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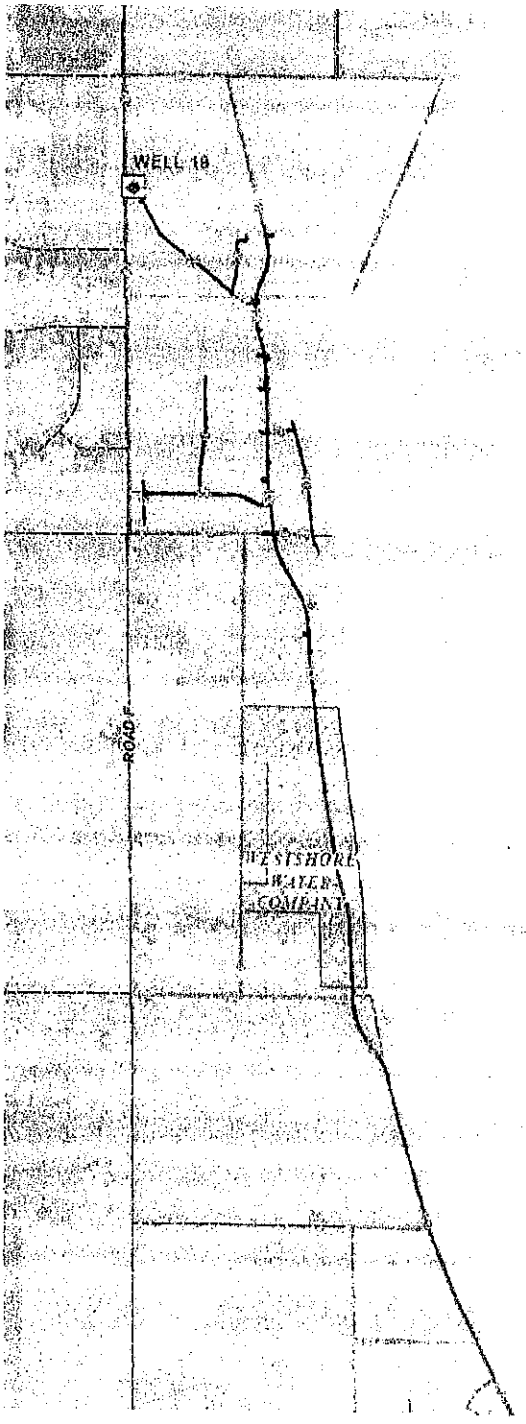
Memorandum

TO: Grant County Planning Department

FROM: Erlandsen

DATE: August 9, 2022

SUBJECT: Moses Lake Water system



Water Rights

The current Moses Lake Water System Plan (WSP) table 2-4 shows that in 2012 the annual city consumption was 9,576 acre-feet and by 2034 that consumption demand would go up to 18,348 acre-feet.

In a quick review of water use in the city and water rights and expected Comprehensive plan Growth expected, the following was found by looking at current City of Moses Lake published documents on water usage:

- The 2021 water use efficiency shows that the city produced a total of 3,083 Million gallons of water = 9,462 ac-ft of water annually.

- The 2021 comprehensive plan estimated population growth within the city limits to the year 2038 to be 11,400 people = 4,560 SFR = 1,788 ac-ft of water annually.

- As mentioned in previous Council meeting testimony and Comprehensive plan suggest the city is adding a minimum 804 ac-ft from transfers.

Table 2-6 of the WSP shows the city has domestic water rights for 25,694 acre-feet yet Ecology adjusted the current water rights to 15,400 acre-feet. Per the city's current WSP that the city has adequate water rights for UGA plat developments.

Based on current use and comprehensive planning out to year 2038 the city of Moses Lake has around 4,154 Acre-Feet of water for domestic use available in the UGA areas.

(14,600 + 804 -9462 – 1,788 = 4,154 Acre-feet)

As part of the Development Agreement, the project will be bringing additional water rights to the table for COML Water system

System Description and Analysis in the Moses Lake Water System Plan:

Moses Pointe area is evaluated as part of the Central pressure zone. Currently, the area has experienced limited development in the lower elevations of the project. Therefore, the Central zone provides adequate pressure and service. Once the development reached 225 ERU's, the Moses Pointee reservoir was to be placed into service. When the reservoir is built the Moses Pointee Booster Pump Station and Well #19 will have a storage facility to pump into and the Moses Pointee area will become a separate pressure zone.

It is our understanding that the city is about to go out to bid on the Moses Pointee water tank project. Our review of the water tank size is based on the tank that was designed in 2017 under ML public works project file A527J. (image below)

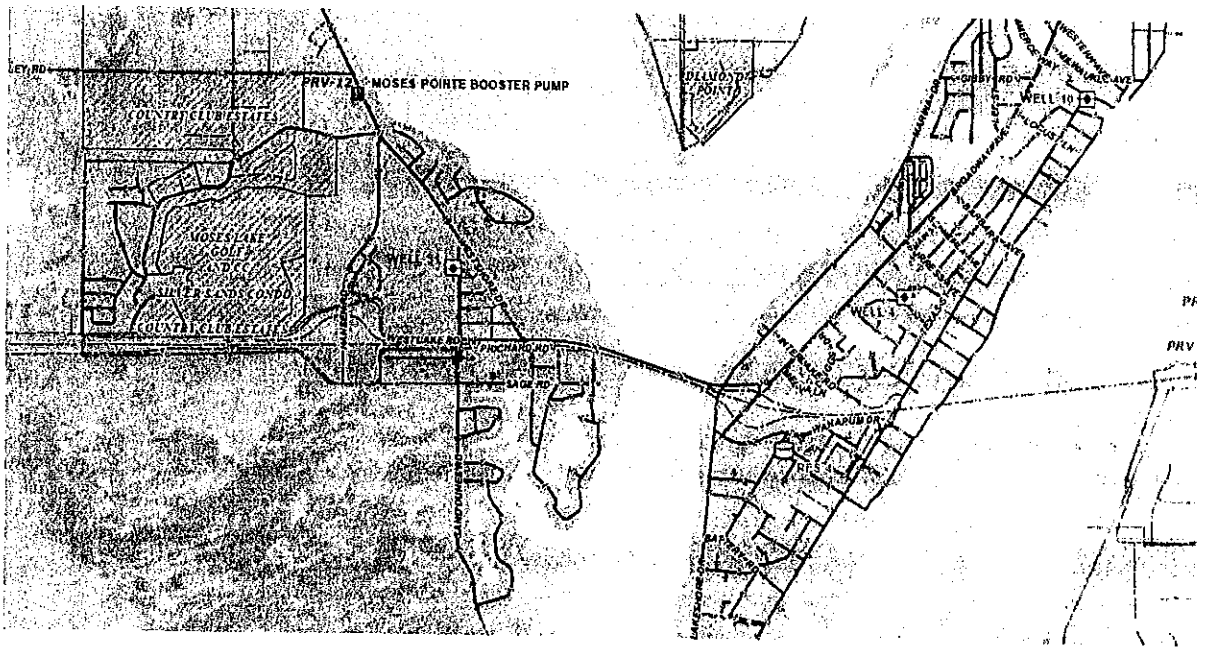
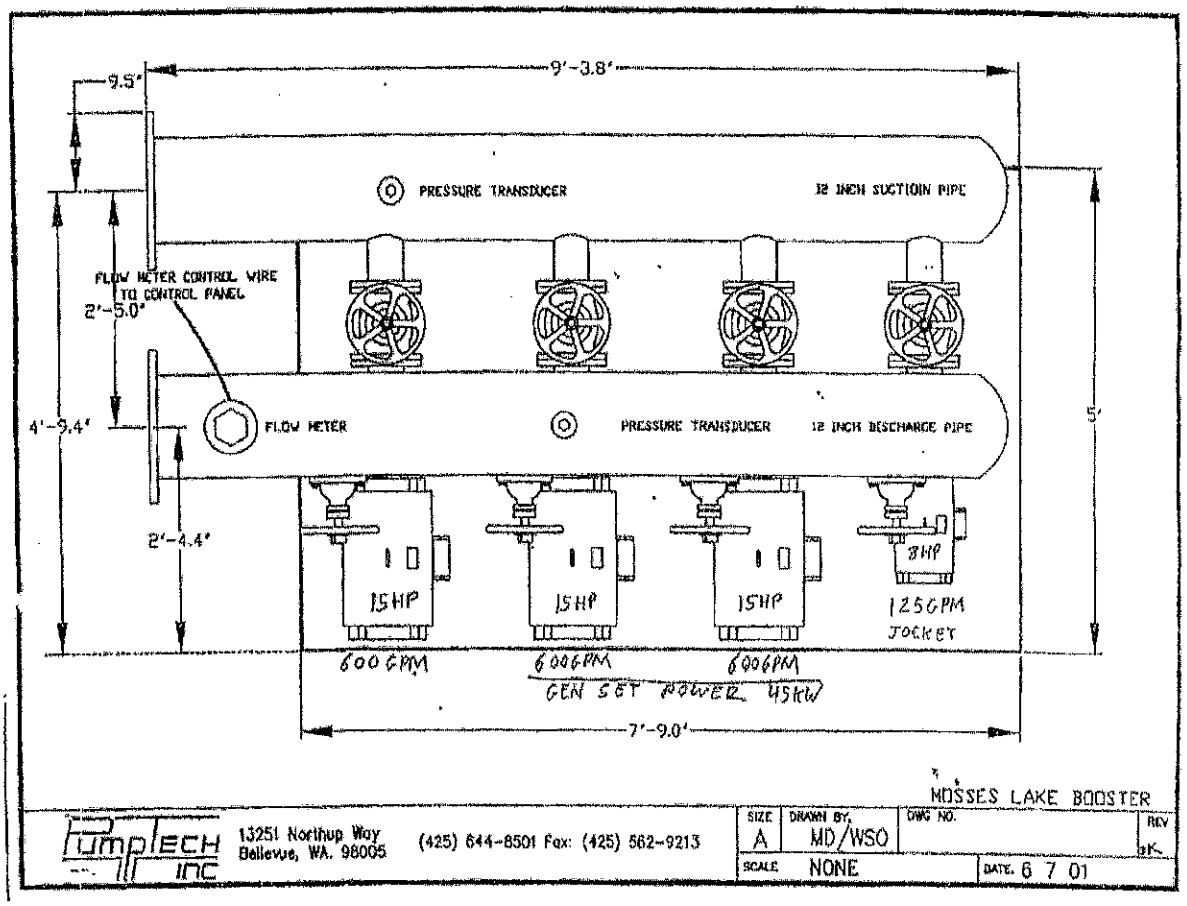


Figure: Moses Pointee Booster Pump Station.



Also part of the Moses Pointee water system is the Moses Pointe Boster Pump. The pump station consists of three 600 gpm 15 hp pumps and one 125 gpm 3 hp jockey pump. Two of the 600 gpm pumps are on a backup generator system. As part of the water tank standby storage calculation, the booster pump can supply 1,200 gpm to the Moses Pointee water system.

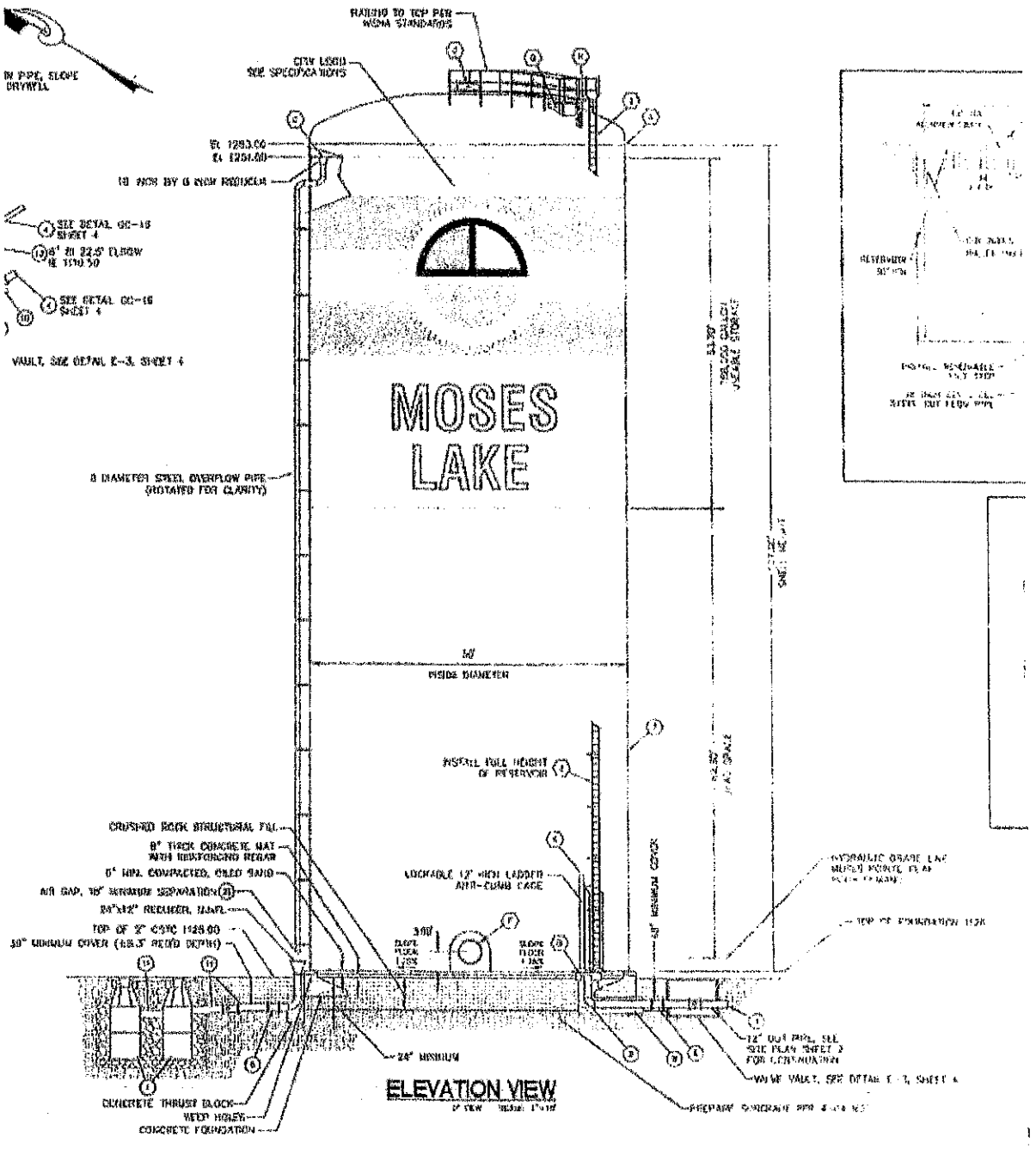


Figure: 2007 Moses Pointee Water tank design drawing.

Urban growth Area north of road 4 Northeast for your review is broken down into the following areas in Table 1

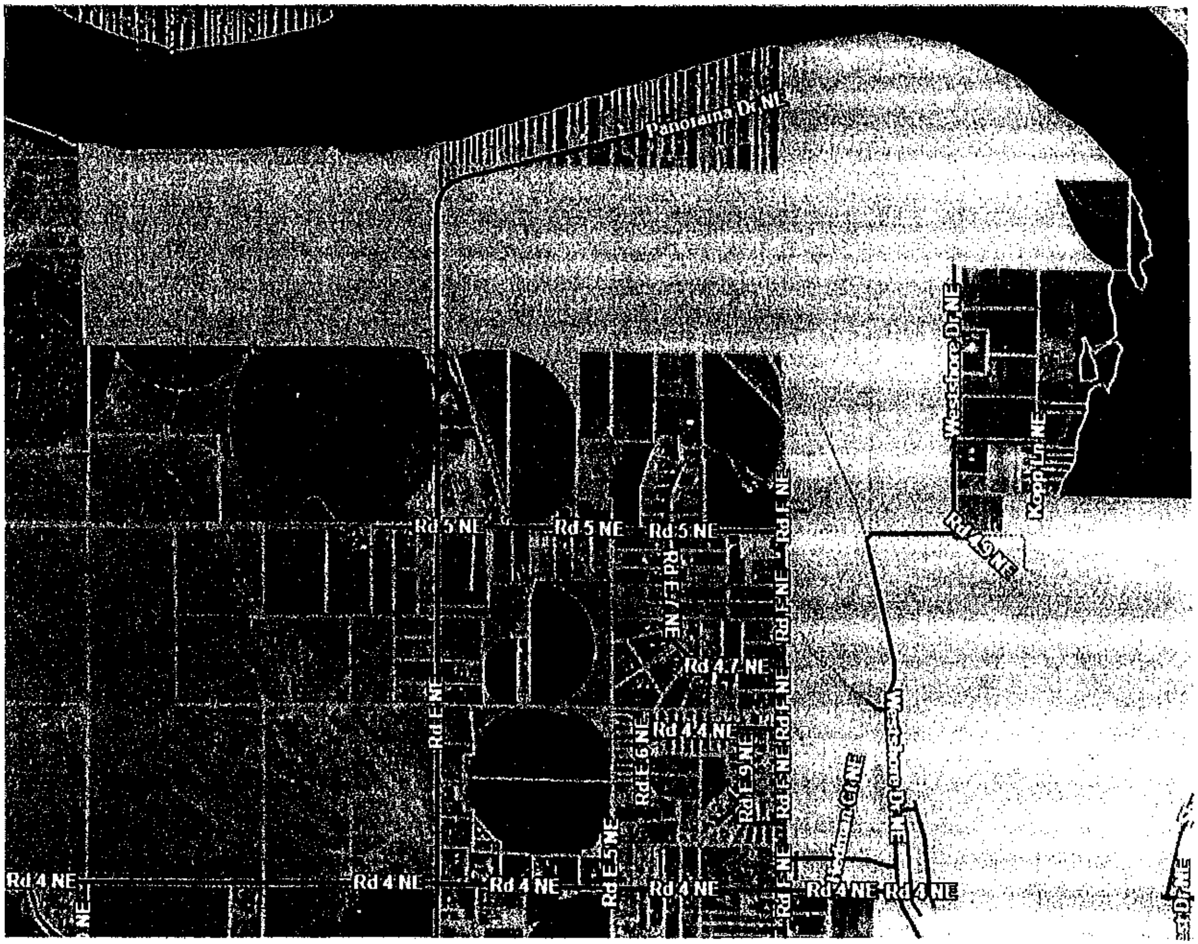
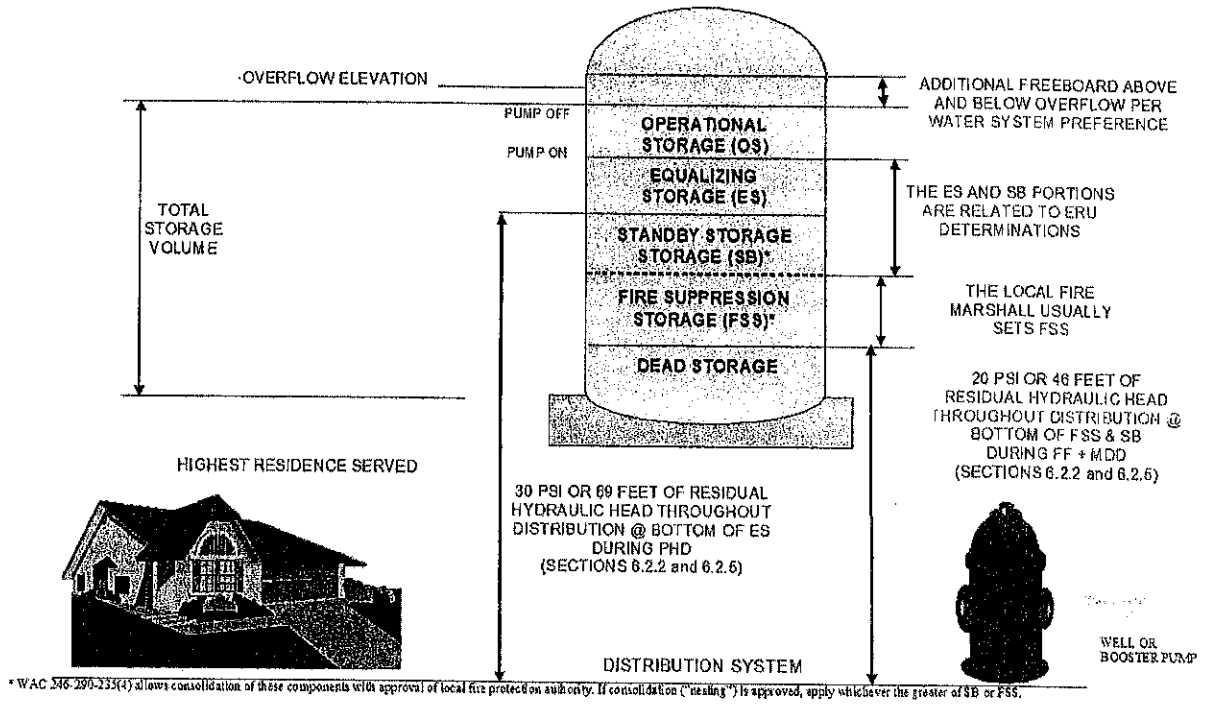


Figure: Mae Valley UGA – purple shade

Table 1

UGA Region	Current Lot #s (SFR Equivalent)	Possible future lot # with allowed density
Lots west of RD F NE	0	2672
Lots east of Paradise Pointe	0	320
Lots in Paradise Pointe Plat UR-3	612	612
Lots in UGA North UR-2	0	3540
Lots south of RD 5 NE	0	380
Moses Pointe UGA	217	641

For the Paradise Pointe plat for zone UR-3 the current build-out at Moses Pointee, the total number of ERUs that will be served is 829. At current Grant County zoning, the full UGA has a total possible density of 6,724 ERUs. For the water tank sizing, we looked at a conservative full building out for Moses Pointe and both Paradise Pointe plats Division 1 and 2 of 3,352 ERUs.



Washington State Water System Design Manual on Standby Storage says:

4.4.3.2 ERUs Based on Standby Storage

Standby storage is a volume of finished water a water system reserves to maintain a certain level of service if one or more permanent or seasonal source of supply becomes partially or completely unavailable for use.

Water systems must provide standby storage in an amount necessary to maintain reliable water service (WAC 246-290-235(3) and WAC 246-290-420). We recommend SB volume equal to the MDD for the pressure zone(s) served (i.e., Td =1 day) and adjust SB volume based on redundant sources and other factors (see Section 7.1.1.3). To satisfy WAC 246-290-235 and -420, we recommend that water systems provide a minimum standby storage volume of 200 gpd per ERU regardless of such factors.

If well 19 were to go down the system can be supplied by the Moses Pointee water system Boster Pump. Two of the 600 gpm pumps are on a back-up generator system. As part of the water tank standby storage calculation the booster pump can supply 1,200 gpm to the moses Pointee water system and thereby no standby storage is required.

The state recommendation at a minimum standby storage of a minimum of 200 gpd per ERU the standby storage would be 670,400 gallons. Based on the 2007 tank design the lowest pressure at Moses Pointee around the tank will be 26 PSI, in the two UGA Paradise Pointe plat would see a minimum pressure of 55 PSI.

Fire storage and Standby can normally be combined in the same area of the tank, especially since the backup booster pumps voids standby storage as a requirement. Planning for 3,000 GPM commercial need fire flow for 3 hours, 540,000 gallons of storage is required. The 2007 tank can provide this with the lowest pressure near the tank being 29 PSI and for the UGA plat the minimum fire pressure would be 59 PSI.

WORKSHEET 4-1
ERU Capacity Summary

Specific Single-Family Residential Connection Criteria (measured or estimated demands)

Average Day Demand (ADD): 350 gpd/ERU Maximum

Day Demand (MDD) 787.5 gpd/ERU

Water System Connections Correlated to ERUs			
Service Classification	**Total MDD for the classification, gpd**	**Total # Connections in the classification**	**ERUs**
Residential			
Single-family	787.5	3352	3352
Multifamily			
Nonresidential			
Industrial			
Commercial			
Governmental			
Agricultural			
Recreational			
Other (specify)			
DSL	400	N/A	
Other (identify)			
Total existing ERUs (Residential + Nonresidential + DSL + Other) = 3352			

Service Capacity as ERUs and Gallons Per Day		
Water System Component (Facility)	**ERU Capacity for Each Component**	**GPD Capacity for Each Component**
Source(s)		
Mae Valley Booster	6,583	2,304,000
Well 19	3,394	1,188,000
Treatment		
Equalizing Storage	3352	337,357
Standby Storage	200	0
Transmission	1700 (@ 5 FPS)	3,400 FPS
Water Rights (Qa and Qi)		825 GPM
Other (specify) Fire Storage	3000 gpm	540,000
Water System Service Capacity (ERUs) = 3352 **(based on the limiting water system component shown above)**		

Notes:

- *Capacity determinations are only for existing facilities that are operational for the water system.*
- *Not shown above are distribution system limitations (Section 4.5.4) on ERUs because these are location-specificwithin the distribution system. These limits not expected to limit the ERU capacity of the entire water system.*

Tank storage Calculations for the 2007 Moses Pointee tank can be found in Appendix A.

Based on those Calculations the tank's Equalizing, standby – fire suppression storage system pressure will be as follows.

The lowest operation pressure at the bottom of the equalizing storage calculations is 44 PSI near the tank, and 73 PSI at the two Paradise Pointe UGA plats. Standby and Fire flow the required minimum pressure is 20 PSI. The system near the tank will see a minimum of 24 PSI at the bottom of the state recommend standby storage, even though not required. Fire flow storage at 3,000 GPM for 3 hours will see a minimum pressure of 28 GPM.

Tank System	Moses Pointe		
1126	Tank Base ELEV	service grades	
125	Tank Height	1122	heighest point
50	Tank Diameter	1053	lowest point
14726.25	Gallons per foot		
1251	Overflow ELEV	service pressures	
1250.5	Operation ELEV		
4	Operation Depth	53.9	low psi
58905	Operation Vol Gal	83.8	high psi
1246.5	Operation Bot ELEV		
337,357	ES Volume Gal		
1246.5	ES top ELEV		
22.91	ES Tank Depth	44.0	low psi
1223.59	ES bottom ELEV	73.8	high psi
0.00	SB Sourse Vol Gal		
0.00	SBtms tank Depth	44.0	low psi
1223.59	Sbtms Bottom ELEV	73.8	high psi
670,400	SB WA Req Vol Gal		
45.52	SBtms tank Depth	24.3	low psi
1178.07	Sbtms Bottom ELEV	54.1	high psi
540,000	FSS Vol Gal		
36.67	FSS tank Depth	28.1	low psi
1186.92	FSS Bottom ELEV	58.0	high psi
1,007,757	Total Tank Stg Vol		
68.43	tank Storage	24.3	low psi
1178.07	Bottom ELEV	54.1	high psi

APPENDIX A

WASHINGTON STATE DEPARTMENT OF HEALTH

CHAPTER 6 WATER SYSTEM TANK STORAGE DESIGN STANDARDS CALCULATIONS

PHYSICAL CAPACITY ANALYSIS
Chapter 6

Largets Lot size	0.1	acres
Number of ERUs	3352	#
GPD per ERU	350	gpd
MDD Factor (range 1.5 -3)	2.25	

Residential demands	WSDM w/ IRR		WSDM w/o IRR
Average Daily Demand (ADD)	350	GPD	200
Maximum Daily Demand (MDD)	787.5	GPD	450
Maximum Month Ave Day (MMAD)	1299.375	GPD	585
Peak Hour Demand (PHD)	3074	GPM	1765

Peak Hour Demand Coef		
ERUs	C	F
15-50	3	0
51-100	2.5	25
101-250	2	75
251-500	1.8	125
>500	1.6	225

Non-Residential demands
Average Daily Demand (ADD)
Maximum Daily Deman (MDD)
Maximum Month Ave Day (MMAD)
Peak Hour Demand (PHD)

Distribution System Leakage

Dist Sys Leakage (DSL)	400	gpd
Persent (DSL)	13%	
Total H2O Produced (TP)	3000	gpd
Auth Consumption (AC)	2600	gpd

Individual Source Capacity
Source 1

Total Vol (Vj)	2,304,000.00	gpd	CENTRAL
Delivery Rate source (Qj)	1600	gpm	
Time flow deliverd (tj)	1440	min	

Source 2

Total Vol (Vj)	1,188,000.00	gpd	WELL 19
Delivery Rate source (Qj)	825	gpm	
Time flow deliverd (tj)	1440	min	

Source 3			
Total Vol (Vj)	0	gpd	
Delivery Rate source (Qj)	0	gpm	
Time flow deliverd (tj)	1440	min	
Total Source Capacity	3,492,000.00	gpd	
ERU Based on ADD			
Number of ERUs (N)	9977	#	
Annual Volume all sources(Va)	1274580000	Gal/yr	
ERU Based on MDD			
Number of ERUs (N)	4434	#	
Total Source Volume per day (Vd)	3492000	Gal/day	
Capacity Based on Storage			
Equalizing Storage (ES)	337,357.03	gal	
Total Pump Source Cap (Qs)	825	gpm	
Number of ERUs (N)	3352	#	Chng C & F
Standby Storage (SBtms)	(1,633,600.00)	gal	With single source down
Average Daily Demand (ADD)	200	gpm	WSDM 4.4.3.2
ERUs	3352	#	
Total Pump Source Cap (Qs)	2425	gpm	
Largest Capacity Source (Ql)	825		
Days of Standby	1	days	
Time well Source pump ™	1440	min	
Total Standby Storage (SBt)	670,400		With all sources down
Standby Storage reliability (Sbi)	200	gal/ERU	
Time SBt is be used	1	days	
Number of ERUs (N)	3352	#	
Total Fire Suppression Storage (FSS)	540,000.00		
Needed Fire Flow (NFF)	3000	gpm	
Duration of (NFF)	3	hours	
Duration of (NFF)	180	min	
System Source Contribution	0	gpm	
Capacity Related Storage (CRS)	1,007,757	gpd	
Max Daily Demand (MMD)	787.5	gpd	
Number of ERUs (N)	4077		

Hot Sheet-Seller/Buyer Information

Address: 4296 Sun Drive , Moses Lake, WA

MLS: 2305934 Contact Name: Alex and Maria

Comments: _____

Closed Date: / /2025 or sooner

Listing/Seller		Sold/Buyer		Completed	
Listing Paperwork		Mutual Acceptance Date		MLS#	
Signed installed		E/M Deposit Date		Cd Turned in to Office	
Photos		Inspection Response Date		Record on Xmas List	
Lock Box Shackle Set up		Septic Pump Date		Send Thank you card	
Sign Removal		Form 17 Sent/Received		Gift Given/Sent	
Notable feature sheet		Water Test		Back up text messages	
Title Company		Buyer Brokage Agreement			
Commission Rate		Title Company			
Set up Showing time					
Upload:	Title report FIRPTA				
Legal Septic Well Info ~ Map	CCR's Notable features				

If Referral is due please fill out below

Company:	Agent:
Address:	City:
Referral Amount:	

Where did lead come from

Referral- In Office	☐	Floor Call	☐
Referral- Other Office	☐	Sign Call	☐
Referral- Personal/Client	☐	Printed Ad	☐
Zillow	☐	Windermere.com	☐
Facebook / Instagram	☐	Networking Group	☐
Personal Lead	☒	Windermere Relo	☐
Past Client	☐	Other FSBO	☐