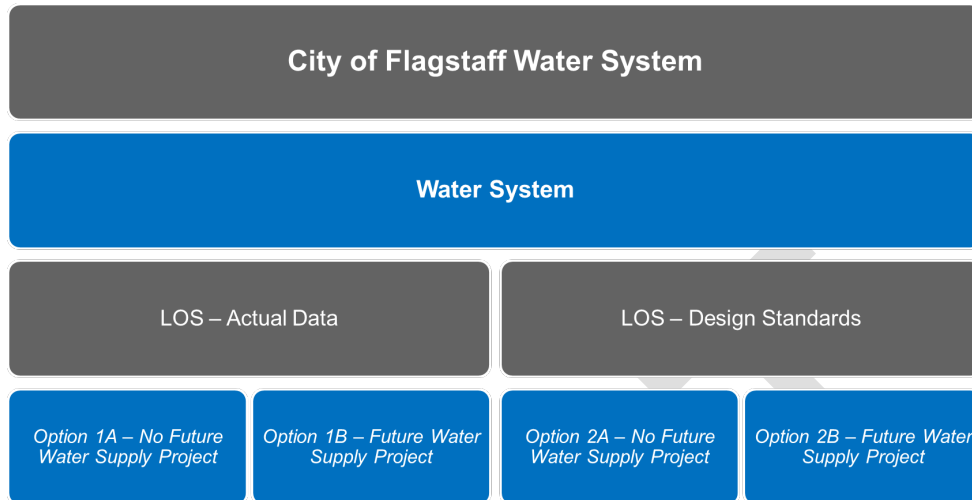
The units of service related to the provision of water and wastewater capacity are often calculated as ERUs. Specifically, the total system capacity (treatment capacity in million gallons per day for each system) divided by the level of service in gallons per day (GPD) is equal to the total number of ERUs Flagstaff can serve within the water and wastewater systems.



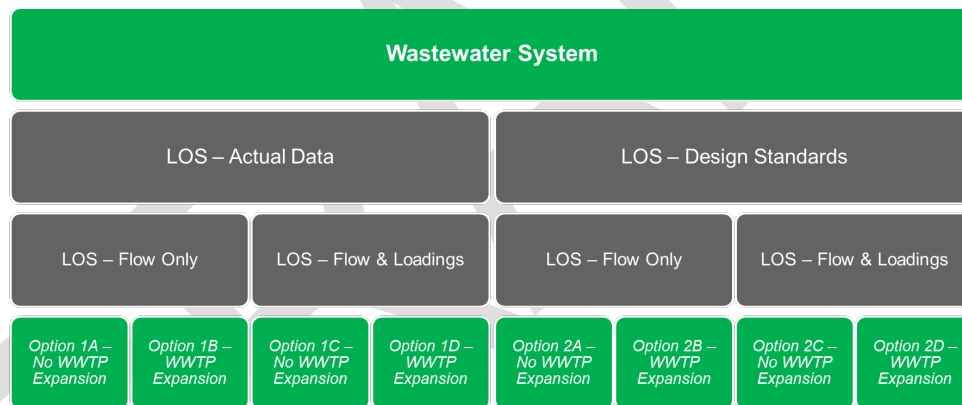
This calculation allows for the determination of a capacity fee per ERU. The per ERU capacity fee can then be scaled based on the potential demand on the utility system for each new customer joining the system.

## 1.3 SCENARIO ANALYSIS AND RESULTS

Due to the multiple possibilities of CIP funding levels for each fund, and multiple distinct potential LOS assumptions, Stantec created four capacity fee options for water and eight capacity fee options for wastewater. Figures 1-1 and 1-2 below is a flow chart depicting the various options and their distinctions for water and wastewater capacity fees.



**Figure 1-1: Water Scenarios**



**Figure 1-2: Wastewater Scenarios**

### 1.3.1 Water Fund

The Analysis for the Utility’s Water Fund capacity fees results in four options given two LOS assumptions (using design standards or actual data) and two options for expansion-related capital projects in the CIP (including the future water supply costs or excluding them):

1. Option 1A assumes a LOS based on actual data and does not include the future water supply capital costs.
2. Option 1B assumes a LOS based on actual data and includes the future water supply capital costs.

3. Option 2A assumes a LOS based on design standards from Flagstaff city code and does not include the future water supply capital costs.
4. Option 2B assumes a LOS based on design standards and includes the future water supply capital costs.

After Stantec and Utility staff presented the options to Flagstaff City Council, option 1B was selected, which uses an LOS based on actual data and includes costs for future water supply. Once the selection was made, Utility staff provided updated data regarding the 10-year CIP, which changed the calculated fee under option 1B. Table 1-7 presents the four options for water capacity fees for a ¾” meter and a 2” meter before the CIP change was made, and also the updated fee for the selected option 1B after the CIP change was made.

**Table 1-7: Water Capacity Fee Options**

LOS – Actual Data	¾” Meter		2” Meter	
	Existing Fee	Calculated Fee	Existing Fee	Calculated Fee
1A: No Future Water Supply	\$5,728	\$6,507	\$30,530	\$34,682
1B: Future Water Supply	\$5,728	\$8,146	\$30,530	\$43,418
LOS – Design Standards	Existing Fee	Calculated Fee	Existing Fee	Calculated Fee
2A: No Future Water Supply	\$5,728	\$17,341	\$30,530	\$92,427
2B: Future Water Supply	\$5,728	\$21,603	\$30,530	\$115,143
<b>1B After CIP Update</b>	<b>\$5,728</b>	<b>\$8,266</b>	<b>\$30,530</b>	<b>\$44,058</b>

Under option 1B after the CIP update, the following schedule of capacity fees by meter size would apply for new or upsized water connections.

**Table 1-8: Option 1B Capacity Fees by Meter Size After CIP Update**

Meter Size	Existing Number of Accounts	FY 2023 Average Usage per Month (gal)	ERU Factor	Existing Fee	Option 1B
¾”	19,188	4,147	1.0	\$5,728	\$8,266
1”	1,068	10,000	1.67	\$9,566	\$13,804
1 ½”	378	34,505	3.33	\$19,074	\$27,526
2”	676	84,485	5.33	\$30,530	\$44,058
3”	34	212,656	10.00	\$57,279	\$82,660
4”	24	387,872	16.67	\$95,484	\$137,795
6”	5	255,082	33.33	\$190,910	\$275,506
8”	4	2,170,630	53.33	\$305,468	\$440,827
10”	0	0	76.67	\$439,157	\$633,756

### 1.3.2 Wastewater Fund

The Analysis for the Utility’s Wastewater Fund capacity fees results in eight options given four LOS assumptions: using design standards or actual data, and including or excluding loadings. There are also two options for the expansion-related CIP: including the wastewater treatment plant expansion costs and excluding the wastewater treatment plant expansion costs. The combinations of CIP scenarios and LOS options result in eight total options for wastewater capacity fees.

Options 1A, 1B, 1C, and 1D reflect the LOS assumption using actual data, while options 2A, 2B, 2C, and 2D reflect the LOS assumption using design standards. The distinctions among those options beyond the actual data or design standards LOS assumptions are estimating LOS using flow only, or flow and loadings, and including or excluding the wastewater treatment plant expansion capital costs.

After Stantec and Utility staff presented the options to Flagstaff City Council, option 1D was selected. No CIP updates were made to the wastewater fund after option 1D was selected. Table 1-9 below shows all eight wastewater capacity fee options presented to City Council

**Table 1-9: Wastewater Capacity Fee Options**

Level of Service (LOS) Scenario	¾” Residential Meter		2” Commercial Meter	
	<i>Existing Fee</i>	<i>Calculated Fee</i>	<i>Existing Fee</i>	<i>Calculated Fee</i>
<b>LOS – Actual, Flow Only</b>				
1A: No WWTP Expansion	\$3,723	\$4,203	\$19,845	\$22,404
1B: WWTP Expansion	\$3,723	\$4,249	\$19,845	\$22,649
<b>LOS – Actual, Flow + Loadings</b>				
1C: No WWTP Expansion	\$3,723	\$3,824	\$19,845	\$20,383
1D: WWTP Expansion	\$3,723	\$4,086	\$19,845	\$21,780
<b>LOS – Design Standards, Flow Only</b>				
2A: No WWTP Expansion	\$3,723	\$6,861	\$19,845	\$36,572
2B: WWTP Expansion	\$3,723	\$6,937	\$19,845	\$36,977
<b>LOS – Design Standards, Flow + Loadings</b>				
2C: No WWTP Expansion	\$3,723	\$5,785	\$19,845	\$30,836
2D: WWTP Expansion	\$3,723	\$5,866	\$19,845	\$31,268

Under option 1D, the following schedule of capacity fees by meter size would apply for new wastewater connections.

**Table 1-10: Option 1D Capacity Fees by Meter Size After CIP Update**

Meter Size	Existing Fee	ERU Factor	Option 1D
¾"	\$3,723	1.0	\$4,086
1"	\$6,218	1.67	\$6,823
1 ½"	\$12,399	3.33	\$13,605
2"	\$19,845	5.33	\$21,777
3"	\$37,233	10.00	\$40,857
4"	\$72,068	16.67	\$68,108
6"	\$124,099	33.33	\$136,176
8"	\$198,566	53.33	\$217,889
10"	\$285,468	76.67	\$313,249

## 1.4 MISCELLANEOUS FEES UPDATE

Miscellaneous fees are fees for services provided by Water Services staff or Customer Service staff that are not for day-to-day consumption of water or use of wastewater services. These fees typically include meter installation fees, turn on/turn off fees, late fees, permit fees, and scavenger waste charges. Water Services' miscellaneous service fees are found in City Code Sections 7-02-001 and 7-03-001.

Stantec updated the Utility miscellaneous fees in conjunction with City Staff in several steps. Stantec conducted interviews with City staff to identify activities and costs associated with each fee, then populated Stantec’s proprietary cost computation template with information from the interviews. To assist with background for some assumptions, Stantec used information from its recently completed fee studies. Finally, an analysis of the cost recovery and financial implications of the updated fees was conducted to propose fees that cover corresponding costs based on City objectives and policies. The following tables present the miscellaneous fee update.

**Table 1-11: Water Meter Installation Fees**

Meter Size	Current Fee	Proposed Fee	Change
3/4"	\$210	\$806	\$596
1"	\$390	\$972	\$582
1 ½"	\$790	\$1,466	\$676
2"	\$940	\$1,703	\$763

**Table 1-12: Service Charges**

Fee Description	Current Fee	Proposed Fee	Change (% Cost Recovery)
Water Service Establishment Fee (Next Business Day)	\$24	\$45	\$21
Water Service Establishment Fee (Same Day Surcharge)	\$65	\$20	\$20 surcharge added to \$45 = \$65
Collection / Non-Payment	\$24	\$45	\$21 (65%)
Existing Meter Testing Rate – Accuracy Test	\$74	\$74	No Change
Backflow Prevention Permit Fee	\$87	\$87	No Change
Backflow Compliance Fee	\$87	\$87	No Change
Malicious Damage	\$150	\$150	No Change



**Table 1-13: Wastewater Miscellaneous Fees**

Fee Description	Current Fee	Proposed Fee	Change (% Cost Recovery)
Industrial Pretreatment Discharge Fee (5-year permit)	\$1,250	\$1,950	\$700 (3%)
Scavenger Wastes – Septage (per 100 gallons)	\$8	\$11	\$3
Scavenger Wastes – Restaurant Grease (per 100 gallons)	\$11	\$11	No Change
Scavenger Wastes – Mud Sump (per 100 gallons)	\$25	\$31	\$6
After Hours Fee for Scavenger Wastes Dumping	\$35	\$146	\$111
Scavenger Wastes Permit	\$24	\$45	\$21 (60%)





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