Civil West Engineering Services, Inc.

486 E Street • Coos Bay, OR 97420 • (541) 266-8601 • Fax (541) 266-8681
609 SW Hurbert Street • Newport, OR 97365 • (541) 264-7040 • Fax (541) 264-7041

·MONTHLY PROJECT STATUS REPORT·

Date: July 2nd, 2015 **Project Number:** 3401-002

Project: City of Yachats – South Tank and Pump Station Water Improvements

Reporting Month: June 2015

Project Manager: Matt Wadlington, P.E.

Narrative of Monthly Progress:

Project kickoff meeting was held on June 8th. Since that time the City was able to procure files from Dyer which saved time by not having to do a preliminary survey. The data from Dyer looks to be very basic topography, but will be good enough for us to design a preliminary road to the tank site.

The preliminary reservoir sizing evaluation has been completed (although the work took place after the cutoff for billing, so it is not billed on the recent invoice). A draft of the evaluation summation is attached to this report for your review.

We have also prepared an evaluation of the access route. That analysis is also attached. Basically, if the hope is to loop the system in that area, which will substantially increase fire flows, the costs are relatively similar. If looping the system in this area is not a concern, then the route up Crest View Drive is the least expensive

Update on Budget Status:

The table below summarizes the Engineering project budget, to date. The table indicates the original budget ("Total Contract Amount column) for each task and the sum total equaling $57,759.00 for Phase 1 and $104,551.00 for Phase 2 and a total of $162,310.00. As shown in the "Total Billed" column, the total engineering costs invoiced toward the contract to date are $4,390.55, or around 3% of the overall budget.

Phase Description	Total Contract Amount	Total Hours Worked	Total Billed	% Complete	Contract Remaining
Phase 1: Preliminary Engineering	$ 57,759.00			8%	$ 53,368.35
1.0 Administration of Site Clearing, Access Rd, and Tree Removal	$ 15,279.00	45.5	4,297.50	28%	$ 10,981.50
2.0 Preliminary Reservoir Sizing Evaluation	$ 12,688.00	0	0.00	0%	$ 12,688.00
3.0 Preliminary Design of Booster Pump Station and PRV Station	$ 4,492.00	0	0.00	0%	$ 4,492.00
4.0 Preliminary Geotech Evaluation and Report	$ 15,815.00	0	0.00	0%	$ 15,815.00
5.0 Preliminary Cost Estimates	$ 2,617.00	0	0.00	0%	$ 2,617.00
6.0 Preliminary Project Schedule	$ 1,100.00	0	0.00	0%	$ 1,100.00
7.0 Preparation of Preliminary Design Technical Memorandum	$ 5,768.00	0	93.15	2%	$ 5,674.85
Phase 2: Final Design and Construction Engineering Services	$ 104,551.00			0%	$ 104,551.00
8.0 Final Engineering Design Services	$ 59,835.00	0	0.00	0%	$ 59,835.00
9.0 Engineering Services During Construction	$ 32,938.00	0	0.00	0%	$ 32,938.00
10.0 Post Construction Engineering Services	$ 11,778.00	0	0.00	0%	$ 11,778.00
Total:	$ 162,310.00	45.50	$ 4,390.65	3%	$ 157,919.35

Update on Project Schedule:

We recognize that the City is starting out a bit behind schedule due to the delay in the Engineer selection process. We will do our best to expedite the process moving forward.

Preview of Upcoming Events (next month +-):

We will have the drive to the tank cleared and soil samples will be taken. While this is going on, we will prepare preliminary tank and booster station design plans.

Additional Notes or Follow Up (if applicable):

Based on concerns raised during the public kickoff meeting, drainage in the tank area is a concern. While we are certain that the tank project will not make the problem worse, if any damage is done downstream, it is likely that they will point their finger up the hill. There are a few options to deal with the flow at the Crest View switchback, but the cost of doing something will not be trivial. We think it's worth the discussion to see if perhaps something can be done to mitigate the concern somewhat.

Civil West
Engineering Services, Inc.
www.civilwest.com

Rogue Valley Office
10558 Hwy 62, Ste. B-1
Eagle Point, OR 97524
541-326-4828

Coos Bay Office
486 'E' Street
Coos Bay, OR 97420
541-266-8601

Albany Office
937-3 Geary Street
Albany, OR 97321
541-266-8601

Newport Office
609 SW Hurbert Street
Newport, OR 97366
541-264-7040

June 24, 2015

Rick McClung
City of Yachats
PO Box 345
Yachats, OR 97498

RE: City of Yachats Treated Water Storage

Dear Rick:

The discussion below is meant as a quick check to confirm the recommended total treated water storage capacity for the City of Yachats.

Total storage capacity for the City should include reserve storage for fire suppression, equalization storage and emergency storage.

Fire Suppression

Fire suppression storage is needed to supply fire flow throughout the water system to fight a major fire. Per the 2010 Oregon Fire Code, the minimum fire-flow requirements and duration requirements are based on the size and occupancy of facilities. For the City of Yachats, because the central commercial area has numerous buildings larger than 6,000 s.f., including the school, we recommend using a target fire flow of 3000 gallons per minute

Based on the table below, from the 2010 Oregon Fire Code, for a target fire flow of 3000 gallons per minute, the required duration is 3 hours.

Fire Flow and Duration Requirements

Required Fire Flows	Required Duration
1,000 gallons per minute or less	1 hour
Between 1,000-2,750 gallons per minute	2 hours
Between 3,000-3,750 gallons per minute	3 hours
4,000 gallons per minute and above	4 hours

A fire flow of 3000 gallons per minute for a period of 3 hours yields a required fire storage volume of 540,000 gallons.

Equalization Storage

Equalization storage is typically set at 20-25% of the Maximum Day Demand (MDD) to balance out the difference between peak demand and supply capacity. Equalization storage typically accounts for the daily rise and fall as storage tank levels fluctuate normally.

Based on data provided by the City, the Average Day Demand (ADD) for the past 12 months was 135,500 gallons per day (gpd). The Maximum Month Demand (MMD) was 171,000 gpd (July

2014). Because meters are not recorded daily, the MDD must be estimated. Standard peaking factors can be used to estimate the peak daily flow. Typical peaking factors between ADD and MDD are between 2.0 and 2.5. For this evaluation a peaking factor of 2.25 will be used. Given the ADD flow of 135,500 gpd, the MDD is calculated at 305,000 gpd.

As described above, the equalization storage should be set at 20-25% of the MDD. 20% of 305,000 gallons is 61,000 gallons. (25% = 76,000 gallons)

Emergency Storage

Emergency storage is required to protect against a total loss of water supply such as would occur with a broken transmission line, an electrical outage, equipment breakdown, or source contamination. Emergency storage should be an adequate volume to supply the system's average daily demand for the duration of a possible emergency. For most systems, emergency storage should be equal to 3 times the average day demand

As calculated above the average day demand (ADD) is 135,500 gallons. This requires a total emergency storage of 406,500 gallons.

The total storage target is therefore the summation of the fire suppression (540,000 gals), equalization (61,000 gals), and emergency (406,500 gals) storage needs. This comes to 1,007,500, or roughly 1 million gallons.

The City currently has a total treated water storage capacity of 1,210,000 gallons, however all of the storage reservoirs are north of the Yachats River Bridge. During a tsunami, or significant seismic event, it is likely that the water main crossing the river could be damaged, leaving the entire southern portion of the city without treated water.

Based on the assumption that roughly 20% of the water is used south of the bridge, equalization and emergency storage requirements can be reduced accordingly. Fire flow, however, should be based on the required fire suppression storage. Because the area south of the Yachats River is primarily residential, a fire flow of 1000 gpm for 2 hours should be provided (as opposed to 3000 gpm for 3 hours for the commercial areas).

Storage Requirement	Amount Required
Fire Suppression	120,000 gallons
Equalization Storage	15,000 gallons
Emergency Storage	81,000 gallons
Total Storage Requirement:	216,000 gallons

Therefore, the proposed 250,000 gallon tank will be adequate to provide for the storage needs of the southern area of the City.

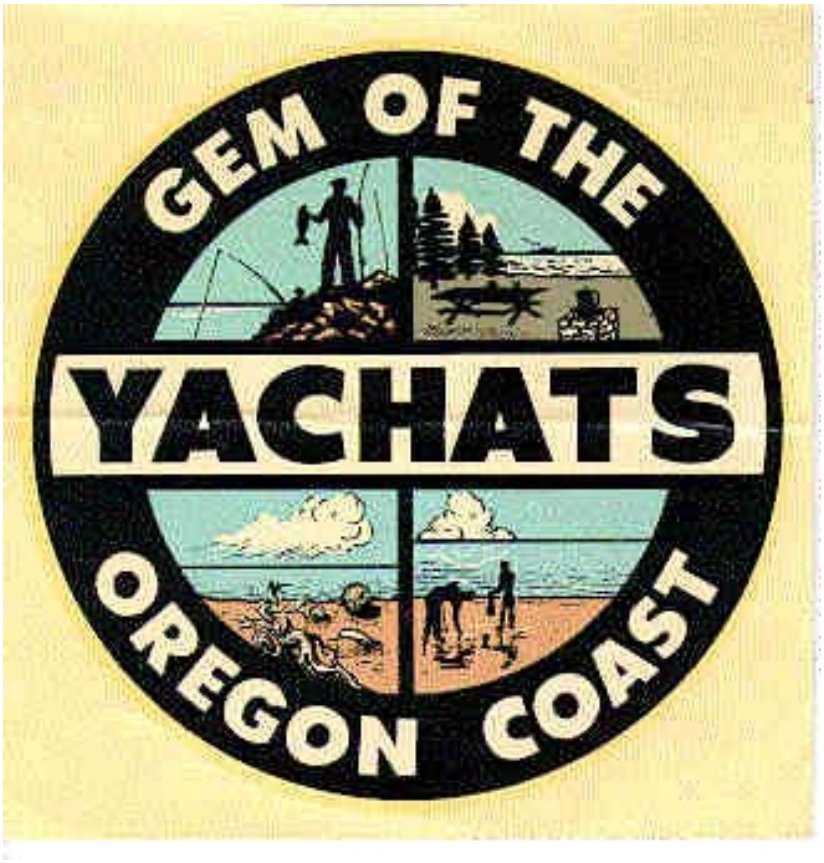
Respectfully,
Civil West Engineering Services, Inc.

Matt Wadlington, P.E.
Project Manager

The City of Yachats

South Tank and Pump Station
Pipline Route Alternatives Analysis
June, 2015

Project No. 3401-002



Prepared By:

Civil West Engineering Services, Inc.

www.civilwest.com

609 SW Hurbert Street • Newport, Oregon 97365 • Ph. 541.264.7040 • Fax 541.264.7041

486 E Street • Coos Bay, Oregon 97420 • Ph. 541.266.8601 • Fax 541.266.8681

10558 Highway 62 Suite B-1 • Eagle Point, Oregon 97524 • Ph. 541.326.4828

1.0 Background

The City of Yachats is planning to construct a new water tank and pump station in the southeast corner of Tax lot 1200, located east of Highway 101, immediately uphill of two residential roadways. The two existing roads that run near the project site are Crestview Drive and Greenhill Drive. Both have the potential to be used to as a route to pipe water to and from the proposed storage tank location. To determine the most cost effective and efficient route to pump water to the tank, four pipeline route alternatives will be analyzed. A description of the four water line route alternatives are discussed below.

1.1.1 Route #1- Greenhill Drive

Option #1 includes placement of a new 8" C900 PVC pipe by open trenching methods from approximately US Hwy 101/ Greenhill Drive, a distance of approximately 750 lf to a steep hill portion at the end of Greenhill Drive. From the end of the road, the pipe will be placed by horizontal directional drill methodology approximately 200 lf to the proposed booster pump location. This option encounters the same obstacles as option #2 and #4, using HDD methods to place the pipeline, but covers the shortest distance of the four options. However, Greenhill Drive is much more narrow a road then Crestview so open trench placement will be more costly. This option will also replace the undersized 2" line that is currently servicing residents on Greenhill Drive, which will fix current pressure issues. See the Route 1- Greenhill Drive cost estimate below:

City of Yachats			Cost Estimate	
South Tank and Pump Station				22-Jun-15
Piping Alternatives Analysis				
Route 1- Greenhill Drive				VAS
Description	**Est. Quantity**	**Unit**	**Unit Amount**	**Total**
General				
Mobilization - Bonds and Insurance	1	ls	$ 13,636	$ 13,636
Construction Facilities and Temporary Controls	1	ls	$ 5,682	$ 5,682
Piping & Appurtenances (5' beyond Booster Station)				
2" Cap and Plug	1	ea	$ 400	$ 400
Cut and Cap Exist'g 2" Waterline	1	ea	$ 500	$ 500
Service Reconnection (Exist'g)	20	ea	$ 250	$ 5,000
8" x 2" Flg Reducer	2	ea	$ 310	$ 620
8" PVC C900 Waterline Class 'B' Backfill	755	lf	$ 55	$ 41,525
8" HDPE Waterline HDD Placement	200	lf	$ 150	$ 30,000
8" Gate Valve	3	ea	$ 1,970	$ 5,910
10" x 8" Hot Tap w/ 8" Gate Valve	1	ea	$ 6,200	$ 6,200
8" HDPE to PVC Transition Flg. Adapter	2	ea	$ 350	$ 700
8" Flg Tee	2	ea	$ 750	$ 1,500
Concrete Anchor Wall	2	ea	$ 825	$ 1,650
Directional Bore Pit	2	ea	$ 1,500	$ 3,000
Ac Patch (2-2" lifts)	100.8	ton	$ 165	$ 16,632
Landscape Restoration	1	ls	$ 909	$ 909
Construction Subtotal				$ 133,864
Contingency				$ 13,386
Total Project Cost				$ 147,251

1.1.2 Route #2- Greenhill Drive and Crestview Drive

This route includes placement of a new 8" C900 PVC waterline by open trench placement from approximately US Hwy 101/ Crestview Drive, a distance of approximately 1200 lf to the proposed booster pump location. It also includes tying into the existing 2" waterline on Greenhill Drive via approximately 200 lf of horizontal directional drilling to loop the system. Like option #1 and #4, using HDD placement is more expensive than traditional open trenching. In addition, this option covers the longest distance of the three options and is therefore the most expensive. Because this option will loop the existing 2" waterline, it will help increase pressure for residents with low pressure on Greenhill Drive. See the Route 2- Greenhill Drive & Crestview Drive cost estimate below:

City of Yachats			Cost Estimate	
South Tank and Pump Station				22-Jun-15
Piping Alternatives Analysis				
Route 2- Greenhill Dr & Crestview Dr				VAS
Description	**Est. Quantity**	**Unit**	**Unit Amount**	**Total**
General				
Mobilization - Bonds and Insurance	1	ls	$ 15,029	$ 15,029
Construction Facilities and Temporary Controls	1	ls	$ 6,262	$ 6,262
Piping & Appurtenances (5' beyond Booster Station)				
8" x 2" Flg Reducer	1	ea	$ 310	$ 310
4" Cap and Plug	1	ea	$ 350	$ 350
8"x 4" Tee	1	ea	$ 650	$ 650
8" PVC C900 Waterline Class 'B' Backfill	1186	lf	$ 45	$ 53,370
8" HDPE Waterline HDD Placement	200	lf	$ 150	$ 30,000
8" Gate Valve	3	ea	$ 1,970	$ 5,910
8" HDPE to PVC Transition Flg. Adapter	2	ea	$ 350	$ 700
8" Flg Tee	1	ea	$ 750	$ 750
10" x 8" Hot Tap w/ 8" Gate Valve	1	ea	$ 6,200	$ 6,200
Concrete Anchor Wall	2	ea	$ 825	$ 1,650
Directional Bore Pit	2	ea	$ 1,500	$ 3,000
Service Reconnections (Exist'g)	15	ea	$ 250	$ 3,750
Gravel Surfacing (3") (Agg Base)	3864	sf	$ 3	$ 11,592
Ac Patch (2-2" lifts)	42.5	ton	$ 165	$ 7,013
Landscape Restoration	1	ls	$ 1,002	$ 1,002
Construction Subtotal				$ 147,538
Contingency				$ 14,754
Total Project Cost				$ 162,292

1.1.3 Route #3- Crestview Drive

This route includes placement of a new 8" C900 PVC waterline by open trench placement from approximately US Hwy 101/ Crestview Drive, a distance of approximately 1200 lf to the proposed booster pump location. This option is longer than option one but does not involve horizontal directional drilling methods, which makes it less expensive. See the Route 3- Crestview Drive cost estimate below:

City of Yachats			Cost Estimate	
South Tank and Pump Station				22-Jun-15
Piping Alternatives Analysis				
Route 3- Crestview Drive				VAS
Description	**Est.**	**Unit**	**Unit**	**Total**
	Quantity		**Amount**	
General				
Mobilization - Bonds and Insurance	1	ls	$ 10,424	$ 10,424
Construction Facilities and Temporary Controls	1	ls	$ 4,343	$ 4,343
Piping & Appurtenances (5' beyond Booster Station)				
4" Cap and Plug	1	ea	$ 350	$ 350
8"x 4" Tee	1	ea	$ 650	$ 650
8" PVC C900 Waterline Class 'B' Backfill	1186	lf	$ 45	$ 53,370
8" Gate Valve	2	ea	$ 1,970	$ 3,940
10" x 8" Hot Tap w/ 8" Gate Valve	1	ea	$ 6,200	$ 6,200
Service Reconnections (Exist'g)	15	ea	$ 250	$ 3,750
Gravel Surfacing (3") (Agg Base)	3864	sf	$ 3	$ 11,592
Ac Patch (2-2" lifts)	42.5	ton	$ 165	$ 7,013
Landscape Restoration	1	ls	$ 695	$ 695
Construction Subtotal				$ 102,326
Contingency				$ 10,233
Total Project Cost				$ 112,559

1.1.4 Route #4- Greenhill Drive with Connection to Crestview Drive

Option #4 includes placement of a new 8" C900 PVC pipe by open trenching methods from approximately US Hwy 101/ Greenhill Drive, a distance of approximately 750 lf to a steep hill portion at the end of Greenhill drive. From the end of the road, the pipe will be placed by horizontal directional drill methodology approximately 200 lf to the proposed booster pump location. Finally, this route includes open trenching an additional 150 lf to the existing 6" waterline along Crestview Drive, which will loop the system. This option encounters the same obstacles as option #1 and #2 using HDD methods to place the pipeline. This option replaces the undersized 2" line on Greenhill Drive and loops the existing 6" line along Crestview Drive, increasing pressure to residents. See the Route 4- Greenhill Drive with Connection to Crestview Drive cost estimate below:

City of Yachats			Cost Estimate	
South Tank and Pump Station				22-Jun-15
Piping Alternatives Analysis				
Route 4- Greenhill Drive with Connection to Crestview Drive				VAS
Description	**Est. Quantity**	**Unit**	**Unit Amount**	**Total**
General				
Mobilization - Bonds and Insurance	1	ls	$ 14,970	$ 14,970
Construction Facilities and Temporary Controls	1	ls	$ 6,237	$ 6,237
Piping & Appurtenances (5' beyond Booster Station)				
2" Cap and Plug	1	ea	$ 400	$ 400
Cut and Cap Exist'g 2" Waterline	1	ea	$ 500	$ 500
Service Reconnection (Exist'g)	20	ea	$ 250	$ 5,000
8" x 2" Flg Reducer	2	ea	$ 310	$ 620
8" x 6" Flg Reducer	1	ea	$ 310	$ 310
8" PVC C900 Waterline Class 'B' Backfill	905	lf	$ 55	$ 49,775
8" HDPE Waterline HDD Placement	200	lf	$ 150	$ 30,000
8" Gate Valve	3	ea	$ 1,970	$ 5,910
10" x 8" Hot Tap w/ 8" Gate Valve	1	ea	$ 6,200	$ 6,200
8" HDPE to PVC Transition Flg. Adapter	2	ea	$ 350	$ 700
8" Flg Tee	3	ea	$ 750	$ 2,250
Concrete Anchor Wall	2	ea	$ 825	$ 1,650
Directional Bore Pit	2	ea	$ 1,500	$ 3,000
Gravel Surfacing (3") (Agg Base)	600	sf	$ 3	$ 1,800
Ac Patch (2-2" lifts)	100.8	ton	$ 165	$ 16,632
Landscape Restoration	1	ls	$ 998	$ 998
Construction Subtotal				$ 146,952
Contingency				$ 14,695
Total Project Cost				$ 161,647