COLUMBIA SNAKE RIVER IRRIGATORS ASSOCIATION

ODESSA NORTH OF I-90 WASHINGTON

PHASE 2 FEASIBILITY ENGINEERING AND COST REPORT

JUNE 14, 2013

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OPTIMIZING WATER RESOURECES THROUGH TECHNOLOGY

Columbia Snake River Irrigators Association
Odessa North Of I-90
Phase 2 Feasibility Engineering & Cost Report

1. Background

IRZ Consulting was tasked by the Columbia Snake River Irrigators Association (CSRIA) with studying the engineering and associated costs of delivering water from the East Low Canal to parcels currently irrigated from deep wells in the Odessa Sub-Area lying north of I-90. The delivery of this water would be provided through the pumping of water through pressurized pipes. A Phase 1 Engineering and Cost Report was prepared and presented to CSRIA and interested land owners. Upon reviewing that report the land owners were approached to see if they would like to proceed with a Phase 2 Feasibility Study. Landowners, irrigating a total of approximately 50,000 acres, agreed to move forward with that study. The following are the results of that study.

2. Process

Following the Phase 1 report, CSRIA contacted all the prospective landowners and determined their interest in the project. Several meetings were held providing the background and process for moving forward with the project. After the final meeting the owners and associated acreages that would be considered under Phase 2 were determined. CSRIA contracted with IRZ Consulting to proceed with the Phase 2 study. This involved refining the cost estimates originally developed for the Phase 1 report and updating the feasibility design and costs based on the refined service area. The Phase 2 cost estimates are still considered feasibility level, although they have been refined.

In Phase 1, it was determined that all currently irrigated acres lying east of the East Low Canal and north of I-90, that could be readily, intuitively and economically served with piped water would be considered under this project. This included a vast majority of the parcels currently being served with Special Service Contracts or deep wells lying within the East Columbia Basin Irrigation District (ECBID) boundary, or that could reasonably be assumed could be included inside the boundary in the future. Parcels that would require a significant amount of pipeline, or small individual pump stations to serve a relatively small acreage were not included.

In Phase 1, 5 new pipeline systems were considered to serve a total of about 75,000 acres. Only 2 pipelines were considered in Phase 2, serving a total area of about 50,000 acres (see Map 1 in Appendix A). The Phase 2 systems are designated as System 1 and System 2 in this report. These systems were determined based on the reduction in the project area following the Phase 1 study. The Phase 2 systems would be similar to Pipelines 2 and 5 in Phase 1, although they would serve some areas included under Pipelines 1, 3 and 4 in Phase 1. Alternative system configurations were considered and it was determined that the 2 systems as presented in Map 1 served the areas effectively and more cost effectively than did other configurations.

Similar procedures were followed for Phase 2 as were used in Phase 1 for determining system size, capacity and costs. The following guidelines were established for Phase 1 and were also used for Phase 2:

A. Delivery points would be located to serve blocks of similar ownership. At the delivery points, individual farm systems would be connected to the main pipeline to receive water for the portion of the property served by that delivery point. Each owner will be responsible for providing pipelines and necessary booster pumps to serve their individual system needs.

B. The area served from each delivery point was based upon adjacency and ownership. The basic delivery volume was based upon 6.5 gpm per acre and a system delivery factor of 75% for most delivery points. Slightly higher delivery factors were used for delivery points serving smaller areas near the ends of pipelines.

C. With the required delivery rates at each delivery point established, the type and size of each section of pipeline could be determined. To facilitate this, a simple hydraulic model of the 2 systems was developed. The criteria used to size the pipelines was the following:

    1. The maximum velocity in the pipes would be maintained between 4 and 6 feet per second.
    2. PVC pipe would be utilized through 48 inch diameter.
    3. Coated and lined steel pipe would be utilized for diameters from 51 through 84 inches.
    4. In Phase 1, if pipelines with diameters greater than 84 inches were required, then similar size parallel pipes would be utilized.
    5. In Phase 2, single steel pipelines up to 108 inches in diameter were considered in place of dual pipelines.
    6. The minimum pressure at each delivery point would be 20 psi.
    7. The minimum allowable pressure at non-delivery high points would be 10 psi.
    8. Digital topographic information was used to establish the elevations for modeling purposes.
    9. The pressure rating of selected PVC pipes was maintained as low as possible.
    10. PVC pipes in certain areas were required to have higher pressure ratings.
    11. The maximum operating pressure for PVC pipe was considered to be 75% of the pressure rating of the pipe.
    12. Inline booster stations were located to maintain low operating pressures while supplying a minimum of 20 psi at all delivery points.

D. With all of the pipelines sized, the model utilized the flows established at each delivery point and the required pressures, as well as the pipeline pressure limits, to assist in locating and sizing the pump stations. Through a number of iterations, optimum pump locations were established and the required capacity, pressure and horsepower at each station were determined. Alternatives have been considered on System 1 including: 4 zones with dual mains, 4 zones with single main and 3 zones with single main. A single alternative was considered for System 2 with a single main. The preferred alternative was utilizing single mains for both systems. The final options considered were Option 3 serving 4 zones in both systems and Option 4 serving zones 1 through 3 on System 1 and all 4 zones on System 2.

E. Given the required volume, pressure and horsepower for each station, a breakdown of a reasonable combination of pumps that would meet those requirements was established. This breakdown is designed to provide flexibility in providing the needs of the system over a fairly broad range of conditions. Associated with that flexibility is the incorporation of at least one variable frequency drive (VFD) at each station. These VFDs will provide the ability to closely match pump capacity to demand.

F. A map showing the layout of the 2 systems is attached as Map 1 in Appendix A

G. With the systems finalized, the estimated costs were determined. The two systems were further subdivided to establish zones for capital and operating cost sharing. It seemed logical to base the zones on the service areas between each pump station. The cost share zones are shown in Map 2 in Appendix A. A breakdown of estimated project capital costs by zone is presented in Tables 1 and 2. The costs for each zone include the proportionate share of the pumps, pipelines and utilities required to deliver water to that zone. Per acre costs are based on the acreage served specifically by each zone, respectively. More detailed summaries of the capital costs for each system are provided in Appendix B. The use of Ground Penetrating Radar aided greatly in determining the need in certain areas for blasting in order to get the trench depth required.

H. The annual energy usage was also calculated. The usage for each pumping station was calculated based on the pumping head, an assumed efficiency, and the estimated annual volume of water pumped. The usage for each area served was calculated based on the portion of water used in that area to the total water pumped through each pumping station serving the area. These calculated energy usage amounts are presented in Appendix B.

Table 1. Estimated Project Capital Costs By System By Zone Option 3

System 1

	Zone 1	Zone 2	Zone 3	Zone 4
Area (Ac)	7,666	7,776	8,407	7,680
Pipelines: Pipe, Apputenances, and Installation	$30,840,000	$43,744,000	$12,471,000	$15,027,000
Pumping Stations: Structures, Pumps, and Panels	$6,091,000	$3,204,000	$1,782,000	$1,308,000
Utilities: Sub-Stations and Transmission Lines	$7,155,000	$675,000	$845,000	$1,440,000
Sub-Total for all Construction	$44,086,000	$47,623,000	$15,098,000	$17,775,000
Contingency @ 15%	$6,612,900	$7,143,450	$2,264,700	$2,666,250
Engineering and Legal @ 5%	$2,204,300	$2,381,150	$754,900	$888,750
Washington Sales Tax @ 8%	$4,232,256	$4,571,808	$1,449,408	$1,706,400
TOTAL	**$57,136,000**	**$61,720,000**	**$19,568,000**	**$23,037,000**
Total Cost per Acre	**$1,812**	**$4,399**	**$5,615**	**$8,615**

System 2

	Zone 1	Zone 2	Zone 3	Zone 4
Area:	6,585	1,891	2,642	6,716
Pipelines: Pipe, Apputenances, and Installation:	$33,287,000	$1,114,000	$9,692,000	$2,942,000
Pumping Stations: Structures, Pumps, and Panels:	$4,480,000	$1,419,000	$341,000	$932,000
Utilities: Sub-Stations and Transmission Lines:	$2,140,000	$65,000	$1,000,000	$130,000
Sub-Total for all Construction:	$39,907,000	$2,598,000	$11,033,000	$4,004,000
Contingency @ 15%	$5,986,050	$389,700	$1,654,950	$600,600
Engineering and Legal @ 5%	$1,995,350	$129,900	$551,650	$200,200
Washington Sales Tax @ 8%	$3,831,072	$249,408	$1,059,168	$384,384
TOTAL:	**$51,719,472**	**$3,367,008**	**$14,298,768**	**$5,189,184**
Total Cost per Acre:	**$2,900**	**$4,681**	**$4,428**	**$5,201**

Note: The total cost for each zone is the actual cost of the system located in that zone.
The cost per acre for each zone is the prorated system cost up to and including that zone.

Table 2. Estimated Project Capital Costs By System By Zone Option 4

System 1

	Zone 1	Zone 2	Zone 3
Area (Ac):	7,666	7,776	8,407
Pipelines: Pipe, Apputenances, and Installation:	$24,126,000	$30,362,000	$7,848,000
Pumping Stations: Structures, Pumps, and Panels:	$5,107,000	$2,610,000	$1,380,000
Utilities: Sub-Stations and Transmission Lines:	$6,980,000	$675,000	$1,020,000
Sub-Total for all Construction	$36,213,000	$33,647,000	$10,248,000
Contingency @ 15%	$5,431,950	$5,047,050	$1,537,200
Engineering and Legal @ 5%	$1,810,650	$1,682,350	$512,400
Washington Sales Tax @ 8%	$3,476,448	$3,230,112	$983,808
TOTAL:	**$46,933,000**	**$43,607,000**	**$13,282,000**
Total Cost per Acre:	**$1,968**	**$4,663**	**$6,242**

System 2

	Zone 1	Zone 2	Zone 3	Zone 4
Area:	6,585	1,891	2,642	6,716
Pipelines: Pipe, Apputenances, and Installation:	$33,287,000	$1,114,000	$9,692,000	$2,942,000
Pumping Stations: Structures, Pumps, and Panels:	$4,480,000	$1,419,000	$341,000	$932,000
Utilities: Sub-Stations and Transmission Lines:	$2,140,000	$65,000	$1,000,000	$130,000
Sub-Total for all Construction	$39,907,000	$2,598,000	$11,033,000	$4,004,000
Contingency @ 15%	$5,986,050	$389,700	$1,654,950	$600,600
Engineering and Legal @ 5%	$1,995,350	$129,900	$551,650	$200,200
Washington Sales Tax @ 8%	$3,831,072	$249,408	$1,059,168	$384,384
TOTAL:	**$51,720,000**	**$3,368,000**	**$14,299,000**	**$5,190,000**
Total Cost per Acre:	**$2,900**	**$4,681**	**$4,428**	**$5,201**

Note: The total cost for each zone is the actual cost of the system located in that zone.
The cost per acre for each zone is the prorated system cost up to and including that zone.

Conclusions

The Phase 2 results are significantly different than the Phase 1 results. This is a result of a smaller service area and the location of that area as compared to what was considered in the Phase 1 analysis. The zone cost approach used in Phase 2 was also different than the entire project cost approach of Phase 1. The three systems that were included in Phase 1 that are no longer being considered were much less costly than the two remaining systems considered herein. The zone approach leads to a much higher per acre cost for those zones that are many miles from the canal requiring long pipelines and multiple booster stations.

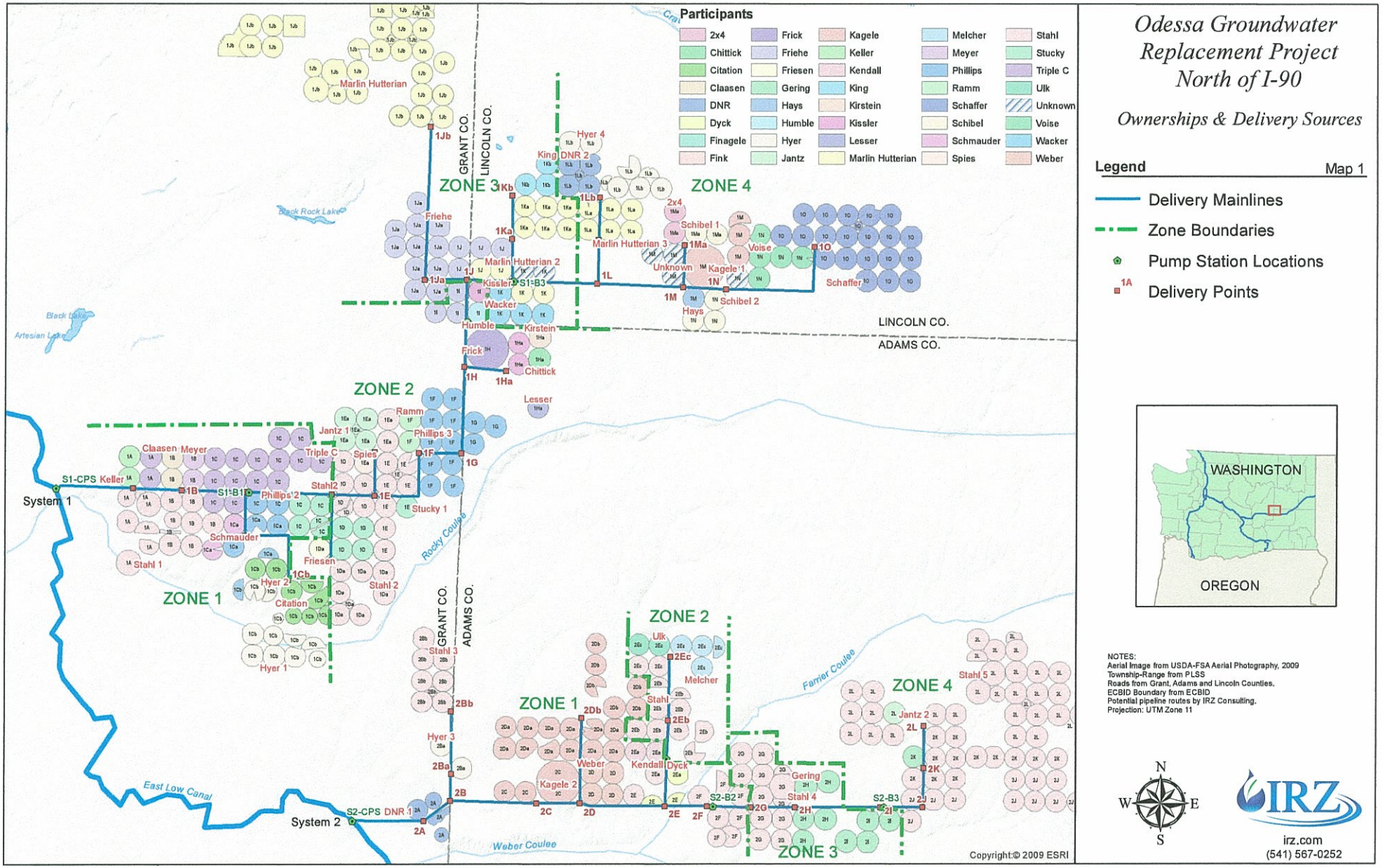
A Phase 3 iteration may be needed as growers determine whether or not they can afford the costs associated with this project as currently proposed. It is more likely that land owners at the ends of the system would opt out than those close to the canal, as the cost for the far zones is greater. If such were the case, the remaining service area would include those fields that are closer to the canal. This, combined with the resulting smaller systems, would likely significantly reduce the project costs.

The project will take a significant amount of time to design and construct. The large steel pipe has a 4 to 5 month lead time for delivery after being ordered. The current project has nearly 50 miles of pipeline trenching to accomplish, with a large portion of that including pipe with diameters greater than 5 feet. If all goes well, construction would start in late 2013 and continue through 2014 with water delivery realistically being available for the 2015 irrigation season.

The next steps in the engineering process would be: First, to get firm commitments from growers and lenders so that the final design can be started. Second, start the design on System 1 including on the ground survey, final pipe and pump sizing and final route selection. Thirdly, work with prospective contractors to finalize the design. Fourth, acquire the right of ways and start construction.

APPENDIX A

Maps



Odessa Groundwater Replacement Project North of I-90

Ownerships & Delivery Sources

Legend Map 1

- Delivery Mainlines
- Zone Boundaries
- Pump Station Locations
- 1A Delivery Points

NOTES:
Aerial Image from USDA-FSA Aerial Photography, 2009
Township-Range from PLSS
Roads from Grant, Adams and Lincoln Counties.
ECBID Boundary from ECBID
Potential pipeline routes by IRZ Consulting.
Projection: UTM Zone 11

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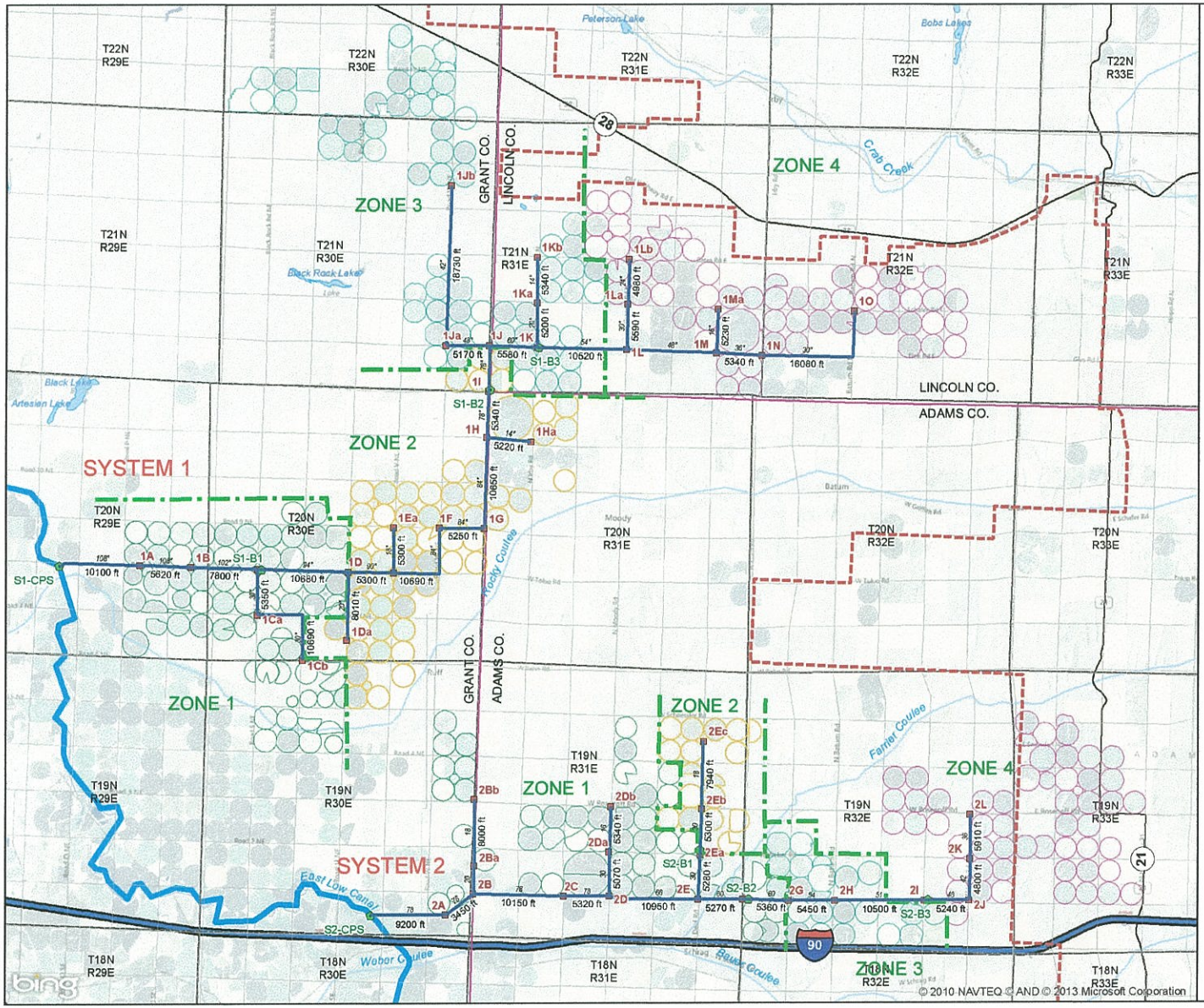

Odessa Groundwater Replacement Project North of I-90

Delivery Pipeline

Legend — Map 2

- Delivery Mainlines
- Zone Boundaries
- Pump Station Locations
- 1A Delivery Points
- Zone 1 Pivots
- Zone 3 Pivots
- Zone 2 Pivots
- Zone 4 Pivots

NOTES:
Aerial Image from USDA-FSA Aerial Photography, 2009
Township-Range from PLSS
Roads from Grant, Adams and Lincoln Counties.
ECBID Boundary from ECBID
Potential pipeline routes by IRZ Consulting.
Projection: UTM Zone 11
Map Date: June, 10 2013

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APPENDIX B

Estimated Capital & Power Costs

CSRIA Odessa North of I-90

Cost Estimates - Option 3 - Zone 1 through Zone 4 in System 1

Estimated Pipe Costs

System 1 — **Area Served:** **31,530 acres**

Size (in)	Description	QTY (feet)	Unit Cost Pipe ($/ft)	Unit Cost Install. ($/ft)	Total Cost Pipe ($)	Total Cost Install. ($)	Total ($)
108	0.300" Wall Steel Pipe	15,720	$624	$411	$9,887,754	$6,460,920	$16,348,674
102	0.390" Wall Steel Pipe	7,800	$525	$384	$4,127,760	$2,995,200	$7,122,960
94	0.360" Wall Steel Pipe	10,680	$447	$349	$4,812,152	$3,727,320	$8,539,472
90	.0360" Wall Steel Pipe	5,300	$442	$333	$2,361,341	$1,764,900	$4,126,241
84	0.375" Wall Steel Pipe	26,590	$402	$309	$10,774,693	$8,216,310	$18,991,003
78	0.300" Wall Steel Pipe	10,680	$361	$283	$3,886,324	$3,022,440	$6,908,764
60	0.312" Wall Steel Pipe	5,580	$256	$164	$1,439,908	$915,120	$2,355,028
54	0.250" Wall Steel Pipe	10,520	$229	$147	$2,428,353	$1,546,440	$3,974,793
48	PVC C905 100 PSI Pipe	15,690	$145	$54	$2,293,250	$847,260	$3,140,510
42	PVC C905 125 PSI Pipe	11,300	$119	$47	$1,355,458	$531,100	$1,886,558
42	PVC C905 100 PSI Pipe	7,430	$100	$47	$748,944	$349,210	$1,098,154
36	PVC C905 100 PSI Pipe	5,340	$700	$38	$3,767,904	$202,920	$3,970,824
30	PVC C905 125 PSI Pipe	5,590	$60	$32	$338,083	$178,880	$516,963
30	PVC C905 100 PSI Pipe	32,120	$49	$32	$1,586,471	$1,027,840	$2,614,311
24	PVC C905 100 PSI Pipe	4,980	$31	$25	$155,615	$124,500	$280,115
20	PVC C905 165 PSI Pipe	3,070	$36	$23	$111,404	$70,610	$182,014
20	PVC C905 125 PSI Pipe	2,470	$27	$23	$67,224	$56,810	$124,034
20	PVC C905 100 PSI Pipe	7,670	$22	$23	$170,090	$176,410	$346,500
18	PVC C905 100 PSI Pipe	5,300	$20	$20	$106,848	$106,000	$212,848
16	PVC C905 100 PSI Pipe	5,230	$20	$19	$105,437	$99,370	$204,807
14	PVC C905 100 PSI Pipe	10,560	$15	$17	$159,667	$179,520	$339,187
	108" Pipe Trench Blasting					$450,000	$450,000
114	Paved Rd Crossing 8 NE	80	$1,192	$470	$95,360	$37,600	$132,960
114	Gravel Rd Crossing P NE	80	$1,192	$436	$95,360	$34,880	$130,240
114	Gravel Rd Crossing Q NE	80	$1,192	$436	$95,360	$34,880	$130,240
114	Gravel Rd Crossing S NE	80	$1,192	$436	$95,360	$34,880	$130,240
36	Paved Rd Crossing 8 NE	80	$175	$104	$14,000	$8,320	$22,320
36	Gravel Rd Crossing 7 NE	80	$175	$85	$14,000	$6,800	$20,800
30	Paved Rd Crossing 8 NE	80	$125	$85	$10,000	$6,800	$16,800
30	Gravel Rd Crossing 7 NE	80	$125	$69	$10,000	$5,520	$15,520
96	Paved Rd Crossing U NE	80	$892	$361	$71,360	$28,880	$100,240
90	Gravel Rd Crossing V NE	80	$760	$301	$60,800	$24,080	$84,880
90	Paved Rd Crossing W NE	80	$760	$331	$60,800	$26,480	$87,280
24	Gravel Rd Crossing 9 NE	80	$100	$52	$8,000	$4,160	$12,160
90	Gravel Rd Crossing 9 NE	80	$760	$301	$60,800	$24,080	$84,880
90	Gravel Rd Crossing Griffith Rc	80	$760	$301	$60,800	$24,080	$84,880
90	Gravel Rd Crossing Arlt Rd	80	$760	$301	$60,800	$24,080	$84,880
84	Paved Rd Crossing 12 NE	80	$710	$299	$56,800	$23,920	$80,720
84	Gravel Rd Crossing 13 NE	80	$710	$271	$56,800	$21,680	$78,480
48	Gravel Rd Crossing 15.6 NE	80	$265	$121	$21,200	$9,680	$30,880
72	Gravel Rd Crossing Lesser	80	$615	$215	$49,200	$17,200	$66,400
24	Gravel Rd Crossing Bates E	80	$100	$52	$8,000	$4,160	$12,160
66	Gravel Rd Crossing Graedel	80	$480	$192	$38,400	$15,360	$53,760
30	Gravel Rd Crossing Bates	80	$125	$69	$10,000	$5,520	$15,520
54	Gravel Rd Crossing Farm Rd.	40	$310	$147	$12,400	$5,880	$18,280
48	Gravel Rd Crossing Fink Rd	80	$265	$121	$21,200	$9,680	$30,880
48	Gravel Rd Crossing Kagel	80	$265	$121	$21,200	$9,680	$30,880
36	Paved Rd Crossing Batum	80	$175	$104	$14,000	$8,320	$22,320
36	Gravel Rd Crossing Fink	80	$175	$85	$14,000	$6,800	$20,800
	Pipeline Appurtenances (20% of pipe costs)				$10,136,936	$6,609,816	$16,746,752
				Totals:	**$61,958,000**	**$40,123,000**	**$102,080,000**

CSRIA Odessa North of I-90
Cost Estimates - Option 3 - Zone 1 through Zone 4 in System 1

Estimated Canal Pump Station Costs

Item	Description	QTY	Unit Cost		Total Cost		
			Material ($/Qty)	Install. ($/Qty)	Material ($)	Install. ($)	Total ($)
1	Pump (13700 gpm @ 338 ft) 1500 HP 4160V 1180 RPM	11	$205,000	$13,000	$2,255,000	$143,000	$2,398,000
2	Pump (9100 gpm @ 338 ft) 1000 HP 4160V 1180 RPM	1	$175,000	$10,000	$175,000	$10,000	$185,000
3	Pump (4560 gpm @ 338 ft) 500 HP 4160V 1180 RPM	2	$105,000	$8,000	$210,000	$16,000	$226,000
4	1500 HP VFD 4160V	1	$200,000	$20,000	$200,000	$20,000	$220,000
5	1500 HP Soft Start 4160V	10	$85,000	$15,000	$850,000	$150,000	$1,000,000
6	1000 HP Soft Start 4160V	1	$65,000	$15,000	$65,000	$15,000	$80,000
7	500 HP Soft Start 4160V	2	$40,000	$11,000	$80,000	$22,000	$102,000
8	13700 gpm plumbing	11	$40,000	$20,000	$440,000	$220,000	$660,000
9	9100 gpm plumbing	1	$35,000	$15,000	$35,000	$15,000	$50,000
10	4560 gpm plumbing	2	$25,000	$12,000	$50,000	$24,000	$74,000
11	By-Pass	2	$15,000	$9,000	$30,000	$18,000	$48,000
12	Intake Structure	2	$100,000	$50,000	$200,000	$100,000	$300,000
13	Intake Screens	14	$20,000	$2,000	$280,000	$28,000	$308,000
14	Building and Fence	2	$100,000	$20,000	$200,000	$40,000	$240,000
15	Miscellaneous	2	$100,000		$200,000		$200,000
				Totals:	**$5,270,000**	**$821,000**	**$6,091,000**

Estimated Booster Pump Station #1 Costs

Item	Description	QTY	Unit Cost		Total Cost		
			Material ($/Qty)	Install. ($/Qty)	Material ($)	Install. ($)	Total ($)
1	Pump (15300 gpm @ 207 ft) 1000 HP 4160V 1180 RPM	8	$175,000	$10,000	$1,400,000	$80,000	$1,480,000
2	Pump (7640 gpm @ 207 ft) 500 HP 4160V 1180 RPM	1	$105,000	$7,000	$105,000	$7,000	$112,000
3	Pump (3060 gpm @ 207 ft) 200 HP 4160V 1180 RPM	1	$50,000	$3,000	$50,000	$3,000	$53,000
4	1000 HP VFD 4160V	1	$145,000	$18,000	$145,000	$18,000	$163,000
5	1000 HP Soft Start 4160V	7	$65,000	$15,000	$455,000	$105,000	$560,000
6	500 HP Soft Start 4160V	1	$40,000	$11,000	$40,000	$11,000	$51,000
7	200 HP Soft Start 4160V	1	$20,000	$5,000	$20,000	$5,000	$25,000
8	15300 gpm plumbing	8	$40,000	$20,000	$320,000	$160,000	$480,000
9	7640 gpm plumbing	1	$30,000	$12,000	$30,000	$12,000	$42,000
10	3060 gpm plumbing	1	$18,000	$10,000	$18,000	$10,000	$28,000
11	By-Pass	2	$10,000	$5,000	$20,000	$10,000	$30,000
12	Building and Fence	1	$100,000	$20,000	$100,000	$20,000	$120,000
13	Miscellaneous	1	$60,000		$60,000		$60,000
				Totals:	**$2,763,000**	**$441,000**	**$3,204,000**

CSRIA Odessa North of I-90
Cost Estimates - Option 3 - Zone 1 through Zone 4 in System 1

Estimated Booster Pump Station #2 Costs

Item	Description	QTY	Unit Cost		Total Cost		
			Material ($/Qty)	Install. ($/Qty)	Material ($)	Install. ($)	Total ($)
1	Pump (12163 gpm @ 107 ft) 400 HP 480V 1180 RPM	7	$90,000	$6,000	$630,000	$42,000	$672,000
2	Pump (6080 gpm @ 107 ft) 200 HP 480V 1180 RPM	1	$50,000	$3,000	$50,000	$3,000	$53,000
3	400 HP VFD 480V	1	$70,000	$15,000	$70,000	$15,000	$85,000
4	400 HP Soft Start 480V	6	$35,000	$10,000	$210,000	$60,000	$270,000
5	200 HP Soft Start 480V	1	$25,000	$5,000	$25,000	$5,000	$30,000
6	12160 gpm plumbing	7	$40,000	$20,000	$280,000	$140,000	$420,000
7	6080 gpm plumbing	1	$30,000	$12,000	$30,000	$12,000	$42,000
8	By-Pass	2	$10,000	$5,000	$20,000	$10,000	$30,000
9	Building and Fence	1	$100,000	$20,000	$100,000	$20,000	$120,000
10	Miscellaneous	1	$60,000		$60,000		$60,000
				Totals:	**$1,475,000**	**$307,000**	**$1,782,000**

Estimated Booster Pump Station #3 Costs

Item	Description	QTY	Unit Cost		Total Cost		
			Material ($/Qty)	Install. ($/Qty)	Material ($)	Install. ($)	Total ($)
1	Pump (7500 gpm @ 172 ft) 400 HP 480V 1185 RPM	5	$90,000	$6,000	$450,000	$30,000	$480,000
2	Pump (3750 gpm @ 172 ft) 200 HP 480V 1180 RPM	2	$50,000	$3,000	$100,000	$6,000	$106,000
3	400 HP VFD 480V	1	$70,000	$15,000	$70,000	$15,000	$85,000
4	400 HP Soft Start 480V	4	$35,000	$10,000	$140,000	$40,000	$180,000
5	200 HP Soft Start 480V	2	$25,000	$5,000	$50,000	$10,000	$60,000
6	7500 gpm plumbing	5	$30,000	$12,000	$150,000	$60,000	$210,000
7	3750 gpm plumbing	1	$20,000	$12,000	$20,000	$12,000	$32,000
8	By-Pass	1	$10,000	$5,000	$10,000	$5,000	$15,000
9	Building and Fence	1	$75,000	$15,000	$75,000	$15,000	$90,000
10	Miscellaneous	1	$50,000		$50,000		$50,000
				Totals:	**$1,115,000**	**$193,000**	**$1,308,000**

CSRIA Odessa North of I-90

Cost Estimates - Option 3 - Zone 1 through Zone 4 in System 1

Estimated Utility Costs

Item	Description	QTY	Unit Cost Lump Sum ($/Qty)	Total Cost Lump Sum ($)		Total ($)
1	For Canal Pump Station; New Grant Co. PUD Sub-Station.	1	$3,815,000	$3,815,000		$3,815,000
2	For Canal Pump Station; Build 3 miles of Grant Co. PUD OH 230 kV Transmission.	1	$3,165,000	$3,165,000		$3,165,000
3	For Booster Pump Station 1; Build 4 mile of Grant Co. PUD OH Transmission.	1	$675,000	$675,000		$675,000
4	For Booster Pump Station 2; Rebuild 6 miles of Grant Co. PUD OH Transmission.	1	$845,000	$845,000		$845,000
5	Additional Grant Co. PUD Costs.	1	175000	$175,000		$175,000
6	For Booster Pump Station 3; Upgrade Inland Power and Light Sub-Station.	1	$1,000,000	$1,000,000		$1,000,000
7	For Booster Pump Station 3; Recondition 4 miles of Inland Power and Light OH Transmission.	4	$110,000	$440,000		$440,000
			Totals:	**$10,115,000**		**$10,115,000**
			System 1 Totals:	**$82,696,000**	**$41,885,000**	**$124,580,000**
			Totals per Acre:	**$2,623**	**$1,329**	**$3,952**

CSRIA Odessa North of I-90

Cost Estimates - Option 3 - Zone 1 through Zone 4 in System 1

System 1. Pumping Requirements

Station	TDH (feet)	Capacity (gpm)	Total BHP (hp)	Full Load Demand (kW)
Canal Pump Station	346	154,976	17,000	14,000
Booster Pump Station 1	214	119,998	8,100	6,700
Booster Pump Station 2	107	79,060	2,600	2,200
Booster Pump Station 3	172	37,440	2,000	1,700
		Totals:	**29,700**	**24,600**

System 1. Estimated Annual Energy Usage
By Pumping Station

	Station	TDH (feet)	Station Efficiency (%)	Rate of Usage (kWh/ac-ft)	Area Served Per zone	Area Served (acres)	Annaul Water Application (Ac-ft/Ac)	Volume Pumped (ac-ft)	Energy Usage (kWh)	Energy Use/Acre kWh/Ac
Z1	Canal Pump Station	346	72%	491	7,666	31,530	2.5	78,825	38,740,000	1,229
Z2	Booster Pump Station 1	214	72%	304	7,776	23,864	2.5	59,660	18,135,000	1,989
Z3	Booster Pump Station 2	107	72%	152	8,408	16,088	2.5	40,220	6,113,000	2,369
Z4	Booster Pump Station 3	172	72%	244	7,680	7,680	2.5	19,200	4,691,000	2,979
				Totals:	**31,530**					

CSRIA Odessa North of I-90

Cost Estimates, Option 4 - Zone 1 through Zone 3 in System 1

Estimated Pipe Costs

System 1

Area Served: **23,849 acres**

Size (in)	Description	QTY (feet)	Unit Cost Pipe ($/ft)	Unit Cost Install. ($/ft)	Total Cost Pipe ($)	Total Cost Install. ($)	Total ($)
94	0.375" Wall Steel Pipe	15,719	$440	$349	$6,971,691	$5,485,931	$12,457,622
90	0.375" Wall Steel Pipe	15,720	$441	$333	$6,987,980	$5,234,760	$12,222,740
86	0.300" Wall Steel Pipe	7,800	$413	$315	$3,247,171	$2,457,000	$5,704,171
78	0.300" Wall Steel Pipe	10,680	$361	$283	$3,886,324	$3,022,440	$6,908,764
72	0.390" Wall Steel Pipe	5,300	$325	$258	$1,736,280	$1,367,400	$3,103,680
66	0.360" Wall Steel Pipe	10,690	$292	$184	$3,146,452	$1,966,960	$5,113,412
60	0.312" Wall Steel Pipe	21,240	$256	$164	$5,480,940	$3,483,360	$8,964,300
54	PVC C905 100 PSI Pipe	5,340	$145	$147	$780,494	$784,980	$1,565,474
48	PVC C905 100 PSI Pipe	5,170	$145	$54	$755,647	$279,180	$1,034,827
42	PVC C905 125 PSI Pipe	11,300	$119	$47	$1,355,458	$531,100	$1,886,558
42	PVC C905 100 PSI Pipe	7,430	$100	$47	$748,944	$349,210	$1,098,154
30	PVC C905 100 PSI Pipe	21,620	$49	$32	$1,067,855	$691,840	$1,759,695
20	PVC C905 165 PSI Pipe	3,070	$36	$23	$111,404	$70,610	$182,014
20	PVC C905 125 PSI Pipe	2,470	$27	$23	$67,224	$56,810	$124,034
20	PVC C905 100 PSI Pipe	7,670	$22	$23	$170,090	$176,410	$346,500
18	PVC C905 100 PSI Pipe	5,300	$20	$20	$106,848	$106,000	$212,848
14	PVC C905 100 PSI Pipe	10,560	$15	$17	$159,667	$179,520	$339,187
	94" Pipe trench blasting					$350,000	$350,000
102	Paved Rd Crossing 8 NE	80	$988	$398	$79,040	$31,840	$110,880
102	Gravel Rd Crossing P NE	80	$988	$367	$79,040	$29,360	$108,400
96	Gravel Rd Crossing Q NE	80	$892	$329	$71,360	$26,320	$97,680
90	Gravel Rd Crossing S NE	80	$760	$301	$60,800	$24,080	$84,880
36	Paved Rd Crossing 8 NE	80	$175	$104	$14,000	$8,320	$22,320
36	Gravel Rd Crossing 7 NE	80	$175	$85	$14,000	$6,800	$20,800
30	Paved Rd Crossing 8 NE	80	$125	$85	$10,000	$6,800	$16,800
30	Gravel Rd Crossing 7 NE	80	$125	$69	$10,000	$5,520	$15,520
78	Paved Rd Crossing U NE	80	$660	$271	$52,800	$21,680	$74,480
78	Gravel Rd Crossing V NE	80	$660	$244	$52,800	$19,520	$72,320
78	Paved Rd Crossing W NE	80	$660	$271	$52,800	$21,680	$74,480
24	Gravel Rd Crossing 9 NE	80	$100	$52	$8,000	$4,160	$12,160
72	Gravel Rd Crossing 9 NE	80	$615	$215	$49,200	$17,200	$66,400
66	Gravel Rd Crossing Griffith R	80	$480	$192	$38,400	$15,360	$53,760
66	Gravel Rd Crossing Arlt Rd	80	$480	$192	$38,400	$15,360	$53,760
66	Paved Rd Crossing 12 NE	80	$480	$218	$38,400	$17,440	$55,840
60	Gravel Rd Crossing 13 NE	80	$440	$166	$35,200	$13,280	$48,480
48	Gravel Rd Crossing 15.6 NE	80	$265	$121	$21,200	$9,680	$30,880
36	Gravel Rd Crossing Lesser	80	$175	$85	$14,000	$6,800	$20,800
24	Gravel Rd Crossing Bates E	80	$100	$52	$8,000	$4,160	$12,160
66	Gravel Rd Crossing Graedel	80	$0	$0	$0	$0	$0
30	Gravel Rd Crossing Bates	80	$0	$0	$0	$0	$0
54	Gravel Rd Crossing Farm Rd.	40	$0	$0	$0	$0	$0
48	Gravel Rd Crossing Fink Rd	80	$0	$0	$0	$0	$0
48	Gravel Rd Crossing Kagel	80	$0	$0	$0	$0	$0
36	Paved Rd Crossing Batum	80	$0	$0	$0	$0	$0
36	Gravel Rd Crossing Fink	80	$0	$0	$0	$0	$0
	Pipeline Appurtenances (20% of pipe costs)				$7,356,094	$5,318,702	$12,674,796
				Totals:	**$44,884,000**	**$32,218,000**	**$77,102,000**

CSRIA Odessa North of I-90
Cost Estimates, Option 4 - Zone 1 through Zone 3 in System 1

Estimated Canal Pump Station Costs

Item	Description	QTY	Unit Cost		Total Cost		
			Material ($/Qty)	Install. ($/Qty)	Material ($)	Install. ($)	Total ($)
1	Pump (13600 gpm @ 344 ft) 1500 HP 4160V 1180 RPM	8	$205,000	$13,000	$1,640,000	$104,000	$1,744,000
2	Pump (9100 gpm @ 344 ft) 1000 HP 4160V 1180 RPM	1	$175,000	$10,000	$175,000	$10,000	$185,000
3	Pump (4520 gpm @ 344 ft) 500 HP 4160V 1180 RPM	3	$105,000	$8,000	$315,000	$24,000	$339,000
4	1500 HP VFD 4160V	1	$200,000	$20,000	$200,000	$20,000	$220,000
5	1500 HP Soft Start 4160V	7	$85,000	$15,000	$595,000	$105,000	$700,000
6	1000 HP Soft Start 4160V	1	$65,000	$15,000	$65,000	$15,000	$80,000
7	500 HP Soft Start 4160V	2	$40,000	$11,000	$80,000	$22,000	$102,000
8	13600 gpm plumbing	8	$40,000	$20,000	$320,000	$160,000	$480,000
9	9100 gpm plumbing	1	$35,000	$15,000	$35,000	$15,000	$50,000
10	4560 gpm plumbing	3	$25,000	$12,000	$75,000	$36,000	$111,000
11	By-Pass	2	$15,000	$9,000	$30,000	$18,000	$48,000
12	Intake Structure	2	$100,000	$50,000	$200,000	$100,000	$300,000
13	Intake Screens	14	$20,000	$2,000	$280,000	$28,000	$308,000
14	Building and Fence	2	$100,000	$20,000	$200,000	$40,000	$240,000
15	Miscellaneous	2	$100,000		$200,000		$200,000
				Totals:	**$4,410,000**	**$697,000**	**$5,107,000**

Estimated Booster Pump Station #1 Costs

Item	Description	QTY	Unit Cost		Total Cost		
			Material ($/Qty)	Install. ($/Qty)	Material ($)	Install. ($)	Total ($)
1	Pump (14300 gpm @ 221 ft) 1000 HP 4160V 1180 RPM	5	$175,000	$10,000	$875,000	$50,000	$925,000
2	Pump (7200 gpm @ 221 ft) 500 HP 4160V 1180 RPM	2	$105,000	$7,000	$210,000	$14,000	$224,000
3	Pump (4300 gpm @ 221 ft) 300 HP 4160V 1180 RPM	2	$70,000	$5,000	$140,000	$10,000	$150,000
4	1000 HP VFD 4160V	1	$145,000	$18,000	$145,000	$18,000	$163,000
5	1000 HP Soft Start 4160V	4	$65,000	$15,000	$260,000	$60,000	$320,000
6	500 HP Soft Start 4160V	2	$40,000	$11,000	$80,000	$22,000	$102,000
7	300 HP Soft Start 4160V	2	$30,000	$8,000	$60,000	$16,000	$76,000
8	14800 gpm plumbing	5	$40,000	$20,000	$200,000	$100,000	$300,000
9	7400 gpm plumbing	2	$30,000	$12,000	$60,000	$24,000	$84,000
10	4440 gpm plumbing	2	$18,000	$10,000	$36,000	$20,000	$56,000
11	By-Pass	2	$10,000	$5,000	$20,000	$10,000	$30,000
12	Building and Fence	1	$100,000	$20,000	$100,000	$20,000	$120,000
13	Miscellaneous	1	$60,000		$60,000		$60,000
				Totals:	**$2,246,000**	**$364,000**	**$2,610,000**

CSRIA Odessa North of I-90

Cost Estimates, Option 4 - Zone 1 through Zone 3 in System 1

Estimated Booster Pump Station #2 Costs

Item	Description	QTY	Unit Cost		Total Cost		
			Material ($/Qty)	Install. ($/Qty)	Material ($)	Install. ($)	Total ($)
1	Pump (12163 gpm @ 107 ft) 400 HP 480V 1180 RPM	5	$90,000	$6,000	$450,000	$30,000	$480,000
2	Pump (6080 gpm @ 107 ft) 200 HP 480V 1180 RPM	1	$50,000	$3,000	$50,000	$3,000	$53,000
3	400 HP VFD 480V	1	$70,000	$15,000	$70,000	$15,000	$85,000
4	400 HP Soft Start 480V	4	$35,000	$10,000	$140,000	$40,000	$180,000
5	200 HP Soft Start 480V	1	$25,000	$5,000	$25,000	$5,000	$30,000
6	12160 gpm plumbing	5	$40,000	$20,000	$200,000	$100,000	$300,000
7	6080 gpm plumbing	1	$30,000	$12,000	$30,000	$12,000	$42,000
8	By-Pass	2	$10,000	$5,000	$20,000	$10,000	$30,000
9	Building and Fence	1	$100,000	$20,000	$100,000	$20,000	$120,000
10	Miscellaneous	1	$60,000		$60,000		$60,000
				Totals:	**$1,145,000**	**$235,000**	**$1,380,000**

Estimated Utility Costs

Item	Description	QTY	Unit Cost	Total Cost	
			Lump Sum ($/Qty)	Lump Sum ($)	Total ($)
1	For Canal Pump Station; New Grant Co. PUD Sub-Station.	1	$3,815,000	$3,815,000	$3,815,000
2	For Canal Pump Station; Build 3 miles of Grant Co. PUD OH 230 kV Transmission.	1	$3,165,000	$3,165,000	$3,165,000
3	For Booster Pump Station 1; Build 4 mile of Grant Co. PUD OH Transmission.	1	$675,000	$675,000	$675,000
4	For Booster Pump Station 2; Rebuild 6 miles of Grant Co. PUD OH Transmission.	1	$845,000	$845,000	$845,000
5	Additional Grant Co. PUD Costs.	1	$175,000	$175,000	$175,000
			Totals:	**$8,675,000**	**$8,675,000**
			System 1 Totals:	**$61,360,000**	**$33,514,000** **$94,874,000**
			Totals per Acre:	**$2,573**	**$1,406** **$3,979**

CSRIA Odessa North of I-90
Cost Estimates, Option 4 - Zone 1 through Zone 3 in System 1

System 1. Pumping Requirements

Station	TDH (feet)	Capacity (gpm)	Total BHP (hp)	Full Load Demand (kW)
Canal Pump Station	346	154,976	17,000	14,000
Booster Pump Station 1	214	119,998	8,100	6,700
Booster Pump Station 2	107	79,060	2,600	2,200
Booster Pump Station 3	0	0	0	0
		Totals:	**27,700**	**22,900**

System 1. Estimated Annual Energy Usage
By Pumping Station

	Station	TDH (feet)	Station Efficiency (%)	Rate of Usage (kWh/ac-ft)	Area Served Per zone	Area Served (acres)	Annaul Water Application (Ac-ft/Ac)	Volume Pumped (ac-ft)	Energy Usage (kWh)	Energy Use/Acre kWh/Ac
Z1	Canal Pump Station	346	72%	491	7,175	23,850	2.5	59,625	29,304,000	1,229
Z2	Booster Pump Station 1	214	72%	304	8,267	16,675	2.5	41,688	12,672,000	1,989
Z3	Booster Pump Station 2	107	72%	152	8,408	8,408	2.5	21,020	3,195,000	2,369
				Total:	**23,850**					

CSRIA Odessa North of I-90
Cost Estimates - Phase 2
Estimated Pipe Costs
System 2

Area Served: 17,834 acres

Size	Description	QTY	Unit Cost		Total Cost		
			Pipe	Install.	Pipe	Install.	Total
(in)		(feet)	($/ft)	($/ft)	($)	($)	($)
78	0.375" Wall Steel Pipe	28,120	$361	$283	$10,232,531	$7,957,960	$18,190,491
66	0.312" Wall Steel Pipe	10,950	$292	$184	$3,222,979	$2,014,800	$5,237,779
60	0.312" Wall Steel Pipe	10,630	$256	$164	$2,743,050	$1,743,320	$4,486,370
54	0.250" Wall Steel Pipe	5,450	$229	$147	$1,258,034	$801,150	$2,059,184
51	0.250" Wall Steel Pipe	10,500	$206	$138	$2,180,304	$1,449,000	$3,629,304
48	PVC C905 100 PSI Pipe	5,240	$145	$54	$765,878	$282,960	$1,048,838
42	PVC C905 100 PSI Pipe	4,800	$100	$47	$483,840	$225,600	$709,440
36	PVC C905 100 PSI Pipe	5,910	$70	$38	$417,010	$224,580	$641,590
30	PVC C905 165 PSI Pipe	5,300	$78	$32	$416,707	$169,600	$586,307
30	PVC C905 125 PSI Pipe	5,280	$60	$32	$319,334	$168,960	$488,294
30	PVC C905 100 PSI Pipe	5,070	$49	$32	$250,417	$162,240	$412,657
20	PVC C905 165 PSI Pipe	3,310	$36	$23	$120,113	$76,130	$196,243
18	PVC C905 100 PSI Pipe	15,940	$20	$20	$321,350	$318,800	$640,150
16	PVC C905 125 PSI Pipe	5,340	$17	$19	$91,506	$101,460	$192,966
84	Gravel Rd Crossing V NE	80	$710	$271	$56,800	$21,680	$78,480
84	Paved Rd Crossing W NE	80	$710	$299	$56,800	$23,920	$80,720
84	Gravel Rd Crossing X NE	80	$710	$271	$56,800	$21,680	$78,480
24	Gravel Rd Crossing Weber	80	$100	$52	$8,000	$4,160	$12,160
24	Paved Rd Crossing Rosenoff	80	$100	$68	$8,000	$5,440	$13,440
84	Gravel Rd Crossing W Heineman	80	$710	$271	$56,800	$21,680	$78,480
84	Gravel Rd Crossing N Moody	80	$710	$271	$56,800	$21,680	$78,480
36	Gravel Rd Crossing Weber	80	$175	$85	$14,000	$6,800	$20,800
24	Paved Rd Crossing Rosenoff	80	$100	$68	$8,000	$5,440	$13,440
36	Gravel Rd Crossing Weber	80	$175	$85	$14,000	$6,800	$20,800
24	Paved Rd Crossing Rosenoff	80	$100	$68	$8,000	$5,440	$13,440
66	Gravel Rd Crossing N Deal	80	$480	$192	$38,400	$15,360	$53,760
66	Coolie Crossing at Heineman Rd	80	$480	$192	$38,400	$15,360	$53,760 *
66	Gravel Rd Crossing Roxboro Dr.	80	$480	$192	$38,400	$15,360	$53,760
60	Gravel Rd Crossing Batum	80	$440	$166	$35,200	$13,280	$48,480
60	Gravel Rd Crossing Damon	80	$440	$166	$35,200	$13,280	$48,480
54	Gravel Rd Crossing Lobe	80	$310	$147	$24,800	$11,760	$36,560
42	Gravel Rd Crossing Weber	80	$205	$104	$16,400	$8,320	$24,720

*Coolie crossing under the basalt have the same estimates as crossing a gravel road.

	Pipeline Appurtenances				$4,564,611	$3,139,312	$7,703,923
				Totals:	**$27,959,000**	**$19,074,000**	**$47,032,000**

CSRIA Odessa North of I-90
Cost Estimates - Phase 2
Estimated Pipe Costs
System 2

Estimated Canal Pump Station Costs

Item	Description	QTY	Unit Cost		Total Cost		
			Material ($/Qty)	Install. ($/Qty)	Material ($)	Install. ($)	Total ($)
1	Pump (8280 gpm @ 307 ft) 800 HP 4160V 1180 RPM	12	$150,000	$10,000	$1,800,000	$120,000	$1,920,000
2	Pump (4140 gpm @ 307 ft) 400 HP 4160V 1180 RPM	1	$90,000	$7,000	$90,000	$7,000	$97,000
3	Pump (2070 gpm @ 307 ft) 200 HP 4160V 1180 RPM	1	$50,000	$5,000	$50,000	$5,000	$55,000
4	800 HP VFD 4160V	1	$120,000	$17,000	$120,000	$17,000	$137,000
5	800 HP Soft Start 4160V	11	$60,000	$13,000	$660,000	$143,000	$803,000
6	400 HP Soft Start 4160V	1	$35,000	$10,000	$35,000	$10,000	$45,000
7	200 HP Soft Start 4160V	1	$25,000	$5,000	$25,000	$5,000	$30,000
8	8280 gpm plumbing	11	$35,000	$15,000	$385,000	$165,000	$550,000
9	4140 gpm plumbing	1	$20,000	$12,000	$20,000	$12,000	$32,000
10	2070 gpm plumbing	1	$13,000	$10,000	$13,000	$10,000	$23,000
11	By-Pass	2	$15,000	$9,000	$30,000	$18,000	$48,000
12	Intake Structure	2	$100,000	$50,000	$200,000	$100,000	$300,000
13	Intake Screens	10	$20,000	$2,000	$200,000	$20,000	$220,000
14	Building and Fence	1	$100,000	$20,000	$100,000	$20,000	$120,000
15	Miscellaneous	1	$100,000		$100,000		$100,000
				Totals:	**$3,828,000**	**$652,000**	**$4,480,000**

Estimated Booster Pump Station #1 Costs

Item	Description	QTY	Unit Cost		Total Cost		
			Material ($/Qty)	Install. ($/Qty)	Material ($)	Install. ($)	Total ($)
1	Pump (9970 gpm @ 123 ft) 400 HP 480V 1180 RPM	5	$90,000	$7,000	$450,000	$35,000	$485,000
2	Pump (4980 gpm @ 123 ft) 200 HP 480V 1180 RPM	2	$50,000	$5,000	$100,000	$10,000	$110,000
3	400 HP VFD 480V	1	$70,000	$15,000	$70,000	$15,000	$85,000
4	400 HP Soft Start 4160V	4	$35,000	$10,000	$140,000	$40,000	$180,000
5	200 HP Soft Start 4160V	2	$25,000	$5,000	$50,000	$10,000	$60,000
6	9970 gpm plumbing	5	$35,000	$15,000	$175,000	$75,000	$250,000
7	4980 gpm plumbing	2	$20,000	$12,000	$40,000	$24,000	$64,000
8	By-Pass	1	$10,000	$5,000	$10,000	$5,000	$15,000
9	Building and Fence	1	$100,000	$20,000	$100,000	$20,000	$120,000
10	Miscellaneous	1	$50,000		$50,000		$50,000
				Totals:	**$1,185,000**	**$234,000**	**$1,419,000**

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System 2

Estimated Booster Pump Station #2 Costs

Item	Description	QTY	Unit Cost		Total Cost		
			Material ($/Qty)	Install. ($/Qty)	Material ($)	Install. ($)	Total ($)
1	Pump (3810 gpm @ 164 ft) 200 HP 480V 1770 RPM	1	$25,000	$1,000	$25,000	$1,000	$26,000
2	Pump (2380 gpm @ 164 ft) 125 HP 480V 1770 RPM	1	$20,000	$1,000	$20,000	$1,000	$21,000
3	Pump (1910 gpm @ 164 ft) 100 HP 480V 1770 RPM	1	$15,000	$1,000	$15,000	$1,000	$16,000
4	200 HP VFD 480V	1	$45,000	$15,000	$45,000	$15,000	$60,000
5	125 HP Soft Start 480V	1	$20,000	$4,000	$20,000	$4,000	$24,000
6	100 HP Soft Start 480V	1	$15,000	$4,000	$15,000	$4,000	$19,000
7	3810 gpm plumbing	1	$20,000	$12,000	$20,000	$12,000	$32,000
8	2380 gpm plumbing	1	$13,000	$10,000	$13,000	$10,000	$23,000
9	1910 gpm plumbing	1	$13,000	$10,000	$13,000	$10,000	$23,000
10	By-Pass	1	$10,000	$5,000	$10,000	$5,000	$15,000
11	Building and Fence	1	$30,000	$5,000	$30,000	$5,000	$35,000
12	Miscellaneous	1	$47,000		$47,000		$47,000
				Totals:	**$273,000**	**$68,000**	**$341,000**

Estimated Booster Pump Station #3 Costs

Item	Description	QTY	Unit Cost		Total Cost		
			Material ($/Qty)	Install. ($/Qty)	Material ($)	Install. ($)	Total ($)
1	Pump (7420 gpm @ 165 ft) 400 HP 480V 1770 RPM	4	$35,000	$2,000	$140,000	$8,000	$148,000
2	Pump (3710 gpm @ 165 ft) 200 HP 480V 1770 RPM	2	$25,000	$1,000	$50,000	$2,000	$52,000
3	400 HP VFD 480V	1	$70,000	$15,000	$70,000	$15,000	$85,000
4	400 HP Soft Start 480V	4	$35,000	$10,000	$140,000	$40,000	$180,000
5	200 HP Soft Start 480V	1	$25,000	$5,000	$25,000	$5,000	$30,000
6	7420 gpm plumbing	4	$30,000	$12,000	$120,000	$48,000	$168,000
7	3710 gpm plumbing	2	$30,000	$12,000	$60,000	$24,000	$84,000
8	2720 gpm plumbing	1	$20,000	$10,000	$20,000	$10,000	$30,000
9	By-Pass	1	$10,000	$5,000	$10,000	$5,000	$15,000
10	Building and Fence	1	$75,000	$15,000	$75,000	$15,000	$90,000
11	Miscellaneous	1	$50,000		$50,000		$50,000
				Totals:	**$760,000**	**$172,000**	**$932,000**

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Estimated Utility Costs

Item	Description	QTY	Unit Cost	Total Cost		
			Lump Sum ($/Qty)	Lump Sum ($)	Install. ($)	Total ($)
1	For Canal Pump Station; New Grant Co. PUD Sub-Station.	1	$1,170,000	$1,170,000		$1,170,000
2	For Canal Pump Station; Build 6 miles of Grant Co. PUD OH Transmission.	1	$970,000	$970,000		$970,000
3	For Booster Pump Station 2; Upgrade Big Bend Electric Sub-Station.	1	$1,000,000	$1,000,000		$1,000,000
4	For Booster Pump Station 1; 1 mile of new Big Bend Electric transmission line.	1	$65,000	$65,000		$65,000
5	For Booster Pump Station 3; 2 mile of new Big Bend Electric transmission line.	2	$65,000	$130,000		$130,000
			Totals:	**$3,335,000**		**$3,335,000**
			System 2 Totals:	**$37,340,000**	**$20,200,000**	**$57,539,000**
			Totals per Acre:	**$2,094**	**$1,133**	**$3,227**

CSRIA Odessa North of I-90
Cost Estimates - Phase 2
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System 2

System 2. Pumping Requirements

Station	TDH (feet)	Capacity (gpm)	Total BHP (hp)	Full Load Demand (kW)
Canal Pump Station	312	90,753	9,000	7,400
Booster Pump Station 1	212	9,219	625	500
Booster Pump Station 2	222	45,620	3,225	2,600
Booster Pump Station 3	103	32,741	1,100	900
		Totals:	**13,950**	**11,400**

System 2. Estimated Annual Energy Usage

By Pumping Station

	Station	TDH (feet)	Station Efficiency (%)	Rate of Usage (kWh/ac-ft)	Area Per Zone	Area Served (acres)	Water Application (Ac-ft/Ac)	Volume Pumped (ac-ft)	Energy Usage (kWh)	Energy Use/Acre kWh/Ac
Z1	Canal Pump Station	312	72%	443	6,585	6,585	2.5	16,463	7,296,000	1,108
Z2	Booster Pump Station 1	212	72%	301	1,891	8,476	2.5	21,190	6,381,000	1,861
Z3	Booster Pump Station 2	222	72%	315	2,642	9,227	2.5	23,068	7,274,000	1,896
Z4	Booster Pump Station 3	103	72%	146	6,716	15,943	2.5	39,858	5,831,000	2,262
				Total:	**17,834**					